

Four Eyes | 1972 | for Apple Records

Confessions of A Multi-Image Maniac

How to Make a Multi-Image Show

Directions and Real-Life Anecdotes

For Audiovisual Aficionados

By Douglas Mesney

File Under: Geriatric Narcissism

Continued from

An Incredible Epic

Volume Ten



Confessions of A Multi-Image Maniac

How to Make a Multi-Image Show

Supplement to

An Incredible Epic

Memoir of A Multi-Image Maestro

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An Incredible Epic is a confabulation[1] based on the circumstances of my life. No part of this book may be used or reproduced without written permission except in the case of brief quotations to be used in critical articles and reviews. The electronic form of this book can in no way, partially or entirely, be copied, reproduced, or forwarded. For exceptions, licenses, permissions, and other information, contact the author: douglas@mesney.com

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The author has researched the information contained in this book to check accuracy.
The opinions expressed in this book are solely based upon the author's own experience.
The author assumes no responsibility for errors and inaccuracies.
Resemblances to persons living or dead may be coincidental.
Some names may not be real.

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[1] In *The Trip to Echo Spring* by Olivia Laing, confabulation is described as "so-called 'honest lying' or false memories." I would add that, we remember (and edit) selectively what we like and repress what we don't. Wikipedia defines the term as: "… a memory error defined as the production of fabricated, distorted, or misinterpreted memories about oneself or the world, without the conscious intention to deceive."

Notes to Reader

- *An Incredible Epic* was started ten years ago, in 2015. It is a work in progress; being expanded and upgraded as new articles and pictures become available. New versions are periodically published. You can see your Edition Number on the title page (iii).

- Volume Nine is filled with pictures that relate to the first six volumes. Volume Eleven has even more, woven into a 1982 treatise called "Confessions of A Multi-Image Maniac"; that is a precursor to *An Incredible Epic* about how to produce multi-image shows. Volume Thirteen, currently in the works, is a 'catch all' for additional material being continually re-discovered in my archives.

- Videos of forty-one Incredible slide shows can be seen on Vimeo (search for 'Mesney') or www.imcredibleimages.com, threaded into an abbreviated biography. Additional shows by other producers have been restored and curated by Steve Michelsen and can be seen at www.youtube.com/@AV_archaeology/videos.

- As the Epic has evolved materially, so too has the refinement of its style(s). Please excuse the small inconsistencies you will encounter. And please don't fret about any spelling errors; they are elusive little buggers; but let me know about them, please.

- The original Epic was split into seven parts when the size of the single volume overwhelmed Microsoft Word (I should have used Adobe InDesign). The index (Volume Eight) could not be split and ceased being updated. Thus, the index is of limited usefulness, covering only the content in the original manuscript – about 80% of Volumes One through Seven.

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[1] Confabulation has been variously described as so-called 'honest lying' or false memories fabricated, distorted, or misinterpreted about oneself or the world, without the conscious intention to deceive. I would add that, we remember (and edit) selectively what we like and repress what we don't.



In memory of these mentors, colleagues, and friends, who departed during the production of *An Incredible Epic*:

Phillip Augustin
Carl Beckman
Kirk Beeler
Wynn 'Kaj' Berry
Max Bjurhem
Gene Butera
John Connolly
Wiley 'Crash' Crockett
Jane Dauber
Hans Falkenhagen
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Peter Grunert
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Glen Tracy
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Randy Will
Mike Yuhas
Constantine Zacharious

With appreciation for their contributions
to my life and well-being.



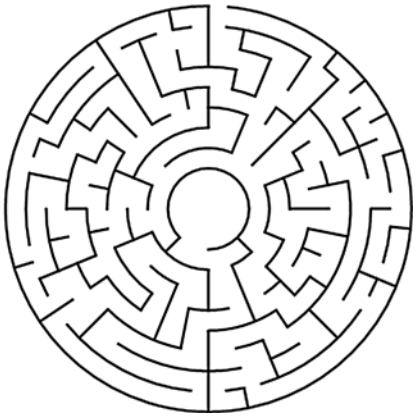
ABOUT THE COVER PICTURE:

By 1972, I was well on my way to a successful career as a professional photographer. By then I had established a recognizable style and was stepping up from conventional photography into the world of "illustrative" photography—creating illustrations with pictures and artwork. You can trace that transition in Volumes Two and Three.



Four Eyes was a repurposed version of *Apple Eye*, made for Apple Records. The quad version created a square picture to fit on the base of a prism that reflected the image to create an invisible mirror effect that was an eye catcher. I made four dozen such prisms; they were Christmas booty for my closest clients, colleagues, and suppliers.

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"You have to go where the story leads you."

Stephen King (PBS interview)

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BACKSTORY

Sandra Sande and I lived in Melbourne, Australia for a year when I got hired by Lindsay Rodda to work at his production company, Sonargraphics. That episode is detailed in Volume Four.

While at Sonargraphics, I wrote the tome that follows: *Confessions of A Multi-Image Maniac.* Why?

Those who have read Volume Four may recall that I was an educator (AVL Institute) as well as a vocal and outspoken advocate of standardized business and production practices (Founder and Chairman of the Business Standards & Practices Committee, for the Association for Multi-Image). Thus, the book was to be an instruction manual about how to make a multi-image show; a sort of cook book, but not for any specific 'dish.' Rather, a chef's book; like Harold McGee's *On Food and Cooking*. Here is what one reviewer had to say about McGee's treatise:

"Hailed by *Time* magazine as "a minor masterpiece" when it first appeared in 1984, *On Food and Cooking* is the bible to which food lovers and professional chefs worldwide turn for an understanding of where our foods come from, what exactly they're made of, and how cooking transforms them into something new and delicious. … Though other books have now been written about kitchen science, *On Food and Cooking* remains unmatched in the accuracy, clarity, and thoroughness of its explanations, and the intriguing way in which it blends science with the historical evolution of foods and cooking techniques." [https://www.goodreads.com/book/show/101255.On_Food_and_Cooking]

I wanted to explain some of the whys and wherefores of the multi-image business; providing anecdotal lessons learned in the 'School of Hard Knocks;' to teach by example. So, after a day's work at Sonargraphics, I cloistered myself in the dining room of our spacious flat on St. Kilda Road and set to work writing *Confessions*.



Photos of Yours Truly by Sandra Sande.



Electronic word processors were new on the scene in 1982. Xerox developed a popular system for business applications; but for multi-image producers the only affordable choice was the *Electric Pencil* program; compatible with AVL's Eagle computer.

Unfortunately, Sonargraphics lacked a spare Eagle; nor had I schlepped mine from Vancouver. Thus, the 500+ pages of *Confessions* were pounded out on an IBM Selectric manual typewriter. The work continued and was completed in Hawaii, where I returned when our Australian visas expired, in December, 1982. The completed 500-page first draft manuscript was bound in two three-ring binders and placed in storage with our other things when Sandra and I went to work at Image Stream in Los Angeles (19830 and then Audio Visual Centrum (AVC) in Stockholm (1984).

1982 cover sketch for *Confessions of a Multi-Image Maniac*.

A decade after closing Incredible Slidemakers (1981) and beginning work on this book, I returned to America from Sweden (1991). Those ten years were tumultuous; the book was largely forgotten; then multi-image became obsolete, replaced by video and PowerPoint. There was no longer a market for *Confessions of a Multi-Image Maniac*.

The two binders sat on my bookshelf for the balance of the next 30 years; by now, totally forgotten—until being rediscovered last year; when I 'found' the two unmarked binders and opened them to see what they were. After an 'Aha' moment, the books were returned to the shelf.

Last September (2022), I decided to read the manuscript; you know, 'just for laughs.' The laugh was on me; I liked what I was reading and decided to tie it in with *An Incredible Epic*; to publish it; for the sake of history, as Volume Eleven.

While reading the book, revisions were made using standard proof-readers marks, done with a red pen (hence the expression, to "red-line" something). Any reader under the age of fifty has likely never even seen a marked-up manuscript, let-alone tried to read it. However, that was what I published; because I have neither the time nor the money to have *Confessions* retyped—that is, input into a word processing program. Also, because the number of people who would read Confessions could be counted with one hand; probably audiovisual historians or, more likely, a handful of still-living multi-image producers from the 1970s and 80s, who remember me. There are also a few out there who, like Steve Michelson, still have working gear. (They tell me film is making a comeback with photographers; maybe slide shows will, too?)

So that is what I did; publish the edited, marked-up, first-draft manuscript. I simply made 'pdfs' of the pages in the binders.

I brought Volume Eleven to the attention of Richard Allison (right). He is researching for a book he intends to write about the history of multi-image in the form of a 'Who's Who' encyclopedia. He and I had recently restored Ken Burke's historical work; that became Volume Ten.

Richard worked out a way of making pdfs of Burke's manuscripts and somehow importing them into Microsoft Word, where they could be reformatted 'better than new.' Of course, Ken was ecstatic to see his work restored; and so was I when Richard volunteered to give *Confessions* the treatment; saying, "I couldn't help myself."

So, for the last few months, Richard has been feeding me ten pages of the first-draft manuscript every day or so, re-typed clean.



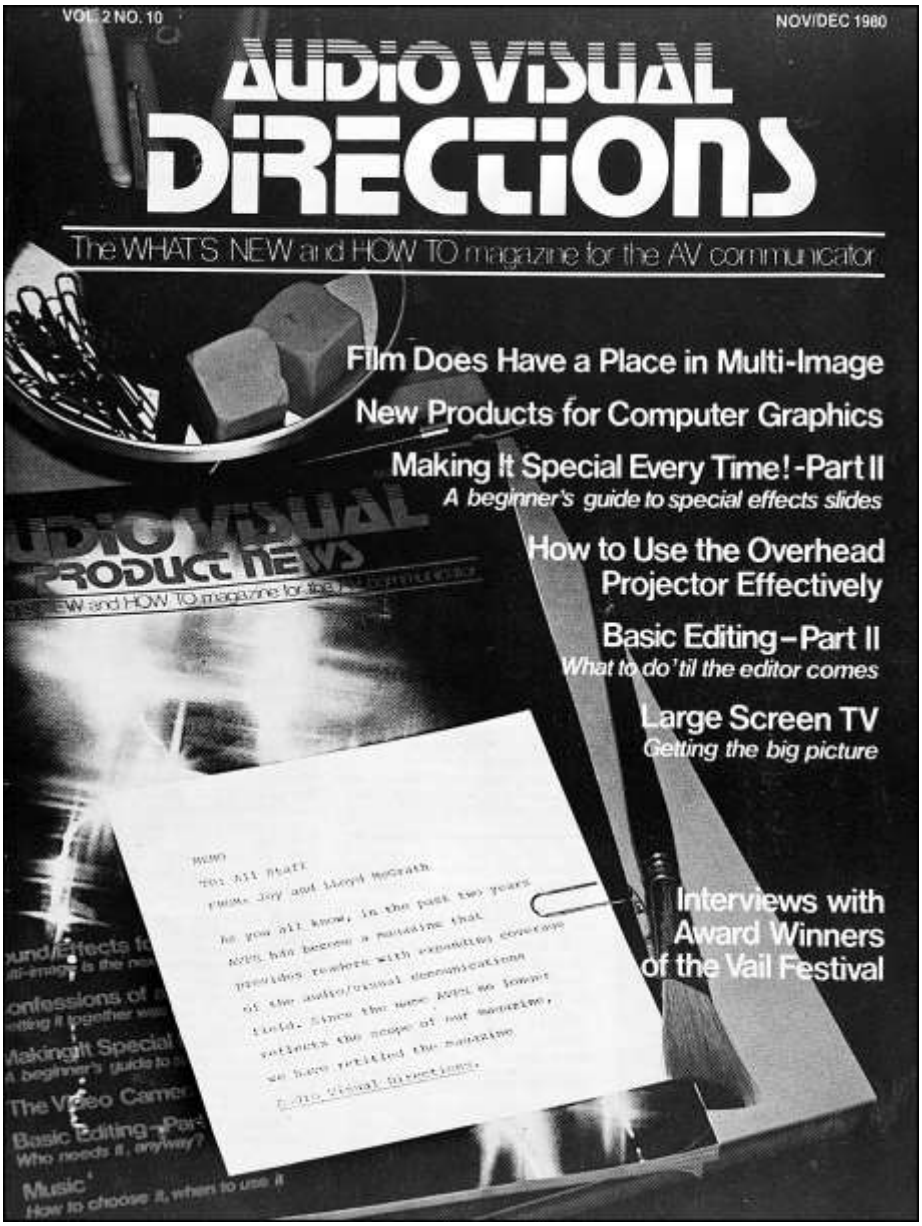
2022 photo of himself courtesy of Richard Allison.

That has been no small task. The edited manuscript was filled with additional notes written in my 'chicken scrawl.' Entire sections were moved around; there were inserts into inserts; sometimes with arrows linking distant pages; in short, a kind of puzzle.

As I received them, I have re-written the book; simplifying the language; adding notes and explanations where necessary; and, of course, adding pictures and illustrations.

Much of the book has to do with photography. Since my company and I were known for 'special effects,' those parts may be of interest to photographers.

I hope you enjoy the book and find it 'useful,' historically speaking.



Joy and Lloyd McGrath came on the multi-image scene in 1978 with a bi-monthly news-letter, *Audio Visual Product News*. Unlike their competitors—Peter Lloyd's *Audio Visual*; Mike Yuhas' *Audio Visual Communications*; and Fred Smith's *Photomethods*—who's contents were more 'editorial,' covering a broad spectrum of industry trends, events, company profiles, and show critiques—AVPN was equipment oriented. It was a low-budget rag that picked-up and printed gear-makers' press releases (if they bought ads). The couple plowed their profits back into their publication and gradually improved it. In the closing months of 1980, AVPN was re-named *Audio Visual Directions*; by then it become a 'real' magazine. Their premier edition (the November/December issue, shown above)) featured an interview with Yours Truly that succinctly extrapolates many of the ideas and opinions in this tome; serving as an introduction.



Doug Mesney taking a moment to feed his pet Eagle, before their busy day. Left to right: Eagle SN # EC 127, Disk Drives SN #'s FD-127, 128, 129, Tower SN # 2-0, Monitor SN # VM 0-127, Keyboard SN # K-00-127 D. Mesney SN # 775 81

A Prolific Profile of Doug Mesney and *The Incredible Slidemakers, Ltd.*
A Multi-Image, Multi-Award Winner

by Nancy Scott

The purpose of the International Multi-Image Festival, as outlined by the Festival committee, is to provide an opportunity for multi-image producers everywhere to gather together in an environment of competitive goodwill to teach, guide, and/or inspire one another in the communications art form that has become multi-image.

Fortunately, the element of competition, although an integral part of the entire awards ceremony, is viewed by most as only a *part* of the festival rather than as the primary focus. Many who attended the festival had no direct involvement with the presentation of the modules and the awards process at all; they were there primarily to learn, to share, and to absorb as much of this medium as possible.

In addition, all of the modules entered in the competition were originally conceived and created as individual audio visual presentations for purposes other than entering the competition. And so, although the competition dictated that there be certain "winners," there were *no* losers. The opportunity for producers to showcase their work, and the fact that it was seen, critiqued *and* appreciated by their peers has its own positive, far-reaching effects.

Nonetheless, the element of competition and the corresponding recognition of high-quality work remains an essential, very valuable part of this industry, and the bestowal of awards a very significant measure of accomplishment. Success builds upon itself, inspires further success, and reaps rewards both spiritual *and* material. Whoever said that "nothing succeeds like success" was undoubtedly a winner.

When we first began our profile of this year's award winners, the one name we heard most often was "The Incredible Slidemakers." Out of 12 entries submitted, they walked away with 11 awards—3 Gold, 7 Silver, and one bronze. They entered productions in every category except the "Religious/Spiritual" and "Education/Academic" and in all three projection formats.

Douglas Mesney, independent producer and founder and president of *The Incredible Slidemakers, Ltd.*, is the primary influence behind the phenomenal creative growth and success of the company. We first approached him for an interview out of a combination of curiosity and sheer amazement. Simply put, we were interested in knowing what accounted for the company's remarkable success. Surely it wasn't the hook of the name, the mere power of suggestion that resulted in work judged by many to be "incredible." (Or maybe it was a matter of their being motivated to *live up* to their name!)

To satisfy our curiosity and find out more about *The Incredible Slidemakers*, we asked Mesney to share some of his "secrets for success," as well as his thoughts on the industry and his involvement in it. Was the success of *The Incredible Slidemakers* due to: a) personal philosophy, b) choice of personnel, c) hard work, d) good luck, or e) none—or all—of the above? We asked him for his comments on the Vail Festival and what advice he might have for others in the industry.

> *"Face it, it's getting harder and harder for us (as producers) to continue experimenting. Sooner or later, we have to be profitable. And if production budgets don't keep up with higher costs of our newer techniques, we'll be forced to go back to more traditional methods . . .Simply put, we won't be able to afford to play the way we do now."*

What follows is his response to all of the above—and a little more. We think you'll find it an insightful look at a very interesting man and a most unusual and inspiring company.

Mesney's entry into the world of audio visuals was, like many of ours, a gradual one, due in part to his other interests and to the slow growth of the medium itself. He remembers that while in high school he had "tremendous scorn, disdain, and indignation for 'audio visualists:'

"As I recall, the scenario went something like this: the teacher (usually the Social Studies teacher) would announce that we were fortunate that day to be able to see a movie or some slides. At his call, a volunteer A/V-type student would wheel in a

An Incredible Epic | © Douglas Mesney 1982-2025

projector and screen the show.

"The A/V-type student was usually some sort of socially retarded youth wearing white socks, pants too short, and a silly grin. After much fidgeting about, he (there was never a she then) would somehow manage to get the show "mostly right." More often than not, the voice on the soundtrack resembled a gagged idiot and was too loud or inaudible, and the picture was usually keystoning out of all perspective considered rational.

"It was, literally, a 'pain' to live through such an experience let alone learn anything . . .except to hate A/V."

While still in his early 20's, Mesney put in a seven-year stint in the advertising business, first as a writer, then as an art director, and finally as an account executive. Although he enjoyed the profession, he wasn't happy with many of the "cut-throat tactics and the fact that key creative decisions were almost always made by 'committee.' I saw too many great ideas diluted to accomodate everyone's egos, and the old adage about a camel being a horse designed by a committee has always stuck with me."

In 1967, Mesney left the agency and opened his own photo studio. From the age of seven, when his grandfather had given him a camera, he had been a photographer. Shooting weddings, bar mitzvahs and portraits of local kids and pets, he had paid his way through high school and college. Returning to photography was "an attempt to regain some sort of creative control."

At that time, he was heavily influenced by "special effects." He admired artists such as Hiro, Silano, Pete Turner and the late Ben Rose. In the process of his own experimentation, he began to veer away from conventional photography, both conceptually and in terms of technique. "Straight shots" became the raw materials for photo-composed montages assembled through strip-ins and retouching. Says Mesney,

"Rarely did I ever do a picture in which reality wasn't in some way altered or augmented. From the start, what I liked about special effects was the ability to create any 'reality' you wanted. My clientelle began to reflect my new techniques. I began to be called on for 'illustrative' rather than 'documentary' photography."

Thus, in 1971, he branched out, adding art direction and graphic design to his list of services. Soon, he was creating entire photo/graphics packages for agency, magazine, and corporate clients, as well as writing, designing, and shooting projects. It wasn't until 1973, when a client requested a slide presentation to go along with a brochure, that he had his first experience with a two-projector audiovisual show . . .and loved it. Once again, he was able to expand his horizons and began pitching other clients on his audio visual capabilities. "Luckily," he recalls, "they liked what they saw, and almost instantly I found myself working on a four-projector show . . .then a six. Within a year, my product mix became almost totally audio visual."

By then, he had hired a couple of assistants and between the three of them, "we dreamt up and built some of the screwiest 'optical bench' and projector 'control' equipment you could imagine." Mesney relates:

"Ironically, the special-effects graphics which we are now primarily known for began as an accident, as did our 'flashy' style.

"One day our rostrum camera went on the fritz: the diaphram stuck open and all the titles came out overexposed—but beautifully overexposed . . .every word was glowing intensely. 'This,' we agreed, 'has possibilities.' From that accidental effect came a radical push to see what other kinds of things we could create if we tried to screw up things intentionally.

"Then, on another occasion, while programming with one of AVL's old punch-tape systems and Mk IV dissolves another freak effect sprang to life. Having diligently punched all the holes necessary for about ten minutes worth of slowly dissolving slides, I was shocked to see about 10 seconds of flashing titles on the screen. I had forgotten to add the holes for the wait times between dissolves . . .but in the process discovered that you could 'fool' the dissolve and have a neat flash effect that wouldn't advance the slides. Presto—flashing, glowing titles."

The rest, as they say, is history. *The Incredible Slidemakers* found an instant market for their new effects, and have continued to create newer and better ones ever since. Mesney claims that their biggest problem is now letting their clients and prospects know that besides being profi-

Space motifs were one of Mesney's earliest special effects, achieved through photo-composed strip-ins and retouching. He applied the techniques to almost every subject he encountered.







cient in special effects, we also do good "straight" work.

Says Mesney, "Now, 14 years since the company's inception, *The Incredible Slidemakers* is a tight little family. I like to think of us as a little guerilla task force able to handle any audiovisual or print promotion project."

Because of Mesney's own negative experiences with large agencies, he has tried to resist the urge to expand and grow. As he views it,

> "In large organizations, *less can be more* when it comes to staff size . . . a concept is built by the same people who created it, not by subordinates responding to a chain of command . . .That goes a long way in keeping ideas and concepts 'pure,' because it avoids dillution."

"Every time I've hired an 'expert' I've been disappointed. Not necessarily by degree of talent . . . more by the inability and/or lack of desire to learn other skills and become 'multi-dimensional.' "

The fact that *The Incredible Slidemakers* has remained small (with a current staff size of 13) is one of the key reasons that Mesney believes the company can experiment, create and is successful in the way it is. Each individual, in fulfilling certain responsibilities, is encouraged to explore and experiment in any way imaginable, and, in the process, the individual effort becomes an integral part of the company effort—to produce the best, most creative result possible, be it one slide or an entire production. Mesney likens the atmosphere at *The Incredible Slidemakers* to an "adult kindergarten:"

> "Each of us is encouraged to 'play' with the medium . . .to experiment. And each is encouraged to learn about what the other team members do.
>
> "For example, we have a fifteen-projector grid in our art department . . .which allows our art director to fool around with a programmer or sound track whenever he wants to.
>
> "Similarly, our audio center, which is primarily geared to signal processing and alteration, is located in our main screening room, which allows our audio director the chance

Another favorite subject was (and is) women and fashion. The nude was done for his own head. The "space ladies" picture was created for one of New York's model agencies as a New Year's card.



An Incredible Epic | © Douglas Mesney 1982-2025



to run the grid while he mixes down.

"Likewise, I sleep with an Eagle . . . there's one in my bedroom so that I can program a dream before I forget it."

In short, there's an attitude of experimentation and comingling of functions that pervades the atmosphere at *The Incredible Slidemakers*."

Throughout our conversation, Mesney often used the term "synergism"* in referring to both the industry and the company's philosophy. Prior to our discussion of the Vail festival, I asked him to expand on this, and on the "unrestricted" atmosphere at *The Incredible Slidemakers*. This kind of playful, creative experimentation seemed at odds with any conventionally-sound business philosophy, and I wondered how this worked from a more "practical" standpoint. Explained Mesney:

"We are in the multi-media business. It's one of the few businesses where the term "synergism" applies in the literal sense. So I consider it vitally important that each of us is professionally multi-dimensional. That allows for a synergistic effect between the people involved in the production of every aspect of a show because each knows something about what others are doing. The creative overlap is 'incredible,' yet the concepts remain pure.

"Then too, traditionally your chances of getting a job at *The Incredible Slidemakers* were always better if you had no audiovisual experience. All you needed was some discernable creative talent, a high degree of motivation, and a personality that would mesh with everyone else's. That allowed for a home-grown species of audiovisualists and permitted each new employee to explore each aspect of the medium to find what he/she liked to do best.

"Every time I've hired an "expert" I've been disappointed. Not necessarily be degree of talent . . . more by the inability and/or lack of desire to learn other skills and become "multi-dimensional." I'd rather take the time to train someone who's naive but fresh, rather than attempt to un-learn and re-educate someone who's set in their ways.

"In any event, adding "raw" talent to a "kindergarten" atmosphere provides a good mix for creativity . . . but a bad mix from a purely business standpoint. Trying to feed the experimental minds of a bunch of a/v loonies (who may not have any idea what they're doing . . . but who have a good idea they want to try to express) doesn't do much for profitability, but adds considerably to the creative bottom line. Experiments and ideas that involve lasers, 360-degree cameras, aerial-imaging multiplexers, and other toys, cost a fortune, do little for pure "profitability," but do everything to keep you sane—assuming you really are a creative person.

"If all this sounds too unbelievable, I emphasize—but it is nonetheless real. Everyone here is here for one reason only: to be able to fulfill their professional creative dreams to the best of *their* abilities.

"It isn't easy to live in a totally unrestricted atmosphere . . . where you have virtually every toy you ever wanted to play with . . . where

"Now, 14 years since the company started, The Incredible Slidemakers is a tight little family. I like to think of us as a little guerilla tactical task force able to handle any audio-visual or print promotion project."

"Part of our corporate philosophy is 'the elimination of all aggravation.' If you don't like it, get rid of it. By doing so, you'll experience more smiles per mile . . . which is very important to your ultimate success."

An Incredible Epic | © Douglas Mesney 1982-2025

various aspects of your show. These judgements can be very valuable in shaping your future directions . . .both from a creative and marketing position.

Last, but not least, I am a firm believer in the concept of Vail, and of AMI, the Association for Multi Image. For years, as we were growing up in this whacko business, we felt alone. We didn't know anyone else in the business and had no idea who or what we were. . . .

"If we are going to succeed, we need standard nomenclature and standard practices, as exist in the TV and motion picture industries . . . We need to be as together and organized as they are. If we don't, we'll never achieve the same degree of customer confidence and credibility."

I support Vail and AMI because, again, synergism is the key to the success of multi-image . . .at every level. Not only can we learn from each other internally, in our own companies, we can also learn from each other collectively, as an industry. By meeting others in the field, talking with them, sharing experiences and knowledge, we will grow more multi-dimensional as individuals . . .and as an industry we will become a tighter, more cohesive, more viable, believable, and marketable communications medium. Simply put, organizations like AMI and festivals like Vail offer us higher levels of professionalism and credibility.

AVD: *What does winning signify?*

Mesney: It's an acknowledgement. Obviously, you can't help feeling good when something like that happens. But there's something more important: it gives you the confidence to put aside what you've done and push onward for even more. That's important for each of us here at *The Incredible Slidemakers* . . .it says to each of us: Look here, you've made it . . .now, what else can we do?

AVD: *What are your comments on the festival?*

Mesney: Well, it's hard to know where to begin. We are such a baby industry, and that was such a big festival.

We learned a lot in 1979. Getting the first festival off the ground was truly an experiment; we learned what worked and what didn't. A lot of people were really upset over some aspects of the affair, but virtually everyone recognized the potential and even more people entered and attended the 1980 event.

I'm sorry that next year's festival won't be at Vail. There was something about having to put up with all the traveling hassles of just getting there . . .and there was also something about having to contend with being in an ice rink, something downright funky. But, the bottom line was that those who got there did so for a reason: they *wanted to be there.* In future years, when it's easier to get to the festival, I'm sure there won't be the *esprit de corps*, the pure hutzpah that existed at Vail in 1980.

AVD: *What advice do you have for other producers?*

Mesney: Avoid trying to make award-winning shows. That's right, avoid *trying.* Make *sure* that every show you produce is a potential award winner: one that provides a new, unique perspective for your client and your audience. But don't bite off more than you can chew.

The key to any show's success is the essential concept behind it and how purely the techniques used in the show reflect that concept. There are million-dollar concepts and "59-cent" items. In any case, to be ultimately successful the product—be it a complete sales meeting, a single show, or a single slide—must have good value for money for the customer and the producer. So it's important that a show's concept not exceed its (profitable) production budget.

In creating a concept it is very important to keep in mind who is producing the show. Sometimes shows are produced by producers, and other times they are produced by clients.

Who, for example, calls the shots? Has the client come up with the idea—in which case you are functioning like a producer's service (like a waiter, taking an order and delivering up a meal). Or did you come up with the idea?

Most clients make bad producers. It's hard enough for those of us who are professional producers to keep up with what's going on technologically. Clients almost invariably are never on top of the situation. They seldom realize the technological possibilities, the intricacies of the production process, or the relative importance of their message(s).

More often than not, client-produced shows are tedious and boring. Clients invariably place too much importance on their messages over and over again when, in reality, it only needed to be said once.

Worse, naive clients can get you into a lot of trouble—by spec'ing visuals that are too difficult to produce in the context of the budget, by not providing sufficient production time, and by imposing a lot of "AA's" (ed. note: author's alterations) as they see the show develop and start changing things they couldn't previsualize and don't like when they finally see them. Shows produced by professional producers are easy to spot—they're almost always tighter, more to the point, and more entertaining.

Right up front you should try to determine who is actually producing the show or event . . .and mold your creative and business decisions to meet the specific needs of every situation. Learn to recognize a bad situation before it happens, and call a spade a spade whenever you need to.

An Incredible Epic | © Douglas Mesney 1982-2025

One display from The Incredible Slidemakers' *Wax Mausoleum, where members of the staff are shown greeting a prospective client. Bottom row left to right: Jim Casey, Doug Mesney, Fred Cannizzaro. Left to right rear: Tim Sali, Doug Sloan, Grace Napoleon, Jon Bromberg, Cathy Howard, Debby Jopling, Nicole Clark, John Leicmon, Rocky Graziano.*



Are you the waiter, or the cook?

The best way to produce a good show is to be happy and confident about the show you are producing. If you are unhappy with the concept, the techniques, the budget, or any other aspect of the production, you will probably not produce an award winner.

In an effort to make money, we all tend to take on "bread & butter" work to help pay the overhead and smooth out the peaks and valleys of our profitability curve. However, sometimes a glut of such jobs can depress you and your staff—in which case it's best to prune.

Part of our corporate philosophy is "the elimination of all aggravation." If you don't like it, get rid of it. By doing so, you'll experience more smiles per mile . . . which is very important to your ultimate success.

Such pruning can be eminently painful. We once turned away a client who in the previous year had spent close to three-fourths of a million dollars under our roof. That hurt like hell, but we survived and our work improved enormously . . .because we were suddenly free from the clutches of dreg work, which bouyed us with renewed feelings of happiness.

Since then we have maintained what we call our "approved client list." Any client who turns out to be an ass promptly goes on the list and everyone knows that if they call we are "too busy."

AVD: *What do you think multi-image will be like in the next five years?*

Mesney: Hard question! A lot depends on what happens in the world economy. We could make a fortune or be out of business in a year.

If, which is mostly likely, things go on much as they have been—inflationary spirals and decreasing dollar value—we are going to be hard-pressed to match video's increasing value-for-money ratio.

Face it, it's getting harder and harder for us (as producers) to continue experimenting. Sooner or later, we have to profitable. And if production budgets don't keep up with the higher costs of our newer techniques, we'll be forced to go back to more traditional methods; and once again, the concept of the show—the packaging of the message—will become of ultimate importance. Simply put: we won't be able to afford to "play" the way we do now.

On the other hand, a *real* economic crunch could be good for us, because we can still produce more effect/affect per dollar than most other communications mediums. However, we must never forget that video is rapidly closing the gap.

"Multi-image, as a concept, will survive . . .but fewer and fewer of the images will be slides. I see us with fifteen video-projector *shows in 1990 . . .maybe even with programmable holograms."*

Part of the answer to keeping multi-image a cost-efficient, effective communications medium will continue to be learning from each other and coming up with standardized nomenclature and methodology.

When you get involved with festivals and the like you learn how different everyone's descriptions and methods are. They make the staging of large events almost impossible, and account for all kinds of lost time just translating from one producer's language to another.

But the real fun starts when you start co-producing with other professionals. Our work with out-of-town producers on special-effects sequences daily reminds us of the need for standardized nomenclature. For example, what we call a glow someone else calls a mist effect, or, what we call a zoom someone else calls a streak. These kinds of differences don't go very far to further our efforts as an industry . . .and they are more confusing to the client than they are for us.

If we are going to succeed, we need standard practices, as exist in the TV and motion picture industries. TV and motion pictures are, ironically, "competitive" media and to compete successfully, we need to be as together and organized as they are. If we don't, we'll never achieve the same degree of customer confidence and credibility. [I say "ironically competitive" because we'll increasingly be using these mediums (TV & movies) in our productions. Already, many multi-image shows are being produced for TV or motion picture transfer . . .we're even beginning to see TV commercials born of programmed slides. I see that trend becoming more and more popular in the future.]

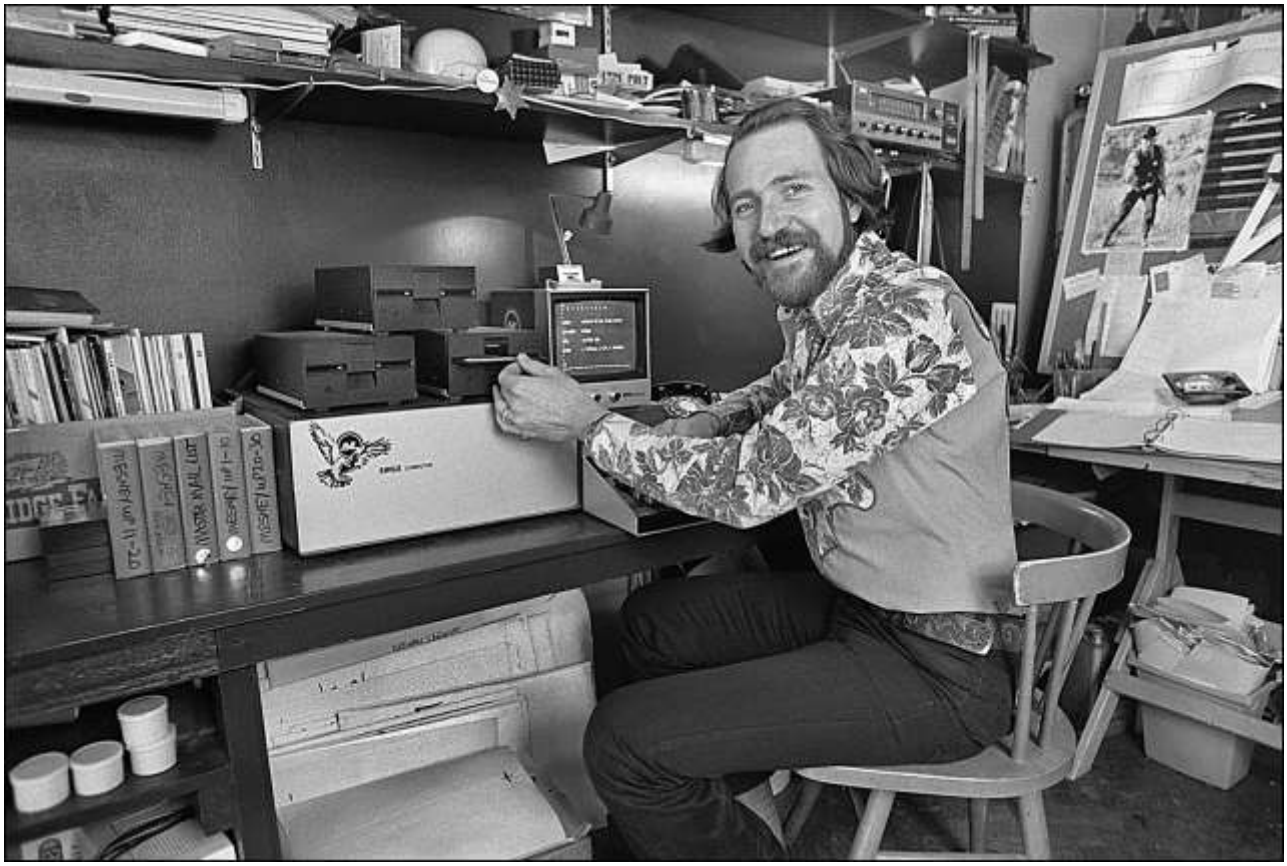
Multi-image must move into *primary* communications—advertising and public relations. We cannot continue to rely on secondary communications exclusively (sales meetings, trade shows, etc.) because the increasing squeeze on the dollar will reduce or wipe out the secondary market. The producer who relies on sales meetings will perish, but the one who encourages TV *might* survive.

Multi-image, as a concept, will survive . . .but fewer and fewer of the images will be slides. I see us with fifteen *video*-projector shows in 1990 . . .maybe even with programmable holograms.

So it is encumbant on all of us to keep up with new technologies . . .learn all we can . . .become organized and experimental . . .and above all, to learn how to cope with the bridging of media that is already occuring.

An Incredible Epic | © Douglas Mesney 1982-2025

PREFACE



Yours Truly in my 4th-floor office at the 73rd Street, NY studio. The AVL Eagle is running *Electric Pencil*; used for writing.

When I first sat down to write this book, I toyed with a Preface; but was dissatisfied with it. At that point, I had only a glimmer of an idea about what the book would contain; no idea what directions it would take; nor what its 'purpose' was. In those early stages, even the 'concept' was a bit tenuous.

Now (1982), with the first draft barely complete, I have a stronger idea of 'why' I have been sitting here för endless hours extolling the whys and wherefores of the multi-image medium.

The first reason is to fill an educational void. I have not seen a book on the market which provides an overall look at the multi-image medium from a variety of perspectives. Usually, specific disciplines are covered in a selective manner. There are books about photography. There are books about audio production. Instructional guides on programing. An infinite array or magazine articles dealing with all phases of multi-image as an art, communications medium, teaching aid and/or business. Likewise. there are endless seminars and trade shows. However, it is virtually impossible for the budding multi-image practitioner to access those countless books, magazine articles, lectures, and seminars; to say nothing of 'digest' them.

Often too, specific books or articles are either too simplistic or too complex. That has been a baffling dilemma for me, writing this book. It is a problem faced by all educators.

Then too, I think that (unfortunately) the multi-image industry has been a little too tight-lipped; it is still a very 'hush-hush,' secretive little industry; where virtually every producer lives in mortal terror that another producer may somehow learn his or her 'secrets;' and maybe build a 'better' show. That is very sad; very few of the techniques used in multi-imagery are proprietary; most have been used in film and audio production for years, even decades.

I recall being shocked, not so long ago, when I attended an AVL Institute training session. The level of education provided at that seminar was so abysmally low that, as I listened in horror, I could not help wonder what the poor schmendricks in the audience were thinking; to say nothing of learning.

When discussing that educational deficiency with Chuck Kappenman, President of AVL, I was told that the purpose of the seminar was merely to be an introduction. When I suggested that perhaps a higher-level Institute program was in order, I was offered his opinion that there was "no need" and "no market" for that.

Obviously; I disagree.

And my experiences in attempting to teach others the art and business of multi-image have by and large substantiated my belief that there is a real need for a 'higher level' of multi-image education.

With this book, one of my intentions is to crack-open the lid of multi-image education a bit further than it has been in the past; to get people talking. teaching, and learning.



Bob Ertell instructs a 1979 AVL Institute session at the New York Hilton hotel. Many students were from overseas.

At the AVL seminar just mentioned, a student asked a very specific question: "How do you make a soft-edged mask?" No real answer was given. Was that because the instructor also had an interest in a firm that manufactures and sells 'softies' (soft-edged masks)? Possibly. But it was sad that right there, in an educational environment, 'proprietary provincialism' prevailed and no 'real' information was provided.

In this book, I try to answer the 'meaningful' questions that I have been asked by many 'students' from around the world. I set 'students' in quotes; because I am not a teacher, per se; I consider myself a consultant. A teacher's role is more 'how too' than a consultant's.

A consultant must also offer judgements and opinions that would tend to obfuscate the simplicity needed in basic education. A lot of my mentees are very accomplished multi-image artists and producers in their own rights; but they hire me to get different perspectives and learn new techniques from someone who's 'been around.'

It is my experience that I have tried to distill into this book. There is a certain amount of basic education—how to do certain specific effects—and a lot of 'philosophical diatribe.' Often the two are mixed in a rambling manner. That is because I find it difficult to totally differentiate between the various disciplines 'homogenized' into a multi-image show.

For example, the reason why a given piece of art is made in a certain way could very well depend on the requirements of a programing move; and that programing move might have been dictated by the 'constraints' imposed by the budget.

Put another way; 'multidimensional thinking' is needed when learning multi-image. You can learn about photography. Then you can learn about audio. But where do you learn to 'synthesize' your thinking about these two discrete mediums and *combine* what you have learned about each. So, I have tackled this book trying to approach the learning process somewhat more synergistically than other books, magazines, lectures, and 'schools.'

To accomplish this, I have written the book from the perspective that you, the reader, are a multi-image producer/director. As such, you are responsible for the entire creative production of the show as well as its business aspects. You must find the client; sell the prospect on your idea; bring the concept to life on the screen(s); and hopefully persuade, motivate, and inform the audience—all within very real time and monetary constraints—and hopefully make a profit.

That is no small undertaking; and to be successful, you must be a 'know it all.' You do not have to be an expert in each area; but the more expert you are the more successful you will be. It is the *blend*, and the *synergism* of knowledge and experience—across the board, in all areas—that makes for a creative and successful 'producer.' Hence, I have taken a synergistic approach and to get the most out of this book requires a bit of reading 'between the lines.'

I mean that you will not find all the information about 'photography' in the photography section. You will find other bits of photographic information contained in other sections, like programing, budgeting, conceptualization, etcetera. This may make learning about a specific subject a bit more difficult, but the rationale is to place the specific knowledge of one discipline within the context of other disciplines that work together to create a synergistic learning effect; at least that is the intention.

The problem of synergism (or the lack thereof) also permeates many production shops. Too often the various specific disciplines involved in the production of a multi-image or multimedia show are separated and isolated.

In situations like those there is little interdisciplinary dialogue; the audio director acts independently of the programmer; the programmer never talks to the photographer; the artist and camera operators never meet each other.

Instead, a job goes from department to department in a very linear manner—a script is written which is then visualized by an art director; an audio track is made; photographers and artists create visuals strictly according to the storyboard; finally, the whole mess is dumped on some unsuspecting programmer who must make it all 'work' on the screen.

The larger the shop, the more separated the functions; at least that is what I have observed to date. This need not be the case, however. Even in the context of a large organization, small production teams can be assembled to handle specific jobs. This is a far better approach.

How much better it would be if all the members of the production team talked and worked together on the project throughout its production cycle. One team member's thought can trigger countless permutations in the minds of the others; and the best ideas can be selected and possibly blended to create the show.

It is critical that each team member have some knowledge about the disciplines practiced by other team members. In my own shop, I encouraged the Forox camera operators to learn about art preparation and programing. Likewise, I encouraged my audio director to learn programing, art prep and camera operations; not necessarily to become an expert in each, but to have a good working knowledge so that a given sound effect, for example, would not be 'just' an effect. Instead, the audio engineer might suggest a sound effect as well as a visuals sequence to go along with it—all based on real capabilities, not just figments of their imagination that would be difficult or impossible to produce.

Isolation breeds introversion and introversion does not work in multimedia production. If you are a big shop, put new employees through a multi-disciplinary training program much as ad agencies do.

At advertising agencies. trainees targeted to fill account-handling or management functions starts in the mail room and spend periods of time working in many different departments. They finish their training with a good general knowledge of all the functions and are therefore better equipped to work within the *gestalt* of the advertising business.

You should encourage the same sort of interdisciplinary training to get as many people as possible able to get things done with more synergism. It will help to avoid your employees dreaming up ideas that are impractical or too costly to produce.

At one large shop I consulted with, the attitude prevailing was isolationist. If a graphic designer was needed, one was hired and called on only for graphic input. When I arrived, the show that I was supposed to supervise was already well in the works. A quick review of the storyboards prepared up to that point revealed that the ideas could never be produced on time, within budget, or within the scope of the talent and technology available in that shop.

What had happened was simple: the graphic designer had gone off in the corner and, being completely naïve of any programing or photographic knowledge, designed an unbelievably elaborate logo treatment. It was, in fact, terrific; but far, far too complex to handle effectively in multi-imagery. It was a sequence that even Bob Able (Thunderbird Studios, New York) might find challenging to produce, with his multi-million-dollar computerized camera.

The tragedy was that the graphic designer in question was doing the best he could; and that all his thoughts and efforts were 'wasted.' I scrapped the whole sequence straight off and completely redesigned the show to make it fit the time and budgetary constraints imposed by the dictates of management. I acquainted that graphic designer to an Eagle programmer and an Oxberry rostrum camera to add some perspectives to his thinking about how an idea comes to life on the multi-image screen. Today he is still dreaming, but the dreams are a bit more down to earth.

Ultimately, then, the purpose of this book is to provide a broad overview of the entire multi-image production process, backed-up with specific instructions and spiced-up with a lot of tales, fables, and yarns gleaned from my personal experiences as a designer and producer of multi-imagery.



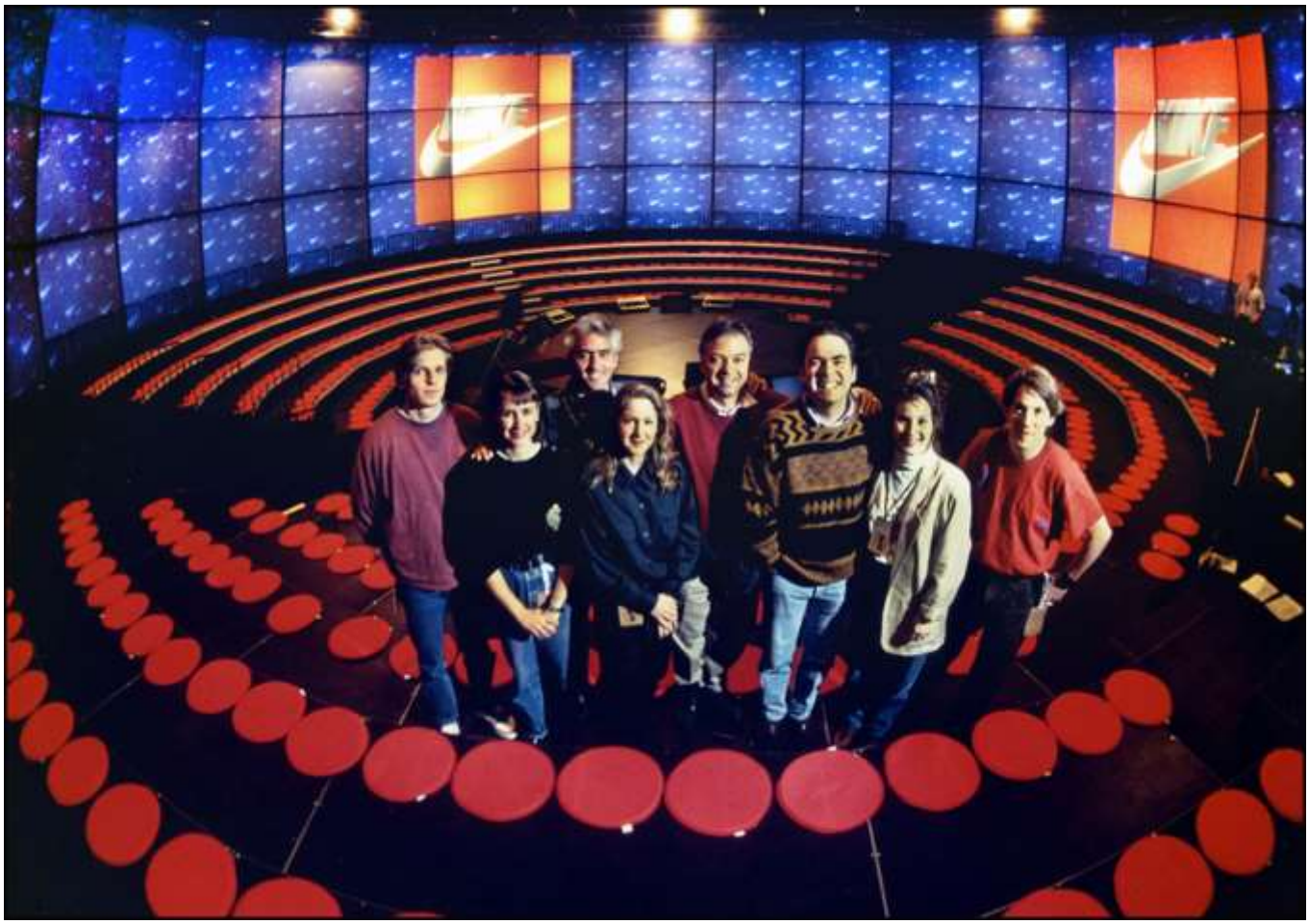
Yours Truly at my desk in 2018, putting together An Incredible Epic. I am still at that desk, writing this book, in 2023.

DEFINITION OF MULTI-IMAGE

Multi-image presentations involve the simultaneous projection of one or more images. The term originally derived from 'multimedia' productions which incorporate not only slides, but also cine, video projections, light-show techniques, pyrotechnics, live talent, and other media.

Originally, multiple-slide projection was usually part of multimedia shows. However, with the development of sophisticated projector-control equipment during the 1970s, slide shows, per se, became more popular. This was particularly true in corporate communications where multiple-projector slide shows offered more 'excitement' at less cost than producing motion pictures. Thus, during the 70s, more and more multiple-projector slide shows—not necessarily multimedia shows—were produced and the term multi-image was concocted.

Multi-image shows ran a full gamut of complexity. The largest known show was a 300-projector multi-image 'experience' produced for Nike by Dave Frey and his team at Sound Images, in Portland, Oregon.



Pictured above is Sound Images' Nike "Thunderdome" show, a 144-projector extravaganza in a specially-constructed circular theater. The screen is composed of 72 rear-projection (RP) panels in a grid framework, three-high by 24-wide. Behind each screen were two projectors; plus, one video projector for each of the 24 columns. Dave Frey is second from left in the back row; Steve Farris is far right. The show's programmer, Gar Benedict, was camera shy. Photo by Dan Root.

[*Editor*: Sound Images' stage manager, Steve Farris, recalls: "That was for the 'Supershow' in Atlanta. Supershow was a trade shoe put on by the NSGA (National Sporting Goods Association), Nike had a booth in the trade show that was the largest booth for the entire show. The show was held every year in the Georgia World Congress Center in Atlanta, and Nike's booth took up the entire ballroom and floor for the ballroom.

["Here is what I can recall of the "experience". You would come up the escalator to the ballroom level, and at the top was a Media Cube wall that was 6 high by 10 wide (each cube was 2' square, so the wall was 12' X 20'). You would walk around the wall to either side and pass through a doorway to enter a curved hall. The two halls curved together to a single exit that went to the main Ballroom floor.

["Each hall had a 4 high X 14 long curved wall on the outside radius that used 2' square plexiglass screens, so 56 projectors in each hallway or 112 total (my recollection of the actual count might be off by a bit). The hallway also had an audio experience using several speakers along the hallway to create audio "zones."

["Once in the booth you would look across the floor over several merchandising displays and office pods. At the other end was a 4 X 7 Media Cube wall mounted high above the entrance to a theater. Once inside the theater, we had a multi screen presentation complete with dancers that had a recurring show through the day.



["All told, somewhere in the vicinity of 300 slide projectors. Phillip mounted somewhere around 30,000 slides to fill all the trays (all the media cube projectors were full trays so they could run continuously in a loop)."]

Left: The late Phillip Augustine at Sound Images in 1998.

However, for every large-scale show produced, there were probably over a hundred smaller ones ranging from two to six projectors. Smaller shows formed the backbone of an industry that at the turn of the decade in 1970 probably involved, perhaps, 24 producers. Now, at the beginning of the 1980s, AMI membership is more than 2400.



Pat Billings lines up a six-projector module at a Clairol show.

Concepting is, without a doubt, the single most important aspect in the production of a multi-image show. It is the hypothesis, the essential core of the show. All the special effects in the world won't help a show that has a bad concept.

But what is a concept?



1986 photo from an SAS Airlines show made at Audio Visual Centrum (AVC), Stockholm, Sweden.

Essentially, it is the basic communications premise of the show.

In advertising much is made of the term 'unique selling proposition' (USP); that 'positions' a product by virtue of a unique aspect that separates if from its competitors and is perceived as discernably different from and better than them.

For the fictitious IDO soap company, the concept was "Space-Age Power to Clean."

Take Rolls Royce. Obviously, with that car you have a quality product. But, to promote it, do you simply say: "Here, folks, is a quality car"?

No. You find something that epitomizes that quality; that 'something' is the unique selling proposition. In their case, they underscored quality by stating that only in a Rolls Royce could you here the clock tick. [*Editor*: In those days, clocks ticked.]

Or, take Doritos corn chips. What makes one corn chip better than another? Very little. But their market research people suggested that 'freshness' was all-important in the minds of consumers buying corn chips. So, freshness became the selling proposition and their entire campaign was based on the 'deafening' sound of a Dorito being munched.

In one famous early commercial, two duck hunters are seen. One is dozing-off in the pre-dawn light. The other munches a Dorito and the noise wake-up the dozer. Other commercials featured dozens of examples of humorous situations provoked by the noise of munching a Dorito. The sound of the munch became internationally known as a symbol of Dorito freshness; that propelled that brand to number one in sales more than 10 years.

Such 'unique selling propositions' are the crux of a good concept; they are the quintessential thought(s) to be communicated to the viewer. They should be 'simple;' clear and easy to understand.

However, a multi-image show is not a commercial. The average length of a commercial is 30-seconds to a minute; some are as short as 10 seconds.

In a commercial, little more can be communicated than a single idea. On the other hand, a multi-image show normally has many messages to be communicated; so how do you approach such a concept?

First determine what must be communicated. Make a list of the major and minor communications messages, then rank them in order of their 'real' importance. Keep in mind that just about every client happens to think that their product is the most important thing since sliced bread and that every feature and benefit must be told repeatedly, *ad nauseum*. Clients, as a rule, are so close to the forest that there is no way they can see the trees. It is your responsibility to recommend to the client what the salient messages and themes are as well as their order of importance. Establishing that order of importance can be tricky, too. Important to whom? Why? In the case of your show, who is the audience? What are their preconceptions about your client's product; how does your client's product solve problems; why do the folks in the audience(s) 'need' it?

When a newspaper story is written, WHO, WHAT, WHEN, WHERE and WHY are the five important ingredients in the story; usually in that order. The next time you read or hear a news story, notice how the first paragraph—sometimes first sentence—answers every one of the 'Five Ws.' Subsequent paragraphs elaborate on the five points.

When you are considering what must be communicated, use that tried-and-true approach. Ask yourself the Five Ws. Normally, you will find that if you approach the central show message in such a journalistic fashion, you will quickly be able to separate the important stuff from the unnecessary; to isolate and order the pivotal points and rank their embellishments. Again, the all-important aspects are who your audience will be and what message(s) will best impress and convince them, in a memorable way.

One way is the traditional 'problem/solution' approach. First figure out what problems your client's product solves for the audience; then explain how it solves them. This, too, can be tricky … how do you know what problems your audience has? Can you rely of the client to tell you? Probably you can. But, more often than not, the client has an extremely biased point-of-view that may or may not provide you with the answers you need. Often it is better for you to do a little of your own market research to find out what people think of your client, and what 'real' problems they have. (You will be amazed at how customers like to talk about their problems.) Be careful, though, to get a full range of views on the subject(s): too little research may unjustifiably damn a product or client, whereas more in-depth research and evaluation will provide a bell shaped 'normal curve' of opinion that you can more accurately use to weigh and assess the situation; to identify the problem(s) and find unique selling proposition(s).

A case in point was *You Can't Stop a Dove!* —aka 'The Dove Show'—produced for Audio Visual Laboratories (AVL) by the Incredible Slidemakers. As I recall, that show was one of the hardest I have come across from a conceptual standpoint. Usually, you can count on a receptive audience; but not in this case.

When we were approached by AVL to prepare a show about their new Dove dissolve we were quite mindful of the fact that, until then, most AVL demonstrator shows were 'fantasies,' with lots of 'trick' multi-image effects but little or no 'information.'

AVL's president, Chuck Kappenman, was quite content with such fantasy shows as he believed that by simply revealing mind-boggling programming techniques, the audience would believe that the equipment made it all possible.

I am reminded of a teaching exercise at the AVL Multi-Image Institute, in Manila, where many of the students really believed that the Eagle programmer would automatically produce all the screen effects we were showcasing; and that a Forox was a machine like a Xerox; that all you did was slip your type or art into the Forox, dial-up the effect you wanted. and low and behold, out it came at the other end!

However, in the case of the Dove show, a 'mind-blower' or 'fantasy' approach would not have made sense for a very simple reason: the year before, AVL had released the QD2 and QD3 dissolves; and they turned out to be potential disaster zones. The units were so unreliable that anyone using them could usually bank on not having their show run.

The net result of the QD debacle was that AVL had, in one short year, undone a reputation for fail-safe equipment that had taken them half a decade to build. The Dove show needed to restore trust in AVL products.

It is important to remember that during its infancy, multi-image went through a prolonged 'black-box' era; there were not many show-control-equipment manufacturers. Producers often had to custom-build their own. As a result, running a show was often a '50-50' sort of affair; using "Walter Mitty" machines; and there was nobody you could call for back-ups. During the early 70s, a lot of big corporate clients started fooling around with multi-media, but then shied away because staging such shows proved too unreliable. Why risk the enormous costs on shaky, unreliable equipment? However, when manufacturers like Spindler-Saupé, UAV, and AVL started producing reliable gear, that was the godsend that created the industry called multi-image. So, when AVL launched the disastrous QD series, it was like a step backwards in time. Most producers' reactions were, "Oh-no … here we go again!"

Thus, while considering possible concepts for the Dove show, I was very mindful that AVL had a hostile audience. A flashy 'fantasy' show would not do because folks would (perhaps rightly) say, "… looks great but I will not risk *my* ass on *their* equipment!" A hard sell would not work either; they had heard it all before. That, despite the fact that the Dove really was a virtually failsafe product with an undeniable range of real user benefits.

As a result, I went straight to the heart of the matter: the sales situation. No one likes to be 'sold' anything. Each of us likes to think that we are somehow above that sort of thing: that we know more than the salesman and that the salesman (ahem, sales person) is some sort of sly fox trying to trick us into a purchase. We may try to throw the salesman off guard in hopes of getting a 'straight answer.'. It is a little game just about everyone plays—and that very game became the basis for the concept of the Dove show. That concept is 'teased' in the show's title: "You Can't Stop a Dove;" that also became the headline for print advertisements in the trade press and sales-promotion fliers.

Simply put, the concept involved an AVL dealer trying to sell a Dove to a dubious prospect. To do that, the dealer uses a demonstrator show (a show within the show) and asks the prospect whether he would like to run it. The prospect replies: "Who me? That's the kiss of death for your Dove show!"

But the dealer prevails and the prospect 'hits the tit' and starts the show rolling. (Up to this this point there have been no slides; just the dialogue between the salesman and the prospect, in darkness. When the prospect starts the tape deck, the dealer's demo show begins and visuals light-up the screen.)

A short way into the dealer's demo show (which is filled with sarcastic stabs at AVL), the customer picks up on a new word, "Positrack", which he confuses with automotive term referring to General Motors' *Positraction*. While the dealer's demo plays, the dialogue between the customer and dealer can be heard over the canned sound track of the dealer-demo (the show within the show).

The AVL dealer explains to the prospect that Positrack means, "You can't stop a Dove show." That challenges the prospect to try to stop the show or get it out of synch.

The rest of the show evolves into a competition between the Dove and the prospect, with the prospect trying every trick in the book to make the Dove fail—pulling out synch cords and power cords, stretching the audio tape, shutting off the tape deck, restarting it, etcetera.

In the end, the prospect becomes so frustrated and infuriated that he grabs a fire ax and smashes the Dove saying: "Guess what, you're Dove show just stopped!" The salesman replies: "Well, don't blame Dove!"



The Dove show's finale scene was shot at the New York Hilton Hotel during a NAVA trade show and featured members of the AVL team. Foreground characters, left to right, are: Clive Butler, Mark Gavigan, Richard Brooks, David Fellowes, Richard Fairclough, Charlie Spataro (wielding ax), Chuck Kappenman Alan Kozlowski, and Mike Winters. [Read more about *You Can't Stop a Dove!* in Volume Three of *An Incredible Epic*. Watch the show at Vimeo, https://vimeo.com/659144943]

In that show, the doubts and mistrust of the viewers are symbolized by those of the prospect character; the idea was that audience would identify with him and kind of cheer him on as he tries to make the AVL gear fail.

Doing so, they are simultaneously re-assured that the new dissolve actually 'works' when the demo 'proves' that the Dove cannot be tricked. That is making negative customer attitudes work *for* you.

Thus, virtually anything goes in concepting; if it sells the audience on your message. Your job is to turn negatives into positives; to make your audience see old problems in a new light; and be convinced that your client has the solution(s) to their problem(s).

Another, totally different example, was the approach we took for Matrix Essentials to promote their new line of professional hair care products to the fashion beauty press. The situation there was quite simple: Matrix was a co-sponsor for a major fashion event held every year in New York, called Press Week.

At Press Week, editors of newspapers and magazines from around the world attend a week-long series of 'reveals' by major fashion designers, hair dressers, cosmetics firms, and their ilk. Our objective at Press Week was to preview the next seasons' new 'looks' in haute couture to the press. It was like a week-long combination fashion show and press conference.

Matrix was a co-sponsor for the Intercoiffure luncheon at Press Week. (Intercoiffure is the leading international trade association of hairdressers.) The luncheon event is a 30-minute presentation of new hairdos created by selected star stylists.

At this event, each of two co-sponsors gets 90 seconds to. 'say' something. Their time is held to a minimum because the event is not supposed to be 'commercial.' However, they give the sponsors some presentation time because, after all, who would plunk down thousands of dollars of sponsorship money without suitable 'motivation'?

The challenge was getting our message across with impact in just *ninety seconds;* to a glib audience made-up of top editors from everywhere and anywhere; to journalists who have 'seen it all' and 'heard it all.'

In years past, other event sponsors had used the traditional approach of a model parade down a runway. As each model appeared, a master of ceremonies would give the details about the 'do'—who did it and how it was done, with an emphasis on products—hair color, perms, shampoos, conditioners, etcetera.

We decided that would clearly not do. But; what kind of show should we present?

Years earlier we had helped change the way that hair-product companies do shows when, in 1975, we used a six-projector show to help a small, unknown salon— Peter's Place— gain national attention as a newly inducted member of the élitist Intercoiffure organization.



The Peter's Place show added AV to the traditional model parade. A 12-minute, six-projector show (2 full-screen, with dissolve, and 4 'quad' projectors; shown at left) presented 'Peter' (Coppola) and his team (led by Cesare Charro) creating a cavalcade of hair styles through six decades (1920s, 30s, 40s, 50s, 60s and 70s). Each case showed the step-by-step creation of the hair style followed by the finished 'do.' The end of each segment featured live photo models—the ones in the slide show—appearing from behind the screen. The audience went wild the first-time models appeared 'out of nowhere!'

Finale of the Peter's Place show.

[*Editor*: Read about the Peter's Place show in Volume Three of *An Incredible Epic*.]

In the years following that little epic, more and more companies turned to elaborate slide shows to sell their goods at industry events. It got to the point where, by the late 70s when you went beauty show there was so much AV gear that it was like a NAVA trade show (National Audio Visual Association, which became INFOCOM).

Although our audience of fashion editors had seen a lot of multi-image shows, they'd never seen a show making use of a lot of concentrated fire-power, as a quick survey of the industry revealed that the biggest multi-image show that had been produced to date was a 22-projector job we'd done for Clairol ('*The New Look of Blonde'*, produced for marketing manager, Ken Perry); that was a three-screen, 6/10/6 format, facilitating animation on the center screen.

So, our audience had never seen the high-impact format we selected: 15-on-one—geared for animation. The decision had been made to go with a show concept that would maximize on-screen 'fire-power' and visual effects while, in turn, minimizing spoken messages. Thus, the concept of the Matrix Essentials show involved fast, dramatic music; visually choreographed with rapidly-changing, rotoscoped hair effects with 'flying' and 'zooming' logos liberally thrown in at appropriate musical punctuation points. The result: the audience was shattered. They could not believe that what they were seeing was really slides; but they could not deny it because the projectors were sitting right out there with them.

That brings to mind an important point which we are prone to forget: audiences are impressed by large, formidable displays of equipment. I have gotten into arguments with both clients and fellow producers as to the merits of front versus rear projection; those are salient points when considering your show concept and the costs for staging it.

Whereas many producers and customers want to hide the projection equipment, I prefer the opposite. I think that people are fascinated by 'all that equipment;' and that seeing it all in action impresses them.

A good concept goes beyond what the audience expects. When you start to conceptualize multi-image performances, consider all the various effects people see, day in and day out, on TV or in movies. In light of those, consider 'audience expectations.' For example, if you are making a film or a videotape, you had better be prepared to spend some big bucks to impress your audience because those two media typically pioneer impressive (and expensive) special effects. If your movie or videotape is to be impactful, it better be up to 'standards' when measured against other examples in the *same* medium. Marshall McLuhan said it: "The medium is the message." If your use of a given medium falls short when compared to the way others use it, your message will be clouded by the 'disappointment' of watching a lackluster production.

However, one of the arguments for producing a multi-image show is that people expect less from slides; it is 'easier' to impress them. One of the things that impresses them is seeing a mountain of equipment (especially when it works). So do not be afraid to show-off your hardware. Front projection has a 'wow' factor; and, frequently, heads will turn to watch the projectors at work.

Conceptual Evaluations

When developing a concept, the most important consideration is: what are you trying to say? How are you going to move the audience to accept your proposition and messages?

Gain a keen awareness of who your audience will be. What have they seen and heard before? Are they naïve; sophisticated; blasé? Do they have identifiable preferences? What do they think of your client? What do they think of your client's products? Are you operating in a negative atmosphere or a positive one?

After you have considered the audience, the next thing is the total amount of money available for the entire project; and how much will be available for you to produce your part. I have heard of instances where there was $200,000 in the budget and a three-projector show was produced. Why? Because most of the money was needed to stage the show in numerous remote locations. Be careful on that point; do not conceptualize a show that will require a dozen projectors when you cannot afford to troupe them. Unfortunately, this is a common error.

Think Small

> *"We're not big; but we're small."*
> Ron Jacklin, Jacklin Creative, Vancouver

If you have a good selling proposition—that is, a good basic message—you should be able to communicate it with words alone. Slides just *help* communicate messages. Although slides make your job easier, think small. Think about how few you need; then expand on that essential simplicity after you have come up with the basic message(s). As in the example of the Matrix Essentials show, a concept can be entirely based on AV fire power; but that is the exception, not the rule.

Especially in countries outside the continental USA, fire power just is not available for a wide variety of reasons mostly hinging on unavailability of equipment and/or money; or even prejudice against extravagant showmanship. Not everyone thinks that big, flashy shows are convincing. In some societies (e.g., Scandinavia) they could *dis*believe you if your presentation is too big or too 'trendy').

After you have determined your audiences' predilections; simplified your message down to its bare essentials; and considered your equipment package; the next consideration is your client's inclinations and preferences.

You may be shocked that I have placed clients' preferences rather low on the list; however, the client is, in most cases, just a bit 'too close to the trees.' Whether or not the client 'likes' your concept does not necessarily have to do with its appropriateness or correctness; and part of your job to convince the client that your concept has merit(s). Some of the best shows I have produced have resulted from 'screaming matches' with the client about the concepts proposed. The preceding examples are not exceptions. The first time Chuck Kappenman saw the Dove show he hated it. It was only about a month later, after several audiences had seen and loved it, that he gradually 'accepted' it. I think he still does not believe it won a gold award in the Vail International Multi-Image Festival!

Fight For Your Idea

Another consideration is: what do *you* want out of the show? Are you in it to build a business; to just 'make a buck;' or win a prize? Do you want to be a 'great' producer, or just 'another'? Are you willing to fight for your idea; or just submit to a committee?

Ask yourself: is this concept 'right'? Does it do the job in the best possible way? Are there any alternative ideas that might be better? What advantages does your concept have? Are there any disadvantages? Does it solve the problems, both from a communication and logistical (staging) aspect? You'd better have answered all these questions; whether they buy your concept or not will depend as much on *your* answers; your rationale; your 'justification' of it; as on the concept itself.

The point here is that you must *sell your concept* to the client. You cannot expect them to just sit back and recognize your efforts as the best of all possible alternatives. *Aux contraire*. The client is going to hem and haw; then likely find 'faults' with the concept. You have got to convince them that your concept is the one and only; for at least '101' reasons. Then, and only then, will they accept it. And, chances are that your concept is being measured against others in a competitive-bid situation. It is not an easy decision for a client to sign-off on your concept; because their reputation, their job, is at stake (as is yours).

This is not to suggest that you should bully your client. You should get all the input you can. Do not be afraid to ask questions since only by asking questions will you get some of the answers you need. But, do not rely solely on what the client tells you. Do your own research. Analyze the client's position as well as your own. Ask yourself the '5 Ws' (Who, What, When, Where, Why).

Armed with real information—and an understanding of the psychological and political forces at play—you will either find yourself totally confused or on the edge of a great discovery—a concept that works. If you find yourself confused, do not despair. Just think through the problems again, point by point. Eliminate weak points as you go and keep on eliminating them until you have gotten to the root of the problem. The concept should stem from that root.

Try A Catharsis

Still another method I have found useful is the 'trial script'. I cannot tell you the number of times I have sat staring at blank paper, at the drawing board or at the typewriter, wondering when an idea would hit. Sometimes I have finished an entire concept and proposal only to have the 'real' idea dawn on me. It is like a catharsis; a purging of all the ideas that were on my mind that needed to be cleared-away in order for me to see the 'right' way to go. That process happens more frequently than not; so I have learned to use it and call it the 'trial script/catharsis approach.' Here is how it works:

After input of all the information and going through the above outlined process, I arrive at a rough concept. I may not be completely satisfied with it, but I cannot think of a better one. So, I begin with what I have got and start writing, doing my best to make that idea the best thing since sliced bread because, after all, it's the only good idea I have. Somewhere in the process of working through the idea and elaborating on it, flaws start to reveal themselves. At that point I must struggle to keep an open mind since, after all the effort, it is going to be a drag to start over. I consider the flaws, one by one. I try to justify them - in my mind, and the client's. I try my best to solve all the problems presented by the flaws.

In this way, I can determine whether I am satisfied with the way the original premise is working itself out ... or whether a better idea is emerging. Emerging? That Is the wrong word. Usually what happens is that, while formulating the trial script, the 'right' idea 'pops' into my mind.

Such was the case when developing the concept for "Nightmares," a multiple award-winning show produced for Eddie McTighe at Slide Transfer Service (STS), who transfer multi-image shows onto motion picture film or video tape. When Ed asked me to produce a demo show for him, the idea of slide transfers, although not new, was certainly not as popular as it is now. Ed was a latecomer to the transfer business with no identifiable image or product superiority.

I recall agonizing over the concept for this show. Normally these sorts to things come easily to me; but this one was more difficult than most because I was, in effect, selling against slides and all the inherent problems and complexities of staging multi-image shows. That, was hard ... trying to sell against myself; against my pitches to clients, explaining the *benefits* of multi-image. Suddenly the tables were turned, and I was selling *against* multi-image.

For that show, I went through three concepts. The first was absolutely terrible; a dry treatise on staging multi-image shows and why you wouldn't want to do it, versus the simplicity of screening a movie ... blah! It was terrible and I knew it.

But it was helping me define the problem. The next concept got a little better. I started poking fun at the problems of stage managers when things go wrong. That was more on target and I knew it. But the script was still mundane, it was too much of a pedestrian problem/solution approach presented in a 'straight' manner - there was nothing unique about it; more like, "You all know that this can happen so why let it?" Yuk!

Midway through that second script the final concept emerged: a show about bad dreams—a salesman's nightmares about staging multi-image shows. The result was a an animated, film-like enactment, of moving around and dealing with a ton of multi-image gear; more than he could cope with. In the nightmare, every conceivable thing goes wrong. Then the alarm clock rings, waking the salesman from his nightmare; then the announcer begins: "The nightmare is over...now you can stage your show anywhere, with no aggravations, no problems …."

The trial concept approach may not be right for you; however, I have found it useful in identifying problems and defining what is really needed. Nothing works better than trying to define in writing what you have in mind. The very act of writing out an idea will force a measure of discipline on the mind that does not exist in a more free-form contemplation. Writing focuses for your imagination; a well-focused imagination produces the best concepts for multi-image shows.

No Speak'a Ingliss

How do you deal with a show that will be presented to a multi-national audience? And how can you concept a show that needs a multi-lingual script? Maybe the answer lies in a concept review.

That was the kind of concept developed for a show presented at Intercoiffure's International Congress of Hairdressers, in Paris. The audience for that show came from all over the world. Subtitles were suggested by the client's 'show committee.' I ruled them out—too distracting (I hate reading subtitles because I can't watch the show). Multi-lingual soundtracks were also recommended; but the $20,000 budget ruled out that option.

We ended up with a purely musical soundtrack and no 'script;' the pictures did the 'talking.' The show was modelled after the Peter's Place show, at the client's request (which suited me just fine). Five hairdos were presented, each to its own music. Each sequence started with 'before' shots of a model followed by a 'how to' section revealing the execution of the hairstyle— (in one case, shooting the step-by-step sequences took 14 hours over two days for cutting, coloring, and curling)—followed by, of course, glamourous shots of the finished 'do'.

In that purely photographic manner, every bit of 'information' was accurately and effectively communicated. No words were needed to understand that show. Measured against many other presentations—which got as elaborate as beauties riding elephants on stage—ours was considered the 'best of show' because it it was the most informative.

Thus, a good concept relates selected ideas and information to an audience in a manner that not only impresses and persuades them but also will enable viewers to remember the ideas and information they have learned. However, once you have your concept, the battle is only half won. The next step is scripting. Speaking of nightmares…. Ha!

Scripting

After a concept has been agreed, a script must be written—unless, of course, you are doing a music-only presentation; like the Intercoiffure show just described. Scripting, as it often turns out, can be far more difficult than coming up with a concept. Anyone, it seems, can come up with an idea for a show. But it takes considerable talent to work and turn the concept, honing it to the point where it is a viable and *producible* script. A basic script needs a lot of finessing and massaging to make it 'work' for a multi-image presentation.

The biggest stumbling block I have encountered in scripting is the lack of writers familiar with the potentialities of the multi-image medium. There are scores of good writers, as there are good artists, musicians, and photographers; but few of them are prepared to do justice to multi-image. The writers, by and large, think in a linear manner; and most photographers are still too concerned with filling a double-page spread with a single photo. Too few fully understand that multi-image is (or can be) non-linear and that, like video and cine, multi-image shows deal in a progression of time.

What is *non-linear*? Most movies and TV productions deal in a linear fashion; that is, they have a beginning, a middle, and an end that flow from one to the next in a relatively 'logical' manner. Even when there are 'flashbacks' or 'visions of the future,' these are generally supportive of either the beginning, middle, or end.

On the other hand, multi-image presentations, by definition, (usually) present multiple images—past, present, and future, can be shows simultaneously. Or, there can be a combination of internal and external points of view; or different aspects of the same subject; the list goes on and on. Multi-image shows are less definable as to 'beginning', 'middle,' and 'end'; they can be non-sequential.

Moreover, a multi-image presentation often couches its communications in visual and musical terms, rather than verbalizing all messages. This does not discount the audio portion of the program; but lays emphasis on the visual materials presented.

Then, too, a multi-image presentation is often vaunted as 'more than the eye can see … more than the mind can grasp.' This latter point can be as much a curse as a blessing, if not handled properly; because it is just as easy to confuse the mind as it is to boggle it. The difference between a successful multi-image show and an unsuccessful one often depends on how careful the producer and designer are in their use of discordant and/or harmonious information and imagery.

The point is, few writers are equipped to deal with the 'ambiguities' of communicating via multi-image techniques; and too often their scripts are too traditional stylistically; too linear for the multi-image medium. They tend to pack too much into the script; leaving the designer with too many details to illustrate and no 'room to move' in terms of visual choreography or creativity. Those kinds of scripts are too 'literal' for multi-image.

What do they say, "If you can show it, don't say it"?

All the above notwithstanding, the first step in the preparation of a script is, as with concepting, consideration of the audience: who are they; what do they think; what are their pre- or misconceptions; and how will they 'see' this presentation? What is the primary goal of the show? If the show is a documentary, or 'how to' type of presentation, then you may well want a linear script. However, if the function is to provoke thought or be a 'think' piece, then a non-linear script is probably more appropriate.

Still another consideration is whether you need a script at all. Many successful multi-image shows present their information by pictures and music alone; with no verbiage. That, in fact, was an important and highly debated question when we were trying to establish the 'point system' for judging shows at the Vail International Multi-Image Festival as well as the AMI competitions. How do you assign a point value to a show's script? Sure, you can measure whether it was 'well written,' and 'appropriate' to the subject, concept, and mood of the show. But if another competitive show did not use a script, would it be denied all the script points?

The situation was resolved by establishing the principle that a non-scripted show was deemed to have an 'inherent' script; that is, the use of a non-scripted method was nonetheless a means of communication and the show was to be judged as to how well it achieved its given communications goal without a script; did the show 'work' (e.g., communicate its message) or would a script have made the show better? [*Editor*: See: Ken Burke; about show evaluation in Volume Ten of *An Incredible Epic.*]

Thus, you must take a good close look at your concept and decide *how much* script is needed. You will probably find, as I often have, that the less script you have the better your show will be. There is something about multi-image shows that makes a lot of words unnecessary; words just seem to get in the way. If it is true that 'one' picture is worth a thousand words, can you imagine the vocabulary of a multi-picture show? Let the pictures do the talking. What do they say, "If you can show it, don't say it"?

Establishing Harmony

Given that most writers are not familiar with the multi-image medium, the best thing you can do is to make them more aware of the potentialities; and the best way to do that is to have frequent (as often as necessary) script-input meetings. At these sessions, the writer and show designer should sit down together and simultaneously come up with a script outline and rough storyboard for visuals. In this manner, both the wordsmith and the visuals director will be working in harmony.

The worst shows I have made were the result of being handed someone else's script; and it is amazing how many clients seem to work that way. They will hire a writer and have them create a finished, approved script, then hand it to you and expect you to come up with a 'creative' visualization and soundtrack.

That situation is the least likely to work, effectively, because it bypasses any initial consideration of visualization. Words are used where pictures should be doing the talking; and writers who are unfamiliar with multi-image often have a way of writing you into a box; that is, writing things that are virtually impossible for you to visualize effectively on the budget you have. The writer and visualizer must work *together* on the script and storyboard simultaneously.

I know some shops where the process of multi-image production is broken down into specific departments—one to develop the idea; another to write it; still another to visualize it; and finally, one to produce it. Frankly, I cannot understand how that process can work, creatively. It may make for a good 'business;' but God save the show! I even consulted for one major outfit where the art department and photography department were not supposed to talk to each other (can you imagine?).

At Incredible Slidemakers we worked in entirely differently: the environment was more like a 'kindergarten;' all the kids playing together. Inter-department communications were encouraged, not frowned upon; and everyone was encouraged to learn as much as possible about all the different aspects of the production. For example, we had a programing grid in the art department where the show designers (who were taught programing) could preview various moves before committing themselves to finished art. This synthesis of inter-function communication proved invaluable in terms of coming up with harmonious concept development through to completion of the show.

Selecting a Writer

If you can find one, go for a writer who has had experience with multi-mage shows. If that is not possible, look for one who is written movies or TV scripts. Avoid literary or magazine writers like the plague, the biggest problem with the print-oriented writers is that they are too verbose; they like to use 'twenty-dollar words.'

The written word and the spoken word are too entirely different things. A good literary writer will use a vocabulary of up to several thousand words-but a good writer for the spoken word will use far fewer; perhaps just a few hundred.

Your goal should be to use fewer words, not more; this is no place to show off your command of the language. The words you use should generally be as simple as possible. An approach I have often used is to pretend that I'm writing for an audience of children; because if I can successfully explain a product or process to kids, I can always go back over the script and 'beef it up;' but I seldom do. Usually, the simplest form of explanation is the best; especially in multi-image, you have pictures and sound working for you; those can be used to add impact and 'implied meaning(s).' Musical 'stings' and 'flourishes' are the audio equivalent of using italics or underlining words.

In the case of technical scripts; do not hire a technical writer to prepare the script; that would be the kiss of death for your show. Technical writers are used to writing for technical people. They assume that their audiences are well informed. Use a technical writer as a script consultant; to answer technical questions and provide you with the information you need. Then be prepared to completely rewrite that technical input into words and pictures that will create a show that is technically accurate yet interesting and understandable—even by children.

It goes without saying that the foregoing does not apply if your audience is 'in the know.' That is, if your audience happens to be medical doctors, speak their language; you know, all those words you cannot pronounce.

The Committee Approach

What is a camel? A horse made by a committee.

Although that old saying is a little far-fetched, it is not far from the truth. A committee can seldom develop a good script—a good concept maybe, but never a script. The reason is simple: a committee cannot provide cohesiveness or coherence because there are too many ideas, attitudes, interests and (especially) egos involved. Group think cannot produce a tangible style and point of view—vital for a good script.

Unfortunately, big business seems to thrive on the committee approach; meeting all the time to discuss this and that; it is a wonder anything ever gets produced at all. Two illustrative situations come to mind:

One time we were producing a press-show for Glenby, Inc., a major chain of beauty salons. The company's executive AV producer was a real 'organization man.' From the word go, I should have known what was going to happen; but I am always the optimist; always hoping. At our first meeting with the client, there were two of us, from Incredible, sitting across the table from six Glemby representatives. The meeting was called to order by the executive producer, who announced that the purpose was to think up what the show should be like. Each person around the table was encouraged to input not one but three things that should be included in the show.

The result was staggering. We walked out of the meeting with a list of about 50 subjects that, the committee 'agreed,' had to be included for a 'complete' and 'effective' show.

Whew!

It was foolhardy to object at the meeting since we were outnumbered; and, after all, they were the experts in the salon business, right?

We finished the meeting, went back to the office, and pieced together a rough budget of what it would cost to include all the proposed elements. As I recall, our 'guesstimate' came to about $240,000. The client wanted to spend about a tenth of that. However, at our next meeting we were able to demonstrate why all those the ideas were not within their means, financially; and we were successful in paring down the list of 'must' subjects to about 10.

In another instance, we were asked to do show for The Washington Post. The purpose of that show was to help the Post win an advertising-space-sales war against the Washington Star, an arch competitor that had recently been purchased by media giant, Time, Inc.

The Star was giving-away advertising space to drum-up business—an effective method! The Star had also completed a multi-image show of its own; that led to a decision by The Post to 'fight fire was with fire' and make an even better show. Thus, the Post's advertising manager, Mary Anne Tortorello, was dispatched to New York to meet with me, see our demo, and strike a deal; all of which went off without a hitch; we were hired.

The project began with a trip to Washington, DC, to meet with Mary Anne and her cohorts. As with Glemby, the first meeting was with a committee; again, I should have known. But optimist that I am, I spent considerable time coming up with a concept. I was convinced that the Post show would be one of my best. After all, with such a prestigious client, could you do less than your best? So, I busted my ass on a script which they thought was OK—for a 'first go round.' They suggested that I include about four more categories of information; mind you, the first draft script was 23 pages, single spaced, for a show destined to be 10 minutes long. (23 pages @ 2-3 minutes/page = 46-49 minutes.)

Back at my 'typewriter' (an AVL Eagle running *Electric Pencil*) I tried diligently to re-work the draft; but it just was not 'working.' So, I completely revamped the concept and came up with a second, entirely different, but equally 'good' show. Upon its submission, my colleagues at the Post found that script to be entirely unacceptable for reasons undefined to me; further, they told me that they would take over scripting. (!)

And, what did they do? They got their friendly advertising agency involved. In that case, a copy writer named Mark was brought into the next scripting meeting to get input so that he could go back and write a 'proper' script. He protested that he did not understand multi-image sufficiently. (Aha—he was not so dumb after all.) So, Mark was flown to New York to view some of our shows; to see what multi-imagery was all about. Poor Mark, he left the screening session more confused than ever; his agency mind was so print and TV oriented that he could not come to terms with multi-imagery. But he did his homework and prepared a script.

Guess what? They did not like that one either!

The next step was to give the Post's promotion department writer, John Helner, a crack at it. To accomplish his draft, John took all three other script versions and did a 'cut & paste' job on them, adding a few bridges and other salient points per the instructions of his boss.

Progress! That script was deemed to be 'on target.' But; to be sure that nothing had been left out, (God forbid), it was submitted to the entire advertising sales force of the Post. They met, in committee, around a big table; and each sales person was encouraged to add, delete, change, recommend, etcetera, etcetera; which, of course, they did, with enthusiasm and gusto. After that, the document was handed over to The Post's editorial board who added the 'finishing touches' in their own, inimitable newspaper style. Finally, it was 'cleaned up' a little by the legal department. So, four months after it was originally due, the Post script (no pun intended) was finally completed and *The Golden Apple* was 'ready for production.'

That 'finished script' proved to be a nightmare for us for two reasons: First, no thought whatsoever had been given to visualization; the script was a purely 'verbal' exercise. It may have read well; but it did not 'sound' good and entire sections were almost impossible to visualize in any kind of interesting or effective way. It called for an approach akin to 'speaker-support' visuals—you know, charts and graphs and that kind of stuff.

Secondly, whereas our original scripts had been written to fit their proposed budget allocation, this new script was much longer and so discordant that to do it justice visually there was no hope of coming within the specified budget.




Left: Yours Truly, Susan (Linda's assistant) & Jim Casey preparing to shoot aerials of Washington, DC. The long, white wire that Casey is holding was used to hang a fisheye camera under the chopper, to get 'bird's eye' views. However, the weather sucked and we did not use much from that expensive shoot. Right: A gag shot of Casey and Susan taken at the development site for a new mall being featured as an example of the dynamic growth of the Washington-area market..

Crying in my beer one night with David Fellowes (or, more precisely, Scotch whiskey); he related an anecdote about a similar situation with General Motors. David had prepared a concept and script for a new-car launch and they had done a similar re-write. When he met with them, his reaction to the rewrite appeared to be extremely positive. He told them that he was most favorably impressed with their re-design of his show and asked whether he might be able to borrow all the technical drawings and engineering details on the new car. What, they asked, would he possibly need with all that technical information when the show was supposed to sell sizzle and not the steak? Well, David confessed, in the process of developing his script he had noticed a few flaws in the design of the car and felt that as they had been most helpful redesigning his show, he could only reciprocate the generosity by redesigning the car for them. Ha! David further explained (not so facetiously) that the show would cost $100,00 if he produced it and $150,000.00 if they continued to help.

Who Is in Charge?

A challenge for anyone in the creative business is avoiding the despair, frustration, and anguish that one suffers when others meddle with your ideas. When you put so much of yourself—so much effort—into a project; when someone wants to make any changes, it can be a deep personal affront.

You can avoid the *ennui* by defining at the outset who is in charge. Who is the producer? Who has the final cut? In unfortunate situations like the ones mentioned above, I learned to behave like a waiter in a restaurant; or a counter clerk in a hardware store. I came to realize that when a committee is involved, I will not be the producer; the committee will usurp me in that role. In my new role as a 'waiter;' all I do is tell the client what we have on the menu and let them make their own selections.

I have found that approach works well for everyone concerned. I avoid the discouragement of seeing my thoughts 're-worked' by a committee and the committee members each get to order a 'dish' of their preference.

That 'method' will probably not produce a 'great' show; but at least it may please the client and make you some money; while maintaining some degree of your sanity. All you must do is, establish up front who the producer will be; you or the client, not both.

Documentary Dilemmas

Documentaries create other dilemmas for the producer and script writer. The primary one is the sheer volume of audio and visual materials that must be gathered, processed, and edited. Another is establishing order and control— 'resource management.'

Another dilemma is that you are never certain what exactly you have got to work with until you have completed all your interviews and research. It is like going fishing; you do not know what you will have for dinner 'till the trip's over. So, how do you plan the menu?

One way of dealing with such documentary dilemmas is to establish a rigid set of controls for the research and interview-gathering process. Develop a list of prospects to be interviewed and spend some time on the phone with each of them. That will help you become familiar with their views on the subject(s) as well as their 'style' of speaking. You will be able to spot the 'pig in a poke' right away.

I remember working on a show for U.S.I. (U.S. Industrial Chemical Company) where one of our chief spokespersons was a decrepit old geezer who lived up in the boondocks of Michigan and oversaw refinery operations there. This guy's voice sounded like our background music track should have been "Turkey in the Straw."

The guy certainly didn't sound as though you'd associate him with 'progress' and a 'dynamic' company. But, because no one in USI's Park Avenue HQ had conducted any telephone pre-interviews, no one knew that until after his 'role' as the primary spokesperson had been pre-approved by 'top management.' So, we were stuck with him.

In a similar situation, we were doing a doco for Owens Corning about radial fiberglass tires. Although all the interviewees were 'recommended' by the client, we had one small problem: half of them did not think much of the new product! Getting good comments was like pulling teeth from an ant-eater.

And the tape splicing needed to make anything sound good rivaled Watergate—I had to create sentences by splicing together individual words. The extra time needed to 'put lipstick on that pig,' was the kind of thing you cannot budget beforehand.

In a telephone pre-interview, you ask the interviewee the questions you will ask while taping on location. That way, you identify any problems up front and can discuss them with the interviewee and/or client.

By the time you arrive to tape the interview everyone knows what is going on. It is a good idea to record these telephone pre-interviews and let the client hear them, if problems are suspected. Also have a transcript prepared to 'refresh everyone's memories' when on location.

Dealing With Nervous Nellies

Another problem you will encounter is nervousness. Even the most out-going personalities tend to clam-up when a microphone is stuck in front of them. Overcoming that nervousness is the biggest obstacle to getting good 'takes' to work with.

Do not pre-write the interviewee's statement or allow him/her to write their own; the results of that approach are almost always disappointingly 'stiff' sounding. Allowing the interviewee to write a statement does not give you the control you need to arrange the information in the order and manner you want it presented. Secondly, a written statement when read always *sounds* like a written statement that is read; it lacks the spontaneity and credibility of informal, 'off-the-cuff' commentary.

The best approach is to have a conversation with the interviewee. Talk about a wide range of subjects and occasionally throw in questions you want answered. This 'round about' method will relax the interviewee and catch him/her 'off guard' for the big questions. It will also help establish a conversational tone of speaking.

By having a list of 'secondary' topics to talk about before getting to the 'biggies,' your sound engineer will also have plenty of time to get levels set without the more formal approach of, "Sir, could you please say a few words so that we can set our recorder levels?" No one ever knows what to say in such situations, which increases nervousness and tension—the last thing you want to do.

It is also a good idea to have plenty of cable extensions so that you can position the sound engineer *behind* the interviewee, but in your full view. Seeing a lot of equipment and an engineer wearing 'cans' (headphones) tends to make interviewees more tense. If there is a 'clam' (mistake), outside noise or other interference; the engineer can make you aware of it with a simple hand gesture or eye-contact without bothering the interviewee. That will enable you to maneuver for a retake when it seems to be the 'right' moment.

Interviewees hate doing retakes, especially for the third or fourth time; then they worry that they've 'failed;' that makes them even more nervous. Sometimes, of course, they *have* failed; possibly by not saying something 'properly;' or by coughing into the mike in a way that cannot be cut out; or by failing to be 'succinct.'

Other times, a plane seems to inevitably fly by; or a Harley; or a truck backfires; that you and/the interviewee may not be aware of; but which makes the engineer cringe. In such situations; make sure that the engineer does not interrupt the session. The engineer, in fact, should never *say* anything; that will also make the interviewee nervous. Rather, though a set of non-verbal 'body language,' the engineer should let you know that a retake is necessary. Then *you* gently coax the subject into the retake.

The type of microphone you use also has a substantial impact on sound quality. I typically use two microphones. I use a Sennheiser 'shotgun' aimed at the subject (pointing at their nose, from above); in tandem with a Sony ECM 50 or similar lavaliere microphone positioned over the chest.

With some subjects, the voice quality with the shotgun will be preferential to the lavaliere; sometimes the reverse is true—but I have a choice, which is nice; or I can use both, on separate tracks, for a kind of stereo 'echo' effect that can be quite pleasing. (Sometimes you will encounter some phase cancelation using this method; but that is usually unobjectionable.

For 'nervous' subjects, using just a lavaliere microphone is the best choice because they tend to forget that they have it on. A radio-remote microphone is even better for this application; but those microphones can create other problems; such as picking up the outside RF frequencies that are often found in large office buildings and industrial sites.

The point is; the nervous subject should be aware of as little equipment as possible. During the interview, your number one goal should be to get the subject to say what you want in the fewest possible words and in the simplest possible manner. That usually requires quite a few 'takes;' because the average subject is 'thinking while talking' and the results will be rough and often interrupted by gaps, or coughs, or 'fidgeting' in the seat, etcetera. An easy way to get a retake is to explain, after the subject has concluded an unsuccessful take, that you do not quite understand what they said. The subject will then try to explain it to you again, usually in the simpler terms you want.

This technique—the 'I don't understand' approach—also works well for technical fluffs or background interference because, again, it does not make the subject think that *they* goofed; that reduces the tension level of the interview.

Another similar technique I often use is the "What does that mean?" approach. In this case the subject has provided you with a perfectly adequate description; but has inserted a few words that are too 'big' or too technical to be 'effective.' For example, I might say something like this: "You said, sir, that the new process involves 'effluents.' What does 'effluent' mean?" They will explain what an effluent is, and you can cut the description of effluents into the previous sentences as needed.

Still another approach is: "You don't really mean that, do you?" I use this method when someone has not said something in a convincing manner. The subject might rattle off a fact that is one of your major points; but which may not seem so important to the subject. By questioning their voracity; subjects will usually restate the same facts with a bit more conviction.

"I still don't understand…," is reserved for hard-core cases where they persist in not saying what I want the *way* I want it said. When I use that approach, I am fully conscious of the fact that the subject probably thinks I am the most stupid person on the face of the earth, but I don't care because, for the moment, I am filling in for the least intelligent person in my audience.

If the subject just cannot get to the point, I will not press it; rather, I move on to another, totally different subject; possibly that I may not even care about. Then I try to thread the conversation back to what I was trying to eek out earlier. I might say something like: "That reminds me of what you were saying before, about the effluents. Please tell me more about that."

It is important in any interview that the subject repeat the question as part of the answer. This is vital where the question itself will not be included in the script. Yet, often the subject, when asked a question, answers "yes" or "no;" or, worse yet, picks up the thought from the departure point of the question. The problem here is that you have no informational bridge; no 'cutting room;' because the audience never knew what the question was.

The easiest way to avoid that problem is to explain to the subject that you need the question repeated before answering it. It is simple, and it works. For example; to my question ("Sir, does this process involve 'effluents'?); the subject would reply, "Does the process involve 'effluents'? Yes, the process does involve effluents;" and we would cut the tape to say, "The process involves 'effluents'," or alternatively, "Does the process involve effluents? Yes."

Using these techniques—which I call "conversational interviewing" (and which you can learn watching Tom Snyder or Dick Cavett; past masters of the conversational approach)—you end up with far more material than you can use.

I have conducted two-hour long interviews to glean a precious 15-seconds of material; but it gets said just the way I wanted it to be said; and/or I have enough material to create the sentences and phrases I need.

Coping with Voluminous Interviews

Playing through long interviews to separate the usable material can be boring and costly. But there are ways to ease the pain and minimize the editing time.

First, 'dub' (copy) the master interview cassettes then send the dubs out for transcripts (never send the original tapes for transcription because you run the risk of tape degeneration due to magnetized heads at the transcriptionists or other damages, including loss by messengers).

At each interview, you should 'slate' every tape at the beginning of each side by saying something along the lines of, "It's Monday, the fourth of September, and I'm at Burger King, in Buffalo, talking with Mr. Soloman Klein, Vice President of Marketing, on the subject of bad publicity about kangaroo meat; and this is tape number 13."
The transcripts should include the slate to tell you the date, name of the interviewee, subject being discussed, and tape number; to help you find specific material in the tapes.

After you have amassed all your transcripts, arrange them in order in a ring-binder. Starting on page one, write '1' about 20 times down the right-hand margin of the page; likewise, number each subsequent page all the way down the right-hand margin. When this laborious task is finished, Xerox the transcript, label the original as 'Master' and file it. Then bind the Xerox and start reading it. Each time you find an appropriate comment, cut it out with a pair of scissors and file it in a series of folders labeled as to the subject of the comment. For example: one file might say, "Kangaroo meat: bad publicity," another might read: "Kangaroo meat: effluents."

Use as many file folders as you need to break down the comments into the detail you require. I have found that the more you break them down, the easier you job will be later, when you must re-connect the culled comments into a cohesive script.

Once you have set up a file-folder 'library' of the best comments, give the edited comments to your sound engineer and ask to have the tape dubs checked to find whether they sound 0K or have any technical or stylistic flaws.

This is where the numbers you wrote on the right-hand margins come into play. The numbers tell the engineer where the material is, for example, say you have a #13 comment followed by a #63 and then a #2. The engineer flips through the master transcript to page #13, then looks at the slate of that interview to get the master cassette number. By judging the total number of typed pages of the transcript of that tape, the engineer will get a good approximation of the whereabouts of comment #13 on that tape. If the transcript is four pages long and your comment came from the bottom of the second page, the engineer would know that the comment is about half-way into the tape.

After finding the appropriate section and determining that there are no technical flaws; the engineer should dub the material (from the master cassettes) up to 15 IPS (inches per second) on quarter-inch recording tape; along with a little 'room tone'.

Room tone is the sound of the room that you recorded the interview in. At the conclusion of any interviews; ask everyone to be quiet and, without changing the levels set on the recorder, lay down about 30 seconds of the sound of the room. This tone will then match the 'blanks' between words and sentences in the interview; and can be cut into sentences where extraneous background noises between words must be eliminated; or where you want to 'space out' words or sentences. If you use blank tape or leader tape for such purposes your background sound level will drop to zero and will not match the rest of the interview 'room tone,' thus giving you audio drop outs which are annoying and distracting.

The 15 IPS dubbed interview sections should also be EQ'd (equalized), level matched, and possibly even compressed or slightly echoed at this stage; so that what you end up with is a distillation of all the best comments on one master reel; processed to sound their best; with all levels matched to each other. Adequate notation of any EQ or other signal processor settings should be made on the transcription page so that in the event you must go back and re-dub you will be able to match the sound of your master 15 IPS tape.

With the 15 IPS master completed; the engineer then makes a cassette dub of tha; as well as a quarter-inch dub. The engineer keeps the quarter-inch master for final editing. You get the cassette to play with to your hearts content.

Although this is a laborious process; believe me when I say that it is the simplest method for dealing with reams of material. For a single show we once had over 500 pages of transcript material representing more than thirty cassette tapes. The final soundtrack, including announcer 'bridge' sections, was 14 minutes—so you can imagine the amount of cutting that took place. Yet, I was able to accomplish all the editing in one week, including preparation of the 15 IPS master.

Do You Need an Announcer?

You may be able to make an entire voice track for a show without the use of an announcer. If you have done your job properly; you should have sufficient interview materials to create 'bridges' from one spokesperson to the next by using the spokespersons own words to create them.

Such bridging can create a story narrated by 'real' people rather than a 'voice-of-God' announcer. These types of shows have the most credibility. However, in most scripts you will likely want to write announcer bridges between interview comments; or use the interview comments to reinforce the announcer sections. It all depends on how much 'voice of God' you feel is required to obtain the result that you want. I prefer a documentary that is told exclusively by interviewed spokespersons.

To shoot the photographs that will illustrate the interviews, make a second trip to the location(s) whenever possible. This is primarily because you will not know exactly how many pictures you are going to need until after you have edited the interviews and know what points of the interview are going to be included and how long they run.

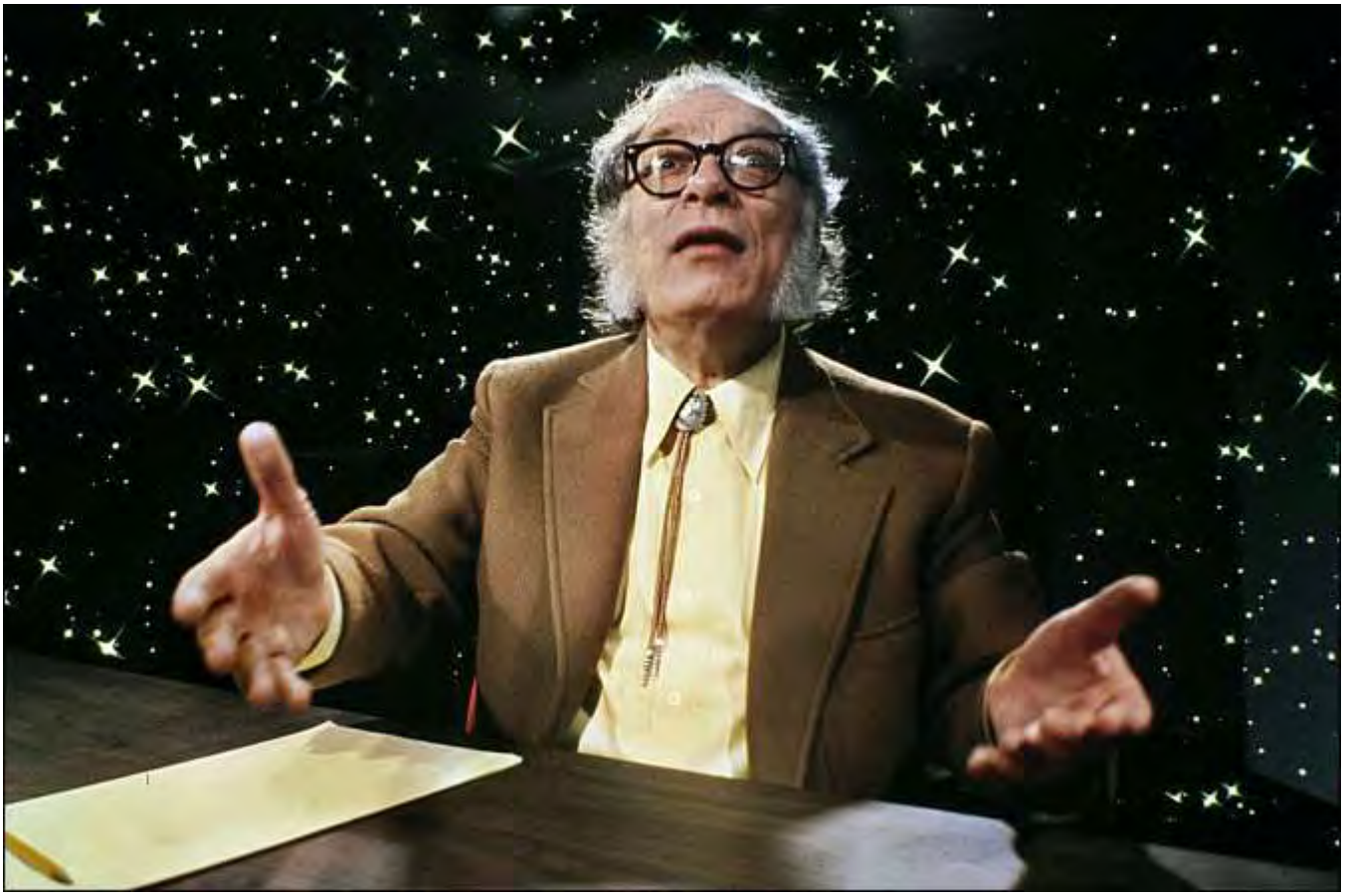
After editing the interviews and preparing the final script—which could be up to a month or more after the interviews—you will know exactly what has been included. That is the time to make a complete shoot list; to shoot the pictures or create other visuals, like graphics, logo treatments and effects.

Obviously, a second photographic trip is not always possible; especially when you're travelling vast distances and two trips will double your airfare and travel costs. If you find that you must shoot simultaneously with the interview, take an hour or so after the interview and go back over the interview tapes making notes as to which sections your most likely to consider using. Then based on those notes, make a shoot list for the photographer. Be sure to budget for extra film if you use this method because, not knowing exactly which interview sections you are going to use, you will have to overshoot; sometimes as much as 10:1.

Special Talent

One sure way to win over an audience is to use recognizable 'star' talent for your show. In the Dove show, for example, we used the famous comedy team, Bob & Ray (Bob Gould and Ray Elliott) to play the roles of an AVL dealer and skeptical customer. American audiences usually recognized the special talent and were impressed that we had gone to such lengths to add impact and humor to the show.

When you are employing special talent, especially 'character talent,' it's often advantageous to let the talent write their own version of the script. They will know their 'style' a lot better than you will and they will often insert some jokes, quips, or extra lines that you would never think of. Usually, I will write a first draft of what I think they would say, and then submit it to the talent for 'cleaning up' before sending it to the client for approval prior to taping.



Isaac Asimov was one of the "Big Three" science fiction writers; the others being Robert A. Heinlein and Arthur C. Clarke. We hired him for an appearance in the Time show for Advanced Management Research (AMR), in 1976. Pat Biilings photographed him during the recording session at G & T Harris studios; because the auteur could only spare us one hour from his busy schedule an (outrageous limitation, considering his fee). The Forox department added the starry background.

Often, you will find that extra gags or lines will spontaneously emerge during the taping session; so, leave yourself enough slack to be able to insert those little gems; they can be the best material in the show.

That also applies to 'regular' announcers. You may hear them stumble on certain words or sentence constructions, or just the way a sentence reads may not sound as good as you thought it would.

Do not permit the client to attend the recording session if you can avoid it. You do not need a committee to help you decide what is a good take and what is not. Inevitably you and the client will disagree on certain takes, requiring the announcer to make alternate versions—a frustrating experience that can break the 'flow' of the session. Usually, the more an announcer must retake a line, the worse it gets. If a lot of retakes are required, you probably hired the wrong announcer or wrote a lousy script.

Be prepared to make instant rewrites during the recording session. For that reason, it is a good idea to have the writer on hand. If your script has already been approved, record the rewritten lines as alternatives that can be edited in later; if and when they are approved.



Top: British scholar and historian, Alistaire Cooke, appeared in the 1975 World Book show. Center: Pulitzer Prize-winning columnist, Art Buchwald, starred in the Washinton Post's 1979 *Golden Apple* show. Bottom: NBC star journalist and TV personality, Barbara Walters, was the narrator and presenter of a show made for Women in Communications annual awards via Burson Masteller; photographed and produced by Pat Billings.



1981 picture of the audio bench at the New York studio of Incredible Slidemakers.

As there are numerous audio engineering handbooks which can do far more than I can in the way of providing technical help in the use of equipment; I will restrict my comments to some general pointers for preparing a soundtrack.

The assembly procedure that I prefer was taught to me by Jerry Kornbluth of A+J Audio in New York. Jerry was one of the most polished engineers I know; superbly attentive to detail. He was also one to take the most expedient route; and his 'parallel track' method, as I call it, has proven expedient for me on virtually all types of soundtracks.

To assemble a track using the 'parallel' method you will need a minimum of three tape decks, preferably four. The method is simple: first you cut your voice track on one reel; then lay down your music on a second; and your sound effects on a third.

Finally, you play these two or three reels in tandem, or 'parallel,' mixing them down onto the third (or fourth) deck. With this method, you can have infinite cutting room on any tape and can therefore achieve any degree of tightening or 'loosening' on either tape.

Here is how to do it:



Start by assembling the Voice Master reel. Leaving ten seconds of white leader tape at the head of the reel, splice in 30 seconds of a test tone recorded at zero decibels (0 db) followed by 2 seconds of yellow leader tape; then add six seconds of blank audio tape (needed for the clock track when programming) spliced directly to your pre-edited voice track master; and end with 10 seconds (or more) of blue leader. This becomes the master voice reel.

Follow the same procedure for the Master Music reel. Advance these two on separate decks so that the splices between the second leader tape and the beginning of the voice and music are sitting right over the playback head of each deck. With the splice between second leader and voice track over the playback head, make a dot with indelible ink just beside the capstan roller on the side of the tape facing you. That is the start mark.

For the third or fourth deck, used for recording a mix of the other two, follow the same initial procedure but splice in blank tape after the second (yellow) leader. Now, by simultaneously starting all three decks together (with the third or fourth in record mode) you can mix the voice and music onto that deck.

(Note: If there are multiple modules on the reel, separate them with ten seconds (or more) of yellow leader tape. Don't skimp on the yellow leader; leave yourself plenty of time to stop the tape deck before it roles into the next module.)

The beauty of the parallel tracking method lies in the ability to match timing differences between the voice and music tracks. The matching procedure is simple. As an example, take a show that starts with 15 seconds of music before the voice begins. Put your voice and music tracks back at the start mark.

Then un-splice the voice master from the leader at the start mark and splice on a reel of blank tape. Do not use leader because it may create a 'click' or a 'thud' at the splices between track and leader.

Set both machines at the start mark; start them together and let them both run until you arrive to the point in the music where you want the voice to begin. At that point stop them simultaneously. On the voice reel, splice in the voice master you removed a moment ago. Then roll back to the start marks and play both together again to make that the voice comes in precisely when you want it.

You will have to fidget a bit on a couple of passes; because it will probably require adding (loosening) or subtracting (tightening) an inch or two from the blank tape preceding the voice to make it come in exactly on cue. But once it is right, you will be 'locked in' and that edit will require no further adjustment.

Next go back to the start mark; roll the parallel tapes together; and stop them together the next time you want to 'space' the voice track.

Say, for example, that the voice is running just about two seconds too long to arrive at a given 'riff' in the music. You simply go back through the voice track in the sections preceding the riff and pull out 2 seconds (either between words, sentences, or paragraphs). If the voice track was running short, you would add room-tone between sentences or paragraphs as necessary to make the words fall where you want them in relationship to the music track's 'punctuation.'

Music has its own 'vocabulary,' 'feelings,' and 'mood'; music can even conjure stories—for example, consider the masterful orchestration of *Scheherazade*, or *Fight of the Bumble Bee*, both by Russian composer Nikolai Rimsky-Korsakov.

It goes without saying that the mood of the music should match that of the script. You would not use a funeral dirge for a show about the conquest of Mount Everest, eh? And it is usually a good idea to avoid music with lyrics; because lyrics fight for attention with the narration of the script. That is, unless the song's lyrics are driving the show.

Usually, you will have to finesse both the music and voice tracks to create the best 'relationship' between the two. To do this you will also have to manipulate the music by editing in or out phrases, measures, riffs, 'stings,' or entire passages.

To lengthen the music, you will have to go back and re-record that section off the master tape or record; unless you were clever enough to record it two or three times up front (so that you do not have to worry about matching any EQ settings or other signal processing settings).

I found that taping each song at least once more than I needed allowed me plenty of room for stretching music tracks and getting musical phrases to fall exactly where I wanted them to.

To do this, cut sections out of the second dub and splice them into the first to make the music as long or as short as you require. You can also cut in musical 'punctuation points' (riffs, flourishes, and stings) to highlight key words.

Every good melody has sections in which the orchestration builds in intensity. The percussion might provide a highlight, or it might be a strong crescendo. Other passages are more mellow. These various intensities and punctuation points can, within reason, be cut and reorganized to make your own orchestration of almost any piece of music.

There is no need to think of the selection on its original form. You can cut the tail out and use it at the head, duplicate the center passages and repeat them ad infinitum; add cymbal or drum riffs just about wherever you want.

By carefully cutting your music and voice to add emphasis, you are going to end up with a music track you would swear was scored just for your script. (It was!)



Mixing music tracks for Burger King rally shows. Top (background): Don O'Neill and Yours Truly
Bottom (right to left): John O'Connell; Rocky Graziano; Yours Truly.

Can the Music Be 'Cut'?

Not all music allows you cutting freedom; in fact, some music is virtually impossible to edit. So-called 'library' or 'stock' music is made for cutting. 'Electronic' or 'Progressive Jazz' music, on the other hand, is extremely difficult to cut or rearrange since there are few, if any, repeats; the arrangement is never quite the same; so cutting from one section to another sounds awkward. Trial and error will tell the tale.

The 'parallel track' method is a swift pain in the butt to piece together; but once you have used that method, I doubt you will ever do a track any other way because the flexibility it allows will enhance your ability to subtly or drastically change the voice and/or music relationship in ways that will rival or surpass any 'punch in' system—short of a $100,000 computerized setup.

All tracks begin from a common start mark; there's a precision that cannot be matched by trying to remember when to 'punch in' a voice or musical passage.

These procedures are for the small- to medium-sized AV studio that is cranking out mixes on Teac, Atari or other 'semi-professional' audio gear. It is all moot if you use a big studio with computerized tape decks and a digital control board.

Mixing down in a computerized 24-track studio is, to say the least, another world. There is so much control; it will probably go over your head—which it should because you are not a 'space-cadet' audio engineer; you are a multi-image maniac. So, just sit back, tell them what you want, and enjoy the session (if you can afford it).

Sound-Effects Mixes

Using the parallel track procedure you can add special sound effects, using a fourth deck, or an extra channel on one of the other two decks.

To find the 'right place' for effects, use the voice track as your guide. Set the voice track at the start mark and use the third (or fourth) deck for the effects.

Set it up in the usual manner—leader/zero tone/leader/blank tape. Then parallel the blank tape and voice track to the effect point; and splice the effect into the blank tape. Repeat this process until all the effects are in place. Then go back to the start mark and parallel the two decks while recording effects onto an available channel on the voice track deck.

The voice deck usually has more channels 'open' since most voice tracks are usually mono, requiring only one channel; whereas most music tracks are in either stereo or triphonic, requiring two or three tracks.

Now we have a combined voice/effects master on one deck; and a music (plus other possible audio effects) master on a second deck; each with common start marks. Those two reels are then played in parallel and recorded onto another deck, through a mixer and whatever other signal processing equipment you choose to have in the program 'buss' (equipment chain).

Although many multi-image producers prefer to go into big audio studios to prepare their soundtracks, I prefer to make my own. The reason is simple: I never know exactly how much 'fooling around' I want to do until I have my basic elements together (nor do know exactly when the mood will hit me, to 'fool around'). Plus, outside studio time is usually too costly for the kind of futzing I like to do. So, I use big studios to record bands or lay down voice tracks and then do all the signal processing and mixing myself.

One advantage of doing your own signal processing and mixing is that the show begins to take form in the assembly stage and during the final 'tweaking' of the visual choreography (programming). Without fail; you will find a section where you want to do 'something extra' to the audio portion of the show. By doing your own; you can 'easily' re-mix your sound while watching your show (the way it is done in a professional cine setup).

In terms of signal processing, I find that the following instruments are quite useful:

- *Orban Dynamic Sibilance Controller* – Sibilance is a hissing sound that can happen as a result of saying the letter "s" and some other combinations of letters. This handy device eliminates the 'essiness' that occurs when 'hot' tapes (ones with very high/loud/strong levels) are dubbed from one generation to another. For example, particularly on location interviews, I often find that some people speak with particularly hot 'esses' (as in the words 'speak' or 'symptoms').

  Those 'esses' can result in loud and annoying hisses on subsequent generations, especially when you try to boost the top end of the EQ to get more clarity in your music track or a crisper overall sound. The Orban Dynamic Sibilance Controller will de-ess your track in the range of 'essiness' that you set it for and in dynamic relation to the overall gain in that range. As such it does not function as a 'notch' filter; that simply removes all of a given frequency range. Instead, the Orban controller acts as a variable (dynamic) 'valve' which will not respond until the gain in a predetermined frequency range crosses over a (variable) threshold.

- *Orban Parametric Equalizer* - this device is an equalizer *par excellence* because it is not 'fixed' with a pre-determined set of frequency ranges. Rather, you can dial-in whatever frequency range you want in either a broad or narrow spectrum. And you can utilize up to four spectrums each on two channels; or run a single channel though both sides (in a series hook-up) to achieve eight spectrums of EQ (!); each infinitely variable before or during your mix without any detection of change (if you do it right, which requires some practice).

- *Roger Mayer RM-58 Compressor/Limiter* – this stereo limiter can either be used to compress both tracks of a stereo mix independently and simultaneously, (on a 'dynamic' basis) or it can be used to 'duck' music under a voice track (on a mono mix) by 'slaving' the music track to compression limits established by the voice track—especially useful for 'simple' mixdowns.

- *Roger Mayer Noise Gates* – Noise gates should give you absolute quiet when there is no voice and/or music. A noise gate should also be super-fast acting so that they do not 'clip' words or phrases of music; and that do not audibly 'click' open or closed.

- *Space Station Echo Machine* – Your 'echo' machine should offer a huge variety of digital delays and echo effects; sixty or more. Although more than you will ever need, it is nice to have them available; because you'll never know which one sounds best till you try them all. And this tech isn't very expensive.

- *Marshall Time Modulator* – I called this the 'Donald Duck' machine because you can make unbelievable voice and music effects, particularly phase cancelation and other 'spacy' sounds

- *Eventide Harmonizer* – Another Donald Duck machine that is particularly useful for adding extra digital delays, synthesizer-type phalanges, and other effects to existing music tracks; as well as for 'crazy' effects.

These basic signal processing devices, along with a good mixer and three (or more) four-track decks, are about all you would ever need to make a dynamite soundtrack. Obviously, there are dozens of other toys available, but these are the basics which will allow you to prepare a good clean track and do a reasonable amount of 'fooling around'.

Fixing-Up Your Track

Use the Parametric Equalizer to eliminate tape hiss generated when dubbing location interviews up to 15 IPS quarter-inch masters. Dial in a narrow-band at the top end of the EQ scale and boost the gain in that band range. Then vary the narrow band from about 15,000 Hz to 20,000 Hz and listen for the point where the hiss intensifies. Then lower the gain in that frequency and broaden the band range until the hiss disappears.

Another useful technique is using a compressor/noise gate combination to virtually eliminate background noise from location interviews. How many times have you done location recording in an industrial plant or similar location where the background noise levels are diabolical? Well, the following technique can solve a lot of those sorts of problems.

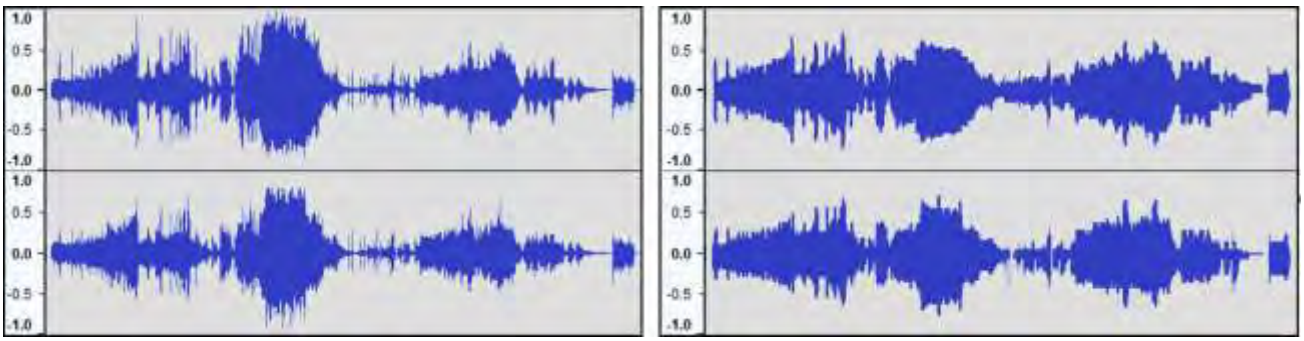
Eliminate Background Noise

On location, get the microphone as close as possible to the subject's mouth and set your recording levels to minimize the background noise, while still retaining sufficient voice level. Then dub the location masters using an equipment buss as follows: voice master>compressor>noise gate>EQ>echo>record deck.

Set the compressor for fast attack and slow decay with threshold set so that it will start compressing the instant it senses the voice and slowly (but not *too* slowly) release background garbage when no voice is present. In a similar manner, set the noise gate threshold so that it picks-up the compressed voice level and eliminates anything not up to that level of gain. Those two devices should sufficiently reduce the levels of background noise to leave you with 'clean' tape between words and sentences. Finally add EQ and echo 'to taste' adding to the clarity and 'depth' of the voice track.

‘Flatten’ Your Music

‘Flattening’ your music is a useful technique that makes mixdowns easier without unduly affecting the dynamic quality of your soundtrack. This technique is especially useful in cases where you have a heavily scripted track in which the music is of secondary importance.



Left: unaltered audio signal | Right: compressed signal is flatter; fewer peaks and valleys.

Run your music through the compressor twice to ‘flatten out’ its dynamic range to the point where the VU meters remain virtually stationary at the selected gain level. The advantage of using a flattened music track is that you will not have to worry about music levels running too far up or down while mixing. The gain level you select is where the music will stay until you decide to change it. This technique also helps where the orchestration’s gain levels fluctuate widely.

Do not attempt to accomplish all the compression in a single pass; if you over compress your track will sound like it is being recorded through a tube. Several passes with a little more compression added on each pass will provide the degree of flatness you want without sounding over compressed.

The flattening technique can also be used to help match voice levels for documentaries and other shows where there are a lot of different voices (or sounds). As you have probably noticed, different voices have different ‘psychological’ volume levels. Even when the VU meters show consistent gain, some voices sound louder than others. As a result, multi-voice mixdowns can be wearying. ‘Matching’ the voice levels by running the entire voice track through the compressor once or twice can provide you with a voice master that is sufficiently flattened that minor adjustment_of the gain levels is all you will need to manipulate during the final mix.

Do your initial voice or music editing assembly using the unprocessed ‘masters’ reel. Wait until you have finished editing voice and music tracks before compressing or processing them. That way if you make an error, you will be able to fix it without having to match any signal processing variables. If you need to change your voice track and/or music, make those changes on the unprocessed master reels and then re-compress the whole lot rather than try to match the compression levels for a specific section you want to edit (which is virtually impossible to do correctly and sounds funny when done improperly).

An echo machine will prove useful for virtually all voices; not as a special effect, necessarily; but to add a little ‘depth’ to the voice. The amount of echo added to a ‘normal’ voice should be almost imperceptible.

Add just enough to get extra 'dimension,' but not so much as to create an echo, per se. As mentioned, the Space Station has about 60 echo effects; different echoes can be assigned to different voices to 'perk them up.' Such effects should be added during the dubbing phase though, and never to the voice master laid down by the announcer or spokespersons. Master tracks should be recorded 'flat' without any processing to permit maximum processing flexibility at later stages.

Orderliness and Filing

Orderliness and consistency are a must in any studio operations. Masters should always be configured the same way(s) using the same track assignments and even the same reel sizes. This makes life easier in subsequent post-production and mixing work.

whether the track is a one-minute spot or a one-hour show; I store all my masters on 10-inch reels, and record them at 15 IPS. That way I am never aggravated by having to switch adapter hubs or accidentally playing a 7½ IPS tape too fast or a 15 IPS tape too slow. Such extreme consistency may seem overly meticulous; but it will eventually save you a lot of aggravation. To me, life is all about the elimination of aggravation.

Setting Up a File

The filing system I prefer is a color-coded labeling system involving red and blue. All master tapes are filed with their job number and title written on a red label. All releasable 'show' copies are labelled in blue. No master tapes are allowed out of the library unless being used to dub show copies or undergoing additional post-production work; only blue-labeled tapes are allowed out for purposes of listening or screening shows.

Whether it is a master or a dub; all tapes should be marked as to:

- Job number.
- Title.
- Track length (time).
- Track configuration.
- Type of synch code (i.e., AVL Clocktrak or Procall version).
- Date (version) of master or dub.

Those markings should be indicated both on the tape reel and packaging container. In addition, masters and dubs should be filed in order by job number, with a written log of the job numbers, job titles and dates. The log book should also keep note of any unusual characteristics if the tracks deviate from the normal tape configuration, programmer type, etcetera.

Masters and dubs should be stored 'tails out' to minimize 'print through' which results in 'cross-talk' on the tapes. Tapes should be stored in a dry, cool location. Heat and humidity are the number one killer of audio and video tapes, causing loss of high frequencies, excessive noise and/or drop outs. High temperatures and humidity cause the iron oxide to flake off the tape backing—taking your sound along with it!



Charlie Watts & Bruce Silverstein, 1997

Using different-colored leader tapes can help eliminate further aggravation by telling you, at a glance, 'where you are' on any given tape. A system developed by Bruce Silverstein, (Watts-Silverstein, in Seattle), utilizes white leader at the head of the tape; yellow to separate test tones from the program; and blue leader at the tail end. Thus, if you open a box and see blue leader, you know you are tails out.

Similarly, if you are ready to screen your show and you see white leader on the take-up spool, you know you are at the head of your test tones, not at the head of your program. Little stuff; but big enough to cause you embarrassment when a prospect is sitting out there who will be measuring your staging skills as well as your program.

By standardizing the play speed of all your master and show tapes, you will avoid any possibility of accidentally screening a show with the deck set at the wrong speed; or playing test tones.

Little Stuff That Can Make Big Differences

Standardize all the types of tape you use because different types have slightly different recording characteristics. If you always master and dub on the same type of tape, you can have your decks calibrated for that specific type and thereby get maximum performance out of each machine.

Use 1.5-mil tape as it is the strongest and least prone to stretch. Avoid C90 and C120 cassette tapes which, although they provide longer play, are so thin that they are easily damaged by stretch and/or 'kinking.'

Clean your heads at the beginning of every session. Manufacturers generally recommend that the heads be 'cleaned periodically;' However, I have found that it's difficult to remember 'when' that is.

By cleaning the heads at the beginning of every session, you will never lose any sound because of dirt or iron oxide build-up (this also applies to the capstan and pinch rollers). Every fifty or so hours, you should also demagnetize your heads—carefully.

When shipping them, wrap tapes (and floppy disks) in aluminum foil to protect them from excessive RF or X-ray frequencies which can cause drop-outs, loss of high frequencies and/or 'noise' (which can even be seen, on video tapes).

At the airport, ask for a hand inspection of your tapes; do not let them pass through metal-detector devices even though the devices maybe marked as 'safe'. As in the case of film, a single 'dose' will probably not make any noticeable difference; but the effects are cumulative and after multiple passes you may begin to hear deterioration or other differences.

Do not take "no" for an answer – you have a legal right to a hand inspection and no inspector should deny you that right.



1980 pictures of the front and rear view of the programming room at the New York studio of Incredible Slidemakers.

This chapter combines storyboarding and programing. These functions should be handled simultaneously. The most common programming problems I have encountered involve storyboards that specify too many slides.

One outrageous example was a show that called for a seventeen-slide sequence in three seconds—using just three projectors! Given six projectors, the move could have looked great; but there was clearly no possibility of accomplishing it with the limited number of projectors available. The tragedy was that the entire sequence of slides, all of which involved tedious special-effects shooting, had been previously shot. Think of the effort that could have been saved had the program been created prior to art preparation and shooting!

The most expedient process the production of multi-image shows involves the preparation of the soundtrack first; followed by programing and storyboarding; then (and only then) preparing the artwork and doing photography. The reason is simple: that is the most efficient and cost-effective sequence; in terms of hours spent (or wasted); as well as supplies utilized. It is much better to know exactly how many slides you need than it is to guestimate and overshoot to cover contingencies.

In the 'old days,' slide shows were not as technically complicated (or competent) as they are today. Back then we would write a script, make a soundtrack, go out and shoot a bunch of pictures (or swipe them out of books and magazines) and do our best to assemble them into a show. Special effects, animations, and the like, simply were not in widespread practice; they did not need to be—a show was 'grandiose' if it involved more than one screen or three projectors. That is not to say that elements of design and style did not come into play; they did and in no uncertain terms; but those design elements were restricted by technological limitations.



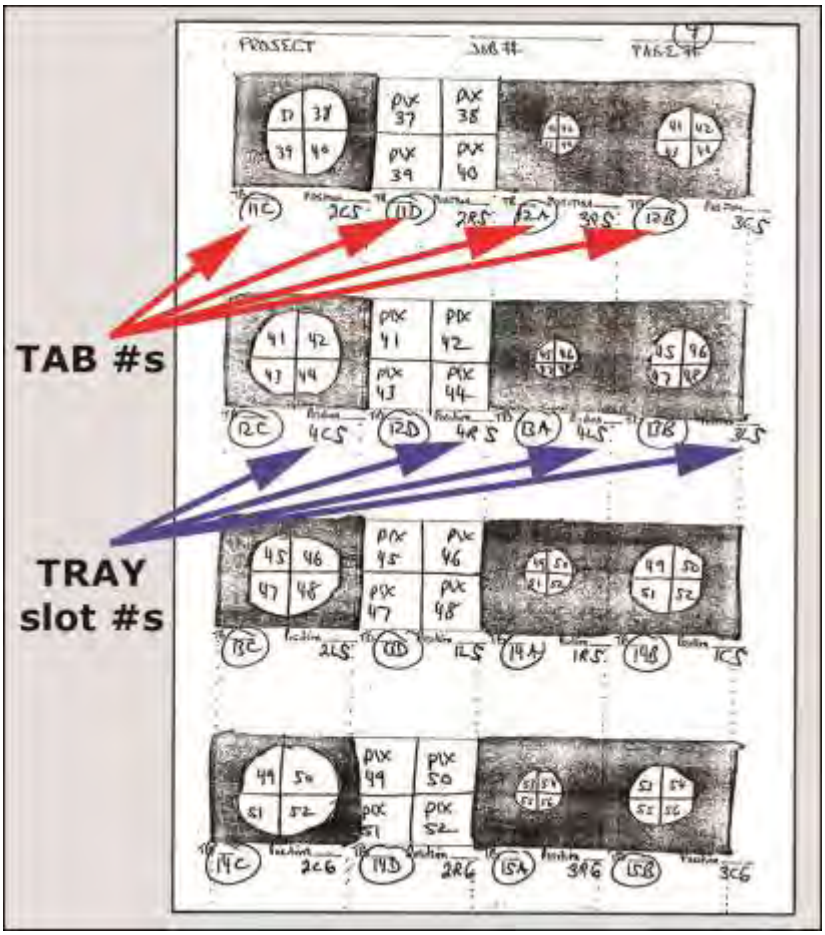
In those days, there were no computers; no Positrack; no Clocktrak. To program a show, little holes were punched by hand into paper or mylar tapes; and every time you made an error you had to manually back each projector up to the start position and run the whole show through again from the beginning. The hours needed to make even the simplest moves, by todays standards, were staggering. 'All-nighters' were par for the course.

With today's computerized slide shows, virtually anything is possible; you can even have slides go faster than cine, if you like. As a result of this technical revolution, special effects and animations have become common bill-of-fare; those cost a lot of money to produce. Today, it is no longer cost-effective to overshoot, covering your ass for any contingency. To be profitable today, you must think in terms of shooting scene for scene, slide for slide, to a tightly storyboarded script.

But how do you 'tightly' storyboard? How can you know exactly how many slides you need? The answer lies in preparing the storyboard and programming the show simultaneously. To program the show, you need a finished soundtrack, or something close to one. You will recall that in chapter two it was recommended that the designer work in collaboration with the writer to develop a verbal description of the scenes desired which forms the basis for the complete program and technical storyboard.

I have never been a believer in 'finished' layouts and storyboards; I think too much money is wasted on painting a pretty picture of what will ultimately be a photograph or special effect (you cannot adequately draw a photographic special effect). However, I am a firm believer in a very complete *technical* storyboard because that 'board' is the blueprint of the show.

A technical storyboard is one that details not only a sketch of what the scene will look like, but also reveals detailed instructions for shooting and programming moves. As the writer and designer start creating the soundtrack script, the best creative procedure is to simultaneously write detailed verbal descriptions for the visualization; accompanied by rough sketches for the writer to follow when massaging the words; and sufficient for the designer to accurately remember what was discussed.



Example of a 'simple' technical storyboard made for the Ford launch show produced for Sonargraphics. The board shows a series of circle-zoom reveals of quad-slide layouts.

At preliminary script meetings, it is also a good idea to have the audio designer on hand to become familiar with the verbal and visual concepts being developed. The goal of those meetings is to get everyone—that is, all key production functions—working *together;* to harmoniously execute the concept.

At such meetings, any thoughts as to appropriate music or audio bridges and effects can be simultaneously thrown into the hopper and blended with the other ingredients. To begin the process, you need storyboard sheets to plot your visuals and programming moves.

Storyboards

There's a lot more to a proper storyboard than you would think. The primary purpose is to provide an illustrated synopsis of every scene in a film or multi-image show. Alfred Hitchcock was known to have drawn elaborate boards detailing the 'look' of scene, vis-à-vis camera lenses, angles and lighting. I'm not suggesting that level of detail; but almost.

Multi-image is more complex than a movie; from any angle; more variables. Specificity is the order of the day; as you'll soon appreciate. In addition to illustrations, each scene is described in elaborate detail; every slide in the show is accounted for—what it is, where it goes and what it should look like. Even the slide mounters get their instructions from the storyboard—the kind of mounts and masks to use, as well as the tray positions.

The storyboard provides for sketching on a camera grid (I use the Oxberry grid) and filling in various details about the scene in the space below each grid. Those details are for the production of art and photography. Let us go through them at this point to understand what a storyboard should include, whether fully illustrated or 'just' a technical board with sketches.

On the camera grid, the designer (working with the programmer) should sketch each visual reasonably accurately and in the space below indicate whether it is a photograph, illustration, or other graphic treatment.

A camera grid is used for sketching in case positioning of any elements is critical to programming moves (in most cases a 'loose' sketch will do, like those shown in the simple storyboard). Sketches should be made in dark-blue pentel which will Xerox as gray. Coloration should be indicated by drawing an arrow to the given section in black pentel and specifying the color(s). I prefer the use of either a given manufacturer's gel numbers, or a series of simple number codes indicating dichroic-filter combinations.

Below each grid, the following information is specified:

- TAB is a way of labeling a slide by number. I use TABS because that is the 'search' method to find program sections using the AVL Eagle's Procall programming language, which I prefer. With Eagle, you can 'GoTo' a specific TAB destination. This is quite handy because if you have a system where you must go to a given program line number or cue number you would never know quite where you are; because as you change and the program, the total numbers of cues are either expanded or shortened; thus, today's line #22 may be tomorrow's line #23. However, the TAB system is oblivious to the number of lines or cues; it provides a sure method of getting to a given section of the program for either assembly or review of the show. (For scenes where a given TAB number involves many slides, the individual slides within the TAB section are labeled by their own sub-TAB number; i.e., TAB1/A, TAB1/B, TABI/C, etcetera.

- STORYBOARD PAGE reference is included in event case you are handed someone else's storyboard that you must key to your own (God forbid).
- SCRIPT PAGE keys back to the written script on which you have indicated your major synch points by a series of slash marks with their appropriate TAB numbers.
- TOP-LIT COPY?_If you are shooting this scene from a photo print, printed page, or other 'reflective' art, you would check this box and specify what the art is (the art should be labelled with the appropriate TAB number).
- DUPE? Is the scene to be a dupe from a slide or larger transparency? If so, check this box, specify what the slide or transparency is; and give it. a TAB number.
- QUANTITY Here you fill in how many copies you need of this slide. (Usually, the answer would be one; but sometimes you might want more copies.)
- COPY STYLE | 1-10 This is an important section because it can simplify everyone's understanding of the show design. On any given show, there is usually a design scheme that is followed throughout; for visual harmony. One such style might be centered type set in all-caps; another might feature capitalized headlines with flush-left, bulletized copy indented 2 picas beneath it; etcetera. You should establish a 'palate' or 'menu' of copy layouts and number each_layout style;_then you simply check-off by number the style for each scene. This serves as a backup for the sketch you have made.
- FIELD SIZE Some complex shows subdivide a total slide area into various sub sections, or 'fields.' An example of this would be a speaker support section where all changeable copy falls within a fixed graphic border; or shows shot to a 'TV safe' area. Establish and number all field sizes and/or areas; and indicate the field for the scene sketched by its appropriate number.
- GRAPH STYLE | 1-10 This is like COPY STYLE 1-10, above.
- DX? Let us say you want to double-expose (DX) words into a background slide. You would specify the background on one storyboard frame, and the type on a second, being sure to check the DX box on both frames and indicating the same TAB reference number on each.
- SUPER? With multiple-projector shows, one slide is often superimposed (projected) over another. If that is the case; check this box for all the slides being supered over each other and be sure to give each the same TAB reference number.
- ANIMATE Does the slide in question belong to a group of slides involved in an animation? If so, check this box. Use one storyboard frame for each step of the animation, being sure to check the animation box on each frame and using the same Tab reference number. For animations, I subdivide the TAB reference even further; for example, TAB1/A-1, TAB1/A-2, TAB1/A-3, etcetera. Sketching the animation will prove invaluable (even if it is a bit time consuming).

- MASK? Is the slide to be masked in any way? If so, check this box. Also indicate whether it is a 'bind-in' mask or a DX mask. A 'bind-in' mask is a separate chip of film that is sandwiched with the slide transparency in the mount (usually either a 'hard-edged' Kodalith mask or a 'soft-edged' mask produced on 5302 stock). A 'DX' mask us used to block out or fill in specific sections of a slide when shooting on camera, resulting in a single slide with the masked elements composited. In most cases, you will bind-in masks as it is a far simpler process; but where multiple masks are required or if you have only a few projectors; you may find it expedient to DX in one or more of the masks; because a Wess mount does not 'like' more than three thicknesses of film to be squeezed inside it; such slides get too thick and may not 'drop' into the projector properly.

- ZOOM_This speaks for itself; however, STREAK means that you want the art shot with 'zoom trails' and STEP means you want a 'frozen' image shot into specific positions to create a zoom *sequence*. Indicate the number of steps in the sequence.

- WIPE Indicate the direction of the wipe (N/S=North/South; S/N=South/North; etcetera.). A diagonal wipe would be indicated as circling N/S+E/W.
  Again, do you want a streak or a 'step wipe' How many steps should it be?

- GLOW/STARS/GLITTER In a subsequent section of this book we will discuss the preparation of an 'Effects Bible;' a record of 'standard' effects that you would probably apply to most shows. The Effects Bible includes standardized colors; types of glows, starts, glitter, auras, and eclipses, etcetera; all reference-numbered and with their appropriate shooting instructions. For any given show, you would restrict your total palate of effects to a few that are pre-selected to work well together in terms of the overall design scheme. These few are assigned numbers one through ten (or whatever); you then specify each effect by number. If it is only a section of a slide that is to be shot with an effect, circle the appropriate section on the sketch and draw an arrow indicating which area gets what effect.

- OTHER EFFECTS_If you have something special in mind, or need a memory trigger, this is the place to make note of it.

- MOUNT This section allows you to specify how you want the slides mounted. I recommend you stick with one standard slide mount throughout your show and possibly for all shows. With all due respect to Bruce Wessinger, who has developed a remarkable series of slide mounts, I always found that I had run out of the 'odd-ball' types (usually in the middle of the night before the show).

  I also found that the special Wess Mounts with masked areas never performed as well as I like on screen because the borders were slightly out of focus (due to the thickness of the mount(s). For that reason, I recommend that you make and use bind-in masks to establish given screen areas. These should be mounted in the Wess #2 standard mount. Such masks are closer to the plane of focus and it is easy to make more copies whenever you need them.

MOUNT (continued) In addition, I never really trusted the accuracy of the subdivided Wess mounts, what with all their various molds; there seemed to be some slight variations from batch to batch. Not all Wess Mounts come out of the same molding machine; in fact, the two halves of a given mount are sometimes molded by two separate machines. Depending on the mold combinations of the mounts you are using (which are noted on the inside of the mounts) there could be some slight differences in the total or subdivided slide aperture areas. Those little differences can make tightly registered sequences appear a bit sloppy on screen. An exception to this is the Wess #2 mount where extra effort is made to insure identical aperture dimensions and *positions*. Thus, the most accurate masking is achieved by binding your own masks into Wess #2s.

To digress for a moment, about TABS: I made a "Master Tab" program which I use to begin any programming/storyboarding session. It looked like this:

TM.1. Time .1 (1/10 th second)
S20G Speed 20 Cues Per Second, Go
TBI TAB 1
TX Time X
N No Operation
TB2 TAB 2
TX Time X
N No Operation
Etcetera
TBZ9 TAB 29
TX Time X
N No Operation
Etcetera

The purpose of the Master Tab program is to facilitate the timing of the program. As you know, the AVL Eagle system allows you to 'automatically' time-out your program by using AVL Clocktrak.

First, record a computerized clock onto one channel of your soundtrack. Then, play the tape's clock back through the Eagle. When you want to establish a 'synch' point, hit the 'Cue button' on the keyboard. The computer replaces the TX (Time-X) cue with the exact time that you tapped the bar. Time-Xs become synch points which are time-locked to specific points in your soundtrack. Before programming; read the script's verbal descriptions and establish where you want the major synch points, indicating them on the script with a slash. If the show is non-scripted (musical or some other 'soundscape') get a written score, or make your own by dividing the show into measures (usually either three or four beats per measure); and establishing separate TABs for every measure. Using this method, you now have a specific TAB number for every desired synch point in the script and/or musical score. These points can be accessed by Eagle and/or identified verbally by anyone, using the TAB numbers.



[*Editor*: Eagle key assignments were way different than modern computers.]

The Master Tab program utilized TB1 through 99, then TBA1 through A9, etcetera, all the way through the alphabet to TBZ1 through TBZ9. This allows for 333 tabs—which should be enough for the average size multi-image show! Thus, the first step in the programming/storyboarding process is to go through the soundtrack and fill-in the Time X cues with the timing for the events on the storyboard.

'No Operation' cues are inserted as 'signposts' or 'flags' that are useful when 'scrolling' through your program. (When you observe the monitor of the Eagle, it is hard to understand 'where' all the 'other' lines of the program are. A simple way of understanding this is to imagine looking at a long roll (scroll) of paper through a small window. The way you get from one part of the scroll to the rest is to wind the roll up or down until the part you want appears in the window. This, essentially, is what the Eagle does – and why that function is called 'scrolling.')

When programming a given TAB section, open lines between the time code and "No Operation" lines, and insert the program cues. When you have finished that section; delete the "No-Operation" line. When 'scrolling' through the program at high speed, you can see where you left off, or which sections need to be worked on, by looking for No-Operation 'flags' as the program scrolls by on the monitor.

Storyboards Should Not Require Explanation

All of this may seem an unbelievably wearying exercise to simply make a storyboard. It is—but far less wearying than having to explain over and over exactly what you had in mind. It is far better to be 100% clear on the storyboard than to suffer the (costly) consequences of having things shot wrong or incorrectly programmed. Virtually all problems in multi-image productions stem from communication break downs between members of the production team.

Another benefit of such detail is that it can be keyed into your estimating and accounting systems. For example, if the zoom box is checked and you know you charge, say $25.00 per zoom step, you can more easily estimate the cost of the sequence and accounting can trace through the storyboard accurately assess what to charge.

Write On!

The storyboard is made by the programmer in collaboration with the designer. Together they work out the show. If there is a programming problem with the designer's idea, it is solved on the spot; if there are major 'gaps' or 'boring sections' in the program, the designer(s) can embellish those parts with extra scenes or slide effects as necessary, on the spot.



For every frame on the storyboard, the designer should simultaneously prepare a write-on-slide that bears the same sketch and TAB reference number These write on slides are 'dropped' into trays and used to observe the programming moves as they evolve. Subsequently they are replaced, slide for slide, as the finished ones are produced. Write-on slides cannot be too detailed; the more details, the better. It is a royal pain in the ass to do this; but it pays big dividends.

Photo courtesy Kodak *Images Images Images*.

Using write-on slides, you get to pre-view your show before committing toa single piece of art or photography; and it only takes about 20% longer in the programming and storyboarding phase (the cheapest) to make a write-on-slide version of the show.

After the programming and storyboarding session; the show is basically 'locked up' and the art and photography departments will know exactly what is needed. The only adjustments that should be needed are the final programming 'tweaks,' once the write-on slides have been swapped out with finished slides and the show is reviewed. (There is never a show that does not require 'tweaking.' In fact, I always allow for an extra hour of 'tweaking' for every hour I spend on the 'base' programing of the write-on-slide version.)

Virtually every shop I have freelanced for has groaned loudly at the prospect of preparing a write-on-slide version for programing and storyboarding purposes; it seemed to be wasted energy. However, all have appreciated seeing the show prior to production and all have agreed that it was ultimately very effective in terms of ironing out problems early enough in the production process to avoid myriad headaches and expenses later.

So now, armed with storyboard sheets, a timed-out script and track, and lots of coffee and donuts, we are ready to start programing and storyboarding.

Introduction To Programming



Yours Truly in 1976; programming punch tapes with two AVL Show Pro IIs.



Yours Truly in 1978; digital programming with two AVL Show Pro Vs.

For our purposes of discussion, I will be couching all my commentary in terms of programming on the AVL Eagle system; it is my favorite of the lot, although most of its benefits are now achievable using competitive machines. In deference to AVL, or whatever programmer you are using, I am going to restrict my comments in this section to tips; little tricks I have learned. Apologies to those who find this information irrelevant or over their heads. However, every manufacturer has instruction manuals for their products; so, there' is no need for me to duplicate what you can read about in those publications. [*Editor*: Section Two of this Volume contains many AVL instruction manuals. You can find more of them at Steve Michelson's website: http://www.stevenmichelsen.com/AVL/.

Programmers have a mystique about them; I have often wondered why. There is actually nothing that complicated about it. All you do is apply a certain degree of logic, and have a clear idea of what you want to have happen (the latter can be harder than the former). Frequently, my programming students don't know exactly what they want to see on the screen. When asked what they want, they will reply: "I don't know … what can the computer do?" The answer: almost anything. But only you can decide what. In its most basic terms, programing gives you two areas of control: the choice of slide(s) and the projector lamp. Lamp controls permit the illumination to dissolve up or down gradually or abruptly. Slide controls permit you to tell you tell any projector to either advance (forward), reverse (backward) or stay put.



AVL Eagle display of the *Procall* programming language; Version 2.

Lamp Controls

On AVL equipment you have the following options;

- Hard Cut - The most abrupt change of all. With hard cut the projector lamp is illuminated simultaneously with the opening of the projector's built-in shutter. Every projector has a built-in 'douser', or shutter, which is a light baffle that closes to 'hide' a slide advance. It is that baffle that creates the blackout during the advance. With a hard cut, you can see the baffle opening and closing; that is what creates the hardness of the cut.

- Cut – Also abrupt, but 'softer' than a hard cut since the lamp is not fired until the projector shutter is open.

- Soft cut_– This amounts to a ¼-second 'dissolve.'

- One-Second Dissolve – Here the projector shutter opens or closes; then the lamp takes approximately one second to achieve full intensity or return to full off. (It is 'visibly' full on or off after about half a second).

- Two-second Dissolve – reaches "visibly" full intensity in about 1.4 seconds.

- Three-Second Dissolve - full intensity in about 2.4 seconds

- Four-Second Dissolve - full intensity in about 3.5 seconds.
- Six-Second Dissolve - full intensity in about 4.5 seconds.
- Eight-Second Dissolve - full intensity in about 6 seconds.
- Sixteen-Second Dissolve - full intensity in about 12 seconds.
- Thirty-Two-Second Dissolve - full intensity in about 26 seconds.

'Alternate' Choices

Cuts and dissolves have a built in, 'automatic' slide advance. That is, any projector fading to black with a cut or dissolve will advance forward to the next slide. If you do not want the slide to advance, you can use a series of commands called "Alternatives."

Why these commands are still called "Alternates" is a mystery to me, since that terminology has proven to be one of the most difficult concepts for beginning programmers to grasp.

(Electrosonics—a British manufacturer of slide-control gear—has a better term: "No Step." That is what an Alternate is—a projector lamp action that involves no slide advance.

Using AVL *Procall*, the choices are:

- Fast Alternate – which looks the same as a hard cut
- Alternate – same as cut
- One second alternate – same as one second dissolve
- 2 second alternate – same as 2 second dissolve
- 3 second alternate – same as 3 second dissolve
- 4 second alternate – same as 4 second dissolve
- 6 second alternate – same as 6 second dissolve
- 8 second alternate – same as 8 second dissolve
- 16 second alternate – same as 16 second dissolve
- 32 second alternate – same as 32 second dissolve

In addition, like dissolves, alternates also respond to "Freeze" commands.

You are not restricted to those dissolve speeds, though. You can create your own dissolve rates using Freezes. In fact, Richard Shipps, one of the world's greatest programmers once boasted to me that he had created an eight-day dissolve (must not have been a very exciting show).

Using Freezes

Freezes are quite useful because you can create variable dissolve rates and/or 'stepped dissolves' to go in tempo with music of other audio effects. To use Freezes, you must address projectors by their 'names.'

To digress for a moment, about projector names: Although AVL gear will automatically sequence between projectors, I do not recommend that you rely on their pre-set sequencing loop; because it promulgates 'sloppy thinking' and poor planning. Rather, learn to specify each projector for every move. If you want a move from 1-L (left) to 1-C (center), say so—write 1-LC. That will help you remember which projectors you are 'talking' to.' Storyboarding will be easier and more specific. You will also be able to read your storyboard and know which projectors are involved in every move.

Beginning programmers have difficulty knowing which projector is which. AVL's "Left, Center, Right," "Top, Center, Bottom" or "ABC" approach is confusing, at best. That 'system' of identifying projectors is a carry-forward from the 'dark ages' of multi-image. It is no longer meaningful and should be replaced with a system like Electrosonic's, where each projector has its own number, from one through ten, or whatever.

The Left-Center-Right system of identification started when people only used two or three projectors and positioned them side by side—one on the left, one on the right for a two-projector presentation. When dissolves were upgraded to handle three projectors, the third one became (logically) the 'center' one. In addition, because there were rarely times when more than two or three projectors were assigned to a given screen, the dissolve units took on the 'name' of the screen. But today, when you might have up to 30 projectors aimed at one screen, it seems silly (and is) to call a projector "5R" or "10C"; a simple numbering system would be for better. However, until that changes you should get used to identifying each projector by its "name"—1-Left, 2-Center, 4-Right; whatever.

As mentioned, to use freezes, you must address a specific projector by 'name.'
Say you wanted to create a seven-second dissolve on the 1 left projector. The program would look like this, called a "Stepped Dissolve:"

Cue Duration	Projector Instruction	
.05	6D 1L	(Six second dissolve, 1-Left)
.09	W .9	(wait nine-tenths of a second)
.05	FZ 1L	(Freeze, 1-Left)
.2	W .2	(wait two tenths of a second)
.05	6D	(un-freeze 1-Left and continue up (or down) at the 6-second dissolve speed)
.9	.9	
.05	FZ 1L	
.05	W.05	
.05	6D	
.9	.9	
.05	FZ 1L	

Continued

```
.05    W .05
.05    6D
.9     W.9
.05    FZ 1L
.05    W.9
.05    6D
.9     W.9
.05    FZ 1L
.05    6D
.05    FZ1L
1.0    W1
.05    6D
```

To 'unfreeze' projectors that are frozen, use only a dissolve speed command *without the projectors name*. This is, admittedly, a bit confusing … it is nonetheless real. Use the specific 'name' of a projector to freeze it, and the dissolve speed without the projectors name to unfreeze it.

You can change dissolve rates in between freezes too. In the above example you do not have to keep the same six second (6D) rate throughout … you can change the fade where you want. For example, if we wanted the slide to 'creep up' until the last few seconds and before reaching full intensity more suddenly, we could substitute another, shorter dissolve speed, say 4Ds or 3Ds in place of the 6D's.

To start a dissolve in the opposite direction, use the specific projector's name along with the dissolve or alternate speed. In the preceding example, you could start the left projector down at the end of the frozen upward sequence by changing the last line from 6D to 6D-1L.

Similarly, you could do the same thing mid-way in the program to achieve up and down pattern to the stepped-dissolve sequence.

```
6A 1L      Starts 1L UP
W.9
FZ 1L
W.05
6A
W.9
FZ 1L
W.05
6A
W.9
FZ 1L
W.05
6A 1L      Starts 1L DOWN
W.9
FZ 1L
W.05
```

Continued

```
6A
W.9
FZ 1L
W.05
6A
W.9
FZ 1L
W.05
6A 1L       Starts 1L UP
Etcetera
6A 1L       Starts 1L DOWN
Etcetera
PF 1L       Projector Forward 1L (when 1L lamp is fully off).
```

Note that in such an 'up/down' sequence you use alternates rather than a dissolves since, if you used a dissolve, the slides would keep advancing. This can be confusing while programming because in the time it takes to write the cues, the dissolve may have advanced the slides so when you look at the screen you see the *next* slide, not the one you thought you were dealing with.

However, by using alternates, you always see the same slide. At the conclusion of the freeze-down sequence, wait until the slide has become completely invisible, then advance it using a PF (projector forward) command.

Whenever you initiate a 'dissolve' up, use an alternate instead. That way, when scrolling through the program or reading a printed version of it, you will know that the projector is not changing slides. I only use a dissolve when I deliberately want to make use of the automatic slide advance feature, which is not too often. (See Cheating, below)

Remember: Dissolves incorporate automatic slide advance; Alternates involve no slide advance.

Computer Speed and Line-Reading Times

The AVL Eagle has three running speeds: line-by-line; or 'runs' at 10 or 20 cues per second (CPS). To start a run, you add a "Go" at the beginning. If you write 10 cues in a row, and the program speed is 10 cues per second (CPS) the programming computer would read and execute them all in one second. If the program speed was 20 CPS, execution of the ten commands would take one-half second.

If you want to slow-down that rate, you do so by inserting 'wait' times in-between the appropriate cues. For example:

```
1D 1L       Dissolve UP 1 Left
W1          Wait one second
1D 1LC      One second dissolve between 1L and 1C
            (1-Left goes DOWN, 1-Center goes UP)
W.5         Wait ½ second
CT 12R      Cut between 1-R (DOWN) and 2-R (UP)
```

You can select any amount of waiting time you want that is divisible by 20ths of a second. For example: you can have .95 second but not .93. But where there are no wait times (or Clocktrak time-related synch points) the Eagle will run the cues at 10 per second, unless you have chosen S20 (Speed 20) mode; then Eagle will execute runs at 20 cues per second. To stop a run the last cue instruction contains a "Stop" command.

When calculating the time it takes the Eagle to do runs at 10 or 20 cues per second do not calculate non-cue information into the total time. Cues mean specific projector action instructions. TABS, time codes, S10 or S20, and similar notes are read by Eagle at a rate of 100 per second—so fast that you need not think of them as taking up any time at all.

During the program you can go in and out of either speed mode. For example, to create a flashing effect, go into S10 mode and at the end of the sequence go back into S20. The reason for this is that a flash at 20 cues per second is so fast that 'lamp lag' would 'mush' all the flashes together and the result would look like no flashing at all. However, at S10 speed, there is sufficient time of the lamp to actually go on and off ten times per second and create a flashing effect.

To create a flashing effect in S20, insert W.05 lines between the alternates or fast alternates which allows enough time for the projectors to flash on and off.
Such a program would both look like this.

S10 SPEED − Ten cues per second
AT 1L (ON)
AT 1L (OFF)
AT 1L
AT 1L
AT 1L
AT 1L
AT 1L
AT 1L
AT 1L
AT 1L
Total: 10 lines = 1 second | No need to insert wait cues

S20 SPEED − 20 cues per second
AT 1L (ON)
W.05 (Wait .05 seconds)
AT 1L (OFF)
W.05
AT 1L
W.05
AT 1L
W.05
AT 1L
W.05
Continued

AT 1L
W.05
AT 1L
W.05
AT 1L
W.05
AT 1L
W.05
AT 1L
W.05
Total: 20 lines = 1 second

In the S20 program above, you can replace any of the .05 lines with other program cues, thus 'threading' a second set of instructions into the first. You could not do such threading in the S10 example (above) without interrupting the smoothness of the flashing sequence.

Making Flash Fades Smooth

In the 'old days' the mark of an expert programmer was the ability to accomplish a smooth 'glitch-free' flash-fade on a Show Pro III or V. if you could do that, or even better, flash-fade up and down, you were worth gold.

Today all that has changed; but only a bit. Now, with the "D" and "X" Doves you can have a smooth flash-fade that the computerized 'brain' of the Dove-D or Dove-X will execute without your having to worry about a thing (or so they say). That command is called "Blink Go."

In practice, using the Blink Go feature of the Dove will work fine as long as it terminates at either the full up or full down stage of illumination. But you cannot blink up, then turn around and blink down without a 'glitch' (a visible pause in the blinking rate while the computer reads the instructions telling it to reverse direction).

That 'glitch' is very annoying to perfectionists; and for that reason, I prefer to write-out every line of the program (a laborious task) to achieve totally smooth flash fades.

However. there is another, more important reason why I write out each line:
I do not trust the equipment. With all due respect to AVL, computers are subject to myriad quirks ranging from sensitivity to static electricity or RF frequencies from nearby radio stations, to 'noise' in the power lines or 'out-of-phase' power somewhere in the total computer/dissolve/projector chain, and a host of other nemeses that make the computer or the Doves 'go nuts.'

Then too, I have found that for every 20,000 or so cues it handles, a Dove-D will drop one, which makes for an interesting show. That is understandable; I drop a lot more than that for every 20,000 cues that I program. Ha.

So, to protect myself from that possibility I still basically program to the old Show Pro V specifications. That means I can, if I must, get a Show Pro V and some Mark VII dissolves (still AVL's most reliable package) and run the show; and I can get that gear virtually anywhere, cheap.

I have found that by building shows to that old standard, I can still get a full range of effects, with greater reliability.

I don 't mind spending the extra programming time if it means my show will be more failsafe; because the audience only sees the show once; and if I have a show go down—for whatever reason—I have not only done a disservice to my client, I have also done a disservice to the industry; to my colleagues and even my competitors. A multi-image show should never go down; there is no reason for that unfortunate occurrence.

Rant Alert: My 'opinion' is that new types of AVL gear are sometimes released a little too early. Anyone who buys the latest technology may become a member of a unique user group known in the computer field as a "Beta Test Site." As such, you help AVL or any other computer builder 'field test' their equipment; but you do not get paid for any of the problems the equipment may create for you. (End of rant.)

If you simply want to have a slide flash-fade up or down the procedure is simple: go into S10 speed and program as follows:

To achieve a 2-second flash-fade up
4a 1L (4-second Alternate 1-Left UP)
FA 1L (Fast Alternate 1-Left)
FA 1L
Etcetera

Note: when doing flash-fades, your dissolve times are visually cut in about half. That is, a 4-second dissolve will appear to achieve full intensity (or full off) in about two seconds. Thus, you should double the 'dissolve' rate to find the flash-fade dissolve speed you want to see on screen.

I put 'dissolve' in quotes because, again, I almost always use alternates, that involve no projector advances. That is because, as in the Freezes example earlier, the time it takes you to program all the lines of instructions might allow the projectors to advance to the next slide; if you use dissolves instead of alternates.

By the time you wrote all the instructions; you might be looking at the next slide; not the one you thought you were programming.

Now suppose you want to flash-fade a slide up, then flash-fade it down with no glitch. To do that you must be in S20 mode and the minimum wait time between flashes must be .1 seconds. Here is why:

The minimum wait-time between flashes is determined by the instructions necessary at the crossover point, where the flash-fade goes from UP to DOWN, or vice versa. Note the following program (overleaf):

```
S20G        (speed 20, Go)
1A 1L       (starts IL UP on a one second ramp)
FA 1L       (‘Bookkeeping’ move that keeps lamp OFF)
FA 1L       (turns lamp ON)
W.1
FA IL       (turns amp Off)
W.1

Etcetera    (to the ‘crossover’ point)

FA 1L       (at this point the projector must be ON)
4A 1L       (starts IL DOWN on a four second ramp)
FA 1L       (‘bookkeeping move’ keeps lamp ON
FA IL       (turns lamp OFF)
W.1
FA IL       (turns lamp ON)
W.1
FA IL       (turns lamp OFF)

Etcetera
```

Avoid Being ‘Incongruous’

If you want a flash fade (or other effects) to involve more than one projector; try to set yourself up so that you can ‘talk’ to multiple projectors with a single line of program instructions. Note the following screen display on Eagle:

```
1L    2L    3L    4L    5L
1C    2C    3C    4C    5C
1R    2R    3R    4R    5R
```

I can ‘talk’ to 1L, 1C and 1R together by writing, 1LCR; and all three will respond together. Similarly, I can talk to 1L, 2L, 3L, 4L, and 5L together by writing 12345L; and they will all act together. If I include an action cue, like 1A (one-second alternate), whichever of the five are UP will go DOWN, and the ones that are DOWN will go UP, at the same time, *together.*

However, one cannot address projectors that are ‘kitty corner’ to each other, for example, 1C 2R. That requires two lines, which takes twice as much time for the computer to read—something to avoid when trying to do smooth flash-fades using freeze sequences involving more than one projector.

Here is an example where 1-Left flash-fades UP and, after a while, flash-fades DOWN while 2-Left flash-fades UP and DOWN:

```
1A 1L       (starts I-L up on a one-second alternate)
FA 1L       (bookkeeping move keeps lamp off)
FA 1L       (1-L lamp ON)
W.1
FA 1L       (1-L lamp OFF)
W.1
Continued
```

```
FA 1L       (1L lamp ON)
Etcetera    (to crossover point)
FA 1L       (1L lamp must be ON for crossover)
2A 12L      (starts 1-L DOWN and 2L UP on 2-second ramps)
FA 1L       (bookkeeping move keeps 1L ON and 2L OFF)
FA 1L       (1L lamp OFF, 2L lamp ON)
2A 12L      (starts 1L DOWN and 2L UP)
FA 12L      (bookkeeping Move keeps 1L on and 2L off)
FA 12L      (1L lamp OFF, 2L lamp ON)
W.1
FA 12L      (1L lamp ON, 2L lamp OFF)
W.1
FA 12L      (1L lamp OFF, 2L lamp ON)
W.1
Etcetera    (Until 1L lamp is OFF; sequence must end in lamp OFF mode)
FA 2L
W..05
PF IL       (Projector forward 1 Left)
FA 2L
W.1
FA 2L
W.1
FA 2L
Etcetera    (to crossover point)
FA 2L       (projector ON for crossover)
2A 2L       (starts 2L DOWN)
FA 2L       (bookkeeping move to keep 2L lamp ON)
FA 2L       (lamp OFF)
W.1
FA 2L       (lamp ON)
W.1
FA 2L       (lamp OFF)
Etcetera    (Until flashing is no longer visible; sequence must end in lamp OFF
            mode)
PF 2L       (projector forward 2-L)
```

A "bookkeeping move" (so-called by AVL) means that the first FA serves to keep the lamp in the same status as it was before you started the lamp ramp UP or DOWN. For example, if 1L was DOWN and we wrote 2D 1L it would initiate the ON ramp of 1L; but the next line—FA 1L—keeps the lamp off; the *second* FA 1L command begins the visible flashing effect by turning 1L ON.

Again, the FA's must be spaced apart by a minimum of .05 seconds (at S20 mode) to appear as flashes, or .1-second (one-tenth of a second) spacing if there is to be a crossover from flash-fade up to flash-fade down at some point.

But suppose you have to flash-fade between two projectors that can't be addressed on a single line of instructions? Then, such a program might look like the following example that involves a crossover between three projectors.

Again, the use of alternates will keep the same slide before your eyes instead of automatically advancing to the next slide, which can be very confusing. But, do not forget to advance the slides after the flash-fade when using alternates instead of dissolves; do that using PFs (Projector Forward).

```
1D 1L       (starts 1 Left up on a one-second dissolve)
FA 1L       (bookkeeping)
FA 1L       (lamp ON)
W.1
FA 1L       (lamp OFF)
W.1
FA 1L       (lamp ON, for crossover #1)
2D 1L       (starts IL DOWN)
FA 1L       (bookkeeping)
FA 1L       (lamp OFF)
2D 3C       (starts 3C UP)
FA 3C       (bookkeeping)
W.05
FA 1L       (1L lamp ON)
W.05
FA 3C       (3C lamp ON)
W.05
FA 1L       (1L lamp OFF)
W.05
FA 3C       (3C lamp OFF)
W.05
FA 1L       (1L lamp ON)
W.05
FA 3C       (3C lamp ON)
W.05
Etcetera    (until 1L flash is no longer visible)
FA 1L       (1L lamp OFF)
W.05
FA 3C       (3C lamp OFF)
PF 1L       (projector forward, 1L)
W.05
FA 3C       (3C lamp ON)
4A 5R       (starts 5R on a 4-second ramp UP)
FA 5R       (bookkeeping)
FA 3C       (3C lamp OFF)
FA 5R       (5R lamp ON)
W.05
FA 3C       (3C lamp ON)
FA 5R       (5R lamp OFF)
Etcetera    (to next crossover (when both_go DOWN)
FA 3C       (lamp ON 3C to initiate crossover to 3C DOWN)
6A 3C       (3C ramp DOWN)
FA 3C       (bookkeeping)
(Continued)
```

FA 3C	(3C lamp OFF)
FA 5R	(5R lamp ON to initiate 5R DOWN)
W.05	
FA 3C	(3C lamp ON)
16A 5R	(starts 5R DOWN on a 16-second ramp)
FA 5R	(bookkeeping)
FA 5R	(lamp OFF 5R)
FA 3C	(lamp ON 3C)
W.05	
FA 5R	
W.05	
FA 3C	
W.05	
FA5R	
Etcetera	(until 3C flash is no longer visible)
FA 5R	(5R lamp OFF)
W.05	
PF 5R	(projector forward 5R)

The only way to know for sure when you can advance the slides is to back up to the beginning of the section and watch the sequence(s) 'at speed'; that way you'll be able to see when a downward flash-fade has 'disappeared,' at which point the slide(s) can be forwarded (or reversed).

Any wait times can be used for additional cues for other projectors (see "Threading," below). That makes it is possible to have many things happen 'at once'. All you must remember is that during flashes and flash-fades, keep the time between each flash the same throughout. Any change in the amount of time between flashes will result in a visible glitch.

Fast-Fades Between TABS and Time Codes

If a flash-fade sequence extends through several TABS and the time codes for those TABS do not 'jive' with your cue-time spacing for the flash-fade sequence, subtract the last TAB's time code from the first. Round-off that time to the nearest 20^{th} of a second (at S20) and fill the 'space' between the TABS with lines of W.05 cues (wait one twentieth of a second) that add up to the total time between the two Tabs' Clocktrak synch points.

For example: if the synch point of TAB 1 is at 10 seconds, and TAB 2 is at 12 seconds; there are 2 seconds between those two TABs—that equals 40 X W.05. Thus, you would delete the clock-synch-time from TAB 2 and insert 40 lines of W.05 between the two TABs.

The amount of time you put into the program with W.05 cues should equal the total amount of clock time between the TAB's synch points making those time codes redundant and unnecessary.

Then, continue the flash-fade sequence through the TABS and add whatever other instructions you want by replacing the W.05 lines with other cues.

'Cheating'

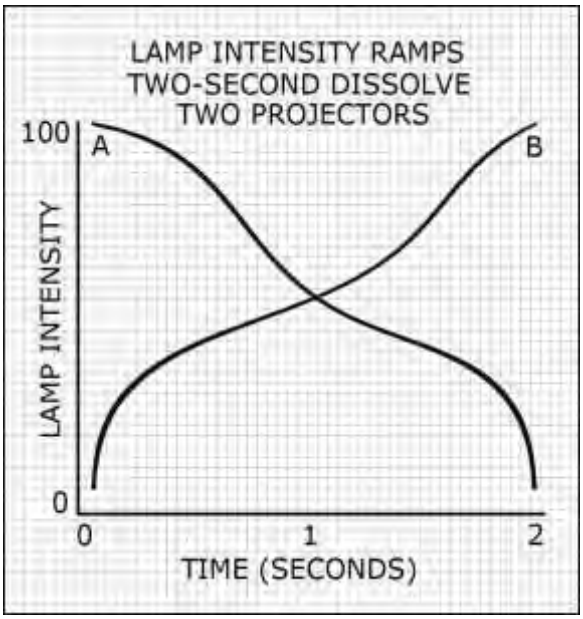
Probably the biggest encumbrance to learning programming is lack of foresight about *access to projectors*: that is, how long it takes a projector to recycle slides before you can use it again. The difficulty is not the programming, per se; but knowing how many projectors you will need to accomplish a given effect considering such recycle times.

If you are using Kodak B2 projectors, you must add .85 seconds to the dissolve time to allow the projector to advance. Thus, a one-second dissolve equals 1.85 seconds, a two-second dissolve 2.85 ... and a 16-second dissolve 16.85—that is, unless you 'cheat.'

By cheating it is possible to do a one-second dissolve in half a second; and instead of the completion of that cue taking 1.85 seconds, it requires only 1.35. That is what cheating is all about: saving time. Cheating is necessary to achieve high-speed shows as well as to get extra speed out of shows involving only a few projectors.

To grasp cheating you must remember that slide shows are optical illusions, like TV or movies. The motion-picture standard is 24 frames per second; that is the fewest necessary to achieve what appears to be smooth motion—not because two dozen is a magic number. The key words are 'fewest' and 'appear.' Thus, cheating involves using the fewest number of slides and the least amount of time necessary to get your move to appear correct.

To further understand cheating, take into consideration the normal dissolve curves on an average projector pair. On a two-second cross-dissolve the image going down is basically invisible one second into the total dissolve-ramp time (two seconds) because another slide is on the way up. On a one-second cross dissolve, the downward image is invisible in about one-half second. In fact. almost any dissolve rate can be visually cut in half. The exception is a fade to black. If there is no upwardly dissolving slide, you may see a bit more of the downwardly fading slide (assuming a pitch-black room − which is seldom the case either). What that means is that you can usually advance the downward fading slide halfway through the dissolve and 'get away with it,' thus picking up time.



Since a one-second dissolve down automatically advances the slide one second after its initiation we would not choose that command. If we did, we would be in the normal cycle, which is not cheating.

The normal cycle would allow one second for the lamp to dissolve from full intensity to 'glow,' then an additional .85 seconds for the slide advance (they build in a .1-second "safety factor"). Net result: 1.85 seconds for a 1-second dissolve.

[Projector lamps are never fully off; as long as the projector is on, the lamp will retain a very low glow, to keep the filament hot. That facilitates a faster response when ramping ON while also increasing the life-span of the (expansive) lamp.]

On a "PF" command the slide advance time (at 60-cycle, 110 volt current) is .75 seconds, so the resulting total time is 1.25 seconds. Such a program looks like this:

```
1A 1L       (1 second alternate, 1L projector DOWN)
W.5         (wait one-half second)
PF 1L       (projector forward 1L projector)
W. 75       (wait .75 seconds)
1A 1L       (1 second alternate, 1L left projector UP)
```

With SAV projectors the advance time is 1.15 seconds (using 50 cycle, 240 volt current). To cheat, use a one-second alternate (instead of a dissolve) which will start the lamp down; but not advance the slide. Then, one-half second later, write a PF (Projector Forward) command for the slide in question. With a PF command, the slide advance time (at 50-cycle, 220 volts current) is 1.15 seconds, so the resulting total time is 1.75 seconds.

Here are the cheat times for a range of 'dissolve' cue (alternate) speeds using Kodak B2 projectors:

```
2a 1L
W1.2
PF 1L
W. 75
3A IL
W2
PF1L
4A IL
W3
PF 1L
6A IL
W4.75
PF1L
8A 1L
W6
PF 1L
16A 11
W 12
PF1L
32A IL
W 20
PF 1L
```

As you can see, the cheat factor increases with the dissolve length. However, keep in mind that these factors are not absolute; they depend on the *densities* of the down-going and upcoming slides. (It also depends on the speed of the projectors.)

For example, if you are dissolving between a snow scene and a coal-mine interior, you are going from black to white; so, the cheat may become visible as you can see the projector's mechanical shutter closing. However, using slides of average density, you can get away with cheating. If you can see the advancing slide, just keep on adding time in .05 second increments before advancing until you do not notice it.

'Threading' Programs

This method is used when you want one series of effects to be occurring simultaneously with another. For example: a situation where you combine a flashing star with an animated zoom or pan and simultaneously dissolve between various backgrounds; all smoothly timed and without glitches.

Let us say that at TAB 2 the time code is 1:32.45 and at TAB 3 the code is 1:37.67. By subtracting the first time from the second, we have 5.22 seconds available in between those two TABs. Round that off to 5.2 seconds (as Eagle only reads cues in 1/20th of a second increments).

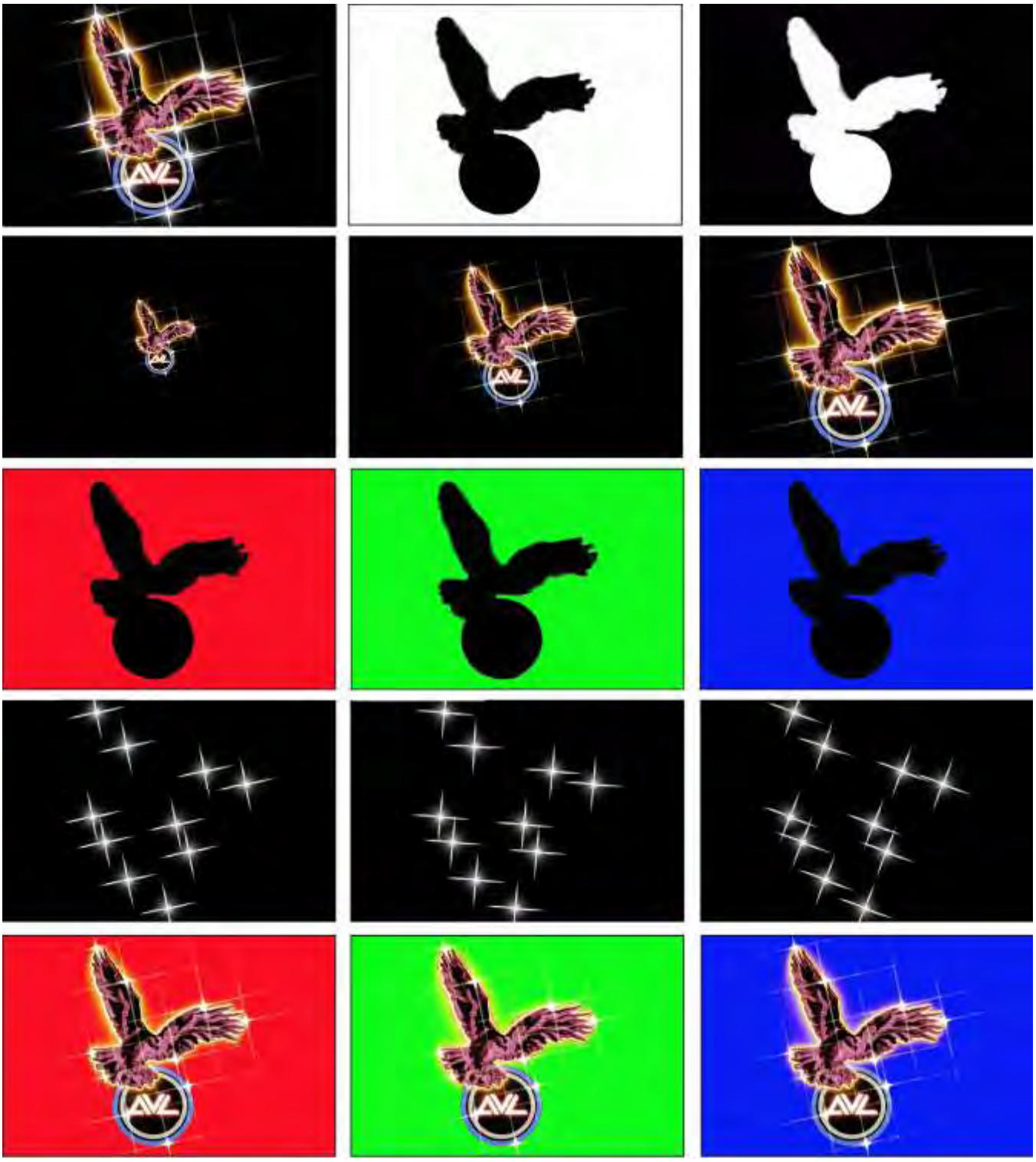
Then, divide 5.2 seconds by .05 (one 20th of a second); that equals 104 twentieths. Next, open space between TAB 2 and TAB 3 and insert 104 lines of W.05 cues (wait .05 seconds). Then, go back and play that program sequence 'at speed' to make sure it does not force a GoTo at TAB3. If the cues require more time than has been allocated and the program arrives at the second time code (TAB3) late, the program will jump past the second time code to the next, at TAB 4. If it has forced a GoTo, stop right there and take out W.05 cues, one line at a time, until it no longer jumps to TAB4.

As mentioned, using AVL Clocktrak, if your cue sequence exceeds the time between two-time codes (subtracting the second from the third), the program will bypass that entire section and jump ahead to the next time-synch code.

Using our example, if I had inserted 105 lines of .05 cues—which equals 5.25 seconds—that would exceed the 5.2 seconds available between TAB 2 and TAB 3 and Eagle would force a GoTo from TAB 3 (1:37.67) to whatever time is nearest to 1:39.67 seconds; that is 1:37.67 (TAB 3) plus 2 seconds. Those 2 extra seconds allow Eagle's tiny brain to catch up.

Forcing a Go To is a frustrating experience; so, after breaking down the TAB interval timing into 20ths of a second, pretest the section by running it 'at speed'. Once the time element is under control, you are ready to go on.

Program the slowest elements first. In our example they are the slowly dissolving background slides. Let us say we want the backgrounds to change about once every second. Replace the first W.05 cue with 1A 1L (one-second alternate UP; 1-Left projector). Then scroll down 19 lines (19 x .05 = .95 seconds +.05 for the 1A 1L cue together equal 1.0 seconds) and write 1A LC (one second alternate between 1-Center UP and 1-Left DOWN).



AVL logo effects-component slides. Top row (left to right): Resolve / Pos / Neg | Row Two: Three-step zoom of Resolve Row Three: Using primary colors you get six colors from three slides; because combining two primaries produces a secondary color; e.g., red + green = yellow. | Row Four: Spinning stars | Row Five: more resolves; for programming flexibility; particularly getting out of loops. Note optical illusion—the 'clear' part of the neg (upper right) looks gray; but it is actually and certifiably white.

Then scroll down another 19 lines and write the next one-second alternative cue, 1A 1CR (one second alternate between 1-Center DOWN and 1-Right UP). In this manner, the background-image-dissolve cues are placed on every 20th line.

Now, since I have 5.2 seconds available in the TAB 2 section, we can to do five dissolves and have .2 seconds (two tenths) to spare. Because we want both flashing images (the star and the logo zoom) to occur simultaneously, divide the 19 lines between background dissolves by 2; that results in 8.5 lines. I cannot have half a line, so I cheat.

Here is the program, with background-image-dissolve cues in place:

Line	Cue
1-	1D 1L
2-	W.05
3-	W.05
4-	W.05
5-	W.05
6-	W.05
7-	W.05
8-	W.05
9-	W.05
10-	W.05
11-	W.05
12-	W.05
13-	W.05
14-	W.05
15-	W.05
16-	W.05
17-	W.05
18-	W.05
19-	W.05
20-	1D 1LC
21-	W.05
22-	W.05
23-	W.05
24-	Etcetera

Program with flashing star and zoom cues threaded in:

1D 1L	(background #)
AT 2L	(star UP)
AT 3L	(zoom move A)
AT 2L	(star DOWN)
W.05	
AT 2L	(star UP)
AT 3LC	(zoom move B)
AT 2L	(star DOWN)
W.05	
(Continued)	

AT 2L	(star UP)
AT 3CR	(zoom move C)
AT 2L	(star DOWN)
W.05	
AT 2L	(star UP)
AT23R	(zoom move D)
AT 2L	(star DOWN)
1D 1LC	(background #2 UP; background #1 DOWN)
AT 2L	(star UP)
AT23R	(zoom move E)
AT 2L	(star DOWN)

Note the cue conflict on the twentieth line (the one-second mark, where the background slide should dissolve). I cannot write the background-dissolve and flash cues on the same line. To cheat, the slowest cue (the one-second dissolve) is moved to and replaces the nearest available .05 cue. That takes into consideration that a tenth-of-a-second delay (2 program lines) will not significantly interrupt the visual ramps of a one-second alternate; whereas even that short break in cue order would drastically interrupt the flashing sequence; the visual version of a musician missing a beat.

Projector-Sequencing Loops

This section should be subtitled "The Shortest Distance Between Two Points Isn't Necessarily a Straight Line."

Many times, I see shows where the projectors follow the manufacturers pre-set sequencing loops—from 1-Left to 1-Center; 1-Center to 1-Right; 1-Right back to 1-Left. That seems logical when you think of it, right? But these pre-set loops can require extra lines of instructions when programming sequences involving more than three projectors.

For example: what is that *fastest* way around a 15-projector grid? This way:

13-1L	*12*-2L	*11*-3L	*10*-4L	*9*-5L
15-1C	*1*-2C	*4*-3C	*5*-4L	*8*-5C
14-1R	*2*-2R	*3*-3R	*4*-4R	*5*-5R

(Projector names in bold face; sequence in *italics*.)

Think about it. Suppose you went down the first stack, then stack two, then three, four and five: you would end up on 5R. To get from 5R to 1L would require two lines of instructions (or three, using pre-sets.) The route illustrated above is one that will you get around the entire grid of projectors with only one line of programming per move. This is not the only possible loop, there are others. The idea is to avoid loops that do not allow you not to get from one projector to the next with just one line of instruction per move. If you need more than one line to get from one projector to the next, re-think your loop. (Of course, that can be disregarded if yours is a s-l-o-w loop; in that case such detalia can be disregarded.)

'Presets'

Presets are all-important, but seldom understood. They are 'alerts.' They are used when you want non-contiguous projectors to simultaneously respond to a single action cue. Since the non-contiguous projectors cannot all be addressed in a single line of instructions, they are all put 'on alert' by pre-setting them to respond together. Whichever projectors are preset will follow the next action cue.

Let us make an (overly) simple comparison. Line up fourteen of your friends. Then say: 'OK, the next instruction is for Mary, John and Fred ... Ready you three? ... Go!'
That, in essence, is how presets work. You specify which projectors you want to involve in the next move; and they all simultaneously follow the action cue. For example, if we want to go from A to B (below):

A

1L (ON)	2L (OFF)	3L (ON)
1C (OFF)	2C (ON)	3C (ON)
1R (ON)	2R (ON)	3R (OFF)

B

IL (ON)	2L (ON)	3L (OFF)
1C (ON)	2C (ON)	3C (OFF)
1R (OFF)	2R (OFF)	3R (OFF)

My pre-set instructions would be:

PS 23L
PS 1C
PS 12R

Those are the projectors involved in the desired change.

Having alerted the specific projectors involved pre-setting them. I next tell them *what* I want them to do together; i.e., cut, dissolve, etcetera.

If I want different moves *almost* simultaneously, I would not use presets. Nor would I if I did not need the projectors to all act together at the same instant—such as all of them hard-cutting ON or OFF together. For example, presets would not be needed if the same projectors we just considered were programmed as follows:

3D 2L
1D 3L
CT 1C
8D 1R
6D 2R

Total time - .25 (one quarter) second

Since the total cue-reading time here is a quarter of a second (.25), there would be little visible delay in the sequence since most changes are dissolves. Notice that the cut is buried in the center of the chain; that 'fast' move camouflages the 'extra' time needed to execute all five cues.

Fast Zooms and Wipes

Zooms and wipes occasionally want to be 'gentle' but usually are more dynamic when they occur quickly. For example, a zoom toward the viewer should be programmed to happen as fast as possible. On a big rig, I accomplish that move in S20 mode with no wait time between cues, using Hard Cuts.

HC 1L
HC 1LC
HC 1CR
HC 12R
HC 2CR

Wipes, if they are 'hard edged,' should also follow this procedure. If that is a little too fast for your liking, switch to S10 mode and keep the same programming instructions. If that is still too fast, insert a W.05 line in between each action cue and switch to Alts.

Soft edged wipes usually want to be a bit slower; stretched out; or "milked", as Chris Korody would say; but not much. I usually accomplish those kinds of moves in S10 mode with either a W.05 or a W.1 between the action cues.

(Note on nomenclature: Wait times are 'passive' cues. Instructions that actuate projectors are 'action' cues.)

Programming for Animation

Animation programming requires a lot of trial and error to make things look 'real' because you are creating an optical illusion. My love affair with animation began when I was doing the preamble for the *Bumbles* show. I was trying to mimic the lip-synch opening of the *Clearlight Fantasy* show—programmed by the late John Sacrenty—and have a jab at their attempts to use slides to accomplish what 'should' be done in cine.

For the *Bumbles* opening, I simply programmed fifteen projectors to go 'full speed ahead' at 10 slides per second. There was no variation in timing; it was cut, W.05, cut, etcetera, *ad infinitum*. At the time, the result was intriguing; but looking back, it was quite monotonous and did not resemble 'reality' at all. That is because in 'real' life, the tempo of an action does not normally occur on a straight time line.

For example, try to jerk your arm up or down. First your arm must overcome inertia of rest to get going. Once up to speed, it must overcome inertia of motion to stop. As such it accelerates to get going and decelerates to stop. Thus, if we were to program such a move, using, say, nine projectors, our move would look like this:

AT 2C
W.1
AT 2CR
PF 2C
(Continued)

W.05
AT 23R
W.05
AT 3CR
W.05
AT 3LC
W.05
AT 23L
W.05
AT 12L
W.05
AT LR
W.05
AT 1CR
W.05 (Time to this point is .75 second. Allows 2C to advance to the next slide.)
AT 12C
W.05
AT 1CR
W.05
AT12C
W.05
AT 2CR
W.05
AT 23R
W.05
AT 3CR
PF 2R
AT 3LC
W.05
AT 23L
W.05
AT 12L
W.05
AT LR
W.05
AT 1CR
W.05
AT 12C
W.05
AT 2CR
W.05
Etcetera

As I have experimented more and more with 'lifelike' animations in the past years, I' e discovered that the time rates of the moves must be finessed with care until they *appear* correct. This can be quite an elaborate procedure because making things seem real is not as easy as it looks. The acceleration and deceleration principles will help; but they aren't the whole answer. Sometimes you may want to *alter* 'reality' for more dynamism.

Since it is impossible to accomplish such programming finesses at the write-on-slide stage of the show, you will have to wait until you have the final slides trayed to tweak the program.

Very few still photographers understand animation techniques adequately. My experience, even with members of my own previous staff at Incredible Slidemakers, was that their interpretations of animations were so crude as to require elaborate programing fixes to make them 'appear' real. That is why it is so important to sketch each animation move on your storyboard in detail to make sure that everyone involved understands; particularly the photographers. They need to know how many steps are involved in the animations.

If you know you are going to be doing animated sequences, your best bet is to either hire a cinematographer who also does stills; or an animation-stand photographer that also does location work. If neither are available, be prepared to re-shoot the sequence one or more times so that photography moves can be programmed to create smooth, real-looking sequences.

To digress momentarily: These plates attempt to illustrate the *Nightmares* show made for Slide Transfer Service (STS). In the actual show, most scenes were animated. There were simple, two-projector moves; loops of up to nine slides (it was a nine projector show); as well as long runs of slides animated at up to eight slides per second.

Marty Sherman was the only professional actor. The rest of the cast was drawn from Incredible's crew (especially John Bromberg, Doug Sloan, and Dan Collins); and, at the airport, actual skycaps and United Airlines staff, arranged for working with United's PR department.

Nightmares was a slide show trying to be a movie. When I shot the animations for it, I overshot on a 6:1 ratio; using a motorized Nikon FTN at varying 'tempos.' For example, on take one; the actor (Marty Sherman) would go through the moves very slowly; and on subsequent takes he would speed up, bit by bit. Then I would select the series which most closely matched the speed of the programming steps (eight slides per second). The animated sequences sometimes paused on a 'key frame;' and at other times they were book-ended with shots of Marty's grimacing, sweating, nightmare-tortured face.

However, few slides of that show have survived the many purges suffered by my archive. Thus, the story presented in these plates is incomplete in several ways: Many scenes are missing and some of those that remain are represented by just a few frames.

All that said, the show began with opening titles and the sounds of Dracula (Bela Lugosi) laughing. As the opening title appears on screen, Dracula threateningly growls, "Nightmares!" (See, *Nightmares Show Portfolio | Plates N^{os} 1-20*) The audio cross-fades into a gentle, orchestral rendition of the Brahms classic, *Lullaby and Good Night*, while the scene dissolves into scenes of Marty getting ready for bed. As Marty falls asleep, the music turns creepy and as his nightmares begins, we hear a witch cackling in the BG (background).

Weird music, sound effects and threatening laughter continue as the nightmare progresses. For example, in the elevator sequence, [see, *Nightmares Show Portfolio | Plate Nº 5*] we hear the creaks, thuds and whining of old machinery; and at the airport, sounds of traffic and honking cars could be heard.

Most of the nightmares focus on the hassles and costs of schlepping tons of gear. At LaGuardia Airport, Marty arrives with three dozen equipment cases. He peels-off fifty-dollar bills into the hands of a skycap and gets hosed with excess baggage fees. The funniest scene was the train of cargo cases pulled by a taxi cab. [*See Plate Nos 7-9*]

An alarm clock, seen intermittently between nightmares, suddenly rings loudly. Marty wakes with a start and, hearing bright, cheery music, blinks in disbelief as the 'voice of God' (announcer} begins the few spoken lines in the show: "The nightmare is over. Now you can screen your show anywhere, anytime, with total confidence. … Etcetera."

As the voiceover continues; the musical tone morphs into a proud theme. We watch a series of expressions cross Marty's face as his doubts morph into curiosity and interest. The show closes with scenes of Marty proudly screening video and film versions of his show; and ends with Marty back at the airport check-in counter, smiling at the camera with a film can tucked under his arm. The closing title was an STS logo doing an 18-slide spin.

As most of the shoot was nightmare scenes, the pictures were shot with available light (a 30-magenta filtration was used for the fluorescent-lit office scenes). That was because I did not want the pictures to look "produced;" I didn't mind the weird colors. Wide lenses were used for intentional distortions on some scenes. Animating wide-angle-lens sequences is exciting; foregrounds zoom out dramatically.

As for the show's concept; for some time, I had been toying with the idea of doing a show without words. I thought *Nightmares* could be the one; but that was not to be. The client (Ed McTighe) insisted on a voiceover to extoll the features and benefits of STS slide-show transfers to film and video.

[*Editor*: In 1986, that show without words was produced, for IKEA. You can watch a video of that show— *Building It Is Half the Fun!* —on Vimeo, at: https://player.vimeo.com/video/229424008.

[For more, see Volume Three, pages 426-435 | 1976—Buhl Multiplexer—*Nightmares*]



1976 | "Nightmares" Show Portfolio | Plate № 1

Opening titles | original sequence was a 6-slide loop.



1976 | "Nightmares" Show Portfolio | Plate Nº 2

Key frames of animated sequences.| Missing scenes of Marty winding alarm clock.



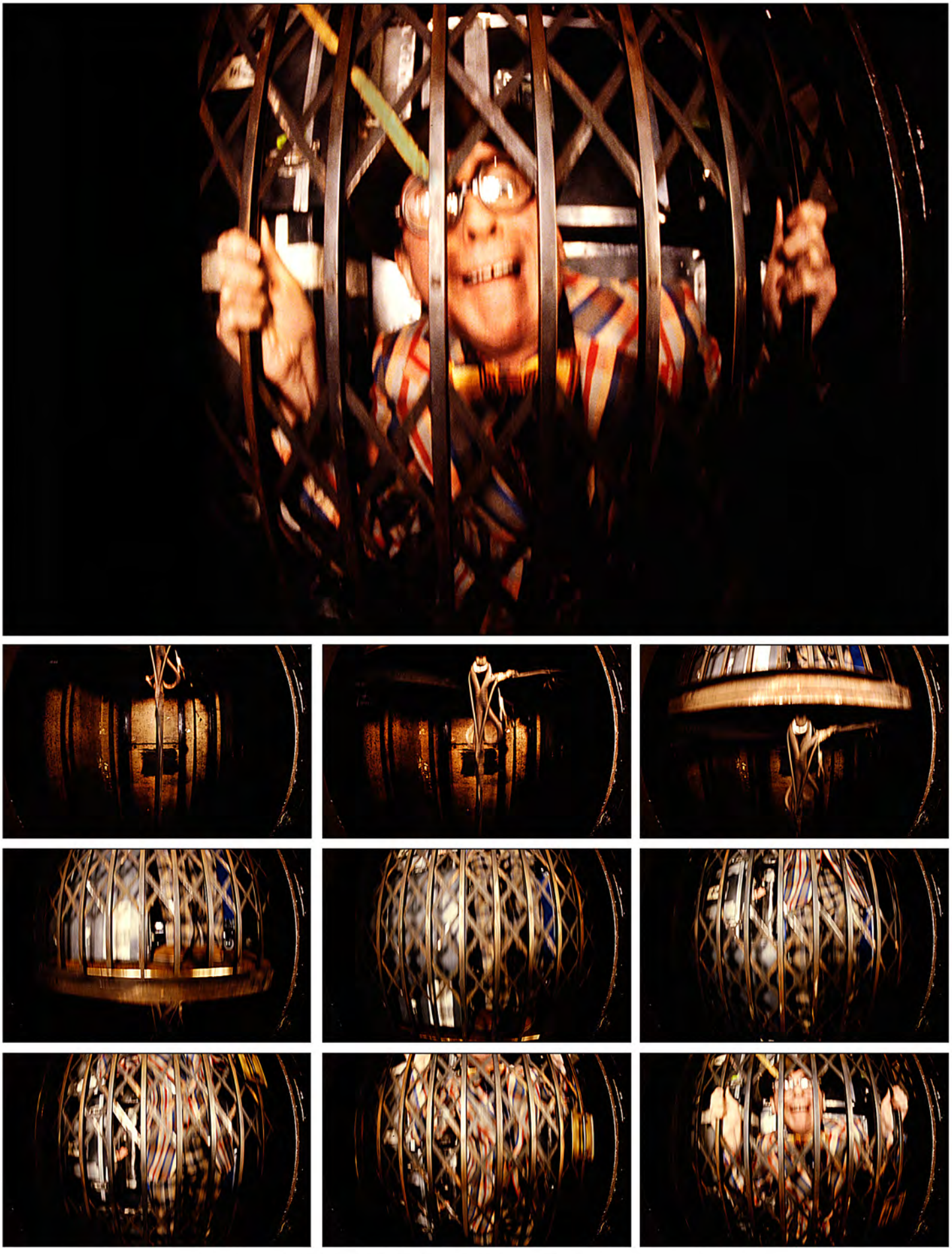
1976 | "Nightmares" Show Portfolio | Plate № 3

Key frames of animated sequences.



1976 | "Nightmares" Show Portfolio | Plate Nº 4

Each of two 4-second "bed-rolling" sequences was 36 slides.



1976 | "Nightmares" Show Portfolio | Plate Nº 5

Elevator sequence was originally 27 slides.



1976 | "Nightmares" Show Portfolio | Plate Nº 6

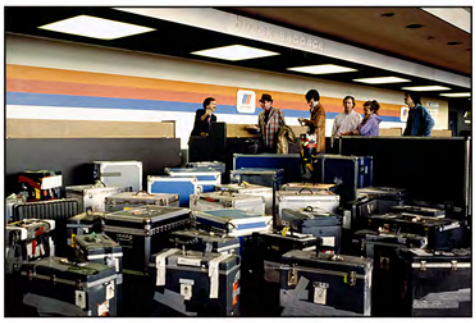
Elevator sequence - and others - finished with short animations of Marty's contorted face.



1976 | "Nightmares" Show Portfolio | Plate Nº 7

Key frames | Cash sequence (bottom row) is actual 3-slide loop.















1976 | "Nightmares" Show Portfolio | Plate Nº 8

Key frames of 9-slide animations | Bottom:2-slide loop.followed by 6-step zoom to extreme close-up of face.











1976 | "Nightmares" Show Portfolio | Plate Nº 9

Key frames of animations | Top: 36-slide zoom in on Marty lifting case from moving baggage carosel.







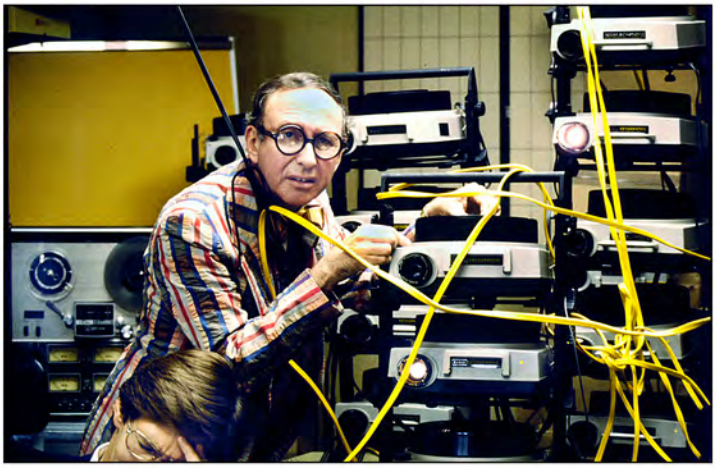


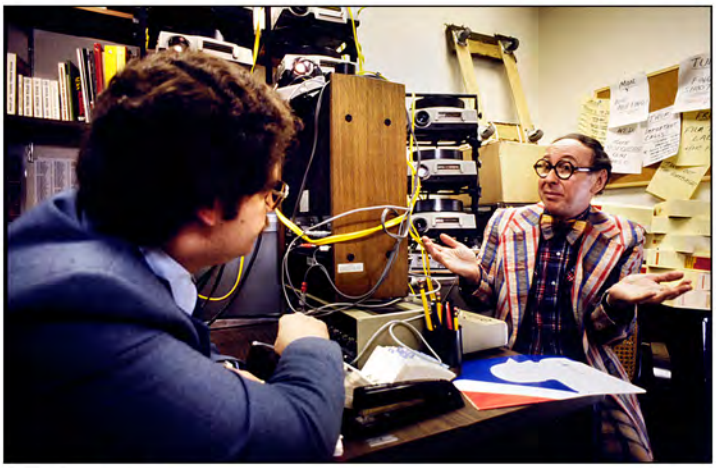


1976 | "Nightmares" Show Portfolio | Plate № 10

54-slide animation of taxi cargo train pulling out of airport.



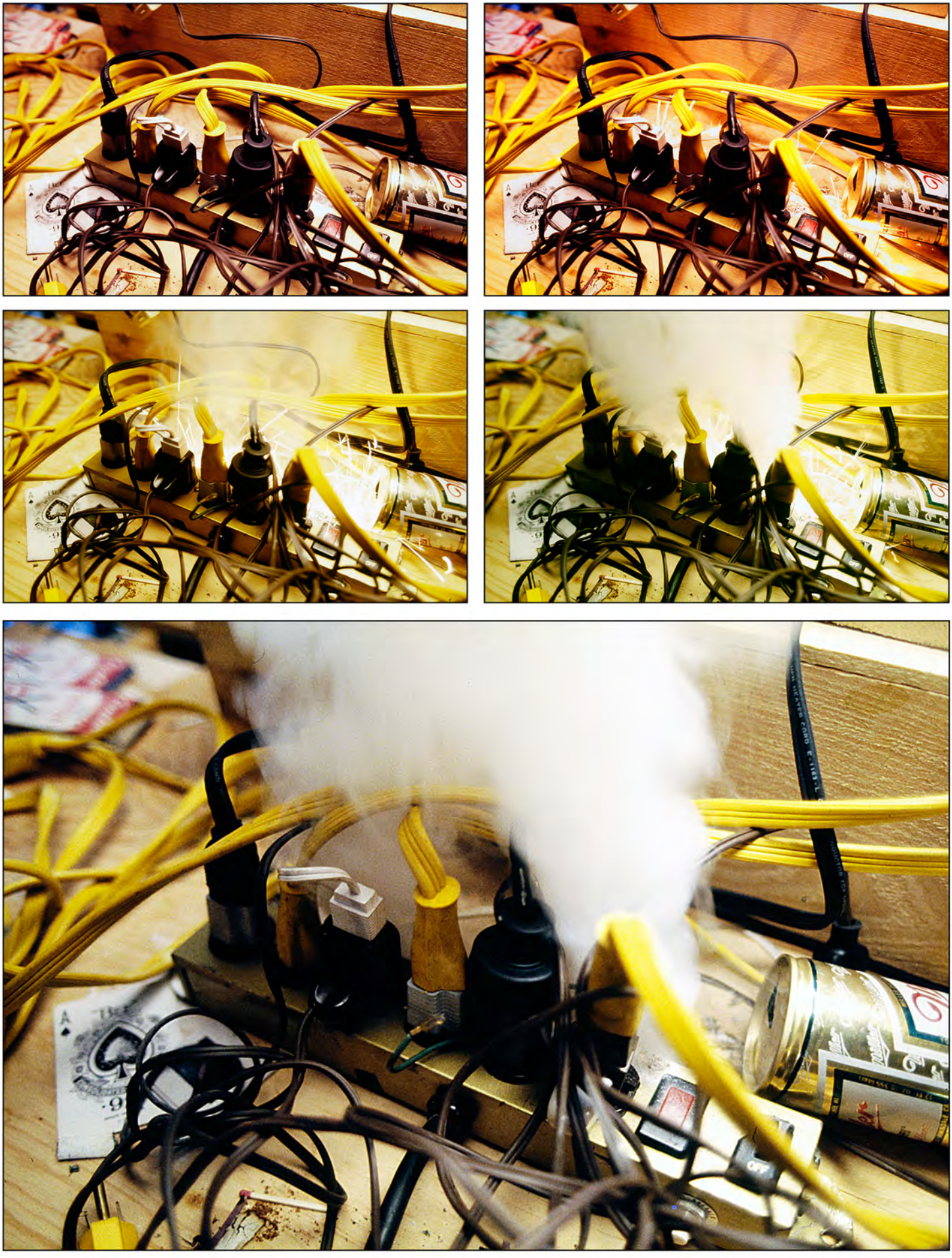







1976 | "Nightmares" Show Portfolio | Plate № 11

Top four: 36-slide, 4-stage zoom | Lower left pair: 3-slide animations of action | Lower right pair;3-step zooms.



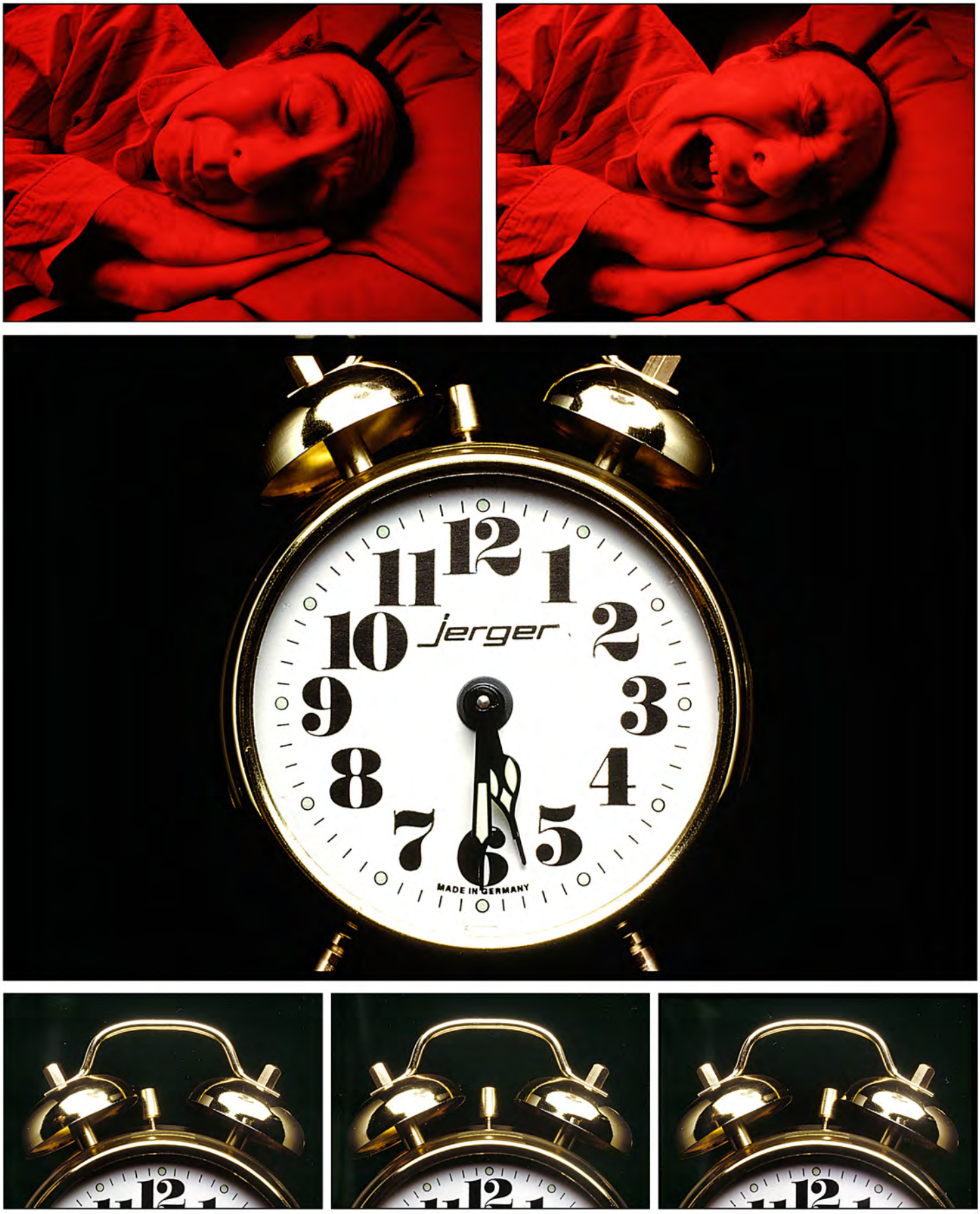
1976 | "Nightmares" Show Portfolio | Plate № 12

18-slide animation with lots of flashing.



1976 | "Nightmares" Show Portfolio | Plate № 13

5-slide flashing effects; then Empire State Building blacks out.



1976 | "Nightmares" Show Portfolio | Plate № 14

Clock appears between all nightmare sequences as hours tick away | Alarm sounds loudly at 5:30 am.



1976 | "Nightmares" Show Portfolio | Plate № 15

18-slide wake-up sequence in three 6-slide animations.



1976 | "Nightmares" Show Portfolio | Plate Nº 16

Original "enlightenment" sequence involved a dozen 3-step animations of Marty's morphing facial expressions.





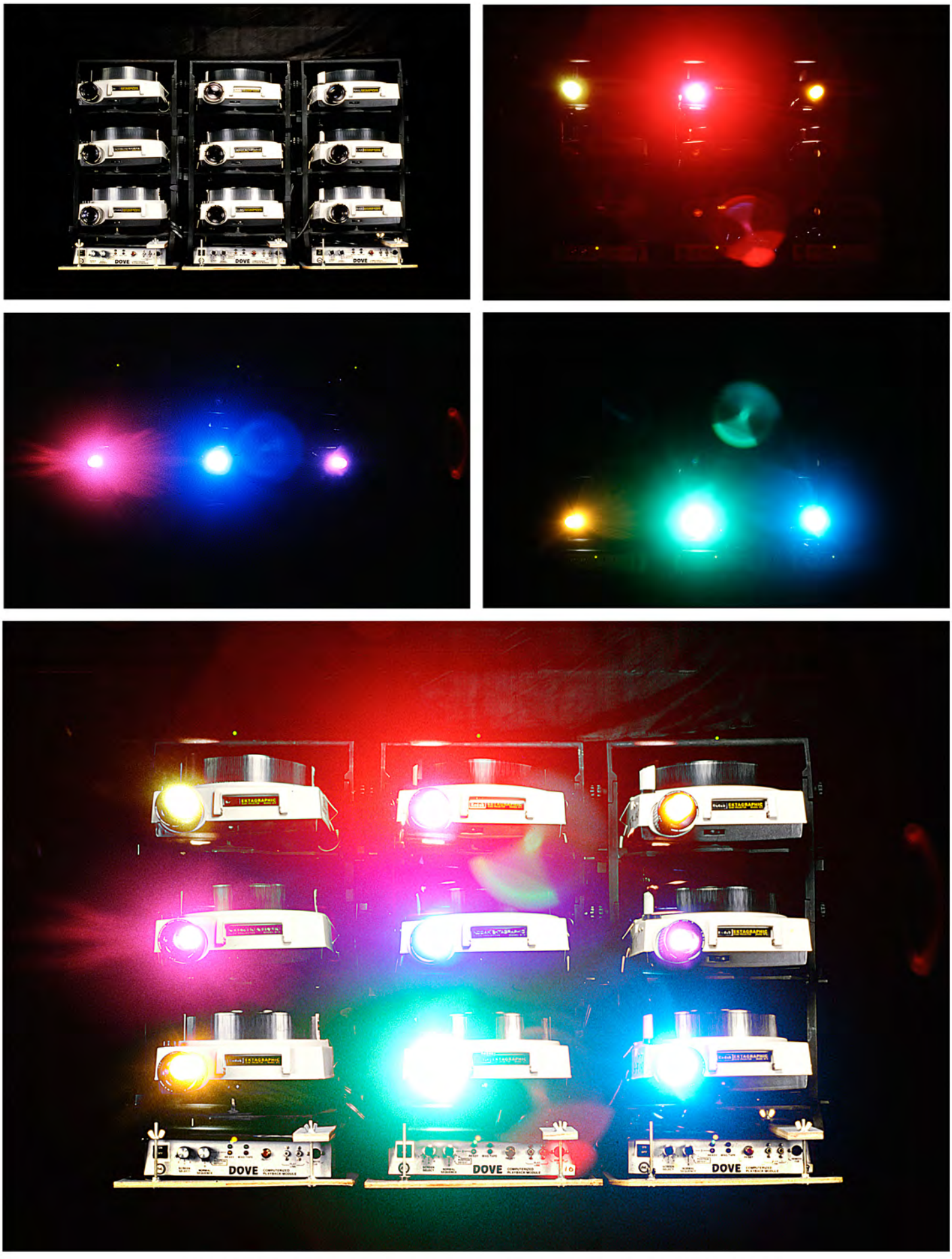






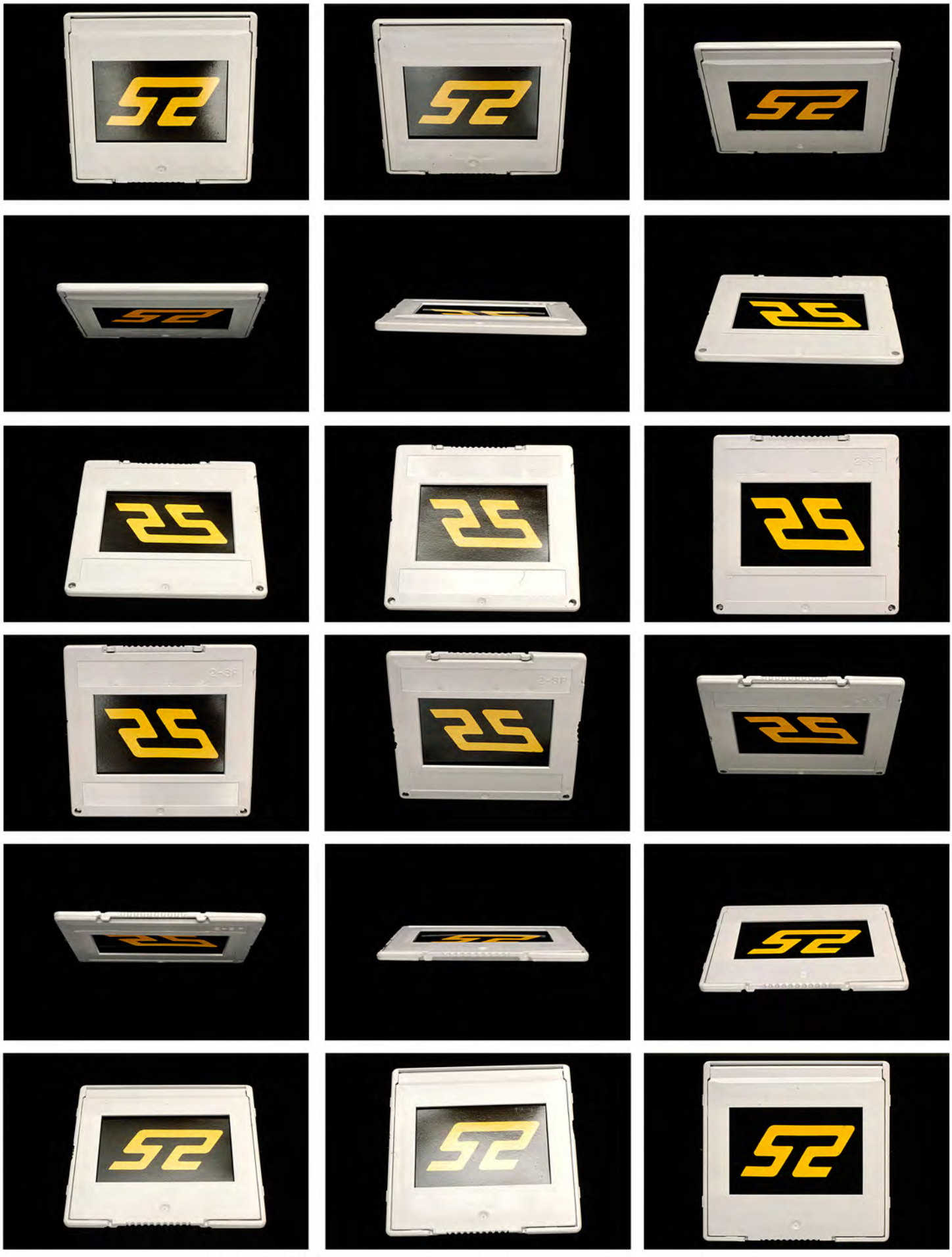
1976 | "Nightmares" Show Portfolio | Plate № 17

Original story ending involved seven 3-slide animations separated by 2-second dissolves between scenes.



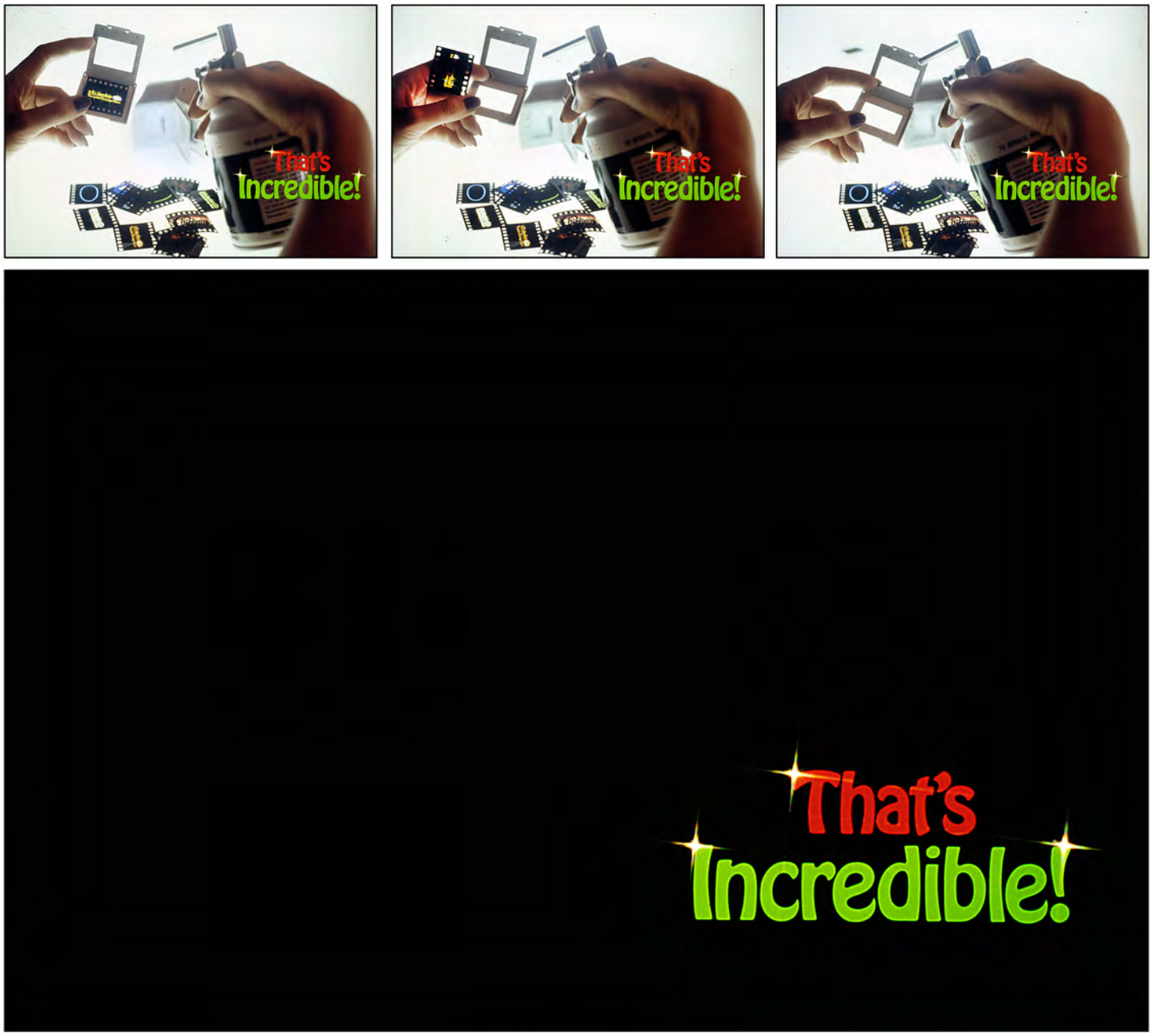
1976 | "Nightmares" Show Portfolio | Plate № 18

Projector lights sequentially looped over projector stacks.



1976 | "Nightmares" Show Portfolio | Plate Nº 19

Show finished with a flipping STS logo



1976 | "NIGHTMARES" SHOW PORTFOLIO | PLATE Nº 20

As one last 3-slide gag slowly faded to black, Incredible's credit line flash-faded, with twinkling stars..

Remember: your maximum program speed for an animation depends on the total number of projectors involved. In the 9 to 15 projector range, you are talking about ten slides per second; that is less than half cine speed (24 frames per second). At that tempo you will be mimicking 'live action;' however, programming must be finessed to accomplish the proper acceleration and deceleration; or you will end up with cartoonish sequences, like *Bumbles*.

Action must occur in super slow motion and rehearsed with a stop-watch, to monitor the time(s) allowed in the program—the total number of slides—against the total being shot. That is where a write-on-slide preprogram is an invaluable shooting guide.

Even if you are talking about a 15 to 30-projector show (single screen); you will want to shoot the sequences with the actor's movements slowed down to *less* than half-speed. It all depends on how many frames your camera will shoot per second. Most motor-driven still cameras average 4 frames per second at their highest speed which is 1/6 th the speed of cine; so, the actor must perform at 1/6th speed.

There is nothing easy about this process; only trial and error will help you to get a 'feel' for it. But once you have gone through a few experiments, it will become eminently clear. Your ultimate control, even in situations where the photography is not quite up to 'speed,' is the program timing; that recreates the appearance of life-like movement. It is a process that can involve hours of finessing.

Another trick when doing animated shows is to juxtapose fast action against slow. If everything happens quickly, you lose impact. By counter-pointing a fast action against a slow one, you add impact to both. Again, using the *Bumbles* opening as an example, the animation there is not life-like at all; the overall effect is cartoonish because it is all at the same speed. Had I changed speeds for the different sequences, mixed it up a bit, the net result would have been far more effective.

Remember to Remember

I cannot urge you strongly enough to make a new disk save every time you complete a new sequence that you are happy with. Whenever I postpone saving, I usually live to regret it. I might be happy with one variation of a move, but want to 'milk' it. Sometimes, I like the next variation better; sometimes not. If the last version was not saved, I might have to rewrite it. That happened to me while programming *Bumbles*; I had to rewrite more than 500 lines of code. Even worse: when I was programming my very first Eagle show, I lost the entire program—a week's work. So, save frequently.

The Element of Distraction

When doing high-speed shows or ones with only a few projectors, you sometimes 'run out of projectors;' when all of them are tied up in projector advances and there you are with nowhere to go. When that happens, you may be able to distract your audience while the projectors are cycling. I usually accomplish that by having the last slide flash, while waiting for another projector to become available. The flashing keeps the screen 'alive' and the audience 'distracted' by maintaining the 'feeling' of action.

There is nothing quite like AVL's Clocktrak for helping you get shows totally in synch. However, there is nothing quite so frustrating as working with Clocktrak, until you come to terms with sone of its quirks and foibles. We have already discussed the issue of forcing GoTo's; but there are some other tips that can make life easier.

Editing AV: Clocktrak

How many times have you come across a situation where a client wants a portion of a show deleted. It would be so easy; just to snip out a section of a punch-tape program.

But, if you've ever tried that with Clocktrak, you've learned what a catastrophe that can be; the computer will force a GoTo, advancing the show somewhere you don't want to be. There is, however, a way you can solve this problem. I do not recommend it unless it is an emergency; but it works.

The process involves setting up 'dummy' cues as a series of 'roadblocks' to the forced GoTo. Let us say that we have to take out 10 seconds from the middle of a show. At the edit point on the audio tape, the Clocktrak reads: 2:40.50 (two minutes, 40 and one half seconds).

After editing, the next clock-synch point is at 2:50.85 (two minutes and 50.85 seconds). If you simply spliced the tape and played the show; when the Eagle clock jumped from 2:40.50 to 2:50.85, it would force a go to well beyond 2:50.85 because the Eagle gets utterly confused by such jumps and needs time to sort things out.

To avoid blowing Eagle's mind you must set up a series of 'roadblock' cues to force the GoTo to a point *ahead* of where you want to be. Here is what the 'roadblock cues' for our example would look like:

TM TIME 2:40.50 (point of edit)
TM TIME 2:50.85 (point of edit)
TM TIME 2:50.90 (roadblock #1)
TM TIME 2:50.95 (" #2)
TM TIME 2:51.00 (" #3)
TM TIME 2:51.05 (" #4)
TM TIME 2:51.10 (" #5)
TM TIME 2:51.15 (" #6)
Etcetera
TM1 TIME 2:51.50 (Eagle catch up point; total 'time lost' in catchup = 1 second).

Needless to say, you must eliminate the program cues and slides for the section between the 2:40.50 and 2:50.85-time-synch points in the program; or let Positrack catch you up in real time during the show. (Unless at least one slide is left ON, that may cause a blackout while the projectors march forward.) However, at least you do not have to re-record a new Clocktrak onto your show tape and offset all the synch times.

Recording AVL Clocktrak

A better way to accomplish a Clocktrak edit on a tape with deletions is to re-record the Clocktrak from the edit point forward. Using the above example, we would splice in about 18 inches of leader tape at the edit point, then advance the tape recorder so that the splice from the leader to the next tape section is about 2 inches to the left of the record head (with leader tape sitting over the record head). Put the recorder into 'Pause, Record,' and set the Eagle for the new Clocktrak by going into the Control Command field and typing COM (Clock Output Mode); then hit the 'Cue button' to start the clock—but do not start recording yet. Let the Clock get to 2:40.50 (the prior edit point). and start recording immediately; picking up the clock as close to 2:40:50 as possible.

Since there are two inches of leader ahead of the tape; the deck will be 'up to speed' when the tape hits the record head and starts re-recording the new clock; and the resulting 'gap' in the newly-taped clock will be about one or two seconds. Continue to re-record the new clock for the entire balance of the show tape. Then back the tape up to the splice, reset the Eagle for Clock Edit Mode, and play the tape into the Eagle, making note of the clock's pick-up point after the leader. If you were quick enough, it will probably be something like 2:41.50; which we will use as our example. Now, in the cues section of the program, delete the cue material from the section between the 'old' 2:40.50- to 2:50.85-time codes; but leave the 2:50.85-time code and everything after it.

As you delete the cues, simultaneously remove the a propriate slides from the trays and move the other slides in each tray forward. (Finish removing the unwanted slides before moving the other slides forward.) With the slides removed, you are ready to adjust the program synch times to the new Clock using "Time Offset Command." Let me explain:

Our pick-up point from the old-time cues was 2:50.85; and our new clock point is 2:41.50. Subtracting the new synch-point from the old, the difference is 9.35 seconds. Assuming, for example, that the 2:40.50-time code is on line 100, and the program pick-up point (2:50.85) is on line 101, go into the Control Command Field and write, "TOC 101,9999, -9.35," which means: Time Offset Command—subtract 9.35 seconds from *all* time codes between line 101 and line 9999 (end of program). That will adjust all time codes after line 101 to the new clock and all your sequences will be back in synch.

'TOC' for Clocktrak Adjustments

When you are first establishing synch points using AVL Clocktrak, you will find Time Offset Command useful in correcting 'human error' delays; such as the delay from the time you hear the synch point to the time you hit the cue button and the machine responds. That can be as long as a half second. (On the best days, my delay time is .15 seconds).

Formerly, you had to anticipate the cue and hit the Cue button a bit ahead of the time you wanted to synch; that was largely guess work. Now, with Clocktrak, you do not have to guess anymore. What you do is hit the Cue button when you hear the synch point(s).

Then, after you have punched in all the time codes, go into the Control Command Field and do a Time Offset Command for the entire program. Start by eliminating .15 seconds from all time codes. Watch the show and eliminate (or add) more time as needed to compensate for your response delays when entering the synch points.

To get a 'preview' on what my delay time is on any given day, I program in a 'dummy' cue Usually that is an Alternate 1-Left just after my first TX (Time X) cue. I hit the Cue button the instant I hear the first sound on the track. When replaying, I should see 1-Left light up the instant I hear something. If there is a delay, the length of the delay is the amount of time I must remove from all the time codes in the program.

Fine Tuning Between Clocktrak Synch Points

AVL Clocktrak cannot do it all. In fact, by having too many Clocktrak synch points you can drive yourself nuts. The best practice is to use the clock for major synch points; and use wait times between them. Such wait times are easily and quickly adjusted for fine tuning of the timing. A good example of this is musical programming.

Let's say that your show opens with a trumpet fanfare:

"Ta...ta ta ta ta ... ta taaahhhhhh!"

You will never get your finger to hit the Cue button fast enough to enter all those time codes. Even if you could, Eagle cannot respond that quickly. What to do?

Establish major synch points at the beginning and end of the trumpet fanfare. For our example, let us say that the whole fanfare takes 2.5 seconds starting at TM (time) 3.65. Our first synch point is at 3.65 seconds, and the second synch point is at 6.15 seconds (the end of the fanfare). After subtracting 3.65 from 6.15, and determining the difference to be 50 lines, open 50 lines between the two synch points and fill them in W.05 cues (50 x .05 = 2.5 seconds). Write cues to light-up a projector on the first "ta;" then wait .05 and turn off the same projector (creating a single flash).

1	S20G	(Speed 20; Go)
2	TAB 1	(Tab 1)
3	TM 3.65	(Time 3.65)
4	AT 1L	(1-Left ON)
5	W. 05	
6	AT 1L	(1-Left OFF)
7	W.05	
8	W.05	
9	W.05	
10	W.05	
11	W.05	
12	W.05	

Continued

13 W.05
14 W.05
15 W.05
16 W.05
17 W.05
18 W.05
Etcetera
53 TAB 2
54 TM 6.15 (Time 6.15)

Replay this program to make sure that the first flash is in synch with the first "ta" of the trumpet. If it flashes too late change the TAB 1 time code (reduce the time). If the flash is too early; either add time to the TAB 1 time code or add 'enough' W.05 cues before the first AT 1-Left cue. For every W.05 added before the AT 1L command, take one out after.

(If you do not take one out for each one added, the entire section gets longer; that makes the total wait time exceed the interval dictated by the time codes (in this case, 2.5 seconds), forcing a dreaded GoTo.

Assuming that the first "ta" and flash are in sync; play the program again and when you hear the second "ta," hit the "Esc" (Escape) button on the Eagle keyboard and the "Stop" button on the tape deck. That will put you near the appropriate program line for the second "ta" flash cue.

Again, there will be a delay factor for your reaction time, usually about six lines, or .3 to .4 seconds. Back up a few lines to allow for your reaction-time delay and enter the cues for the second flash. Replay the program to make sure that the second "ta" is also in synch. If it is late, remove a few W.05s between the first and second flash cues. Remember to put the wait times (W.05 cues) back in after the second flash cues. Continue in this manner until the trumpet-fanfare section is complete.

The objective is to maintain the same total number of W.05s and/or lines of cue instructions in the section between the TAB 1 and TAB 2 synch points. What you are doing is moving around the flash cues within a fixed number of wait times; until the flashes are in synch with each "ta" of the trumpet.

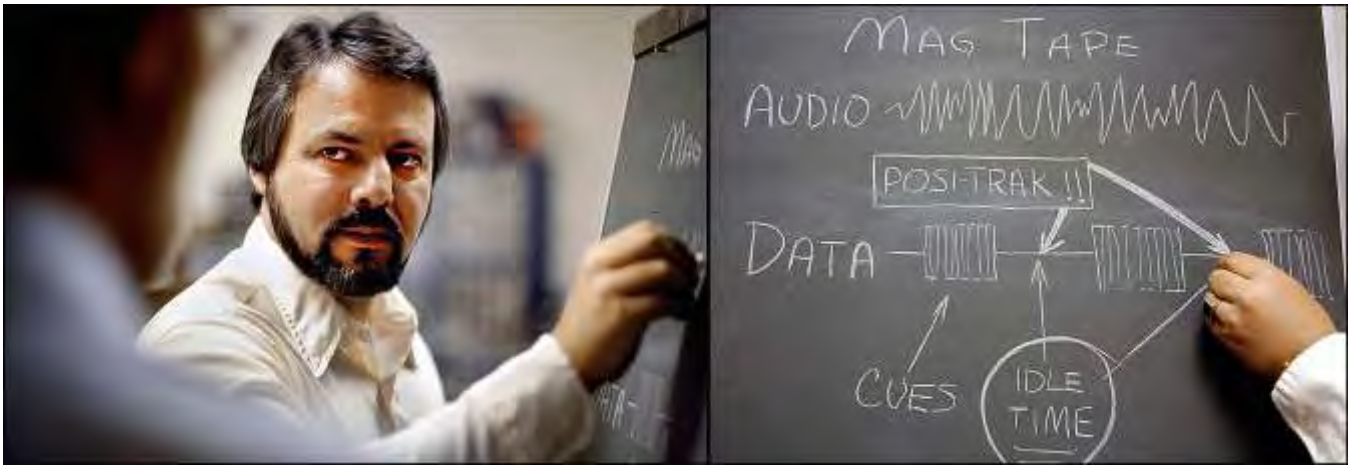
Music is 'mathematical.' A "measure" is usually four "beats." Each of four beats can be divided into two, four, eight or sixteen. Similarly, the total number of W.05 lines in a measure or beat can be divided to match the music. Divide each TAB section into W.05 lines, then write in your cues on the appropriate lines.

If the programming is simple, say one slide per beat, you do not need to divide the TAB section into W.05 lines. In that case; you simply calculate the total for each beat, or use TX cues and 'hit the tit' (Cue button) on every musical beat. The point of dividing each beat or measure's time into W.05 lines between time codes is to allow a lot of cues to be written, as well as to easily finesse the timing of effects that must be in synch with half, quarter, eighth or sixteenths of a beat.

Later, go back and tighten-up all the leftover W.05 lines into 'bulk' wait times. For example, if you have three W.05 lines in a row, condense them into one W.15 line. The reason for this is twofold: You save lines and Positrack does not work if your entire program is cue lines and W.05's. Positrack is only emitted during wait times that are longer than W.05.

So, if you left all your wait times as lines of W.05 cues, you would never get Positrack instructions. That is why it is expedient to tighten-up all your 'loose' W.05 lines into 'bulk waits.' The W.05 lines are only there to help you pinpoint specific time points between the major Clocktrak synch points. Once they have accomplished that function, they should be gathered up and combined into single-line wait-time cues.

How Positrack Works



In scenes from *The Inner World of AVL* show [see, Volume Nine] Charles "Chuck" Kappenman, founder and CEO of Audio Visual Laboratories (AVL), explains Positrack.

Positrack (aka "Posi") is update information that is sent to each Dove to 'remind' them 'where' each projector is supposed to be (which slide) and 'what' it is supposed to be doing (lamp intensity).

For example, Positrack might 'say' to Dove-1: "Your left projector is supposed to be on slide #3 and your lamp should be off; your center projector should be on slide #4 and your lamp should be on; and your right projector should be on slide #5, lamp on."

In the 'old' days before Positrack, if a cue was 'dropped' because of mag tape damage, electrical fluctuation, or any other of a dozen reasons, the show would get out of synch; how would the dissolves know where they were supposed to be?

Positrack 'fills in' the (formerly) 'blank' tape (the wait times between cues) with 'update' information. Look at the illustration (above) for 1-second of tape time. The first .05-second is the cue command. The next 'active' cue does not occur until we are, say, .75 seconds into the tape; all the rest of the cue track is (or was) blank. Positrack 'fills' in those sections of the tape with update information that tells each Dove 'where it's at,' and 'what's happening.'

The minimum wait time needed for Positrack is W.10; and in that time Positrack can address only one Dove with information about one projector. It takes Positrack W.10 to address each projector. The Positrack instruction sequence begins with 1-Left and sequences down the line. For a full 30-projector grid's worth of Posi information, you would have to have a 3 second wait (30 X W.1 = W3).

Remember: Since the minimum Positrack emission time is W.1, Positrack will not 'broadcast' if you have a long series of W.05 lines; they must be combined into a 'bulk' wait time to allow Positrack to work, e.g., W.05, W.05, W.05, W.05 = W.2.

In the case of a full 30-projector grid, you do not have to have 3 continuous seconds of wait time. It could be broken down into any amount greater than 10th of a second.

The first 10th of a second of wait time would emit Posi for the 1-Left projector; the second W.1 would emit Posi for 1-Center; the third for 1-Right; the fourth for 2-Left; the fifth for 2-Center; etcetera. Thus, Posi information can be 'threaded' into a program, like any other active-cue information; as in this flash sequence:

```
AT 3R        (alternate 3-Right)
W.1--------  (Positrack for 1-Left)
AT3R
W.1--------  (Positrack for 1-Center)
AT3R
W.1--------  (Positrack for 1-Right)
AT3R
W.1--------  (Positrack for 2-Left)
AT3R
W.1--------  (Positrack for 2-Center)
AT3R
W.1--------  (Positrack for 2-Right)
AT3R

Etcetera
```

Posi does not know (or care) whether you are doing a 2 projector show or a 30-projector extravaganza. It will emit its data sequentially for all thirty projectors, then go back and start the same sequence again, repeating the entire 30-projector Posi 'loop' over and over (updated with the latest projector status) until the end of the show. Thus, you can see that if you created a program where there was never a wait-time of more than 1/20th of a second, you would never have the benefit of Positrack.

Likewise, if you have a long lamp-flashing sequence and without any wait times, no Posi will be emitted until a wait time of 1/10th of a second or longer is encountered; at which point the Posi will be emitted, in sequence, one projector at a time, every 1/10th second, for all 30 projectors in the basic AVL Eagle grid.

When using the CX120 Expander with Eagle; there is *no Positrack* for projectors 31 through 120. Likewise, no Positrack for auxiliary functions; or special lamp statuses (like freezes). Posi only updates tray position and basic lamp status (on or off).

Program Storage

Eagle allows you up to 8 alpha-numeric symbols to name your program; and up to thirty-eight spaces for the "Operators Name." How you name a program is very important.

My rule of thumb is that a program name must be understandable by anyone. (Maybe we should call that my rule of *dumb,* instead?) For that reason, I use numbers—job numbers. For example, O792221 might mean Olivetti, 1979, Job Number 222, Section 1 (of a multi-section show). If the show is a 'stand alone' module, the last digit is zero. If the show needs more than 9 modules, which is rarely the case, I drop the client-initial prefix and use the year, job number, and two-digit show section.

It is unfortunate that AVL only allows eight spaces for "Program Name" information; it would have been better with 12 spaces. But you can alternatively use the 38 spaces available in the Operator Name section to fill in any other information you need. You do not need to know who wrote the program by full name; an initials code will do. So, you actually have 46 spaces available to write in reference codes or other information, such as the version of the program, the date or "See Notes."

I use a verbal name for trial programs. Later, after the show has been fully approved, I change the verbal name to the job-number code, as above. That way, when scanning Library entries, I can see at-a-glance which programs are trial versions and which are final. For example, "Olivetti" would be the trial program name, whereas O79222.1 would be the name for the finished program.

In the Operator Name section, I would list my initials, DTM, the date I wrote the program, the Master-Disc numbers, the program version number (sometimes a given show might have different endings, different speaker support sections, and/or be in a different language). I would also write: "See Notes" (if any), and list special equipment (if any), such as X-Doves or a CX120 expander. Thus, the Operator section might read: DTM / 28-01-82 / MD 33-34 (Master Disks 33-34) / V3 (Procall Version 3) / See Notes / X-Dove.

Red/Blue System

Another problem is 'ICFI syndrome' (I Can't Find It). There is absolutely no excuse for that. Library *systems* are an absolute necessity in multi-image; because we deal in so many production elements. A simple one that has worked for me is the "Red/Blue" system.



Any "Master" is labelled Red and any show (release) copy is labelled Blue. Red-labelled items are strictly taboo; no one touches them without the approval of the producer or authorized team members. Blue copies are available for use by anyone. This Red/Blue system applies to documents; art; program disks and tapes; audio tapes; record albums; and slide trays—any and all aspects of production.

Note red and blue-labelled recording tape boxes.

Red means "Do Not Remove." Blue means, "OK to use." Yellow can be the "Caution" color; anything labelled Yellow involves changes; it is neither a master nor a release version. Establish a Red Master-Disk file for your programs and a Red Master-Tape file for your audio and show tapes. You should also have Blue labelled copies that can be used and/or distributed without risk to the masters. Each master disk should be numbered and the disk number should be encoded in the "Operator" section of Eagle programs. In that way, every blue (release) disk will show where the master program is. The blue disks should also be numbered so you can tell which is which. A 'card catalogue' or log book should be established for the disk library. The cards should list the appropriate data three different ways:

- 1 –Program number.
- 2 –Client name.
- 3 –Disk number.

If I had a question about where I could find a program, I would look up the card (or log entry) with the program number; that would tell me which master disk it is on; the date it was made; who wrote it; what it is for; the version of Procall it requires; any special equipment needs; and any other details you feel necessary. If you do not know the program number, you can look it up by the client's name card (or log); that lists all the programs written for that client by number, date, description, and disk location. The disk cards tell you what programs are on each disk by number, name, date, and client. Thus, with using a card catalogue or log you can find any disk or program quickly and easily. Master tapes should be stored, labelled, and cataloged in a similar manner using the same numbers (job numbers) as their programs.

You may also wish to make a mag-tape storage library of master programs. This is a good, safe backup to disk storage. Floppy disks are a notoriously *unsafe* way to store data; the disks are too easily damaged by fingerprints, heat, humidity, air pollution, cigarette smoke, etcetera. You may also wish to make print-outs of all master programs to have a 'hard copy' on file for protection and general reference. In a similar manner, the master show trays should be red labelled so that everyone knows "this is the master show; treat it with all due respect." Masters should be locked-up in their own storage area; one that everyone knows is off limits. Likewise, blue labelled copies should have their own storage area; so you can see at a glance what is accessible and useable. If you have several programmers and/or trainees, assign each programmer his or her own set of discs to work with.

Protecting Your Program

"Write Protect" and "Name Protect" should be used to avoid accidentally writing over any programs stored on disks. Accidental 'rewrites' (write-overs) are a fairly common event, and can create a devastating problem. When you save a program on a disk using the Control Command SV (Save) instruction; the program is saved along with the name written in the name section. When you ask to see what is in the library (Control Command / LIB (library) / Enter), you will see the program listed by that name. If you change the program, but do not change the name, the next time you save the program, the older version with the same name (that is already on the disk), will be eliminated (written over) and replaced with the new version bearing the same name. So, if you are happy with the one version and have saved it; then create another version and want to save that; change its name.

But suppose several programmers are working on the same project and one of them inadvertently calls their program by the same name as yours? If that other program is saved on the same disk, yours (with the same name) will be replaced by the other. You can see how this could create a few hassles. Write Protect does just what the name implies: it prevents a new version of a program bearing the same name to be saved. If you try to save a Write Protected program, the Eagle will comment "File is Write Protected." That will alert you to a possible re-write problem. If you really do want to replace an older program with an updated version having the same name, you can do this by "Clear Write Protect" (CWP program name); saving (SV program name) the new version of the program; then write protecting the new version (WPR program name).

"Name Protect" prevents you from changing the name of a program already saved on the disk. For example, say you had saved a finished program by its verbal name. After the show was approved, you wanted to change the disk library name to the job-number code (indicating Master Program). You would do this by going into the Control Command field and writing *RNM* (rename) *olivetti, 079222.1* (the comma means "to"). The final master-program name should be name protected to prevent anyone from accidently changing it.



You can provide even more protection for your master disk library by affixing a "Save Protect" label, sticker, or tape around the notch in the upper right corner of the disk, as seen in the picture (left).

That prevents *any* saving on the disk. To save, you would have to remove the label and re-expose the notch.

Scene from 1978 production, *Bumbles*. The red label indicates that it is a master disk; and the disk-name (Bumbles) indicates that it is not a finished program; otherwise, it would be the job number

Double Disk Saves

For even more protection; always save trial programs and masters on at least two disks. "Mini-floppies" are the least reliable form of data storage and retrieval. I have had few problems; knock on wood. However, there have been occasions when a disk has gone bad. You can tell if a disk is bad because the Eagle will comment "Disk Read Error" or "Bad Sector DOS xx [x=version].

If you bought several storage disks at the same time, and one goes bad, the others probably will too; at least, that is what I have noticed. For example: at Sonargraphics, we got in a package of 10 new disks. After only two weeks, six of them went bad (disk read error). On another occasion, at Watts-Silverstein, both a version 3 and a version 5A Procall disk went kaput; making it impossible to load-in previously stored programs. But since the programs were stored on multiple disks, the programs were retrieved without problems.

The ultimate protection is to make a print out of the program. 'Hard copy' prints are also quite handy to review programs when an Eagle is not nearby. For example, on a plane; or when logging a rostrum camera shoot.

I once had a very embarrassing situation; when I arrived to stage a show; with disks for only four of the five programs to be shown. Because I had filed a print-out of the fifth program, I was able to call the office and have an associate read the program to me— a costly long-distance call; but far cheaper and faster than flying home to get the disk or messengering one to me from New York (which there was no time for anyhow). Of course, keying the pencil-written program cues into the Eagle was a chore.

If you are ever in a total bind and cannot get a disk to load a program due to Disk Read Error, AVL has a way of retrieving the data—if the disk has not been "packed" [*Editor*: In AVL's parlance, Disk Packing meant disk defragmenting] You must send them the disk; but that is a small problem compared to losing the program.

Cue Saving to Build Effects Loops

Keying-in sequences of repetitive cues is boring and tedious. So, wherever possible, I build effects sequences as little loops which can be saved as a 'block' and inserted into a program wherever needed.

That 'insert' method is particularly useful where effects sequences are complex and prone to operator error while making hundreds—more likely thousands—of keystrokes.

To build program 'blocks' you selectively save sections of cues (referenced by their line numbers). For example, to save the block of cues from line 222 to line 444, the command would be: SC0222,0444.A, which translates to: SC (save cues) 222, (from line 222) , (comma=to) 444 (line 444) A (call that block "A").

When building repeatable blocks, the blocks' entry and exit points must access the same projector(s). For example; let us say that the loop begins with a cut from 1-Left to 1-Center. In order to string several of these blocks together the "exit" point for the block must leave the 1-Left projector in the ON mode; so that the first cue of the next loop cuts from 1-Left to 1-Center.

Let us say you are doing a series of soft-edged wipes and want to highlight every other wipe with a glitter-fringe border. First, assign, say, 3-Center for the glitter-fringe border. Then assign 1- and 2-Left for the first pair of soft-edge-masked images; 1- and 2-Center for the second pair; 1- and 2-Right for the third set; and 3-Right for the fourth, final step (unmasked scene). Then, assign 4- and 5-Right as the first pair of the next soft-edge-wipe sequence, 4- and 5-Center for the second step, 4- and 5-Left for the third step, and 3-Left as the fourth (unmasked scene). The block program, using those projector assignments, would look like this for a "whip-wipe" (a very fast wipe) at 20 CPS (Cues Per Second):

Line#	Program cues	
0220	AT 12L	(Alternate 12L ON)
0221	W.05	(Wait .05 second)
0222	HC 12 LC	(Hard Cut 12L OFF, 12C ON; 12L advance automatically).
0223	W.05	(Wait .05 second)
0224	HC 12CR	(Hard Cut 12C OFF with automatic advance; 12R ON)
0225	W.05	(Wait .05 second)
0226	HC 123R	(Hard Cut 12R OFF, with automatic advance; 3R ON)
0227	W1	(Wait 1 second)
0228	HC 345R	(Hard Cut 3R OFF with automatic advance; 45R ON)
0229	W.05	(Wait .05 second)
0230	HC 45 CR	(Hard Cut 45R OFF, with automatic advance; 45C ON)
0231	W.05	(Wait .05 second)
0232	HC 45LC	(Hard Cut 45C OFF with automatic advance; 45L ON)
0233	W.05	(Wait .05 second)
0234	HC 345L	(Hard Cut 45L OFF, with automatic advance; 3L ON)
0235	FA 3C	(Alt 3C ON)
0236	W.05	(Wait .05 second)
0237	FA 3C	(Alt 3C OFF; no advance)
0238	W.05	(Wait .05 second)
0239	FA 3C	(Alt 3C ON)
0240	W.05	(Wait .05 second)
0241	FA 3C	(Alt 3C OFF)
0242	W.05	(Wait .05 second)
0243	FA 3C	(3C ON)
0244	W.05	(Wait .05 second)
0245	FA 3C	(3C OFF)
0246	W.05	(Wait .05 second)
0247	FA 3C	(3C ON)
0248	W.05	(Wait .05 second)
0249	FA 3C	(3C OFF)
0250	W.05	(Wait .05 second)
0251	FA 3C	(3C ON)
0252	W.05	(Wait .05 second)
0253	FA 3C	(3C OFF)
0254	W.05	(Wait .05 second)
0255	HC 123L	(3L OFF, with automatic advance; 12L ON)
0256	FA 3C	(3C ON)
0257	W.05	(Wait .05 second)

Etcetera

Note that lines 235 through 255 (the flashing glitter border for every other wipe) is a 20-line (one second) sequence matching the one second wait on line 227 (after the prior wipe). Save that block; from line 0223 to line 0257. Line 0257 (the exit point), leaves 1- and 2-Left ON, and line 0223, (the entry point) 'picks up' the loop by assuming that 1- and 2-Left are in the ON mode; thus, a smooth transition from one loop's (block's) end to the beginning of the next. Label that block "A" and save it.

From that point on; whenever you want to do series of similar wipes; get yourself to the 12L on mode and insert program block "A" from the library. OK, it is not quite *that* simple; but you get the idea (I hope).

You can easily make another block without the flashing border (3C). Go into Control Command and DLC (delete cues) 0235 (from line 0235) ,0255 (to line 0255 the comma means "to"); then insert a 1-second dissolve in place of the previous 20-line flashing sequence; then save the new block as "B" (or whatever).

When adding blocks to your program be sure to use the Insert command. The Eagle will then automatically 'open' space (at the line where the cursor is flashing) and insert the block. Be careful not to use the Load command (!) or Eagle will *replace* your block program—a nasty situation!

Using Repeats

When you are using "Repeats;" a program block (or loop) must also have matching entry and exit points. Using the preceding example: if I were going to use repeat(s); I would place a "Go" at the end of line 0224—Go serves as the start point of the repeat—and program my repeat instructions on line 0258. Eagle will then repeat the loop from the Go on line 0224.

You might ask, why did I save this block section of cues as program "A" if I could simply repeat it? For two reasons:

First, to be able to re-use the block later (or earlier) in the program. Second, because I do not like using repeats; they're simple enough to use but they slow down Eagle's tiny brain; especially when you're 'backing up' through the program; or doing a Go To; because Eagle has to do all the 'mental calculations'—counting all the repeats—to figure out 'where it is' before it can reverse cues or Go To anywhere else. Those kinds of delays can be very annoying. With a program that includes a lot of repeats, you could be sitting there for several seconds every time you do a Go To. So, I simply store the loop and insert it as many times as needed, rather than use repeats.

Master Cues Library

When I got my first Eagle, I thought to myself: "Gee, now all I have to do is write a Master Cues Library of pre-programmed projector sequences that I could use over and over. It sounded like a great idea at the time; and I recall discussions with AVL about the prospects of selling a standardized library of programs.

Unfortunately, that did not work out. I got about 36 programs in the can before I gave up on the project; after realizing that the number of possible projector combinations was astronomical. After all, a standard library would have to assume a specific format; a specific number of projectors; and specific moves for each format and grid size. It was a great theory; but was too complicated to produce; because one seldom produces two shows that are identical in format. (If you did; you probably could make use of such a library).

[*Editor*: AT&T standardized on a 9-projector, three-screen-panorama format, for their network of more than 100 nationwide office theaters. (Now you know how Sylvia Allen—who ran AT&T's theaters from her plushy executive suite in the telephone giant's New Jersey HQ building—became AVL's sales manager (a commissionable job). She did not last long in that position; but long enough to ensure that AT&T used (a ton of) AVL gear.]

Using AVL Clocktrak for Sequential Show Modules

Often, a large show is made up of many different sections, called "modules." Such shows can prove troublesome if Clocktrak is not handled 'properly.'

Let us say we have a three module show and the slides for all three are in one set of trays. First, we prepare our master audio tape with the three modules separated by 3 seconds (minimum) of yellow leader tape between each.

Record Clocktrak for the first module in the usual manner; then let the whole tape run through (even though the clock will not be recorded on the leader tape divisions). Do not record a new Clocktrak for each module (unless there has been a tray change). If you do, when Eagle 'hears' the second module's clock start, it will force a Go To. All the trays will march back to the first module's opening tray positions—back to the head of the trays—and start playing the first module's slides.

However, by letting the clock roll through, all the clock-synch points will be sequential; throughout the entire tape; and you will not force a Go To.

The reason the clock synch points must be sequential through all three modules is because the three modules' individual programs must be strung together to create one continuous master program. If all three programs are separate; when you load the second modules program, after screening the first module, all the trays will automatically 'home' instead of staying in the second module's start position.

You can avoid that annoyance by typing "NEW" in the Control Command field before loading in the second module's program. That will prevent the trays form marching home. However, NEW establishes a new 'home point'—and that makes going backwards through the modules extremely difficult because you must reload each module's program; go to the end; create another NEW home position for each; then backup to the head of each program; etcetera. Very tedious and confusing for both you and the Doves. My experience has been that using NEW frequently creates situations where the Eagle and Doves lose track of each other's tray positions.

The exception to that is when you have a tray change. If each module has its own trays, a new Clocktrak for each module is OK. That is, in fact, a far safer and simpler method than using NEW.

Always start with each tray in the #1 slide position. Do not start your show with the trays in the Zero position. A lot of producers make this occasionally fatal mistake. In theory it sounds fine; you simply plop the trays onto the projectors and the first cue pulls them all forward to the first slide. But in practice this often fails because, as I am sure you have noticed, a projector will occasionally balk and won't advance if the tray has not been properly 'seated.' And seating a tray can disturb projector alignment.

When seating trays onto projectors, make sure they are snugly seated. Reverse each tray to the slide #80 position then advance back through zero to the #1 slide position. In that manner, you know that the trays are properly fitted and that there are no tray 'hang-ups' in either direction. If the tray will not seat at all; it is probably because the rotating metal 'slide-retention' plate on the bottom of the tray is not 'clicked in' to the zero position. Reset that metal disk by flipping the tray upside down and rotating it until it 'clicks' into the zero position and rotates no farther. If the tray is not upside down, slides will fall out as you spin the retention disk.

Include a 'check program' as the start point of any show—especially high-speed shows involving a lot of projectors. The check program allows you to make sure that all projectors have reset to the proper start position; that you have not blown any bulbs; and that the alignment is acceptable. You cannot rely on all the projectors automatically resetting to the right start positions. 99.9% of the time they will; but occasionally one or more projectors will not make it all the way back to the slide #1 start position. The check program gives you a visual confirmation that all projectors are ready to start the show.

The "check program" illustrated below assumes that the show starts in the #1-slide position. First all the projectors are reversed to the slide #80 position, containing the line-up slides; then one is 'lit' and each of the others is compared to it, sequentially, one at a time. Then all the projectors are returned to the #1 position. Following is the check program for th 30-projector, single-screen, *Hawaii-Xanadu* show:

Line#	Program Cues	Description of Actions
001	S20 Stop	(Speed 20 cues per second; Stop)
002	PR 11234567890 LCR	(reverse all projectors from 1 to zero)
003	PR 1234567890 LCR	(reverse all projectors from zero to 1)
004	AT 5C	(turns ON the 5C lamp)
005	AT 1L	(turns ON 1L lamp)
006	AT 1LC	(1L OFF, 1C ON)
007	AT 1CR	(1C OFF, 1R ON)
008	AT 12R	(1R OFF, 2R ON)
009	AT 2CR	(2R OFF, 2C ON)
010	AT 2LC	(2C OFF, 2L ON)
011	AT 23L	(2L OFF, 3L ON)
012	AT 3LC	(3L OFF, 3C ON)
013	AT 3CR	(3C OFF, 3R ON)
014	AT 34R	(3R OFF, 4R ON)
015	AT 4 CR	(4R OFF, 4C ON)
016	AT 4LC	(4C OFF, 4L ON)
017	AT 45L	(4L OFF, 5L ON)
018	AT 5LR	(5L OFF, 5R ON)
019	AT 56R	(5R OFF, 6R ON)
020	AT 6CR	(6R OFF, 6C ON)
021	AT 6LC	(6C OFF, 6L ON)
022	AT 67L	(6L OFF, 7L ON)
023	AT 7LC	(7L OFF, 7C ON)
024	AT 7CR	(7C OFF, 7R ON)
025	AT 78R	(7R OFF 8R ON)

Continued

026	AT 8CR	(8R OFF, 8C ON)
027	AT 8LC	(8C OFF, 8L ON)
028	AT 89L	(8L OFF, 9L ON)
029	AT 9LC	(9L OFF, 9C ON)
030	AT 9CR	(9C OFF, 9R ON)
031	AT 90R	(9R OFF, 0R ON)
032	AT 0CR	(0R OFF, 0C ON)
033	AT 0LC	(0C OFF, 0L ON)
034	AT 0L	(0L OFF)
035	AT 5C	(5C OFF)
036	PF 1234567890 LCR Go	(Projector forward all projectors from #80 to zero)
037	PF 1234567890 LCR	(Projector forward all projectors from zero to #1)
038	AT 1 LCR	(1 LCR ON)
039	AT 12 LCR	(1 LCR OFF, 2 LCR ON)
040	AT 23 LCR	(2 LCR OFF, 3 LCR ON)
041	AT 34 LCR	(3 LCR OFF, 4 LCR ON)
042	AT 45 LCR	(4 LCR OFF, 5 LCR ON)
043	AT 56 LCR	(5 LCR OFF, 6 LCR ON)
044	AT 67 LCR	(6 LCR OFF, 7 LCR ON)
045	AT 78 LCR	(7 LCR OFF, 8 LCR ON)
046	AT 89 LCR	(8 LCR OFF, 9 LCR ON)
047	AT 90 LCR	(9 LCR OFF, 0 LCR ON)
048	AT 0 LCR	(0 LCR OFF)
049	TAB 1	(tab one – indicates start of show)
050	TM 0:03.50	(Time 3.5 seconds; initial clock synch point.)

(The start point should be no less than 3.5 seconds into the taped Clocktrak; you can 'get away with less' but risk forcing a GoTo.)

Lines 38 through 48 run through all the projectors to make sure that none of them got hung-up while advancing from slot 80 back to slide #1. If one or more of the projectors had gotten hung-up, you would be able to identify the stack at fault; seeing either no slide (at zero position) or a line-up slide instead of the first show slides.



A visual examination of the tray position will also help to ensure correct start-up.
I accomplish this by setting the tray to the #1 slide position; then affixing a vertical strip of tape to the tray that is aligned to the "on/off" switch on the back of the carousel projector—which, as it turns out, is above the #20 slot number on the rim the tray. I use a green tape at the #20 slot to mark the start (or "go") position; and a red tape tape over #19 slot; that corresponds to the zero position, for tray removal (red for "remove"). A similar tape system can be affixed to the opposite side of the trays for situations where front access is easier that rear access.

For example, if you program with the Eagle positioned in front of your projection grid, it would be a pain to go behind the grid to check tray positions. A front labelling system enables you to look over your shoulder and tell at a glance weather any projectors have failed to "home."

Other tape colors can be used to mark the start positions of specific sections of a show, or different modules contained in one set of trays. I make sure that all tray numbers and codes are written boldly and clearly.

I do not like to be the one who sets the trays because I have 'dyslexia of slides.' That is, I sometimes reverse the left and right trays when loading them onto the projectors; that always makes for an interesting show!

One time, I accidentally made such a reversal while assembling a show. When my crew set-up the show on location, I got frantic calls saying that it looked "screwy." They swore (correctly) that they had the trays on properly.

It took a while to figure it out, but Patty Billings finally remembered my "dyslexia" and suggested that the trays were probably loaded in 'switched' position which, embarrassingly for me, proved to be the case. With large, clear tray numbers and triple checking you can minimize that possibility. (Or, by letting someone else load the trays onto the projectors.)

'Crash Starts' Reveal Problems

Those of you who have seen my shows are likely familiar with the kinds of "crash starts" that I frequently use to spot any problems early enough in the performance to stop the show and make the fix before the audience gets upset. I have learned that if you have a false start (that is, something goes wrong with the show) in the first five seconds or so, the audience is more forgiving than if the problems occur, say, 30-seconds or one minute in. At that point you will hear loud groans from a justifiably pissed off audience.

A 'crash start' cycles through all the projectors very quickly, enabling you to see any problems straight off; allowing you to shut down the show immediately. A crash start could be a zoom sequence, or a fast series of wipes—anything that gets all the projectors on during the first five or six seconds of the show. Crash starts provide an extra margin of safety and can be dramatic opening sequences. [*Editor*: See the opening of *Bumbles* at https://vimeo.com/232773655?embedded=true&source=vimeo_logo&owner=69927143]

If you see a problem, the best sequence of events to shut down a show is to first go into Standby with a ^S cue (^ = Control key). That turns off all projector lamps. Then kill the volume of the audio. If you see you will need some time to figure out what is wrong, raise the house lights partially to let the audience know that something is being fixed—no one likes sitting in the dark wondering what is going on.

You can even use a crash start for slow build-ups. For one such show, I programmed a slow dawn sequence for a music track that started low and built-in intensity over the first fifteen seconds. The 'crash' in that scene was a series of 'twinkling' stars in the night sky, each of which used one of the projectors. Thus, if I saw all stars twinkling, I knew every projector was OK. And if saw anything else twinkle, I knew I had problems.





Receiving a Bronze award for the 80-projector Saab 9000 CD launch show at the 1988 AMI competition was disappointing. You can imagine what I spent for entry fees, screen-shipping costs, and crew travel costs (from Belgium). Ken Burke, the chief judge, admitted to me (in 2022) that it was a politically-oriented (wrong) call.

Using Master AVL Clocktrak

If you use outside studios, keep a pre-recorded master clock track on file at the studio and request that they record the clock on one channel of every show's master tape; that way, every dub of the master will have the same time code. If you do not follow this procedure, you will have to record Clocktrak on each of the dubs yourself, and go through a Time Offset procedure to re-synch the show for each dub. The Time Offset procedure, described earlier, is easy enough; but it takes time and is boring.

To accomplish the Time Offset procedure, record time code onto the dub tape; then roll the show letting the dub's clock drive the Eagle. The dub will either be playing the slides ahead or behind the audio track because its clock does not match the master tape's clock. Calculate how far out of synch you are; then use Time Offsets to get back in synch.

Once you have calculated the time differential between the opening synch points of the master and dub, subtract that amount of time form all the time-code synch points in the program using TOC—Time Offset Command. If, for example, you determine that the dub's clock was delaying the opening visuals by 4.8 seconds, go into Control Command and type in TOC1,9999,-4.8. (Time Offset Command; subtract 4.8 seconds from program lines 1 through 9999.)

Time offsets can also be selectively made for sections of the program in the (unlikely) event that your dub is not playing at a speed consistent with the master. To offset a section, you simply indicate the From and To lines for that section of the program and the time correction for that section.

For example, say that (for some mysterious reason) the show is moving too slowly in the middle of the dub; but the beginning and end are OK. Scroll through the program and identify the slow section by its line numbers. In this example, well say the program section is from line 1234 to line 1456 and the show is running late by .15 seconds (three 20ths). Go into Control Command and type in TOC1234,1456,-.15; . (Time Offset Command, subtract .15 seconds from program lines 1234 through 1456.)

Get Your Cues on Tape

When you have a finished program that is locked-up and approved; always record the program cues onto the master audio tape, red-label it "Master Show Tape," and file it in the master show tape library. Thus, the Master Tape not only has the master Clocktrak, but also the master program cues. With dubs of this tape, you can either use an Eagle to drive the show, or you can eliminate Eagle and simply use Doves.

To record the cues on the master tape, use a four-channel deck. Record the left audio 'image' on track L1 (Left 1) and the right image on R4 (Right 4). Record the Clocktrak on L2, and the cues on R3.



Many of my clients and colleagues consider this an 'oddball' tape format, but I prefer it for a number of reasons.

First, if your master audiotape was mixed on an Ampex (or similar professional two-track equipment) when you play back the 2-track studio master on a 4-track deck the strongest audio signals will be on channels L1 and R4.

This is because the 'band separation' on professional 2-track equipment is so wide that when the tape is played on a four-track machine, the L2 and R3 tracks—that are closest to the 2-track separation band—will show half as much as signal strength (or less) as the L1 and R4 tracks, which are at the extreme edges of the tape.

So, by using L1 and R4 for audio, you can maintain full signal strength and use the studio master without having to dub it to four-channel configuration; thereby losing a 'generation' of audio quality. That leaves L2 and R3 for Clock and Cues.

I use L2 for Clock and R3 for Cues since, 9 times out of 10, my road show will not involve an on-location Eagle. If, for some reason, I cannot get my hands on a four-channel machine and can only get a 'regular' stereo deck (which plays L1 and R3), I have one audio track and the program cues. If the cues were on L2, I would be up shits creek without a 4-channel deck.

When making dubs of your Master Show Tape, you can do all the signal processing you want on the audio channels of the tape; but do not process the time code or cue tracks; dub them 'straight.'

The Procall language used by the Eagle and Doves incorporates very precise frequencies (500 Hz, 2000 Hz and 8000 Hz). If you use equalization, DBX or other processing on these channels, you risk distorting the digitally-based 'Morse Code' of Procall in one or more of those frequencies, risking damage to the clock and/or cue data.

Similarly, never make a hi speed dub of a Master Show Tape. High-speed transfers tend to 'drop' frequencies at the extreme ends of the audio spectrum; so, you may well loose the 500Hz portion of the Procall code, the 2000 Hz signal as well.

Always test each dub before releasing it. I have consistently gotten my ass in trouble when did not follow that procedure. You never know when the mag tape material your using will be defective, causing drop-outs in either the audio or cue tracks; or both. Although it is true that Positrack will get your Projectors back in synch, you may get an annoying visible 'glitch.'

Avoid Delays

Use Time Offset Command to eliminate the slight delay incurred when recording the program cues onto the master show tape. This slight delay is caused by the difference in the positions of the "Play" and "Record" heads on the tape deck.

(Note: on some decks, like late model Teacs, there is no difference of position because play and record are both done by the same heads.)

When you are recording the cues, the Clocktrak is being played from the tape (channel Left-2) into the Eagle while the cues from the Eagle are being recorded onto the tape (channel Right-3). Since there is about ¾-inch distance between the Play and Record heads on the deck, this results in a .1-second retardation of the cue information being recorded on the Master Show Tape. To eliminate this delay; go into Control Command and eliminate .1 seconds from every Clock synch point by typing in TOC0001,9999, -.1 (Time Offset Command subtract one-tenth of a second from program lines 1 through 9999.)

The time code must start at least three seconds before the first audio and/or cue information. Eagle needs that amount of clock start-up time to latch-on to 'where the program is' in relation to the clock. If you try to cut down that latch time, you will risk forcing a Go To. When splicing in leader at the head of the show to separate it from the test tones, splice in the leader before the clock start. Many technicians monitor only the audio portions of the tape and give you a nice 'tight' leader splice at the head of the audio; that chops-off the 3 second start and forces a GoTo.

Disk Packing Procedures

As a disk library starts to fill up, or if you have deleted programs from the disk library, sometimes you will notice a disk going into "packing mode" when you try to make a save on it. The Eagle monitor will read: "Please Wait, Disk Packing in Progress." This can be extremely annoying, especially if there are a lot of programs on the disk, because the process can take five, ten, maybe even fifteen minutes; that can seem like an eternity, especially if you are not expecting it.

The reason a disk 'packs' is to create more 'room' for the data you are trying to save. [*Editor*: In modern computers, the process is called "defragmenting."]

A disk stores programs on 'bands;' like the tracks on an LP (long play) record album. The disk turns like a record on a turntable, and 'records' the data on available bands called "sectors". When you delete a program from the disk, you erase the sectors that the data was stored on; so, you might end up with a few blank sectors in-between others that are storing active data.

When you go to save a program; the disk drive might determine that there aren't enough sequential sectors left to store your program data; so, it will go into packing mode whereby it 'lifts' all the data from the old band(s) and re-stores it on consecutive sectors; thus, eliminating any blank sectors between active ones and creating 'more' space to store your program. The disk drive will go into disk-packing mode automatically whenever it senses that it does not have enough room for your program. At the conclusion of the packing process Eagle will comment either "Operation Complete," or "Not Enough Disk Space Available."

To avoid going into a packing mode when you are not expecting it; pack your disk after each save. That way your disk is always packed and each packing procedure will be short and sweet.

I always get nervous whenever the disk is in a packing mode; because I know that my disk and all its programs are in a very precarious condition during the process.

If there was a power failure during the packing process, all the contents of the disk would be screwed. So, I try to keep packing times to a minimum, and accomplish that by telling the disk to pack after each save.

I cannot overemphasize the importance of saving frequently. Almost without fail, if I do not pack frequently, I get myself in trouble. The 'funniest' example I can think of was in Denver late one night, when Joey Kimball and I were at Colorado Visual Aids finishing up programing a show she was producing for Mountain Bell. We were making great progress and I was not saving as often as I should have been.

Confident of an early finish, we had made reservations at Joey's favorite Italian restaurant which, with a little luck, we would make by the skin of our teeth. Just as I pushed the Enter button, to save the program, a bolt of lightning hit the roof of CVA's studio causing a brief power blackout and loss of the entire program! At 2:00 am Joey went for Pizza and we worked on through the night. So much for not saving frequently!

Be A 'Flasher'

One of the hardest aspects of learning to program is remembering all the computer codes. AVL Procall has over 100 of them. Each code is an abbreviation of the English word(s) used to describe the programming instructions. For example, "CAC" means "Clear All Cues"; "AT" means "Alternate", etcetera.

To help memorize the abbreviations, use 'flash cards.'. Make them with 3 x 5-inch (7.5 X 12.5 cm) cards—commonly called "Index Cards" (like the ones used in your local library's card catalogue). Write an abbreviation on one side and what it means on the other. Now, flipping thru the cards you can self-test your familiarity with the abbreviated codes and refresh your memory by flipping the cards over to see what the codes mean. AVL's Pocket Procall guide (next page) is also useful; but it is a bit like the dictionary; you must know how to spell the word to be able to look it up and check the spelling.

AVL *Pocket Procall Guide* | Plates N^{os} 1-3

Pocket Procall



VERSION 5 - POCKET PROCALL

THE PROFESSIONAL TEAM IN MULTI-IMAGE

PROGRAMMING COMMANDS

ENTER UNDER CODE HEADING

AT	ALTERNATE
FA	FAST ALTERNATE
1A	1 SECOND ALTERNATE
2A	2 SECOND ALTERNATE
3A	3 SECOND ALTERNATE
4A	4 SECOND ALTERNATE
6A	6 SECOND ALTERNATE
8A	8 SECOND ALTERNATE
16A	16 SECOND ALTERNATE
32A	32 SECOND ALTERNATE
CT	CUT
HC	HARD CUT
1D	1 SECOND DISSOLVE
2D	2 SECOND DISSOLVE
3D	3 SECOND DISSOLVE
4D	4 SECOND DISSOLVE
6D	6 SECOND DISSOLVE
8D	8 SECOND DISSOLVE
16D	16 SECOND DISSOLVE
32D	32 SECOND DISSOLVE
AX	AUXILIARY FOR DISSOLVES
BG	BLINK GO
BS	BLINK STOP
FZ	FREEZE
HOME	PROGRAMMABLE HOME
LD--	PROGRAMMABLE LOAD FILE xx
LG	LOOP GO
LL	LOAD LOOP
LS	LOOP STOP
N	NO OPERATION
PF	PROJECTOR FORWARD
PR	PROJECTOR REVERSE
PS	PRESET
RP0	REPEAT ZERO
RPX	REPEAT X (TO BE RESOLVED
RPxx	REPEATxx TIMES
S10	SPEED-10 CUES PER SECOND
S20	SPEED-20 CUES PER SECOND
SG	SMOOTH GO
SS	SMOOTH STOP
TBxx	TABxx
TMxx	TIME IN .01 SECOND STEPS
TX	TIME X (TO BE RESOLVED)
W.05-W10	WAIT IN .05 SECOND STEPS
WX	WAIT X (TO BE RESOLVED)

ENTER UNDER SCREEN HEADING

G	GO
S	STOP
P	PROCEED
12345	SCREEN NUMBERS ON OUT 1
67890	SCREEN NUMBERS ON OUT 2
ABC	A, B, C
LCR	LEFT, CENTER, RIGHT
TCB	TOP, CENTER, BOTTOM

CONTROL COMMAND FIELD ENTRIES

EDITING CONTROL COMMANDS

BPF	BEEPER OFF
BPN	BEEPER ON
BPN	BEEPER ON
CAC	CLEAR ALL CUES
CLN	CLEAR NOTES
CUES	DISPLAY TOTAL CUES
ESNx,y	EXCHANGE SCREEN NUMBERS
IAMxx	CHANGE OPERATORS NAME TO xx
KBF	KEYBOARD EDIT OFF
KBN	KEYBOARD EDIT ON
NEW	ESTABLISH NEW HOME POINT
NOTES	EXAMINE AND EDIT NOTES
PA	PROJECTOR ASSIGNMENT
PGMxx	CHANGE PROGRAM NAME TO xx
RCF	REMOTE CUE OFF
RCN	REMOTE CUE ON
RTCx,y	REPLACE TIMES CUES WITH TX
SEQ2	PROJECTOR SEQUENCE 2
SEQ3	PROJECTOR SEQUENCE 3
TOCx,y,±	TIME OFFSET CUES HH:MM:SS.FF
TPO	TRAY POSITION OFFSET
XSNx,y	EXPAND SCREEN NUMBERS

MEMORY/DISK DATA TRANSFER COMMANDS

APxx	APPEND FILExx
CNPxx	CLEAR NAME PROTECTxx
CWPxx	CLEAR WRITE PROTECTxx
DELxx	DELETE FILExx FROM DISK
DLCxx,yy	DELETE CUES xx TO yy
DSKx	USE DISKx
INSxx	INSERT FILE NAMEDxx
LDxx	LOAD FILE NAMEDxx
LIB	LIBRARY
NLDxx	NOTES LOADxx
NPRxx	NAME PROTECTxx
NSVxx	NOTES SAVExx
PACK	PACK DISK
RNMx,y	RENAME FILE x AS y
SV	SAVE
SVxx	SAVE WITHxx AS FILE NAME
SCxx, yy, nn	SAVE CUES xx TO yy AS nn
WPRxx	WRITE PROTECT FILExx

MAG TAPE CONTROL COMMANDS

CEM	CLOCK EDIT MODE
CIM	CLOCK INPUT MODE
COM	CLOCK OUTPUT MODE

COM HH: MM:SS.FF	CLOCK OUTPUT BEGINNING AT TIME HH:MM:SS.FF
MIF	MAG TAPE INPUT OFF
MIN	MAG TAPE INPUT ON
MLD	MAG TAPE LOAD
MOF	MAG TAPE OUTPUT OFF
MON	MAG TAPE OUTPUT ON
MSV	MAG TAPE SAVE
MTD	MAG TAPE DUMP (SP V)
PIF	POSITRAK INPUT OFF
PIN	POSITRAK INPUT ON
POF	POSITRAK OUTPUT OFF
PON	POSITRAK OUTPUT ON
STL	SET LEVELS
VER	VERIFY (MSV ONLY)

COMMANDS FOR PERIPHERAL EQUIPMENT

RAVEN PROGRAMMING COMMANDS

FFxx	FILM FWD @ xx FRAMES PER SECOND
FRxx	FILM REV @ xx FRAMES PER SECOND NOTE: 1, 2, 3, 4, 6, 8, 12, 18 OR 24 FPS
FFS	FWD STEP THE FILM ONE FRAME
FRS	REV STEP THE FILM ONE FRAME
FS	FILM STOP
FB	FILM BEGIN POINT
=	xxxxx (1-65535)
FE	FILM END POINT
=	xxxxx (1-65535)

FTN	FILM TRACKING ON
FTF	FILM TRACKING OFF
Fx	FILM SPD CHANGE ×x% (1-6)
F-x	FILM SPD CHANGE -x% (1-6)
F0	FILM SPEED NORMAL
MN	MOTOR ON
MF	MOTOR OFF
LN	LAMP ON
LF	LAMP OFF

RAVEN EDITING COMMANDS

AF	ASSIGN FILM SCREEN NUMBERS
FS(x)=	FILM FWD ONE FRAME
FS(x)-	FILM REV ONE FRAME (x) = SCREEN #
FOCx,y,=/-	FRAME OFFSET CUES × OR -

X-15 PROGRAMMING COMMANDS

XS	SHORT PULSE	**XN**	LATCH ON
XL	LONG PULSE	**XF**	LATCH OFF

PRINT COMMANDS

PRINT	PRINTS CUES AND NOTES
SPDxxx	SET BAUD RATE FOR PRINTER
PBH	PRINTER BUSY HIGH
PBL	PRINTER BUSY LOW
NPB	NO PRINTER BUSY
PLP	PARALLEL LINE PRINTER
SLP	SERIAL LINE PRINTER
PLB	PRINT LIBRARY

EDITING COMMANDS

CTRL/A	ADD-A-CUE
CTRL/B	REVERSE TO LAST TAB
CTRL/C	CONTROL COMMAND FIELD
CTRL/D	DELETE CUE
CTRL/F	FILM DISCONNECT/NORMAL
CTRL/G ENTER	HOME PROJECTORS
CTRL/G--	GOTO CUE--
CTRL/G,T,M	GOTO TIME HH:MM:SS.FF
CTRL/K	REVERSE TO PREVIOUS GO
CTRL/N	DISPLAY NOTES/NORMAL
CTRL/P	SLIDES DISCONNECT/NORMAL
CTRL/Q	STEP REVERSE CUE
CTRL/R	REPEAT PREVIOUS CUE
CTRL/S	STANDBY
CTRL/T	GOTO NEXT TAB
CTRL/T,xx	GOTO TABxx
CTRL/X	AUX DISCONNECT/NORMAL
CUE	CUE
ENTER	ENTER
ESC	ESCAPE
Q	STEP CUE
REPEAT	REPEAT DEPRESSED KEYS
RETURN	SAME AS ENTER
RUB OUT	CLEAR ENTRY
↑	REVERSE CUE
←	CURSOR LEFT
→	CURSOR RIGHT

SERIAL & PARALLEL PRINTER COMMANDS

PRINT MEMORY TRANSFER TO PRINTER. CAUSES A HARDCOPY PRINTOUT OF CUES CURRENTLY STORED IN MEMORY.

PLB PRINT ALL FILE NAMES OF THE PROGRAMS STORED ON THE DISK.

SERIAL PRINTER COMMANDS

SLP WILL DIRECT ALL PRINT OPERATIONS TO THE SERIAL LINE PRINTER PORT A.

SPD BAUD RATE (BITS/SEC) THE BIT SPEED EAGLE WILL OUTPUT TO A PRINTER. THE EAGLE CAN RESPOND TO THE FOLLOWING BAUD RATES 110, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200 AND 9600

NPB THIS COMMAND IS USED IF THE PRINTER THAT IS BEING INTERFACED TO THE EAGLE DOES NOT USE A PRINTER BUSY SIGNAL (No Printer Busy)

PBL THIS COMMAND IS USED IF THE PRINTER THAT IS BEING INTERFACED TO THE EAGLE GENERATES A LOW PRINTER BUSY SIGNAL (Printer Busy Low)

PBH THIS COMMAND IS USED IF THE PRINTER THAT IS BEING INTERFACED TO THE EAGLE GENERATES A HIGH PRINTER BUSY SIGNAL (Printer Busy High).

PARALLEL PRINTER COMMANDS

PLP WILL DIRECT ALL PRINT OPERATIONS TO THE PRINTER ON PARALLEL PORT B.

AVL, Inc.
500 Hillside Avenue,
Atlantic Highlands, New Jersey 07716-2197
(201) 291-4400 TWX: 710-722-9499



1977 views of the photo studio at Incredible Slidemakers' New York studio at 23 East 73rd Street.

Multi-Image photography is a breed apart; an eclectic blend of motion picture and conventional 'still' photography. A multi-image presentation can animate or 'freeze' images and create dazzling multi-projector special effects. Good images look better in a slide show, too, since a 35mm slide aperture is nearly twice as big as a 35mm cine frame; and the image holds rock-steady; it does not 'shake' or 'quiver' as a motion picture image often does. Multiple images can also be more easily 'blended' in a multi-image show than in cine or video. A lot of that has more to do with audience expectations than technological obstacles.

As we discussed earlier, though, it is surprising how few photographers really grasp what multi-image is all about. Too often, they think in purely 'linear' terms or are overly concerned with capturing a single 'great' shot. Maintaining high standards can be difficult too, because photographers are prone to thinking that since a given picture will only be on screen for 'an instant' that it does not need to be 'as good' as if it were to be used for a magazine cover shot.

Your best bet in locating a multi-image photographer is to look for a cinematographer who also shoots stills. They are hard to find; but can be found if you look hard enough. A cine/still photographer should be able to jump the hurdle of variable time dimensions.

We also previously discussed the need to develop a precise technical storyboard of the visuals required for a show. This permits a detailed shoot list to be established. And because the technical storyboard includes programming notes, the photographer will know how long the images will be on screen, how they will blend or merge with others and how one scene dissolves to the next. Thus, there will be better understanding of the 'time context' for each image. This is particularly important for animations; when knowledge of the timing as well as the number of steps is important to recreate a smooth sequence.

Rather than just hand a photographer a storyboard; you should correlate it with the soundtrack and screen the write-on-slide version of the show during your briefing session. The more detailed your brief, the greater the photographer's understanding; and the more likely you are going to end up with material that's great rather than just 'useable.'

In addition, a precise technical storyboard and brief will help avoid the necessity of having to shoot the scenes many times to cover all 'contingencies;' thus concentrating effort and materials on what's actually required. Photographers often shoot the shit out of a subject and you end up with piles and piles of over matter.

Some say: "There are never too many slides for a multi-image show." Others add: "Film is the cheapest part of the shoot." Both are essentially correct; but both also have a way of getting out of control and driving your disbursements so high that they strain the budget and cut into your profitability. It is nice to have lots of shots to choose from—within reason.

I once sent a photographer from my staff out to get a single 'head shot' of an executive. I got back no fewer than twelve rolls; that is, 442 slides, or a 442:1 ratio. Whew! That kind of selection I just do not need.

Film is not necessarily the cheapest element. Even at a 10:1 ratio, you can imagine how disbursements can add up for a 15-minute, fifteen-projector show.

I normally calculate using a shoot ratio of between 6:1 and 9:1 with film costs based on $15.00/roll (36 exposures). That amount is determined by adding the cost of the film (at $5.50/roll); processing (at $5.50); staff handling time at ($.50); special messengers (at $.50); pre-editing and 'sheeting'—taking the slides out of their boxes and inserting them into plastic viewing sheets—(at $1.50/roll for time plus the cost of plastic sheet); and 'mark-up' on all the above (at 15% or roughly $1.00). Thus, you should budget about $15.00 for a single 36-exposure roll—if you intend to make money on the show.

If you shoot 100 rolls a day—my average on a "hot" day—you have spent $1,500.00 on film and processing alone. That ain't 'cheap.'

Add the cost of the photographer at a daily rate of between $500.00 and $1,000.00; plus the cost of a staff liaison at $300.00/day; plus travel and per diems; and you've spent upwards of $3,000.00 per day for photography. That is why it is important to know precisely what you need before shooting.

Besides these more obvious costs, there are 'hidden' ones. If you are showing an animated sequence, it may require rehearsal time, which reduces the number of scenes you can shoot in a given time period. Likewise, a scene may require precise positioning for matte effects; or you may be using (high-priced) models and talent. All these factors, and many more, can contribute to high photographic disbursements. Thus, the more precise your storyboard and briefs the more cost-effective the shoot(s) will be.

Although it takes far longer to prepare a thorough technical storyboard and write-on-slide version of the show, your costs, in terms of staff time and materials, are much less at that stage of production than they will be when you get into photography and art preparation.

Types of Film | Their Advantages/Disadvantages

The ultimate show, in my estimation, would be entirely shot on Kodachrome 25. That is the finest-grain, sharpest resolution color film available. (In fact, I have found well-focused 35mm Kodachrome to be sharper than 120-sized Ektachromes shot with a Hasselblad and Zeiss lens).

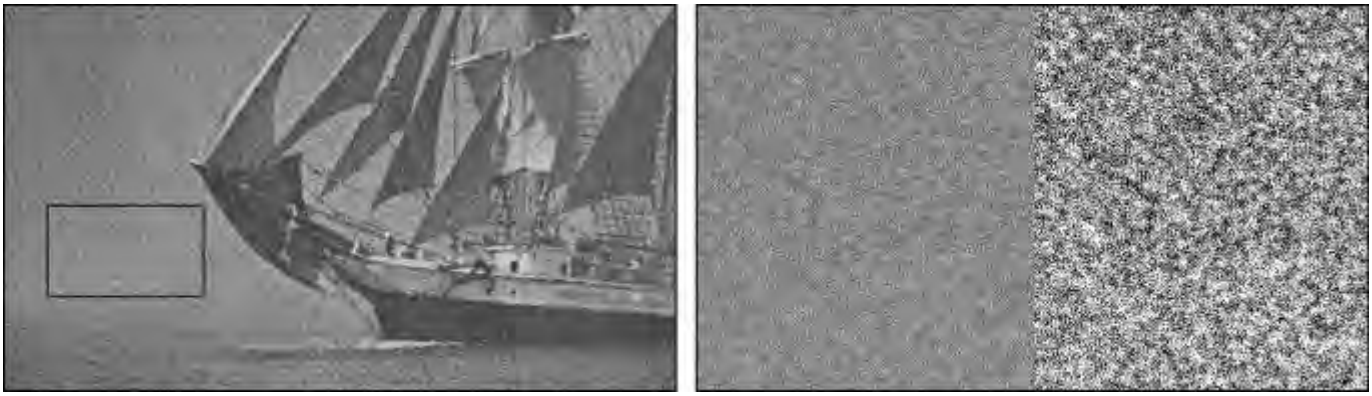
Kodachrome 25's disadvantage is its slow speed. It simply cannot be used indoors effectively (without lighting) and even outdoor use often requires a slow shutter speed and, therefore, a tripod.

Kodachrome 64 is one f-stop faster and has almost the same color saturation, grain structure and 'clarity' (sharpness) as the 25-speed version; thus, it is a little more versatile.

However, like 25-speed Kodachrome, the 64-speed version must be processed by a Kodak-licensed laboratory which, in remote cities, can take upwards of two or three days. This can be a problem since 99 times out of 100 you are shooting in a rush time frame and need your shoot back as rapidly as possible.

Ektachrome films, which you can even process yourself (in a pinch; but I don't recommend self-processing; because you can not match the consistency and cleanliness of a good professional lab). Ektachrome 64 is OK, but not as 'clear' or color-saturated as Kodachrome 64. I put "clear' in quotes because it is function of grain.

To digress, about grain and clarity: Grain is the term for the particles which comprise the image on the film's emulsion. The emulsion for black-and-white film is a thin layer of a gelatine-like material filled with tiny particles of photo-sensitive silver halides. Light breaks down the halides into metallic silver; the degree of transformation is proportional to the amount of light; e.g., a gradient. The brief exposure to light generates a so-called "latent image" in the emulsion; the transformation of halides into metallic silver begins, but is so slight as to be invisible. In the development process, chemicals continue the process begun by light until a satisfactory negative image is achieved—one with enough density to block light and be printed. It is possible to over-develop and/or under develop any film emulsion. To see a positive image, the negative must be printed onto another piece of film or photo paper (emulsion on a paper base; the base for most film-emulsions is made of polyesters.



Close-ups of a negative made with Kodak Tri-X film; ASA (ISO) 400. Right: high-contrast rendition for illustrative purposes.

However, by using a so-called, "reversal processing" method, a positive image can be obtained on the original emulsion. At the risk of over-simplifying, here is how that works: The film is first processed in the usual manner until the correct negative density has been achieved—that is, there's enough metallic silver particles to create a satisfactory image. Then, that image is beached away, removing all metallic silver from the emulsion.

Remaining in the emulsion are all the unexposed silver halides—in *reverse proportion* to the metallic silver particles beached away—creating a 'latent' positive image. When the film is re-exposed to light—done by exposing the film to a 100-watt light, at 18 inches (~46 centimeters), for one minute. That totally exposes all the remaining halides. When those are developed, the result is a positive image. The Ilford chart on the next page summarizes the steps in the reversal development process.

All that said: the light sensitivity of a given emulsion depends on the fineness of the halide particles in the emulsion—the ones that become the solid metal particles we call "grains" (possibly because they resemble the look of sand grains). Panatomic-X, a popular, fine-grain Kodak film, had an ASA (ISO) speed of 32. Tri-X was way faster; its speed was 400; but the grains were more like gravel than sand—a look some preferred and some exaggerated in processing by the temperature-shock method that 'crystalized' (clumped together) smaller grains into larger ones.

Kodachrome created its colors using a process like the black-and-white reversal one just described. In the Kodachrome process, when the negative silver is removed its gelatine hardens; the unexposed gelatine remains soft and absorbs colored dyes. There are three layers in the emulsion. They are sensitive to red, green, and blue light, creating a color negative. But the soft remaining emulsion in those layers is made to absorb dye colors of their respective spectral opposites (blue layer gets yellow dye; green layer gets magenta; and the red layer cyan; and those colors create the positive-color image. Importantly, the particles—grains—in the emulsion were like a fine-grain black-and-white film; e.g., Panatomic-X. Great results, but a very complex development process.

"Reversal color films" are another breed that uses "dye couplers" in the emulsion. That is, the basic halide particles were coupled to 'half dyes'—one half in the film emulsion and the other half in the film processing chemistry. That simplified processing by eliminating the individual dyeing steps required in the Kodachrome process. However, the grains of a reversal-film emulsion are larger than Kodachrome. The result is less sharpness, less acuity, less clarity.

THE REVERSAL PROCESS AT A GLANCE

Processing Steps	Time (min:sec)	Comments
First Development	12:00	May be adjusted to give optimum time for particular ISO rating. A longer development time will give a lighter image and a shorter development time will give darker image.
1st Wash	5:00	Preferably running water
Bleach	5:00	Strong acid and therefore stops development immediately: extend time if necessary, for full bleaching: continuous agitation
2nd Wash / Rinse	1:00	
Clearing Bath	2:00	Clearing solution removes any yellow staining caused by bleaching
3rd Wash / Rinse	1:00	
Second Exposure	1:00 per side	See Processing Notes
Second Development	6:00	Development as for normal black and white processing
4th Wash / Rinse	1:00	
Fix	5:00	Fixing as for normal black and white processing
5th Wash	10:00	Running water
Rinse and Dry		

https://www.ilfordphoto.com/wp/wp-content/uploads/2019/06/REVERSAL-180619.pdf

The only advantage that Ektachrome has over Kodachrome 64 is processing speed. Ektachrome 200 is fast ... 3-stops faster than Kodachrome 25, but for the speed you lose a lot of color saturation and resolution.

Ektachrome 400 is even worse; in fact, that stuff is the pits as far as image quality is concerned. Even if you are in focus, it will not look that way. Everything comes out with a granular softness that, by the time you dupe your show, is objectionable—certainly not the look of 'quality.'

To digress again, with an anecdotal story: The first few shows we did for Burger King rallies were shot on High Speed Ektachrome. Although lousy looking (as I ranted earlier), visual quality was traded for versatility while shooting. Put simply: it was a 'run and gun' type of assignment; shooting candids of burger flippers in action at five restaurants a day. However, when it came time to produce shows about Burger King's upgrade program—new uniforms; new restaurant interiors; new menu selections—higher-quality imagery was requisite. That is when I switched to Kodachrome 64 and started using fill lighting with GE '*Bright Sticks*'—hand-held fluorescent tubes; they looked like *Star Wars* light sabers. Bright Sticks were perfect in the fluorescent-lit Burger King restaurants. The results looked so good; I started shooting everything on Kodachrome.

Kodacolor and Vericolor are both negative stocks that can be used to create master negatives, then printed on emulsion 5382 stock to obtain positive trannies for projection purposes. Although I still have not done it, I have always reckoned that it would be far better to shoot an entire show on negative stock and then 'print it;' which is exactly the process used by most cinematographers. Movie makers seldom shoot on 'reversal' stock unless it is needed in a hurry; possibly for that night's TV news broadcast; and/or there isn't enough time to print negative footage.

Negative stocks have nearly twice the "latitude" of positive, reversal stocks. That means they are twice as forgiving of little errors in exposure or lighting contrast. They can also be pushed and pulled with less image degradation than reversal stocks. Moreover, with negative film you have exposure controls at two stages—you can push/pull the original negative and you can further adjust the exposure (and color balance) when making prints. Finally, because you are operating from a master negative, all prints of the show will be virtually the same, in terms of image quality.

However, there are some 'negative' aspects to this process. First, you would have to print each negative to see what you shot. Then you would have to prepare a 'neg matched' set of trays for printing the final show copies. That is, for every 'slide' in the show, you would have to go back, find the master neg and assemble those frames in sequence—like one used to have to do in the days before slides, when "filmstrip" presentations were made (see, https://en.wikipedia.org/wiki/Filmstrip). It would be tedious and laborious; but I am convinced it would be a better way to go.

Consistency of Image Quality

Consistent image quality can be an obstacle to creating a visually harmonious multi-image show. If you cut back and forth from dupes and originals, your show will look like a "mish-mosh" because the quality differences between dupes and originals is unbelievable when they are projected side-by-side. Some labs claim that they can produce dupes that 'look better' than the originals. Hmm. The originals must not have been very good for the dupe to look better. [*Editor*: Starting with my stint at Image Stream, in 1983, I never used camera originals in a show ever again.]

Besides that, cutting between slides shot on different camera stocks can be disappointing in terms of consistent image quality. Even though different stocks can be filtered to match each other, the 'feel' of a Kodachrome slide is different from Ektachrome, and the difference between a Kodachrome 25 Slide and an Ektachrome 400 is jarring.

Ideally the best way to avoid these differences is to use the same stock throughout the show. Or, if this is not possible or practical, keep the variety of film types to a minimum.

In some cities you can get bulk processing of Kodachrome; that is helpful if you are operating a large animation camera that takes 100- or 400-foot loads [30.48- or 121.92-meters]. Try to shoot all your location work on Kodachrome. If you are using an Oxberry Pro II camera or similar camera that takes 36-exposure rolls, shoot all your original effects on Kodachrome. That way you will have consistent image quality throughout the show.

Or, if you are shooting your titles and effects on Ektachrome, shoot all your location work on Ektachrome, too; using the slowest-speed version of the stock that you can.

The worst situation for visual consistency is having to work form assorted types of visuals—some original studio or location work; stock-house transparencies; large format chromes; possibly a few 'swipes' from magazines or books; and dupes of dupes of dupes that the client insists you use. Put all those different types of visuals together in a multi-screen show and you will be mightily disappointed; the quality will be all over the place.

When you have such a mixed bag of visuals to work with, degrade all the *originals* one 'generation' down by duping them. The quality of the duped originals will more closely match the other dupes; and the entire show will look more 'harmonious' from the standpoint of image-quality consistency. This should only be done for one generation of duping. If the lowest-quality slide were a three-generation dupe, you would not degrade everything else by duping three times to match. Also, this procedure is only necessary in rare cases when the variations of quality from one slide to the next are clearly intrusive to the overall quality of the show. In most cases unless you have total control over the shooting and use the same stock throughout, you will end up with various quality visuals on different stocks. More often than not, this will cause no great concern.

If you end up having to make duplicate sets of the show and have a variety of pictures shot on different camera stocks, you will have to make subtle filtration corrections when duping each type of film. For example, duping a Kodachrome slide requires different filtration than an Ektachrome slide. These subtle differences are also necessary for different speed stocks in the same film family; the filtration for an Ektachrome 64 slide will be slightly different than an Ektachrome 200—that is, if you want a perfect dupe. That said, if you do not change the filtration, 4 out of 5 times, you'll get 'passable' dupes.

The amount of fussing over filtration when duping depends largely on the subject matter of the pictures. If your show involved ski fashions, your filtration would have to be basically perfect, otherwise white snow might end up yellow, or light pink, or some other weird color. Or, if you were duping slides of specific paint colors, or hair-dye colors, your filtration would have to be more precise because subtle shifts there could prove disastrous in terms of matching the client's brand colors. On the other hand, if you are talking about flowers and sunsets or other scenes where there is no specific reference point for identifying color shifts, you can get by with less precise filtration.

Pushing and Pulling Film

I hate pushing and pulling. You simply cannot maintain image quality. Grain increases; your coloration is thrown off; and the contrast build-up can be intolerable—especially considering that you will probably make a dupe set of your presentation for a 'show' copy. (*Editor*: See Red/Blue system, discussed earlier on page 2761.).

In the duping process you are going to lose a generation of quality, so it is important that your originals maintain the maximum degree of image quality. Moreover, there is no need to push or pull unless it is an absolute emergency. If there's not enough light to hand-hold the camera, use a tripod. If there is still not enough light, bring in lighting. If the image is too bright, use neutral density filters to reduce it to the exposure you want.

Sometimes, however, you cannot control the shooting situation and/or there is some other emergency. For example: a 'grab shot' or fast-action situation where there is no possibility to bracket the exposure or reshoot; or a camera that malfunctioned.

I recall two situations clearly: one where I pushed the film, and another where I wished that I did. In the first instance; I was shooting for Arab Wings; they are. a Learjet 'taxi' fleet in Aman, Jordan. [*Editor*: Arab Wings modelled their business on Executive Jet Aviation; Bruce Sundlun's successful business-jet-for-hire operation; now called *NetJet*s.]

When you are shooting airplanes, you seldom get the opportunity to do a lot of retakes; because aircraft cost so much to fly (up to $800.00 an hour for a Learjet) that you simply can't afford to shoot a lot of 'takes.' For that reason, I use motor drives set on high frame rate and bracket like hell! Nerve wracking, yes; but necessary.



In this case it was getting near dusk and we were doing 'touch and goes' on a seldom used runway in Southern Jordan near the Israeli border.

Each time the plane did a 'touch & go;' it would have to regain altitude, divert around a mountain range to avoid going into Israeli air space, then reapproach the runway; a maneuver that took nearly 15 minutes. I was advised that I would get exactly three touch & goes to shoot; then the plane would land and we'd be off to the next location. As luck would have it, on the first two passes the plane 'touched' the runway about 100 yards away from the agreed spot; where my cameras were set up. Since I was using wide angle lenses, this was clearly 'NFG;' the plane looked like a tiny white dot. That meant one—and only one—more pass.

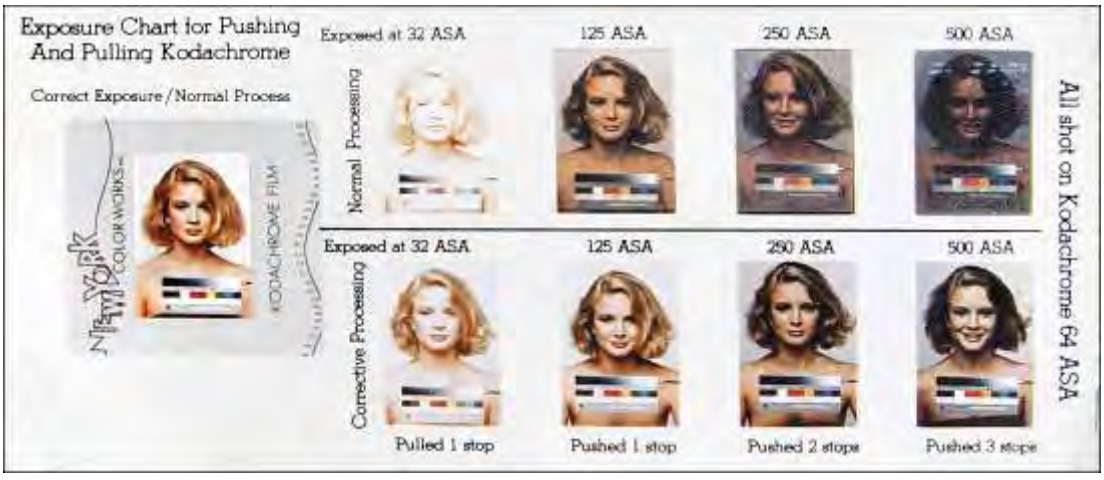
I unloaded the Kodachrome, reloaded with ASA 64 Ektachrome, and decided to shoot only one exposure of the whole sequence. If I bracketed, I would lose frames on either side of the correct exposure. Planes travel quickly; in terms of the plane's position in the frame, you only get one or two good shots, even on a perfect touch & go sequence; I was fearsome of losing those one or two good frames to a bracket.

Thus, I shot the entire sequence at one exposure, then removed that roll from the camera, reloaded with another roll of ASA 64 Ektachrome, and shot the same scene at the same exposure (but without the plane). I labelled that as a test roll, processed it and subsequently found that my exposure was off by a stop. So, I pushed the roll with the 'touch & go' sequence & got away by the skin of my teeth!

In another situation I was shooting for Piper Aircraft in Florida. We were doing air-to-air shots (from one plane to another). After I got back to New York, I sent all my Kodachrome into the lab and discovered that 1/3 of the take was overexposed by a stop and a half. On further investigation I found that one of the three cameras I was using had mal functioned—the lens diaphragm was stuck open; the aperture-retention spring had vibrated off its mounting screw. What are the odds for that happening, eh?

Alas, Kodachrome, could not, at that time, be pulled or pushed (see note, below). Had I shot on Ektachrome and test-processed every tenth or so roll (which I often do) I could have spotted the problem, then clip tested each roll to identify the bad ones, and pulled the suspected culprits the stop and a half necessary to obtain 'usable' images.

I subsequently learned that there is (at least) one lab which can push and pull Kodachrome. It is New York Colorworks and if you write to them, they will send you a handy reference card which reveals what images look like when the Kodachrome processing is altered. Handy for an emergency where this film must be pushed or pulled.



'Slate' Your Shoot





Cinematographers 'slate' every scene by shooting a few frames of a blackboard or other sign indicating the scene number, roll number, camera operator, director, and all other details needed for the editor to identify the scenes on the roll.

Photos courtesy of Wikipedia.

You can do the same thing on location, in the studio, or on your rostrum camera not only to aid in the identification and editing of scenes, but also to spot possible camera or exposure problems early enough to solve them by processing modifications.



The slate I use has two components: The first is a small 'white board' on which I can write the roll number, scene and/or TAB number, camera number, photographer, date, and location. The second is a Kodak gray card together with color bars and a gray scale; these are useful for tweaking the exposure and coloration of dupes and/or prints. The same procedure is used for rostrum-camera shoots. At the lower left is Image Stream's 'China girl' slate. Note the gray card and color bars on the upper left.



Although the ideal would be to slate each roll you shoot, it is impractical and not necessary. Slate the first roll of any given series of rolls; or at any change in location, lighting, film, or other variable. Use the slated rolls to knock off a few sample scenes. Then mark the slate rolls with a batch number; and mark each roll in the batch with that number. Have the test/slate rolls processed and look for any problems which could be corrected in the processing; and identify those rolls by their numbers.

Bracketing

'Bracketing' is shooting a variety of exposures to increase the chances of a 'perfect' one. Let us say the exposure meter indicates f8 @ 1/100th second. If you bracketed one f-stop under and over, you would also shoot f5.6 @ 100th and f11 @ 100'th; or f8 @ 1/50th and 1/200th second. Many photographers bracket in ½-stop intervals, under and over the suggested exposure.

Bracketing is much a debated issue. 'Purists' say bracketing is a 'cop out'. Cost-accountants say it's too expensive. However, I recommend that you bracket in all situations.

I bracket one stop above and one stop below the recommended setting as indicated by my exposure meter. That means I am shooting at least three frames for every one useable picture. I do this for a number of reasons: First, I own a lot of cameras, and each shoots slightly differently; their meter-readings are not exactly the same. Even though I periodically run checks to see which cameras are shooting 'hot' and which are under-exposing; bracketing helps to insure fewer errors. Secondly, the lab never runs the same way twice (believe it or not). Kodak 'tweaks' their processing during night runs at the Fairlawn, New Jersey plant. Professionals can request 'expedited' service at about $1.00/per roll extra to get their film processed during this tightly-monitored period. During day runs; the processing tolerances can 'drift.'

If you have ever processed your own color film or prints, you know how temperature, chemistry fatigue, and/or timing variations can have extreme effects on exposure latitudes; especially on reversal stocks. Bracketing can help 'smooth' variations among labs, or between different runs at the same lab.

If you ever want to be shocked; shoot one scene with ten different rolls of the same stock under controlled conditions and send each roll to a different lab. We did that in New York; as an experiment to determine which lab was operating the 'cleanest.' We were amazed at the differences; not just in cleanliness; but also in color saturation, D-Max, and exposure. Run that test in your town.

Still another reason; I bracket because I am not always certain what the exact exposure should be. Nine times out of ten it is probably the exposure indicated as 'perfect' by the meter; but occasionally, being a stop lighter or darker will enhance the look and 'feel' of a photo and the bracketing will provide a choice. In addition, not all photographers are fully aware of what they are metering in any given situation; so, by insisting that they bracket, you will be able to recover from their possible errors in judgement.

To digress for a moment about exposure meters and their use: Exposure meters are calibrated to faithfully reproduce an 18% gray card. (Why 18%? Don't ask me.) Wherever you point your meter, you will be given an exposure that will render that scene as 18% gray. Whether it is white snow or black coal, the meter will give you an exposure that will make each gray.



Most meters also provide a white dome that is used to measure so-called "incident light.' The dome blends the light from all sources and renders an exposure that is roughly equivalent to an 18% gray card. Using an incident-light meter, one points it directly at the light source instead of measuring the light reflecting off the subject or gray card (appropriately called "reflective light"). Incident light readings were my preferred method for metering scenes.

The best way to measure the reflected light in a scene is to find a shade of gray that is close to an 18%-gray card and aim the meter at that (for example, the pavement of an asphalt roadway). If there is no gray in the scene, add your own—always bring a Kodak gray card. Use the card to measure the reflected light from all the main sources, especially the main light. Then check the differences between the highlight exposure and shadow areas. The highlight 'should' be in the range of two to three stops brighter than the gray-card, and the shadows one or two stops less. That gives you a five-to-six-stop total range, which 'fits' within the latitudes of most films.

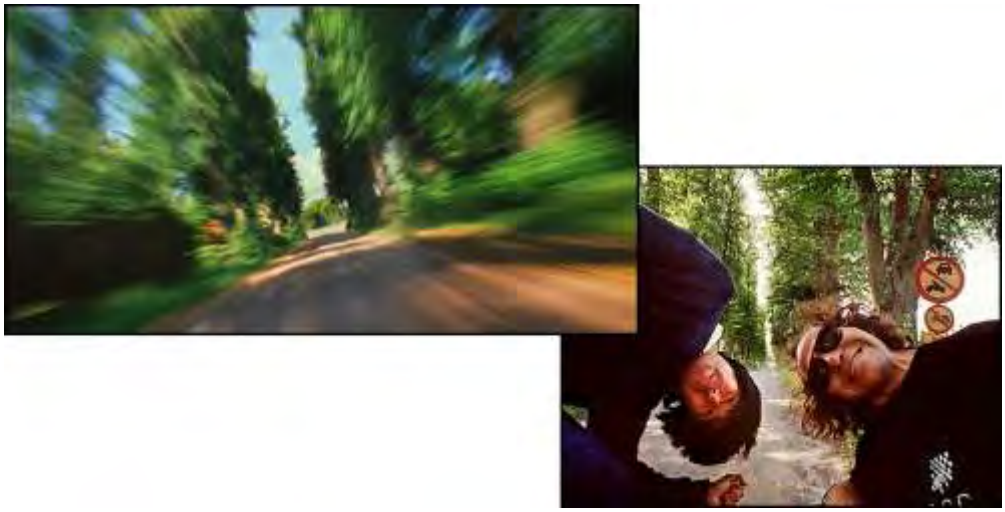
Avoid wider ranges; they are harder to dupe. The lighting may look ‘flat’ to your eye; but the contrast will increase by at least 10% when you dupe or print the picture.

However, as mentioned, different meters will give slightly different results. That can be worrisome. When I was shooting the Saab shows, Juki Nakamura and Filip Jarnehag were hired to assist me. They were great photographers in their own rights; in fact, when it came to studio lighting, Juki was ‘light years’ ahead of me (sorry, I could not resist that one). Anyway, each of us was using our own light meter and none of them ever agreed. However, the differences helped me determine what my bracketed exposures would be.

In addition to the exposure bracket, I also insist that at least three originals be shot for every scene. Add that factor and you are now shooting nine frames for every one you intend to use (a 9:1 ratio). I will drop that to a 6:1 ratio if the budget is extremely tight or if I am running out of film; but I generally stay on a 9:1 ratio. This provides extra protection form loss or damage to any frame used in the show, as well as the option of using the same shot in another section of the show without the necessity of duping it (and therefore losing a generation of quality).

I bracket in two different ways: shot-for-shot, or roll-to-roll. Whenever possible, I bracket shot-for-shot. However, some situations make this almost impossible; for example, shooting animations or sequences of events. Take the Lear jet example above. If I was shooting an animation of the plane landing, I would not bracket shot-for-shot, because I might lose important steps from the overall series; and since the plane will never land in the same place twice, I will not be able to edit different frames from different sequences together. So, in situations like that I would rather have an entire sequence bracketed so that I get all the animation frames correctly (or incorrectly) exposed; that way the action of the series is not interrupted.

When shooting the slates, I also made it a practice to check the shutter/diaphragm—to make sure both are correctly opening—and the film gate—to make sure there are no hairs or other bits of crap caught in it. The gate check is done by locking the camera’s mirror in the up position, removing the lens, and shooting a frame using “T” (time exposure) or “B” (bulb) mode. Those settings keep the shutter open long enough for you to closely examine the edges of the gate. Check those each time you load a new roll of film.)



Juki Nakamura (left) and Yours Truly checking the lens diaphragm operation of a bumper-mounted, remote-control, 250-exposure Nikon F3 camera before shooting a 90-frame motor-drive ‘streak’ sequence of the car zooming down a country road in Sweden.

If you get an entire shoot back and it is all a bit underexposed, you may be able to dupe yourself back to a 'correct' exposure. That situation happened to us on one occasion when we were producing a show for Yves Saint Laurent.

YSL had sent a (terrible) photographer all the way to India with a cast of thousands to shoot fashion pictures. All the shots were on Kodachrome and all were about a stop underexposed.

To make matters worse, this show was supposed to get transferred to videotape for final use as a POP (Point-of-Purchase) display in stores all around the country. Ugh!

Ultimately, the problem was solved by carefully duping each original slide and making exposure and color-filtration corrections to get the best possible images. In this instance we were all surprised at how well the dupes came out; we learned that if you have slightly underexposed slides and dupe them for 'correct' density you can get good-looking dupes with very saturated colors. However, I would still prefer to have the correct exposures on the original take.

[*Editor*: The same holds true for digital imaging; brightening an underexposed picture produces great results.]

That process can be reversed; you can dupe overexposed slides down to a 'more correct' density, but the results are far less pleasing than brightening dark shots. The resulting dupes will look 'dull' because the contrast 'kick' is working against you. When you dupe an underexposed picture 'up,' the brighter highlights will tend to 'burn through;' but that is OK if the average densities and shadow details are maintained. On the other hand, when you dupe an overexposed slide 'down,' the highlight areas tend to become 'grayish' and the resulting slide has a flat, low contrast look.

Contrast Correction:



Left: original photo made for the Ardell Hennaluscent show. Center: A black-and-white negative is used for a mask that reduces contrast. Right: A positive mask increases contrast; darks get darker. Note, masks shown have 'normal' density, for illustrative purposes. Actual masks are very much 'thinner.'

Whether duping up or down, if you run into bad contrast problems (or just want to improve the quality) use a "contrast mask." Do this by 'contacting' (contact printing) the original slide to 5302 stock (Fine Grain Release Positive film) and preparing a very *underexposed* black and white negative. The underexposed negative should only have density in the highlight areas and should appear as a very 'thin' (transparent) negative. Its sole function is to hold back light from the highlight areas, pulling the highlight exposure more 'in line' with the mid-tone and shadow-area exposures; thus, 'flattening' the contrast range.



By varying the densities in the contrast mask, you can achieve varying levels of contrast balance. The way to maintain registration during the contacting process is to use a Marron Carrel contact strip device. Both the raw stock and the slide frames are pin-registered and sandwiched together in glass for maximum emulsion-to-emulsion contact.

If you are duping 'down' an overexposed original, do the same process in reverse. After preparing you contrast-mask negative on 5302, reverse that neg to create a pos on 5302. The positive mask will hold back the exposure in the shadow areas and *increase* the contrast range, thus letting you burn through highlights while maintaining the shadow details and the mid-range-tone areas of the image.

The corrective procedures just described are boring and time consuming; but they will bail you out in emergency situations and can even be used 'creatively' to come up with some interesting new looks that can be used to create impactful dissolve and cut sequences; for example, from "high key" to normal contrast.

Using 5071 Duping Stock

When shooting dupes, you will probably be using Kodak 5071 duplicating stock. This stuff is a royal pain in the ass because it is very 'finicky' and unless you expose and filter with precision, you are going to go nuts. Even the processing can severely alter your results giving the whole shoot a color cast (tint) of magenta, green, yellow, or some other color. And every different emulsion batch of the stock (indicated by its emulsion number) requires slightly different filtration. My advice is:

1.) Use an excellent quality Dichroic color head. The new digital Bessler dichroic light source is one such device; it digitally 'reads' the blended colors of the light source accurately enough that what you 'read' is WYSIWYG (what you see is what you get). With some dichroic sources; you don't know if the lamp or filter elements have 'faded' with use or age—so that what you dial-in may not be totally accurate.

2.) When you buy 5071 stocks, buy large quantities with the same emulsion number; and keep the stock in the freezer. That way you will not have to waste time and film constantly re-calculating your base filtration. [*Editor*: Like matching paint or dye colors, every new batch of any film is slightly different than the last.]

3.) Keep careful log books indicating the correct exposures and filtrations for different types of film originals (i.e., Kodachrome, Ektachrome, Fujicolor, etcetera); as well as the different filtration and exposure corrections needed for those stocks; including under or over-exposed variations. You should also log the 'aesthetic' filtration corrections for unusual lighting situations; most notably the green-cast of originals shot under fluorescent lights (even when a correction filter was used when shooting the originals).

The log book should also indicate which lab processed the tests and include samples of the originals and dupes used in the testing process for evaluation and comparison purposes. That way you can look-up examples of many duping problems in your log and likely find an appropriate solution.

We were constantly updating and adding to our duping log as we found more and more exposures and filter combinations to 'massage' different types of originals when duping.

Still another reason you must learn to master the art of duping is that, as you will see later when shooting special effects, a lot of time and effort can be saved by shooting one master effect, then duping it, or its elements, into position for the final slide(s). In order to accomplish that; you must have full control over your duping procedures and be able to produce the perfect dupe.

Registered or Non-Registered Cameras

This is another area where debate runs rampant. Except for rostrum-stand photography and re-photography, I rarely, if ever, use a pin-registered camera in the field. The reasons for that are quite simple:

First, pin-registered cameras are much 'slower' than non-registered cameras. For example, the Oxberry pin-registered Pro II camera—a beautiful instrument for shooting registered sequences in the studio or on the rostrum stand—is a beast on location. It requires an enormous (and expensive) battery pack and shoots only one frame every two seconds. Using our earlier Learjet example, can you imagine asking the pilot to, "Please take that at a slower speed"?

Using the talents of a professional actor, or shooting a studio set-up where you can take your time with each frame, the precision of a pin-registered camera cannot be beat. But when you are on location or shooting fast-action animations, you simply cannot use such a slow shooting camera. I normally use my trusty old Nikon FTNs with F-36 motor drives. They are not pin registered; but the amount of mis-registration from frame to frame is minimal and can usually be corrected when duping the originals.

Secondly, I do not care how carefully you line-up a slide show; after the first few slide advances, the projectors' registration has slipped a bit anyway; and that amount of slip, or the use of non-matched lenses, and/or keystoning (however minimal), far exceeds any mis-registration on the part of a motorized Nikon.

If, on the other hand, I know that the show is going to be shot on a multiplexer for broadcast TV standards, then I might take the entire sequence shot on an unregistered camera and dupe individual frames back into position. Or, I would do what a lot of producers have done (which I can never quite believe); shoot the original sequence with a 35mm or 70mm cine camera; then take individual frames of the movie and reshoot them as slides. (!) Can you imagine? Why not just make a movie to begin with? Why shoot a movie and then reshoot slides and project them fast to look like a movie?

Multi-image is not cine. The look you get from even the fastest animations is still a staccato, 'pixilated' kind of imagery that is different from pure cine; yet which can be equally pleasing; creating its own unique style. In my estimation, the slight misregistration that occurs when using a non-registered camera to shoot high-speed, animated sequences are not displeasing from a stylistic standpoint. If you want perfectly registered, precision animations, shoot a movie!

Shooting Animations on Location

The biggest problem I have encountered with shooting animations involving real-life situations is pre-planning the number of steps needed to make the animation real enough to be believable. Remember, an animation is an optical illusion; it is the recreation of movement using still images. The smoothness of the action depends on the relative amounts of movement in relation to the total time allowed for the sequence.

The first thing you must consider is the number of steps you will need to make the action look smooth in the time allotted. The number of steps can be radically different that what you might think.



Three of more than 1,000 'generis' models; portraying 'generic reactions'—happy, sad, angry, surprised, puzzled, etcetera—shot against limbo—to be inserted into background illustrations—for educational CD-ROMs produced by PIR Sweden, 1993.

For example: a smooth-looking 'head turn' is a two-step move. One shot of the subject looking away and one shot of the subject looking into the lens, or somewhere else. With a 1- or 2-second dissolve between the two slides, the resulting head movement will be amazingly lifelike. On the other hand, to animate a jogger running; you will need at least nine steps; and a looping program for sustained action. Otherwise, the animation will be jerky and unrealistic.

To glean some insight as to how animations work, you can refer to any number of reference books on the subject. Those will reveal the number of intermediate steps required for a given action to appear real. If you are in doubt about a specific animation sequence; try shooting the sequence in black and white as a trial run. Then program the sequence at various rates using as few steps as possible to get the desired illusion of motion. After you have narrowed down the number of steps needed, shoot the finished color slides. (If you are a good enough artist, try to test the action using write-on slides.)

Or, if you are in a situation where you cannot experiment; slow-down the action to the maximum extent possible and shoot more steps than you need. It is far better to have too many steps—from which you can edit as many steps as required—than it is to have too few steps and end up with a jerky-looking animation.

With controllable subjects, (such as an actor, or a car that can be driven at variable speeds) controlling the animation steps is relatively easy. As you can see from the illustrated steps from the 9-projector, single-screen, "Nightmares" show (see, *Nightmares Show Portfolio | Plates Nos 1-20* starting on page 2795), there is little differential between successive frames. The actors' movements were slowed down to match the camera's shooting speed in relation to the 'playback' speed.



For the 'dream sequence' of actor Martin Sherman rolling around on the bed; the camera speed had to be set on 'low' (1 frame per second) because the shutter speed was too slow (1/8 second) for a faster frame rate. As a result, Martin was instructed to roll about the bed in very slow motion (which was not easy). Notice that Marty's action 'blurs' in some of the frames. For animations that is not undesirable; it can help enhance the perceived smoothness of the action.



For the sequence of the taxi towing the 'train' of equipment cases; the speed of the cab never exceeded five miles per hour. By having enough 'steps'—that is, small amounts of movement between each action frame—I could control the 'speed' of the taxi by increasing and decreasing the program timing and/or the number of steps used.

Obviously, to create smooth animations requires a lot of projectors. You will simply not be able to achieve complex animations with any degree of acceptable smoothness using fewer than nine projectors; twelve or fifteen or even more is preferable. If you are restricted to three or six projectors, re-think animating. It just will not look good. Or, in the case of six projectors, keep the animations to short little bursts; involving no more than six frames; like a finger pushing a button; or a fast zoom in or out of a subject.

The problem with using fewer projectors derives from the 'stepping time' required to do a smooth animation. With only six projectors, you do not have enough projector access to get the slides moving fast enough; so, you cannot use the kind of small-steps that achieve smoothness. The fastest you can advance a six-projector loop is basically six frames per second—not enough for smoothness. Nine frames per second just makes it; and at 12 or more you are operating closer to cine speed, which is far better.

Analyze the steps necessary and/or possible in relationship to the time available for the sequence (a factor of the number of projectors available in your rig). For that bed-rolling sequence in *Nightmares*; I knew that the soundtrack called for three seconds of action. With a 9-on-one rig, the action could not exceed 27 steps (3 seconds X 9 slides-per-second).

I divided the total movement (from one side of the bed to the other) and rehearsed Marty so that the time it took him to roll from one side to the other could be shot in 27 steps. [*Editor*: All 27 steps are not included in Plates because only a few key frames were archived.]

If you cannot control the speed of the subject's action, you have got problems. In situations like an aircraft landing sequence, you simply shoot as many frames as you can; then juggle your program timing between steps; trying to approximate 'real' time as best you can—unless you choose to intentionally speed things up or slow them down.

One thing you can do before the shoot is to get some indication of the relative speeds and factor backwards. In the airplane sequence I knew that the plane was landing at a speed of approximately 200 miles an hour [~322 kilometers/hour]. I also knew that I would be using a 28 mm lens.

A quick walk to the street, viewing cars passing through a 28 mm lens, revealed that the plane would be too small if farther than 200 yards away in either direction; and that at 200 miles an hour the plane would traverse the total camera field in about 1.5 seconds. With the camera cranking at its fastest speed (4 frames/sec.) the best I could hope for was a six-frame animation.

Thus, for my write-on-slide version of the show, I allowed for a six-frame move; and since the sound effect for the sequence was about 3-seconds long, I slowed each frame down slightly in programming accomplishing the sequence using six half-second dissolves. It did not look as 'real' as a movie; but it looked good; and that is what counts.

In retrospect, I could have 'lengthened' the action sequence by using a longer lens; getting further away from the plane; and following it for a longer period; with the camera shooting at its highest speed.

That sequence, however, would have lacked the visual dynamics offered by the wide-angle perspective of the 28 mm lens. The longer lens would have 'compressed' the plane instead of 'stretching' the wing at the point where the plane was closest to the camera. The trade off was smoothness for visual dynamics.

In the studio, using inanimate objects, puppets, 'clays' (figures modeled in pliable clay) or wire-frame models, you have more control over every move in your animation sequence.

One of the best shows of this type that I have ever seen was an animation sequence involving models of boxers made from cans of the sponsors product. Little arms and legs were attached to the cans. The 'good can' and the 'bad can' slugged it out in a boxing match shot in stop-motion animation and set to the theme of the movie *Rocky*.

That show brought the house down and was awarded a gold medal at the one of the festival competitions (I can't remember which). It deserved it; being one of the best slide-animation sequences I have ever seen; and such a 'logical' a use of the slide-show medium. Slides are, after all, perfect for stop-motion animation techniques. I am surprised we do not see more of this type of animation; even if it is unbelievably laborious to execute.

Animation of Graphics

The animation of titles, artwork, and graphics using a rostrum camera and carefully prepared artwork is controllable; thus, well suited for slides. This section is about artwork preparation. Rostrum camera shooting techniques will be in discussed in a later section.

We begin with analysis of the types of animations possible and how to program them.

Animation of falls into one of two categories:

- Movement of the subject around and within the field; such as a zoom, pan, wipe or cartoon.

- Movement in a fixed position; such as a glittering word; a spinning wheel; twinkling stars; etcetera.

As in the analysis of a live animation, shot on location, the elements of primary consideration are:

- Number of steps needed to make the action look smooth

- Total time required for the action

If you need a lot of small steps occurring rapidly, you need a lot of projectors. If you do not have a lot of projectors available; do not plan an action that requires a lot of fast-moving, small animation steps.

Sounds so easy, right? Why then, do you see so many shows with jerky animations? Because too few steps were included to make the action smooth. That is usually the case where there is not sufficient projector fire-power; but the client or designer may have insisted on an animation; or the designer was naïve.

The rule of thumb in all cases is to use the maximum number of steps that are available; that will keep all the actions as smooth as possible. For example: say we have a six-projector rig and we want to have a logo zoom back and forth from small to large.

Because there are a total of six projectors, the maximum number of steps we can have is six, right? Wrong. More realistically, we would probably have only four projectors available to do the move since, while the zoom-sequence was running, the fifth would likely be advancing from the previous scene and a sixth would need to be readied to 'get out' of the zoom sequence. Or, if the zoom was to be 'tucked into' another series of dissolves; or there were 'supers' (superimpositions); you might only have two or three projectors available.

That is a perfect example of why you should pre-program, before preparing art and/or photography. If you told an art director you were using a six-projector rig, the unwitting AD might design a six-step move where there were only three projectors 'available.' That sort of thing happens over and over again. I cannot tell you the number of times I have been presented with six slides to 'fit' into three projectors.

So, at the risk of being overly repetitious; the first thing to do is prepare a program, with write-on slides; to calculate the total number of animation steps; along with the relative timing of the steps. Then, and only then, are you in a position to accurately assess the artwork and/or photographic steps that need to be employed in the animation.

Separation of Elements in Graphics Animation

One dynamic, easy to produce 'family' of special effects falls into the category of 'fixed-field' animations. An example of such an effect would be a glittering logo; or a pulsating logo set off against a field of twinkling stars. In cases like those; there is no movement of the subject within the field (i.e., it the logo does not zoom, or wipe, or spin) rather, it holds position—is 'fixed'—in the field. Animation is achieved by separating the subject into its 'base elements.'

Again, our start point in the production of an effect is determining how many projectors are available to accomplish the animation. That total will dictate the number of elements for programming; artwork separation; and rostrum camera effects on individual elements.

Fortunately, these types of effects do not always need vast numbers of projectors to look good, which makes them well suited for smaller multi-image shows comprised of three or four projectors.

However, their 'success' on screen depends not only on the tastefulness and appropriateness of the element's separation; but also, on how the elements are reassembled on screen; that is the function of 'choreography' (programming).

For our example, we will use a nine-projector, single screen configuration; and we will use all nine projectors for the effect.

With fixed-field, graphic affects you can usually dedicate all the available projectors to the effect; because so many visual things are happening; that when it comes time to 'bail out' of the effect and get on with the next scenes; you can drop one or two of the elements without anyone noticing; thus, freeing up a couple of projectors for the next move.

That, of course, would not be the case if the next move were an equally complicated effect or a rapid animation involving a lot of frames; but there are ways to cheat and accomplish those types of sequences, (which we will discuss a bit later in this section). For now, we will discuss the making of a nine-projector,' fixed-field, logo animation.

Begin by making write-on slides for the various elements of the graphic (see illustration, page 2832) For example: you might have a base logo with three different over-projected effects—inner glow, outer glow and stars. Program the write-on slides to confirm the steps.

In most cases, animated effects are set to music; they flash and pulsate to the beat of the tune(s). Take the musical beats and subdivide them into their smallest 'usable' units (usually 1/8 beats). This is where your old dancing-school lessons will prove worthwhile.

Type in a series of TXs (Time-X commands); string out about 30, 40 or more. To do this, type in the first TX and use the "Control-R" repeat function. If the first TX is on line 20, and you are adding 40 lines, hold down the Control-R keys until you hit line 60; it takes about 2 seconds.

Next, play the music track for the section with the effect. Set the tape deck a little ahead of that section and 'roll in' to allow yourself time to 'catch' the beat before you get into the specific section you want to choreograph. Then, hit the keyboard Cue button for every beat of the music and keep hitting the bar for at least 20 beats. You will find that your best average accuracy will be somewhere between the center and end of those 20-beats.

Using a calculator, measure the time intervals between about four or five beats and strike an average. You can also get an average by dividing the total time between the first and twentieth beats by 20.

Following is an example of such a result:

Line#	Program	Time Keyed-in
020	TX	1:01.20
021	TX	1:02.15
022	TX	1:03.05
023	TX	1:04.10
024	TX	1:05.05
025	TX	1:06.10
026	TX	1:07.10
027	TX	1:08.05
028	TX	1:09.05
029	TX	1:10.07
030	TX	1:11.09
031	TX	1:12.11
032	TX	1:13.03
033	TX	1:14.06
034	TX	1:15.12
035	TX	1:16.08
036	TX	1:17.14
037	TX	1:18.09
038	TX	1:19.08
039	TX	1:20.11
040	TX	1:21.07

The average time between beats in this example is very near one second. Now eliminate the time-code lines; because using them to 'latch in' to specific beats in a rapid sequence makes threading the program for the separated elements very difficult.

Since a beat is one second, every beat will require 20 lines of W.05 cues. And, as I timed 20 beats, that equals 400 lines (20 x 20 = 400).

Replace the time-code lines with 400 lines of W.05 cues. Replace the W.05 cue with an "N" cue (No Operation; aka "NoOp") on every 20th line—where the beats 'should be.' Do not open a line and insert that cue; because, if you do, you will be adding time and 'losing the beat.'

Note: keep the first-time code; that synchronizes the start point for the 400-line, 20-second 'run' being programmed. (If need be, that starting-time code can be 'tweaked.'

Directly after the start-time cue, type the first W.05 line and using Control-R repeat the W.05 until you arrive at line 420 (line 20 + 400 W.05 lines). After that, GoTo line 40 and replace the W.05 line with a NoOp; then do the same at lines 80,100,120,140, etcetera, replacing the W.05 on every twentieth line with a NoOP, until you get to line 420.

Test the start-point synchronization by going to line 21 (the first W.05 cue) and replacing it with AT 1L (Alternate 1-Left, ON); then on line 41 another AT 1L (Alternate 1-Left, OFF); repeat on lines 61, 81, 101, 121, 141, 161; ON and OFF, ON and OFF; etcetera; to line 421. That establishes a series of projector on/off cues which 'should' synch with the beats of the music—providing that the timing of each musical beat is, indeed, one second.

Play the track against the program. The start-time cue will begin the sequence running; watch to see if the beats begin on time and are in synch with the flashing projector. If you are 'late' at the start, shave time off the starting time code; if you are early, add enough time to the start code to get on the beat.

Next, determine if the subsequent flashes are in synch with the music beats. If they are getting later and later, start eliminating one W.05 line every forth beat. Then play the section again. Are you still getting later? Then remove a W.05 line from every second beat. Still late? Take a W.05 line out for every beat from which you have not removed one before.

If you are getting earlier; reverse that process; adding a W.05 where would have eliminated one in the above example. This may seem laborious; but it is actually quite easy and surprisingly fast when you get the hang of it. Once the section's primary timing is locked in, the rest is dead simple.

Go back through that section and replace all the AT 1L's with NoOPs; so you are where you began; nothing but a block of W.05s with NoOPs every twenty lines. Assume that we have the major beats established at every 20th line; that means 'half beats' occur every ten lines, (mid-way between the major beats); and quarter-beats occur every five lines, (mid-way between the half beats). That is about all you need to know to program to the beat of the music.

Another thing to determine is; whether there are any major 'riffs' in the music that you want to accentuate—a cymbal crash; drum beat; guitar 'twang;' or other musical effect might provide an opportunity for a visual effect.

To determine where these riffs occur, simultaneously hit the Escape key on Eagle's keyboard and the Stop button on the tape deck you hear the riff. Then back-up about eight program lines (for 'human-reaction delay') and enter AT1L (ON), W.05, AT1L (OFF).

Do that by *replacing* the existing W.05 lines, *not* by adding more). Then roll the program and determine if the 1-Left projector flashes at the precise point of the riff. If you are late, move the lines 'up;' if your early, 'down;' until 1L flashes with the riff.

As with the beat-identification process; eliminate the AT1L instruction and replace it with an N (No Operation). Follow that with two more NoOPs (written over the next two W.05's). By doing so, you know that when you see the three NoOPs, you're at the riff. Remember to write the NoOps over the W.05 lines, replacing them. If you add or subtract lines, you will interrupt the timing within the 'chain.'

For a musical animation; try establishing visual 'events' on every major beat, every half beat, and every quarter beat; then use the 'left over' W.05s to have 'other things happen.'

Since, for our example, we have nine projectors available, if we were to assign, say, two projectors for each major beat, half beat and quarter beat, we would tie-up six projectors, leaving three available for 'other things.'

Next, we need to establish *what* will happen. Of course, discussions like this are somewhat academic, because you can have almost anything you want happen; it is purely a matter of taste and skill in the preparation of the artwork and photography.

However, there are some "rules of thumb" that apply to basic musical animations: Major beats should be the most visually distinct elements; say a move from neg to pos, or the application of glows to the graphic. And these major beat elements should, by and large, be the 'slowest moving' elements—say, one-second alternates back and forth. That is because the major beats are spaced about one second apart and you have enough time available for softer, slower moves.

The half beats should employ a somewhat more staccato palate of effects; they are occurring every half a second, so some appropriate examples might be flashing stars; or a pulsating background color.

The quarter beats, which occur every quarter of a second, want even more staccato elements, such as "glitter fill;" an "aura;" or "eclipse;" that visually define the edges of the graphic.

Finally, the 'left over' W.05's, (which should be clustered together into longer wait times—to facilitate Positrack) can be used for a wide variety of purposes. Since we have three projectors available in this example; we might assign these extra 'spaces' to spinning stars; or dissolving background pictures; whatever.

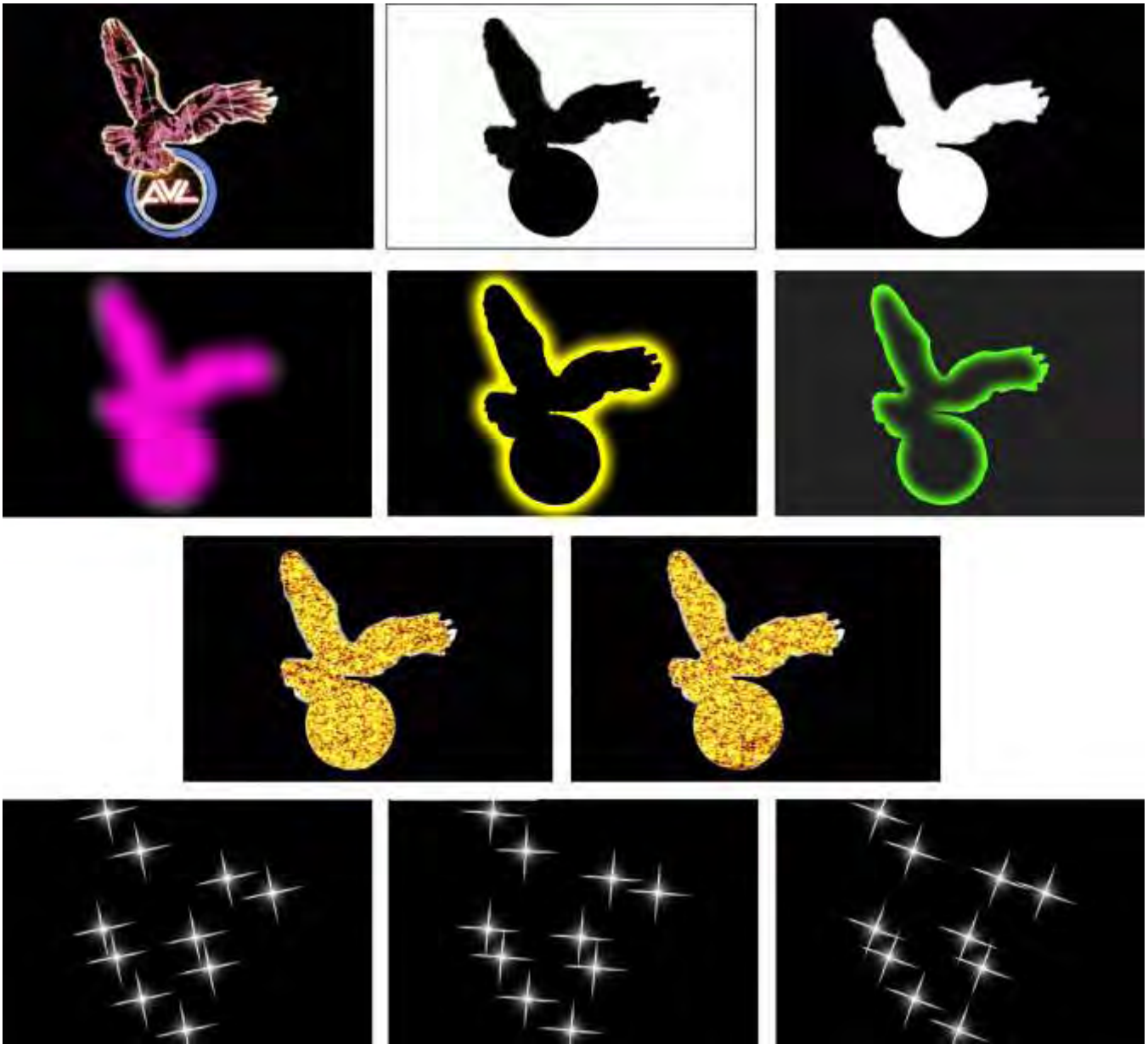
The only danger inherent in all this is that you will get so much going on that the total effect will become an unappealing visual 'mush.' Thus, you should be prepared to pull-back if necessary and eliminate elements until you've gotten the degree of effect/affect you're after.

A bit of practice and experience in this area will help you determine what elements 'work' together and which do not. At the write on-slide stage, though, you should arbitrarily assign elements of the graphic to the various projectors and make fairly tight sketches of them on the write-on slides to pre-test the effect as it is programmed.

I often make very elaborate write-on slides to test effects elements, even going so far as to use colored pentels and 'blacking out' extraneous areas on the write on with India ink or black pentels so the sketches are better defined when projected onto a screen. (When nine write-on slides 'pile up' on the screen, you tend to get a big white blob; making it almost impossible to see what is happening—unless you blackout the unused areas of each write-on slide).

For this example; we will assume that for the major beats we are going to have one-second cross-fades between a 'straight' color-burn logo and that color-burn DX'd with a glow; that will mean the 'same' color burn will pulsate with a glow every other beat.

For the half-beats, we will alternate back and forth between two different-colored auras. For the quarter beat we will alternate between two different colored glitter fills. And with the 'left over' W.05s we will establish flashing, spinning stars—stars that flash on and off while spinning, then flash off. That program would look like the one on the overleaf.



Line #	Cues	Projector Action	Effect
020	TM 1:01.00	Time 1 Minute & 1 second	
021	1A 1L	1L on	Color-burn (CB) logo#1
022	W.05		
023	W.05	No other elements in this first	
024	W.05	quarter second, to allow 1L to	
025	W.05	achieve some screen	
026	W.05	illumination	
027	AT 1R	1R ON	Glitter#1
028	AT 3L	3L ON	Star #1
029	AT 3LC	3L OFF, 3C ON	Star #2
030	AT 3CR	3R ON, 3C off	Star #3
031	AT 123R	1R OFF, 2R on, 3R OFF	Glitter#2 on, #1 Star #3 off
032	AT IC	1C ON	Aura#1 on
033	AT 3L	3L ON	Star #1
034	AT 3LC	3L OFF, 3R ON	Star #2
035	AT CR	3C OFF, 3R ON	Star #3
036	AT 3R	3R OFF	Star #3 off
037	AT 12R	1R ON, 2R OFF	Glitter#1 on, Glitter #2 off
038	AT 3L	3L ON	Star #1
039	AT 3LC	3L OFF, 3C ON	Star #2
040	AT 3CR	3C OFF, 3R ON	Star #3
041	AT 123R	1R OFF, 2R ON, 3R OFF	Glitter#2 on, star #3 off
042	1A 12LC	1LC OFF, 2LC ON	CB Logo#1off#2on,Aura#1off#2on
043	AT 3L	3L ON	Star #1
044	AT 3LC	3L OFF, 3C ON	Star #2
045	AT 3CR	3C OFF, 3R ON	Star #3
046	AT 3R	3R OFF	Start #3 off
047	AT 12R	1R ON, 2R OFF	Glitter #1 on #2 off
048	AT 3L	3L ON	Star #1
049	AT 3LC	3L OFF, 3C ON	Star #2
050	AT 3CR	3C OFF, 3R ON	Star #3
051	AT123R	1R OFF, 2R ON, 3R OFF	Glitter#2 on #1 off, Star #3 off
052	1A12C	1C OFF, 2C ON	Aura #2 off #1 on
053	AT 3L	3L ON	Star #1
054	AT 3LC	3L OFF, 3C ON	Star #2
055	AT 3CR	3C OFF, 3R ON	Star #3
056	AT 3R	3R OFF	Star #3 off
057	AT 12R	1R ON, 2R OFF	Glitter #2 off #1 on
058	AT 3L	3L ON	Star #1
059	AT 3LC	3L OFF, 3C ON	Star #2
060	AT 3CR	3C OFF, 3R ON	Star #3
061	AT123R	1R ON, 2R OFF, 3R OFF	Glitter #1 off #2 on, Star #3 off
062	1A 12LC	1L ON, 2L OFF, 3R OFF	CB logo #2 off #1 on, aura #2

Etc.

Notice that program lines should be reversed between lines 31 and 32, 41-42, 51-52, 61-62. That is to achieve equal timing between the spinning stars.

Notice also that, in this example, every other spinning star sequence, say between lines 33 and 36, allows me to turn the #3 star (projector 3R) off before the next move; and that in the other sequences I have an intervening cue line before the instruction AT 3R that turns the #3 star off. That intervening cue line makes the timing for the spinning star sequences uneven.

To even it out, I combine the AT 3R instruction with the AT 12R instructions and flip the line order; that puts the flashing glitter fill out of order, (in terms of strict timing). However, that will be less noticeable than a pause in the spinning star sequence.

Thus, I flip the line order and look for a loop I can repeat so that I don't have to write all 400 lines of the section.

Such a loop exists from line 32 to 52; and conveniently this loop is one second long (20 lines). There is also a 1.5-second loop, from line 32 to line 62. Since we want to 'fill up' 400 lines, which is divisible by 20, not 30, save the 20-line loop by going into Control Command and typing SC0032, 0052,A (save cues from lines 32 to 52 and call that loop, file "A").

Next, type in DLC0053,0420 (delete cues from lines 53 to line 420). Those cues are no longer needed because we have established a loop that can be inserted to replace them.

(Before deleting the cues, scroll down the program to see where the riff accentuation points are and make note of the line numbers where they occur.)

Then, place the cursor on line 53, go into Control Command, type in INSA (insert program file A). Eagle will add the loop called "A" creating lines 32 to 52.

Subsequently, GoTo line 73 and repeat the process; and continue inserting "A" at lines 93, 113, 133, 153, 173,193, 213, 233, 253, 273, 293, 313, 333, 353, 373, and 393; leaving off at line 413; that is seven lines, (or .35 seconds) ahead of the prescribed 'bail out' time.

Before that bail out time we must get at least one projector freed-up so that there is 'somewhere to go.' We only have nine projectors, and all nine are involved in the effect. So, we must liberate at least one projector; to advance to the next visual.

To do that, count backwards to a point at least .75 seconds ahead of the time you need a projector; forward it at that point; so the projector has enough time to advance before you access it again. In this case, I counted backwards to line 407 and found that I could change an alternate to a hard cut and free-up the 2R projector in time to use it at TAB2.

Here is what those programs cues look like:

Line #	Program	Projector action	Effect
393	AT 3L	3L ON	Star #1
394	AT 3LC	3L OFF, 3C ON	Star #2
395	AT 3CR	3C OFF, 3R ON	Star #3
396	AT 3R	3R OFF	Star #3 off
397	AT 12R	1R ON, 2R OFF	Glitter #2 off #1 on
398	AT 3L	3L ON	Star #1
399	AT 3LC	3l OFF, 3C ON	Star #2
400	AT 3CR	3C OFF, 3R ON	Star #3
401	AT 123R	1R OFF, 2R ON, 3R OFF	Glitter #1 off #2 on, Star #3 off
402	1A 12LC	1LC OFF, 2C ON	Color burn logo with glow, Aura 2
403	AT 3L	3L ON	Star #1
404	AT 3LC	3L OFF, 3C ON	Star #2
405	AT 3CR	3C OFF, 3R ON	Star #3
406	AT 3R	3R OFF	Star #3 off
407	HC 12R	1R ON, 2R off (advance)	Glitter #2 off #1 on
408	AT 3L	3L ON	Star #1
409	AT 3LC	3L OFF, 3C ON	Star #2
410	AT 3CR	3C OFF, 3R ON	Star #3
411	AT 13R	1R OFF, 3R OFF	Glitter #1 off, Star #3 off
412	CT 12C	1C ON, 2C OFF (advance)	Aura #1 on
413	AT 3L	3L ON	Star #1
414	CT 3LC	3L OFF (adv.) 3C ON	Star #2
415	AT 1C	1C OFF	Aura #1 off
416	CT 3CR	3C OFF, 3R ON	Star #2 off #3 on
417	PF 1C	1C (advance)	Projector forward 1C
418	W.05	Wait .05 seconds	
419	PF 1LR	1LR projector advance	Projector forward 1LR
420	1D 2L	2L OFF (advance)	CB logo with glow off
421	TAB 2		
422	TM 1:22.10		
423	N	No Operation	

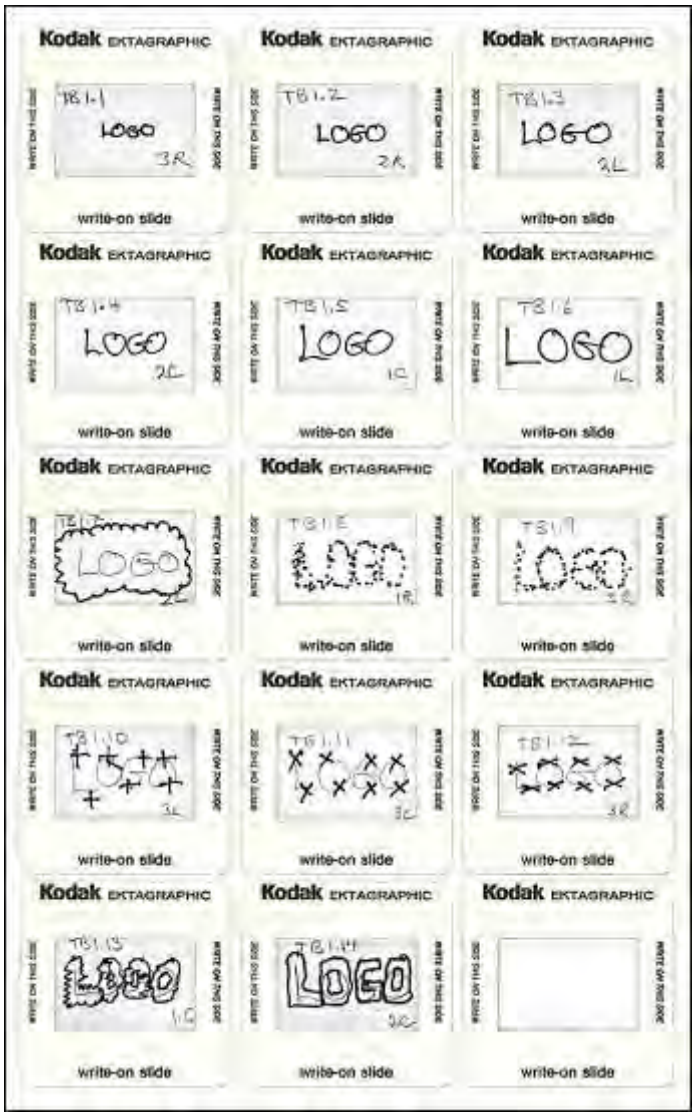
I put 'in time' in quotes because if you count them, you will see that there are actually only 13 lines (or .65 seconds) before TAB 2's Time Code; that is two lines shy of the 2R projector completing its advance; that requires .75 seconds.

To fix the situation we would open a line between 419 and 420 and add W.1, thus being sure that at our exit point from the effects sequence 2R will be available for access.

On replay, if we see that we have forced a GoTo, we know that we have too many lines of program between the TAB 1 and TAB 2 time-synch codes. But how many do we have to eliminate? To find out, we open a line just ahead of TAB 2 and insert a "No Operation Stop," then run the sequence (without the tape deck) from TAB 1 and note where the Eagle's clock stops.

Let us say that by using the above procedure we discovered that Eagle's clock stopped at 1:22.2 that would mean that the W.1 cue we added (to allow the 2R projector to advance) had overextended the time in the TAB 1 section. In that case we would eliminate the W.05 from line 418, thus picking up a twentieth of a second, and eliminate the TAB 2 Time Code because we are 'automatically' arriving at TAB 2 'on time'—albeit .05 seconds late. That 1/20th-second delay of entry into TAB 2 will probably be unnoticeable. However, if we *must* eliminate another .05 seconds to arrive precisely on time for TAB 2, move the line 419 instructions (PF ILCR) to the line after the first action cue in TAB 2.

Quite an exercise, right? After just having written all the above, I wonder why anyone would ever want to program slide shows for a living! However, in practice, sitting at Eagle, it is a lot simpler than it may seem from reading this tome. Use the above as a programming exercise. Make write-on slides like the ones sketched in our example (below), so that you can 'see' the effect on the screen. Programming without the use of real or write-on slides is an exercise in futility because you will never know whether what you were programing 'works.' Try moving lines around to achieve variations.



Slides #1-#6 are the 6-step zoom-to-position of Color Burn (CB) Logo #1 |. Slide #7 is CB Logo #2 | Slides #8-#9 are Glitter-fills #1 & #2 | Slides #10-#12 are Spinning Stars #1-#3 | Slides #13-#14 are Aura #1 & #2.

Duping a Finished Look into Position

Sometimes you will want to precede a fixed-field, separated-element animation with a zoom or wipe into position. In the above example; say the logo wanted to zoom into position before animating to the beat of the music. Since the fixed animated graphics are programmed and shot as separated elements, how do you achieve the zoom; and if the zoom were, for example, six steps into the final position, how would you have enough projectors to get into the fixed-field animation (that requires all nine projectors) when six were tied-up with the zoom into position? To accomplish that effect, take the 'base logo' slide (that is also used to begin the fixed-field animation on line 021); and dupe it into position for each of the six steps of the zoom; because that is faster and easier than having to change camera positions when shooting the larger-cel art used to shoot the base logo. This is especially true if the base logo were a metallic effect, or a complex 'look' composed of several art elements.



A simple slide-duping stand; I use it to digitize slides.

Duping into position eliminates unbelievable amounts of time because the alternative would be to repeat the entire effects sequence for each step of the zoom. By duping into position (in this instance) you are cutting down camera time by a 6X factor.

As for the programming, we can see by scanning down the program example (above) that the projectors needed first for the fixed-field animation are 1-Left, 1-Right, 3-Left, 3-Center, and 3-Right (in that order).

We do not use 1-Center until line 31; 2-Right until line 32; 2-Center and 2-Left until line 41. So, working backwards from when I need them; the 5 projectors 'available' for the positioning zoom move are: 2-Left, 2-Center, 2-Right, 1-Center, 3-Right; the sixth step (final logo position) we already know will be projector 1-Left.

3-Right will be the 'trickiest' projector because it is needed shortly after the logo has arrived at its final position. Using Hard Cuts for the zoom steps; we can minimize projector advance time to .75 seconds for each projector.

Knowing that, I count backwards 15 lines from where need 3-Right. Since we need 3R on line 30; we therefore know that we must Hard Cut 3R off no later than line 15. Since we need 3R first, we will use it as the *first* step in the zoom.

Thus, the latest I can start my zoom and still have all the projectors needed for the effects animation is line 14. Before I can hard cut it OFF (on line 15), we must get 3R ON.

That program would look like this:

Line #	Program	Projector action	Effect
014	AT 3R	3R on	Zoom step #1
015	HC 23 R	3R off, 2R on	Zoom step #2
016	HC 2LR	2R off, 2L on	Zoom step #3
017	HC2LC	2L off, 2C on	Zoom step #4
018	HC12C	2C off, 1C on	Zoom step #5
019	HC1LC	1C off, 1L on	Zoom step #6, (animation step #1)
020	W.05		
021	AT 1L	1L off	Flash logo off
022	W.05		
023	AT 1L	1L on	Flash logo on
024	W.05		
025	AT 1L	1L off	Flash logo off
026	W.05		
027	AT 1LR	1 LR on	Flash logo on, Glitter #1 on

Notice how I have amended lines 020 through 027 from the previous program example; because we arrived at the beginning of the fixed-field animation 'on time;' we no longer need the time Cue (1:01.00).

However, where we previously allowed five W.05 lines before commencing the effects animation (to allow 1-Left's one-second dissolve ramp to achieve some brightness—see page 2845); now, we no longer need to wait—1L is on and the base logo is in position. So, the five W.05 lines are merged to a bulk time of .25—that allows Positrack to kick in. But we still need time to allow the projectors used in the zoom steps to advance and become accessible. So, rather than have the base logo (1L) just sit there like a lump, we flash it; to keep the screen alive while the other projectors catch up.

What does that have to do with photography? Programming, art prep and photography are so interrelated that it is virtually impossible to discuss one without touching on the others. In terms of conceptualization and production, you must think in such "homogenous" terms. If you separate the elements of production, you will end up with a lot of confused team members; and a lot of wasted time and supplies.

At the risk of being redundant, an efficient production sequence begins with a soundtrack; proceeds to the programing/storyboarding phase; and finally, an analysis of the program and storyboard to determine what art elements and photography are needed.

On-Screen Eye Movement

The direction of the action on the screen is a cinematographic aspect of screen design that applies equally to multi-image visualization. The basic idea is to have on-screen movement that keeps the viewer's eye on the subject; while leading the eye from one part of the screen to another; e.g., watching a fly buzzing around.

For example, if you animate a subject from the left (west) to the right (east) of the field, the eye needs a little time to 'follow' the subject across the field. Having ended that action on the east side to the field, it would be logical to begin the next move on the east side, right? So, to make a wipe sequence more 'logical' you would wipe west to east, then east to west.

Direction of eye movement is an important consideration in terms of screen layouts. Besides the movement of elements in and around the field, there is also eye movement within the borders of 'still' images. Every picture has its own visual dynamics—elements that lead the eye into, across, perhaps out of the field.

The best still images generally have a three-point dynamic; there will be a primary point of interest and two secondary points. Together, the three encourage the eye to 'travel' in a triangular manner within the borders of the picture (see below).



Two examples of triangulated compositions. Left: Las Vegas neon lights form a simple triangle. Right: *Out of The Blue*, a 2009 photo-illustration, is composed of triangles within triangles. In both cases, the viewer's eyes stay within the borders.

Triangles are not the only good dynamics, though. Many paintings and pictures use two-point, back-and-forth dynamics; others use four or five points. The opposite of this would be a picture of an arrow or hand pointing; what does your eye tend to do? You likely look in the direction of the arrow—perhaps right out of the picture. For multi-image, the best pictures and layouts are ones that keep your eye inside the screen borders.

In multi-image, you have the unique opportunity to blend the visual dynamics of still images with the time-related screen animation. Also, by using multiple screens, you can create one large field and/or several 'fields-within-a-field'; that is a wide range of dynamics—including coherent direction(s) among the sub-fields; or, conversely, 'incoherent' eye movement. Anything goes. But if your goal is to be 'understandable'; that is, to relate information in an easily comprehensible manner; you should try to achieve as much coherence as possible in terms of eye movement in and around the screen. Thus, although the composition of every image is important, how the sequence of compositions flows from scene to scene is equally or possibly more important.

[*Editor*: My so-called 'mind-blowers' were by no means 'coherent.' However, they consistently won (way) more applause than coherent, documentary shows. Their purpose was not to be informative; motivation was the goal; getting the audience 'fired-up.'

One rule of thumb is to pick up where you left off. If you lead the eye to the right, pick-up the next action on the right before leading the eye elsewhere.

Shooting On-Location Animations



Yours Truly operating a four-camera rig to capture a jump-shot for Car and Driver magazine. Upper right, L-R: Steve Wilkinson, Anonymous, Chris Hoina and Yours Truly. With the Nikon FTN model, interconnecting motorized cameras was easily done using ordinary "zip cord" (lamp wire) and standard, 110-volt, 'male' plugs. With later models, Nikon introduced their own special cords and connectors—at considerable expense to photographers.

Some of my favorite moves are the ones that are dead simple to shoot; but which yield high-impact on the screen. Among them are:

- Focus Pulls This technique is a variation of 'follow focus.' A good example would be shooting down a row of heads in an audience seated theater style. You lock the camera down on a tripod, and focus on the farthest face; then, on successive frames you 'pull' focus to the next closest face; and then the next. The same technique can be applied to a row of cars, products, etcetera.

The key to shooting the focus-pull effect is using the longest lens possible that will still permit focus through the necessary depth of field; together with a wide aperture for minimum depth of focus. By minimizing the depth of focus, you call maximum attention to the focus pull—to what is in focus—while simultaneously minimizing any apparent misregistration; because the background is obscured (out of focus); there are no reference points to make misregistration noticeable.

Although I recommend that you us a tripod, there have been occasions when I have shot focus pulls hand-held with perfectly adequate results. Focus pulls are an excellent technique for shows involving few projectors because the 'ideal' dissolve time between frames ranges is two to four seconds.

- Zooms and Pans: are the simplest moves of all. My favorite lens for shooting them is a mid-range 80-200 mm; because it is very portable and you get more zooming effect than you do with, say, a 28-45 mm, or a 35-70 zoom. (See pictures; overleaf.)

  I usually use a motor-drive camera set at the fastest shooting speed (frames per second) that the exposure allows; (you cannot combine a high frame rate with slow shutter speeds). Unless indoors, I rarely use a tripod. I focus with the lens set at its longest focal length (200 mm) and while shooting slowly pull back to the shortest focal length (80 mm).

  Exposures are bracketed by series; that is, I will shoot an entire zoom sequence at one f-stop; then shoot two more sequences with a bracketed exposure—one up and one down from the theoretically 'ideal' exposure. The bracketing is not done frame-by-frame to avoid 'twisting' the camera; by turning the aperture-ring during a sequence.

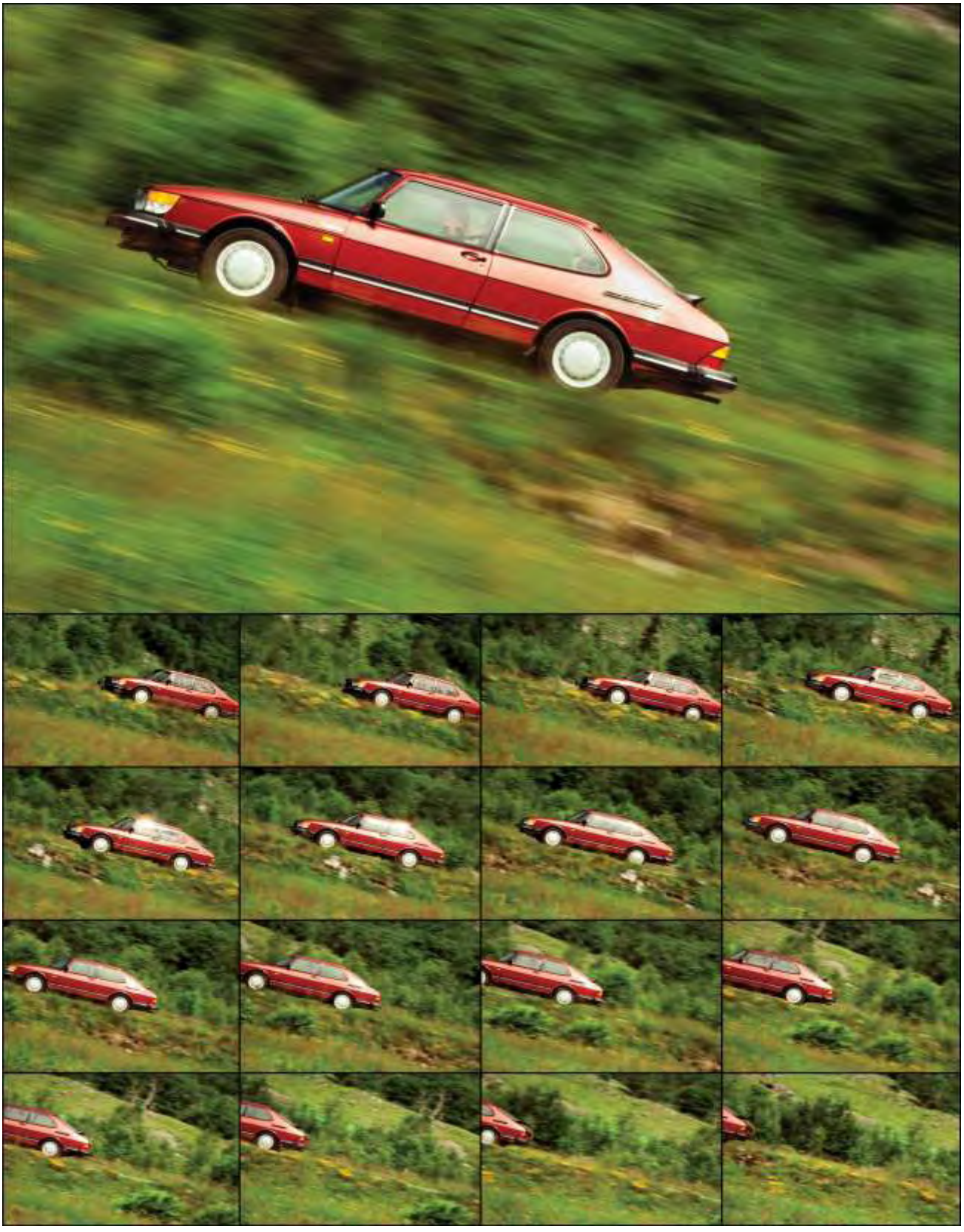
  Part of the technique is to pull the zoom back (or turn the lens) smoothly and slowly; even if it means shooting more frames than you need. If I need three steps, I will shoot up to nine; because the slow, smooth action will avoid jerkiness and give me an option as to which three steps look best. Often, a strictly 'mathematical' division of the zoom steps looks awkward because there is no ramp to the movement; that may not look 'right.'

  Before I learned about movement ramps, I used to shoot zoom steps according to the focal length guide on the lens. On the 80-200, for example, I would shoot a frame at 80, then 90, then 100, then 110, etcetera. "Ramp" means accelerating as you zoom in or zoom out. For a smooth-looking zoom sequence; the first few steps should be smaller ones; each step should be a slightly greater change of focal-length than the last. A mechanical or straight-line division would be:

  80/90/100/110/120/130/140/150/160/170/180/190/200/210/220

  A ramped sequence might be:

  80/85/90/100/120/150/180/190/200/205/210
  Accelerate Decelerate



Saab 900 Turbo pan was shot with a Nikkor 80-200mm zoom lens. The car drove at 30 mph (45 lmh); the motorized camera shot 4 frames per second at a shutter speed of 1/60th second.

You should also ramp the timing of your program steps (accelerating) to match the ramp of the photographic steps.

SA (Soft Alternate) 1L W.05 | SA1LC W.1 | SA 1CR W.15 | SA 12R W.2

Whenever possible, use a minimum shutter speed of at least 1/60th second, and Preferably a 125th. This allows you to use a higher motor speed (up to three frames per second, using a Nikon FTN) and reduces the possibility of accidently 'streaking' the images during the pull-back. (Needless to say, some very interesting effects can be obtained by using a slower motor and shutter speeds to intentionally streak the images.)

You will find it easier to maintain focus by pulling back rather than zooming in. Zooming in, you may find that although you were in focus at the short focal-length, you will not be at the long end; there is less depth of focus at the longer focal-length.

By shooting the longest focal length first, you start at the point of critical focus and, while pulling back, your sharp focus will be maintained because the depth-of-focus increases. For pans, use the same procedure.

- Zoom-Pans Here you are pulling back while moving the camera across the subject. These kinds of moves are doubly interesting because these are two kinds of movement.

  Multiple zoom pans can be combined to create exciting moves in, out and around the subject; calling attention to various details. For example, the last step of one zoom pan can be the first step of the next. The effect is that of a 'roaming camera.'

  If you use a tripod; your best bet is the so-called 'fluid-head' type. They are pricey; setting you back a minimum of about $300; on up to $9,000+ for the *least* costly "Miller" tripod. If you use a cheaper, conventional tripod; you will be frustrated by the lack of control needed to achieve smoothness during zooms and or pans.

- **"Super zooms"** These involve using multiple zoom lenses in sequence to increase the total focal-length (the depth) of the zoom. These super-long zooms are so impressive that they can make virtually any subject look good.

  One time I had to shoot a 'hero' sequence of a rather mundane little oil refinery near Houston, Texas. The rig was out in the middle of the boon docks. It was an old refinery; singularly unimpressive. However, a super-zoom sequence made it look 'larger than life.'

  To accomplish this effect, I took a battery of zoom lenses on a hike through the surrounding fields until I found a place where I could get a dramatic silhouette of a cracking tower using a 1000 mm lens. I locked the camera into position on a tripod and shot the scene with a 1000 mm, followed by 500 and 300, then a 200-80 zoom, a 70-35 zoom, and four fixed-focal-length 'wide' lenses—a 28 mm, 24, 20, and, finally, a super-wide-angle 15 mm.

The resulting 14-step super zoom was then programmed to move very fast; but stop, momentarily, at key mid points—frames one, seven, and fourteen—the close-up of the cracking tower, a full screen view of the plant, and the plant way-back on the horizon with the rising sun refracting in the lens (actually, it was setting; I hate getting up early).

Exposures were bracketed frame by frame throughout so that the backlit close-up of the cracking-tower (frame #1) had considerable shadow detail, whereas the full-screen view of the plant (frame #7) was partially silhouetted (to make its age less noticeable); and the final, wide-angle view (frame #14) was exposed to maximize the sun flare; putting the plant in true silhouette. As 'icing on the cake;' while the camera was still locked in position; I shot a roll of Infrared Aero Ektachrome, of the wide-angle scene, to 'posterize' the colors for a match-dissolve from 'reality' to a bold, graphic look; for a title-over sequence.

When super zooming be sure to use a heavy-duty tripod and sandbag it (if you can) to avoid any tripod movement during the lens changes. If you do not want to carry around a lot of sandbags, bring some rope and tent spikes; hammer the tent spike into the ground and tie-down your tripod by slipping a noose around the head and securing it to the tent spike. (Of course, then you're lugging a hammer.)

- Streaked Backgrounds & Fixed Subjects For this effect; you frame the subject in a fixed position, and shoot with a slow shutter speed so that the background and/or foreground 'streak,' creating the feeling of movement.



For this photo (above) of a Scania bus entering a tunnel, a motorized Nikon F3 with a super-wide 20 mm lens was clamped to a passenger-support pole to keep the bus and driver stationary during a slow, half-second exposure; used to give the background tunnel a streak-zoom 'speed' effect.



For this streak, the camera was locked into position and the car driven a way during a time exposure.

- Tilt Zooms Start with the subject tilted on an angle; Then, while zooming in, progressively tilt the camera over so that in the final frame the subject is either horizontally oriented, or possibly 'cocked' at the opposite angle. These moves are especially effective with frontal views of cars, bikes, and similar subjects.

  If it is a sunny day, throw on a star filter for some variation; while you tilt-over, the stars axis will also move. That is especially true for those lenses that zoom by turning the front of the lens barrel.

  With moves like these it is a good idea to shoot the subject against a 'nebulous' background with no reference points—for example, from a vantage point looking back up at the sky; or an uncluttered horizon; or a studio cyclorama—because if there are discernable reference points in the background—like buildings, telephone poles, trees, or the like—they may look 'weird' in the extreme tilt positions.

  Shots like this, and far more, can be achieved with a minimum of complexity. Most can be shot without a tripod, in 'real time.' Even a small amount of camera bounce or misregistration is tolerable because people accept such action sequences to be a bit shaky; a bit of jerkiness can enhance the action.

  One of my favorite sequences using the streaked BG effect was a motorcycle screaming through a tunnel. I shot the sequence out of the end of a station wagon; laying on the open tailgate; using an extremely wide-angle, 15 mm lens (to get more peripheral blur and to minimize the car's bounce relative to the motorcycle).

  The bike followed the car about 4 feet from the lens. The car drove at 30 miles per hour and I shot at a low motor speed (1-frame per second) at a relatively slow shutter speed (1/15th-second). That streaked the surrounding tunnel; yet the cycle and cyclist were relatively sharp. (Truth be told; I didn't get a perfect shot; with the cycle needle sharp.)

  In the programming; I speeded up the action and the results were spectacular; especially when the cyclist leaned over in the turns; the changing perspectives were dynamic. Unfortunately, I have none of the slides; the sequence was shot for a Yamaha show produced by Image Stream.

- Strobe Freezes Using an electronic flash at night with a slow shutter speed, the foreground subject is 'frozen' in a fixed position, while background and periphery is streaked. The picture below provides an example. It originally appeared in a 1970 *Cycle* magazine article; and was shot from the tailgate of a station wagon travelling at highway speed; using a one-second exposure. In this case, the streaks are wavy because the highway was bumpy. The rider was Jess Thomas, the magazine's Technical Editor.



Variable Timing and Direction

Variable timing and direction are features of multi-image. All the photographic sequences discussed above can be programmed to move either forward or reverse. For example: although you should shoot most zooms as pull-backs; you can reverse the action when editing and programming, to zoom in. Similarly, you can change the speed of the action when programming; to create slow-motion; fast-motion; or 'real-time' effects.

Screen Layout and Composition

Good artists and photographers are born, not made; at least that's what I think. You can learn principles, techniques, processes, and materials; but you cannot learn how to 'see' a picture, or compose one, or any other 'subjective' or 'aesthetic' aspect of art or photography—especially from a book like this. Those, it seems, are qualities that you are either born with, or without.

I am sure that this is not something you do not already know or sense. [*Editor*: How about that for a double negative?] When it comes to artistic 'temperament;' deep down inside you know whether you've 'got it' or not.

If you've got it; you have a lot of ways to flaunt it in a multi-image show.

It is difficult to describe exactly what makes one layout bad and another good. There are so many points of view; it is so subjective; there is no point in either exploring the subject or debating it. In the simplest terms: some people like red and others blue. Some go for 'clean-looking' or 'corporate-style' graphics—ones that offend nobody. Others prefer 'wild,' 'eclectic' styles. Some like a straight-forward photographic style; others prefer crazy angles, distortions, and/or bizarre colorations and effects. Some people like fast, 'flashy' shows; while others prefer slower tempos. Who is to say what is 'better?'

How does that adage go: "You are your own best judge—and worst critic?"

The best advice I can offer is: Keep the stylistic content of each show harmonious and consistent. That is, do not change styles radically within a show (unless it is a modular presentation; with different looks for different segments). Most people will tolerate any design scheme—whether it be a 'loud,' 'carnival' style; or a subdued, conservative, *Time* magazine approach—as long as it is appropriate to the theme and content of the message. Can you imagine a news magazine taking circus-billboard design approach? Or vice versa? The 'style' clearly would not 'fit' the content.

So, it goes with multi-image'—perhaps even more so; since the medium itself can be, "more than the eye can see; more than the mind can comprehend." Because of its non-linear character, it is important that your multi-image designs enhance and reinforce your messages and themes.

Aside from the question of taste (which is personal); it is always a good idea to approach your design scheme from the standpoint of what your prospective audiences might expect to see. Do not venture too far from their communal persuasions (unless your intention is to 'shock' them); you risk 'losing' your audience; turning them off consciously or unconsciously. One case pounded that into my brain forever:

We had been asked by Merrill Lynch (through their public relations agency, Burson-Marsteller) to produce a 'speaker-support' slide program to be used by the Chairman of The Board for an announcement to the press, big customers, and VIPs; about a major new investment package. The new-product launch was termed "important;" so we (Don O'Neill and I) decided to go 'all out.' Not only did the agency consider it important, we did too, since it was Incredible's first big exposure in the Wall Street market; the world of high finance. We wanted to 'wow' them. Well, we did; but then again, we did not.

We decided on a 9-projector, single-screen format; that would give us considerable graphics-animation capabilities. Then, we took the artwork submitted by the agency's staff; broke it down into multiple elements for animation; and shot special effects up the kazoo. The elements were 'reassembled' on screen with high-speed programming to produce what was (up to that time) the most complex, most 'sophisticated' speaker-support presentation we had ever done. We were knocked out; so was the agency.

The client, however, was not impressed (to say the least). The Chairman canned the slides during the first rehearsal (which was a half-hour before show time!). The reason? The slides were considered too 'dominant.' As the Chairman reckoned, the AV overshadowed him; it was a distraction. We had to break-down the gear at break-neck speed and hustle it out of the auditorium; but we could not remove the screen (there was no floor space to lay it down, for folding); so, we projected a single logo slide on it—a black-and-white Kodalith (!)—with one lone Carousel.

I guess they could not take a joke, eh? Ha!

Another case in point was a show we did for "Ma Bell" (the former Bell Telephone Company, now AT&T); to introduce a new modem product. As background: Bell has about 120 multi-image screening rooms located all over the continental U.S.A. Each room is standardized and equipped with 9 projectors for a two-screen, center-overlap format; controlled by AVL equipment. Through standardization; they can ship copies of any shows to any training center, for screenings. That is neat. However, the limitations imposed by such equipment standardization can also put considerable restraints on a producer.

Anyway; when we got the show, our reaction was, "Gee whiz, Ma Bell wants us to do a show!" Again, we decided to go all out. We would show them what AV was all about!

(Prior to that, I had been to one of their centers and seen some of the shows they had produced in the past. My reaction was, "Whew! we can certainly do better than that!").

Again, we used animated special effects wherever possible; programming 5,000+ cues—for a 10-minuet show. When it was done, we loved it and so did my former colleague (at Basford), PR writer turned independent consultant, Bill Flanagan; for whom we were subcontractors.

You guessed it: Ma Bell did not.

The first things to go were virtually all the flashes; then nearly all the special effects. By the time the ordeal was over the program was down to 900+ cues and the logo sequences (our favorites) went from neon and glitter to basic gray with one single star highlight (and some of their exec's balked at that!).

I could tell you other tales like these. The point is, we goofed. We failed to take the aesthetic tastes of our clients into consideration from the word go. We made the mistake of thinking *we* were producing the show; that we knew what AV was all about; and that we knew how to please audiences. We forgot that they were far more expert at that sort of thing than we could ever be. What did we know?

More seriously, though; what I learned from those experiences is: Never veer too far from the aesthetic points of view of your clients and their audiences. That is, unless you have good reasons and can justify those reasons (before going onto production). Such aesthetic points of view involve not only styles of artwork and photography, but also the 'speed' of programming, and the music and/or 'soundscape' of the show.

From a graphics standpoint, you can get an idea of what a client will accept by studying their annual report and their advertising campaigns. Then add a 20% 'pizazz-acceptance factor.' A company's annual report usually shows its most conservative graphic style. On the other hand, the same company's advertising campaign, designed to excite and motivate customers, will probably be far less conservative; because ad agencies typically get as 'far out' as they can; because they secretly want every campaign to win an award for 'creativity'. Thus, the annual report represents a company's conservative graphics 'attitude' and their advertising reflects the liberal side of their aesthetic tastes. However, you can usually get a little 'wilder' than the advertising graphics (if you feel that is the best approach) because AV usually is not considered as 'important' as advertising—so you can get away with more 'Tomfoolery,' from a design standpoint.

Clients generally either do not understand AV or don't consider it important enough to fuss about; unless you go too far. Thus, it is a good idea to get your design concepts approved up front and have a full rationale worked out as to why you've chosen a given design concept.

Such rationales can approach the sublime in terms of the 'bullshit factor;' because, again, who can say what is better? Only research can determine whether one approach is better than another. That is why considerable sums are spent testing package designs and advertising campaigns before commitment is made to a final set of plans or designs. But, when's the last time you heard of anyone funding research into multi-mage show designs?

I look forward to the day when clients wake up to the fact that we need the same kind of testing. Ha! That way, we might get to produce two, maybe three shows for every one that is finally used. Imagine the budgets!

When you are trying to sell a design; whether a simple layout or the design scheme for an entire show; the best advice I can offer you is the same advice that was given to me years ago by my graphic-design 'Godfather,' Gene Butera.

Gene was one of the best designers I know; he was the creative director of Car & Driver magazine—one of more than three dozen different magazines marketed by Ziff-Davis, a huge publishing empire.

From time to time, Gene and I got into trouble; and he would have to make the trip upstairs, to the C-Suite (Corporate Suite); to 'justify' our work to the executive committee, run by Marty Touhey.



I recall one assignment, the 'Butterfly Bora,' (above) for which I had made an elaborate 12-element photo strip-in to create fantasy pictures of a naked 'butterfly lady' picking a flower in a field with her Maserati Bora parked in the background.

All told, I had put in about 40-hours labor for a picture that would ultimately earn me about $200 (for a full-page shot). I loved it. Gene loved it. But apparently lot of readers did not; because the magazine got more 'hate mail' over that one than any other picture in the previous 5 years. That did not go over very well upstairs. (I guess they could not take a joke either.)

Another time, Gene and I featured a black couple swimming in a pond; he embracing her in the limpid pool of water, with their Jaguar XKE parked in the BG. That job cost me a speeding ticket—and nearly the car. (See pix, overleaf.)

We had parked it too close to the edge of a New Jersey reservoir. When we tried to drive it out, the rear end broke traction and slipped into the pond. It had to be hauled out by a tow truck. Besides that; the property was a No Trespassing zone owned by the State of New Jersey. We had to be on constant alert for approaching cops—a fun day, to say the least. But again, more hate mail; that time Southern readers objected to the black talent. "What," one writer asked, "would a nigger be doing driving an XKE?"

[*Editor*: Butera died in 2019. Covid related? Just saying….]



Gene was a great talent because he was willing to take the kinds of design risks that keep audiences on their toes; the kind that are controversial; the kind that can occasionally offend; but that make a magazine (or a show) unforgettable. In a word, the kind that make people excitedly exclaim, "Holy cow!" His approach to selling a design was as follows (and, folks, this method works at least 90% of the time):

First, work-up the design you want. Do all the necessary sketches, reports, and ancillary bullshit. Then put that design into your drawer, for later.

Next; based on your original design, make another version that is at least twice as 'wild.'. Present that crazy version to your client.

They will probably react by saying they appreciate your effort, but that you do not understand the 'personality' of their company; that you have not considered the nature of the product or the predisposition of the audience; that what you have designed is not 'fitting;' that it is not in keeping with company's design objectives—blah, blah, blah.

Do not despair.

Go back to your drawing board and make a new set of sketches that are twice as conservative as the one you ultimately want (in the drawer). Present that to the powers that be, as your 'correction.'

This time their reaction is likely to be: "Well, perhaps we were a bit hard on you; you've over-reacted."

Act disillusioned and disappointed. Explain how you have sweated and slaved for hours; how you've given them the best your mind can offer; but that you will try one more time; then, that's that; if they don't like it, perhaps they should get another designer; etcetera.

Finally; go back to your studio; open that drawer; pull out your original design and make any final adjustments. Then, wait about a week (if possible) before presenting it—so they think that you have really sweated over this one.

I can almost guarantee that your client will buy that 'middle of the road' design; that 'compromise.' So much for selling design concepts; thank you Gene Butera!

Sit Yourself in The Last Row

Another 'trick' is to imagine yourself sitting in the last row when preparing write-on-slide versions and (especially) during final editing and assembly. By that, I mean seeing the show the same 'size' as seen by viewers in the last row of seats.

An easy way to do that is to use long lenses during programming and review. I use 9.5-inch (~24 centimeters) Buhl lenses with a throw distance of about 15 feet; that gives me an image size (single-screen) of about 18 inches wide [~46 cm]. Thus, while programming, I see 'postage-stamp-size' images.

That makes it easy to spot graphics, photographs or programming moves that may be difficult for the schmendrick in the back of the theater to see. If they are difficult for me to see, you can imagine how the audience will react. After all, I get to see the show (at least) 50 times, whereas audiences will generally only see one screening.

If, on the other hand, you will have a small audience and they are going to see the presentation up close; give yourself their 'front row' perspective by switching to shorter projection lenses and watching in large format while programming.

Put The Message in The Middle

People tend to look at the middle of the screens without seeing the peripherals. Try sitting in the front row at the cinema and see how much you miss. Then sit yourself in the back row and watch the same movie; it will be a different show. The same applies a multi-image presentation, especially a wide-format show. The people in the front row see only a portion of everything that is on screen.

For that reason, concentrate your most meaningful information and imagery in the center-screen area; that's where people will most likely be looking. If you want them to take note of an image area away from the center, be obvious about it. Use a directional screen move that leads the eye to that area; or superimpose an effect of some sort to highlight what you want everyone to notice.

Leave Enough Time to See the Imagery

Unless you are taking a cavalier, 'throw away' approach; leave the audience enough time to see and appreciate the visuals you are presenting.

Some of the best multi-screen shows I 've seen have been produced by David Innocencio and Minette Siegel. Their imagery is usually didactic—they make shows for museums—so they leave their imagery up long enough to really see and understand the content. David Fellowes, too, does an admirable job in the area of screen layout, design, and timing; and for the same reason—audience comprehension.

On the other side of the equation; folks like me are tempted to make our shows go fast; to pack as much as possible into every second. Doing so, amazing imagery can get 'lost in the squash;' or be a visually-confusing 'mash-up.' Remember; you get to see the show repeatedly and thus are 'stilted'. You already know what the show is about. So, if it is the slightest bit difficult for you to make out what something is about, your audience will be totally baffled.

Ask a **'Naïve'** Audience

One way you can pre-test comprehension and understanding is to ask a 'naïve' audience to view your show. Naïve audiences can pinpoint any communications failures and point the way for correction.

Consider the comments of 'naïve' audiences only in terms of potential gross errors. Act on what you consider valid in their critique. Do not take their comments personally. (We put so much effort into the production of a multi-image show; it is hard not to take criticism personally.)

Understanding is the key to valid criticism and improvement. If audiences simply do not 'like' a given color or effect, that is not valid criticism; some people like red and some blue. If *nobody* likes it; you should consider changes.

On the other hand; it could be argued that not liking something might make someone remember it. How many times have you recalled a TV ad that was so offensive that you could never forget it.

Such offensiveness is the principle recall device of many TV ads; they are so bad that they are good—not aesthetically; but in terms of getting people to remember the message.

The New York TV and radio ads for the "Crazy Eddie" electronics chain are a perfect case in point. They are atrocious; in your face; and very annoying. But you never forget that tag line (by DJ Jerry Carroll): "Crazy Eddie—his prices are *insane*!"



https://www.pennlive.com/midstate/2013/06/lee_ioacoca_col_sanders_crazy

Whether on a rostrum camera or on location; filters will make a world of difference for your multi-image photography. The number of visual manipulations possible with filters make them one of the easiest ways to add visual impact to your shows; and the least costly. The average photo filter costs less than $10.00; you can have a complete repertoire for as little as $2,000. [*Editor*: $10 filters? Those were the days!]



Upper left: 52-and 72-mm glass filters. | Upper right: 4- and 6-inch-square [~10 X 15 cm] graduated and color tint filters. Lower left: Cokin effects filters; a complete set. | Kodak 3- and 5-inch gelatine CC filters; two complete sets.

Although I rarely use more than 5% of them, I own more than 600 filters (see pictures.)

[*Editor*: That number grew to 900 by 1990.]

Nearly every shot I take has some filtration—warming, cooling, 'correction,' polarization, etcetera. Those are the 5% I use frequently. The rest are for effects. Fellow photographer, Bob Peterson, calls those "fruitcake filters."

In those cases where I use funky filters; I am usually mighty glad to have them. They can transform a mundane scene into one with more visual interest and appeal; as the pictures on the following pages demonstrate.



A drab street in Warsaw, Poland is transformed by smearing Vaseline on a UV filter. Images shot for Scania Bus calendar.



A non-descript country road is transformed with a Cokin "speed" filter—a multi-faceted, acrylic 'prism.'



The Tiffen 8-point star filter also has a distinct diffusion effect.



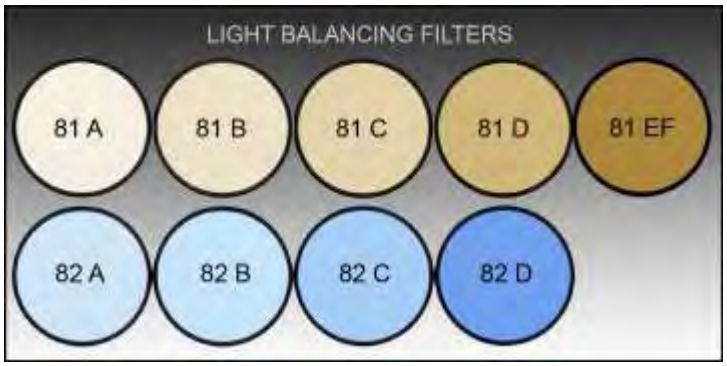
A rainy day in Angers, France, enhanced with a Tiffen Fog #1 and a UV filter smeared with Vaseline (on the right).

Since there are books and more books packed with information about filters; I am only going to discuss material that you may not find in those books; as well as some 'tricks of the trade.'

To begin with; most books tell you to use a UV filter on all your lenses. I could never figure out why. UV filters are visually transparent and colorless—like window glass. They do not 'do' anything, except provide physical protection for a front lens element. However, UV filters are useful for 'soft focus' effects; by smearing Vaseline, or spit, or 'nose grease' on them (see previous Scania bus pictures).

The UV filter is supposed to cut-down excessive 'bluishness' in outdoor scenes. An 81A does the job much better. In fact, the 81A—which has a faint amber cast—is my 'standard' filter; mounted on just about all my lenses. It not only kills the inherent bluishness in Ektachrome stocks; it does the same thing for Kodachrome when using studio strobes or shooting with window light (without sunshine). In sun-lit scenes; an 81A lends a warmth to your pictures that is far more pleasing than cooler, bluish tones.

The 81A series also includes 81B, 81C, 81D and 81EF (see picture, overleaf). Those are deeper amber tones; that are ideal to 'warm-up' pictures shot on overcast or rainy days; or when shooting in the shadows of trees or buildings; or when shooting at high altitudes. In those situations, the Kelvin temperature of the light can get as high as 10,000-20,000 degrees.



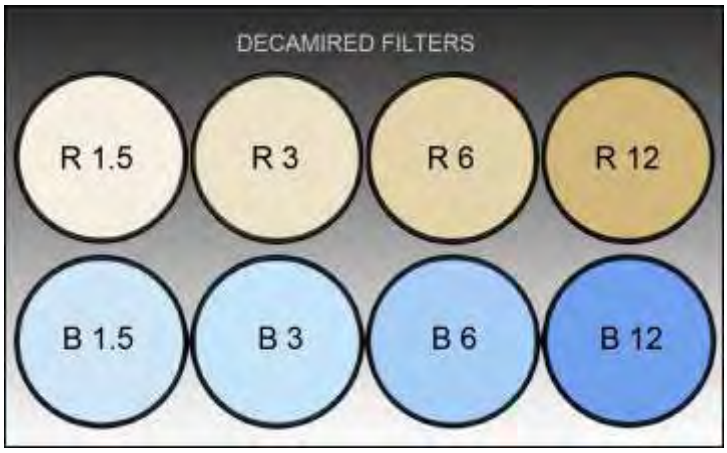
Daylight film is 'balanced' for 5,500 degrees Kelvin. At that temperature, colors photograph 'correctly.' With higher Kelvin temperatures, daylight-balanced films shoot with a blue cast; lower temperatures produce a red cast. You probably do not notice the blue or red cast in the light; because we 'mentally adjust' the colors in the world around us, no matter what color light illuminates them. However, you will definitely notice those color shifts in your slides.

(For tungsten-balanced films, the ideal Kelvin temperature is either 3200 (Type B films) or 3400 (Type A). Others include: Type F, (balanced for the 3800-degree light produced by flash bulbs; not strobes—those are closer to daylight); and the rare Type-S films, (balanced for a compromise between daylight and tungsten). I have never come across any Type-S emulsions.)

Think of it; if you are in the shadows of a building, your subject is not being illuminated by direct sunlight. Rather, the light reaching the subject comes from the blue sky. To achieve 'normal' coloration, you must filter out the blue cast to the degree necessary (pun intended). On a cloudy day, or whenever direct sunlight is obscured, the same holds true. An overcast sky is like a giant diffuser; the clouds 'pick up' more blue sky than the ('pinpoint') sun source. As a result, the overall coloration of cloudy-day 'scrim' lighting is too blue for daylight balanced film. 81-series filters will reduce unwanted cool tones. The same holds true in the studio. Most strobes are a bit blue; and the use of one of the 81 series of filters will render your pictures in the tones that are more pleasing to the eye.

Alternatively, the 82 series will 'cool down' situations where there is excessive warmth. Out of my 600 filters; I think I have just four 82s. That is because I cannot understand why anyone would want to cool down coloration; I prefer the warm tones.

However, if you were shooting fashions in warmer early morning or late-afternoon light, and the manufacturer was concerned that the colors were accurate, you could correct for more normal colors by filtering out the excessive red and yellow of early or late-day light with one of the 82 series. Conversely, you might want to enhance the cool tones if you were shooting winter scenes or stormy weather, for example, using one of the 82 series—82A, B, C or D.



Well before "light balancing" were introduced, Hollywood movie makers used "decamired filters" to tame variations in the Kelvin temperature of light. For them, keeping the color of light consistent throughout the day was important for 'continuity.' Comparing the pictures of them, it it easy to see that there is little difference between decamired and light balancing filters. In Europe, they use similarly colored filters with a different nomenclature—KR (Kelvin red) and KB (Kelvin blue)

If you were shooting in late morning or early afternoon and wanted warmer light—simulating sunrise or sunset colorations—you could also use a combination of CC10Y (yellow)+ CC20R (red) or CC20Y + CC30R, with or without your basic 81 series filter(s), to add even more warmth. Or, to cool thing down, you could use a CC10, CC20 or even CC30B (blue) filter. [*Editor*: "CC" means Color Correction.]

CC filters are pastels of primary and secondary photographic colors—Red, Blue, Green and Magenta, Cyan, Yellow. Each color comes in seven densities—5, 10, 20, 30, 40, 50, and 100—that range from light pastels to more saturated hues. They can be used in combination. Those pastels can enhance the basic colors of any subject.

For example, if I am shooting a close-up of a yellow rose, I will add a CC10Y or 20Y filter. The pastel yellow gives a little boost to the yellow rose and warms-up the green leaves. Yet, they are so pastel that they will not 'interfere' with other colors in the scene; a blue sky will stay blue. Likewise, when photographing a red car; I might throw on a CC05R or CC10R filter to help punch up the red without unduly altering other colors in the scene. For extreme closeups, when there are few if any other 'reference' colors, heavier CC filtration can be used.

One example of the versatility of CC filters was a series shot for Clairol. CC filters were used to change a girl's hair color from light, light blond to dark, dark brown. This was accomplished by hiring a very patient model and setting her head in a brace (so it would not move during the 20-minutes it took to shoot (registered) close-ups of her hair through 30 different CC filters.

The model's hair was light blond to begin with. To make it an even cooler, so-called "ash-blond," I overexposed ever so slightly and used a CC05B blue filter. Then I switched over to CC05Y yellow to get "light golden blond." Then I added CC05 red for a light "strawberry blond." After that, I switched to CC10 versions of red and yellow; then CC20 and CC30. All exposures were bracketed two stops up and down in half-stop increments. Finally, I used various combinations of CC05 through CC30 versions of those colors and bracketed all those exposures, too.

As you can imagine, the 'overshoot factor' was unbelievable; but so was the effect. Before your eyes the gal's hair morphed through two dozen colors going from light blond to dark brown in a series of matched dissolves.

Note that during re-photography, adding the same CC filters on rostrum camera's lens would not work. You could not get the same kind of hair color changes by filtering the studio picture of the model's hair when duping it; because the highlights and shadows would not 'react' dynamically to the filtered light the same way they would in the original studio shot.

Outdoors or in the studio; there are lighting contrasts that affect the relative amount of filtration on a dynamic basis. Highlights tend to 'burn' through the filters' effects. However, the illumination of a duping stage is flat and uniform. Highlights do not burn through; they get tinted, as do the mid-tones and shadows. All you get is a flat, overall color-cast to the entire scene.

Primary-Color Filters

Another three important filters are 47-Blue, 61-Green and 29-Red. Those are the primary colors—Blue, Green and Red. Each filter eliminates all but their own color. They are the same filters used to make the 'color-separation negatives' for dye-transfer prints of still pictures and Technicolor prints of movies. Theoretically, if you shot three slides of the same subject, one through a 47B, the second through a 61G, and the third through a 29R, then superimposed them, the resulting combination would render the original colors of the subject.

Using Infrared Aero Ektachrome

The possibilities for 'effects' are staggering with those three filters. This is especially true of you shoot with Infrared Aero Ektachrome, a film that renders the scene in "false colors". Infrared Ektachrome was originally developed for scientific investigation of terrestrial events in photographs taken from satellites.

Using a 13Y yellow filter, all green foliage will be rendered shades of red and magenta. With such 'false colors,' scientists can discover whether forests or crop fields are thriving or not, among other things. The film exaggerates color differences between different green hues by changing them to shades of red and magenta. Differences in those bright colors are easier to identify than subtle changes between the greens and green-browns of forest colors. Regular color films cannot differentiate between greens and-browns as accurately. As well, some people (including Yours Truly) are color-blind to greens and green-browns. However, false colors and exaggerations can be used to advantage by the multi-image photographer who wants to 'fantasize' reality or come up with 'alterations' of reality.

Infrared Aero is a high contrast Ektachrome stock with very little exposure latitude. Mid-range tones are stripped away and entire groups of tonal ranges are lumped together into a single color, creating a "posterized" effect).

The best filters to use with Infrared Aero Ektachrome are those that "strip out" all but specific band widths of the visible spectrum; the narrower the band that passes through the filter, the more spectacular the results on this film. Pastel filters will do you no good with Infrared Aero Ektachrome because they pass a wide-band of light that is almost full spectrum. By using narrow-band filters with Infrared aero Ektachrome you can achieve posterized effects on location. The filters you need for such effects are:

13Y - This "pure" yellow filter will render the scene in the closest coloration to "natural' that Infrared Areo can render; the only startling difference is that anything that is green will be rendered in a shade of red or magenta. (See pictures, below.)



Top Right: Natural colors of Florida foliage photographed with Ektachrome 64 in 1968. Top Left, below and overleaf: similar foliage photographed with Infrared Aero Ektachrome and a 13Y (yellow) filter.





Praying Nymph | Model Betty Schelanski was photographed in Central Park with Infrared Aero Ektachrome and a 13Y filter.

29R - This deep red filter will render your scene in shades of white, yellow, green, and black. White will only occur where a strong highlight exists, such as the sun. Most of the scene will be rendered in shades of yellow and green; deep shadow areas will appear in black.



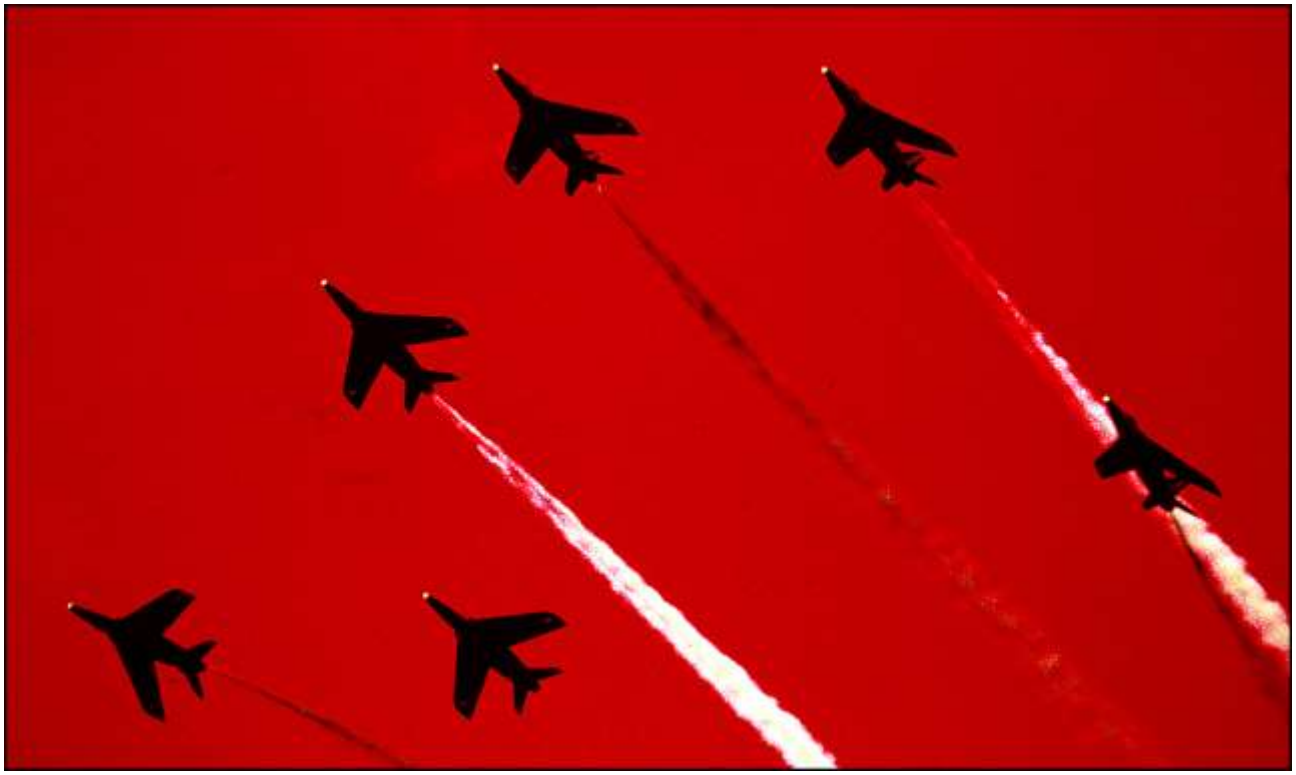
1966 portfolio shot of Queen Anne's Lace was one of my first infrared-color pictures.



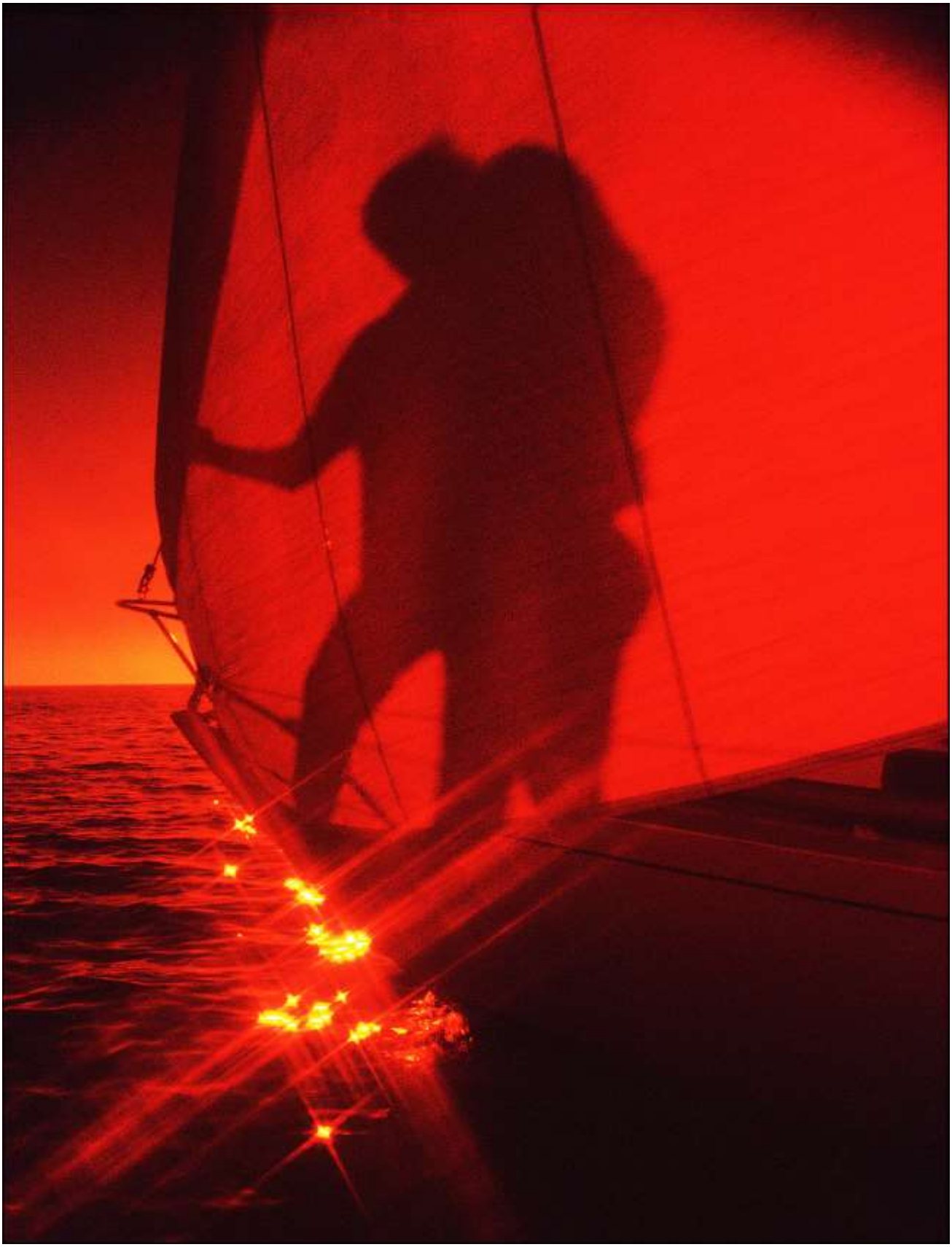
Jumping Bike was shot in 1967 using a motorized Nikon FTN equipped with a fisheye lens and rear-mounted Red 25 filter.



Above: surfer was photographed in Rincon, Puerto Rico, in 1967, using a Nikkor 300 mm with a rear-mounted Red 25 filter.



Blue Angles formation-flying performance shot on Ektachrome 64 film with a 55 mm Nikkor equipped with a 29R filter



Shot for *Gentlemen's Quarterly* magazine (GQ) in 1972 using Kodachrome film with a 105 mm Nikkor and 29 Red filter.

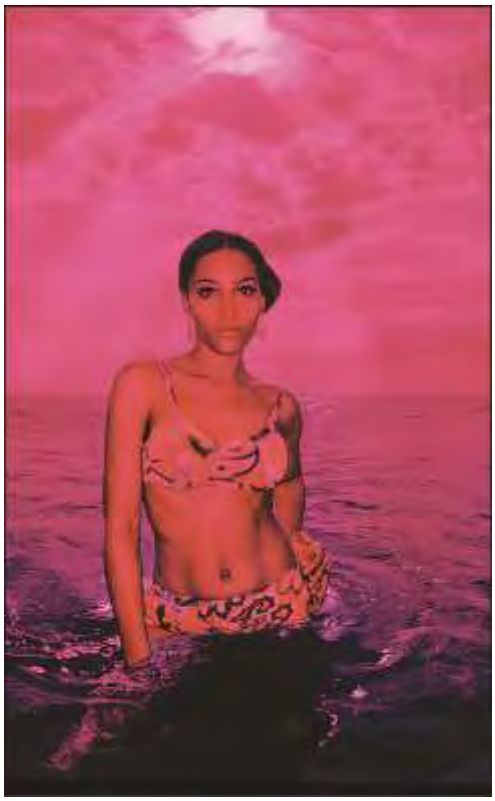


1969 candidate *Cycle* magazine cover shot featured my wife, Leslie Shirk, in a 'moon-suit' of her own making. The image was made using Infrared Aero Ektachrome with three filters: Tiffen 47B (blue); Tiffen 2 mm Star; and a Spiratone Circular Diffusion filter, mounted on a Nikkor 28 mm Nikkor lens.

47B - This filter will render the scene shades of pink and red; white will only appear in strong highlights. This deep-blue filter is also useful for night scenes shot on regular Ektachrome or Kodachrome.

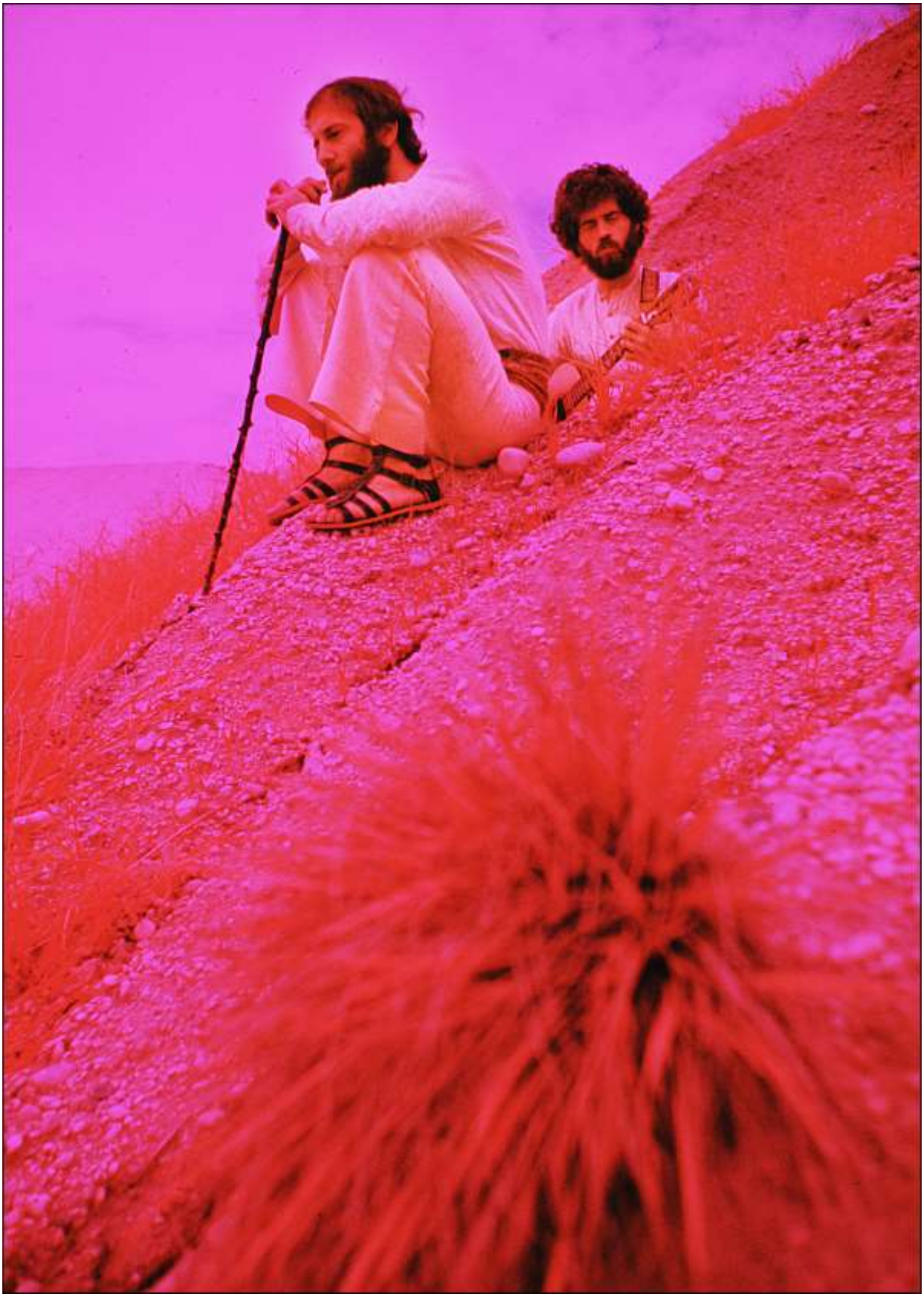


1969 Cycle magazine cover shot was a 'tamer' version of my wife, in her moon-suit; but without the effects.



Above and overleaf: Model Angelique Monique photographed in Rincon, Puerto Rico with flash-fill and a 47B filter.





Folk singers *James & Richard* in a 1969 Infrared shot made with a 20 mm Nikkor and 47B filter.

13G - This green filter is ideal to create "night" scenes in broad daylight as the subject will be rendered in shades of blue and black; the hues will be especially vibrant shades of "reflex blue." Whites will only be seen in strong highlights.



One of five Block Island Race pictures included in a Christmas-gift promotion for Kenyon Marine, 1972.



Steel Service Center Institute's annual design award was photographed for the American Iron and Steel Institute using a Nikkor 105 mm lens fitted with a 13G filter; lit by studio strobes.

58G - This deep-green filter will render the scene in shades of blue and magenta; the blues will be deep and saturated and the magenta tones will be 'pinkish.' Bright highlights will burn through into white. Strong shadows will be black.



Block Island Race picture that appeared in *Nikon World* magazine, 1974.



January 1971 Modern Plastics cover of a USI bag-making machine was shot with a 28 mm Nikkor lens fitted with a 58G filter in combination with Tiffen 1 mm and 2 mm stars.



Folk singers *James & Richard* in a 1969 infrared shot made with a 28 mm Nikkor and a 58G (green) filter.

61G - A dark green filter that also renders scenes in shades of blue, black, and white.



End title credit for a television public service announcement made for St. Regis Paper Company in 1968.



New York's Olympic Tower, photographed for Arlen Realty in 1975 using a 28 mm Nikkor lens with a 61G filter.

72B - This is a deep orange filter that is quite dark. It renders the scene in shades of yellow, orange, red, and black. Extremely bright highlights will burn through to white.



1968 advertisement for Babcock & Wilcox.



1971 Cycle Racing Annual featured a shot taken at Pepperell International Motocross in 1968 using a 72B filter.

73 - A very dense, yellowish-green filter; this one will render the shadow scene in shades of cyan-green, along with black shadow areas and white highlights.



1972 photo of a Maserati Bora shot for *Penthouse* magazine with a #73 filter on a 20 mm Nikkor lens.

87 - This is the true infrared filter. It appears black and only allows penetration of infrared radiation that is invisible to the naked eye. Scenes shot with an 87 filter will be rendered in shades of red and black only. The result is extremely monochromatic and disappointing. You could get the same result by shooting a black-white positive and gelling it red! Therefore, I have no color examples. In black-and-white photography, green foliage photographs as light gray or white, as in the picture below.



Maserati Bora featuring model Frya Trost shot for Car & Driver magazine with a tripod-mounted Nikon camera filled with A 28 mm Nikkor and #87 filter. Set-up and focusing were done without the filter in place; because you cannot see through an infrared filter..



Yours Truly, photographed in my Stockholm studio using a combination of a Lee 8-point star with a Fog #3 filter. The photographer (name forgotten) used a 4X5 view camera. A double exposure was made. First, I was photographed with the projectors off, illuminated by an electronic flash; without filtration. That was followed by an exposure with the projectors illuminated and filters in place..

There are a host of filters on the market that claim to be 'fog' filters. Unfortunately, most of these are either diffusers or 'light scatterers;' both of which affect focus. The ideal fog-effect filter renders the scene in sharp focus but with the subtle veil of haze that fog offers in a real-life situation.

The brand that works best (by far) is Tiffen. Their Fog effects #1, #2, and #3 give results that are truly superb. Hoya is a reasonable substitute. The Cokin variation of the Tiffen filter gives results that are too exaggerated; and the other brands I have tested (which are primarily diffusion-type filters) slightly blur the scene, which I find annoying. Large-sized filters that fit view-camera compendiums (attachments combining filter holders with a lens shade) are made by Lee and Tiffen.

The appearance of a Tiffen #1 Fog filter is that of glass that has been lightly sand-blasted; the amount of sand-blasting is heavier on the #2 and #3 versions. The microscopic 'pits' in the surface of such fog filters scatters the light, creating the fog. As they retain a certain amount of clear glass, sharp focus is maintained, although less so when you are using the #3 versions.

I do not use fog filters just to create 'fog.' They work beautifully when doing portraits or hair work. They also do nicely to soften backlit scenes, flowers, even food shots. The fog #1 could even be considered a 'basic' filter for such shots. Fog filters are also terrific for shots of chrome or glassware; the reflected highlights will have little halos around them—a most pleasing effect—while maintaining sharp focus.



White Iris | The photo was double exposed; once 'straight' and once with a Tiffen Fog #3 filter.

Illuminated signs, particularly neon lights, look especially good when shot with a fog filter.

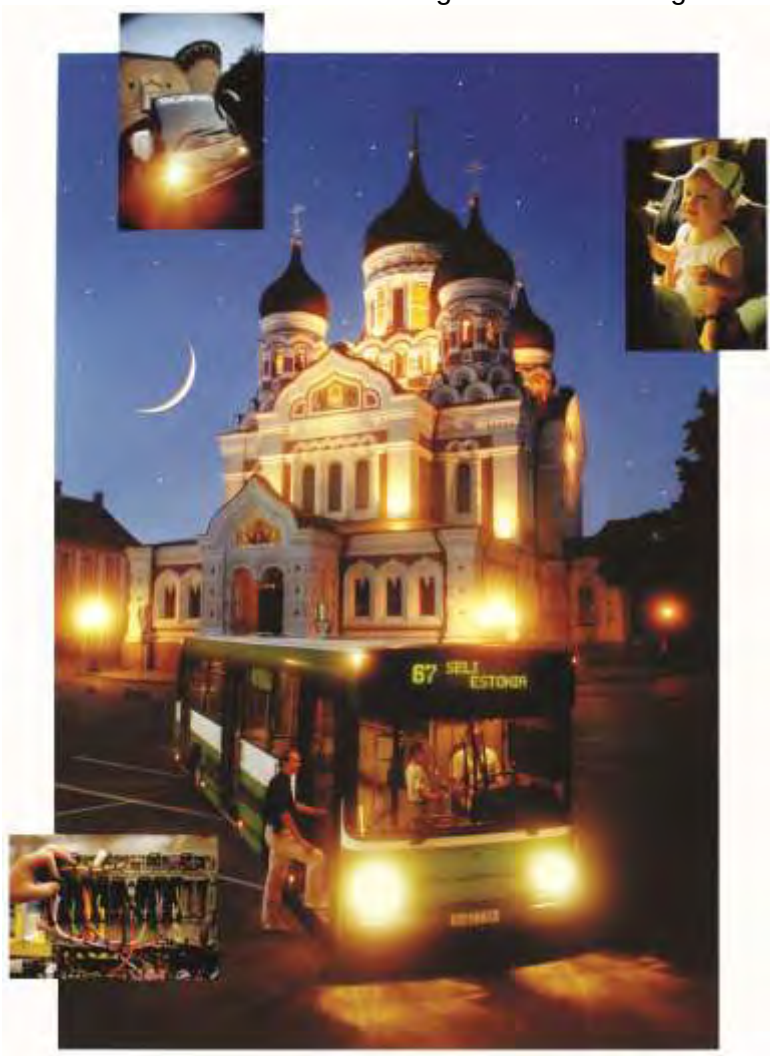


A flashing neon sign at the Peppermill Casino in Reno, Nevada, was photographed with a Tiffen Fog #1 filter on a Nikkor 70-200 mm zoom lens using an 8-second exposure, starting close and zooming out after 4 seconds.



A Tiffen Fog #1 filter enhances the glow around the illuminated letters of Las Vegas casino.

Since I discovered the Tiffen Fog filters, I have not used a diffuser unless I intentionally wanted to render a scene in soft focus, which is not often. Other uses include the scene enhancement when shooting rain or neon lights.



A Scania bus photographed in Tallin, Estonia, using a 35mm Nikkor lens with a Tiffen #2 Fog filter.



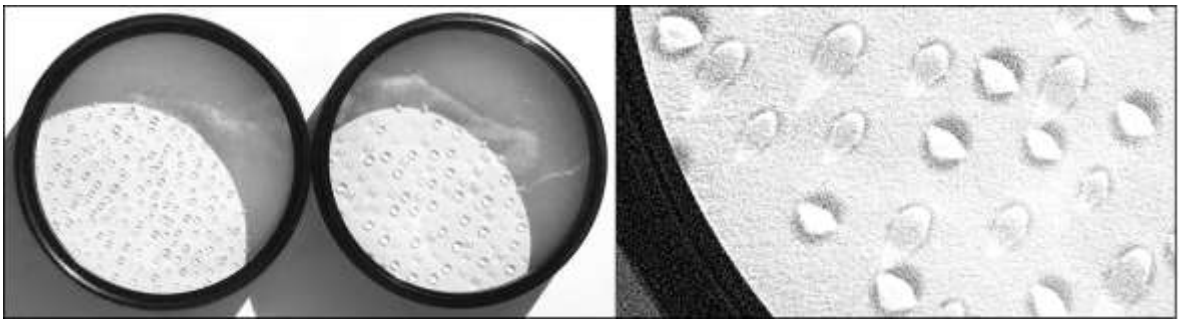
A Tiffen #1 Fog filters enhances the candles on AVL's 20th anniversary birthday cake, being lit by Yours Truly in the Brussels studio conference room.



My wife, Pamela Swanson, photographed in 2014 for her modelling 'head sheet.' I used a 180 mm Nikkor lens fitted with a Tiffen Fog #1 filter.

Zeiss 'Softars'

This is a set of filters you have got to own. They are extravagantly expensive; but the results they offer cannot be achieved with any other filter of their type. Basically; they are a 'diffusion' filter set that comes in three 'strengths:' Softar #'s 1, 2 and 3. I prefer the #1 Softar; it has the most subtle effect. I almost never use the #3; the effect is too heavy.



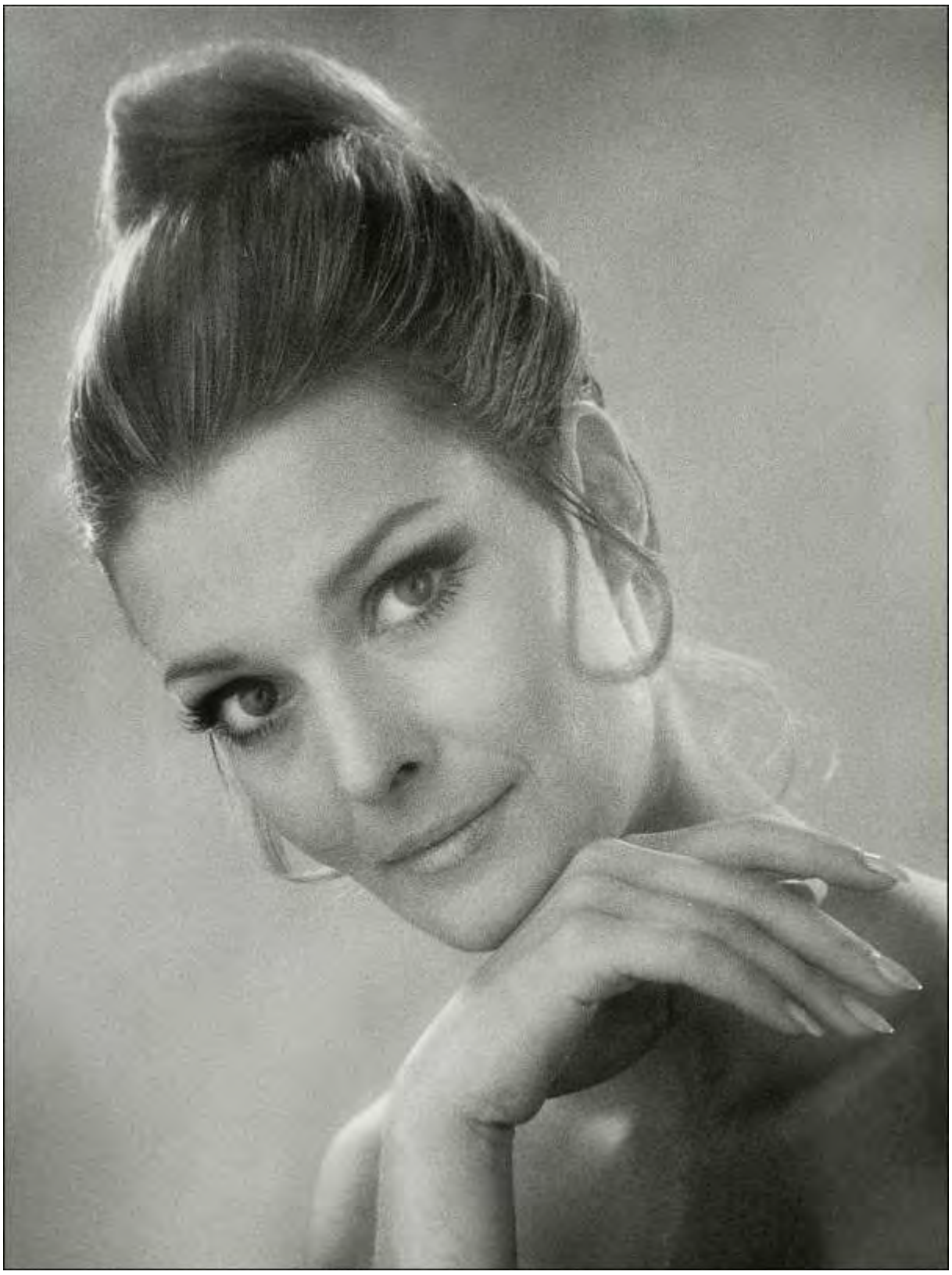
Left: Zeiss Softar #2 | Center: Softar #1 | Right: Close-up of Softar #1.

Softar filters have dozens of 'mini lenses' scattered randomly across the front surface; but there is plenty of clear glass, which is why you get sharp focus with a halo effect. Using a super-wide lens and narrow f-stop (f/11-f/32) the little 'lenses' are noticeable—so does oblique direct lighting, as in the pictures, above. The best effects are with wider f-stops.

What makes the Hasselblad series different from the others is that the scene will basically have sharp focus throughout; but the subjects will be outlined in a distinct halo of diffusion; a most unusual effect; one that works particularly well with backlit subjects or ones with lots of highlights. As I said; this is a 'must try' filter set.



Blue Lady was photographed in 1969 using a Zeiss Softar #2 filter in combination with a CC50 Blue filter.



1970 portrait of my sales rep, Sue Keeton; shot with a "Softar #1" filter.



Yours Truly photographing a *Penthouse* massage feature using a Hasselblad 80 mm lens and Softar #2 filter. The unfiltered picture of me provides a comparison to the Softar-filter's effect.





Above: a 200 mm Nikkor with a Softar #1. | Below: an 85 mm Nikkor with a Softar #2.



1974 picture of Falcon jets; shot with a Nikon 35mm lens equipped with a Spiralite *Rayburst Stellar* star filter.

There are star filters, and there are star filters. There are so many star filters on the market that you could go nuts trying them all—and you *should* try them all; because each brand and type will give you slightly different types of stars—some 'straight' and others with rainbow flares.

The subtle differences between stars comes from the depth of the grooves scored into the glass; the quality and thickness of the glass; and, especially, the spacing between the grooves. Some star filters use 'dichroic' glass with metallic coatings or other 'holographic' films to generate rainbow-colored star shafts, as seen in the Falcon Jet picture, above.

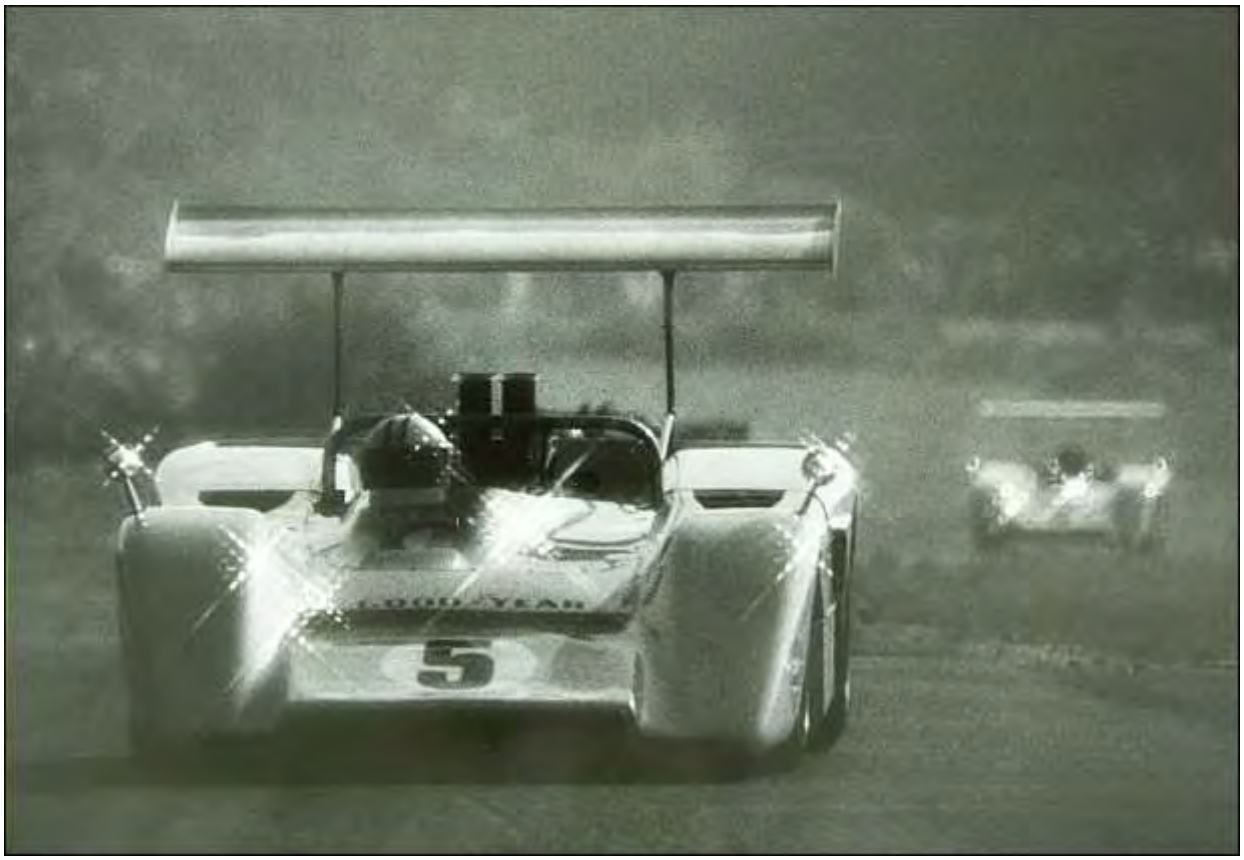


Left: Tiffen 2 mm Star | Center: Tiffen 1 mm Star | Right: Close-up of 1 mm Star filter.



The effect of *Rayburst Stellar* filters on a rostrum camera lens; shooting a *Roscopaque* star plate on a bottom-lit stage.

Almost any grating can be used to create star effects on spectral highlights and other 'pin-point' light sources. Early film makers stretched a lady's silk stocking over the lens to soften the image and generate star highlights; you could do the same, in a pinch. [*Editor*: Ladies do not wear stockings anymore. Ha!]



Denny Hulme's Maclaren won the 1967 Bridgehampton Can-Am race. I shot it with a piece of silver-gray window screening over the front of a Russian-made 500 mm MTO mirror telephoto lens.

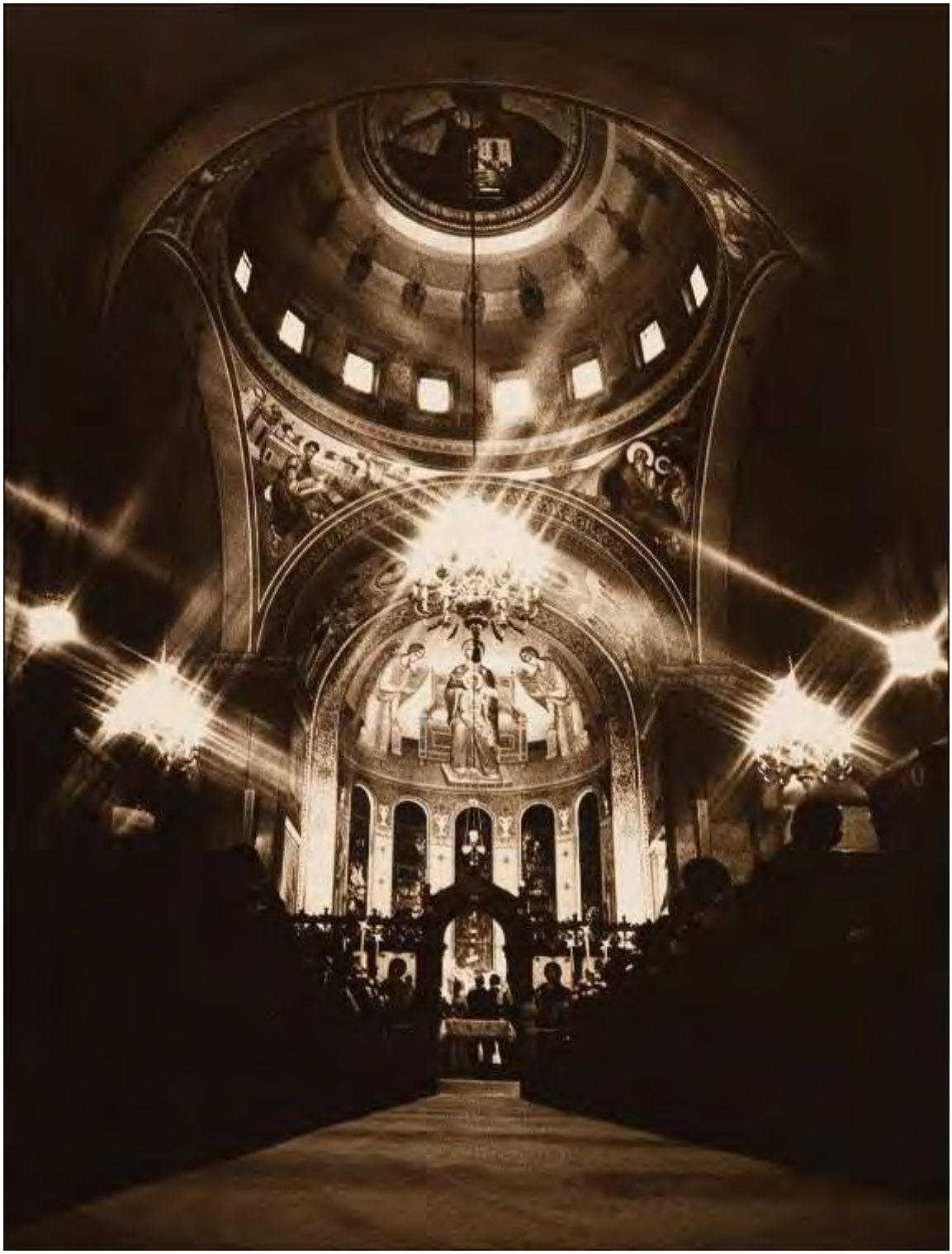


Dan Gurney's 1967 Can-Am Lola T70 Mk3B Ford; shot with a Tiffen 4 mm star on a 200 mm Nikkor lens.



A Tiffen 2 mm Star filter was used to create Incredible's "Glitter" effect.

To my eye; the most pleasing effects are made with a 2 mm star filter (grooves spaced 2 mm apart). That filter gives you long star shafts. With a 1 mm star filter the shafts will be considerably shorter; and with a 3 mm and 4 mm versions the stars could be so tiny that you might as well forget them (unless you like really) small stars; and/or the shafts will be banded or broken.



1966 picture of the Cathedral of Saint John the Divine in New York; shot with a Tiffen 2 mm star filter on a 21 mm Nikkor.



1968 photograph of the yacht *Wanderer*; shot with a Tiffen 1 mm star filter on a 21 mm Nikkor lens. The combination of a small aperture (f/22) and the extreme depth of focus of a super-wide lens make the scored lines of the filter visible.



1985 Saab Turbo shot using an 85 mm Nikkor with a combo of filters: a Tiffen 2 mm star and Cokin "Speed" prism.

Using a star filter; you can obtain some interesting 'over-projection' (OP) effects on location. One of my favorites is to shoot a car with strong highlights (or headlights on, at night) without a star filter; then add the star filter and shoot an underexposed frame in which the car itself will be too dark, but which will have highlights with bright stars. Those are flashed over the 'base' scene of the car.

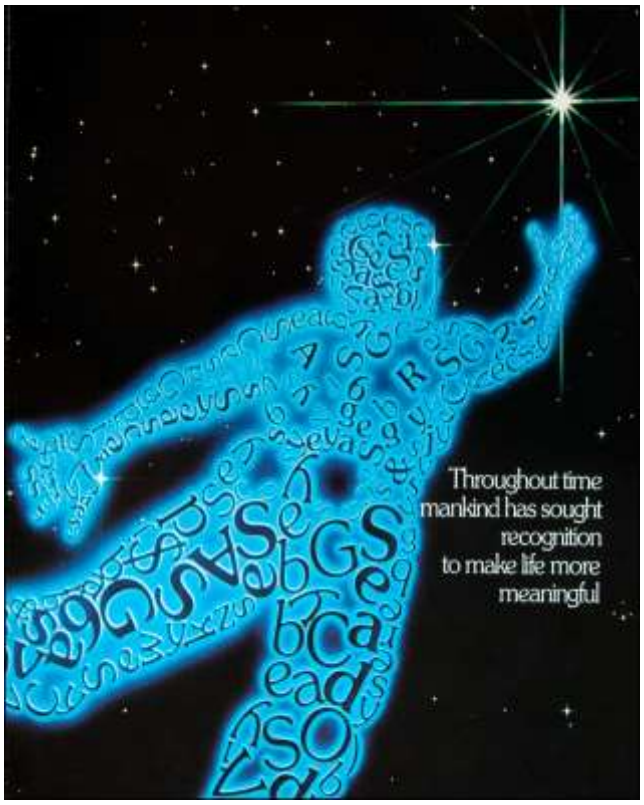


Stars shot with a rostrum camera using a custom filter (made by John Emms) were flashed over a picture of a spark plug.



USI's Houston refinery was shot using a 28 mm Nikkor outfitted with a Tiffen 2 mm star filter.

The same technique is great for shooting refineries at night. First, take a time exposure of the refinery without the star filter; then shoot an underexposed version of the same scene that captures the star-highlights of the refinery's lighting grid. The highlights can be over-projected on the refinery and programmed to flash.



The star is the 'star;' made with a triple exposure with a Tiffen 2 mm star on 3 axes (30, 60, 90 degrees) of a Roscopaque star plate. Background starfield made with multiple layers of unregistered mezzotint negatives.



Multi-faceted prism filters can be especially exciting for a multi-image show when they are used to create an animation. In the examples of rotating hair styles shown; I used 9-face (above) and 5-face (below) Tiffen "Multi" filters. With the camera locked on a tripod; a series of frames was shot while rotating the filter faces; thus 'mirror images' of the hairdos rotate around a single, centered version of the subject. Such mini-animations are very easy to shoot and can provide some animation for your show. However, be careful with these filters because the effects, unless used to accentuate a copy line or conceptual point, can look 'hokey.' What do they say, "A little goes a long way"?





Building It Is Half the Fun! (aka the IKEA show) was photographed with Ektachrome 64 Daylight film. Tungsten fill lighting (aka "hot lights") was daylight-balanced with Rosco Full Blue CTB gel filters.

Besides their use as lens filters, there are a host of gelatine filters that can be employed over lights to 'balance' the colors of different sources; or altering them for effects. The most popular brands of these gelatine filters are Rosco, Cinemoid, and Lee.

[*Editor*: GamColor, a division of Rosco, came on the market in the late 80s. Beware of the cheaper *Roscolene* because, unlike *Roscolux*, there is no batch-color matching.]

Rosco's deep-dyed polyester gels were the type we used at Incredible; as well, their diffusion materials. Their products are available in several sizes:

- 12 X 12-inch (30 centimeters) 'sample' sheets
- 20 X 24-inch sheets (50 cm x 60 cm) sheets
- 4 X 25-foot rolls (1.2-meter x 7.62 meter)
- 5 X 20-foot rolls (1.5-m x 6.1 m)
- 55-inch X 22-foot rolls (1.4-m x 6.71 m)

Let us say you have a job shooting offices for an interior decorating company. You likely could not get away with the mixed light sources typical of most offices—daylight from windows as well as tungsten and/or fluorescent interior lighting. Such mixed lighting would affect how the interiors looked; the colors would not be 'right;' and you can be sure your client would want 'perfect' colors.





Top: Yours Truly directs actor Filip Järnehag (below).





Petra Larsson played the bride. The show was shot in a new Stockholm apartment. Juki Nakamura assisted me on camera. Sandra Sande worked with the models. The whole thing was done in one l-o-n-g day. Deep blue gels were used on the windows to shoot day-for-night; for the candle-lit scenes. Read more in Volume Four, pages 644-645.
[Watch a video of the show at https://vimeo.com/229424008]

If you must contend with all three sources—daylight, tungsten and fluorescent—you have three options:

- Option One: Filter for Daylight film
- Option Two: Filter for Tungsten film

Since there are only two different types of color film available—Daylight or Tungsten balanced—you must balance all light sources to one or the other. But, which?

To determine that; pick a portion of the room that is of average light intensity (usually the middle of the room) and pick a subject of average tone; something that in a black-and-white version of the picture would come out in a middle-gray tone.

If you are using a 'TTL' (through the lens) light metering system, get-in close to the subject and take three readings: one with only the window lights; one the window lights plus the incandescent (tungsten) lights; and one with the window lights, incandescent, and fluorescents.

Notice the change in exposure each time you add one of the light sources. Alternatively, measure the exposures of each source separately. In most offices, the window source will be the brightest (assuming there are windows); the fluorescents will be the second brightest; and the incandescent lights last on the list.

Some offices use overhead fluorescents with 'spot' incandescent over counter areas or other places where an extra light is required. In that case, your choice would be to balance for the fluorescent lights; unless your subject is directly lit by the incandescent lamps; e.g., things on the counter top.

However, in our example, the windows provide the most illumination; so, the best choice would be the first option: balancing for daylight. To accomplish that we would:

- Filter all tungsten light sources using Rosco "tough Blue 50 (TB5) gel.
- Wrap all fluorescent tubes with "Tough Minus green (FTM)".
- Use an 81A warming filter on the camera lens.
- If it is a heavily overcast day; or if the window light source is illuminated by the blue sky (no sunlight); use Rosco Tough TD25 (TTD) gels over the tungsten-light sources and use an 81B or 81C warming filter on the lens. That is because areas Illuminated by a sunless sky are (way) bluer than scenes illuminated by the sun.

TTD gel is a little bluer than TB5; more closely matching the color of the window light; and the 81B or 81C corrects for the excessive bluishness in the entire scene.

For option 2 we would follow basically the same procedure, but balance all the light sources for tungsten film:

- Cover the outside of the windows with *Roscosun 85* gel (S85) which converts the daylight (5,000-degrees Kelvin) to 3200° K. Place the gels on the outside of the windows to avoid having to meticulously cut out gels for each window pane. Using Scotch-brand *Crystal Clear* tape; you can tape together smaller sheets of gel to create larger ones. For larger sheets or connecting rolls, use 2-inch-wide (~5 cm) transparent packing tape.

- Cover the fluorescent tubes with Rosco *Tough Minusgreen*; better yet, if you can, lay sheets of gel over the *inside* of the fixtures' diffuser panels.

- Shoot the scene using Tungsten-balanced film; or, if using daylight-balanced stock, use an 80A or 80B filter on the lens.

An 80A balances Daylight film to 3200° K, and an 80B to 3400° K. If you wanted the scene to appear normal, you'd use the 80A. If you wanted it to be rendered a bit cooler (less amber) you'd opt for the 80B.

On the other hand, if you wanted the scene to be a bit warmer (more amber), you would use an 80A together with an 81A, 81B, or 81C, depending on the amount of warmth desired. The 81s can also be used with the Tungsten-balanced stock; for added warmth.

Another concern when shooting interiors is balancing the amount of indoor light with the outdoor readings; to avoid seeing an overexposed, bleached-out world through the windows.

To balance the inside and outside levels you must either add light indoors until you match the exterior levels, or filter-down the exterior by applying *Roscosun N3, N6,* or *N9* gels to the windows. Those are neutral density gels that reduce the light by 1-stop (N3), 2-stops (N6), or 3-stops (N9). They can be used in any combinations; e.g., N3 and N9 together reduce the light by four f-stops.

If you are shooting with tungsten-balanced stock; Rosco also has gels that combine neutral density with color correction: *Roscosun 85N3* combines the correction of daylight to 3200° K plus one stop of neutral density, *85N6* has two stops of neutral density; etcetera.

A third option would be to convert the entire scene to fluorescent balance by applying Rosco *Windowgreen* (*FWG*) to the windows and using an FLB or FLD filter. However, I would not select this option because my experience with FLB and FLD filters has not been good. Personally, I do not like the flesh tones rendered with these filters; there is too much yellow; people look sunburnt (not sun-tanned); or jaundiced. When correcting for fluorescent lights; I prefer a 30-magenta filter. The 30M filter seems to respond best to fluorescent sources in general. I do not mind the flesh tones going pink; that is more flattering than orange; even if the scene still retains a slight green cast. Besides, those faults can usually be corrected when duping.

Part of the problem with fluorescent lights is that there are several types; that emit slightly different light colors. Each type requires a different filter pack; combining various CC filters.

FILTERS FOR FLUORESCENT LIGHT **KODAK Color Film**

Fluorescent Lamp	KODACOLOR VR 1000*, VR 400* VR 200, VR 100	EKTACHROME 200 and 100 (Daylight) KODACHROME 25‡ (Daylight)	EKTACHROME P800/1600 Professional (Daylight) EKTACHROME 400 (Daylight) KODACHROME 64 (Daylight)‡ EKTACHROME 64 Professional (Daylight)	EKTACHROME 160 (Tungsten)	KODACHROME 40 5070 (Type A)
Daylight	40M + 40Y + 1 stop		50M + 50Y + 1⅓ stops	No. 85B + 40M + 30Y + 1⅓ stops	No. 85 + 40R + 1⅓ stops
White	20C + 30M + 1 stop		40M + ⅔ stop	60M + 50Y + 1⅔ stops	40M + 30Y + 1 stop
Warm White	40C + 40M + 1⅓ stops		20C + 40M + 1 stop	50M + 40Y + 1 stop	30M + 20Y + 1 stop
Warm White Deluxe	60C + 30M + 2 stops		60C + 30M + 2 stops	10M + 10Y + ⅔ stop	No filter None
Cool White	30M + ⅔ stop		40M + 10Y + 1 stop	60R + 1⅓ stops	50M + 50Y + 1⅓ stops
Cool White Deluxe	20C + 10M + ⅔ stop		20C + 10M + ⅔ stop	20M + 40Y + ⅔ stop	10M + 30Y + ⅔ stop
Unknown Fluorescent†	10C + 20M + ⅔ stop		30M + ⅔ stop	50M + 50Y + 1⅓ stops	40M + 40Y + 1 stop

Note: Except for the No. 85 and No. 85B filters, the filters suggested for fluorescent illumination are KODAK Color Compensating Filters (CC). Increase exposure by the amount shown in the table.

*For critcal use

†These filters are for emergency use only, when it's not possible to determine the type of fluoresecnt lamp in use. Color rendition in pictures taken with these filters will be less than optimum

‡Includes professional version of film

CAMERA FILTER RECOMMENDATIONS† FOR COLOR PHOTOGRAPHY WITH DISCHARGE LAMPS

Lamp manufacturers may assign Kelvin ratings to fluorescent lamps and high-intensity discharge lamps, as a guide to their appearance to the human eye. These ratings do not apply to photographic use, because discharge lamps do not have a uniform, continuous spectrum. Color film will not see the picture the same as the eye. Filtration at the camera can help to give a more realistic color balance with color-positive films.

SHEET AND ROLL FILM—Tests at 1 Second Exposure

FILM	HIGH INTENSITY DISCHARGE LAMPS					
	White Mercury	Deluxe White Mercury	Color-Improved Mercury	Multi-Vapor*	Xenon	Luxtron*
Ektachrome Daylight Sheet	30M + 1/2 1	10C + 20M 2/3	20C + 20M 1	40M + 10Y 3	10C + 10M 1/3	10CC + 20M 1-1/3
Ektachrome Type B Sheet	10M + 20Y 1-1/3	10M + 40Y 2	20M + 30Y 1-2/3	70M + 20Y 2-1/3	20M + 30Y 1-1/3	20C + 10M 2/3
Ektachrome ED	20M + 30Y 1-2/3	40M 2/3	20C + 20M 1	30M + 20Y 1	10Y —	20C + 40M 2
Ektachrome EH	20M + 40Y 2-2/3	40M 2/3	20C + 40M 1-1/2	20M + 20Y 1	10M + 10Y 1/3	10C + 30M 1
Ektachrome EHB	110M + 110Y 5-1/3	50M + 50Y 2-2/3	30M + 30Y 1-2/3	50M + 50Y 2	20M + 30Y 1-1/3	20C + 30M 1
Kodachrome 25 KM-135 Kodachrome 64 KR-135	30M + 50Y 2	40M + 30Y 1-1/3	30C + 30M 1	30M + 20Y 1-1/3	10M + 20Y 2/3	10C + 50M 2-2/3
Kodachrome II Professional KPA-135	10M + 30Y 2/3	20M + 10Y 1	20M + 40Y 1	20M + 60Y 2	10M + 60Y 1-1/3	40C + 10M 1-1/3
Kodachrome G-64	70M + 40Y 3-1/3	60M + 40Y 1-2/3	20C + 20M 1	60M + 40Y 1-2/3	30M + 10Y 2/3	60C + 30M 2

*Standard Warren Filter—not CC values.

†These values are for 400-watt and 1000-watt lamps. For 1500-watt Multi-Vapor lamps, use only about 1/3 as much Magenta filtration.

GENERAL ELECTRIC

Rosco also has a wide range of gelatine filters to correct the balance of carbon-arc spotlights. These gremlins are a real pain when shooting stadium and theatrical events; or when shooting night scenes when they are used for large area illumination.

Now, while all that is well and good for a Hollywood studio or a 'big time' photographer who has the wherewithall to make major lighting corrections; in multi-image there is rarely enough for a full regalia of lighting gear and a crew of gaffers to rig it.

Of all the photographers I have known—and there have been a lot—there is only one who took the trouble to perfectly light-balance every shot. Chris Smith—who shot two shows for me—the *DHL Brussels Hub Launch* and Kodak's *Got to Be…SAV!*—schlepped a full set of Kodak CC filters everywhere he went. He used a Minolta Color Meter II to determine the precise filter combinations needed. For the DHL show, he shot with a Fuji panorama camera equipped with a compendium that accomodated up to five 4-inch-square (~7.5 cm) glass filters and/or more gels than one would ever need to use.



The pictures show the compendium set for a Mitchell motion picture camera. It is larger than a still-photographer's compendium; but not by much. Such gear ships in it's own equipment case; addding considerably to a photographers baggage. Photos credit: https://calkovsky.com/mitchell-35mm-movie-camera-matte-box-compendium-set-sold/

(Truth told: I, too, packed a full set of CC filters and a Minolta Color Meter II. However, rarely did my shooting situations permit the use of a compendium and even more rarely did I have the time to 'fuss around.' I made basic corrections on location and tweaked them as best as possible when duping.)

In most shooting situations, you will have to live with what you have got (unless your name is Chris Smith). But there are some 'tricks' that will help improve your pictures.

When surveying a room; make note of the primary light source. As discussed earlier; in most offices it will be the fluorescents and/or windows; depending on how close to the windows you'll be shooting. If you are shooting near the windows and the subject is being illuminated by window light, use an 81A and daylight stock. If it is a cloudy day use an 81B or 81C. However, if you are shooting *toward* the window, the subject is probably being front-lit by the fluorescents and back-lit by the windows. In this case you should use a 30M filter. That will correct for the green fluorescents; but also cause the window light to go bluish.

Some offices have recessed tungsten bulbs instead of fluorescents. There, I use daylight stock and either no filter or an 81A. Usually, the daylight will be the strongest source and the little tungsten mixing with it will serve to warm-up the flesh tones; that is not objectionable. If an 80A or 80B was used, that would create a blue-cast to the scene which, to my eye, would not be as 'nice.'

Another problem with office lighting is that it is usually all from overhead ceiling fixtures. Those illuminate the tops of people's heads and create ugly facial shadows. You can easily correct that situation by using G.E. 'Bright Sticks.' Those are self-contained, 20-inch-long (~50 cm), 20-watt, 'warm' fluorescent lights. Importantly, they can be hand held. Tape-together three-or-four (or more) Bright Sticks and have an assistant hold them over the camera when doing office portraits or desk scenes. The fill light from the Bright Sticks will be balanced with the overhead fluorescents (actually, slightly warmer, more yellow; which is a good thing); you will get great flesh tones.

In stadiums and factories illuminated by 'mercury-vapor' lights; use daylight stock with either a 30M; or a 40M + 10Y; or an FLD filter. Mercury vapor lighting has about the same spectral composition as fluorescent lighting; and dealt with the same way.

Some industrial plants have 'strange' yellow lighting. Those are 'sodium lights;' they are like those used by some municipalities for street lighting. For sodium lights; use daylight stock with either a 50B or an 80B filter, depending on how close you are to the windows. The 80B is bluer than the 50B; use that one for subjects being exclusively lit by sodium lights.



Repent; photographed at Burning Man in 2015; using an 81D warming filter on a Nikkor 20 mm lens with daylight-balanced film.

For candle-lit scenes and fires; when the primary lighting is from the flames; you can use either daylight or tungsten film with no filter. The tungsten film will yield slightly warm 'normal' coloration. Daylight stock will render the scene in very warm yellow-orange shades which can, depending on your taste, enhance the candle-lit effect.

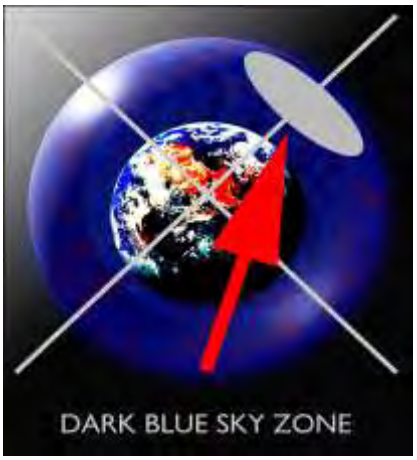
When shooting outdoors with strobe fill; keep in mind that most strobes are balanced at about 5500° K; but the color of direct sunlight—at its high-noon zenith, on the Equator—is 5000° K. Translated, the strobe light is bluer— 'colder'—than sunshine; the strobe light will not be balanced with daylight. The difference is even greater if you are shooting closer to dawn or sunset, when daylight is quite orange. To correct for the strobe's bluishness, place a piece of *Roscosun* 1/4 CTO (light-amber-colored gel) over the strobe light when shooting mid-day; or *Roscosun* 1/2 CTO (deeper amber) if you are shooting around dawn or sunset. In the studio; when all the light is from strobes; use an 81A, 81B, or 81C over the lens to correct for the strobes' blue cast. In all cases, the trick is to determine what type of light is dominantly illuminating the subject matter; then filter for that and forget the rest of the scene.



Raspberry shot for The Stock Market picture agency in 1993; on Vashon Island in the gardens of Bea and Tom Lorentzen using a Micro-Nikkor 105 mm lens with a linear polarizer.

Polarizers are another category of 'must have' filters. Simply put, polarizing filters 'beef up' the color saturation of outdoor scenes shot on sunny days. The sky gets bluer; the leaves get greener; street pavements get darker;' and ugly reflections can be eliminated from shiny surfaces, like cars. The list of polarizer effects goes on and on and on. I rarely shoot an outdoor scene without one.

The effect of a polarizing filter is maximized when the camera is aimed at a 90-degree (or 270-degree) angle to the direction of the sunlight. When pointing the camera toward the sun; or 180-degrees from it; the polarization is minimized. That is, polarizers work best when the sun is to your right or left. When the conditions are right, just twist the polarizer until you see the colors 'pop.' I wear polarized sunglasses to see the scene the way it will appear; if I use a polarizer when shooting.



There are two types of polarizing filters—circular and linear. The difference between these two types involves how light waves pass through them.

A linear polarizer only lets horizontal or vertical light waves enter the filter as it is rotated. Circular polarizing filters pass circularly polarized light waves through the lens but are also sensitive to linear polarized light. A circular polarizing filter is like a linear polarizer but has extra glass behind it called a "quarter-wave plate;" that polarizes light circularly.



These images were part of a 200-frame animation shot for the Saab 9000 World Launch show.
A polarizer was used to intensify the green foliage, darken the pavement, and eliminate reflections from the car.

A polarizing filter does not do much of anything on cloudy days. (On overcast days I use and 81A, 81B, or 81C. Or when shooting at high altitudes, where the light is way bluer, an 81D or 81EF.)

[*Editor*: A circular polarizing filter is can be used with digital, DSLR cameras but a linear polarizer is not. Linear polarizers interfere with auto-focusing functioning and create light metering errors. This means that circular polarizing filters offer great versatility for use with a wide range of camera types.]



This can be a real problem; because as you start to pile-up filters over a wide-angle lens, you start to create a 'tube' over the lens that starts to become visible in the corners of the frame. Such "vignetting" will eventually create a circle mask

To avoid this. do not use a wide-angle lens. Ha! What to do?

Place gelatine filters behind the lens. Do that by cutting a small circle of the filter material; slightly larger than the diameter of the rear lens' element. Then, using a small, fine-pointed brush—the kind you use to 'spot' photo prints—carefully cement the gel disk to the lens-element mounting ring with clear nail polish.

The gels can be 'easily' removed by using nail-polish remover (acetone). Be sure to remove all the excess nail polish from the lens using cotton-buds (Q-Tips) dipped in acetone. Do not saturate the Q-Tips; use very little acetone; be careful not to get it on any lens elements, plastic parts, or your skin; and inspect the lens carefully to be sure no cotton hairs remain.

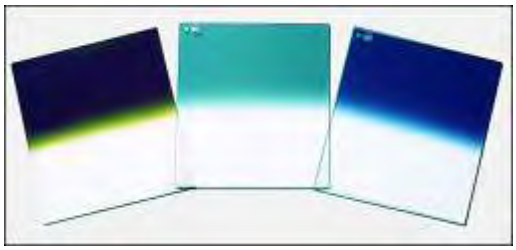
That technique also works well for long telephoto lenses where the focus is severely degraded when you introduce filters over the front lens element. However, those procedures are not for the faint of heart or nervous nellies with trembling fingers; mistakes can be costly.

(Incidentally, did you ever notice that your camera's small screws eventually loosen; especially if you take a lot of airline flights? You can prevent that by tightening them and then placing a drop of clear nail polish over the head of the screw. If you ever want to loosen the screw; remove the clear nail polish using cotton buds and acetone. Note: keep acetone away from plastic parts.)



Left: Tiffen four-inch-square (~10 cm), glass, graduated filters—'soft' above; 'hard' below. When used with a telephoto lens, the hard-edged grad appears soft. Right: A soft-edge grad was used on a Nikkor 55 mm Micro-Nikkor lens to photograph an Arab Wings Lear Jet in Amman, Jordan, for a 1974 brochure cover.

Graduated filters, especially the Cokin series, are especially useful when you want to shoot scenes with the camera aimed toward the sun or a bright sky; yet you want good foreground detail that is not under-exposed or silhouetted. If one 'grad' is not enough to 'knock down' the sun or sky; combine two or three to get the degree of balance that you want.



Colored grads further enhance skies.

Note, however, that graduated filters work best at wider lens apertures; with normal to slightly telephoto lenses. The reason is; the 'graduation' of the filter gets thrown way out of focus with wider apertures and longer lenses; thus 'spreading' (softening) the blend between the dark (or colored) and clear parts of the filter. When you use a smaller lens aperture or a wider-angle lens; the 'line of demarcation' between the darker and clear filter areas becomes narrower and more noticeable.

Graduated filters are also useful when shooting in stadiums at night; when they are illuminated with large banks of lights mounted on the stadium roof. Those lights can create flares in your pictures at the top of your frame. Grads can be used to reduce the flare and balance the stadium lights with the light levels on the playing field. Similarly, they can be used to knock-down overhead office lighting; 'balancing' room illumination.



A four-inch-square (~10 cm) Tiffen Soft Pink graduated filter was used with CC30Y on a 180 mm Nikkor lens to photograph Stockholm church steeples in 1985 for The Stock Market picture agency.

Neutral Density Filters

These filters are useful when you want to shoot at wide lens apertures but there is simply too much light. By introducing an ND3 (minus one f-stop), ND6 (2-stops), or ND9 (3-stops); you can control the amount of light entering the lens and shoot at the desired lens aperture or shutter speed.

On bright days; you often can't get an exposure below a shutter speed of 1/30th of a second or so. By using an ND9 over the lens; you can use 1/4 or 1/8-second exposures; or even longer; ideal for creating 'super streaks' when doing pans or zooms. With those low shutter speeds; it is best to use a fluid-head tripod to avoid 'camera shake.'

On the other hand; some subjects move too fast for a fluid head. Another problem is that you can't 'track' high-speed subjects when shooting streak-pans with an SLR (single-lens reflex) camera; because the camera's mirror is locked in the up position during exposures, blanking the view. (Viewfinder cameras don't have that problem; there are no black-outs.)

To overcome those problems; learn to shoot without looking through the viewfinder. Do not hold the camera to your eye; you can't turn your head evenly or fast enough to keep up with the subject. Instead, hold the camera well away with one hand and hold the end of the strap with your other; to create a kind of radial 'arm' with a 'pivot point.' Practice 'swish panning' on passing cars or passers-by—anything that moves.



Yours Truly shooting streak-pans at the Pepperell International Motocross in 1967 using a 20 mm Nikkor with an ND9. The minus-three-stop filter facilitated the long, 1/2-second exposure needed to streak the bikes.

Neutral-density filters are also advantageous when shooting streaked backgrounds when "panning" with moving vehicles.



Maserati *Bora* was shot in a gravel quarry with a 180 mm Nikkor filtered with ND6, CC30R + CC20Y. As the car drove in a circle around me, I hand-held the camera and used a 1/8th-second exposure. Three rolls were needed to get the perfect shot; with the car tack sharp and the background streaked with 'speed lines.'



John Surtees driving #7 in the 1967 Bridgehampton Can-Am race; shot at ½-second using a 28 mm Nikkor with ND9.

Another application for the neutral-density filters is for selective focus; when you need a wide aperture.



Purple sage blossoms were photographed using a 'wide-open' (f/2) 300 mm Nikkor with ND9 and CC30B.

Filters for Underwater Photography

Underwater photography is its own specialty; and, for most of us, selecting the 'right' filters is a guessing game at best. The biggest problem is that water filters out the red portions of the spectrum, leaving blues and greens. The deeper you go the bluer the light becomes until eventually there is nothing but blue.

When shooting in a pool, or in the sea at depths down to about 10 feet; a 30R or 40R filter will help balance for the blue and create more normal colors. An FLD filter is even better, as it adds a bit of yellow, to warm up flesh tones.



Sandra Sande and I took lessons from Dan's Dive Shop, in Waikiki, Hawaii. I used a Nikonos with a CC30R filter for this shot of her. At a depth of sixty feet (~18 meters). CC30R was not enough red to kill the blue cost entirely.



Pete Bjordahl (left) and Joey Kimball in the pool at the Kaanapali Mariott, Maui, Hawaii at the 1981 Great West Life show; shot with a Nikon FTN camera in an Eva Marine underwater camera bag. The lens was a 28 mm Nikkor with an FLD filter.

If you are in a pool painted blue; you are never going to get rid of all the blue even if you use tons of red and yellow filtration. In this instance you have the water filtering the red out of the light, creating blue light that is being reflected by the blue-painted pool—you are shooting in a totally blue environment. To get the colors right; you would have to illuminate the subject with an underwater strobe

In the sea, however, the 30R or FLD will correct well down to about 10 feet. From 10-15 feet, a 40R or 50R will be needed; possibly with 10Y or 20Y. Beyond about 15-feet; be prepared to suffer bluer and bluer pictures as you dive deeper. The only way to get normal coloration in underseas shooting is, like the blue pool, by using underwater strobes to illuminate the scene. Since using those is very tricky; I would suggest you hire a professional underwater photographer; who is very experienced in underwater lighting; to either shoot the pictures for you (best idea) or, at very least, be a consultant; possibly diving with you for the shoot.

A more common circumstance is shooting in large marine aquariums; when you shoot through large windows into artificial sub-sea environments. Such aquariums normally have a depth of about 15-feet (~5 meters); thus filtration of 30R, 40R, or an FLD filter, will work quite well; and that is about all you can do to easily correct for the blue underwater light.

On the other hand, there are many circumstances where I have shot aquariums or underwater scenes and not used a filter; because I wanted to retain the blue-cast to emphasize the fact that the pictures were shot underwater.



A composite of undersea creatures and flora assembled from pictures taken at Scripps Oceanic Aquarum (San Diego, CA) The Aquarium of The Pacific (Monterrey, CA), the Oregon Coast Aquarium (Newport, OR) and, of course, Vancouver Aquarium. The elements were shot under too many different lighting conditions to elaborate on; however, very little filtration was needed because most of the tanks were not very deep.

There is a useful, multi-purpose, 'goody' you can get for all kinds of wet work—underwater photography; shooting in torrential downpours; shooting 'splash sequences;' any condition that might soak your camera.

It is a heavy-duty plastic bag that is made to fit all commonly available 35mm cameras—including motor-drive units. The bag has with two 'portholes' (one for the camera lens; the other for the viewfinder. There are interior-mounted gloves with which you operate the camera.

The $75 bag, made by EWA Marine, is far less costly than an underwater camera or solid housing; and although it is a little cumbersome to use, it's a great alternative to those expensive alternatives. It is especially useful for multi-image photographers since it can house a motorized camera, allowing you to shoot sequences that would ordinarily require a custom-made camera housing costing several hundreds—even thousands—of dollars.

The EWA bag is ideal for 'surface' work down to about 10 feet as well as any terrestrial sequences which might risk the camera getting wet. I would not trust it below ten feet, though; and I would certainly recommend that you carefully test the bag every time you open it and re-install the camera (when changing film). Make sure that there are no leaks!

Using the Ewa Marine bag is not problem free. There are the annoyances of having to resurface and dry it off to reload the camera. Of course, that is the 'case' (sorry, couldn't resist) with any underwater-camera housing. To alleviate the reload problem; I use two bags, each equipped with a matching camera and lens.

Keeping the camera oriented correctly—to shoot through the lens porthole and see through the viewfinder porthole—is challenging; especially near the surface, where you get tossed about by waves. Likewise, manipulating the f-stop aperture is also a challenge. Shoot all brackets as entire sequences; rather than trying to bracket frame for frame during a sequence; and use a 20 mm lens, to have deep depth-of-focus.

Underwater there is less light than on land. You will find yourself operating in the range of 1/60th-second at f/5.6 when using ASA (ISO) 64 stock. Since it is hard to hold the camera steady underwater; and since the amount if light is restricted; you need a good shutter speed of at least 1/60th and as much depth of field as you can get.

Collapsing the bag as much as possible before sealing it up makes it easier to work with; otherwise, with lots of air trapped inside, it becomes a 'bubble' that wants to float to the surface; making it hard to control underwater. Holding your breath; you are a big bubble too. The bubbly combination of you and the camera may not sink to the depth you want; you might have to wear a weight belt and/or weight the camera bag (use fishing sinkers for that).

If you are going to get seriously involved in underwater photography; take a scuba-diving course. Scuba diving and underwater photography may seem simple; but there are a lot of inherent dangers to your well-being. On top of that; to rent scuba tanks from a reputable shop you must be a certified diver. And I would be mighty careful about strapping-on a bunch of weights; sinking to the bottom; without an air tank.



Yours Truly and Allan Seiden dove at Hanauma Bay State Park, Oahu.in 1982.

By and large, lighting techniques for multi-image photography do not differ substantially from those used in still photography. However, some techniques lend themselves to our medium more than others

One is careful control over contrast ratios. In multi-image, flatter lighting is generally better because we are using reversal stocks; more contrasty than negative films.

In addition, we are often duping our slides both for effects and to create additional copies of our shows. In fact, a picture may be several generations away from the original by the time it gets on the silver screen. In such cases; flat-contrast lighting is preferable; because every time a slide is duped it picks up contrast; usually between 5 and 10%. What that means is that; every time you copy a picture; you are losing about one segment at each end of a gray scale.

Say you have a 'perfect' slide of a gray scale (below). When you dupe it, you pick up the contrast. In the first dupe the 5% gray tone will become white, and 95% gray will become black. If you dupe the dupe, 10-20% gray will become white and 80-90% will become black. Each time you dupe, therefore, you are losing subtleties at both ends of the gray scale. And so, it goes with the contrasts of each color.



As a picture is repeatedly copied, fewer and fewer intermediate shades remain.

Since that contrast kick is inevitable; you can minimize its 'negative' effect on your dupes by making sure that your lighting ratios are flat enough; so that you maintain shadow and highlight details when the slides are duped (unless such detail really does not matter). The way to accomplish that is to make sure that the differential between the brightest part of the picture and the darkest part does not exceed four f-stops.

Understanding the "latitude" of film is critical to the conceptualization of lighting ratios. Latitude is the films' ability to record the extremes of light and dark in a scene. Most color films have about a four-stop *usable* range of "latitude."

Every film has a specific Exposure Index (EI) also known as its ASA or ISO speed. [*Editor*: ASA = American Standards Association. ISO=International Standards Organization.] The speed of a film is related to the amount of light necessary to record an image at a given f-stop.

In the motion picture industry; light intensity is measured in "footcandles." It is sad that still photographers never used that system of light measurement; because it is much easier to understand than the shutter speed/f-stop readings we get on 'our' light meters.

A footcandle meter is kind of like a thermometer. When you measure temperature using a thermometer; it tells you the amount of heat. In like manner; a footcandle meter tells you the amount of light.

The EI or ASA of a given film relates to the amount of light needed to record an image. That amount of light is, technically speaking, the amount of light needed to record an 18% gray subject as an 18% gray value (with normal processing).

The aperture of the lens—which photographers speak of as "f-stops" and cinematographers speak of as "T values"—affects the amount of light reaching the film. Thus, cinematographers will talk in terms of the number of footcandles needed at a given T value (or f-stop).



18% gray cards are inexpensive and indispensable.

What is primarily different between cinematography and still photography is that; motion pictures have a fixed shutter speed of approximately 1/50th of a second (unless you are filming in slow or fast motion). With a fixed shutter speed, the only way to control the amount of light is via the aperture. Cinematographers thus relate their exposure requirements to footcandles per T value; that is, say, at T-8, 'X' footcandles of illumination are required if using a film with an EI of 'Y.' Lighting is adjusted to get T-8 with that film.

In still photography; you can also control the amount of light by varying the shutter speed; so we speak in terms of f-stop and shutter-speed combinations. The combinations must yield the proper exposure for the film being used and relate to the footcandles of illumination available. Let us look at an example:

Say that; using a filmstock with an EI of 100; we require 100 footcandles of light if our camera exposure is set for 1/50th of second at f/5.6. Now, if a cinematographer had to use f/8—say for extra depth of field—they would have to double the number of footcandles of light illuminating the subject; because the shitter speed could not be changed. Still photographers would not need additional light because they could shoot at a lower shutter speed; say a 25th or 30th of a second; making f/8 possible.

As you can see; there are a lot more ways to control the footcandles of light reaching the film in still photography; than there are in cinematography.

The latitude of a given film relates to the *ratios of footcandles* required for a minimum exposure (to get any image at all) and a maximum exposure (maintaining highlight detail before everything 'burns out' to white).

I mentioned before that most color films have a latitude of four f-stops. If we were photographing an 18%-gray card and underexposed by 2 f-stops, the card would appear black; and if we overexposed by two stops, it would be white. From black (no exposure) to white (full exposure) the latitude range is four f-stops.

In practical terms; we are seldom asked to shoot an 18% gray card and reproduce it faithfully as 18% gray. Our subjects usually have varied ranges of colors and contrasts; and our lighting situations are equally varied.

In 'normal' photographic situations; the film's latitude affects the *difference* between the amount of light reflected in the shadows and highlights. If the film's latitude is four stops; that means the amount of light reaching the darkest area and lightest area cannot have more than a four-stop differential—or else something has got to give (either shadow detail or highlight detail).

Using a film with a four-stop latitude; if the amount of light reflected off the shadow areas calls for f/4, then the maximum allowable light reflecting off the highlight areas cannot exceed f/11; if it does, you will lose highlight detail; or shadow details, if you expose for the highlights.

When you use your exposure meter; it is important to remember that the meter doesn't know what you are trying to do. Nor does it know the color of the subject; whether it is white or black or gray; or what shades and colors you are trying to capture. Frankly, the meter is dumb. So, what is it telling you?

The meter is telling you that if the subject is 18% gray; and you want it to appear 18% gray; you should use the exposure it has determined. No matter what you point your meter at, it will tell you how to make it 18% gray.

Thus, if you aim your meter at a white sheet and it says f/8, you must say to yourself: "Aha! That is if I want the white sheet to be 18% gray. But I do not; so I will use a lower f-stop; say, f/5.6 or f/4." Or, if you are aiming the meter at a black cat and it says f/8; the 'real' exposure is likely to be something closer to f/11 or f/16. The meter is trying to make the black cat gray.



You can get a preview of the contrast range of a scene by looking at it through a so-called "viewing glass." Those are used by cinematographers and movie-lighting directors to evaluate the contrasts of a scene. It works this way: After setting the illumination for the lighter parts of the scene, the viewing glass is used to look at the shadow areas as they are lit with "fill light." When the shadow details can be seen through the viewing glass, they will appear in the film negative; and, more importantly, be visible in prints of the movie made from the neg.

You can use a viewing glass for the same purpose. If you do not have one, look at the scene through 'squinted eyes.'

Yours Truly demonstrating the use of a cinematographer's viewing glass, in 2010.

Let us look at another example to see how lighting ratios can be brought into the film's latitude range. We will use a conventional three-light portrait setup. That includes a "key light," to illuminate the face, usually at 3/4 angle; a "fill light" to "open up" the shadows; and a "hair light" (back light) to add highlights to the hair. In our final picture; we want the key areas to be properly exposed. We want to see details in the shadows; and the highlights in the hair should appear bright and 'sparkling.'.

If all the lights are of equal intensity and equally far from the subject; we would have flat lighting ratios. That is, the same amount of light would reach the subject from each light; and the resulting picture would have few shadows and highlights; because the same amount_of light is hitting the subject from every direction. To achieve highlights and shadows, we must vary the amount of light—but how much?

First, measure the amount of light provided by the key light; we will say that it calls for f/8. Now, turn on the shadow-fill light and move it back until the meter reading in the shadows is *less* than the key light. Then, move the hair light closer until the reading is *more* than the key light. Assuming that the flesh tones lit by the key light are "mid-range" (refer to the middle of the gray scale pictured on page 2904), and that the latitude of the film is four stops; if the exposure for the shadow-fill light fell below f/4, the shadow area would go black; because it was below two stops of the mid-range tone exposure (f/8). Likewise, if the exposure of the highlight area exceeded f/16; the hair lit by that light would start to go solid white, 'burned out;' because the highlight exposure exceeded the mid-range tone exposure (f/8) by more than two stops. The ideal lighting ratio would have the shadows at f/5.6, the hair highlights at f/11 and the key light areas at f/8. That yields a portrait that looks a bit 'flat' but is suitable for copying and/or printing.



Every time you copy a picture, you pick-up about a quarter- to a half-stop's worth of contrast kick; as mentioned earlier. Using the portrait in our preceding example; when copied, the shadow areas will 'kick-down' to appear as if they were shot at f/5.6-f/8. Likewise, the hair highlights will kick-up a bit, appearing as though they were shot at f/11-f/16. The next duping pass will further increase contrast: the shadows will look as though they were shot at f/5.6 and the highlights as though they were shot at f/16.



An example of contrast build-up; the portrait of my wife, Pamela Swanson, was made for her actor's 'head sheet.'

In other words, the shadows will keep on getting darker and the highlights will keep on getting lighter. The flatter the original (in terms of the ratio of light between light and dark) the better it will dupe. This is an extremely important consideration insofar as you rarely want to send your original show out on the road; thus, you will likely be duping every slide in the show at least once.

Before I got into multi-image; I was a magazine photographer with a reputation doing multiple-strip-in photo compositions—collages. I cut-out various elements of different photos; then pasted them together and re-photographed the collage to make the final print. (See example; overleaf.)

Knowing that I was going to re-photograph the collages—losing up to 20% of my grays at either end of the gray scale (10% when making the copy neg, and another 10% when making prints from it)—I made sure that; when I was printing the elements for the original composite; the darkest 'black' was 80-85% gray and the 'whitest' white was about 10-15% gray. The contrast kick in the re-copying (duping) could be counted on to make the 10-15% gray areas white and 85-90% gray tones black; with additional changes through the rest of the range.

The same thing holds true in color-slide photography; only more so; because color-reversal films have less latitude than negative stocks. The films with the greatest latitudes are black-and-white. Those with the least amount are high-speed, color-reversal stocks.

So, to create a color slide original that can 'successfully' be duped at least once and probably twice; make sure that your ratio of lighting is no more than one stop below the median average exposure for the key light area. Such ratios are easily obtained in studios and controlled lighting situations. Outdoors, Hollywood movies are produced with a lighting crew on hand to balance lighting ratios. Maybe you should, too?



The Transpo-72 exhibition was the subject of this six-element 'strip-in' job for Car and Driver magazine. First, the jets were printed into position on a 16 X 20-inch (~41 X 51 cm) sheet of Kodabromide F2 paper. The five elements pasted on top—the overhead "sky cab (1) carrying the US Secretary of Transportation (2); the train, including the foreground (3); the car (4); and the Goodyear blimp (5)—were printed on single-weight paper, to facilitate cut-outs. The edges of those cut-outs were lightly sanded with the finest emery cloth, to bevel the edges and make them less visible when they were pasted onto the base print (using One Coat rubber cement). The edges were pressed in so as not to reflect the camera-stand copy lights. Edges of dark areas were also painted with gray shades of Dr. Martin's Dyes, to enhance the blending. To copy the collage—a job that was done by Modernage Photo Labs—the 16 X 20 artwork was placed in a vacuum stage, under glass, to squeeze the collage together; then photographed with a 4 X 5-inch (~10 X 13 cm) camera. The last step was the preparation of release prints from the 4 X 5 master (copy) negative.

The lighting director's job is to make sure that the original negative has the proper contrast ratios to successfully undergo at least three duping steps:

- First, a CRN (color reverse negative) for opticals
- Then a CRI (color reverse inter-neg) of the opticals
- Finally, release prints of the CRI

Cinematographers have the benefit of using negative stocks which have more latitude than the reversal stocks that we normally use in multi-image.

When we shoot reversal film and then dupe it on 5071 duping stock; we must keep these same considerations in mind. That is; we are going to kick up contrast and must therefore shoot low-contrast originals (whether on location or on the rostrum camera) to be able to successfully 'print' (dupe) release versions of the show.

Flat ratios are even more important if you are shooting for a show that will eventually be transferred to film and video. In those cases, you might up end up six or more generations away from the original by the time anyone sees the final film or video.

Consider:

- First the original slide is perhaps duped into position with a special effect.
- Then the duped slide is reshot onto motion picture stock.
- That movie original is re-duped into a CRN for other opticals.
- Those are reshot to create a new negative.
- A and B rolls may be recombined to create a single strand CRI.
- A print is made of the CRI.
- Finally, the resulting film may be transferred to video.

Count them, folks; that is six steps from the original—or, a contrast kick equal to a stop and a half or 2 stops in the highlights and shadows. Although the above is an extreme example—usually a slide show is shot directly to film or video, not both—the idea is to shoot with flat lighting ratios. Whether you are in the studio or on location; use fill lighting whenever possible to achieve the flat contrast range you need to get the final image looking its best. Balance your lighting ratios according to what the final product will be.



A simple collage made for Executive Jet Aviation's 1974 Christmas card.



A lot of multi-image effects depend on having the subject appear in "limbo;" against black, white or any solid color. In multi-image, black is the preferred limbo BG for a simple reason: it does not show dust. Slides with white backgrounds (or any light color) are always problematic and require extra attention to keep them looking clean. That is why I say, "Black is beautiful."

There are two ways of achieving true limbo: either shoot the subject against a black background or mask the BG out. For now, we will talk in terms of achieving limbo in the original photograph. In a later chapter we will talk about masking.

The basic question for creating a limbo BG is; "What is black?"

As already discussed, anything underexposed beyond the film's latitude will appear black; and that is the key to achieving limbo on your original shots.

Even if you shoot against black 'seamless paper,' it is unlikely that the background will appear black in the finished slide; that's because seamless paper does not photograph as black; it appears dark gray—unless it is far enough back from the subject that the exposure for the background is beyond the film's latitude. That means; the amount of light falling on the black seamless background should be at least one stop less (preferably two) than he amount falling on the subject. This is achieved by getting the seamless paper well back; and "flagging" (baffling) the lights to prevent any from 'spilling' onto the background seamless; getting a 2:1 ratio.

When shooting small objects, such as jewelry; limbo can be accomplished by shooting the subject on a large sheet of glass and placing the black seamless (or any background) well behind the glass. [A polarizing filter can help reduce or eliminate reflections.]

Small and medium-sized subjects can also be affixed to a long pole which holds them out in front of the black seamless. The subject must be carefully positioned in the viewfinder; to keep the projecting pole behind the subject, so that you cannot see it. A pole arrangement like this can also be used to create a 'floating platform' on which you can rest heavier items, like typewriters, small appliances, machine parts, etcetera; things you cannot directly attach to the pole itself. (See illustration; page 2919.)

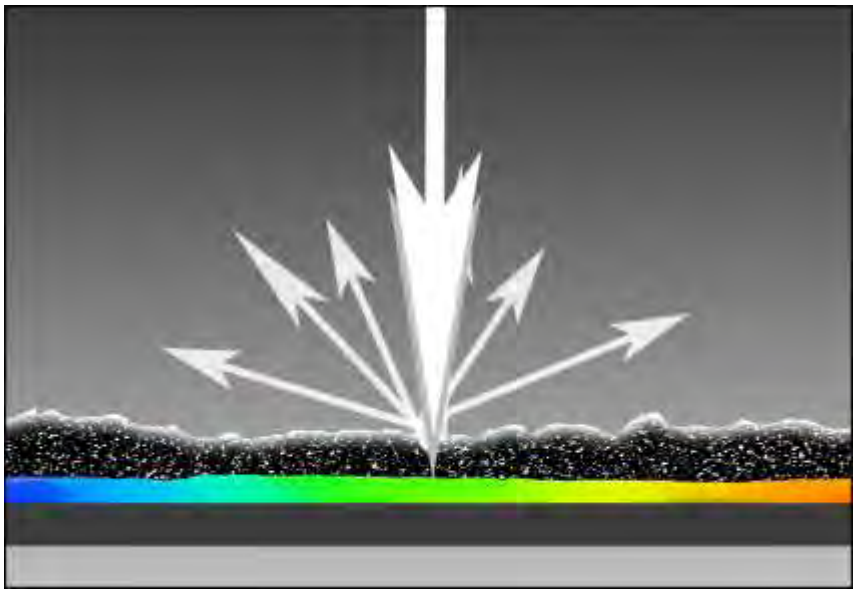
Possibly, you should substitute your background material. A better substitute for black seamless is black velvet; that really soaks-up the light and photographs as true black (when draped without any light-reflecting folds). The only problem with velvet is that it is prone to picking up dust, lint and other dirt; that is hard to get off. The best bet is to carefully glue the velvet onto Masonite and create a curved "cyclorama" background. The purpose of gluing the velvet to the Masonite is to permit easier cleaning. With the Velvet glued on a hard surface; it can be briskly brushed with a lint-remover, or even vacuumed.

Another substitute for black seamless is black Plexiglas. Any highly polished black surface will photograph 'blacker' than one with a matte finish. For small items, you can use black "Flint" paper. However, the highlights of shiny subjects will reflect in the shiny black plex or paper if not properly lit. [*Editor*: a polarizing filter may help reduce the reflections. On-lens polarizers can be used in conjunction with others placed in front of the lights.]

The trick is to get the black background far enough away from the subject to under-expose it. If you have large, heavy items, like cars, you may have a problem. In those cases, paint the cyclorama with matte-finish black paint and try to light the car in a way that avoids light spilling onto the black surroundings.

Sometimes, of course, that is impossible. For example, take the car's tires. You have black rubber tires against a black floor; the floor and tire color are virtually the same. In a situation like this you should blanket the floor with sheets of black velvet that extend well beyond the subject in all areas visible in the field. If the black velvet extends far enough back into the set, the point where it overlaps the black-painted cyclorama will be in the 'underexposed zone' of the background; both will merge as true black. With that technique you have a 'blacker' (velvet) floor area around the tires; that allows you to pump more light onto the tires without revealing the floor; getting the car into limbo while holding tire details.

Another favorite trick is to make the subject 'less black.' Again, tires are a good example. In 1974, I had an assignment shooting Fiberglas-belted radial tires for Owens Corning Fiberglas. It was a royal pain in the ass; but I learned a lot about shooting black on black.



First the tires were sprayed with Krylon "Dulling Spray." It puts a thin (removable) film on bright or glassy objects; making surfaces 'rough;' scattering light (right); thereby reducing the shine or glare.

The spray worked for some views, particularly close-ups; but not for the long shots, which required a shorter exposure. For those long shots we spray-painted the tires with matte-finish, dark-gray paint; so, the tires were not black.

The hardest scenes long views of the front and back of the car that revealed the tire-tread pattens. Whenever we pumped in enough light to see the treads; there was so much light under the car that it spilled-over onto the floor, breaking limbo and looking 'strange.' We ended up spraying the treads with lighter gray paint which brought out sufficient tread detail while retaining the black-limbo look we were after.

Black subjects generally need a bit more light; just to 'see' details in the film. Shooting black-on-black is an exercise in creating a background that is *blacker* than the black subject matter; then lighting it in such a manner that you create a 3:1, or 4:1 ratio lighting ratio. If the amount of light required for a black subject is, say, f/8, then the amount of light falling on the background should be reduced until the meter reading is f/11 or f/16.



Sue Keeton photographed in 1972 for Vidal Sassoon. Shot with a Zeiss 120 mm lens and Softar #1 filter.

Another trick for black-on-black photography is to provide a lot of backlights; to define the edges of the subject and thus help 'lift it out of limbo'. (See picture, above.) Backlight emphasises the outer edges of the subject and helps to separate it from the background. In addition; if you choose to create a mask of the subject for added background density (discussed below); the backlit edges will make life a lot simpler because the subject will be more clearly delineated from the background; making rotoscoping far easier.

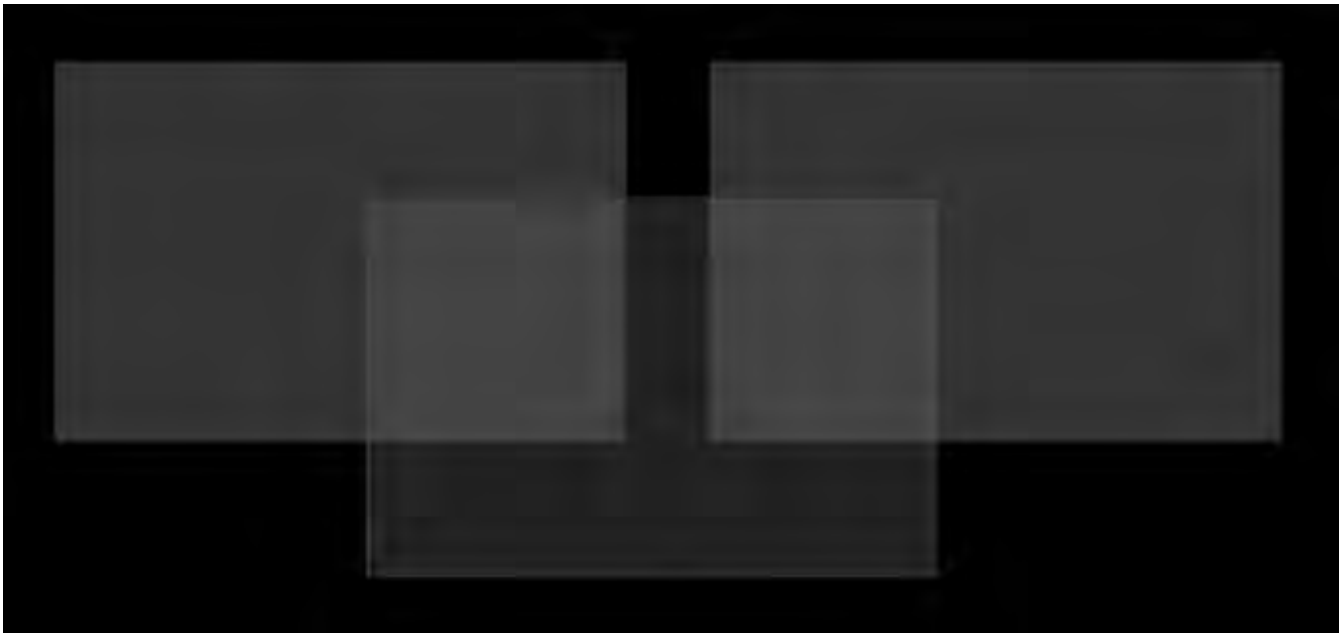


Figure study of Andrea Suter photographed in 1969 at the 23rd Street studio.
When shooting white limbo, the background should be flooded with more light than the foreground.

'Film Black' Versus 'True Black'

It is important to remember that color film does not give you true black. That is; even if you never exposed the film, the processed slides will not be 'black black' (even though they look that way). Hold one up to a strong light; you can see through it.

'Film black' is a dark shade of green or greenish-brown. That is a problem in multi-image that must be dealt with.



The problems begin when you start to overlap slides on the screen, as can be seen in the illustration; above. As one 'black' slide overlaps another; there is twice as much 'film black' in the overlapping areas; those become quite visible. Worse; when you start 'piling up' a lot of slides on the screen; the 'black' areas get lighter and lighter—hardly black limbo.

That becomes especially annoying when you are transferring a show onto film or videotape; because the 'black' background can become bright enough to be noticeable in the transfer.

That can also happen when duping several effect elements into position; compositing them into a single slide. On the resulting composited dupe; you may be able to see the original slides' 'black' backgrounds; appearing as dark-greenish rectangles. The only way to correct that situation is to either create a 'density mask' and bind that in with the slide; or double-mount two film chips of the same image into a single slide mount.

The object of both methods is to create a second, registered piece of film that adds extra density to the black areas in the image; so that no light will 'seep through' the film black of the original slide. Such masks do not have to be super 'thick' (dense); they can be thin— 'ghostly'—because the small amount of added density in the dark areas is all that is needed to create 'true black.'

[*Editor*: Adding to the relativity of 'black;' one must also consider the illumination in the slide-show viewing area. Even in a professional theater, there is a degree of ambient light that reflects off the screen. The first place you notice it is in the darkest areas of the projected images.]

If you need dense, 'black-black' masks, then shoot them on Kodalith, Kodaline or LPD4 films; those stocks will give you a truly opaque black. However, they are 'line' films (very high contrast; no grays; just black and white) making them great for type, graphics and hard-edged subjects; but inappropriate for 'continuous tone' images. Furthermore, those films are 'orthochromatic' (aka 'Ortho'); they are blind to red.

For example, if you have a portrait of a girl with fluffy hair, a Kodalith, Kodaline or LPD4 slide mask would not have the latitude to pick-up the subtleties of exposure around the fluffy hairs; to say nothing about not 'seeing' red. [*Editor*: Kodaline is the same as Kodalith, except it has an Estar base making it more dimensionally stable; that helps avoid mis-registration due to film shrinkage. LPD4 is also Estar based.]

In that type of situation; you should create your mask on 5302 (Fine Grain Release Positive film) or Pan Masking Film. Those are the same stocks used to create contrast masks for duping; and soft-edged (gradient) masks for wipe effects (which we will discuss in the next chapter).

Using this method, you first contact the original slide onto 5302 (or Pan Masking film) using a Marron Carrel film-contacting strip or similar device. A strip of unexposed 35mm film, is placed emulsion up and secured on registration pins (three along one edge of the film and three more along the other). The strip of film with the images being contact-printed is placed on the pins, emulsion side down; in contact with the unexposed-film emulsion. A cover glass (clear Plexiglas, actually) squeezes the two emulsions together. Emulsion-to-emulsion contacting ensures that both images are exactly the same size.

The first contact will yield a negative. The negative should be exposed and processed to achieve good dark grays in the original's lighter areas; with a perfectly clear background. This negative is then re-contacted onto 5302; this time exposed and processed to create a 'thin' positive.

Again, it is not important that the background of the mask be solid black. All that is needed is a light-to-medium gray which will add sufficient density to the background of the original slide to achieve true black. When re-contacting the negative mask, to create the positive; underexpose it a touch and/or underdeveloped it. The subject area of the mask should appear totally clear.



Ektachrome 64 original



5302 Negative



5302 Positive

For the "double mount" method the original is contacted or shot 1:1 onto duping stock to create an over-exposed version of itself. In the overexposed dupe; the subject will be significantly lighter than in the original; but the black background will retain sufficient density that when sandwiched with the original (double mounted), it adds enough density in the background to kill any light seepage through the original's film black.



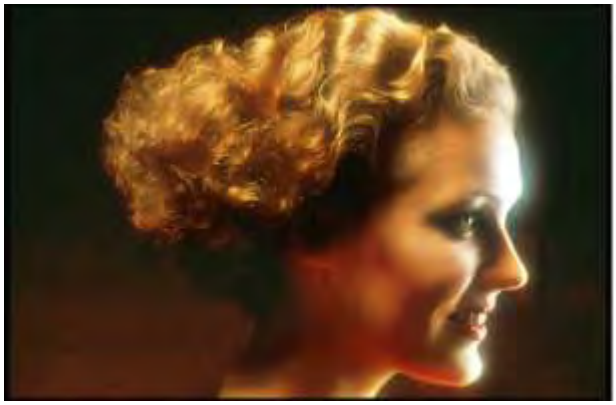
Ektachrome 64 original



Overexposed dupe of original

Double-mounting is a far less desirable method because the light areas pick-up density as well. Whites will not be white anymore; they will take on the color of the films emulsion and backing material. Kodaline, Kodalith and LPD4 have colorless backings; color-film backings have a pale color cast that you do not really notice until you double it up.

Both methods are tedious and require a bit of 'fooling around' to come up with just the right densities to achieve the boost desired in the background without impinging on the subject matter. Once you get the knack of it; masking can be very effective way to achieve true black limbo on screen; when transferring; or when duping into position.



Ektachrome 64 original



5302 Negative

While on the subject of masking: Reducing contrast is done with a 'contrast Mask' that is a thin negative made by contacting, as above, then sandwiched with the original when printing or duping.

(I suppose you could use it for a projection effect; maybe a weird transition style; but the brightness would be very subdued, especially in the highlights.)

As discussed earlier, achieving a black background is as much a product of reducing the amount of light on the background as it is using black-colored background materials. By sufficiently reducing the amount of light reaching the background, it is possible to make a white seamless background appear as black! And that is the key to self-masking.

Take, for example, a shot of a cereal box which we want to 'float' in various changing backgrounds. To accomplish that sequence we must make a series of positive and negative masks that are 'windows' for the product and its various backgrounds.



These masks can be created by using a-Creatron *Slide Analyser* (right) to "rotoscope" the photograph of the cereal box.

Using the Analyzer; the picture of the cereal box is placed in a slide holder on the stage, beneath a mirror box. The image is projected upwards and reflects off the mirror onto a 14-inch-square RP screen (~36 cm) that can accommodate 12-field cels mounted on Oxberry registration pins, horizontally or vertically.

The artist traces the image onto suitable material (tracing paper, vellum, or frosted acetate) taped to a transparent, registration-punched, mylar or acetate cel. A positive Kodalith of the rostrum-camera's grid is bound with the slide of the cereal box and several coordinates are marked on the traced image; those coordinate points are used to line-up the artwork with the rostrum-camera's reticle grid.

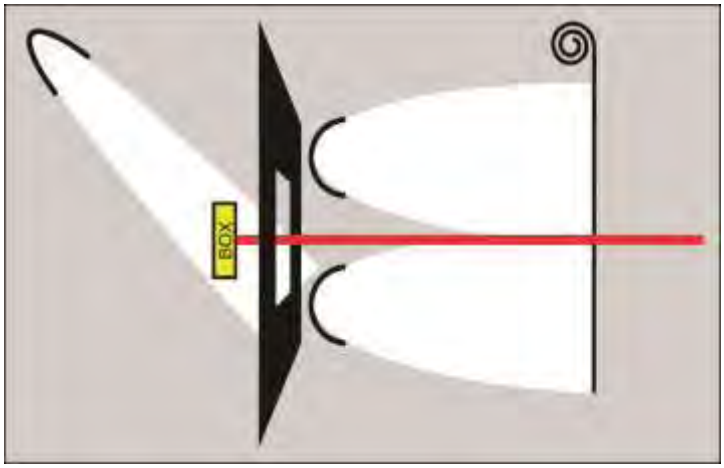
A special-effects slide is projected on the screen of a Creatron Slide Analyzer at Incredible's New York studio.

Or, you can simply use the cereal box in a 'self-mask' studio setup. The self-mask method is more accurate than rotoscoping; because no artwork is involved; subjects mask themselves. Here is how to do it:

The cereal box is first emptied (to make it lighter) and firmly affixed to one end of a long pole. The other end of the pole is inserted through a small hole in white background paper; and secured behind it. Looking directly at the front of the box; the pole cannot be seen. Using an 8-foot pole [~2.4 meters], the white BG will be about six feet [~2 meters] behind the cereal box (allowing about two feet [~60 cm] of the pole's length for anchoring; behind the seamless).

The cereal box is spot-lit from the front; the spotlight's direction is such that it hits the box on a 45-degree angle from above and slightly to the right or left. Any light from that front spot should be flagged(baffled) so that no light spills onto the seamless background. (See illustration; overleaf.)

The baffling is done by cutting a 'picture window' into a sheet of black seamless through which the cereal box protrudes. In addition, black velvet is laid on the floor to 'soak-up' any light that spills onto it. No light should reflect onto the background seamless. Behind the black, picture-window baffle, lights are aimed at the white seamless background and positioned to avoid spilling onto the cereal box. Now, we have one set of flagged lights illuminating the box and another the background.



If the front spot is used exclusively, the white background photographs as black; and if the background lights are used exclusively the product is silhouetted against bright white seamless.

With the lighting in place; the camera is first loaded with color film and bracketed exposures of the product are made with the front spot only. Then the front spot is shut down and exposures are made on Kodaline or Kodalith with the rear lights only; to create a 'hi-con' (high contrast) negative mask. Alternatively, on 5302; using a diffuser on the lens, for a 'soft edge'. The neg mask is then contact-printed to create a pos mask.

Or, while on the set; the pos mask can be shot on LPD-4, a high-contrast *reversal* black-and-white film that is extremely useful in mask-production, for obvious reasons.

I suggest that you shoot the product on color film before reloading the camera with the masking films—in case you accidently move the camera from its original position when reloading; the color shot can be contacted into Kodaline and/or LPD4 to create the masks.

Simple enough, eh? (Ha!)

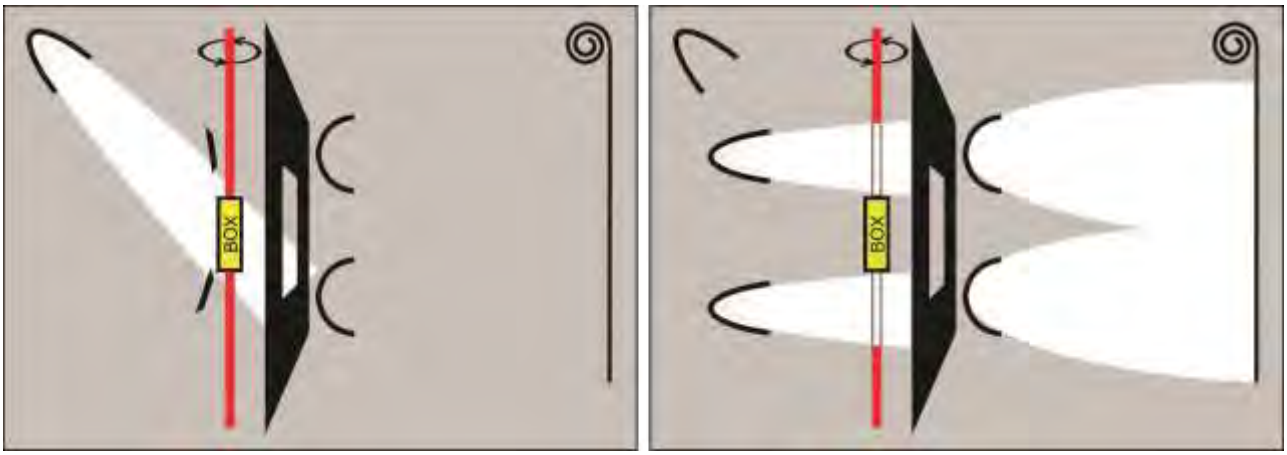
Of course, not all products are small enough to deal with in the manner illustrated; but for those that can, this procedure will save countless hours of rotoscope art preparation to create the masks necessary for special effects work.

The self-mask process is also useful to shoot scenes of products that will be animated. Let us take the same cereal box, for example, and shoot a "flipping zoom" sequence. The box starts at 'infinity' and zooms toward the camera while flipping end-over-end.

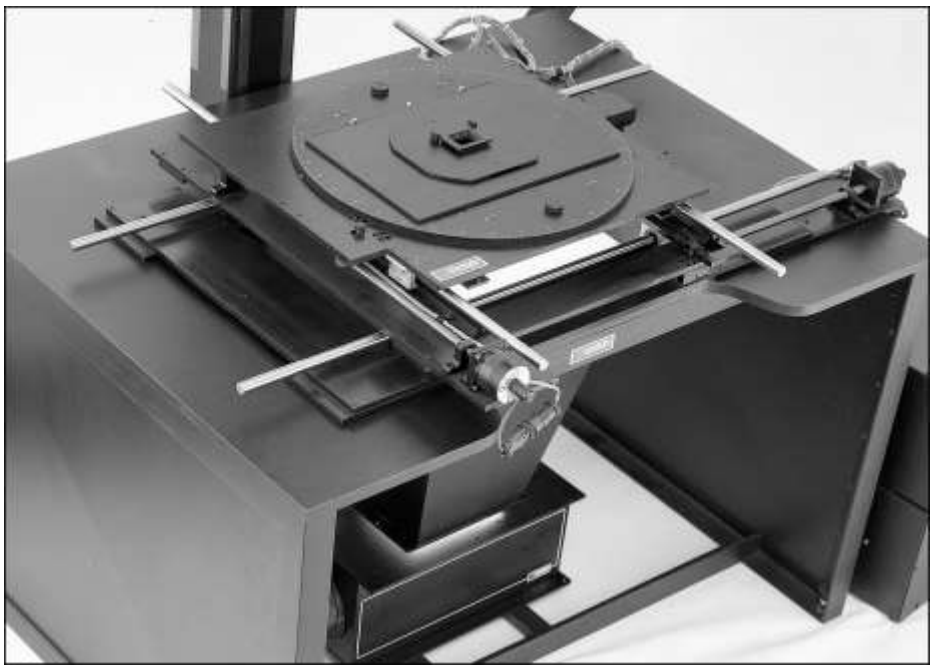
Rather than mount the box on a pole behind the box; we mount it on a pole that is run through the box and secured by two pole-cat claws on the left and right. The poles are painted white. The lighting rig remains the same; except that extra flags are used to shade the front of the box; and two additional spotlights are carefully positioned and baffled to illuminate the camera-facing side of the pole (not the product) during the mask exposures.

The pole sections visible in the frame are first covered in black velvet (which is simply draped over them) and the box placed into position 'A'—right-side up. The initial exposure is with the front spotlight only; being careful to minimize any spill light reaching the black-draped poles. (Left picture; below.)

(The flags being used to shield light from the poles should be as close to the poles as possible without being visible in the shot. That will 'sharpen' the flags' shadows. If the flags were closer to the spotlight; their shadows would be softer and wider; making it harder to keep spill light off the product.)



Then the front spot is turned off, and the lights illuminating the poles and white background seamless are illuminated. The black velvet is removed from the white poles and the silhouette-mask exposures are made. (Right picture.) This process is repeated, rotating the box on the shaft. The result is a series of color shots and masks of the box in each of its rotation positions.



A Marron Carrel MC-1600 compound table base rigged with a slide-copy compound.

To achieve the zoom aspects of the move; the rotating-box images are subsequently duped into position. For the duping; each color slide of the box is sandwiched with its positive mask (black field with a clear "window" through which we see the box). The size of each rotation step is controlled by raising or lowering the rostrum camera so the box gets bigger with every rotation step. To make sure that the slide and its mask are in perfect register; you must use a slide stage with registration pins such as the Forox #602 stage, the Double "M" Industries stage, or similar product. (See pictures; below.)



Double M Industries (above) and Marron Carrel 35mm compound tables.

"Can't You See Your Mother, Baby, Standing in The Shadows?"

With multi-image; it would be easy to illustrate that line from a Rolling Stones song. Interesting effects can be created by shooting scenes with heavily shadowed areas and then projecting other images (pictures, type, or graphics) into the shadows.



One of the most beautiful examples of this I have ever seen was created by Allan Koslowski for a Ford launch produced by Purchasepoint in London. Allan had shot an ocean beach at dawn using a wide range of bracketed exposures; all with the camera locked into position. The first exposures were made before the sun came up; those were long time exposures of the waves breaking illuminated by moonlight. The breaking waves looked like rolls of fog against the black night sky. Then, as the sun came up, exposures were made to silhouette the foreground sea against the bright sunrise.

Allan Kozlowski; photographed in London, 1979.



Projection rig for Kozlowski's Ford launch show; 18 slide projectors, two-plus-one panorama forma (6/6/6), with a 16mm motion-picture projector for the center screen.

The two scenes were then DX'd together to create a very surreal dawn sequence in which the sun rose over a sea of rolling fog. The sun scene filled the (black) night-sky area of the fog-roll exposures; and the fog-rolls filled the dark foreground of the sunrise exposures. Neat!

Those sorts of images can be created by shooting with intentional shadow areas; then double-exposing other scenes into those shadows. To accomplish that, you can either shoot through dawn or sunset while on location or, in the studio, light your subject for strong shadows; then rotoscope the finished slide(s) to make masks that will permit you to DX anything into the shadow areas.

To digress, for an 'inside baseball' story: I had the pleasure of freelancing at Purchasepoint, 'along side' Alan Kozlowski; that is how I came to take his picture. Alan was there to produce a new-model launch show for Ford. I was there to produce a product-launch show for Rank Xerox; it was half the size of Kozlowski's. The Ford show was 18-projectors in a panoramic, two screen center overlap format (6/6/6). The Xerox show was nine projectors, single screen. The Xerox budgets were half size, too.



A 'selfie' of Yours Truly at Purchase Point's new facilities in the Shepherds Bush section of London, in 1980.

Both shows were produced in a huge new facility into which the entire Purchasepoint would soon move; but we were the first. Alan and I actually lived in the place; in makeshift facilities. Kozlowski had arrived a couple of weeks before me. He had bought a pair of roller skates to get around the cavernous space with dispatch; I followed his example and learned how to skate.

Alan got priority, when it came to facilities and staff. He got to use the new Marron Carrel MC-1600 rostrum camera and Purchasepoint's cameramen. They rented time on a Forox SSA at a location a few blocks away; and I ended up having to import Nicole Clarke, an Incredible Slidemakers' camera person, to shoot my stuff. It was a high adventure for her; but she was also in a pressure cooker; responsible for the whole nine yards—making the artwork and cels, then shooting them.



Above: Nicole Clark, photographed at Incredible Slidemakers, NY | Right: Judith Doyle with Xerox-show client contact, Roger Middleton, at the dress rehearsal.

Nicole and I spoke the same language, so to speak (sorry). She knew what I 'meant,' intuitively. And I knew what she could do; how to balance the content of the Xerox show to our production capabilities—me and Nicole. That explains the single screen format.



In a pre-production meeting, Judith Doyle—a savvy producer (and boyfriend of PP's Managing Director, Peter Thomas,)—agreed with my rationale: that it was better to make a high-impact, animated show; because there was only enough money for nine projectors (who makes those decisions?); a wide-screen show would have a 3/3/3 allocation—that's not much 'fire power.' Plus, the client asked for something 'snazzy.'

The single-screen format also 'fit' our capabilities. I could shoot scenes as animations; making the Xerox copiers 'come alive.' (Ha!) Add a few snazzy graphics and, voila! …a combo that can be produced on budget (sort of; we went way over on film).

My Xerox job was arranged a half-year earlier, at the January AV80 show, in London; where I demonstrated Magic Lasers (the laser machine that nearly bankrupted Incredible); in a partnership deal with MediaTech, the equipment and staging 'sister' company of Purchasepoint. That deal was arranged by Richard Fairclough, Managing Director of Purchasepoint Group; with the tacit approval of Angela Green and Bob Jackson, Directors of MediaTech. Dan Collins came along with me; he ran Magic Lasers while I played the floor, schmoozing with prospects and, more importantly, industry colleagues. That show boosted my European 'image,' big time.

[Read more in Volume Three, pages 476 and 483. Note: in Volume Three the date for the Xerox show is stated to be 1978; that is an error confirmed recently by the date stamped by Kodak's lab on some of the pictures seen in the following plates.]

1980 | Purchasepoint Group Portfolio | Plates Nos 1-8



1980 | Purchasepoint Portfolio | Plate № 1

MediaTech's Steve Sharpe at Rank Xerox show | Note 9-inch [~23 cm] lenses; for an extremely long throw.

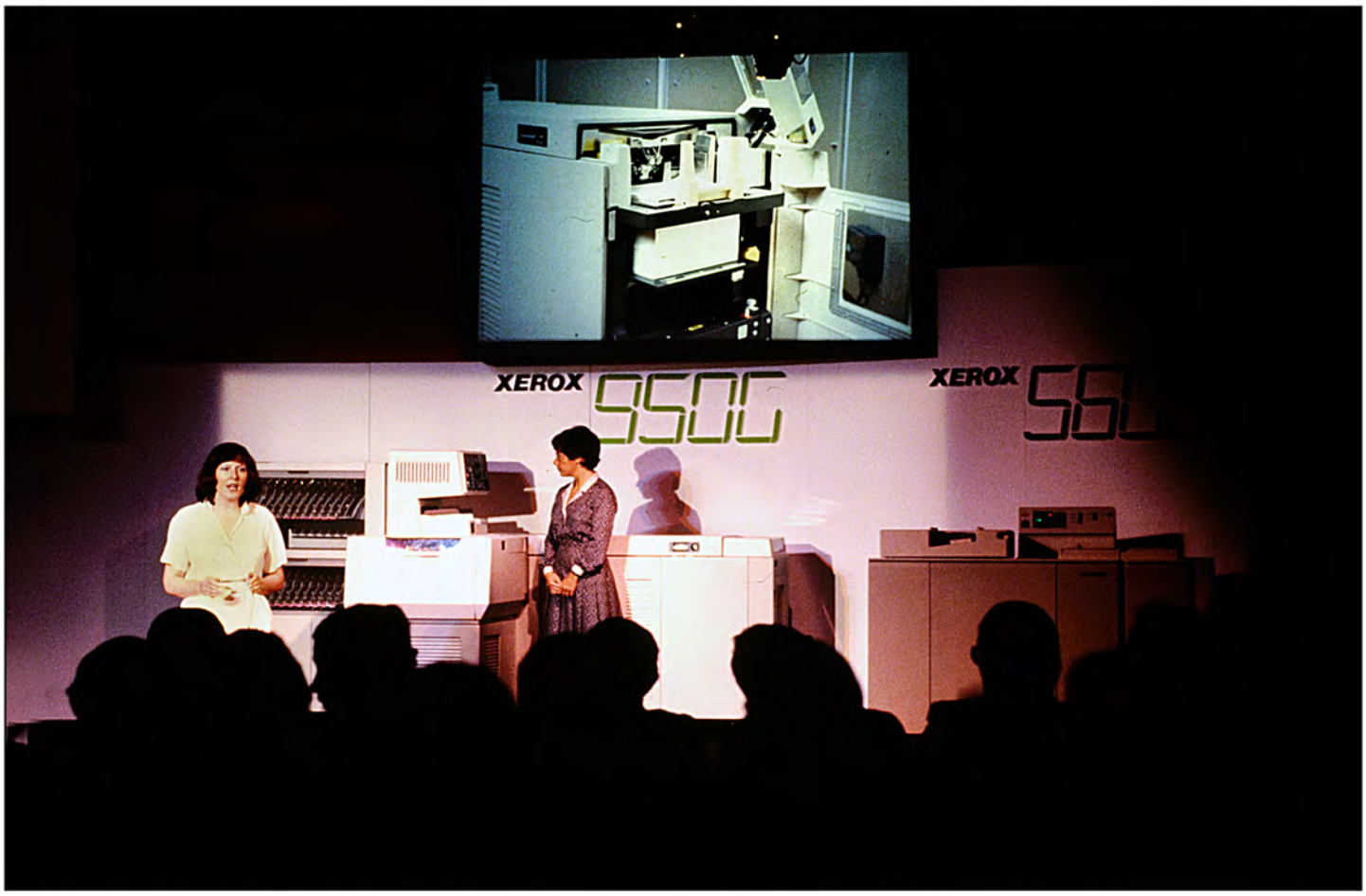




1980 | Purchasepoint Portfolio | Plate Nº 2

Above: Geoff Leon, Judith Doyle, Rob Harris, Lois Jacobs | Below: Forox crew,.Keith Goundry and Leigh.





1980 | Purchasepoint Portfolio | Plate Nº 3

Stage sets for Xerox show | Below: slide screen can be seen above presenters.





1980 | Purchasepoint Portfolio | Plate № 4

The projection rig for the Xerox show; operated by MediaTech's Steve Sharpe (standing) and Geoff Leon.





1980 | Purchasepoint Portfolio | Plate № 5

Above: Geoff Leon, Judith Doyle, Atom (lighting guy) | Below: MediaTech's stand at AV80 show.

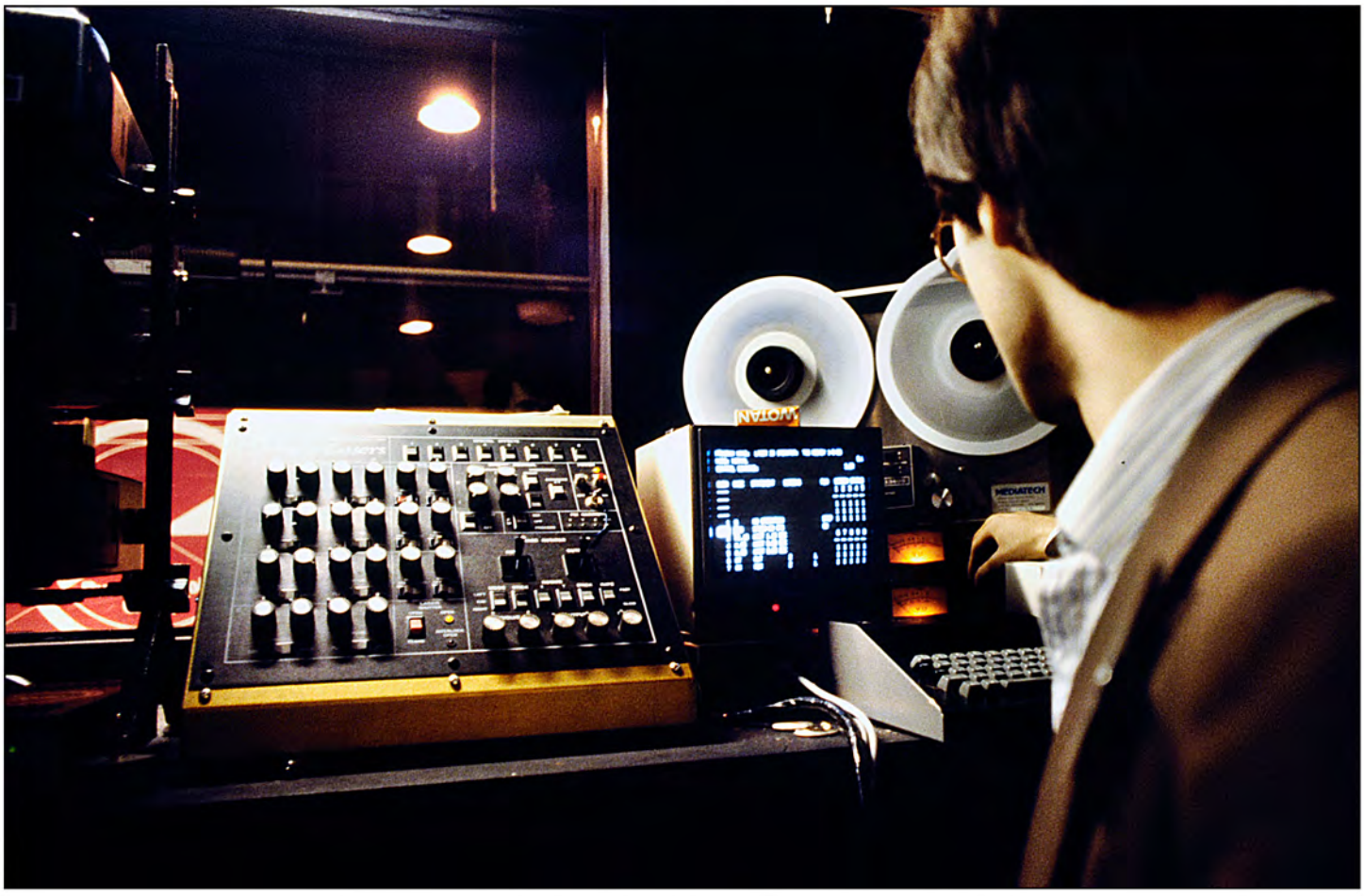




1980 | Purchasepoint Portfolio | Plate Nº 6

Magic Lasers *display was featured above the Purchasepoint Group stand at the AV80 show.*





1980 | Purchasepoint Portfolio | Plate № 7

Above: Dan Collins tweaks Magic Lasers scanning galvanometers | Below: Magic Lasers control room.





1980 | Purchasepoint Portfolio | Plate № 8

Hail hail, the gang's all here | Below: John Castle, Jeff Gayle, Bill Yates, Richard Fairclough.

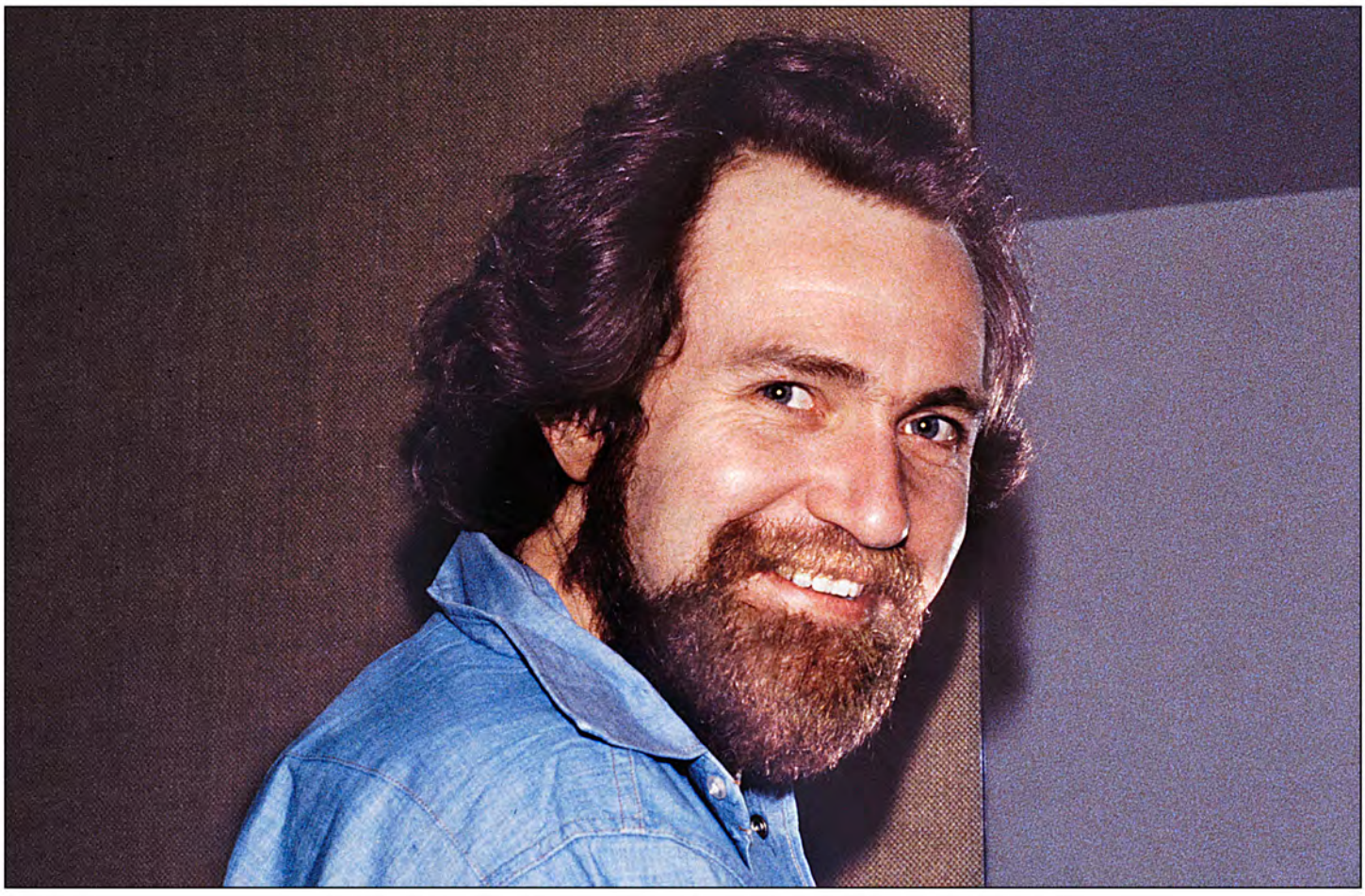




1980 | Purchasepoint Portfolio | Plate № 9

Above: JMediaTech headquarters | Below: MediaTech Directors, Bob Jackson and Angela Green.





1980 | Purchasepoint Portfolio | Plate Nº 10

Above: Richard Fairclough | Below: Yours Truly

In a show we did for Hoffman-LaRoche; we used a similar technique to create an interesting method for dissolving from one scene to the next. The product in this case was freeze-dried food.

Hoffman LaRoche had developed a method of freeze-drying various fruits and vegetables. In that process, the fruits and vegetables are rendered as flakes; similar in texture and consistency to dry Pablum. Water is added to make a fruit or vegetable 'pulp;' that can be used in a variety of ways; for soups, ice creams, sauces, etcetera.

To obtain detail and texture in the flakes; I used strong side-lighting and macro-photography techniques. A Micro-Nikkor 105 mm was used to shoot extreme close-ups of the flakes. (Funny; the lens name is "Micro;" but it is used for 'macro' photography.)

Exposures were made on Kodachrome as well as on lith film. The liths were then contacted to create both pos and neg 'flake masks.' In the show, I dissolved from the close-ups of the flakes (slide #1) to another copy of the same slide with a negative 'self-mask' sandwiched with it (slide #2). Product-use pictures with matching, *positive* flake masks (slide #3) were over-projected into the dark areas of slide #2. Each 4-step reveal resolved with unmasked product-use shots (slide #4).

Mirror Tricks

Mirrors are a neat way to get special lighting effects or angles on a subject. There are two types of mirrors: 'normal' and front-surface.

Normal mirrors have their silver coating on the back side; you see your reflection through the thickness of the glass. That protects the mirror coating; but the glass surface, being reflective, shows a second image; a very faint one; like a ghost image.

Front-surface mirrors have their silver coating on the top (front) surface of the glass. The silver finish is very fragile and is easily damaged; but the front surface is preferable for photographic purposes because it avoids that ghost-image problem.



2003 "Gazing-Ball Portrait" of Yours Truly was photographed with a Nikkor 13mm super-wide-lens.

Using normal mirrors, you can 'throw' extra light into strange places that would ordinarily be too difficult (or too hot) with normal lighting fixtures. The 'texture' and shape of the light you bounce off the mirror can be changed with the same types of diffusion materials and/or flags that you would use over a regular light source.

Front-surface mirrors can be used on or at the camera to achieve unique angles. For example, if you want to photograph the underside of a car—perhaps to reveal the suspension components working while the car is driving—use a mirror rig on the car and shoot down onto the mirror to see underneath the car. It is far easier than strapping yourself or your camera under the car.

Illuminating objects on a rostrum-camera stage is another 'logical' use for mirrors.

The size and shape of the mirror you need will depend on the angle of view of the lens. The wider the lens, the closer the mirror will have to be to the camera; unless you use a huge mirror.

Yours Truly with Hita Johnson (von Mende) in Nong Khai, Thailand, 1995. Was it the beer?



Yours Truly with Hita Johnson (von Mende) in Nong Khai, Thailand, 1995. Was it the beer?

You can also have a lot of fun with 'stretchable' mirrors. With flexible, mirror-finished mylar; create 'fun-house' reflections that can be used for interesting dissolve effects. Some very strange illusions can be created very easily that way.

Mirrors can also be used to backlight transparent subjects; like wines, beers, liquors, or the like. In those cases; a small mirror or piece of silvered illustration board is positioned behind the bottle or glass of liquid; and light bounced off the board; to brighten the inside of the bottle or glass. Care must be taken to cut the reflective board to the shape of the bottle or glass as seen from the camera's point-of-view; allowing a slight angle on the reflector; to facilitate bouncing the light source off the board. The light source itself will have to be 'snooted;' or otherwise flagged; to keep light on the reflector without spilling onto other parts of the subject.

Large mirrors make fantastic stages for small products. Those types of photographic set-ups are a pain in the butt to light, however. They are like photographing polished stainless steel or silver products; because they reflect their surroundings. That is; you cannot light a mirror by aiming the light at it; rather, you aim the light at what the mirror is reflecting. In the case of a product set-up on a table-top-mirror; the background may be the ceiling. To illuminate it, bounce lights up from the floor below the table-top; the illuminated ceiling BG will be reflected in the mirror.

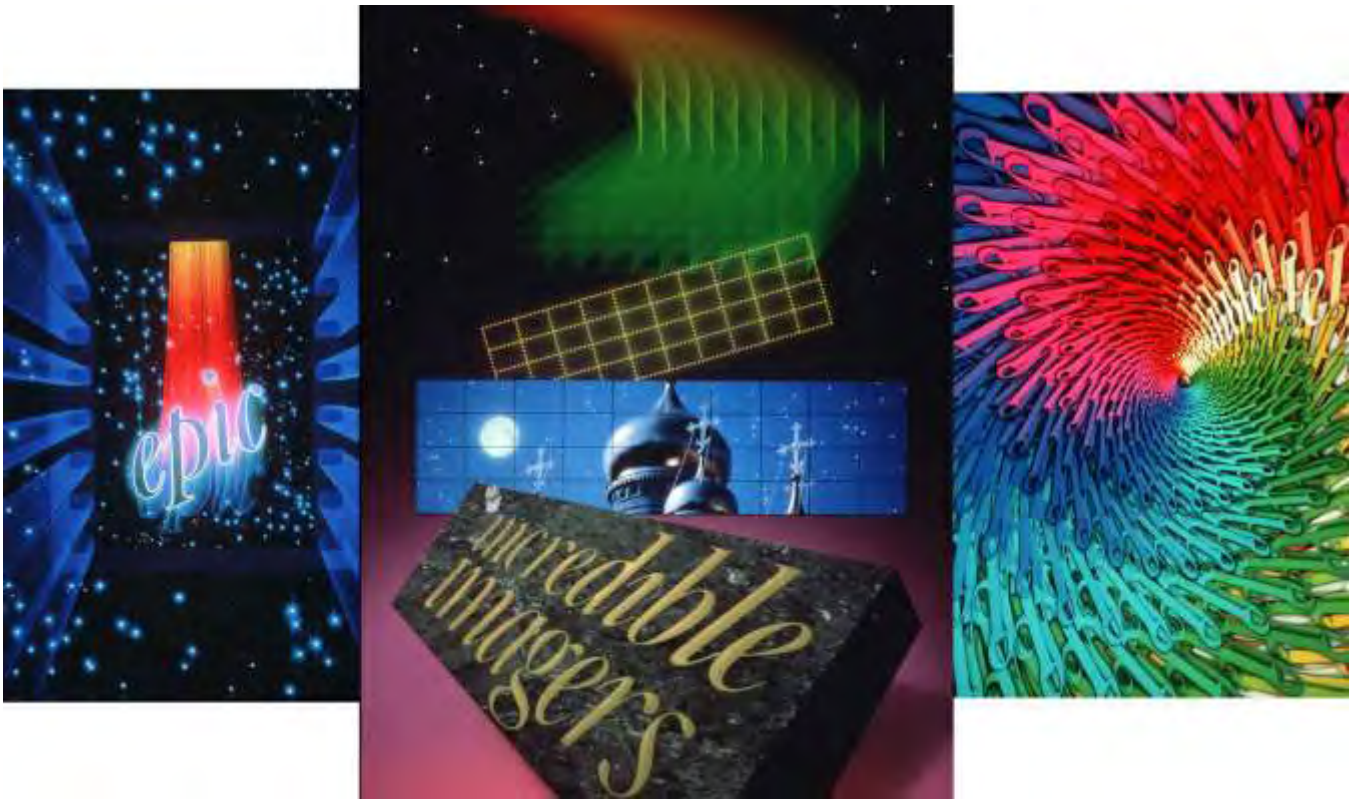
Large mirrors can also be used for "trick shots;" like the classic ones of speeding locomotives that appear to be smashing right into the camera. You guessed—it is done with mirrors. A mirror is placed in the middle of the railroad tracks, at a 45-degree angle to the train and camera.

[*Editor*: We tried that trick when shooting a movie sequence for the launch of the Saab 9000, in 1984; with unintended consequences. A large mirror, measuring three-feet square [~one meter] was used because the cinematographer insisted on the camera being well away from it. (The closer the camera and/or the longer the lens, the smaller the mirror need be.) The crew was nervous because this was going to be a one-take scene. On the director's cue, the car charged at the mirror from 50 yards [~50 meters] away, reaching about 60 miles per hour [~90 kmh] when it hit the mirror.

[A bazillion little shards of glass flew everywhere; they scratched the car badly, trashing the front end. It took the crew the rest of the afternoon to get the car back in shape for more photography.]

Vary Lighting Angles for Interesting Dissolves

A particularly simple and good-looking screen effect can be easily achieved by shooting slides while changing the angles of lighting on a subject; then dissolving between them. For example, take a simple portrait. Lock the camera into position using a strong, sand-bagged tripod. Also lock the subject into position using a head-rest positioned out of the camera's view; to make the model more comfortable. First, key light the subject from the extreme left; possibly using gelled (colored) lighting. Shoot a frame or two. Then move the key light source slightly toward the center. Shoot another couple of frames. Continue moving the light source around the subject shooting more frames on each move; and possibly changing the color of the light on each move. Now you have a series of slides which can be slowly or rapidly dissolved in sequence to create either a sweeping 'light reveal;' or a kind of 'ripple' effect. You can also switch to Kodalith film and shoot a silhouette of the same subject; to make a self-mask series of high-cons that can be used to DX in other backgrounds during rostrum camera photography.



Rostrum camera photography by John Emms, 1986.

This category of photography is so immense, with so many sub-categories, that it is almost mind-boggling. Like the other subjects covered in this book, my efforts will be to amplify what other books in the field have to say. One of the best basic reference works for basic rostrum camera photography is the Oxberry Pro II instruction book, which, though less specific in its instructional notations, is nonetheless good reading matter.

[*Editor*: A search of the internet in 2022 for the 1979 *Oxberry Slide Handbook* by James Anneshansley, produced no results. Meanwhile, the Oxberry Pro II camera instruction book is included in the Addenda of this tome.]

A Systems Approach

To successfully operate a rostrum camera; a systems approach is a must. You will never know for sure what you are doing; without a carefully thought-out system—and if you do not know, no one else will either. The system is not only for shooting; but also for communicating with the rest of your team; and possibly your clients.

As an example of what I mean, let me pose the question: "What color is red?" There are hundreds of red hues. So, the mere indication on a storyboard that a given title is to be shot red just will not do; the instructions must be more specific.



The camera room at Incredible's Stockholm studio. As shown, the Marron Carrel MC-1600 camera is fitted with a 4X5 view camera. Top lights are fitted with polarizers. The camera was computer controlled and formerly belonged to Image Stream.

Your systems approach should be designed to expedite production by making it simpler. My former chief camera man, Fred Cannizzaro, had an axiom that I always appreciated: "If you're killing yourself, you're doing something wrong."

Unfortunately, we sometimes must go through myriad gyrations and tirades before concluding that, "There's "got to be an easier way." Though there is no single system that will take care of all your shooting problems; a systems orientation will take most of the pain out of slide production.

Start With Colors

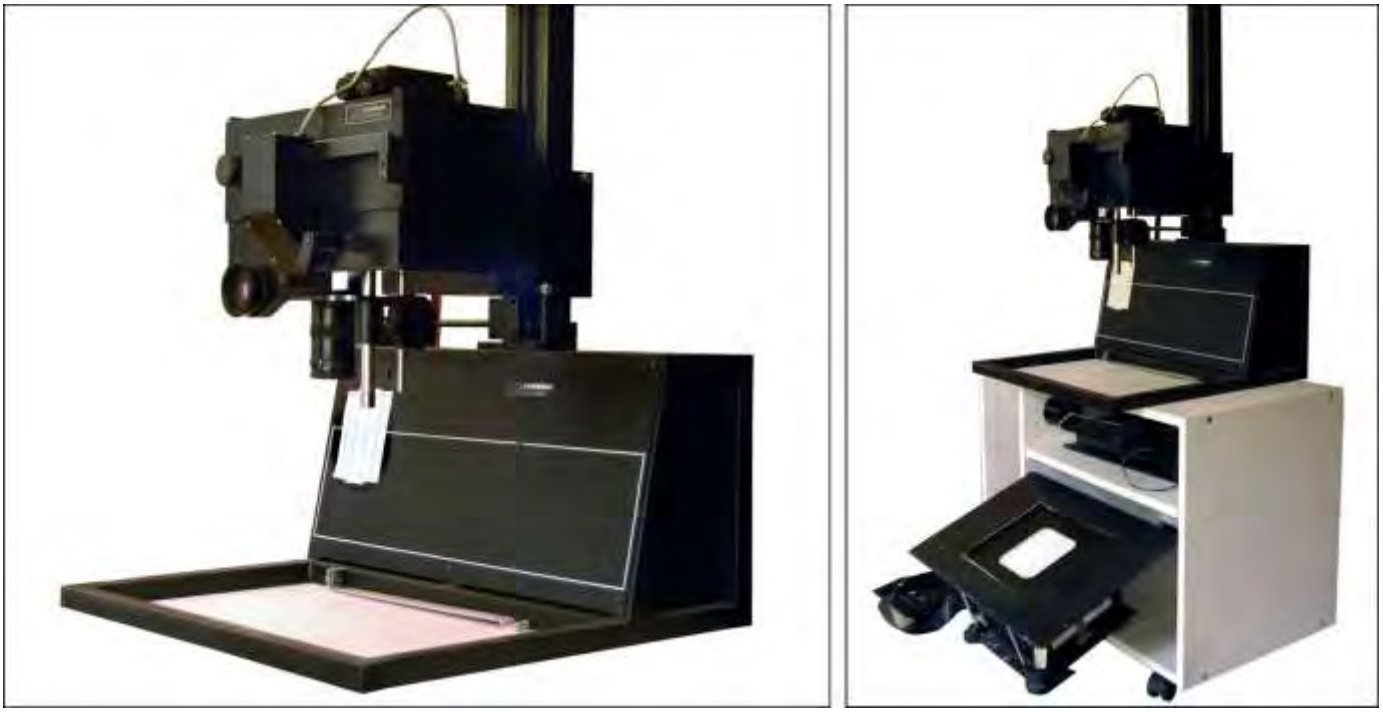


Photo courtesy of Lee Filters [https://goknight.com/blog/everything-you-need-to-know-about-lighting-gel-sheets/]

To begin your system; start by creating an "Effects Bible" of colors. This reference book will eventually include all the different effects and optical processes you develop; and will be keyed by numbers to a directory of instructions about how to shoot the effects.

Before delving into the subject, I 'd like to point out that the systems we are discussing are primarily designed for those using a non-computerized rostrum camera. The use of a computerized camera has its obvious benefits; however, although the systems discussed here can be easily transferred to a computerized camera operation, they are designed to simplify non-computerized camera operations. Sort of like taking a computerized approach without a computer. After all, the computer is simply functioning as an add-on brain; backing up your own with added memory and calculation capabilities.

Just as you must be logical, orderly, and specific with a computer; you must be equally systematic with non-computerized, manual operations.



The Marron Carrel 'table-top' rostrum camera. Right: The dichroic 'bottom light' unit is seen on the stand's bottom shelf, together with a film cannister. This camera was purchased for the Vashon studio in 1993; but it was never used.

There are two basic ways of achieving colors on the rostrum camera. One involves the use of gels; and the other a dichroic light source. With colored-gelatine filters; lay them over a tungsten or cold cathode (fluorescent) light source; under the artwork cels. With a dichroic light source; you dial-up colors using combinations of magenta, cyan and yellow.

You can also use filters on the lens; but I do not recommend those; because you must change filters between exposures if you're doing a multi-color shot; and fiddling with the filters might accidentally jar the camera or lens position; and/or focus.

One of the cardinal rules is: never touch the camera unless you must. Merely changing the aperture of the lens could, conceivably, introduce a slight optical movement of the subject in relation to the field.

Some rostrum cameras I have encountered, even the 'big ones,' have loose lens mounts. If you project the reticle grid onto the field; you can see the projected grid move as you twist the aperture or focus rings on the lens barrel; because the lens is moving in its mount. Using small rostrum cameras that are less substantial than full-size animation stands; you are even more prone to camera movement. So, the idea is to get your shooting procedures set up in a manner that eliminates, or at least minimizes, the number of occasions which require camera or lens adjustment. Thus, the objectives of our standardized system of colors will be twofold:

- to achieve the color desired without having to change the lens aperture setting
- to be able to communicate to others the exact color desired

I prefer the gel method; because dialing (keying in) colors on a dichroic light source takes more time than simply slipping a gel under the art or in front of the lens. While dichroic lights are necessary for micro-managing scource-light color when duping color slides; they are a pain in the butt for 'straight' colors.



Cinemills is one of several gelatine-filter makers. Other brands (in the US) include Lee, Rosco, Apollo and Kodak.

The brand I prefer is Rosco *Supergels*. They are the thinnest. When they are taped onto Kodalith sheet negs and the gelled neg taped onto a registration-punched, clear-acetate animation cel; the thickness of the 'sandwich' is not become excessive. The thickness of each cel is important when your using multiple cels simultaneously. Adding a second or third cel adds to the combined thickness (height) of the 'sandwich.' The uppermost cel may be out of the plane of focus as well as slightly larger in the camera aperture (by virtue of being closer to the lens) than a single cel. The goal is to keep each cels thickness to a minimum; and *Supergels* are the thinnest.



"Gam Color" is the 21st-Century name for the old *Supergels.*

There is, however, one good reason why you might opt for a dichroic light source rather than gels: virtually no gels that I know of are ever totally even in coloration. Many are rather blotchy; unsuitable for large fields requiring even coloration (a problem which can be solved; which we will deal with-a bit later). Gels are also prone to scratching and marring. Overall, though, the gel method is the fastest, in terms of shooting time; that is why I prefer it.

The next thing to do is identify your color needs. How large a palate of colors do you really need? Rosco makes over 100 gel colors. Although I used to stock nearly every color, I rarely ended up using more than two dozen of them.

Since gels are expensive, and since the range of colors should be reduced for the sake of simplifying shooting procedures, limit your palate to the colors you will need in the normal course of events. If you need a special color for a special job, you can always go back and create one (being sure to add this new color to your Effects Bible).

I recommend that you narrow down your palate to about 30 shades. That is more than enough to play with and, particularly if you start getting involved in the transfer of your shows to film and video, it is all you need since these transfer processes tend to 'strip away' subtleties of coloration; especially video transfers. In video, your 'effective range' of colors will only be about 24 shades.

Assuming you take this simplified approach, a 'workable' color palate using Rosco *Cinecolor* gels includes these color-gel numbers:

- 602 Bastard Amber
- 604 Straw
- 613 Light Amber
- 618 Orange
- 621 Light Red
- 625 Pale Rose Pink
- 628 Bright Rose
- 631 Middle Rose
- 632 Salmon
- 637 Purple
- 638 Light Rose Purple
- 642 Surprise Pink
- 644 Deep Lilac
- 645 Indigo
- 646 Dark Lavender
- 648 No Color Blue
- 650 Cool Blue
- 654 Daylight Blue
- 655 Electric Blue
- 657 Primary Blue
- 659 Green Blue
- 661 Medium Blue
- 662 Deep Blue
- 669 Pale Yellow Green
- 671 Light Green
- 672 Moss Green
- 676 Blue Green
- 680 Light Gray
- 681 Medium Gray
- 682 Chocolate

As you can see; this limited selection has allowed for light, medium and dark shades of the primary colors. From my experience; these are all you will need for up to 90% of your rostrum camera work.

Rosco diffusion materials that Incredible used for glow effects included:

102 Light Tough Frost
103 Tough Frost
104 Tough Silk
105 Tough Spun
106 Light Tough Spun
111 Tough Rolux
115 Light Rolux
116 Tough White Diffusion

Having selected gel colors and diffusion materials; the next step is to see how they photograph using various exposures. To accomplish this; you need to establish what your basic operating field is going to be. That field will be the size that all your camera-cel negs are shot to. Although we will be discussing this in more detail later; let us go over the basics now:

If you always use the same-size for-camera art (cels); you never have to re-field the camera. That is; you never have to move the camera on the column to re-size the field or crop he art. All enlargement and reduction work should be done in the art preparation stage so that by the time the job arrives "camera ready" all the elements are pegged into position and no camera movement is necessary (unless, of course, you are shooting an effect that requires camera movement, such as streaking or zooming).

How big should your standard field size be? My recommendation to use a 7.5 field—art that is 7.5 inches wide (~19 cm). This size allows cel elements (primarily Kodalith negatives and positives) to be shot on either 8 X 10-inch or 18 X 24-centimeter film, with enough room for registration marks and ancillary notes.

Since the gels come in large sheets; first cut the large sheets down to 9 X 12-inch pieces (~23 X 31 cm) which equally divides one large sheet into six small ones larger than our 7.5 field cels.

Set the cameras height so that the reticle-grid projection is 7.5 inches wide (~19 cm).

Next, introduce a gel on top of the light source beneath the stage and set the camera for a 'base shutter speed;' that is the shutter speed which will be used consistently for all shooting (unless it is a tracking shot, streak or zoom requiring a time exposure). The base shutter speed should be a short one; to save shooting time.

Since I am used to a Forox; and since the shortest shutter speed obtainable on a Forox is 1/4-second, we would opt for that speed. On the Oxberry Pro II system, which uses a modified Nikon camera, you have a full range of shutter speeds available. However, even on that system; I would stay with 1/4 second as it will permit a higher f-stop to be used, which means better depth of field and sharper focus.

Having established a base shutter speed of ¼ second and a standard field size of 7.5 inches; shoot each of the selected gels from f/5.6 through f/22 at half-stop increments. Be sure to mask out extraneous light around the gel. Shoot three frames at each exposure. (Rule of thumb: if you need one, shoot three.) DX (double expose) the gel number into each frame. When you get the slides back, label them with the gel number and exposure.

Say we use gel #602; shoot off the 27 frames (3 each of nine aperture sizes—f/5.6 through f/22 at half-stop increments); and DX the #602 in the lower right corner (using a Kodalith neg). When the film is processed and mounted, the mounts are labeled as "#602/5.6, #602/5.6-8, 602/8, #602/8-11, etcetera.

It is also a good idea to include the type of shooting stock being used. Thus, if we are using tungsten-balanced Ektachrome (EPY404) the numbers become #602/5.6/EPY404, etcetera.

Finally, the light source is also indicated. You will likely end-up using only one light source; but you might, conceivably, have two. For example; I prefer a strong tungsten source for basic cel work (because I like short exposures, to save shooting time); and a dichroic light source for duping and other effects. In any event, note the type of light source; because the light source will affect the coloration and if you change light sources, you will have to make the necessary filtration adjustments to get back to the basic colors in your Effects Bible. Thus, the final color number burned into the lower right corners of the color-test slides would be: #602/5.6/EPY404/T (tungsten) or D (dichroic) or CC (cold cathode).

I do not recommend cold cathode light sources insofar as they are generally too low in illumination and require too much basic filtration to balance them for daylight or tungsten film stocks (the nominal starting pack for daylight film is CC40R+CC40Y). Furthermore; being a fluorescent light source, cold cathode lights lack red emissions and thus are too green to be practical.

I prefer a good, strong tungsten source positioned far enough below the field to give even light distribution; and ventilated with a fan to keep the stage cool and prevent cels from heat-buckling or warping during set-up times and long exposures. Even the slightest changes in size or shape will result in the mis-registration of image elements.

Ok, now we have a set of nine exposures each for our basic thirty colors, all appropriately labeled. Those are divvied-up into three sets—one Master, one Release, and a Backup.

You will likely find that there will be one f-stop that photographs the gels in hues that are close to their original colors. Let us say that exposure is ¼-second at f/8. Go back through the test colors and pull out all the slides exposed at f/8. Those become our basic colors.

Recall that we do not want to change aperture settings because that could introduce camera or lens movement. Thus, we select the exposure that consistently reproduces the gel colors most accurately without changing the aperture.

So, why did we go through the exercise of shooting each gel at half-stop increments from f/5.6 to f/22? Because there will be cases where you need lighter or darker shades of basic colors; and by testing each gel thru all f-stops, you will know what your color alternatives are.

However, in keeping with our goal of not touching the camera, opt for adjusting exposures by changing the shutter speed rather than f-stop. Alternatively, use an appropriate amount of neutral density to make the necessary exposure compensation; use Rosco ND3, ND6 or ND9 gels which are, respectively, 1, 2, and 3 stops darker.

On the Forox system, for example, ¼-second is the shortest shutter speed; so, you would have to use neutral density gels to get darker shades of colors (if you didn't want to touch the lens aperture; that is set at f/8).

If the Effects-Bible color you want is #602/16/EPY 404/T; and if the exposure for that color is f/16, but you want to shoot at f/8; use an ND6 gel, along with a #602 gel; to get the equivalent exposure for the color selected; e.g., f/8 + ND6 = f/16.

That assumes you do not move the lens aperture; the case when you are doing multiple exposures on the same frame and there is the risk of camera or lens movement and mis-registration between exposures. However, in many situations, using reasonable care you can change the aperture or make other camera adjustments.

Having established 30 basic colors; name and label them as color numbers one through thirty; that will simplify communications with others. It is much easier to understand "Color #1" than "602/8/EPY404/T."

To create an Effects Bible of dichroic colors; begin by restricting the palate to your basic needs. On a dichroic source, the number of possible colors is virtually unlimited; you could go nuts (and broke) testing them all. I would suggest that you limit your tests to increments of 30 points for each color; then combinations of two colors in sequential values of 30, each. For example:

30Y + 30M	60Y + 30M
30Y + 60M	60Y + 60M
30Y + 90M	60Y + 90M
30Y + 120M	60Y + 120M

As with the gel tests; run each combination thru all f stops at your base shutter speed; and DX the color number into the lower right corner of each slide. On the processed mounted slides; label each according to the dichroic filter combination, the exposure, and film stock. For example:

D/30Y + 60M/8/EPY404

'Burn-Through' Colors

The next thing we must determine is what our basic colors look like when 'burned through' other colors. For example, you can successfully burn yellow(s) through red(s) because both colors are in the same spectral family. But you cannot successfully burn yellow(s) through blue(s) because they are spectral opposites and together create neutral density (gray).

You will be amazed at how many different colors can be produced by shooting combinations of 30 basic gel colors. In fact, the permutation of 30 is 900. By all means; experiment. But to avoid losing your sanity, do not include every possible color in your Effects Bible. Reduce the selections to the fewest number of colors that you might need.

To know what our basic colors will become when burned into other colors, create a series of color 'chip' tests. To begin, create a sheet neg with 30 clear circles each bearing a gel number. Then tape the appropriate gel specimen to each circle. This creates one 7.5 field neg with each of the 30 gel colors; appropriately labeled. (See pictures; overleaf.)



Color-chip-test artwork. Above: 7.5-field gelled Kodalith negative. Below: artwork as seen through colored gels. Note: gels are usually the bottom layers; under the neg. They are placed on top for illustrative purposes.

Next, set the camera for the predetermined base exposure for all gels (in this case ¼ second at f/8). Shoot three full-field frames of each of the 30 selected gels, generating 90 background colors chips (30 X 3 = 90). As with the base-color tests, DX the background gel-color number into the lower right corner of each frame. (Those numbers would be too small to see in these pictures).

Back-up the camera again and DX the color-chip cel into each background color at the same exposure. (Again, we are trying establish a standard exposure for standard colors). The result will be three sets of chip-test slides (Master, Release and Backup). Each set will reveal how each of the 30 gel colors looks when DX'd through each of the 30 standard gel colors. You will learn what 'works' and what does not. Of course, you can extend this DX'd color chip test into other colors and/or exposures if you so choose. I would suggest, however, that in practical terms, all the colors you will ever need will be identified by restricting yourself to a single exposure for the color-chip-neg.



You can always create custom color combinations whenever you want for a specific show; like the custom set tested for a Sonargraphics production; shown above. Whenever you do, enter that information and put samples into your Effects Bible for future reference.

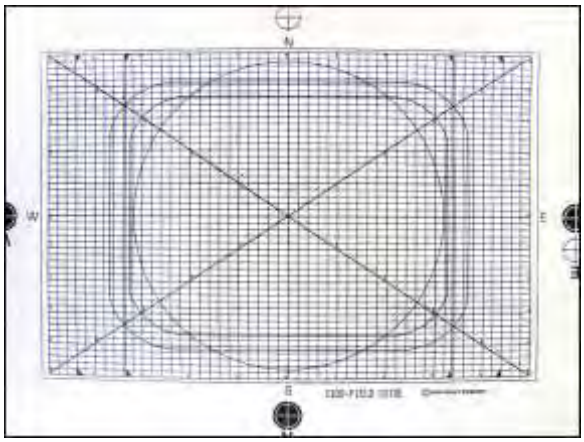
To create a color chip test for the dichroic light source, substitute your previously exposed dichroic color sample slides for the gel colors. Shoot three frames of each color to create the backgrounds, then DX a sheet containing slide-samples of your basic dichroic colors thru each background color. (Shoot the 30 dichroic colors into separate film chips; assemble them on a 7.5-field neg; like the chip-test art illustrated above).

Establish A Standard Field

Basic to a systems approach for rostrum camera photography is the utilization of standard fields. These are standard sizes to which all artwork, negs and positive cels, are conformed. Using standard fields may mean a little more time in terms of art preparation; but once your job is on the camera, that is when you will save a lot of time. The standard fields you use can be any size that is convenient for your camera system. I use two standard fields: a 7.5-field (in which the 'live' area of all cels is 7.5 inches wide by 5 inches high (~19 X 13 cm)—a 1:1.5 ratio for full aperture 35mm slides); and a 35mm field, for doing 1:1 duping work and 'assembling' special effects in the duping process.

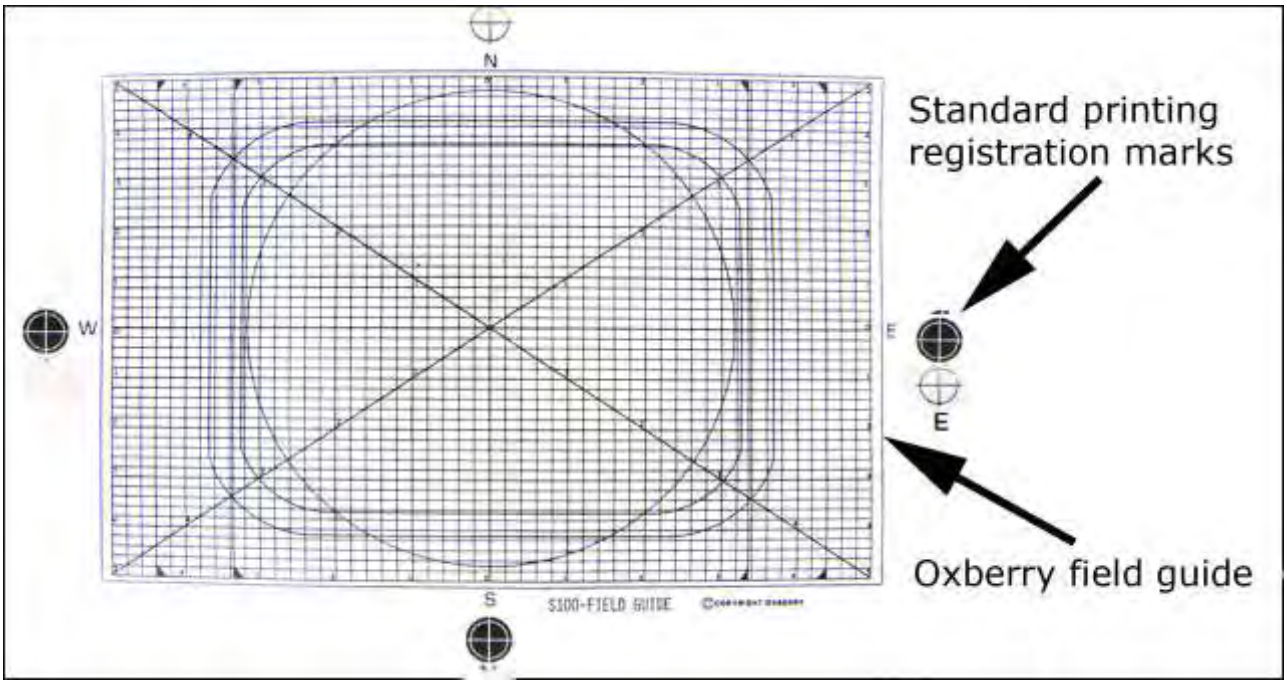
The motion picture industry has is established on a 10 field—10-inch-wide art (~25 cm). Other commonly used systems recommend 4 X 6- or 4 X 5-inch (~10 X 13 cm or 10 X 15 cm). [*Editor*: I switched to 10-field in 1983 after working at Image Stream.]

I have found that the Oxberry field grid is the most versatile. In addition, Oxberry sells pre-printed, pre-punched layout sheets, mechanical boards, and clear animation cels which make the preparation of registered artwork a simpler process. The field grid is reproduced in light blue, which will not reproduce on Kodalith or similar line film. If you choose not to use the Oxberry grid; you can have your own field grid layout and mechanical boards printed. Layout pads should be printed in light blue ink on tracing paper or velum as well as on 85- or 100-pound offset stock.



Mechanical boards should be printed on 10-point cover stock. It is important that the grid printed on the layout sheets and mechanical boards be the same as the grid in the camera reticle. To prepare the art for printing such layout and mechanical boards, remove the reticle from your camera and contact it onto Kodaline (Estar based) film.

Then, using a top-quality photostat camera (aka "repro camera") and the bottom light source, enlarge the grid to your standard field size on a sheets of Estar-based line film. That will be used to make a film mechanical instead of a paper one. Never shoot your grid onto paper; because paper prints shrink and/or stretch unevenly and may not line-up perfectly with the reticle grid (that you put back) in the camera.



Your film mechanical should also include registration marks centered on each side of the field about 1/4-inch away from the 'live' area. In addition, you can include any special information that you normally require for art and cel identification; such as: job number, date, cel number, TAB number, etcetera.

The way to assemble your film mechanical is to affix Kodalith or Kodaline positives of the grid (and any other copy) into position by taping them onto registration-punched clear acetate or mylar sheets (cels) using Scotch *Crystal Clear* tape.

Once the Master film-pos mechanical is complete, contact-print it onto Kodalith film, making more than one copy. Label each as "Master Grid." Submit one to the printer and keep the other(s) in your file. Then make a contact positive of the Master Negative. This contact pos will make it easy to see any possible discrepancies on the sheets your printer delivers. If there is any noticeable discrepancy, have the printer correct it. You can use the Master Negative for that purpose; but a contact positive makes it easier to see; clear with black lines.

Before sending your Master Negative off to the printer; check to make sure that it locks-up with the camera grid. Most of the large rostrum cameras feature reticle projection; that is, they project the reticle field grid down onto the stage; for positioning your art.

With the reticle grid being projected onto the stage; place your master negative (or positive) onto the stage and make sure that all the grid lines lock up. If they do not, you will have to go through the art-prep process again; until you have accurate "lock-up." (There will likely be an error of +/− 1/2 % at the extreme edges, due to film stretch or shrinkage.)

Most manufacturers will sell you "Master Art" of their reticle grids; make your own. There are fractional differences between art supplied by the manufacturer and the actual reticle grid in your camera. Of course, you can buy the master art and check it out on your camera; if you get lock-up, terrific; but you probably will not.

I prefer a 7.5 field for a variety of reasons. First, it allows for the preparation of relatively large sheet negs and positives; useful in shooting special effects. Second, it allows artwork to be prepared to a 7.5-inch width and then shot onto either 8 X 10-inch or 18 X 24-cm Kodalith (or Kodaline) film; to prepare negs and positives with enough 'edge room' for half-inch-wide registration marks on all four sides; and additional notes such as the cel number, scene number, etcetera.

Since I use Oxberry pre-printed mechanical boards; I prepare my art to a 10-field size then reduce it to 75% creating a 7.5 field. I prefer using the Oxberry pre-printed boards because the punching is 100% accurate from batch to batch. If you have your own printed; make sure that your master art indicates exactly where you want your registration-peg holes punched; so that they are accurate and consistent from print run to print run. With the Oxberry cels you get built-in accuracy and although you pay a bit more for that, you will ultimately save a fortune.

[*Editor*: After working at Image Stream in 1983, I came to prefer the Acme registration system; because it is a three-pin system (Oxberry's is two pin). John Emms experimented and found Acme more accurate; especially for frequently-used cels and mechanicals that suffer from punch-hole wear and tear.]

So, following the steps outlined above, we have prepared:

1.) Master Negatives and Positives of our camera grid.
2.) Camera grid layout sheets and mechanical boards, that lock-up to the camera's reticle grid.

Those are sized to our standard field; for the preparation of artwork; as well as larger sheet-film negs and positives.

The next step is to make a 35mm master grid; that is used to make 1:1 slide dupes and for assembling effects components on a registered duping stage. To accomplish that; take the master 7.5-field negative of the camera's grid and register that to the cameras projected grid. Shoot a series of 35mm Kodalith or Kodaline master positives. Repeat this process using the master positive; to make 35mm master negatives.

Now, place one of the 35mm master grid negs onto a pin-registered slide stage and lock the camera's reticle to the 35mm grid. Shoot the 35mm master neg or positive onto either line film or color stock. The resulting copy slide should lock-up exactly with the 35mm master neg and positive. If it does not, your camera has a problem—it does not shoot in registration. That should be investigated; because unless your camera shoots straight, you won't be able to accomplish sophisticated special effects that require camera lock-up at both the larger standard field and the 35mm, 1:1 field sizes.

Note that Forox and other 'rack-over' cameras are subject to slight misalignments every time the camera racks to the shooting position and then racks back for reticle projection and viewing. Although the mis-registration that results from such misalignments during the camera rack over are very slight; they will seriously affect any 'tight' effects. So, you will probably have to go through continual grid-lock-up checks while shooting any given effect.

Using the Oxberry Grid on Non-Oxberry Cameras

As previously mentioned, I prefer the Oxberry field grid. However. I do not always shoot on an Oxberry; in fact, I prefer a Forox SSA or other large camera that enables me to use 400 or 1000-foot loads of stock; because every time you change 36-exposure film cassettes on an Oxberry Pro Copy II, III or other 'small' camera; you subject yourself to the possibility of camera and/or lens movement; and therefore have to continually make grid lock-up checks. (Yawn.)

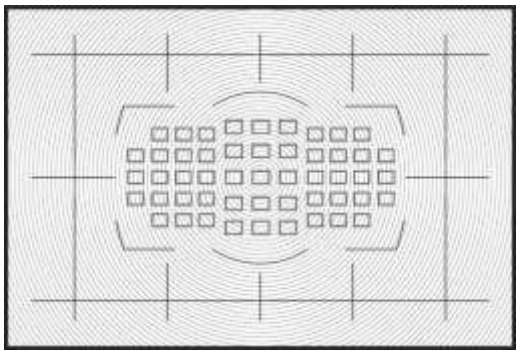
To register the Oxberry Grid to another, dissimilar one; use 'coordinate points' as references. Project your camera's reticle grid onto the Oxberry grid (use the 7.5-field master). Align the extreme north, south, east, and west borders of each grid. There should be no discrepancies between the outer borders of each grid since both are for full 35mm slides. However, if there *is* a discrepancy, lower the camera height slightly to crop in on the Oxberry grid, fractionally.

Next, place a sheet of white mylar over the Oxberry grid on the stage and tape it securely in place. With a fine-pointed, indelible-ink pen, mark the 'intersections' of at least four, preferably eight grid lines. These coordinate points can now be used to accurately position the camera height and stage position at any time. Mark that cel "Master Coordinate Points for Grid Lock-Up" and file it in a safe place. Make several other copies to work with.

Now, with the Master Coordinate Cel, I can get the camera back into position (relative to the Oxberry grid) anytime want; just by making sure that the coordinate points lock up with the camera's projected reticle grid. What that means is that I have "locked" the Oxberry grid—on which I'm going to prepare all my art—to the camera's grid.

35mm master positive grids can also be affixed to your 35mm SLR camera's focusing screen (assuming the focus screen in your camera can be removed) by using the clear-nail-polish-gel-filter cementing method described in the last chapter. Although it will not be totally accurate, it is nonetheless useful to have the same grid in your location camera(s) as well as your rostrum camera—particularly if, for example, a location photographer must shoot for specific grid coordinates.

With the Nikon system, use their "E" screen; that has central X- and Y-axis lines by which you can get the focus-screen grid and rostrum camera grids lined up. [*Editor*: What you see on the focus screen and what a Nikon shoots are not identical; the position of the image will not be precise unless you have had your camera's view screen aligned by a professional camera-repair service.]



A modern E screen. Mine did not have a center field sensor array.

Having established our master field sizes and our standard palate of colors, we are now ready to start preparing artwork.

Preparation of Artwork for Rostrum Camera Photography

Life in the art department should become immeasurably easier; now that we have standard fields. For example: with all artwork being made to the same size, type specification becomes far less complicated.

With our standard field size, we can determine the point size needed for any size type in the field. Using the 7.5-field Oxberry grid for example, I know that 9-point type will be the same height as the distance between two grid-lines. Thus, the height of 36-point type will equal four lines; 72-point, eight lines; etcetera. On 10-field, pre-printed Oxberry mechanical boards, the distance between 2 grid lines equals 12-point type. Thus, type sizes are standardized; type-setting specifications for determining the sizes needed.

Knowing that; I can spec my type so accurately that I won't have to 'cut and paste;' I can simply line-up the set type over the grid and tape it down, saving immeasurable time otherwise spent making mechanicals.

Or; I can layout my type doing a rough sketch on the Oxberry layout sheets and give that to the typesetter with a Kodalith pos of the master grid; enabling the typesetter to position the type elements exactly according to my layouts. *Voila*—no mechanicals; just line-up the finished typeset units on the camera grid. Work on a light table; to see the pos grid through the pegged mechanical board; or pegged acetate cel. Being able to see the grid lines makes positioning and line-up of type or other art (much) faster and (way) easier than using a T-square and triangle.

Masks of Standard Field Divisions

Having established a standardized field; the next thing to do is divide the field into standardized sub-field areas—half fields; quarter fields; eighth fields; circular shapes; *ad inifinitum*. Make a series of "Master Masks" that are Kodalith 'block-outs' and/or 'windows' that subdivide the full field into whatever shapes are wanted; "Quads" (quadrants), for example. (See pix; overleaf.) To properly divide your field, you will need a standard method of preparing mechanicals. Here is the method I recommend:

First, use a rotatable, backlit, pin-registered art table. Mount a Master-Field-Grid positive. on the peg bars. Then, position either a pegged mechanical board or pegged acetate over the master grid pos. By pegging the artwork on the stat camera stage, and using peg bars and punched film, you will avoid the necessity of time-consuming re-pegging later.



Examples of "Qaud" (quarter-screen) split-field artwork and bind-in masks (sandwiched with pictures in Wess mounts). The top row shows the four cels used to make the slides and masks shown in the next three rows. L-to-R: Master 7.5-field grid | Quarter-field master negative | Quarter-screen master positive | Quad-picture composite (four slides shot into position using a Double-M Industries 35mm slide stage). Second and third rows: Quadrant masks made from the master neg and pos (row one) are bound into copies of the four-picture composite. Fourth row: resolve slide with all four quad pictures bound with a 4-window pos mask (top row, third picture) | Mask variations used to change pictures. Using four projectors, Individual quads can be programmed to 'build' in any number of ways. Ending with a resolve slide (fifth projector) facilitates slide advance in the other four projectors.

Choice of Materials

The materials and methods used to prepare artwork for rostrum camera photography do not differ substantially from those used in print production. The only exception is that some print artwork is made 'oversized' and reduced to make the printing plates. In multi-image the art is enlarged (substantially). Art that is 7.5 inches wide; that is projected 10 feet wide; is a 4X enlargement. Any errors are going to be blown up large enough to be immediately apparent. That is another reason that I prefer larger sheet-neg artwork for rostrum photography.

Art is prepared to a 10-inch field; type, drawings—all elements—are large enough that subtle finessing and retouching can be more easily done. That helps insure the best-looking show.

Working with smaller fields, such as 35mm or 4 X 5; small imperfections that may go unnoticed with the small sized art, negs & positives will appear on the screen in horrendous detail. For example, consider type:

Most people have their type set on some sort of computerized system. The computer has certain degrees of control over point sizes, leading (pronounced 'ledd-ing;' the space between lines), and kerning (the space between letters). But the degree with which you can finesse the typeset depends on the size that you set the type.

If you set your type at 10-point size, every extra point of lead equals 10% of the height of the type. If the same word were set in 36-point size, each point of lead would be 1/36th the height of the lettering. The same applies to kerning (letter spacing). The larger the type size, the more you can use the computer to finesse the layout.

In addition; most computer type processes involve the making of a film negative from which paper prints are made. The film neg is made from the typesetter's master photo font(s); that, in turn, is reduced to final size and printed on paper. [*Editor*: The computer was used to control the printing of master alphabet negatives (sizes and positions); it did not generate fonts, like today's computers.]

Each step of the way; the process is subject to the usual range of photo-mechanical glitches—imperfections in the materials; dust and dirt; processing flaws; fingerprints; etcetera. The smaller the type size, the harder it is to retouch imperfections. Thus, if you set all your type in 10-point size, you will likely spend a lot of time cleaning up the type to make it camera-ready.

The minimum size I normally have type set is 14- or 16-point; and those sizes only in layouts that have many lines of copy. Normally, I like to think of 36-point as the smallest usable size. This allows more careful control over line and letter spacing; and facilitates the retouching of type proofs (if necessary).

Handset vs Computer

Despite the improvements in computer-set type during the last decade, I still prefer to have 'decorative' type set by hand. Nothing can beat the ol' human eyeball to create subtleties of kerning and spacing that display fonts need. I like type that is set 'tight,' so tight that one letter almost overlaps the next. Machines cannot do justice to this style of setting. To my mind, even the best computer-set type is still 'horsey.' This is particularly true with ones featuring ascenders, descenders, and swashes.



https://www.flickriver.com/photos/tripprintpress/1127728

If you are designing with Helvetica, a computer will probably suffice; but if all you design with is Helvetica, you probably do not need this book.

As far as Letraset or other do-it-yourself type-setting methods are concerned; you can toss them. Not only are the results inconsistent; they are also non-cost-effective and impractical for volume work.

The only time I use 'press type' is for trial layout purposes; when I want to 'play' with the type; or if the desired font is not available from typesetters in the cities where I work.

If you are seriously considering using press type I suggest that you look for good computer-type setter. The economies of computer setting more than offset the time spent making words with Letraset; and the results will be far more consistent.

What do they say, "Time is money"?

Think of all the time you spend just rubbing letters onto paper! A machine does a far better job and if you need a second copy, *voila!* However, if you just want to play around, the Letraset products cannot be beat.

Some shops where I have freelanced keep Letraset fonts on hand for making emergency patch-ups to machine-set jobs. This does not work and should be avoided at all cost. There is no way that you will be able to perfectly match machine-set results without unbelievable (costly) effort.

To digress for a moment, about Letraset: During the 60s and 70s, I was a big fan of DIY typesetting. However, readers should bear in mind that photo type had not yet come of age. Here is a short primer about Letraset for those readers unfamiliar with 'press type.'



Photos courtesy of Wikipedia.

Letraset was an extensive collection of type fonts, borders, rules, and textures that could be 'dry transferred.' Letraset products were polyester sheets the size of legal paper (8.5 X 14 inches; ~22 X 36 cm). Type fonts (textures, etcetera) were printed on one side with a 'wax-like' material that could be rubbed-off onto paper, mylar, velum or illustration board, using a 'burnishing tool'—a metal stylus pen with a rounded tip.

Letraset began as a plaything for children called *Action Transfers*—transferrable figures (cartoon characters, animals, etcetera). Their fonts became popular with graphic designers in the 1960s; for the 'freedom of expression' they facilitated; together with cost savings. At the time; typesetting was still done with metal fonts set into 'galleys'—metal trays holding about twenty-inches of metal type (right). Selections were limited and the 'looks' constrained by the physical limitations of steel and lead—no 'tight' letter spacing.



https://www.pinterest.ca/pin/329114685250420686/

Typesetting was a tedious, labor-intensive process only done by professionals in quasi-industrial 'foundries.' In the late 1930s, photographic technology was applied to type setting (and publishing). Fonts were hand-drawn to exacting standards and copied onto photo film, producing alphabet negatives which were then printed onto photo paper, creating 'proof prints.' The beauty of the photo process was that different sizes were easily intermixed, as were different fonts; and type could be kerned so tightly that letters touched, or even overlapped. In short, photo lettering liberated typographic design.

The New York company that pioneered it—appropriately named *Photo Lettering*—dominated the high-end of a rapidly expanding market. Photo Lettering's catalogue was a graphic designer's go-to source of inspiration. Their services were highly sought after by Madison Avenue designers and architects; and they had customers from all over the world.

The drawback was cost; no matter who did it; photo lettering was expensive. The least expensive photo-type shops charged about a buck a word for display fonts.

Thus, when Letraset brought out a line of DIY (do it yourself) products aimed at the publishing industry, it was an instant success. The company hired type designers to make exclusive fonts and copy many others. They had hundreds of styles and thrived until the 1980s, when desktop publishing took over the trade.



1960 cover for Photo Lettering's *Alphabet Thesaurus 9000* catalogue; courtesy of http://luc.devroye.org/fonts-24788.html

I first encountered Letraset when I worked at CBS, in the mail room. The advertising department was on my mail run. Herman Aronson and his team mentored me; one of them was 'the type guy;' he spent his days doing Letraset work. I was hooked and was soon learned all about type design. At about five dollars per font-sheet, Letraset fonts were very affordable. I had more than 100 fonts and 'embellishments.' [*Editor*: Design elements now called "Wing Dings."].

By 1980; just about everyone at Incredible Slidemakers was proficient in Letraset. That is not to say we did everything that way. At a certain point, time out-weighs the cost savings of Letraset. For example: If someone was being paid $15/hour, they would have to produce more than fifteen words per hour to be 'competitive' with professionally-set type. That was something that could not be done with Letraset. Jobs with tons of type were sent out to be set, as was all 'body copy' (too small for Letraset).

The Photo-Lettering library, a collection of film-based display type, was widely used by art directors and designers from 1936 until the rise of desktop publishing. Pioneering type house Photo-Lettering, Inc. (or PLINC, as it was affectionately known) utilized photo technology in the production of commercial typography and lettering, offering the largest library from a single foundry (before or since). Featuring type hand-drawn by the likes of Herb Lubalin, Milton Glaser and Seymour Chwast, New York City-based PLINC employed such influential designers as Ed Benguiat. Since going out of business in the late 1980s, graphic designers today best know Photo-Lettering from its highly collected type catalogs." [http://idsgn.org/posts/introducing-photo-lettering/]

Learn How to Specify Type

It constantly amazes me how many 'professionals' in multi-image do not know how to 'spec' (specify) type. The process itself is simple enough and any typesetter will be more than happy to teach you how.

Make time to visit type shop; have a tour of the facilities; check out the latest methods. Take along your entire art staff. It will be an education because today's typesetting machines and methods are changing almost as fast as your AVL gear.

I recall that when I was doing magazine paste-up work; we kept typesetting costs to a minimum by setting the type in the galleys and doing the layouts at the mechanicals stage. [*Editor*: "Mechanicals" are paste-ups of type, according to layouts. Finished mechanicals are camera-ready art. They are photo-copied to make printing plates and/or engravings.] My rationale was simple: a typesetter's time was worth more than paste-up time. However, after many years making mechanicals; that rationale has a lot of fallacies—particularly in multi-image.

In multi-image, our artwork will be enlarged when it is projected onto the 'silver screen.' It is best to correct any flaws or errors well before that. The typesetter is in a better position to give you perfect type than you are trying to re-create what the type shop does for a living.

If you have your copy galley-set; then paste-up your layouts; you've got your typeset costs plus your mechanical-time costs. However, if you learn how to spec type; you can get the whole job set 'into position' for a fraction more than it costs to have galleys set and paste them up yourself. The results will probably be far better, too.

Needless to say, type specifying is its own professional discipline. Even if you become very proficient at it; there will be cases when you will find yourself up against the wall. That is when you will appreciate using a standard field size.

When in doubt about how to spec the type; make a tissue drawing of the final screen layout and give it to your typesetter. Stick around while they spec the type; that way you will know how to do it next time.

The bottom line is that you should have your type professionally set; and to do that you should become an expert type specifier

Making Film Mechanicals

As previously mentioned, paper reproductions of art are more subject to stretch and shrink than film. Therefore, the more work you can do on film, the less warp you will possibly suffer; the more accurate you will be in terms of the registration of elements, up and down the line. Again, all multi-image artwork is blown-up on screen; any flaws will be magnified.

Making film mechanicals is actually a lot easier than doing paper mechanicals. The reason is simple: you can see through film; so, it is easier to line things up with perfect accuracy on your master grid.

Instead of paper, ask your typographer for film positives; or the first-generation negatives. If the typesetter cannot supply them; shoot your own from the paper prints. Then assemble those on pre-punched, clear-acetate cels. Do that on a light table and have a pegged master grid cel underneath the type cel. Tape the film positives into position using Scotch *Crystal Clear* tape. The film mechanical is then contacted onto Kodalith (or similar) line film. The resulting neg is contacted again to create a pos.

Making film mechanicals avoids risking the dimensional instability of paper type, paper mechanical boards, and paper negs or positives; all of which are subject to a lot more shrinkage and stretch than film; and all of which are more opaque, making them harder to position on master grid; requiring the use of a T-square and triangle.
.
Whatever method you use; always keep a master grid positive on the lightbox or mechanical board; as an underlay. In that way, all art is positioned to the same grid.

Film has obvious advantages. Making mechanicals on a light box using clear cels over a master grid is much faster—and why that is way most typesetters 'compose' your job.

Using Outline Typefaces

Outlined typefaces provide added potentials for special effects. An outline can take various over-projection glows; or the outline can hold position while the type 'fills' with color, glitter, or pictures. The most difficult part is keeping the outline in register with the fill. Some typefaces have outline variations. However, do not order the same words set in both solid and outline versions; because the chances of the two being set in register are virtually nil.



To set up the artwork; have the type set in the outline version only. Request a film positive instead of a paper print. Contact the film pos onto Kodalith to create a same size neg, then re-contact the neg to create another positive. You now have two positives and one negative of the outline type.

Check to see that they a match perfectly in size. Then, using opaque black "India Ink" or *Speed Opaque*; carefully fill-in the outlines on one of the positives. Contact the filled-in type onto Kodalith to create a neg. You now have a neg and a pos of the outline, as well as a registered neg and pos of the filled-in type.

Note Speed Opaque is the best opaquing material on the market. It dries faster than any other material; doesn't dry 'tacky' as some brands do. If you cannot get this product at your art supply stores try a lithographer's supply house.

Another method of getting perfectly registered outlines for solid type is to use a marvelous machine called a *Graphics Modifier*, which is made by the P.R. Byers Company, located in Garden City, New York This amazing machine can create outline versions of any type or artwork, as well as drop shadows, in-lines, contours, and a host of other modifications.

The Graphics Modifier achieves its effects by rotating a negative of the type or art over a fixed-position positive which is either perfectly registered to the neg or slightly misregistered (as if creating a drop shadow). If you do not have access to one of these machines, I suggest you get one because the Graphics Modifier is virtually indispensable for special-effects artwork. If you do not want to invest in one, you can usually buy such services from a large type house.

Preparing Solid-Fill Artwork

Many artworks require solid fills with outline variations. One example would be a bar chart; another would be a line illustration of a building for which you want a solid-colored fill with details in another color.

To prepare such art; start by creating the outline version on a sheet of mylar that is taped along one side to an Oxberry pre-punched mechanical board. I usually tape across the top; although that is not 'Gospel'. Then draw the outline version in black ink using a high-quality drafting pen. I use non-clogging India Ink; Kern and Rotaring inks are good substitutes.

The reason you use mylar instead of tissue or velum paper is that ruled lines will be sharper. If you rule on paper overlays or the mechanical board itself, the ruled line(s) will have rough edges; because, any paper surface has a certain degree of 'tooth' that will result in a ragged-edged line, no matter how careful you are. I have also used clear and frosted acetate; but ink won't 'take' to these surfaces as well as on mylar. With mylar you can also clean-up any errors by 'etching' with a razor blade or scalpel. The razor-etch technique is simpler and more accurate than using white opaque for sharpening corners on box-rule outlines and similar hard to fix inking problems. It is easier to ink-over an etched area than a blob of white opaque (in the event you blow it during the clean-up).

When using the razor-etch clean-up technique; do not use the point of the razor as this will tend to gouge into the surface of the plastic. The blade technique is like etching spots off a black-and-white photo print. When cleaning the corners of box-rules, for example, lay the blade along the box outline; to get yourself 'lined-up.' Then raise the back of the blade and etch-off the unwanted 'over-rule' at the intersection of the corner; using a sideways scraping action; only in one direction. It is better to go over the area being etched several times with light pressure than to try to do it in one stroke and possibly cut into or through the plastic sheet.

After you've created the outline version; place another sheet of mylar on top of the first overlay so that you can see the outline version through it. Then, ink-in the areas desired with as much precision as you can muster. Use a thin brush, such as a #0, and paint-in close to the edge of the outline. After you have gone around the outline with a thin brush, use a thicker one to fill in the rest.

Another reason why it is best to do your inking on mylar is because if you have large inked-in areas on a paper or a mechanical board, the sheer volume of water in the ink will 'pucker' and warp the paper; minimizing any possibility of precise registration between the base mechanical and its overlays.

Another (better) way of doing overlays is to work on a bottom-lit art table (or light box) with a master-grid positive placed on the peg-bars. All overlays are done with pre-punched clear cels laid over the master-grid positive on the same peg bar.

Use peg bars on the art table as well as on the 'stat' (repro) camera's art and film stages (see photo; right).

That will keep all your cels in perfect register without the necessity of using registration marks and re-pegging the negatives and positives on clear animation cels later.



Use identical master-grid positives on the stat camera and on the drawing table. These master positives are aligned and registered to each other; so, all art is prepared and shot to the same (constant) grid position.

On each side of the master grid there should be a traditional ('cross-hair') registration marked with its position (i.e., North, South, East, and West).





For shooting film mechanicals, a special version of the stat camera master grid is created for the repro camera's film stage; only the registration marks appear—without the grid lines.

That should be pegged in perfect registration to all other master grids. This allows the registration marks to show on each side of any artwork being shot.

(Film mechanicals are contact-printed on the repro camera's film stage using the art-stage lights illuminating a plain-white board.)

For shooting 'top-lit' mechanicals on the art stage; a sheet of bright white paper is placed over the pegged, master-grid positive and all mechanicals; with 'cut-outs' that reveal the four registration marks. Thus, identical registration marks show through clearly on each neg or pos shot.

This process, which is quite simple, has the benefit of achieving common registration marks on every cel you produce (if you don't change the height of the stat camera or move the peg bars on the art and shooting stages).

The alternative is to place registration marks on the base of each mechanical and try to accurately position other reg narks on each overlay or cel. That is far more tedious and a lot less accurate.

When you do change camera height or peg bar positions; you can easily get your stat camera back into perfect registration by matching the master grids on the art and film stages. Thus, the camera height can be changed, which it eventually must, without sacrificing the benefits of using common registration marks throughout all art preparation.

The basic idea, though, is that all mechanicals, overlays. negs and positives share identical registration marks. That saves time and keeps all art and photography more accurately registered.

Avoid a Lot of Overlays

The common registration mark procedure will not work if you pile-up a lot of overlays on top of each other. Overlays get 'higher' as the thickness of the sandwich increases. As the height increases and the top layer gets closer to the lens; the size increases, in the "eye" of the camera. Thus, although the registration marks will remain the same size (they do not change height because the master-grid cel is seen through cut-outs in every overlay) the art will be gradually getting more out of register as the top overlay increases in size with number of overlays.

I recall one job that we shot for an outfit in Boston. The AD had prepared a 'build-up' sequence showing the growing complexity of Boston's street grid over a 200-year period. There was one overlay for every five years and the monster mechanical he delivered to us had 40 overlays on one base. The bloody thing was an inch thick (~2.5 cm) and weighed nearly a pound (~1/2 kilo).

Every overlay had been meticulously prepared with type and *Chartpak* tapes (used to make ruled lines, instead of using a ruling pen) on clear Acetate.

Needless to say, the art was useless; no registration could be achieved due to the depth of the overlays. We ended up having to strip all the overlays off and re-registering every cel to a master grid. Very boring.

When you have a situation requiring a lot of overlays; use the bottom-lit art table (or lightbox) method. Affix your master grid to a peg bar on the light table. Then affix a registration-punched mylar cel over the master grid; for the base mechanical.

Over that base; place another punched mylar cel; for the first overlay (A). Place another punched mylar cel over (A) and prepare overlay (B). Then remove (B) and place (C) over (A); then remove (C) and place (D) over (A); etcetera. That way you are never more than three overlays deep; and never more than two cels deep when shooting your negs on the stat camera. Since the art is pegged in register; all the negs and pos's will share the same registration marks. (You can do the same procedure with paper cels; but you can't see through those; so, they take longer to make.)

Use Rubylith Instead of Ink

Using Rubylith material instead of inking-in solid areas will save you countless hours in the art-preparation in the neg/pos stages of getting your artwork camera ready.

Rubylith is a red-film emulsion on clear base. To use it, cut a sheet the size of your master grid. After punching it, lay it over the outline version of your art and peg it on the same bar with the emulsion side up. Lightly cut through the red emulsion all around the outline of the artwork and peel-away the unwanted ruby material.



(If you cut too hard, you will cut through the clear backing—a definite no no.) The remaining 'Ruby' will photograph as black when shot with 'ortho' Kodalith film (which is blind to red).

Rubylith is very expensive; but the time you save makes it well worth the money. As well, an inked surface is never totally even in the 'depth' (density) of the black (as the stat camera 'sees' it). The result is that you will have to be more careful about your stat camera exposures when shooting inked surfaces; because any over-exposure will reveal inconsistencies in the inking (you'll be able to see the brush strokes). Ruby is not like that. In fact, if you over-expose or over-develop it (within reason) you will still get good, solid blacks that require minimum 'spotting' with Speed Opaque.

I seldom use fresh developer; it is too vigorous; too biting. Your exposures must be spot-on (especially if your shooting large areas of inked-in art on paper); and you cannot 'play' with the neg in the development tray because the development is too fast.

I use Kodalith A/B Developer. I use it cold (65-68 degrees Fahrenheit) and diluted 4.5:1. The object of the slight dilution and colder operating temperature is to slow down the development time to about 3 minutes, rather than the recommended 2-2.5 minutes. The longer development time does two things:

First, it gives you a chance to watch the development process in 'slow motion.' You can yank-out an otherwise good neg that is just starting to reveal, say, brush strokes in an area that is supposed to be crystal clear. Second, it allows you to leave the neg in longer so the blacks really heavy-up in density, thus requiring less opaquing.

When lith film is developing, the blacks 'come up' first. If you have overexposed the film, areas thought should remain clear will start to cloud-up faster because there was enough light to initiate development of those areas. If you get past 2.5-3 minutes and the clear areas have not filled in, you have the right exposure for 'normal' negatives.

But; say we want a neg that is super-dense in the blacks, yet clear in the 'highlights.' To accomplish that; decrease the exposure and develop the film longer. Start by reducing the exposure by 15%;' and if you can get away with it, 30% (or more). Develop each negative longer and longer; until you reach the point where you can leave it in the developer up to five minutes without the clear areas filling in. By then, the blacks should be solid, requiring minimal opaquing.

After the negs have been cleaned-up, they are ready for contact-printing; to make positives. Contacting is best done using a normal photographic enlarger. It is faster than using the repro camera; and why tie-up a $5,000 stat camera to do the same job that a $500 enlarger can do?

Set the enlarger's height so it over-projects the size of your negs by 25%. That will reduce the possibility of 'hot spots' giving an inconsistent exposure across the full field.

Place a sheet of mat-black paper on the enlarger's base board; large enough to cover it entirely; and tape it into position. The black paper acts as a 'blotter' and prevents any 'spill light' from exposing the film; filling-in areas that should be clear (unexposed).

Next, place the peg bar and neg in the center of the enlarger's projected light cone. Leave about a eighth-of-an-inch clearance around the neg (~3 mm); and position a double thickness of black tape around the outer edge of the neg cel. Then, lay an oversized piece of 1/2-inch [~1.25 cm) plate glass over that neg; 'hinged' to the baseboard with gaffer tape. Also make a gaffer-tape 'handle,' to lift the glass when changing cels on the peg bar.

Now, operating in 'safe-light' conditions (red for ortho films like Kodalith and Kodaline; light yellow-green for blue sensitive films like LPD4 and 5302) increase the safe-light's brightness until a piece of unexposed film fogs in the developer after seven minutes.

Lay a piece of punched, unexposed film on the peg bar, emulsion-side up. It should fit nicely within the black-tape 'corral.' Then position a neg on top of it in "right reading" position. Close the 1/2-inch plate cover glass to compress the film-to-film contact. Test for the least exposure necessary to permit five-minute development in 'old' developer.

As mentioned before; I hate fresh developer. I prefer to mix spent developer (dark, muddy red) with equal parts of fresh stock to keep the old stuff 'alive.' And I monitor each batch (good for up to thirty 8 X 10-inch sheets per batch) by holding processed specimens up to a bright white light after they have fixed; looking for 'pinholes' in the black areas (they look like 'stars' against a black night sky). I know I need to add some fresh stock; when there are more than a half-dozen stars,.

Unlike using old developer; use fresh fixer and change it often. After the fixer has processed half its normal capacity, dump it, and mix fresh solution. One important reason for keeping your fixer fresh is that large batches of Kodalith sheet negs are hard to handle in the processing trays. When you have a lot of sheets in the fixer, they all sort of clump together.

Unless you constantly separate and agitate them, they will settle down on the bottom of the tray like a big lump. That means severely reduced (or zero) chemical flow over the emulsions on the sheets; and the risk of uneven fixing. (Unless thoroughly fixed, films and photo papers will continue developing when exposed to light; that makes brown 'stains' in the clear areas.)

Keeping the fixer fresh; you can agitate the sheet-film batches for as little as four minutes. Then, after a rinse, immerse them in fresh Hypo Eliminator. That reduces the wash time to 10 minutes. (I rinse for 20 minutes; because I want to be sure that all the chemicals are washed out; to avoid any possibility of future staining when the negs are exposed to the bright lights of the camera; and because I want my negs to last.)

The larger the development trays you use, the better. I prefer 20 X 24 trays because they easily hold three gallons of chemistry. Such large amounts of chemistry hold temperature better and maintain processing consistency far longer than using small trays. In small trays the chemistry gets exhausted far sooner; so, your exposure and /or development times will really start to vary. Big trays with large enough capacity can handle hundreds of negs before the chemistry need freshening.

Having said all that; the difference between Rubylith on mylar and inked-in areas on paper can be as much as 50% of the exposure required. The camera sees Ruby as so black that you can give the negs twice the exposure on camera and still developed them for five minutes.

If you tried that exposure with brushed-ink art; the clear areas would cloud-up almost immediately in the developer. Inked art often must be given shorter exposures to avoid such clouding; thus, the black areas will not be in the developer long enough to avoid making thin negatives with) insufficient density and a 'Milky Way" of starry pinholes.

Do not over-fix your lith negatives. If you are using 'fresh' fixer; leave the negs in for a maximum of 10 minutes with constant agitation for the first 60 seconds and for 30-seconds every three minutes thereafter. Fresh fixer is 'aggressive' stuff that will start to 'eat away' the emulsion; reducing the densities of the negs; blacks will become less black, eventually becoming semi-transparent grey. Using fresh fixer; degradation of a properly exposed film starts to occur in as little as a half hour; and in even less time with 'thin' or underexposed negatives.

When the films are rinsing; be sure there is good agitation. Creating a circular water flow will help; particularly if there are a lot of sheets washing together. The water flow should be sufficient to keep the pack circulating so that the individual sheets are gently moving around each other and around the trays without clumping together. You do not want the water to spin them too fast either; because if the water is too 'rough,' the corners of one sheet could gouge into the emulsions of others; causing pitting and scratches.

When drying the prints; do not force them too much. Overheating will cause the film to stretch unevenly, thus losing registration. You can get away with a 100°F drying cabinet (~38°C); but do not use a 1000-watt hairdryer to 'blow dry' the negs at close range because that kind of heat can warp your film.

One problem with Rubylith is that the edges around ruby emulsion, where it has been cut, can 'kick up' highlights when shot on the repro camera. Although these highlights (which appear black on the negs) can be etched-off using a razor blade or *X-Acto* knife, the etching process can be difficult and time consuming, especially around intricate artwork or type.

If that happens, there are two things you can do to avoid the necessity of etching in areas that are so small and/or so detailed that the etching might ruin the image:

1.) Contact the lith neg to create a pos and opaque-out the Rubylith cut-work highlights; then re-contact the pos to create a clean neg.

2.) If you opt to etch-out cut marks from your negs and positives, use Agfa Litex—a matte-finish line film that etches more easily than Kodalith or Kodaline film.

Automatic Processors

Hate them. Will not use them. That is because there is no way to 'see' what is happening and possibly adjust the development of your films and/or prints. [*Editor*: John Emms used Agfa automatic processors at Incredible in Sweden 1986-1990.]

Clean-Up of Negs and Positives

When you clean your negatives and positives (with black tape and opaque); do that work the reverse side of 'right reading' cels. That way all your touch-up work will be on the under side when you are on camera.

On camera, the cel is likely going to be taped-down to the camera stage to hold it firmly in position; it may also have certain sections 'taped-out' or otherwise masked on the stage to block-out elements; or to shoot 'build-ups.' Or it may have glass or other screens placed over it during the shooting of effects. All this handling can damage the retouching.

In addition, if you are laying a texture screen or glow scene over the surface, excessive tape-outs on the upper surface can cause the screen(s) to lay 'funny.' So, keep the upper surface clean.

Once the negs and pos's are cleaned-up they are ready to be pegged; that is, positioned on Oxberry pre-punched acetate cels in registration with the master grid as well as with each other—unless the film itself was pre-punched and peg bars were used when making the negatives and positives (better).

On a light box or light table; place a master-grid cel on the peg bar. On top of the master-grid, mount a pre-punched, clear-acetate, Oxberry animation cel. On that clear acetate cel, place your pos Kodalith (clear field with black art and registration marks) and register it by aligning its registration marks with those on the master-grid pos beneath it.

Line-up the registration marks first to be sure that you are 'in the ballpark.' Then cross-check the position of the art element(s) against the field grid. If your art was field-critical, there would probably be some minor adjustment necessary; that is, you cannot totally trust the reg marks; because film shrinkage and other 'mysterious phenomena' sometimes create situations where the art isn't in exactly the right place on the field; even if the reg marks line-up perfectly. Having too many overlays can create such problems, as discussed earlier.

During the cel-registration procedure; hold your hands so that your palms are resting on the lightbox away from any of the cels. Use only your thumb and forefingers to 'slip' the pos around the surface of the acetate animation cel. With the pos in position; bear down hard with the thumb and forefinger of one hand; and tape down an upper corner of the film with the other using a strip of #600 Scotch *Crystal Clear* tape. Slide your hand gently from the one side of the neg to the other, and use your free hand to adjust the position of the film as needed to correct any minor misregistration. If the position is NG at this point, remove the tape 'anchor' from the corner and begin again. When registration is confirmed, apply a second tape anchor to another comer. Use both hands to confirm position and registration. If all is good, place a strip of #600 tape across the entire top edge of the pos, anchoring it firmly.

The next step is registering the neg to the pos. To do this add another punched acetate over the two already on the pegs (the Master Grid and the pos cel). Repeat the procedure outlined above until the neg and the pos are in perfect register. To achieve register, you must be looking at the art from directly above the center of the field. Looking at the art from any other angle will result in mis-registration. Theoretically the neg and the pos should cancel each other out completely and you should see nothing; but that hardly ever happens unless you cover it with a heavy glass plate. You should look for an even 'corona' of light where the neg and pos element 'kiss.'

Because films sometime shrink or stretch the .01% their manufacturers say is the 'tolerance;' you will find that your neg will be 99.9% 'mated' with the pos; but you'll seldom see a 100% perfect fit. This is where your own judgement comes in: should you 'split the difference,' or, as in the case of a drop shadow or directional highlight, favor one side?

Even the most careful pegger in the world will not get perfect registration on the camera stage. The pegs are only on one side and there is always some fractional movement, especially in shooting situations which require long-periods on the stage where the heat build-up on the cels can cause stretch and/or movement.

To minimize that phenomenon; double-check positions against the camera's projected reticle grid. Once in position; tape-down the side of the cel opposite the peg bar (typically the bottom side of the cel). Lay the pos cel over it. Make whatever adjustments are necessary and tape it-down along the top edge (the neg is taped along the bottom edge). For these purposes, the top of the neg—the bottom cel—should be trimmed to be ½-inch (~1.5 cm) shorter than the pos. That way they can both be taped without interfering with each other. This procedure is only necessary when you need exact registration and the peg bar is not providing it. However, most times, the registration of Oxberry-pegged cels is adequate.

Back to Art Preparation

One favorite 'new' (at least for me) process is called "rotoscoping." Actually, it's a technique that has been used for decades in the motion picture industry. Rotoscoping creates artwork that is in register with a photograph, illustration, or printed piece. The technique can be subtle—like carefully positioning an over-projection sparkle into an eye—or it can be used to completely transform a "real" photograph to a surreal animation of, say, "neon" people dancing; or, for 'silhouetting' a product, or over-projecting an image into a picture of a TV screen.



Making registered artwork for a printed piece or large format 'trannie' (transparency) is relatively easy.

The original is placed into position on a clear acetate animation cel and taped into position (relative to the master grid).

Then, on separate punched overlays, the artwork is created by tracing around the parts of the picture that will be conjoined with effects.

Finally, sheet negs and positives are made of the artwork; and pegged to the original print or transparency.

A magazine picture of dancers was rotoscoped to create the multiple outlines used for these glow and glitter effects.

Say you have a 30 X 40-inch poster and you want to position a glow for over-projection on a slide of the poster. Place the poster on the rostrum camera stage and project the camera reticle onto it. On a mechanical board pre-printed with the camera's grid; note the coordinate points for the area to be glowed. Alternatively, use a Slide Analyzer to rotoscope a slide made of the large poster.

On pegged animation cels; create art for the glow (or other effect). Once the negs and positives are ready; position them on clear acetate punched cels using the same coordinate points (unless you used pre-punched film to make the neg and positive).

To shoot the final effect; the camera is aligned with the master grid. By matching the coordinate points; registration of elements is retained.

Registering artwork to 35mm slides is equally easy, but twice as tedious. First the slide must be enlarged and then traced to create the artwork. That can be done using a photo enlarger or a Creatron Slide Analyzer (see page 2914). Then the artwork is reduced to 35mm, in perfect registration with the 35mm slide. This procedure also involves the coordinate points.

To determine the coordinate points; bind your original slide in a pin-registered Wess Mount. Use black #52 mounts; they have an aperture that is 1 mm outside the picture area of a 35mm film chip; there is no cropping of the image.

Mount a 1:1 pos of the camera grid on the same Wess-mount pins. Enlarge that sandwich to the size of a pegged master grid. Lock the projected grid to the mechanical-board grid. Note at least four coordinate points from the image. With the coordinate points noted, trace those elements of the image that are necessary for positioning your artwork accurately.

Rotoscoped artwork can get as complicated as recreating the original scene as a full-blown illustration; or it can be as simple as tracing a few lines around a subject; perhaps to 'rag' type around it.

After the art is prepared, shoot it into negs and/or positives. Be sure that the coordinate points are included. After the sheet negs and pos's have been made; they can be locked into position on cels by aligning the coordinate points on the master grid; and reconfirmed by the camera's projected reticle grid, just prior to shooting.

Using a Slide Analyzer; a slide-and-grid sandwich is projected onto a 10-field screen, which has Oxberry pegs (Acme pegs can also be installed). You do all your coordinate point transfers on the screen. The Slide Analyzer is overpriced; but it's an invaluable product. You will have only one problem with it; that is, you will not be able to get totally accurate registration unless you reverse the screen. Creatron's screen has the focusing surface on the inside of the light box; and by the time an image passes through the thickness of the glass to the side you are working on, it is ever so slightly larger. By reversing the glass screen; you risk damaging the relatively soft focusing surface; but you gain the advantage of working with the correct size.

The secret to rotoscoping is being able to maintain a constant position in the camera field while using art elements of any size; by utilizing coordinate points to map positions on the camera field. Once you have locked-up your positions; virtually any special effect you can think of can be accurately positioned on any original slide, motion picture frame, or to oversized prints or transparencies.

Some Additional Tips

To get camera-grid lockup when shooting in 35mm 1:1 ratio; it can be difficult to see the projected reticle on a small 35mm pos. To aid in the line-up of the grids; position a piece of thin white paper under the 35mm pos on the shooting stage. Use the thinnest possible paper; because the added thickness of the paper could raise the 35mm pos enough to make it appear slightly larger than it will be in its final shooting position, with the paper removed. Tracing paper is very thin, although not white.

After getting the camera and slide grids locked; shoot a Kodalith test. Mount it over the master grid in a Wess mount to confirm lockup; or indicate any misregistration's before commencing the rotoscoped-art photography.

Keep an open mind and a good sense of humor when rotoscoping. The work is very tedious and seldom will you ever achieve perfect registration of all the elements. Hollywood spends millions of dollars on 'blue-screen' stages and optical printers to make intricate rotoscoped mattes for productions like "*The Empire Strikes Back*." All you have is a slide camera and Wess mounts.

From film stretch and shrinkage; to manufacturing tolerances in our equipment; our multi-image equipment and supplies have greater 'tolerances' than Hollywood gear. If you compound all the little tolerances; they can add up to a lot.

For example, there is usually at least a thousandth of an inch tolerance in every camera movement; another thousandth on the stage pins; another in the reticle projection; another in the film-stock sprocket holes; it goes on and on; at every stage of production. By the time you have produced your finished set of rotoscoped slides; it is conceivable that one element could have 'accumulated' two- or three-thousandths of an inch (or centimeter) of mis-registration due to 'normal' tolerances. There is very little you can do about that; except for testing and retesting.

Then consider the typical multi-image projection rig. It is a miracle that we can do as well as we usually do. Think of all the time spent lining up projectors. One minute into the show; that 'perfect' alignment seems lost; and often it is. Just the action of the projectors advancing slides can throw them slightly out of perfect alignment.

Then too; the lenses used in projection generally aren't as good as those used on optical printers or even slide cameras. And although you can spend hundreds of dollars on alignment stands for the projectors; those stands are often placed on table tops or other bearing surfaces that are less than rock steady.

The net result is that; getting two or more rotoscoped images to lock-up on the screen is a chore and a half; and it is a small miracle when they do.

You should keep these factors in mind before you spend countless hours preparing rotoscoped art for special effects. What I have found is that 'softer' rotoscope effects generally work best for multi-image shows. Softer-edged effects are more forgiving of slight misregistration's.

Trying to match-up two or more hard-edged rotoscoped images normally does not work that well; particularly on over-projected elements. For hard-edged effects; it is best to composite all the elements into single slides. You have a better chance of getting lock-up of the elements on the camera stage than you will on the projection grid.

One area where matte or mask slip can be corrected rather easily is in the neg/pos pegging stage of production. Any discrepancies can be corrected by opaquing on the wrong-reading side of the neg or pos. Agfa's matte-finish, *Litex* line film is ideal for that purpose. It has a matte finish on both the emulsion and backing sides; thus it can be inked on either side; and the ink will adhere far better than on the slicker surfaces of Kodalith, Kodaline or other glossy-finish films.

Use Pencil Art to Save More Time

Since a lot of the effects are optical illusions; and since many of them are on screen for a brief split second; it is 'wasteful' to spend hours and hours doing tedious ink work when pencil lines, or pencil 'fill,' will work just as well.

Working with pencils has the obvious benefit of easy error correction—just erase your mistake and redraw it. It also has the benefit of being able to shade areas for 'feathered-edge' line negatives, which are softer than a true hard edge.

Your pencil art will be a bit more tedious to shoot onto Kodalith; since you will not be able to really punch the exposure and overdevelop. Pencil lines are gray, not black; so pencil art tends to fill in when converted to line film. Thus, an exposure to obtain pencil detail often cannot be developed for pure, solid blacks. By making a positive of the original and reversing it to make a second generation neg; the contrast build-up should get you good D-max (black density) while maintaining the pencil-art details.

Preparing pencil art is unbelievably faster than inked art. A notable example of such time savings was job produced by Sonargraphics Multimedia of Melbourne, Australia for a Ford new-car launch. An elaborate so-called "Engineering" module had been undertaken, which involved numerous technical 'cut-away' drawings revealing, for example, how a piston moved in the engine block; or how the rear suspension worked.

Each scene required multiple overlays to separate the required illustration elements for slide animation with a 12-on-one projection grid. On the piston-movement sequence, for example, there were many layers over a 'base' drawing of an engine block 'cut-away.' There were three overlays of the piston in its upper, lower, and mid-point of motion; a fourth overlay for the spark plugs ignition; a fifth and sixth overlay for the intake and exhaust valves; plus, three more overlays for over-projection highlights of specific engine features—a total of ten drawings for one scene that would be on screen for less than five seconds.

In all, more than 300 drawings were made for the Engineering module. Had these drawings been done in ink, it would have probably taken the artist about two months (optimistically). Using the pencil-art technique; all the original drawings were done in two weeks (giving us a third week for animation tweaking).

All the pencil drawings were made on punched Oxberry mechanical boards. First, a slide of the auto component was rotoscoped on a photo enlarger. That outline drawing was then affixed to a peg-bar on a light table. One by one, overlays were stacked over the base mechanical and the components separated out by tracing them with a pencil. Working on a light table that was brighter than normal permitted greater 'see through' of multiple paper overlays stacked on one another.

When the original drawings were completed; each was shot in registration onto 35mm Kodalith film and the animations tested by replacing write-on slides with Kodaliths and watching the sequence as programmed.

In that testing process; animation art and programing steps that were not as smooth as they could be were identified and corrected before the final art was shot with effects. Since the final look of the drawings was "neon" (a burn exposure with a DX'd glow around the line art) the pencil-art technique was perfectly suited because the neon look hid any small imperfections in the pencil lines.

Airbrush Techniques

You can create special textures by using an airbrush and spraying black ink (mixed with *Wondersol*—a solution that makes water-based inks 'tacky' enough to adhere to glossy surfaces) onto a clear punched acetate or mylar cel in register with your type or art.

If we consider your original airbrushed art as the neg; the hard part of the airbrush technique is creating the "pos." We can't make the pos by contacting the 'neg' onto line film; because line film is too contrasty to match the feathered edges of airbrushed art; it will strip away any of the middle-grey values. Thus, you must also airbrush the pos.

The best way to do that is to place the airbrushed 'neg' cel on a peg bar that is taped to a light table. Then place a clear acetate or mylar cel over the neg cel and carefully airbrush the pos version. Watch to see when you have sprayed-on just enough ink to cancel-out the light showing through the neg cel. Getting perfect match-up using this technique is difficult at best. However, one can get close enough for satisfactory results.

If you are finding it impossible to get an airbrushed pos version; take the master airbrushed neg to a lithographer and have him shoot either a Velox or a film halftone using a coarse screen size; like a 50- or 60-line screen. Those create a line-art versions of the airbrushed gradient tones. On your stat camera; shoot film negs and positives of the master Velox or halftone; then peg those together. Do not worry about the dots; you will not see them in the final slide; because they are shot using glow screens; to eliminate the dot patterns.

Other methods of creating custom textures for specific effects are to use charcoals on textured papers; or crayons; or pentels—almost anything goes. Such original art can be shot on either line film or converted into mezzotints or halftones to make texture blocks or texture highlights. Using glow screens with them renders still other effects, as mentioned.

Posterization Effects

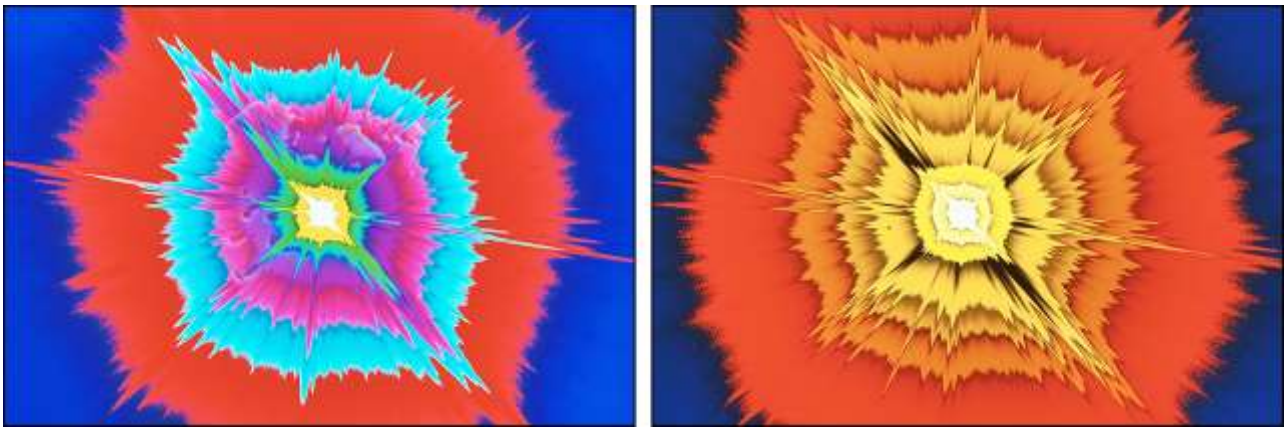
Normally, posterization of a photograph is achieved by shooting the original slide onto line-film with varying exposures to give varying degrees of black-to-clear 'relationships' in the line negs. Those line negs are converted into positives. Separately, and together as sandwiches, the Kodalith negs are used as "color masks" to assemble the scene in posterized hues.

Although you can achieve a good variety of masks by simply varying the exposures while shooting the negs; even greater variations can be achieved by preparing "color separation masks." Here is how you do it:

After shooting the varied-exposure negs on line film; shoot a series of varied exposures on Plus-X or Panatomic-X film using a #29 red filter over the lens; then a #61 green; and a #47 blue.

The first negatives will have density only where there was red present in the original; the other two sets will have density where there was green or blue. These continuous-tone negs can be reshot to create continuous-tone positives using Pan Masking film, Panatomic-X, Plus-X, or Fine Grain Release Positive film (5302).

The colors you use will overwhelm that the blue-base of Plus-X and Panatomic-X films. If you must have a clear base, reverse those negs onto 5302; and reverse the 5302 positives onto 5302; to make clear-base negatives.



Starburst posterization effect was made by making line-art color separations from a continuous-tone starburst. Those were made by using different exposures on eight sheets of line film. Negs and positive were made of each step and used in various combinations with glow screens to made soft drop shadows between layers. Eight exposures were made, each with a different-color gel. For each step, the neg of one was used with the pos of the next. For example, neg #2 with pos #1. Drop shadow cels were created by making black outer glows on Fine Grain Release Positive (5302) stock.

John Emms explains the procedures for a three-tone black and white posterization:

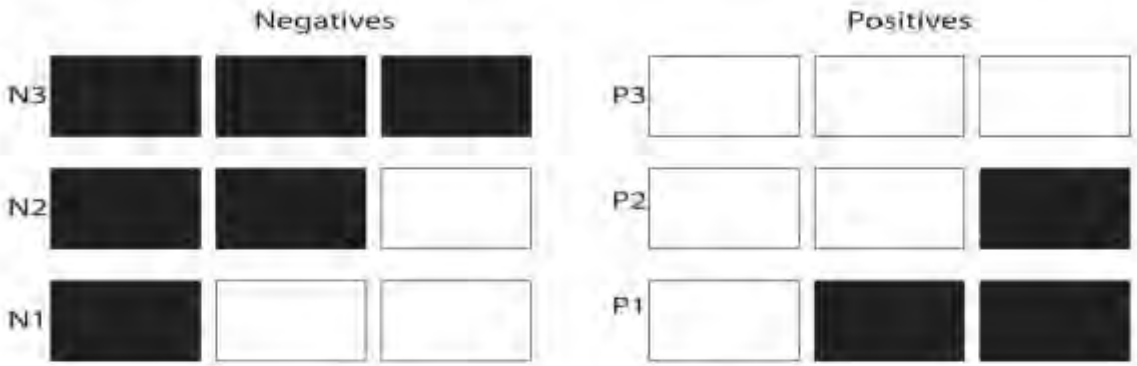
You [start with] three pieces of film showing the progressive three steps building:

1. The first negative lith shows step one
2. A positive copy of the first step sandwiched with the second negative
3. A pos of the second step sandwiched with the third negative

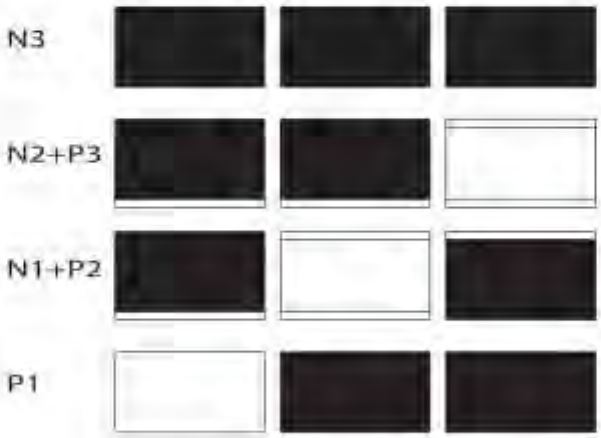
Now you can sequentially expose those three items above to light, medium and dark gray and you will simulate the original [black-white] with just three tones.

POSTERIZATION SCHEMATIC | by JOHN EMMS





Combine the positives and the negatives shifting them a step



In this example to produce a posterized image from the combined cells

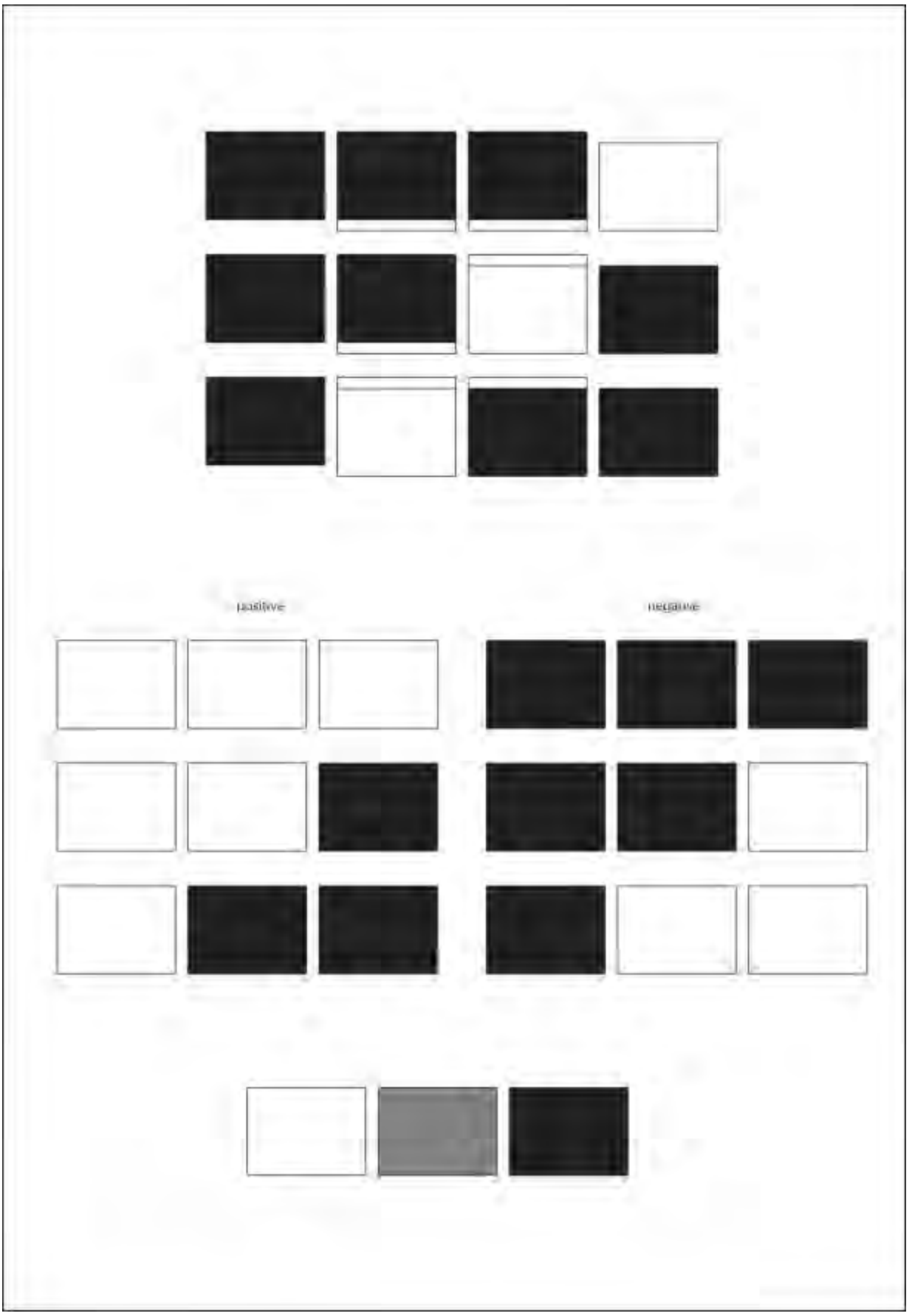
P1 would be exposed to White

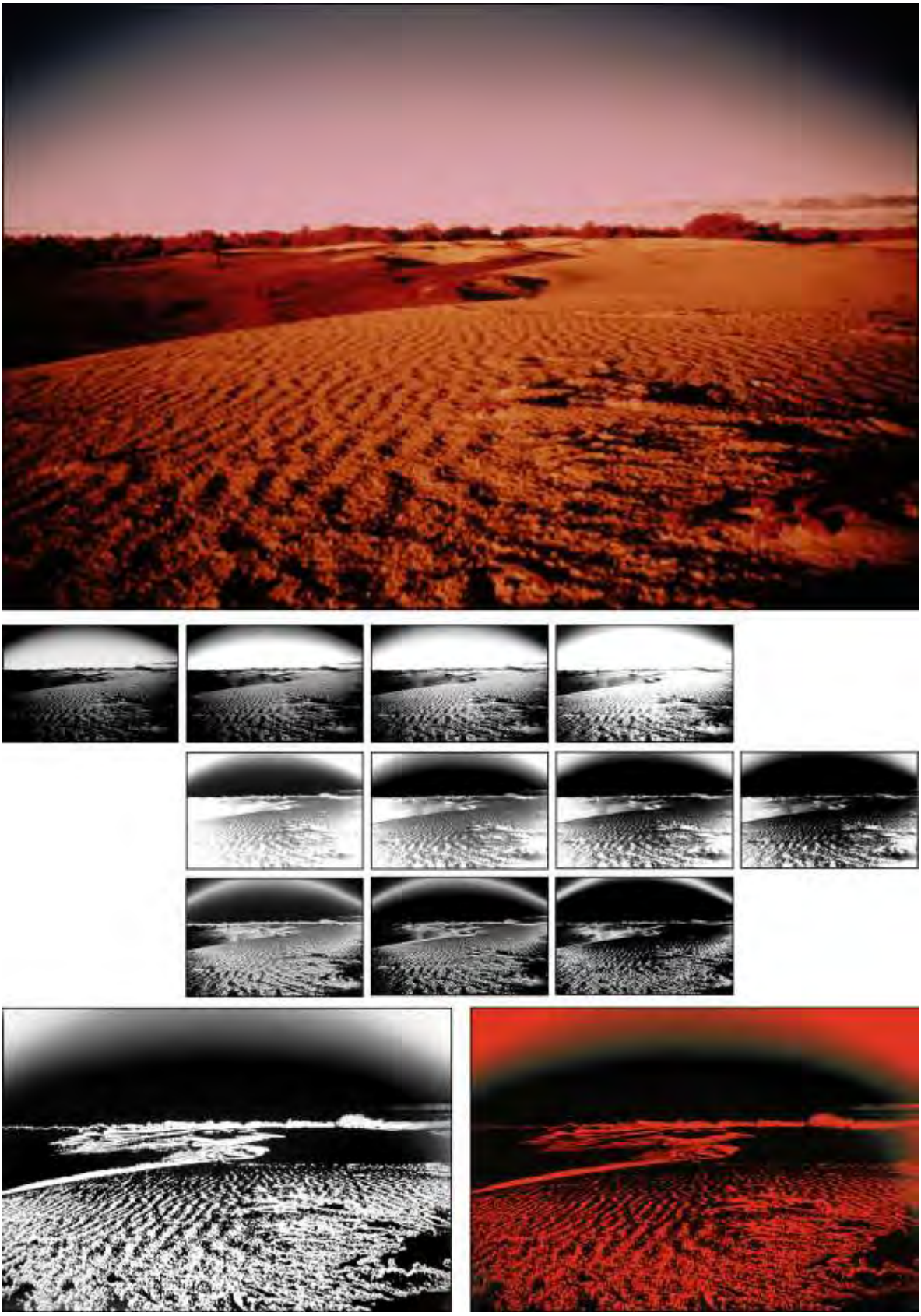
N1+P2 would be exposed to grey

N2+P3 would bexposed to black

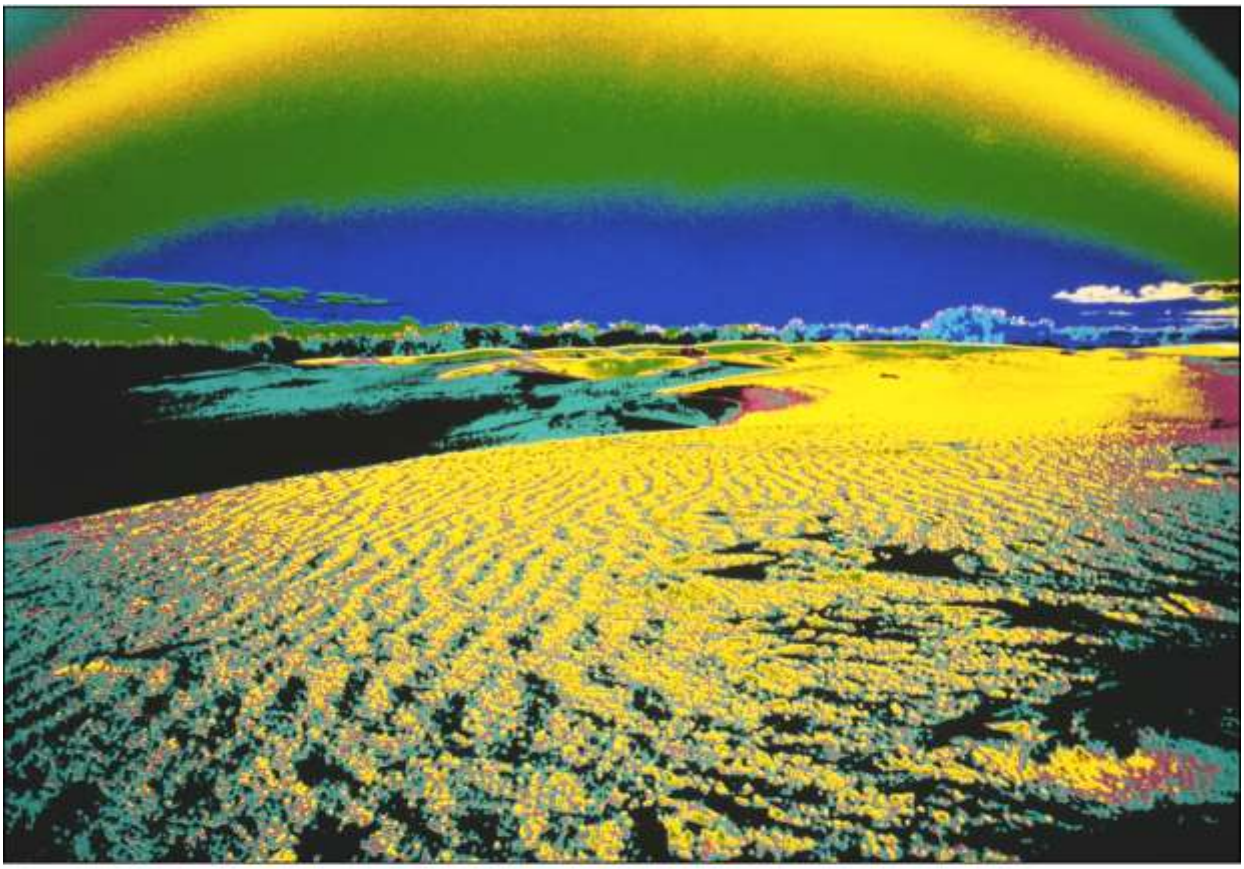
To do this in full color would be the same except you would produce each negative and each positive for red, green and blue

using a Wratten or similar filter (Red #25, Green #58 and Blue #478)


positive
negative



Top: Original photo | Row 1: progressive negatives | Row 2: progressive positives offset one position
Row 3: pos-neg sandwiches | Bottom: gelled pos-neg sandwich.







Andreas Wannicki setting-up the Forox at Audio Visual Centrum (AVC) in Stockholm, 1984.

Rostrum camera photography must be disciplined; without it, your creativity will be severely limited. I have known many Rostrum camera operators with creative ideas; but who could never get their ideas on film because they never took the time to work in an organized manner. With them, it was always 'hit or miss.'

Rostrum photography is not as 'whiz, bang' as studio or location photography. Like cine opticals and effects; multi-image techniques are complex, precise, and tedious. Often, too, they are repetitious—which makes concentration difficult. (I cannot count the times I've almost nodded-off while shooting a long series of 32-second star exposures).

Because there are almost an infinite number of variables; the hardest aspects of Rostrum camera photography are nomenclature and precise communications. Keeping accurate records and logs is another must.

Incredible Slidemakers did a lot of work for out-of-town producers and agencies. Most often, the work they sent us was highly complex; they would do the simple stuff themselves and farm-out the complicated shots. Specifying exactly what was to be shot was often the most difficult part of the job. Sometimes; the time it took to describe the desired effect on long-distance phone calls rivalled the costs of shooting the job. What one producer called an "aura" another called an "eclipse;" or "under-glow;" or "halo;" or "silhouette glow." The list goes on and on ... and that is just one type of effect.

You say you want a star? What kind? Long shafts; short shafts? How many shafts—two; four; six; eight? Rainbow-fringe stars? Colored stars? What color? Yellow? What shade? How about the orientation of the star—north-south; east west; ‘2:30;’ other? Where should the star be in the field? On the letter "W?" Which part of the letter? Should the star be DX’d into the letter; or shot as an over-projection element? Etcetera.

Those are just some of the questions that can come up when describing an effect. The same data is needed when planning an effect, keeping notes, writing a shoot log, or trying to communicate the desired effects to a camera operator, producer, or client.

Unfortunately, there is no adequate way of drawing complex photographic effects short of making a full-blown illustration that could cost more than the photographic effect. If there were a way of adequately sketching effects, life would be a lot easier to cope with because everyone would have a true visual representation of what they ultimately want to see. That is seldom the case, even though I have seen a lot of time and money wasted trying to storyboard special-effects sequences.

Equally unfortunate is the fact that the multi-image industry will not have a standardized nomenclature for a long time. Multi-image is a new, fledgling medium compared to the motion picture industry.

Because of that, most producers are still ‘protective’ about their ‘trade secrets.’ On top of that, most producers have their own ‘tantalizing’ names for effects. That is too bad; because if there was a standardized nomenclature, we would be able to communicate better amongst ourselves and with our customers.

What you name an effect really is not the important issue, though. What counts is that you have a succinct and precise method of writing the instructions about how to shoot the effect.

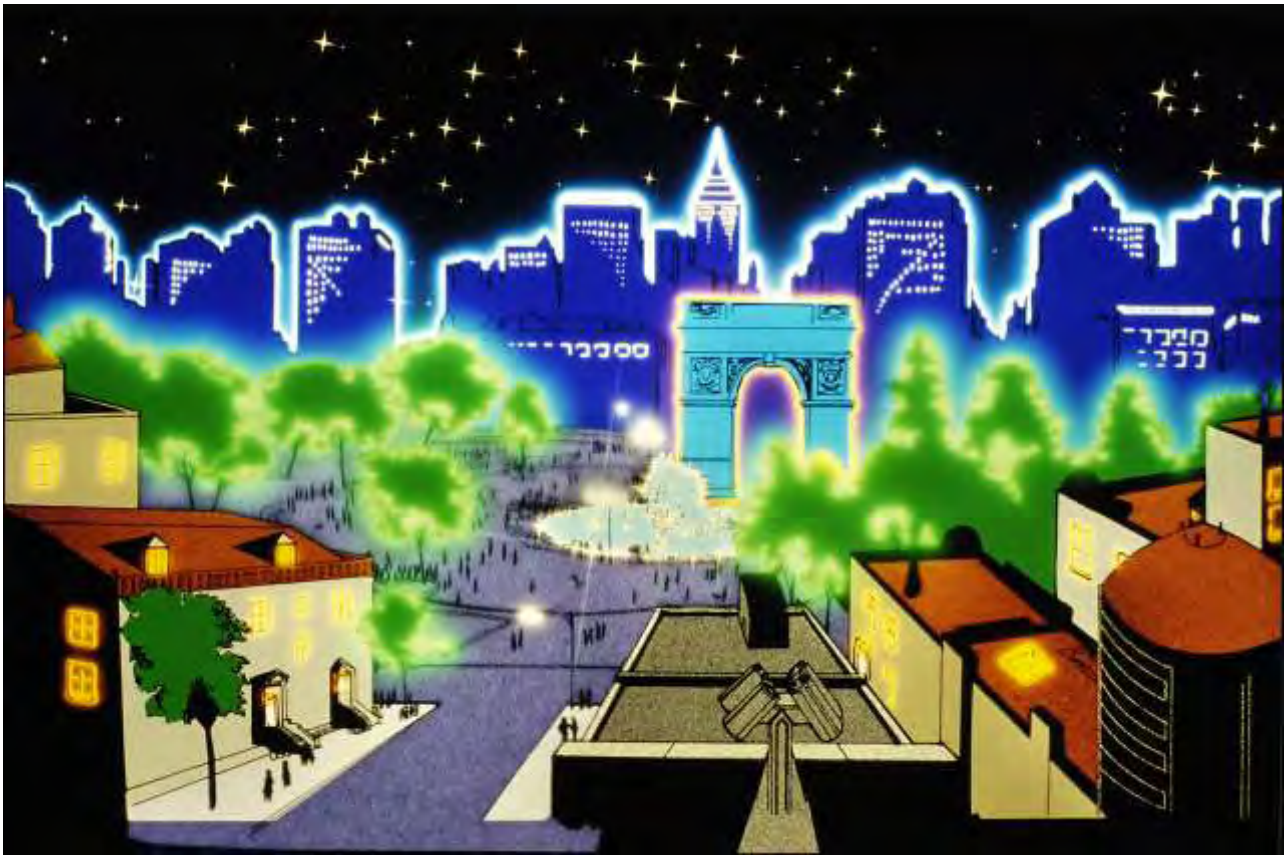
Without keeping precise logs; you will never be able to shoot complex effects sequences with any degree of skill or repeatability. You may come up with a ‘fluke’ that is smashing; but can you repeat it? Repeatability is all important; because the effects can get so complicated that your chances of getting every element correct on the first shoot are nil.

You will have to modify the elements that you blew on the first shot and shoot them again; to recreate the total effect; likely with more corrections and ‘refinements’ on the second, third, and maybe even fourth pass.

I recall one rotoscoped sequence illustration Greenwich Village that we prepared a for The Village People. (See picture; overleaf.) The shot involved over three dozen individual exposures on the same frame of film to composite about two dozen neg and pos cels, some ‘straight’ and others with effects. That shot was on camera for about eight reshoots before all the right colors and exposures were worked out to everyone’s satisfaction.

Actually, the finished slide looked deceptively simple; until you started noticing all the matte work; the color butts and burn-throughs. It was an agonizing experience; but we learned a lot about keeping logs.

A proper log is not a sketchy, cryptic notation on a canary pad. It is a permanent record of your shooting procedures, processing instructions, as well as complete listings of effects and colors catalogued by number. Those elements form an appendix to the actual log sheets used for your jobs; the log sheets refer to the appendix for purposes of brevity in logging procedures before or during the shoot.



Incredible Slidemakers artist, Bob Smith, created the artwork for this illustration of Washington Square. Produced for the Village People's tour of the USA.

Take our example of star effects, pages 2877-2881. The appendix of the log would have examples of all the different types of stars you have shot; along with the shooting instructions. The specimen stars are numbered. In order to be specific in the job log, you would refer to a type of star by number.

See next 3 pages for (fold out) log sheet sample.

JOB NUMBER			DATE		CAMERA OPERATOR								DIRECTOR				PRODUCER			
SCRIPT REFERENCES					EXPOSURE															
TAB	FRAMES		TIME		DX	CELLS					EXPOSURE		STREAK		GELS		DICROIC			S
	FROM	TO	FROM	TO	?	1	2	3	4	5	F	SHTR°	BEGIN	END	1	2	Y	M	C	A

First page of a Master Shoot Log prepared for Sonargraphics. The original was a three-page fold out.

sonargraphic

MASTER SHOOT LOG

SONARGRAPHIC MULTIMEDIA / 602 ST. KILDA RD. / MELBOURNE 3004 / TELEPHONE: 51-6132

PRODUCER	ART DIRECTOR	STOCK 35MM 16MM ACADEMY OTHER	SILENT

EFFECTS | MOV

DICROIC			STAR	GLITTER		FOG	AURA		GLOW			DFSN		OTHER	OTHER	OTHER	N-S		S-N		E-W	
Y	M	C	AXIS	HLD	MVE		IN	OUT	LW	MD	HI	H	L				FROM	TO	FROM	TO	FROM	TO

Second page of a Master Shoot Log prepared for Sonargraphics. The original was a three-page fold out.

1-6132

SILENT SOUND	FORMAT	RATIO	IF ?? CALL:	PAGE OF

MOVEMENT								NOTES			
E-W		W-E		ROTATION		HEIGHT		DESCRIBE EFFECT	SHOT	OK	ERROR
FROM	TO	FROM	TO	FROM°	TO°	FROM	TO				

Third page of a Master Shoot Log prepared for Sonargraphics. The original was a three-page fold out.

The specimen log sheet (previous three pages) gives you an example of what a relatively complete log sheet should include. This one, which I developed for Sonargraphics Multimedia, in Melbourne, can be used for either slide or movie production. Let us run through some of the categories of information to shed some light on how that log is used:

TAB: refers to your (AVL) slide program's TAB reference points.

FRAMES: Two columns are provided in the event you are shooting in cine; multi-image slide makers would consider each frame one slide.

TIME: Another motion picture reference; but also useful for multi-image work insofar as you can make specific time annotations so that if your camera operator or shoot logger is also experienced on an Eagle or similar time-based programmer (which is helpful) the camera operator will be able to assess more accurately what is happening on screen via projector-light effects; and thus get a better understanding of how the slide is going to be seen. A multi-image producer might use the time column to indicate a dissolve rate and/or the time at which the dissolve occurs; for example, *2D 3:33.50*— or, 2-second dissolve at 3 minutes, thirty-three and a half seconds.

DX: Is this exposure being double-exposed into the preceding exposure; if so, check this box and/or indicate the number of the DX—is it the first, second, third? Note: this log assumes each individual line to be one exposure; thus, the notes for a DX slide would involve two lines; two double exposures would require three lines, etcetera.

CELS: Here there are five columns; sufficient to cover the number of cels you would normally combine into a single exposure. Each of the cels should be identified by:

- Job number; perhaps including a job-section reference for big shows that include more than one module
- TAB number (particularly to indicate steps in an animation or sequence)
- Individual cel number. For example: *122-B-TB29/7-P131* which translated means: Job Number 122, Show Section B, TAB29, section 7 Positive #131.
- All cels should be indicated as to whether a positive - "*P*" - or negative – "*N*" - or top-lit - "*T*" - or Cel Paintings – "*CP*", or slide – "*S*" - or large-format transparency – "*LT*"

In addition, all the cels should be consecutively numbered; even if you get to 1,000,001. That way you will never be confused enough to end up with log notes reading P131 which corresponds to one or more possible cels. However, for the shooting log notation, use only the last part of the cel number, in this case "*P131.*"

The numbers 1 through 5, under "Cels," refers to the number of cels in the 'sandwich' being photographed. If you were creating an aura, you would indicate the sandwich by writing, *P131* (pos) in the "Cel #1" column and N131 (neg) in the "Cel#2" column.

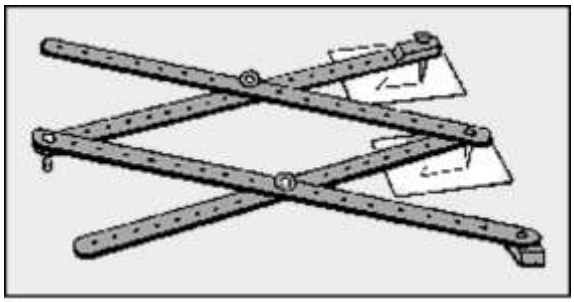
EXPOSURE: F-stop is self-explanatory. Half stops should be noted their proper numbers, e.g., *3.5 / 4 / 4.5 / 5.6 / 6.3 /8 / 9.5 / 11 / 18.5 / 16 / 19 / 22 / 27 / 32.*

SHUTTER: The shutter is indicated in degrees here; in the event you are using a cine camera with a rotating-wedge shutter. For those using a Forox or other still camera, degrees should be noted as shutter speed; or length of exposure.

STREAK: These are effects caused by moving the art across the field or moving the camera up or down on the art with the shutter open; producing smears of light which some call "trails," but which cinematographers call "streaks." Indicate the start and end (stage) positions; as well as any camera height movements.

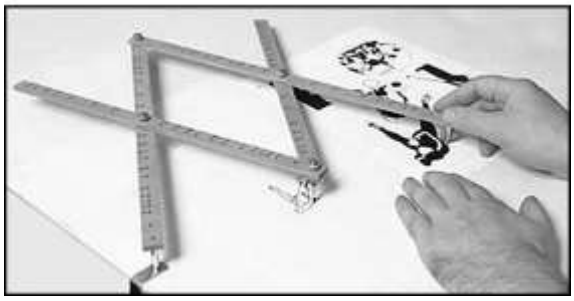
First, note the stage movement in the "movement" columns (further to the right of the log sheet). If you were moving the art up from the center of the field to out of the field on the north side; you would indicate this as *CFF* to *OF/N* in the "N-S" (north-south) column. (Translated, that means Centered Full Field to Out of Frame on the north side). You can come up with your own acronyms; make them part of your production nomenclature.

For shorter streaks within the field; use a pantograph keyed to your grid's coordinates. Or if your blessed with a computerized camera, the coordinates themselves.



Wikipedia: A pantograph is a mechanical linkage connected in a manner based on parallelograms so that the movement of one pen, in tracing an image, produces identical movements in a second pen. If a line drawing is traced by the first point, an identical, enlarged, or miniaturized copy will be drawn by a pen fixed to the other.

https://www.merriam-webster.com/dictionary/pantograph



Merriam Webster: four light rigid bars jointed in parallelogram form for copying something (such as a map) on a predetermined scale consisting of]

https://www.jarrold.co.uk/departments/stationery/drawing-and-writing/drawing-accessories/jakar-wooden-pantograph-18$7

For pantograph readings; set the camera and stage to the Centered Full Field position. Place one end of the pantograph at the center. Mark with a small dot where the other end of the pantograph points to on a 'pantograph-reference sheet' (another Master Grid) and label that as "Position #1." For our example, that is the start point of the streak move.

Now slide the stage to the end position for the streak exposure. In like manner; place a small dot where the Pantograph is pointing and mark that *Position #2*. If the streak is a straight-line motion; connect the two dots with a straight line indicating that. If the streak has a compound motion (such as a curve or wave) then trace the path of the pointer with a pencil on the Pantograph grid; to indicate the stage motion during the exposure.

Mark the pantograph grid with the scene's TAB reference number. On the columns marked "Height" indicate changes in the camera's height. If your camera does not already have one; attach a tape rule to the column of the camera and a pointer to the camera chassis.

As the camera tracks up and down the columns, the pointer will give you the height of the camera from the stage. The "From" and "To" columns under streak are for noting the start and finish points for the camera's height during the streak exposure.

For a "Roller Coaster Zoom," the camera might move down from a height of 100 to 43 while the stage moves from Center Full Field to Out of Field on the North Side; or from pantograph position #1, to position #2, and finally position #3.

Since this is a roller-coaster zoom; the stage motion will not be linear; we won't move the stage at a constant speed; we'll slowly build-up the speed (accelerate) to create a 'swoopy,' curved zoom streak. That is done by slowly moving from Position #1 to Position #2; then, as we pass position #2, accelerating while moving to Position #3.

Most large rostrum camera have a rheostatically controlled camera height motor; that can drive the camera up and down the column at variable speeds. Place a 'speedometer dial' with a pointer over your motor-control knob and mark it with speeds 1 through 10 (one is slow, 10 is full-tilt boogie).

For our example, we will say that our total streak exposure time will be 16 seconds (it's good to allow a long exposure for streaks; that way you have plenty of time to make your stage and camera height movements slowly and with precision).

Thus, the streaking speeds noted in the "Streak" columns read: *1/2* (Begin) *6/2* (End) which means at the one second mark start zooming in on the art at speed 2, and continue that speed through the 6th second of the exposure. On the next line down in the "Streak" column, directly beneath your last markings, indicate *6/A2* (Begin) *16/10* (End); that means accelerate the zoom speed (from 2) at the 6th second, arriving at speed 10 near the 16th second of exposure.

Since a complex movement such as a roller-coaster zoom is intricate, you should verbally describe the effect on the right side of the log sheet in the "Notes" section; perhaps with reference to a storyboard sketch, or a technical diagram of the streak movements.

GELS: Here, note the gel colors to be used for the art elements being exposed. Usually, you will be using only one gel; but you might conceivably be using more to create a custom color.

If you are using the Dichroic light source to create a colors or filter for dupes; indicate the percentages of Yellow (Y), Magenta (M), and/or Cyan (C) in the filter pack. If the dichroic is supplying white light, indicate "W" in each of the Y, M and C boxes.

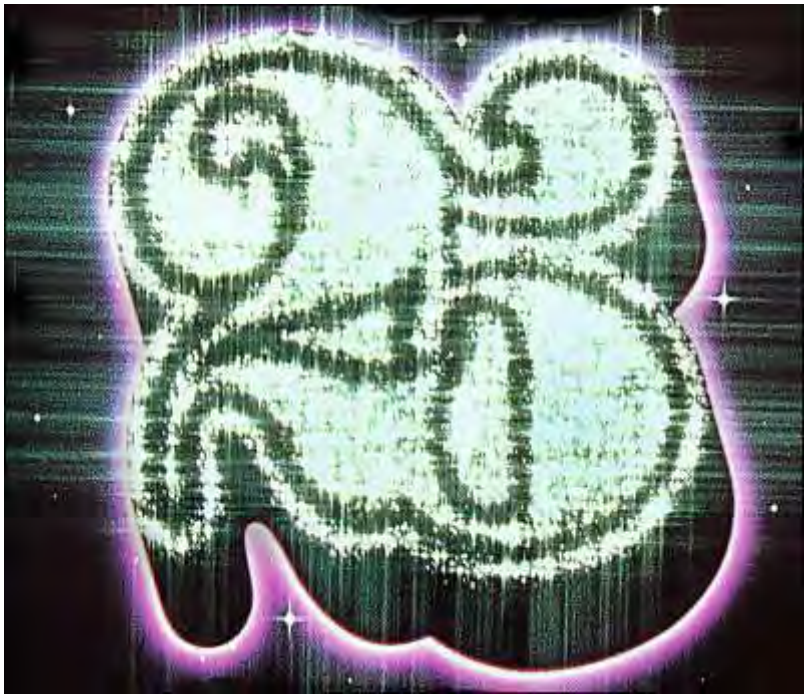
In our example, we are using the Dichroic light source in White Light mode; but we are using gels #12 and #47 to create our coloration. The gel numbers indicated on the log sheet should be the same numbers used by the gel manufacturer. If you use different brands; add a letter code to the number, which will indicate the manufacturers name; e.g., *RSG12* would mean Rosco SuperGe1 #12.

[*Editor*: Rosco no longer makes Supergels; they were rebranded as *Cinegels.*]

STAR: Here, you would indicate the type of star(s) by number and axis. The star-type number would be keyed to the Effects Bible in which there are samples of all your different types and sizes of stars, numbered. "Axis" refers to the orientation of the star. If it is a typical 4-point star; the axes are North/South and East/West, indicated by degrees (0° to 360°). Using the rotation scale on the stage as a guide; mark where the northern-most shaft of the star points to on that scale. With a 4-pointed star; that could be any number of degrees from 0° through 45° (rotating to the right); or 0° through 315° (to the left). [When you have reached 45° or 315° degrees of rotation; the two shafts are back to a north/south orientation; continuing rotation will result in redundant positions.]

Thus, a sample star notation on the log sheet might read: 7/30, meaning star type #7, with its northerly shaft pointing to 30 degrees of rotation. Upon looking up star #7 in our Effects Bible, we might discover that it is created using a Tiffen 2 mm Star filter in combination with a Tiffen Fog#1 filter. In the Gels column, indicate the color; for example, a yellow star might read *RSG12* (Rosco SuperGel #12). In the Exposure column, it might read 12 seconds at f/3.5.

GLITTER: Like stars. there are many types of glitter effects and you should keep samples of these effects with their shooting instructions in your Effects Bible, all appropriately numbered. *HLD* means "Hold Position," and *MVE* means "Move" or Change Position. These two references become meaningful in revealing whether you want a shimmering glitter effect on the screen; or simply want lots of little glitter stars that hold in a fixed position.



For example, a shimmering-glitter effect is created by shooting three (or more) different slides of the glitter-fill areas. For each slide, you change the position of the little glitter stars by moving the glitter screens (multiple mezzotint texture screens) to different positions. Then you program the glitter-fill slides for a quick-paced sequence of Alternates; so the projectors flash rapidly between those slides. On the log, if you want such a shimmering-glitter effect, indicate that the glitter should *MVE*.

FOG:



1962 Carvette Roadster shot for *A Classic Collection of Corvettes* (Penn Press, 1975) using a Tiffen Fog #3 filter.

Fog effect filters are available in wide range of brands. Each brand creates a slightly different effect. As mentioned earlier, I prefer the Tiffen series; although the Cokins can create a stronger effect which might be desirable in some instances. Again, in your Effects Bible; have samples of the different effects all numbered, and use the number code on the log sheet to indicate the type of fog effect desired.

AURA:



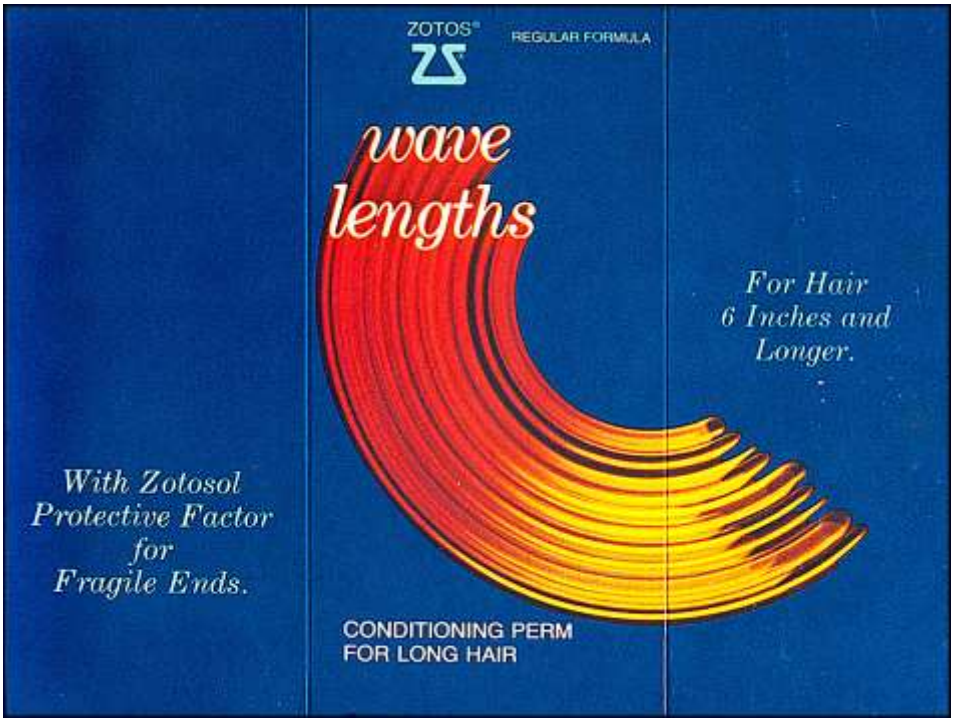
An aura is a glow defined by a shape; either within or around the outer edges.. Note your aura types in the Effects Bible and indicate the type by number in either the "IN" column, meaning inner aura, or the "OUT" column for an outer aura. If the art elements have both an inner and an outer aura, note type the outer aura on one line and the inner a on the next line, being sure to note that the two are being shot together (if that is the case). If you have enough projectors available, though, you should consider shooting the inner and outer auras as two different slides to be recombined on the screen; that will give you more programing versatility; and a lot of interesting screen effects can be created by either flashing or dissolving between the inner and outer auras.

GLOW: This is a common technique. In most cases your glow will be either *HI* (High), *MD* (Medium), or *LW* (Low). If you have more than those three types of glows, indicate the number of the type you want (keyed back to samples in the Effects Bible) in the column that most appropriately describes the intensity of the glow (i.e., *HI*, MD, or LW).

DFSN: "Diffusion." Again, there are many types of diffusion filters ... and an even greater number of diffusion effects. Note them by numbers that key to the samples in your Effects Bible.

OTHER: Three columns are left open here in case you have some effects that don't fall into the commonly used categories provided for on the log sheet.

ROTATION: This column is used to indicate the stage positions for either a step rotation (without streaks) or a streaked rotation. To indicate the stage position for a step rotation, indicate the rotation-guide pointer position (say, 170°) in both the '"FROM°″ and "TO°" columns. If streaking is desired; indicate the start and finish of the streak rotation; as, say, from 0° To 170°; and check the streak box.



Example of a 180-degree rotation shot with a long exposure to create streaks.

SHOT | OK | ERROR: On the extreme right-hand side of the sheet; you see the "Shot," "OK," and "Error" columns. During the shoot; as you progress down the log; check the "Shot" column to indicate 'where' you are. If you think all is ok; check that column.

If you have made an error; check the "Error" column and re-shoot the frame. Later, checking your 'take' against the log; you will be able to identify the frame with the error. and know that the correct frame is the next one on the roll (if that is the case). If you make two errors in a row on two separate frames; indicate that as *2X* in the error column, rather than just a check. This may seem overly detailed; however, errors can be so subtle that the slide mounters and editors could conceivably not notice the slide as being erroneous. Thus, an indication on the log sheet will alert everyone to the error and where it is on the processed roll.

A Note on Numbers

A systems approach to rostrum photography is imperative to create complex effects; and a system, of necessity, involves a lot of acronyms, abbreviations, and code numbers; to keep track of large masses of data.

The numbering and code systems I discuss in this book are designed for a larger, high-volume shop; one that employs a lot of people; who all need accurate instructions. Your own numbering system might be simpler—a lot simpler—depending on your requirements.

The system you use should be the simplest one possible that still permits completely accurate communication and understanding of what is going on at every point in production; by all members of the production team. If your numbering system does not provide informational accuracy and communications flexibility; it should be replaced with another that does. However, if you have one that works, stick with it even if another seems more attractive; people resist change and there will be a long period of upheaval following any changes you make in numbering or coding.

How to Use the Log Sheet

The log sheet is used to either "Pre-Log" shoots or "Log While Shooting." Pre-logging is by far the best way to approach a complex shoot.

If you are not sure about how elements will look in a finished shot and feel uncomfortable about pre-logging; shoot a series of trial shots, keeping an accurate log of all your tests; then use the (successful) test results to pre-log your final shoot. Or, in situations where your either shooting simple stuff or 'making it up as you go along;' then use the "Log-As-You-Shoot" method. (I tend to daydream while shooting and get new ideas while staring at the art being shot.) In either situation; a good idea is to create a two-person team for all shooting operations. One team member operates the camera; the other reads the pre-logged data and monitors the shoot; or notes the camera and shooting moves, etcetera, while the shoot is in progress.

When doing complex effects, you really must be either Superman or a nut to shoot without a second person monitoring or logging. It is virtually impossible for one person to keep track of everything with 100% accuracy; and when you get into shooting individual frames that have 10 or 20 exposures per frame, one error could set you back an hour or more.

Materials Needed for Shooting Effects from 7.5-Field Cels

Color Gels: I recommend Rosco Supergels in the following colors.

[*Editor*: Rosco no longer makes *Supergels*; they were rebranded as *Cinegels.* The gel numbers below are the old, Supergel codes. See page 2934 for the new color numbers.]

- 01 - *Pale Pinkish Yellow*
- 07 - *Pale Yellow*
- 09 - *Medium Yellow*
- 11 - *Yellow*
- 20 - *Orange*
- 23 - *Dark Orange*
- 19 - *Orange-red*
- 25 - *Red*
- 36 - *Warm Pink-Magenta*
- 48 – *Magenta*
- 52 – *Light Magenta*
- 65 – *Blue*
- 67 - *Dark Blue*
- 69 – *Darker Blue*
- 72 - *Aquamarine Blue*
- 73 - *Peacock Blue*
- 86 - *Yellowish Bright Green*
- 90 – *Deep Forest Green*
- 880 - *Gray* (*Roscolene* gel; not Supergel)
- 882 - *Chocolate* (Roscolene)
- ND3 – *Neutral density* (1-stop exposure difference without affecting color).

Using various exposures on these gel colors will provide an almost unlimited palate of colors; however, as previously discussed, you should select the colors that were all shot at the same f-stop for your basic selection.

Glow Screens and Glass

Glow effects (including Auras) are different from fog effects. Fog is shot by with a filter over the lens; whereas glow effects are shot by introducing a sheet of diffusion material over bottom-lit art. I call such diffusion materials, "Glow Screens." There are all sorts of diffusion materials available; each produces a slightly different type of glow effect. For example: common typing paper, or artists′ tissue, even kitchen wax paper; all can be used for glow effects when placed over the art and lit from below.

However, I've Rosco″ found the following *Cinegel* materials work best:

- Rosco #100 - *Frost*
- Rosco #101 - *Light Frost*
- Rosco #104 - *Tough Silk*
- Rosco #112 - *Bubble Frost*

Continued

- Rosco #113 - *Matte Frost*
- Rosco #114 - *Light Frost*
- Rosco #801 - *Frost* (from the *Roscolene* series, not *Cinegel*)
- Rosco *Tough Frost* - available in rolls only, and expensive.
- Rosco *Tough Rolux* – also in rolls only; also pricey.

The most versatile of these are the last two (obviously, since they are also the most expensive). In fact; the best of the lot for rich, texture-less pillows of glow is the Tough Rolux; that material has no 'grain;' it is totally smooth.

One of the advantages of using the Glow-Screen technique is that you never have to touch the lens to add a filter, risking lens or camera movement. Another benefit is no change of focus—which affects image size—is required. I know some cameramen who used to think a glow was created by simply shooting the art out of focus. Well, that will create a glow; but by changing the focus of the lens you also change the relative size of the image on the film; and you also risk camera or lens movement.

Three elements affect the size of the glow:

- Glow Screen material
- Height of the screen from the art
- Length of exposure.
-

The two most important variables are the glow screen material and the height of the screen over the art. The higher the glow screen, the larger the glow.

To shoot glows, use 10 X 12-inch glass sheets (~25 X 30 cm), that fully cover your pegged cels, in varying thicknesses—the more variety, the better.

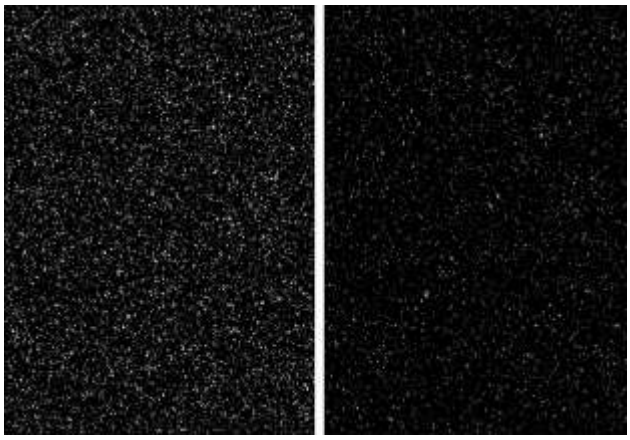
Stock a few sheets of 1/8-inch-thick glass (~3 mm); 1/4-inch plate glass (~6 mm), as well as sheets of 3/8-inch (~9mm), 1/2-inch (~12mm), and 1-inch thicknesses (~24mm). They should be clear; not tinted glass. Those 'standard' thickness will raise the glow-screen material(s) over the artwork in standard heights.

To achieve an even glow across the entire field; from corner to corner; the glow screen should be sandwiched between two sheets of glass, to keep it flat. (Rolled glow-screen materials such as *Tough Frost* and *Tough Rolux* tend to have a curl, especially when they are fresh off the roll.) With use they tend to develop "kinks." Thus, because the amount of glow depends on the height of the screen(s), any curl or kink will produce uneven glows.

After positioning the 'right' thickness of glass over the art—to achieve the height you want—lay your glow screen on top of that glass and cover it with another sheet of glass (I prefer the "cover glass" to be 1/4-inch because it is heavy enough to really hold everything firmly in place and flat).

For logging purposes, number the glass sheets as to their thickness, i.e., 1/8, 1/4, etcetera. And number (or code) the glow screens.

Glitter Screens



Glitter screens are actually mezzotint screens that can be easily made by shooting a Letraset #906 texture sheet. The sheet can be shot at various enlargements and reductions to create coarser or finer mezzo patterns. By assembling a sandwich of mezzo screens, more and more areas block each other, eventually creating a pattern of various sized 'pinholes.' With a star filter over the lens, the pinholes create a field of stars. Using mezzo screens is a lot easier than punching a lot of holes in black paper.

Left: a single mezzotint. Right: two screens, offset. Sandwiching offset 35mm mezzos in a Wess mount is an easy way to make a realistic-looking star field. As the sandwich gets warmer, the mezzos change position, creating a twinkling effect.

The size of the glitter stars can be controlled by the coarseness of the mezzo screens, which determines the size of the pinholes. Fewer, larger stars are created by fewer sheets of coarse mezzos sandwiched together. A 'tight' field with bazillions of teeny-weeny stars is created by a few sheets of fine-screen mezzos. The more screens in the sandwich the fewer pinholes per square inch. Coarse, medium, and fine-screen mezzos can also be combined in the sandwich for more variations. Likewise, you can control the length of the star shafts by varying the exposure time. The longer the exposure, the longer the shafts.

One of my favorite-looks is made by multiple-exposing three different glitter fills together (see picture; page 2970); or shooting them as separate slides and recombining them on screen. One glitter fill is made by using a lot of coarse-screen mezzos (usually five or six) to create a few larger stars; give these a long exposure (sometimes as much as 36 seconds @ f/3.5) for long, long shafts. Then, make a second exposure using 3 or 4 medium screen mezzos sandwiched together. Finally, make a third exposure with even shorter exposure time and using 2 or 3 fine screen mezzos in the sandwich.

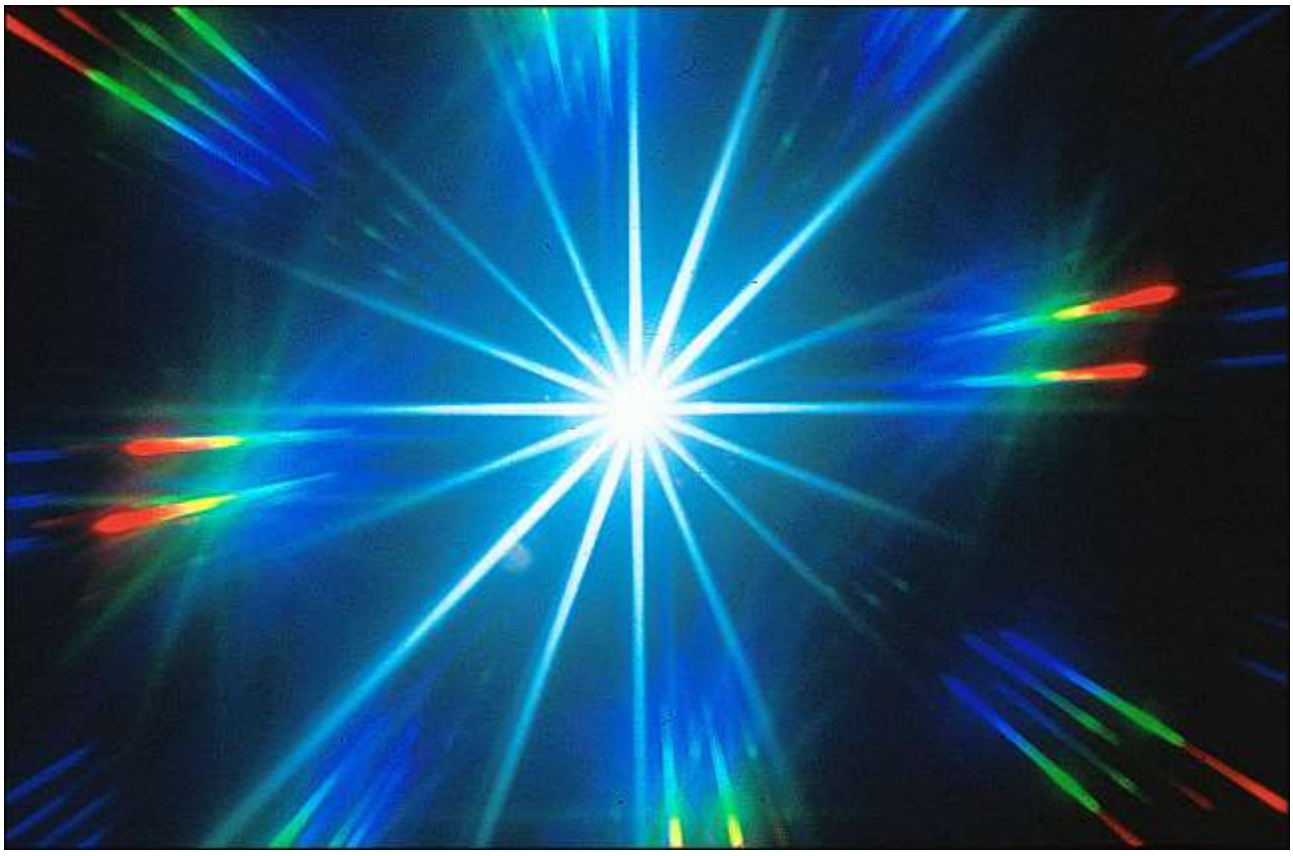
Another great effect is created by making (at least) 3 separate slides of the same mezzo sandwich & exposures; but moving the top screen between each exposure. That changes the pinhole positions and thus changes the pattern of the glitter stars. When programmed to flash rapidly in sequence, the three slides (or more) will create a shimmering-glitter effect that is especially nice.

Of course, the glitter screens can be used in conjunction with color gels to create colored - even multi-colored glitter in a single frame or multiple slides. For a terrific shimmer effect, try shooting one slide with the glitter white, another in yellow, and a third in orange or green; then program them for fast flashes. I am sure you'll be pleased with the result.

"Glitter Flares" are created with extremely long exposures to create long star shafts; then double exposing (or over-projecting) a glow of the same art; and possibly an aura to help define the shape of the word, symbol, or other element. When shooting glitter screens, lay a sheet of 1/8-inch glass over the neg or pos then lay the mezzo screens on top of the glass. Use the thinnest glass because if you raise the glitter screens too high above the art, the pinholes will be out of focus and you will get soft stars (which are also nice).

Another function of the glass is to allow you to slip and slide the sheets in the sandwich (until you get the combination you want) without moving the art itself. Unless your glitter screens are severely bent or curled; you should not need a top glass. (Don't forget to take the star filter off the lens after you have shot your glitter exposures.)

Star Plates



Star made with triple exposure using a Tiffen 2 mm Star, a Spiratone Rayburst ,and a 1A filter smeared with Vaseline.

Stars are created by punching pinholes into double-weight black cover stock with either a sewing needle, pushpin, thin nail, or the like. Three factors affect the size of the star:

- Size of the pinhole—the larger the pinhole, the bigger the star's 'core.'
- Length of exposure—the longer the exposure the longer the star shafts.
- Type of star filter.

The size of the pinhole is, of course, dependent on the proximity to the lens. If the camera is down close to the pinhole, it will appear larger. Virtually all the star effects described here are designed for a 7.5 field. They will work equally well at 5- or 10-field; but not much closer than a 5-field.

Because there are times when you are going to want very long star shafts; the base material for the Star Plate should be very opaque. I use either doubleweight black cover stock (which is about twice the thickness of black 'construction paper') or Rosco's *Tough Roscopaque*—thin, opaque, dimensionally-stable, black-plastic sheeting which is also useful to mask-out stray light around the edges of cels being shot.

Since you cannot see your artwork through the black cover stock or Roscopaque; it i's kind of hard to tell where to punch the star holes—unless you do the following:

1.) Place your pegged base-art cel (image to be starred) on the art-table peg-bar.

2.) Place a punched sheet of tracing paper over the base-art cel.

3). Indicate with a pencil dot on the tissue where you want the stars; note star colors and types by circling the dots in question and writing the star-type number and color next to the circle.

4.) Remove the punched-tissue from the art table peg bar

5.) Tape a peg bar to a sheet of rubber, vinyl tile, felt, or cardboard; something to push the pin (or needle or nail) into.

6.) Over that peg bar place a sheet of punched doubleweight cover stock or Roscopaque; that will become the actual star plate.

7.) Over the star plate place the punched star-position tissue.

8.) After noting the star type from the description on the tissue; push the right sized pin through the pencil dot, clear through the star plate and into the substrate beneath the star plate.

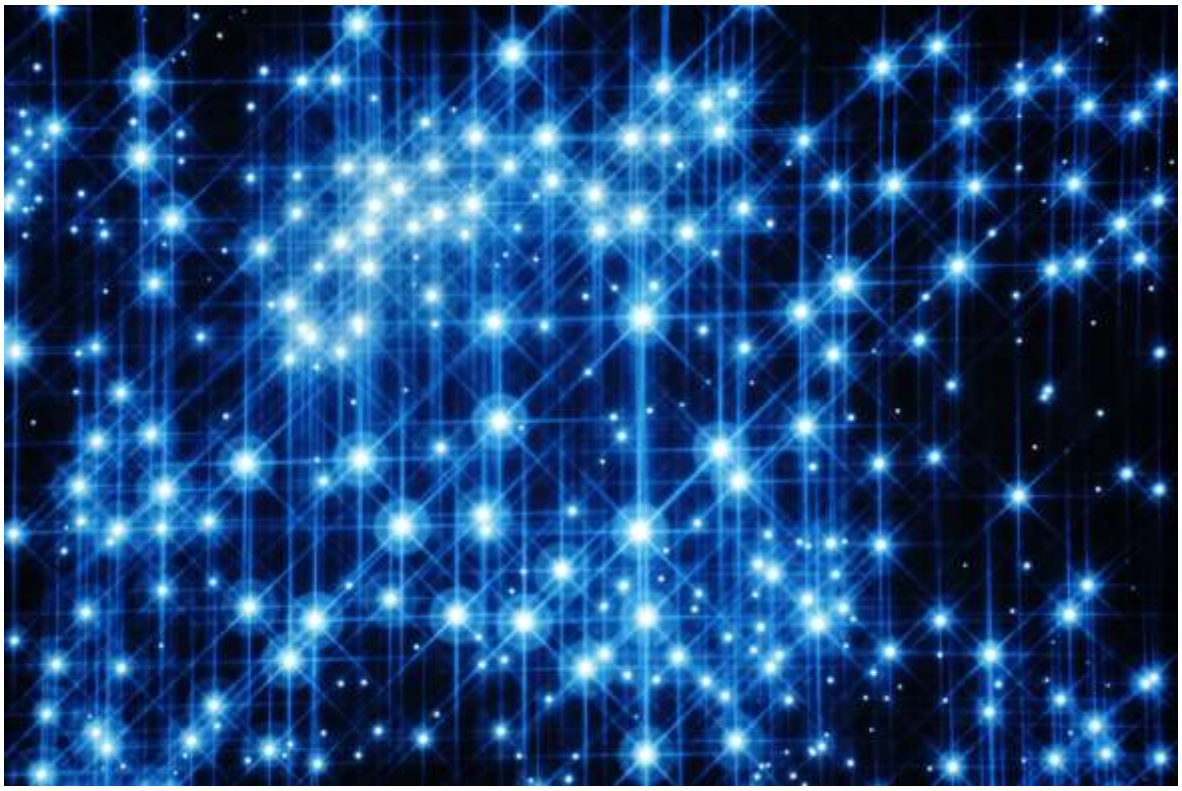
9.) Using a red grease pencil; appropriately label each hole in the black cel by circling it and adding the same star-type and color numbers noted on the tissue. The reason you use red grease pencils not white or yellow, is to minimize the possibility of this data showing up in super-long exposures.

10.) If the plate is for a Star Sweep or similar effect—when the total number of star-holes in the plate 'build up' in a series of slides—indicate which holes get shot in each different exposure. Once the plate is on the camera stage ready for shooting; you can tape out or mask-off unwanted stars for any given exposure. Or, if you do not want the hassle of un-taping pre-taped areas for any re-shoots; prepare a series of underlay blackout sheets using black tape on clear acetate punched cels. These are called underlays because they go under the star plate. The reason you don't place those blockout sheets over the star plate (in which case they would be called "overlays") is because you don't want the star-hole's light to richochet off the clear acetate cel.

With your star plates made; you can achieve a wide variety of star effects. For example: a thin-shafted star can be created using a very tiny hole and a long exposure. Short-shafted stubby stars can be made using a larger hole with a shorter exposure.

The two can be combined in a single frame to make an interesting star with a very hot core and shafts that are long but tapered; fatter toward the center and thinning-out toward the end.

Making such stars would require two pinholes registered together on two separate star plates; one hole would be larger than the other. The two plates would then be used to DX the two stars together; or be shot as different slides; programmed to flash together for a twinkling-star effect.



John Emms produced Incredible's so-called "Disney Stars" effect by combining the glow effects described below in combination with Hasselblad Softar I and Softar II filters.

Glow-core stars are interesting too. They are made by first shooting the star in the usual manner; then the star's pinhole light through a glow screen—without the star filter.

Glow-shaft stars can be created by double-exposing the base-star exposure with another exposure through a glow screen—with the star filter. The glow star exposure will be a long one since the glow screen reduces the light of the star shafts. For this effect, try using 'low glow' Rosco #801 Frost; laid on a thin sheet of glass over the star plate.

Color-Band Star Shafts are also visually exciting. They can be created in several ways. The easiest is finding a star filter that will spectrally separate the star shafts by itself. Certain star filters do this better than others. The ones I use are the Spiralite *Rayburst* and *Rayburst Stellar*.

However, let us say you wanted to create a star with white shafts that have blue tips. This is another DX situation. First, expose for a big, long-shafted blue star; use the color gel of your choice and go out to lunch while making the exposures; ha! (Blue stars and blue glitter have by far the longest exposures. I would not be surprised if your blue-star exposures were not 2 minutes with the lens aperture wide open). Then DX in a shorter-shafted white star.

Rainbow-shafted stars are another matter altogether. These are stars where the core is white and the shafts pass through vibrant color hues in rainbow fashion. They are great stars and a real pain to make because they require masking and reassembly on a 1:1 slide stage. In any event, here is how it has done:

Let us say we want a star with a white core and shaft colors that pass from blue to red to yellow at the tips. We cannot simply DX all these colors together. The longest shaft is yellow; which means the entire shaft length is yellow. So, when we DX in the shorter red shafts; they will DX with the yellow shaft to create lighter yellow. Similarly, the even shorter blue shafts will DX with the red and yellow exposures creating some sort of ugly grey tone. So, we must separate the colors from one another.

Shoot four separate slides. The first will have a small white star. The second a star that is blue with slightly longer shafts. The third slide will have the red star with even longer shafts; and the fourth will have a yellow star with the longest shafts of all.

Make "color-hold-back masks" (negatives) by contacting the blue, red and yellow star slides onto Panatomic-X film (sensitive to all colors). Expose the contact negs for maximum contrast, and develop in D-11, (a contrasty developer). Then re-contact the Panatomic X negs onto 5302 (Fine Grain Release Positive film) twice, to make positive masks. The finished masks should be dense black in the star areas and clear everywhere else. If the maximum density is grey, not black, then your exposure was too short. If your exposure is too long, the clear areas will start to get muddy.

The 5302 should also be developed in D-11 (or D-19). The original contact negs are shot on Panatomic X because 5302 is a blue-sensitive film that will not 'see' the yellow or red stars. However, since Panatomic X is a blue based film (the film's backing material has a slight blue cast), the contact negs are re-contacted on to 5302 because that film has a clear base.

The shooting procedure for the finished slide begins by shooting the smallest star first; followed, in sequence, by progressively larger stars. This procedure is done on a pin registered 35mm slide stage.

Place a pos master grid (35mm version) onto the stage pins and get the camera into position by locking the camera's reticle grid with the stage grid. (Remove the stage grid when finished aligning the camera.)

Load the camera with 5271 (slide duping stock) and set the dichroic light source for the filtration needed for the film emulsion number you are using. Shoot exposure tests for the white, blue, red, and yellow slides. Note the correct exposures in the log.

To assemble the final slide, first shoot the white star; then DX the blue one. The white star will burn through the blue, which is larger, so no mask is required for the blue star.

Place the red star slide onto the pins with the blue-star mask under it. You position the mask under the slide because you want the mask-area to lock-up with the first and second shaft positions.

If the mask were on top of the slide, it would be slightly larger in the fields because when you are working 1:1, even the thickness of the film chips in the 'sandwich' creates slight differences in size; because the top level of the sandwich is fractionally closer to the lens than the levels beneath it.

Keep the camera focused for the lower level—the same level at which you locked grids. Place size-critical elements of any sandwich on the bottom of the sandwich (in this case it is the mask for the blue shaft area).

Now make the DX exposure for the red star; which is being masked to block-out the white and blue stars; so that no red will be exposed in the white and blue regions.

Next, sandwich the red-shaft mask under the yellow-star slide and expose that.

Voila! A rainbow star is born.

Now let us go one step farther. Suppose we want to position that star somewhere in a location-shot? On a Creaton *Slide Analyzer*, or with a photographic enlarger, prepare a rotoscoped outline of the location picture.

Indicate where you want to position the star by noting the location and size in terms of the grid coordinate points at the desired star position. When rotoscoping, note the coordinates of the stars outermost shaft points as well as its central core, and make note of those coordinates.

Place the master rainbow-star slide onto the pin-registered 35mm slide stage. Adjust the X and Y positions and the camera's height until the right size star lines-up at the desired coordinates points. With the star correctly sized and positioned, shoot the star.

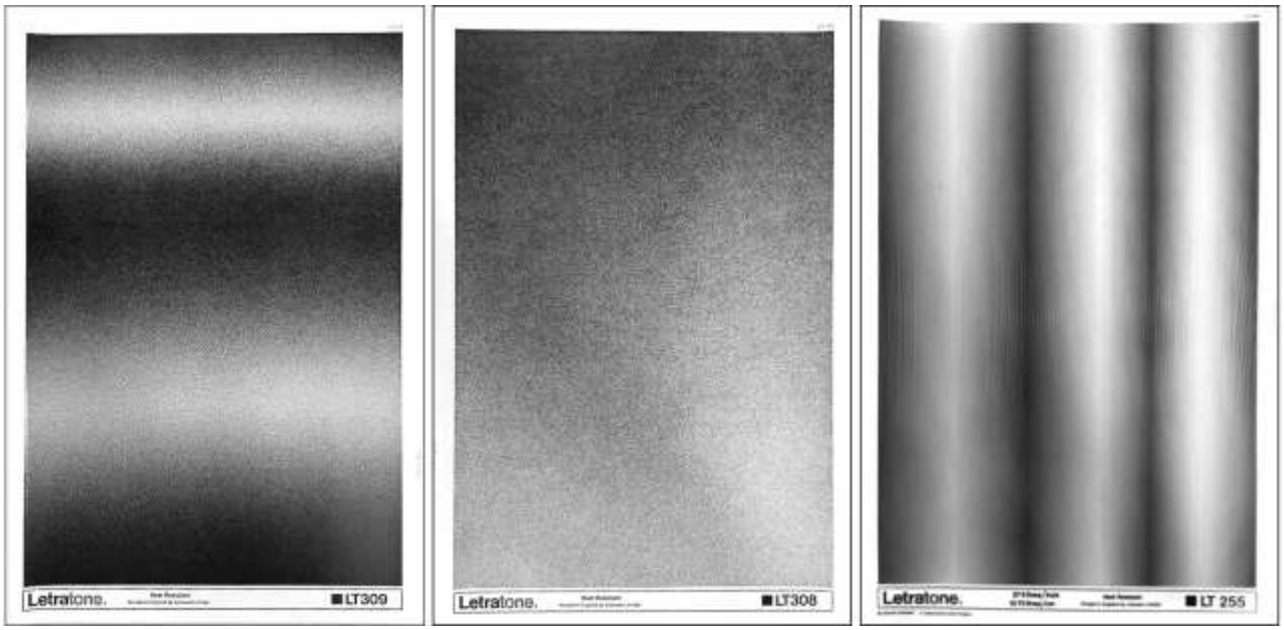
Replace the master rainbow star slide with the 35mm negative mask of the yellow star (it has the largest shafts) and shoot an in-position pos mask on 5302. Now you have two slides: the location-picture and the rainbow star duped into the correct position with a matching pos mask.

Bind the star mask with the location picture; then DX the star into position after duping the location picture with the star mask—creating a single slide. And/or shoot the star as a separate slide for over-projection into the original photograph using a bound-in star mask.

You can see why some special effects cost hundreds of dollars; and why you should be careful how you allocate effects in any given production. And the next time you specify a star and someone asks, "What kind?"; you will understand the intent of the question.

Grid Stars—stars in even rows—require a different technique. Here you prepare your art by shooting a Letratone #115 screen—which has rows of little dots—onto lith film. Vary the sizes shot from 100 to 500%; to get cels with varying concentrations of dot rows per square inch. Pos the negs and peg the negs and positives to animation cels in the usual manner. Use the dot cels by themselves or as overlays (or underlays) sandwiched with a type or art element negs and/or positives.

Graduated Tones and Texture Screens



Shoot Letratone sheets #LT309 (above, left), LT308, (center) and LT255 onto lith film at a full range of reductions (100%, 90%, 80%. 70%, 60%, 50%). Make positives of the resulting negs and register the negs and positives on pegged animation cels. These serve as underlays for glow exposures of various colors (or portions of art or photos).

To create a slide background that graduated from red on the top and bottom to blue in the center, I would use the uppermost selection of the LT309 Letratone sheet.

Whether I used the 100% (full-size) version or a reduction would depend on the desired width of the center blue band.

To shoot the sequence; take the pos (clear center stripe) of the LT309 art and position it on the camera stage. Under it, place a blue gel of the desired color. Over it, place a 1/8-inch glass (~3 mm); and on top of that a glow screen (Tough Rolux). Finally, cover the sandwich with a 1/4-inch glass cover plate (~6 mm). Expose the blue center stripe.

For the red exposure, remove all the above; replace the positive with the neg of LT309 and a red gel under it. Cover those with the same 1/8-inch glass, glow screen, and ¼-inch cover plate. Expose the red as a DX with the blue frame(s) to create single slides or as separate slides for over-projection. (Wherever possible, shoot elements as separate slides and recompose them on the screen; that gives you more programming possibilities).

For the same effect inside lettering; place the lettering negative down first. (Remember: always place the position-critical element at the same level relative to the lens; usually that is the bottom.). Then place the red and blue sandwiches on top of the type neg and shoot the same sequence.

The resulting graduated color blend will merge from blue in the center, arriving at red at the extreme top and bottom, with magenta 'cross-overs' where the red- and blue-glows merge into each other. To avoid magenta crossovers; make 5302 masks for the blue and red areas as described above (in the rainbow stars example). The same Letratone film masks can be shot without the glow screens for a colored mezzotint blend.

Note: although I peg all my neg and pos texture screens together—for full-field, fixed-position work—I often use the screens off the peg bar (or use a second, un-pegged set) to be able to move the texture screens around on the stage and tape them into oblique field positions.

There are dozens of Letratone patterns that can be used to create texture screens; they include burlap, mezzotints, dot screens, lines, 'snowflakes,' and craquelure (a fine pattern of dense 'cracks') to name just a few. Likewise, you can use virtually anything that will register on line film. We once made some interesting texture screens by photographing sand patterns (and spent an hour cleaning up afterwards).

Metallic Looks

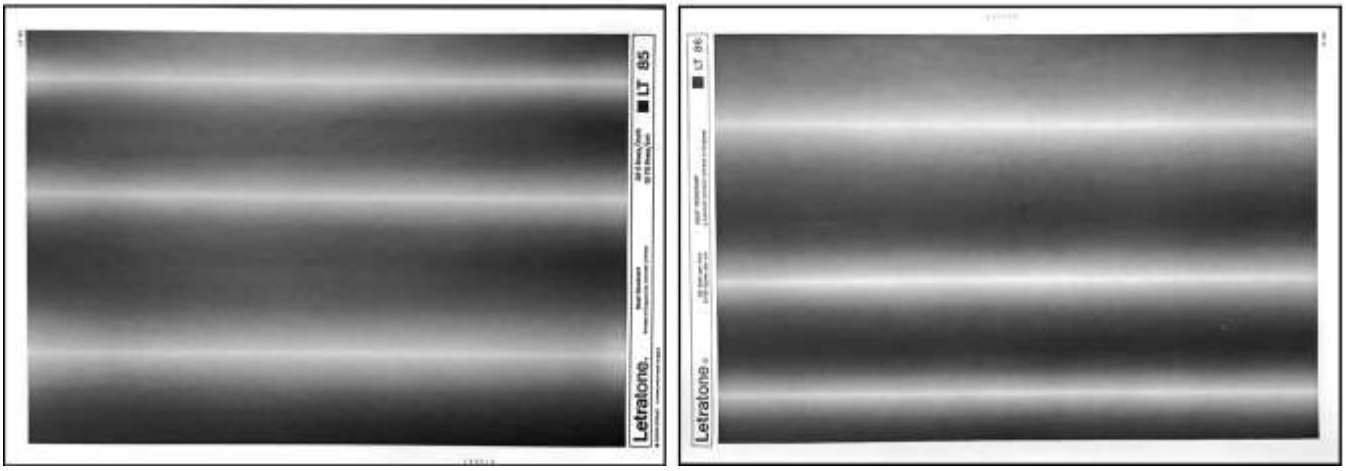
These are a variation of the graduated-tone effects just described. For metallic looks; the band separations are more defined and differentiated. There is a broad highlight area on the upper part; then at some point there is a hard-edged 'shadow' (often with some unevenness to simulate the surface waves of polished metal); followed by another highlight area (usually of a slightly different color) as if the 'metal' were reflecting two different-colored surfaces. The metallic look also includes highlights that imply the direction of light sources (not seen in the picture; right).



Using metallic lettering for our example: On your original type mechanical, create a (light-source-direction) highlight overlay. Using a thin brush or ruling pen; paint a black 'highlight' along the edges of the type on one side; let's say, Northeast. Shoot a neg of that overlay and peg it to the neg and pos of the type.

Prepare a second overlay with the hard-edged outline of the 'waves' shadow line. In the metallic musical note shown above; the shadow line was painted with an airbrush.

Ink-in or Rubylith the area opposite the shadow. Shoot that to neg and pos and peg them to the neg and pos cels of the type.



Next; create graduated-tone texture screens with an extremely narrow band by shooting Letratone #85 (above, left) and/or #86 (right) sheets. Peg together positives and negatives of the Letratone sheets. Also make a second, moveable set that is not pegged.

To summarize our shooting elements, we have:

- Cel #1 – neg of type
- Cel #2 – pos of type
- Cel #3 – northeast highlight neg
- Cel #4 – shadow-line neg (upper half)
- Cel #5 - shadow-line pos (lower half)
- Texture screen #1 – neg of narrow band
- Texture screen #2 – pos of narrow band

Now, let us say the coloration specs call for white highlights with a red and yellow surface reflection. The shooting procedure would be as follows:

First; shoot the upper-half of the 'reflection' by creating a sandwich of yellow gel, texture screen #1, 1/8-inch glass, cel #1 and cel #4. Place this sandwich on the peg bars with the yellow gel under it and make the first exposure.

Then; replace texture screen #1 with texture screen #2 and add an ND3 gel under the sandwich. These two exposures create a graduated yellow tone in the upper half of the lettering, separated from the bottom half by the shadow-line negative mask.

Swap the yellow gel with the red one and replace cel #4 with cel #5. Make an exposure with the ND3 gel in place. Then switch back to texture screen #1 and make an exposure without the ND3 gel. These two exposures create the lower, graduated red 'reflection.'

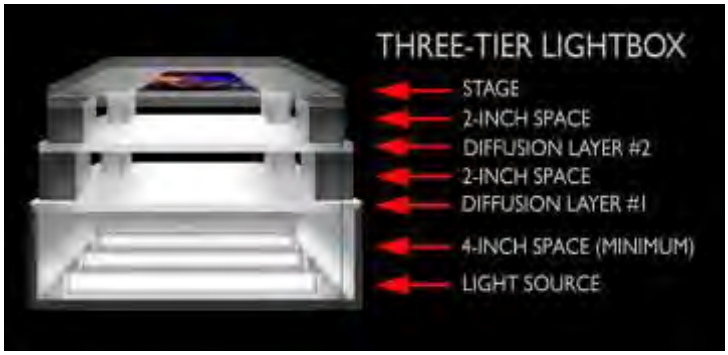
Remove all the above but leave the 1/8-inch glass on the stage. Place cel #3 on top of the glass and place another 1/8-inch glass over it. Expose cel #3 for a white burn; then place a glow screen over the glass and DX in a low glow for the highlights.

Next; remove the top glass and cel #3 but leave the bottom glass in place. Over it place the type neg (cel #1) and pos (cel #2) with a glow screen between them. Then place a yellow gel under the entire stage sandwich. This will create a light-yellow outer aura that will help define the shape of the type and enhance the 'brightness' of the metallic-looking 'reflection.'

Finally; create low auras above and below the shadow line by substituting cels #4 and #5. for cels #1 and #2; with #1 on top. Leave the glow screen between those cels. Use the same gels as for the aura of the lower-half but remove the ND3 gel for the upper aura—so it appears brighter. To make the aura of the upper half, you will also have to flip the order of cels #4 and #5.

Nothing to it eh?

A simpler method of achieving a metallic look is to use actual metallic surfaces (duh). That is accomplished on the rostrum camera by using a double- or three-tier stage set-up. Basically, what you do is make an elevated primary stage on which you mount a full-field neg of the type or art. The neg is positioned in the usual manner using grid coordinate points.



An inch or two (~2.5 or 5 cm) under the primary stage, place a 12-inch-wide (~30 cm) piece of silver-coated illustration board; or a piece of *Roscolux-M*; or any other metallic surface. This metallic surface is lit by bouncing light off (white or colored) boards that reflect on the metallic surface. (Remember, you cannot aim lights at a mirror or reflective surface since the light is reflected away. Instead, illuminate panels that reflect into the mirror or reflective surface.) In this manner the reflective metallic surface is revealed through the neg mounted on the primary (upper) stage. It is important to keep the metallic surface as close to the bottom of the primary stage as possible. Use a higher f-stop if you need more depth of field; to have the metallic surface in sharp focus. Do not change the focus of the rostrum camera lens after it has been focused on the upper-stage neg, or else the size of the neg art will change (by virtue of being closer to or farther from the lens). Rather, leave the lens focused on the neg and manipulate the depth of field (with your f-stop) until everything is sharp.

You can use the multi-tier stage in the photo studio to create other spectacular metallic looks. Those can be used for backgrounds as well as for filling type or other art. In those situations, an Oxberry Pro III or similar pin-registered camera will prove invaluable since it can be used in the studio as well as on the rostrum; holding registration throughout.

On-Lens Filters

In addition to camera stage materials, you will also need a small battery of over the lens filters for stars and other effects.

- Tiffen 1 mm 4-point star, get two to be able to produce 8-point stars.
- Tiffen 2 mm 4-point star. Get two.
- Tiffen 3 mm 4-point star.
- Tiffen 4 mm 4-point star.
- Tiffen 1 mm 6-point star.
- Tiffen 2 mm 6-point star.
- Varicross 4-point star with variable shaft angles
- Rayburst Steller
- Variburst
- Tiffen Fog Effect #1
- Tiffen Fog Effect #2
- Tiffen Fog Effect #3
- Tiffen 3-face prism
- Tiffen 5-face prism
- Tiffen 6-face prism
- #47 Pure blue.
- #61 Pure green
- #29 Pure red.

Colored Backgrounds

There are several ways to shoot color backgrounds: The simplest is to use Wess gels. Those are 35mm-sized gels in a wide range of colors that are pre-punched to fit Wess registration slide mounts. They can be used with neg or pos Kodalith masks; or used to make blended colors by sandwiching them with soft-edged masks.

Another method is to shoot top-lit colored paper. However, that method renders colors that are 'flat.' Unsaturated colors may be beneficial in some design situations when 'subtlety' or muted tone are considered desirable. As for myself; I like brighter, bolder colors; so I seldom shoot top-lit colored paper. When I do, I throw the lens out-of-focus to avoid picking up any surface textures, dirt, or imperfections.

[*Editor*: glossy surface-colored papers render more saturated colors.]

If you use the Pantone color sheets, or similar brands, do not expect the colors in the final slides to look exactly the same as the paper colors; and never accept a job where the client requires you to match a given PMS or pantone color. Simply put: you cannot.

The colors photograph differently for a variety of reasons; because of variations in the color rendered by specific emulsion numbers of the same film; or because your lights are not burning at exactly the right Kelvin temperature; or because processing is never exactly the same form run to run. Because of those variables it is virtually impossible to match a pantone or PMS color photographically.

Color Correction Techniques

Back in my ad-agency days, I had occasion to be present during the filming of a commercial for Brioschi (a popular Alka-Seltzer type product). Those of you who are familiar with this product will know that it comes in a rather dark blue bottle (about the shade of a #47 blue filter) with a white label.

In take after take; even with all kinds of special lighting; the bottle would not appear blue in the film sequences; it always came out black. If it was given more illumination and exposure, to lighten the blue, the white label would wash out.

Finally, a special Brioschi bottle was made of light-blue glass that photographed darker, like the original color. The special photographic bottle was about as light as a CC70 blue filter; some difference!

Before that; working at Peterson Color Laboratory, I learned early that colors do not photograph as they appear. Peterson was a very prestigious lab that specialized in making custom dye-transfer prints for New York's most prestigious advertising agencies. They had a reputation for manipulating colors to match product samples.

Several of their clients were major fashion houses who would hire the world's best photographers and pay them thousands of dollars per shot. The transparencies used to make large. 20 X 24-inch (~51 X 61 cm) 'dyes' (dye-transfer prints) were 8 X 10 inches (~20 X 25 cm) to begin with; and gorgeous.

Yet, hundreds and thousands more dollars were spent making color alterations to match fabric color samples that were provided to the lab for color-matching purposes.

In multi-image work; we seldom, if ever, have the time or the money to color-match a slide that will appear on screen how long; a second, or maybe three or four?

Even though there is no way that you can match a PMS shade; there are certain techniques that you can employ to get as close as possible—if the client is willing to pay.

You can use CC filters to make overall corrections. If CC filters do not get close enough, you can also use color bleaching chemicals (for which Kodak will send you the formulas, or sell you pre-mixed concentrates). Those can be used for overall reduction of specific color layers of the emulsion.

Similarly, you can use dye-transfer printing dyes (yellow, magenta, and cyan) to add overall color; these dyes should be used very diluted to obtain subtle results.

I emphasize 'overall' because; working in 35- or 46-mm format, it is impossible to work on small areas of the picture. You are probably going to end-up 'dipping and dunking' (in the case of dyes) or shooting the entire frame with CC-filters.

These techniques are only good for scenes in which you are either controlling a background color, or correcting a super-close-up of a product; when other colors will not be impaired by the overall change.

I recall one situation in particular; when color-bleaching saved my neck. Bob Schwartz's Motiva Corporation purchased a considerable number of my marine photographs for a fifteen-projector, multi-image presentation; sponsored by Nikon for the National Boat Show.



The show was built using Motiva's modular, rear-projection-boxes in a 3 X 5 grid. Each box was a self-contained unit with a 24 x 36-inch (~61 X 91 cm) RP screen, two projectors and a dissolve. The boxes were stacked on each other in rows; creating a 'checkerboard' rear projection rig that fit snugly against a wall.

Motiva created scenes by carefully cutting 35mm sections from large transparencies using their own, secret cutting jig. My job was to supply Motiva with 35mm images blown up to specific sizes on sheet film; for specific 'shapes' (screen combinations) on the checkerboard grid.

After diligently making all exposure and color-balance checks; I printed the whole job. After processing; lo and behold, all the chromes were about 20% too red. It seems that because it was summer in New York, and we were experiencing 'brown-outs;' that my enlarger lamps may have been burning at a lower intensity (i.e., redder) than normal. At least that is what the lab said.

If you work with 8 x 10 sheet film; you know how expensive it would have been to redo 40 scenes for the show. Thus, I searched for a solution to my dilemma and found it in Kodak's emulsion-dye bleaches. Soaking the chromes in a mild solution of the magenta and yellow bleaches proved a 'cheap' and 'simple' corrective measure. Using the Kodak emulsion bleaches, you can 'locally' bleach a major area of any slide or transparency using *Photo Maskoid* to isolate any area needing correction. In addition, you can blend the bleaching action to create a gradient effect by using very dilute solutions and repeatedly 'building-up' the bleach with a brush or *Q-Tips* (cotton buds).

This must be done gently; the emulsion is wet and may be scratched or otherwise damaged if too much pressure is applied to the brush or cotton.

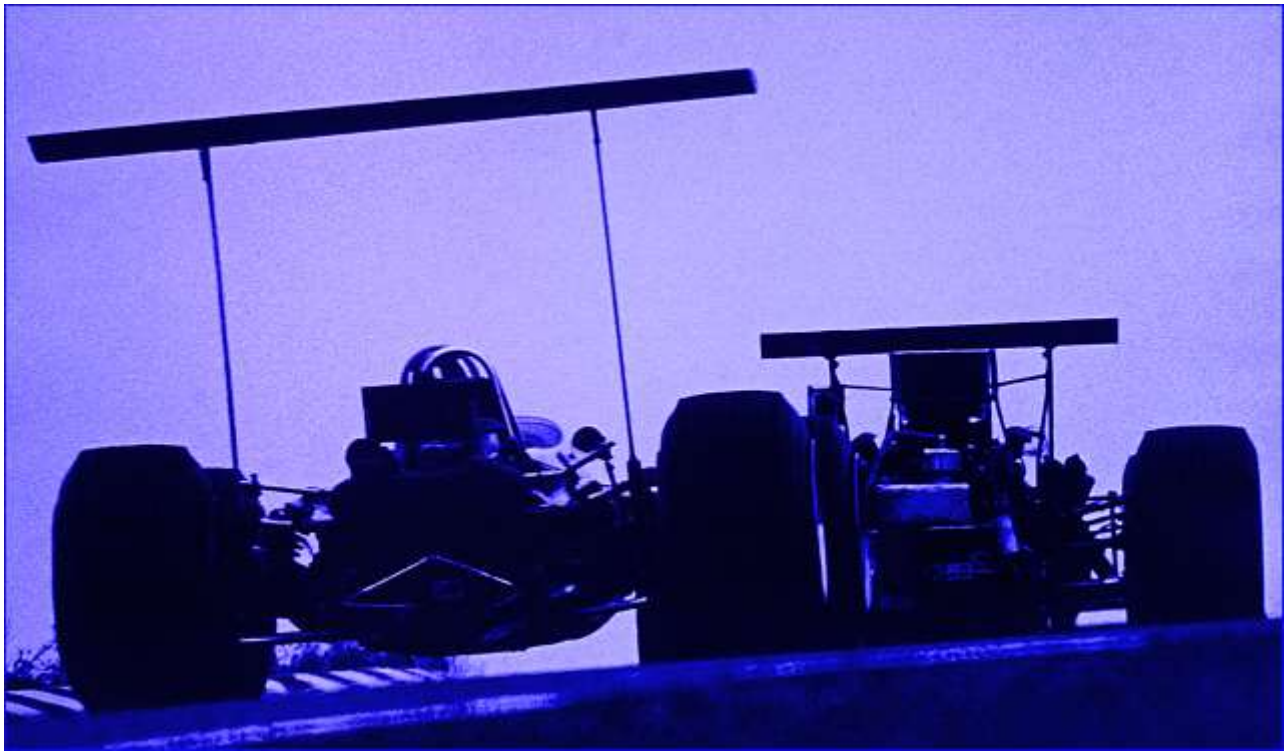
Dye-transfer dyes can be used several ways to make 'quick and easy' background slides or 'wild' hand-painted scenes. For example: how many times have you had to work with black and white photos for lack of any other art? And how many times have you resorted to gelling them? They do not look particularly attractive, do they?

Possible alternatives include expensive line conversions and/or posterizations to create color visuals from black and white photos. That is time consuming and expensive, though; maybe your budget just cannot afford those techniques. If that is the case; try coloring the black and white photos using dye transfer dyes. Dr. Marten's Watercolor Dyes are another choice. And you can also use McCormick food coloring dyes; they are commonly available in the grocery store, but the bottles are very small and the color selection limited to red, yellow, blue, and green).



A black-and-white paper print toned with magenta, cyan and yellow dyes applied with cotton balls.

For an overall tint, dilute the dyes with water and a healthy amount of glacial acetic acid (some experimentation is required here). I normally add about a half-cup of dye concentrate with an equal amount of glacial acetic acid and dilute that in two quarts of water to fill a one-gallon-size tray. To prepare the black-and-white print; soak it in a tray filled with Photo-Flo; a so-called 'wetting agent.' (In a one-gallon tray; add one-half cup of Photo-Flo). The purpose of the Photo-Flo is to thoroughly soften the emulsion of the print and provide a slick surface so that, as the print is slid into the dye-bath, the dye washes smoothly and evenly across the print; and does not unevenly 'bite' into the surface, resulting in uneven 'immersion' lines.



Black-and-white print of the 1965 Watkins Glen Formula One Grand Prix dyed with a mixture of cyan and magenta dyes.

After immersing the print in the dye; agitate the tray by gently rocking it in all directions, periodically pulling it out to see how much dye has set. When you see the color you want; pull the print, and plunk it into a normal stop-bath solution. The acetic acid helps set the dyes. Make sure that your agitation is smooth and continuous throughout the wash cycle and do not over wash the dyed prints; the wash is removing dye. Unlike a rinse after fixing; there is no unwanted chemistry to be removed except the acetic acid. Thus, you only need to rinse for about 2 or three minutes (or until the rinse water runs clear).

When you are applying dye to a localized area of a print; say to get a graduated blue sky; have a lot of "Q-Tips," cotton balls and brushes handy. In a plate; dilute the dye with water and Kodak Photo-Flo. Have another plate of straight water and Photo-Flo close at hand. Anchor the print to a working board with masking tape. Pre-soak the entire sky area with Photo-Flo and water; and keep the entire area moist throughout the dying process using cotton balls with water & Photo-Flo.

After the area is moist; start building-up dye(s) gradually, using a cotton ball (Q-tip or brush) with the diluted dye. Do not be tempted to add more dye concentrate to speed things up; because that may result in uneven dying. The trick is to use dye that is so diluted that any given stroke will not be seen. Rather you slowly and gently rub the dye into the emulsion. The dye density should build up with no visible strokes. The process takes a l-o-n-g time; often up to a half hour for a small area.

You can also use this technique to create 'abstract' color backgrounds by working dyes together; concentrated or diluted; rubbed-in or 'raw;' to create a wide range of color backgrounds. How about combining them with other effects—glows, streaks, prisms, etcetera?

Where were we? Oh yes, continuous tone color backgrounds.

Solid-Colored Backgrounds

There are other ways to shoot solid background colors. One involves shooting a dichroic light source with appropriate filter combinations and exposures. One problem to watch for is the tendency of some dichroic light boxes to 'hot spot' in the center.

So, if you shoot the dichroic light source at a 5-field, 7.5-field, or 10-field, you are likely to get a color brightness variation between the center and North, South, East or West sides of the slide. To avoid hot spots, you can shoot lower on the light source—closer to the center—and/or shoot with the lens out of focus; or using glow screens.

That procedure can also be used with gel-colors. In fact, shooting close and out-of-focus is almost a necessity with virtually every manufacturer's gels because they all have a 'mottled' appearance when shot at a large field size. The dyes in the gel itself are not evenly dispersed throughout.

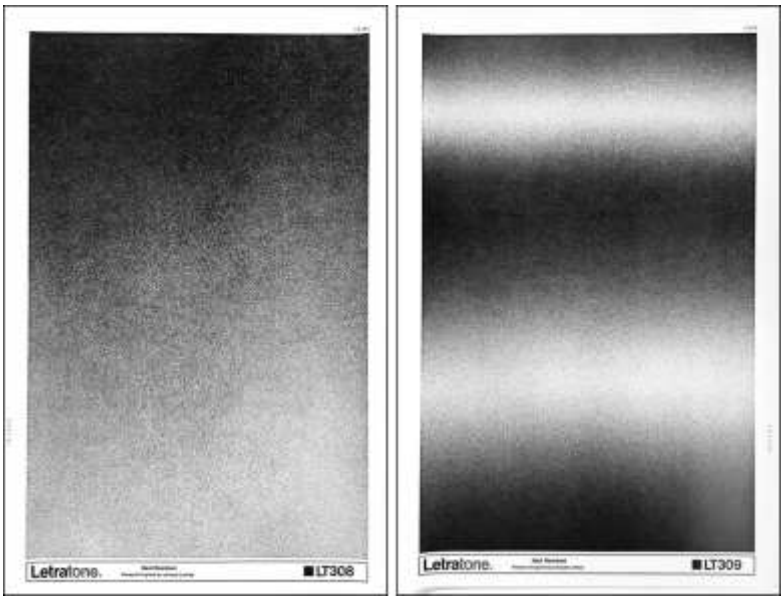
If you do not want to move the camera; you can get even colors by glowing them. This can be accomplished at full field on most dichroic light sources and on diffused-tungsten stages without risk of hot spotting; because the glow process 'evens out' the light source more than the source's own diffusion. (See picture of three-tier stage on page 2985.)

One benefit of working at "full field" is that you can easily introduce pegged (and therefore predictable) graduated-shade masks to create graduated-tone color backgrounds.

Graduated-Shade Masks and Procedures:

Consider the procedure for shooting a totally smooth blue field. After aligning the camera place a piece of blue gel on the backlit stage. Place a ½-inch (~1.25 cm) glass on top of the gel and a glow screen of Rosco *Tough Rolux* on top of that glass. Place a ¼ inch (~65 mm) cover glass over the glow screen; and shoot.

To create a graduated tone of blue that changes to another color; use a pegged pos and neg of a Letratone #'s LT308 (left) and/or LT309; gradient mezzotints. First insert the pos over the gel and place the same glass/glow-screen/glass sandwich on top of the gel and mask. Shoot it; but do not advance the frame (if you want to DX in the next color). Then, replace the pos with the neg and shoot in your next color. The result will be a 'soft-edged' blend of two colors. Of course, this method can be used with any combination of masks, to create some colorful and unusual results.



Textured Backgrounds

The same basic procedures (without glow) can be used with any number of "texture screens" such as dots, checkers, 'psychedelic spatters,' mezzos, 'steel plates,' etcetera. If positives and negatives of the texture screens are pegged together; you can have a lot of fun just playing with patterns and colors.

Here' an example: "swirling moiré" effect. Place a pegged neg of a "dot-screen" over the glowed gel or dichroic color and shoot, say, a dozen frames in one color. Back-up the camera and place the pos over the neg—but do not peg the pos; leave it loose so you can move it. To move it smoothly; fix the pos to the underside of a 1/8-inch (~3.1 mm) glass with thin tape. Also tape-down the neg; so that it will not move while sliding the glass-mounted pos over it.

Position the glass-mounted pos over the neg and align them (as if they were pegged). Shoot one frame of another color. Then, ever so slightly, move the glass mounted pos in any direction and shoot another frame. Change colors, move the glass again and shoot another frame. Continue this process using as many colors as you like. If the movements are slight enough; you can create an animated moiré-pattern by programming the resulting slides with 1-second alternates and half-second waits; or faster if you prefer. If you do not like the 'hard' dot-moiré look; place a (low) glow screen on top of the dot-screen-pos glass.

A swirling pattern like this is just one of a wide range of similar effects that can be created by using Letraset and Letratone screens.

Setting Up Your 'Effects Bible'

Now that you have spent a small fortune for all the materials needed; you are ready to begin testing those materials and assembling your 'Effects Bible.' The purpose of the Bible is two-fold: it provides visual examples of al the effects you have shot; to show others what you are describing and provide accurate instructions on how to achieve those effects.

As mentioned before; all the specimens in the Effects Bible should be number-coded to simplify log notations and general shop talk when discussing effects. For example: the first set of tests we'll run establish standard glows. The resulting samples are code named Glow #I, Glow #2, etcetera.

Each time you develop a new type of glow effect (and there are scores); number it sequentially. Before you know it, you will probably have 50 or more types of glows; and the numbering system will be an accurate way to discuss and log them.

For the glow tests, keep in mind that the three principal factors determining the size of a glow are:

- Type of glow screen material
- Height of the screen off the art
- Length of exposure (amount of light).

To control the height, use glass sheets of different thickness. Like everything else, assign each thickness of glass a reference number; i.e., Glass #1, Glass #2.

Length of exposure is difficult to standardize become it is a factor that is derived from multiple other factors. For example: an extremely thin typeface, like L&C Hairline, will perform a lot differently with any glow screen material than a huge, chunky face like Gil Sans Ultra Bold. Likewise, a 'normal-weight' typeface, like Optima, will have its own exposure requirements. Test all three types to see how 'thin,' 'normal,' and 'chunky' artwork responds to various glow-screen and glass combinations.

Have your type set to look like our example; large and centered in the field; with plenty of leading between the lines. Use the actual names of the typefaces, as it is more accurate in terms of future referencing than any other words. Thus, our test slide will be:

48 Gill Sans UB
48 Optima
48 L&C Hairline

The three display fonts were spec'd (specified) as 48-point for the 10-field Master Grid which is 12 points per line. As our 7.5 Master Grid is 9 points per line; the type is reduced by 75% and shot as a negative.



[*Editor*: Photoshop type fonts were substituted for Optima and L&C Hairline.]

The reduced-size neg is contacted to create a positive. Both are pegged to clear animation cels in the usual manner using the 7.5-field master grid (unless pegged film was used).

Place the neg on a (bottom-lit) camera-stage peg bar. Place the #1 (1/8-inch) glass over the neg. Place Glow screen #1 on top of the glass (Glow Screen #1 could be any of the various materials you use; but should have its own, unique number). Shoot a series of bracketed exposures on EPY404 (Ektachrome 64 tungsten) and send the film to be processed. This first series will get you in the ballpark as far as your basic glow exposure for white is concerned. For this example; we will say that the best-looking glow from the first test is ¼-second at f/3.5.

Back on camera; using a white light source; shoot the same glow screen test using ½-second @ f/3.5; ¼ @ f/3.5; ¼ @ f/5.6; ¼ @ f/8 (you can include half-stop brackets if you wish). Repeat this procedure using the #2 (1/4-inch) glass; then the #3 (3/8-inch); the #4 (1/2-inch); and finally the #5 (1-inch)—all with glow screen #1. Follow this procedure until you have tested all your glow screens on each type of glass using the white light source. Follow that with tests of a series of colors that should include yellow, red, orange, blue, green, cyan, and magenta (the primary and secondary colors).

With the glow tests completed; we will now test for color burns through glows. To do that we first establish the normal burn exposures for each of the eight colors tested in the glow series. Like glow effects; colors respond slightly differently to various type 'weights.'

Blue, for example, shot the with a thin font like L&C Hairline, will appear darker than the same blue shot through Gill Sans Ultra Bold or other 'chunky' typefaces. For this series; also test your primary-color filters (#47, #61 and #29) using the type neg. Shoot a wide range of exposures.

Now, select the best burn exposure for each color in each typeface. Probably the exposure will be the same for each; however, you may find that the thinner type face, when combined with darker colors, requires a little more exposure.

Record the results in your Effects Bible, together with sample slides.

Look in the Effects Bible and pick a high-glow and a low-glow specimen. For example: Rosco Tough Rolux on the #4 (1/2-inch) glass for 'high-glow,' and Rosco 801 Frost on the #1 (1/8-inch) glass for 'low glow.' Note the exposures for these two glows using each of the eight test colors. For each color, shoot the following tests:

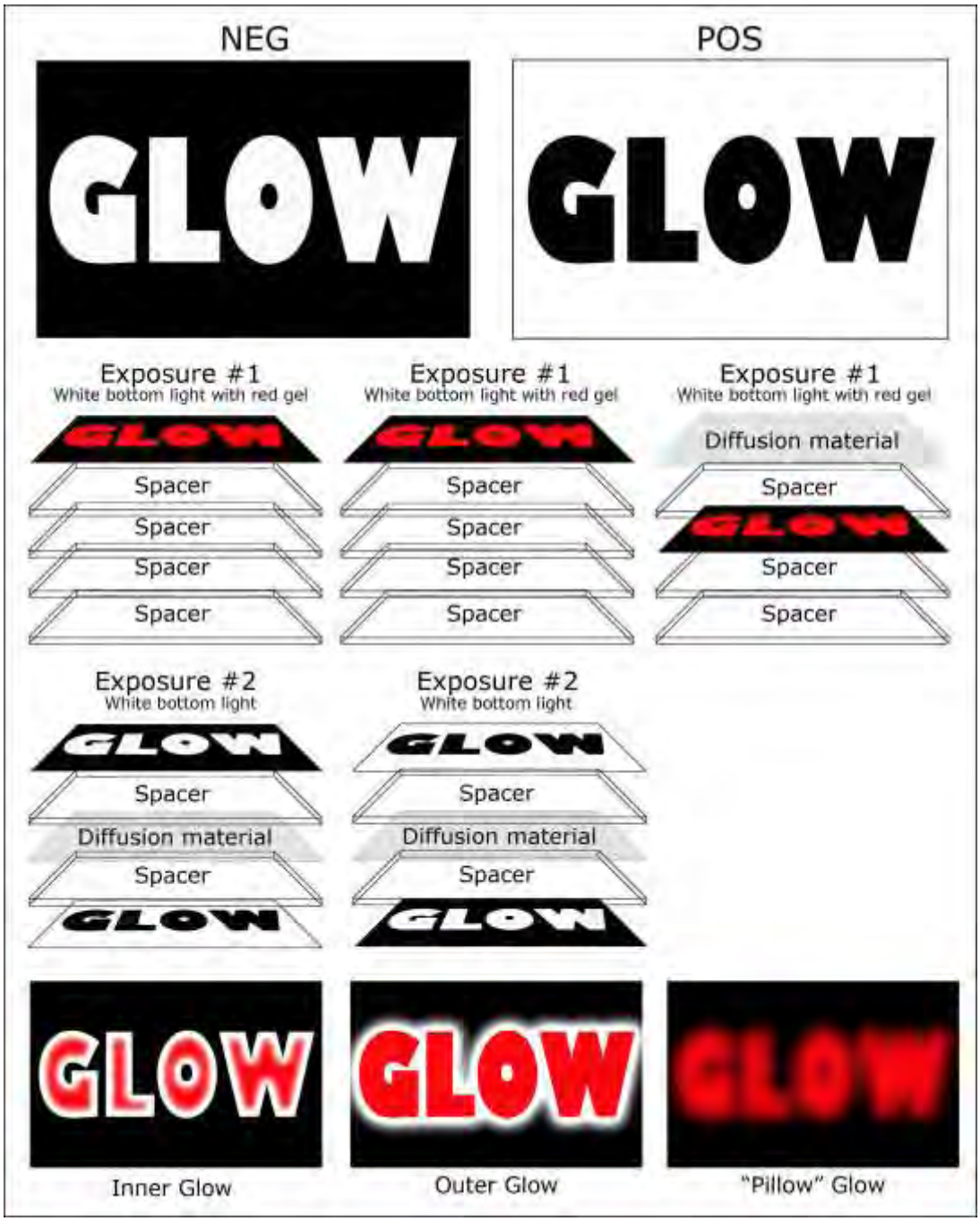
Shoot three frames of the glow at the 'ideal' exposure. Into the first frame; DX a burn of the type (using the same color) at the pretested 'ideal exposure.' Into the second frame; burn a stop up; and on the third frame bracket the burn exposure one stop down.

These tests will reveal how a given color burns through a glow of the same color. You will notice that certain colors burn into glows better than others. For example, a yellow burn into a yellow glow is hard to see. A blue burn into a blue glow probably needs a lot less exposure in the burn, or else the type becomes too pastel. A red burn into a red glow may likewise require a lot less exposure; or the type area will start becoming too orange or yellow. In any event; this battery of tests will reveal the basic exposures for color burns into glows of the same color. Another series of tests can be performed to zero-in on certain subtle variations that you might have interest in exploring.

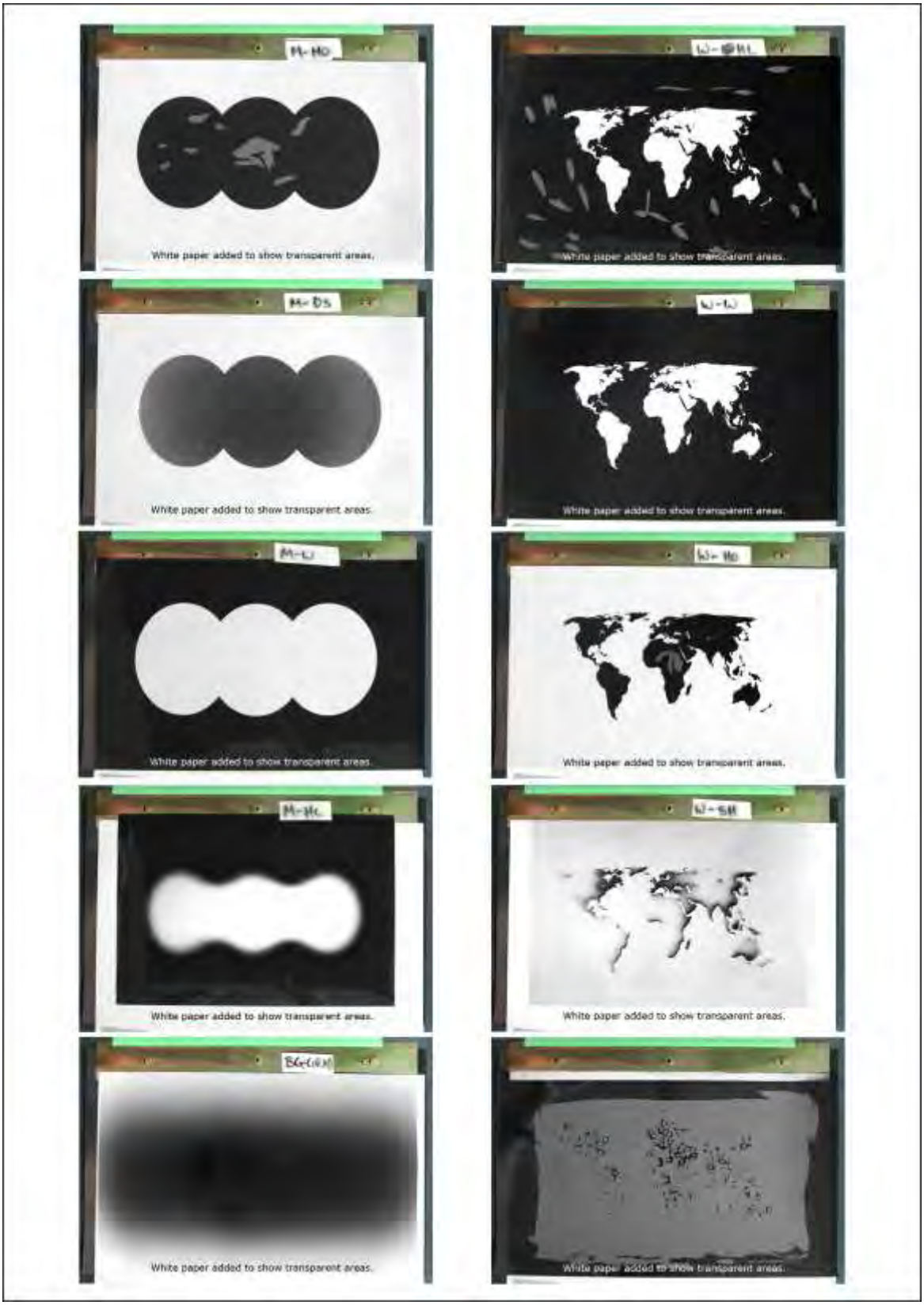
Glow-Effects | Excerpt from *Volume Nine*



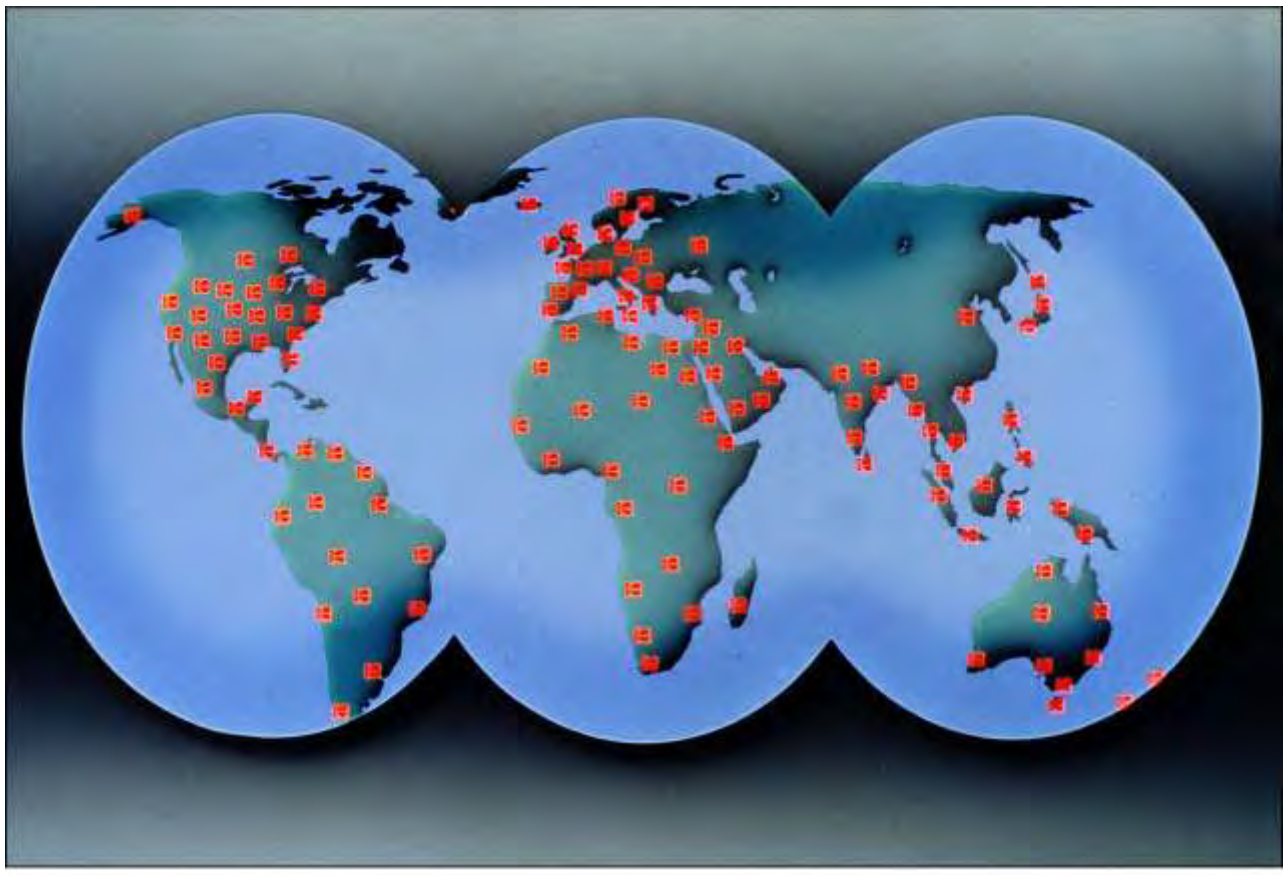
Glow effects are produced by photographing multi-layered 'sandwiches' comprised of high-contrast film positives and negatives with diffusion materials and transparent spacers. The process begins with the creation of line artwork (black-and-white; no grays). Typically, glow-effects are used for typographical applications. For our example, we will use the word "Glow."



Spacers were used to keep the stack height equal for all sandwiches; otherwise, the size of the word would have changed, because different sandwich thicknesses had different heights, making the top layer closer to the lens or farther from it, creating misregistration. [*Editor*: For more, see Glow Effects Production in Volume Nine.]



Refer to finished slides next page (overleaf).





That leaves the testing of color burns into different-colored glows. Before running this test series (which could conceivably involve far too many variations, given the fact that we have so many possible color combinations); go back in the Effects Bible and refer to the color-chip tests shot earlier. You will see that certain colors DX better than others. Select a dozen or so of your favorite combinations and repeat the burn/glow test series using the selected combinations of colors.



Carefully label each slide as to the glow screen number, glass number, and exposure. For example: 1-3-3.5-1/4-73, which means glow screen #1, glass #3, shot at f/3.5 for 1/4 second, with gel #73.

With these tests completed, you now have a full range of glows and a limited range of burn-glow combinations from which other looks and exposures can be extrapolated mathematically and visually.

'Aura' Tests

Next you should do a series of tests for inner and outer auras. As in the glow tests; check the sizes of auras using different glow-screen and glass-height combinations.

First test outer auras. Leave the neg on the camera stage peg bar and shoot the first tests with white light. Place the #1 (1/8-inch) glass over the ne; then glow-screen #1; the pegged positive of the type; and finally, the ¼-inch cover glass. Shoot the same exposures as required for the tests of the #1 glow screen with 1/8-inch glass. Repeat this process for each thickness of glass. Then change to Glow Screen #2 and check it against each piece of glass; use the same exposures previously tested for that glow-screen/glass-height combination.

When you have completed the 'white-light tests;' repeat the procedures using four of the original eight colors tested for glows—red, yellow, blue, and green. Test the same screen/glass combos for the same exposures as the glow tests. It goes without saying that, if those exposures do not 'work,' make adjustments and test again; until you are satisfied with the results.

As your library of test sequences grows; you will not have to test as many color combinations because exposure 'patterns'—or maybe a better word is 'trends'—will start to reveal themselves. For example, the exposures for magenta and cyan will be the same (or very close) to the exposure for red. You will not have to test all colors on texts. A few basic colors will tell you what you need to know for their chromatic cousins; those colors are usually the primaries (red, green, blue) and secondaries (magenta, cyan,yellow).

You now have a full range of outer aura sizes and exposures in white as well as enough color examples to determine with fair accuracy the exposures and glow screen/glass combos needed for any other color. That does not rule out the possible other needs for specific jobs. Any additional tests should also be logged in the Effects Bible; with examples (unless they are utter flops).

Since inner auras will respond about the same as outer auras; make only one test series using white light. Other exposures can be factored from the white-light tests. The only difference between an outer aura and an inner aura is that the neg and the pos are reversed in their order on the stage.

To shoot an inner aura, place the pos down first; then the glass; then the glow screen; then the neg; and finally, the cover glass. Run the same series of exposures as you ran for the white outer-aura tests. In the results; look most closely at the aura inside the thinner typefaces. Thin faces require minimal exposures and low-glow screen/glass combinations because anything more than a fractional inner aura fills-in the type and does not look like an aura.

Some additional tests you might want to perform are glow screen/glass combos in conjunction with on-lens filters such as fog effects or star filters.

Glitter Tests

By now you are staring to accumulate so many tests that you have a lot of examples to 'factor' exposures for other colors not tested. So, for glitter tests, limit your test colors to white, yellow, red, blue, and green.

Glitter effects are as diverse as glow and aura effects. The glitter can be small and subtle; big and brassy; 'shimmering;' 'spinning;' etcetera. The main things to test for are:

- Density of glitter stars (number of little stars per square inch)
- Size of the star-cores
- Length of the star shafts

As discussed earlier (page 2976); those are the factors determined by the mezzotint screens and the length of exposure. Fine mezzo screens produce little star cores and coarse screens create larger ones. Using more screens in the sandwich reduces the number of stars per square inch. Using longer exposures lengthens the star shafts. Another variable is the type of star filters used. A 1 mm star filter, for example, will produce a different type of glitter than will a 2 mm or 3 mm star filter.

Mezzotint screens can be purchased from lithographic-supply vendors. Or, you can make your own by shooting Letratone sheets onto line film and contacting them to make negs and positives. My favorite Letratone mezzo sheets are:

- LT-188
- LT-297
- LY-377
- LT-396

Make a half a dozen negs and positives of each mezzo screen at various magnifications (i.e., 100%, 80%, 60%, 40%) and label them; i.e., Glitter #1N (Neg); Glitter #1P (Pos); Glitter #2N; Glitter #2P; etcetera.

As with the glow and aura tests, you will find that blue colors require the greatest amount of exposure. In fact, you will find that the exposure ratios required by different-colored glitters is virtually identical to those needed for glows or auras.

Start with white light and Star Filter #1 on the lens. Place the neg of the type on the stage with a #1 (1/8-inch) glass over it. Randomly place a few Glitter #1N mezzo screens (not aligned with each other) on the glass. Cover them with another thin glass. Add sheets of Glitter #1 positives on top of the glass cover; the more you add, the fewer 'pinholes' you will see. Those pinholes will become the glitter stars.

Note the number and type of mezzo screens in the sandwich and shoot a series of test exposures. Start your tests with four times the glow exposure. If the 'ideal' glow exposure is, for example, ¼-second @ f/3.5, start the glitter-test exposures with 1 second @ f/3.5; then shoot 2-, 4-, 8-, 16-, 32-, and 64-seconds. (The 64-second exposure should produce what I call a "Glitter Explosion.")

Start reducing the number of Glitter (mezzo) #1N & #1P screens until you see a noticeable increase in the density of the pinholes. Shoot another exposure series and note the sandwich composition. Do that two or three more times until you finally reach the point of 'maximum pinhole density.' Shoot full exposure brackets of these sandwich combinations with the #1-star filter. Process that film and label the slides with their full data in the usual manner; filing the data and samples into your Effects Bible.

From this first set of tests; you can pick your favorite three or four exposures and use those for the next tests; with Star Filter #2; then Star Filter #3; etcetera. After those tests are processed and labeled; use your favorite star filter and test four basic colors (red, yellow, blue, and green). You might also test combinations of different-sized mezzos in the sandwich. Try combining some #1s with #2s, #3s and #4s.

Star Tests

The next tests, for stars, are simple. Make a 7.5-field star-test cel using a sheet of double-weight black cover stock or *Tough Roscopaque*.

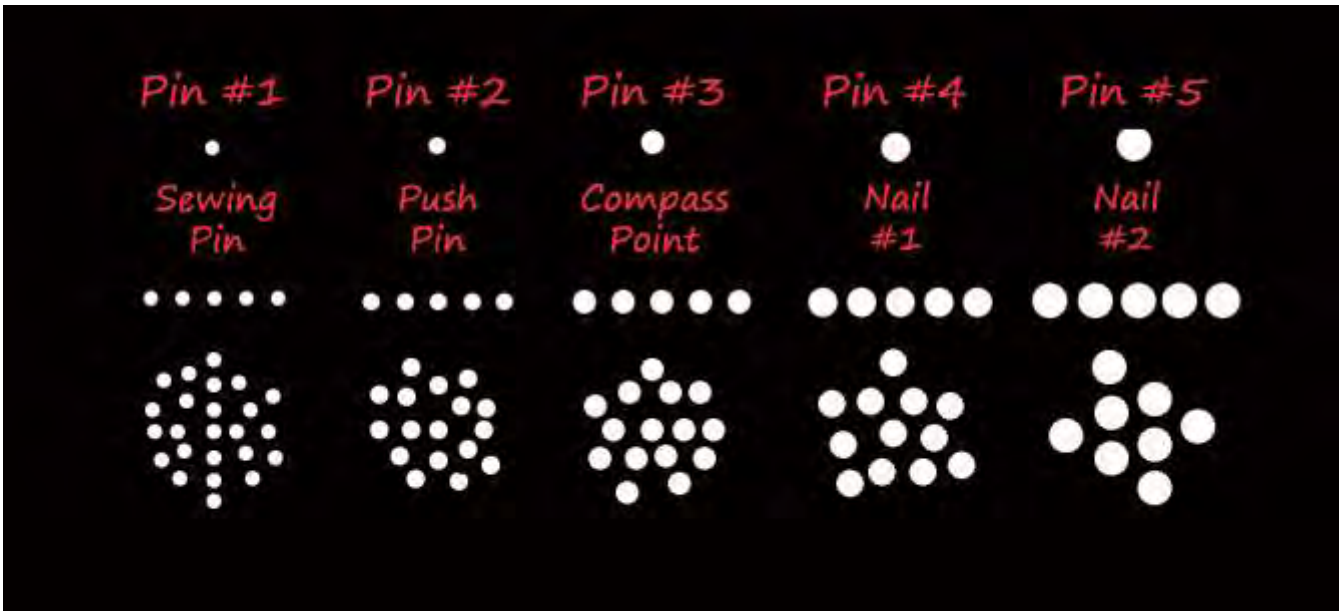
Across the top of the star cel, punch five different sized holes in a horizontal row. To make the pinholes, I usually use a thin sewing pin; a standard 'push pin;' the point of a cheap compass; a thin nail; and a thicker nail (about a '10-penny' wood nail).

The first star should be one-inch down from the top (North side) of the field and one inch in from the left (West) side. The others should be spaced about an inch apart along the horizontal West/East axis.

Then; directly beneath each single hole; punch a line of five pinholes using the same instrument. Under those lines, punch 'a bunch' of pinholes in a circular pattern; they should occupy a one-inch diameter circle.

Number and label the holes using a red grease pencil; note the instrument used to create each size hole.

The resulting star plate for tests should look like this:



Pinhole-simulation dots are (way) oversized for purposes of illustration.

Place the star cel on the camera stage pegs. Be sure to completely mask out any stray light from around the black star cel by using *Tough Roscopaque* sheets or double-weight black cover stock sheets. (Masking all cels should be a standard practice when shooting effects—any stray light is a no-no; especially with star and glitter effects which require long exposures.

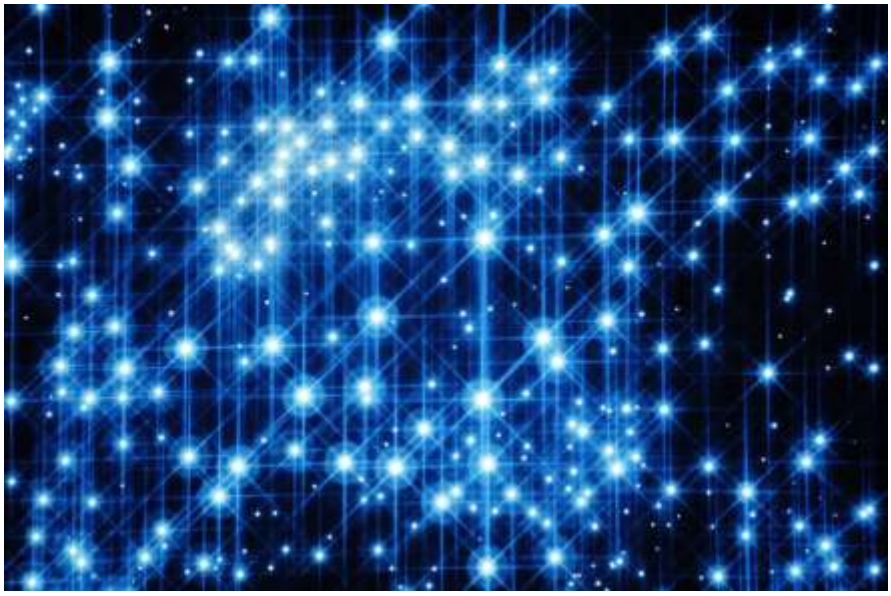
Again; shoot the first tests with white light. Place Star Filter #1 over the lens. Shoot the same exposures you used for the glitter tests. Do the same for Star Filter #2, etcetera. If you want, shoot some 'freaks' by combining star filters.

When these tests come back from the lab; label them and pick your favorite half dozen or so star effects; then test those with the four basic test colors (Red, Yellow, Blue, Green) using the same 'ideal' exposures.

You now have everything from teeny-weeny stars to great big mothers. If you wish; try testing DX's of different star sizes and colors. Some interesting variations can be achieved using Spiralite *Steller Rayburst* and *Variburst* filters; or Rosco diffraction gratings; to produce rainbow streaks. They respond as well as star filters to pinhole light sources; however, they generally work best with white or yellow light. So, run a series of tests using the star plate and a few glitter sandwiches to get a feel for how these diffraction-type filter materials respond.

Similarly, run some tests on a 'straight' type neg using star and diffraction filters. Those tests are for 'star words' and 'rainbow words.'

Fog Tests



John Emms created this star field at Incredible Imagers, Stockholm, in 1986. The effects were made with five exposures of a custom-made star plate using a Tiffen 2 mm Star filter shot twice (at 45- and 90-degree axes); Hasselblad Softer I and Softar II filters; and a Tiffen Fog 1 filter.

The Fog Filters listed earlier provide very subtle effects which are quite the pleasing. You should test each using the white light source together with the star plate, then a glitter fill sandwich, and finally. straight type. Fog filters do not radically change your exposures; you can calculate the exposures from the other tests in your Effects Bible. All you need be concerned about in this test series is the amount of fog provided by each filter with a given type of art, color, and exposure.

Prisms



When I visited the Statue of Liberty, it was a cloudy day. I used a prism filter to counter for the dullness of the scene. But it still looked lousy. So, I made a color chip and sandwiched that with the prism shot to make this image. The color effect was made by heavily glowing pieces of gel colors laid-out on a light box.



Two Cokin prism filters: *Speed 8* (above) and *Multi 25* The six Speed filters are particularly useful for panoramic-format shows.

Prism filters generally will not alter your exposures in any way. However, these filters respond best to smaller-sized subject material that 'fits' within the smallest, centered prism 'face.' It will then repeat that facet in each other face. If the subject is too large, the prism will break it apart; that can be a pleasing effect in some instances. If you are combining a prism filter with other on-lens filters, place the prism behind the other filters.

While you are at it; in any or all test sequences, make note of which exposure brackets are the best exposures when 'double mounting.' As discussed earlier; double mounting is particularly useful when duping effects elements onto 5071; and/or to improve D-max for multi-screen shows. Mounting two slightly overexposed copies of the same slide into one registered mount creates greater D-Max in the black areas.

Your Effects Bible is now complete in terms of 'basic' special effects materials and procedures. Next you should test how these effects look when duped on a 1:1 slide stage using 5071 (Slide Duplicating Film). That information is mandatory because many effects that we will be discussing later require the 'assembly' of 35mm effects 'elements' shot from 7.5-field sheet negs and positives.

The various elements needed for an effect are individually shot from 7.5-field sheet negs and positives. The resulting slides, each of which has part of the total effect, are then DX'd together as a single frame of 5071.
There are several reasons why you might select this method to make effects.

One example would be shooting a 15 step-zoom of a complex logo that would be too time-consuming and error-prone to shoot fifteen times. For example: suppose the logo has a double glow of two 'opposite' colors; three DX'd glitter fills; an outer-aura; an inner-aura; and three stars (of different sizes).

Think of all the shooting procedures to shoot just one copy of the logo. Then, multiply those shooting steps by fifteen; for the zoom sequence. Wouldn't it be simpler to shoot one copy of the effect; label it Master; and dupe it into the zoom positions using 5071?
If the logo is being DX'd into a BG picture, texture, or color; here is how you'd do that:

- Create the base-effect slide without the second (opposite) glow color; that would be shot as a separate slide (so the opposites don't cancel each other out, creating a gray color).
- Contact the base-effects slide onto Panatomic-X to make a negative mask of the effect (the effect elements are black and shades of grey and the surrounding areas are bluish clear).
- Contacted the Panatomic-X neg onto 5302 to create a pos without the bluish tint; that is contacted again onto 5302 to create a clear-base neg.
- Re-assemble the master effect by first placing the base effect slide onto the pins of a registered 35mm stage and shooting it.
- DX the second glow color by removing the effects slide from the pins and replacing it with a sandwich of the base effect mask with the slide of the second (opposite) color glow (with the mask on the bottom). The mask keeps the second glow color from double-exposing into the base effect.

Because the use of 5071 is so important to assemble effects elements and shoot finished looks into position; we must know what exposures various effects elements require. For those tests, it is necessary to use a full range of effects types and colors because 5071 responds somewhat differently to various densities and colors; especially at the extreme ends of the spectrum; and extremes of brightness.

First test your standard colors and color-chip slides. Pick a range of about twelve of each; include some extremely light as well as some extremely dark colors and be sure to include one or two specimens of white. Established the proper filter combination to obtain white light (by setting your Dichroic light source to the filter pack specified for the emulsion number of the 5071 stock your using)

Shoot a widely-bracketed 'ball park' test using a white-colored slide and a dark blue one. Process these tests to determine that the white is, in fact, white; as well as to get the exposure range worked out for further testing within narrower, 1/2-stop brackets. Exposure adjustments should not be done using the lens-aperture ring. Working at a 1:1 ratio; your rostrum camera has become a microscope; you are working so close that just touching the lens can throw off registration. Thus, make all exposure changes using the shutter-speed control.

If you are using an Oxberry Pro II; keep the camera in the "B" (Bulb) setting and use a *Gray-Lab* or similar darkroom timer to turn the dichroic light source on and off for the proper exposure—the same way you would use a photo enlarger.

[*Editor*: The shutter speed "B" (for "Bulb") derives from the device used by photographers to actuate the camera shutter. Also called a "cable release," it consists of a flexible wire moving within a sheath, with a plunger on one end and a 'bulb' (rubber pneumatic plunger driver) activated by squeezing the air-filled bulb.]



https://www.icp.org/browse/archive/objects/weegees-hand-holding-the-shutter-release-cable-of-graflex-speed-graphic

(Actually, an Oxberry Pro II is a beast to try to reassemble effects on; because you *must* handle the camera to change film every 36 exposures; thus, your chances of maintaining registration between rolls are reduced; making it necessary to frequently re-align the camera with the master grid.)

Shoot a series of tests with narrow exposure brackets for each of the selected glows, auras, stars, etcetera. While you will probably find that 75% of the effects elements will all share one 'ideal' duping exposure; some of the extremes will require modified exposures. As in the previous sheet-neg exposure tests; carefully check your overexposed brackets to determine which are best for double mounting. Since many of your shows will likely be dupes of the master trays; and since 5071 has very weak D-max (compared, say, to a Kodachrome original); you may need to double mount (or density mask) all the slides in overlap-screen format shows.

Contrast and Color Control

Another test series you should eventually get around to performing is contrast control and color correction for duping effects slides and location originals shot on different film stocks. For example: when duping a scene of an office lit by fluorescents; the slide original will probably be greenish (even if a magenta compensating filter was used) and contrasty. When duped 'straight;' the green tint will get greener and shadow areas will get darker. If the shadows happen to be in faces, which they probably will be in that overhead-lighting situation, the resulting dupe could be atrocious. Both problems, though, can be fixed.

You can remove the excessive green when duping by adding some additional magenta filtration to the Dichroic-light-source filter pack. And, to keep the shadows in the face from becoming excessively dark, you can use either a contrast mask or a 'film-flashing' procedure.

A contrast mask is a 'thin' negative mask that is created by contacting the original slide (on registration pins) onto 5302. Under-expose and/or underdeveloped to make a mask that has some density in the shadow areas only. Then, sandwich the original slide with the contrast mask to shoot the dupe. (See pictures; pages 2833 and 2916.)

Since different contrast ranges in different types of shooting require different contrast-mask densities, it is impossible to say what a 'perfect' contrast mask should be. Only trial and error will determine what is best for any given slide; but after a while, you will get the hang of it.

If you want to *increase* the contrast of the shadows while decreasing the contrast of the highlights; use a contrast mask; a very thin, *positive* black-and-white image of the original slide.

Make that by contacting the slide onto Pan Masking Film or Panatomic X to create a thin neg mask; then re-contact the neg mask onto 5302 to create a thin positive mask with a clear base.

[*Editor*: Pan Masking Film was not available in 35mm.]

Film-flashing is somewhat 'simpler.' To do this, remove all your clothing and put on a dark trench coat. While holding your exposed film in one hand, go up to a stranger and….

Seriously; film-flashing is a technique that adds density into the shadow areas of contrasty originals, making them less contrasty. All film stocks need a certain minimum amount of light to record an image; as discussed earlier. (See pages 2906-2908 for more about film latitudes.)

When you are shooting a dupe, you normally base your exposure on the mid-range tones. By doing so it is possible that the highlights and shadows will fall outside of the film's latitude range. Thus, there may be too much light passing through the highlights and/or not enough through the shadows, making them even darker.

Flashing adds a small amount of extra light over the entire image area. The amount of light is so small (generally 4 or more stops less than the original exposure) that it won't significantly affect the mid-range tones or highlights; but will help provide sufficient light in the shadows to 'open them up' a tad.

To flash your film; use a ND96 (neutral density) Kodak Filter. Place it over the light source on the duping stage (not on the lens; you do not want to move the lens) and shoot the filtered light source without the slide. Then remove the ND96 filter and dupe the slide. You will probably have to 'fiddle' to get just the right amount of flash for any given original.

[*Editor*: Another way to flash film is in the darkroom. There, rolls of film are unspooled and exposed to a dim light for a brief period. Motion picture film is wound off one reel onto another; the film passes over a 'flash light.']

You can even 'correct' off-color shadow areas to some degree by altering the dichroic filter pack in combination with the ND96 while flashing.

If, for example, the shadow areas are too blue, add extra yellow (the chromatic opposite) to the filter pack when making the flash exposure. To eliminate a given color, add the chromatic opposite of that color to the filter pack in the amount needed to correct it.

To Eliminate:	Add:	Or Subtract:
Blue	yellow	blue
Magenta	green	magenta
Red	cyan	red
Yellow	blue	green
Green	magenta	green
Cyan	red	cyan

The color tints you may want to correct are pastel shades of primary and secondary colors. You will have to 'futz' with filter-pack combinations to get exact results. You can preview the filter pack combo needed to correct the slide using 3-inch-square (~75 mm), gelatine, CC (color-correction) filters.

To see an approximation of how they will alter the color; view the slide through combinations of them. It is important that you view the slide-filter sandwich over a daylight-balanced light source—such as a MacBeth lightbox.

[*Editor*: MacBeth lighting systems are the standard of the photographic and printing industries.]

Taking our previous example of the green-tinted office scene; hold combinations of light magenta CC filters under the slide on a daylight-balanced lightbox.

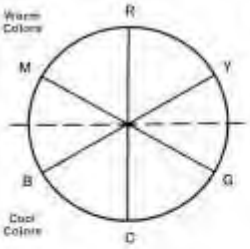
Mask off all peripheral light around the slide with black paper or Tough Roscopaque; because any peripheral light makes it difficult to judge the correction.

Placing the filters under the slide also helps you see the resulting color shift without the filter(s) changing the colors of anything else (for example the slide mount); that might bias your judgement.

If magenta alone is not the answer; try adding a little red and/or yellow. Although what you 'see' on the lightbox will not be exactly how the film records it; the preview will get you close to your ultimate corrective filtration.

Such previewing can also be accomplished using Kodak color-print analyzing filters (see next two pages).

Color Relationships:



The color wheel indicates:

1. Complementary colors are opposite each other.
2. Any one color is made up of the two colors adjacent to it:

   $R = M + Y$ $\quad C = G + B$
   $G = C + Y$ $\quad M = R + B$
   $B = C + M$ $\quad Y = R + G$

3. The warm colors are above the horizontal axis and the cool colors are below the horizontal axis.

The first three viewing cards in the filter kit are warm-color filters.

The last three viewing cards are cool-color filters.

Combining Filters:

1. Filters in the additive colors are converted to their equivalents in the subtractive colors:

   $2R = 2M + 2Y$ (not $2R = 1M + 1Y$!)
   $1B = 1C + 1M$ (not $1B = .05C + .05M$!)

2. Filters of the same color are added and subtracted normally:

   $2M + 1M = 3M$
   $2Y - 1Y = 1Y$

3. Filter combinations containing all three subtractive colors have neutral density (N.D.), which is removed by subtracting an equal amount of each color:

   $1C + 2M + 2Y$
   Subtract $1 \quad 1 \quad 1$ (remove 1 N.D.)
   $1M + 1Y$

Professional, Commercial, and Industrial Markets Division

EASTMAN KODAK COMPANY - ROCHESTER, N.Y. 14650

Kodak Color Print Viewing Filter Kit
Publication No. R-25

New Publication 9-72 BE
Printed in the United States of America

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FILTER FUNDAMENTALS

Additive Primary Colors Are:

Red, Green, Blue — White light is composed of a mixture of light of these three colors.

Subtractive Primary Colors Are:

Cyan, Magenta, Yellow — Filters of these three colors are useful to control the amount of red, green, and blue light reaching the color sensitive emulsions in the paper. Magenta and yellow filters are used most commonly in filter packs for printing on Kodak Ektacolor Papers. Cyan filters are seldom used.

Complementary Colors Are:

Red and Cyan, Green and Magenta, Blue and Yellow — Each is the complement of the other color in its pair. Each has the effect of neutralizing or absorbing the other color in its pair.

Filter Factors for CC and CP Filters

FILTER	FACTOR	FILTER	FACTOR
YELLOW		RED	
05Y	1.1	05R	1.2
10Y	1.1	10R	1.3
20Y	1.1	20R	1.5
30Y	1.1	30R	1.7
40Y	1.1	40R	1.9
50Y	1.1	50R	2.2
MAGENTA		GREEN	
05M	1.2	05G	1.1
10M	1.3	10G	1.2
20M	1.5	20G	1.3
30M	1.7	30G	1.4
40M	1.9	40G	1.5
50M	2.1	50G	1.7
CYAN		BLUE	
05C	1.1	05B	1.1
10C	1.2	10B	1.3
20C	1.3	20B	1.6
30C	1.4	30B	2.0
40C	1.5	40B	2.4
50C	1.6	50B	2.9

To use the factors: *Divide* the current exposure time by the factor for any filter you remove. When you add a filter to the pack, *multiply* the time by the factor. For two or more filters, multiply the individual factors and use the product as your factor.

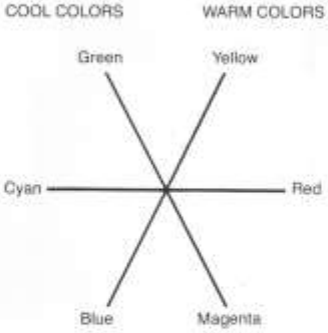
Color Relationship

The diagram shows that—

1. Complementary colors are opposite each other.

2. Any one color is made up of the two colors adjacent to it:

R = M + Y C = G + B
G = C + Y M = R + B
B = C + M Y = R + G



Kodak is a trademark.

Technical Note

When you correct the color balance of your prints, you may notice that prints made from color transparencies (or from color prints) need twice as much adjustment in filtration as prints made from color negatives to produce the same degree of change. The difference in filter effectiveness is due to the difference between the gamma of reversal papers (approximately 1.0) and negative papers (approximately 2.0).

These viewing filters are not manufactured to the same critical tolerances as KODAK Color Compensating and Color Printing Filters, and some unevenness of density may be apparent. This unevenness will not interfere with the use of these filters for viewing prints. *Do not use these filters for exposing color prints.*

KODAK Color Print Viewing Filter Kit
Major Revision 5-88-EX
Printed in U.S.A.
KODAK Publication No. R-25

R-25

KODAK Color Print Viewing Filter Kit

This handy kit of six color-print viewing filter cards will aid you in evaluating the color balance of a test print. The values and colors of the viewing filter(s) you select to make the test print look best are used in determining how much to change the exposing filter pack for the next print.

To make sure that the revised filter pack has the desired effect, it is important for you to be consistent in your exposing and processing techniques from one print to the next.

Each viewing card contains one of six filter colors: magenta, red, yellow, green, cyan, and blue. Each filter is represented in 10, 20, and 40 density values. These viewing filters are not manufactured to the same critical tolerances as KODAK CC or CP Filters and some unevenness of density may be apparent. Such unevenness will not interfere with the use of these filters for their intended viewing purposes. Do not use these filters for exposing color prints.

To Use: Judge the test print under the same type of lighting conditions to be used for display of print. View the print through the filter that makes it look best. If the color balance is on the warm side, use the green, cyan, or blue color filters to view the print. If the color balance is on the cool side, use the magenta, red, or yellow color filters to view the print. At times, you will find that a combination of a warm and a cool color may be necessary to make the test print look best.

Look at the lighter middletones in the print by holding the filter away from the print so that the light falling on the print does not go through the filter first. Quickly flick the filter in and out of your line of vision to observe the color correction the filter makes. Viewing filters will tinge the highlights excessively and the shadows insufficiently. You will, therefore, have to disregard these tonal extremities and judge the effect primarily on the middletones. You have a choice of three density levels for each filter.

For Prints on KODAK EKTACOLOR RC Paper or EKTACOLOR Print Film:

When you have made your selection of the viewing filter or filter combination that makes the test print look best, adjust the filter pack by adding or removing the filters that are specified on the card below the selected viewing filters.

Example 1: If you selected a 20C viewing filter, you would add 10M + 10Y to the filter pack.

Example 2: If you selected a 10R viewing filter, you would remove 5M + 5Y from the filter pack.

Example 3: If you selected 20M and 10B viewing filters, you would remove a 10M and add a 5Y to the filter pack.

Exposure adjustments for filter changes are discussed in another section. The filter pack adjustments printed on the cards are based on the following rule:

> Add to the filter pack a filter that is ½ in value and complementary in color to the viewing filter. If the filter to be added is a cool color (such as green, cyan, or blue) instead of **adding** that filter to the filter pack, **remove** its complement from the filter pack.

For Prints on KODAK EKTACHROME RC Paper:

When you have made your selection of the filter or filter combination that makes the test print look best, use the rule which follows. Do not use the filter pack adjustments indicated on the filter cards.

> Add to the filter pack a filter that is the **same** value and color as the **viewing** filter. If the filter to be added is a cool color (C, G, or B), instead of **adding** that filter to the filter pack, **remove** its complement from the filter pack.

Example: If the viewing filter is a 20M, **add** a 20M to the filter pack.

If the viewing filter is a 10B, **add** a 10B to the filter pack; but since 10B is a cool color, **remove** its complement (10Y) from the filter pack.

You can also use the CC Filter Computer found in the **KODAK Color DATAGUIDE** (R-19) to determine the filter pack after selecting the appropriate viewing filter.

EXPOSURE ADJUSTMENT FOR FILTERS

Whenever the filter pack is changed, allowance should be made for the change in exposure introduced by (1) the change in filtering action, and (2) the change, if any, in the number of filter surfaces. Otherwise, the density of the corrected print will differ from that of the test print.

If the pack is changed by only one filter, use of the appropriate filter factor in the following table is convenient. Otherwise, the use of the computer numbers with the Color-Printing Computer in the **KODAK Color DATAGUIDE** will probably be preferred.

Computer Numbers and Factors for KODAK CC and CP Filters

Filter	Computer No.	Factor	Filter	Computer No.	Factor
05Y	.04	1.1	05R	.07	1.2
10Y	.04	1.1	10R	.10	1.3
20Y	.04	1.1	20R	.17	1.5
30Y	.05	1.1	30R	.23	1.7
40Y	.05	1.1	40R	.29	1.9
50Y	.05	1.1	50R	.34	2.2
05M	.07	1.2	05G	.06	1.1
10M	.10	1.3	10G	.08	1.2
20M	.16	1.5	20G	.12	1.3
30M	.22	1.7	30G	.15	1.4
40M	.27	1.9	40G	.18	1.5
50M	.32	2.1	50G	.22	1.7
05C	.06	1.1	05B	.04	1.1
10C	.08	1.2	10B	.12	1.3
20C	.12	1.3	20B	.21	1.6
30C	.15	1.4	30B	.29	2.0
40C	.18	1.5	40B	.38	2.4
50C	.21	1.6	50B	.47	2.9

To use computer numbers: Add the computer-number values for all the filters in the old pack. On the "Density" scale of the Color-Printing Computer, set the sum of the computer numbers so that it is opposite the exposure time used. Read the new exposure time opposite the sum of the computer numbers for the new pack.

To use factors: First divide the old exposure time by the factor* for any filter removed from the pack. Then multiply the resulting time by the factor* for any filter added.

*For two or more filters, multiply the individual factors together and use the product.

Another trick for shooting better dupes is to over expose them slightly and underdeveloped the film. Generally, a half-stop is all you need. This, too, helps flatten the contrast. (On the other hand, if you want to increase the contrast, under-expose and over-develop). This is exactly the opposite of how you would handle negative stock. If you want a better dupe with negative stock; underexpose the negative and overdevelop it; again, about half a stop. This technique applies to black & white as well as to color film stocks. With black-and-white; 'pushing' (longer development) and 'pulling' (shorter development time) can be increased to a full stop or more. All the pictorial results of these tests, together with the relevant data, should be entered into your Effects Bible.

There is still another area of testing that should be completed before we can consider our basic Effects Bible to be complete: line-film and soft-edged mask production. Masks are used for several purposes:

- Sub-dividing a screen area; or part of a picture
- Shooting image elements into position while duping
- Making 'wipes' and/or 'OP' (over-projection) effects

First, and easiest, are Kodalith exposures. As previously discussed in the art prep section, the best art for making Kodalith masks is other (backlit) Kodaliths. When backlit, the contrast ratio between the clear and black areas of a Kodalith is so great that it far exceeds the latitude of the film; thus, back lighting allows the Kodalith copies to be over-exposed and over-developed to achieve really solid blacks (that don't need much spotting); without risking fogging (in the clear areas).

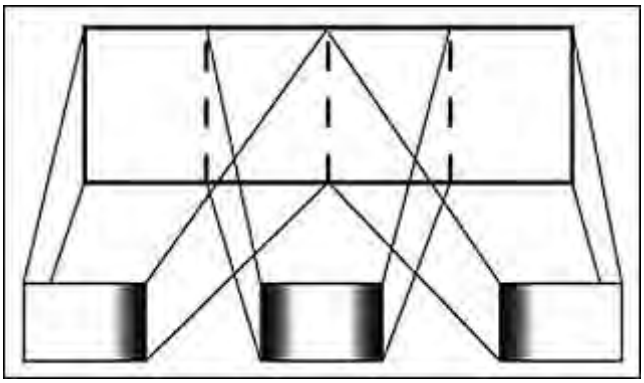
You can see that dramatic difference by placing an inked-in piece of art under the top lights and using a spot meter to measure the exposure for the white and black-inked sections. There will probably be about a four-stop difference. Now, if you make the same measurements on the clear and black areas of a 7.5-field, bottom-lit Kodalith cel; there will be about an eight-stop difference. Thus, it pays to make all your mask art as pegged Kodalith 7.5-field cels; rather than shoot your 35mm Kodalith masks directly off the original top-lit art.

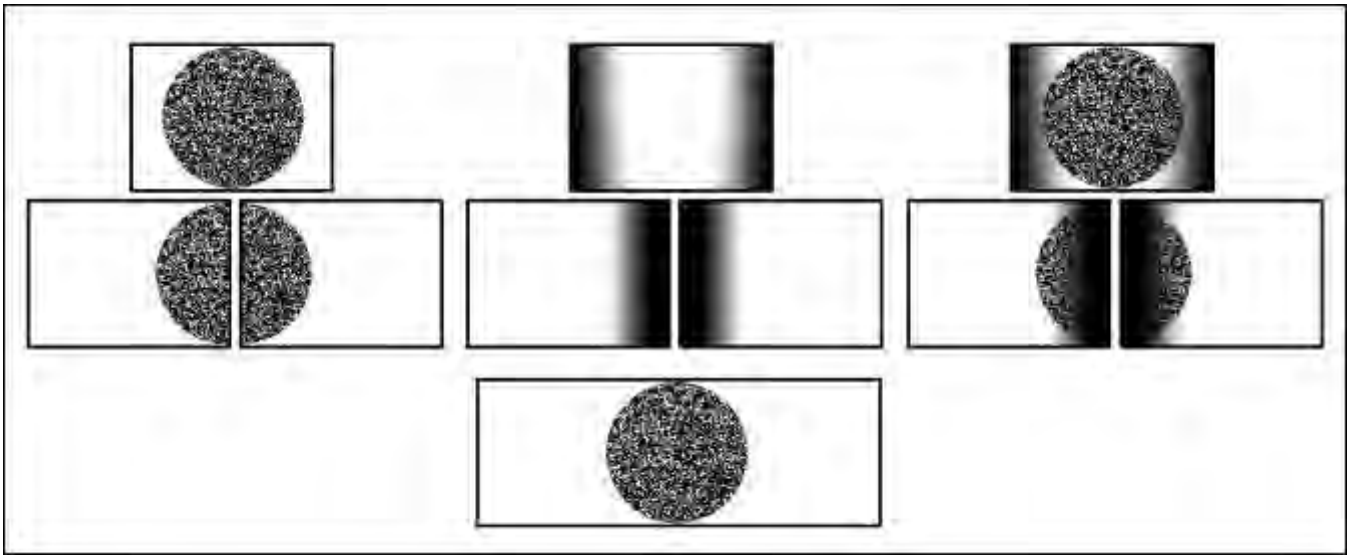
Shoot your 7.5-field backlit mask art onto 35mm Kodalith, Kodaline or LPD4 (a reversal line film; i.e., positive to positive) Bracket widely and process in developer that is cold (65° to 68° F | 18.3°-20° C) and diluted with 20% more water than called for. With Kodalith AB developer you are looking for a processing time of about 4-5 minutes; not the 2.5 to 3-minute recommended processing time. Test exposures for both a 'fine-line' and 'solid' Kodalith (the exposures for fine-line negs and solid masses are different). Note the exposure that provides the best 35mm Kodaliths in your Bible.

Also test a variety of color effects as well as location and studio originals; to see how they convert to line versions. Here you should test a wide range of exposures because the results will reveal a progressively greater amount of 'clogging' in the highlight areas. These progressively greater densities will provide a wide range of clear areas that can be used to create posterization effects. (See earlier discussion of posterization; page 2955.) Also test the exposures needed to contact 35mm liths. If you use a photo enlarger to contact your sheet negs (as recommended earlier); you will find that if you use the same filmstock for your 35mm contacts as for sheet neg contacts, you'll be able to use the same enlarger settings. The small strips of contacted 35mm film can be easily tray processed just like their 'big brother' 7.5-field sheet films.

What is the difference between a soft-edged mask and a "panorama mask?". Nothing. Both are 'soft-edged,' (aka 'feather-edged,') gradients; but the artwork and shooting procedures are different because each has a different function; thus, two different names.

Panorama masks are used to project a panoramic image using multiple projectors in an overlap format—a so-called "seamless panorama." Those masks are bound with 'splits' of the scene and should have a wide density band from 80% grey in the darkest area to clear. The width of the gradient should be at least 1/4 (and preferably 1/3) the width of the slide field. Narrower gradients result in visible 'stripes' of brightness where the slides have overlapped.





Left: splits of picture | Center: panorama masks | Right: masks bound with image splits | Lowest: panorama as projected.

On the other hand, a "soft-edged" mask is basically a hard-edged mask that has had its hard edges softened a bit. These types of masks are usually used to achieve various kinds of "wipes;" e.g., left-to-right; top-to-bottom; diagonal; circular; etcetera. In a wipe, sequence, there is less need to worry about a perfect blend of image sections because the sequence usually occurs quickly; the illusion of softness, in the context of the short duration of the individual slides on screen, disguises any 'striping;' thus, narrower-bands of density change are sufficient.

Any hard-edged mask art prepared as 7.5-field negs and positives can be used to create soft-edge versions of the same masks by using the glow procedures previously described with 5302 (Fine Grain Release Positive) film developed in HC-110 dilution F. The greater the diffusion of the glow-screen material, and the higher the glow screen is positioned over the art (using thicker-glass spacers), the softer the edge of the mask.

To test for the exposure needed to create a soft edged mask using the glow technique:

- Place the neg onto a (bottom-lit) peg bar.
- Position a one-inch-thick glass plate over the neg
- Place a sheet of Rosco Tough Rolux diffusion material over the glass
- Use a ¼-inch-thick cover glass over the diffusion sheet
- Shoot a widely-bracketed range of exposures on 5302
- Repeat this procedure using the pos as the base cel instead of the neg.
- Process film using HC-110 developer with dilution F (the lowest contrast development formula)

In soft-edge- and panorama-mask making, we want low contrast; not high. We do not need the D-max to be jet black; all we need is 80% to 90% density. What we are after is a broad (wide) gradient.

Note which exposure is best and bind together the neg and pos masks in a Wess mount. The two should cancel each other out. If they do not keep changing the exposure for the pos mask until you find which pos-neg combination most completely—and evenly—blocks out the light. You can now repeat this using any range of glow to achieve any degree of softness.

The resulting 35mm softies can be used as bind-in masks to create wipes or soft-edged multi-image screen effects using pairs of projectors; or they can be used in duping to DX two or more images together with soft-edged blends.

To accomplish such a double exposure; place the softie neg mask on the pins of a 35mm, 1:1 slide stage; then position the scene A slide over the mask (the mask goes on the bottom because that is the "focal plane;" and the 'size' of the mask is more critical than the size of the image). Shoot scene A. Then, without advancing the camera, remove the neg softie mask and scene A slide. Place the scene B slide on top or the positive softie mask and shoot scene B.

Whether the two scenes blend 'perfectly' will be determined not only by the 'mate' between the mask; but also by the 'relative brightness' of scenes A and B. The reason, once again, is film latitude.

If the scene A slide were particularly dark; the densities in the softie mask would force areas of scene A (where it enters the masked area) out of the duping film's latitude. Likewise, but completely opposite, the lighter scene B would 'punch through' the lighter densities of the pos softie. The result would be a mis-match of densities in the mask's 'crossover' band.

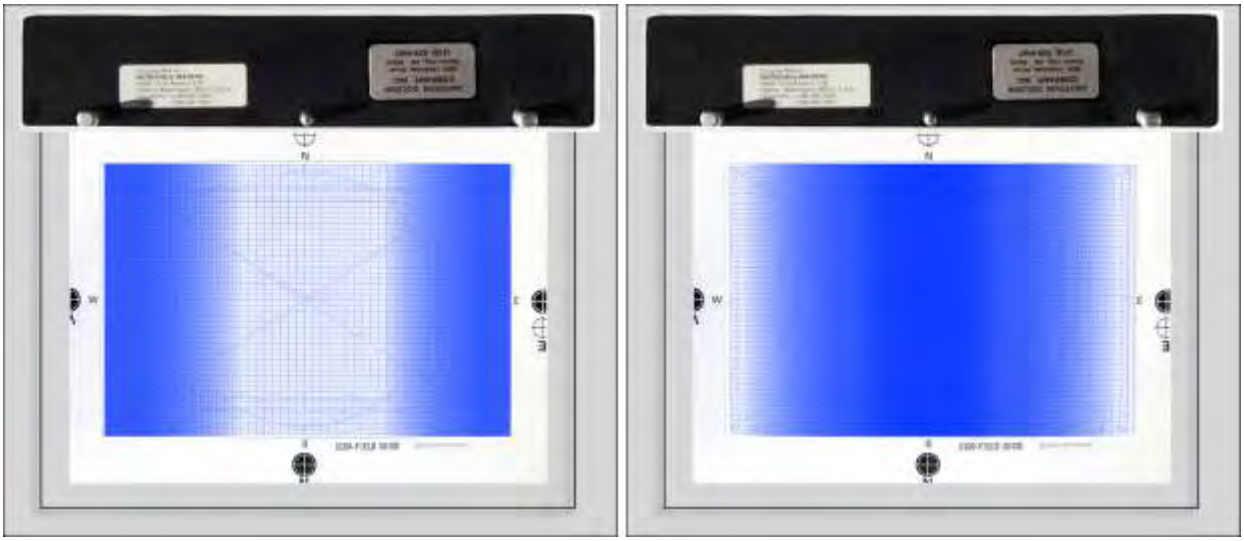
To do that merge effectively; you would have to either balance out the exposures. Or, use a denser pos softie with scene B and a thinner neg with scene A. Yes, folks, it does get complicated; which is why you will be needing your Bible more and more.

The above is one reason why soft-edged panoramas are nearly always created with bind-in masks. It is so difficult to match the right density neg or pos softie with the original being 'panned' that it is nearly impossible to shoot the soft edge into the dupes without 'striping.'

Creating panorama masks is 'a horse of another color.' Again, our goal is to have a maximum-width gradient band; ideally, 1/3 the width of the slide aperture.

There is a popular 'master 35mm negative' that is being sold under the pretense of being the "easiest and best" way to make soft-edged masks. It simply does not perform the way a soft-edge mask should. Remember: every time you dupe—whether in black and white or in color—you are stripping-away each end of the grey scale; thus, you are building-up contrast and narrowing the band of mid-range tones. Thus, duping a soft-edge master is defeating the purpose; that is to maintain the mid-range tones, not reduce them.

A better way is to make a 7.5-field master neg and pos artwork using layers of blue gels. The reason to use blue is to control how 5302 'sees' the art; because that emulsion is sensitive to blue light. If we leave the art unfiltered; the blue-sensitive 5302 will see it one way. If we introduce various yellow filters; the 5302 (or other) film stock will read the art as various shades of blue-grey, or gray (yellow is the chromatic opposite of blue, hence, together they create neutral density).



To create the art for a soft-edged mask: overlap layers of light blue gels; e.g., Rosco #3208 (1/4 Blue) or #261 (Light Steel Blue) over a 7.5-field master grid. Each layer should be about 1/4-inch shorter than the preceding layer; and you need at least 12 layers to build enough exposure difference between the single layer and all 12. Position your gels so that you have established a rather narrow 25% field clear band down the vertical center of the field. That is, from the "2" lines to the "6" lines right and left of "0" on the Y axis; then apply the other layers on quarter-inch intervals until you reach the "6" line. After layering these gels, apply one final 'cover gel' over the entire field; the clear area along the Y axis will be lightest shade of blue. If you were to leave this area clear there would be too much exposure difference between the white center and the first layer of blue gel, increasing contrast. By applying a blue cover gel over the top of everything, you not only reduce the overall contrast, you also protect the multi-gel-sandwich; because the top-sheet is taped down on all four sides; keeping dirt and dust out of the composite sandwich. With the art made for the left- and right-side softies (left, above); make a matching, but opposite blue gradient for the center softies (right, above).

If you start by cutting sections out of total-field gels, the resulting cut-outs will fit perfectly to create the pos mask. To build the pos art; lay a registration-punched, clear acetate cel over the neg gel assembly. Start your gel build-up by positioning the narrow, center-band gel (that fits between the left and right "2″ lines on the Y axis) so that it "mates" perfectly with the neg assembly beneath it. Continue this process until you have completed the pos cel; then cover that with a taped-down blue cover gel.

Now, what you should see before you on the light table are pos and neg gel assemblies that 'cancel each other out' in perfect registration; that is, you should see one continuous blue color with barely perceptible gel overlaps (those create darker lines). You now, have a matched pair of Master Softie Art cels.

Shoot this art using 'low-glow' screen material with thick, 1-inch glass. If we used 'high-glow' screen material; the individual layers of the gel composite would 'mush together' too much. We want to 'see' the individual gel-layer colors, but with a subtle blend. Shoot a series of widely bracketed exposures of this and repeat the procedure using the pos gel assembly.

After processing the film; mate the various exposures of the glowed neg and pos gel assemblies in a Wess mount to determine which neg exposure mates with which pos exposure (you will find that you'll be using two different exposures).

Next, try the same series of exposures while introducing a yellow filter (preferably a #13 'pure' yellow) over the lens. You will get slightly different results; because now the 5302 is 'seeing' the gels as gray instead of blue, and the film has a different sensitivity to gray than it has to blue. Of course, use whichever results are best.

Consistency of processing—agitation and chemistry stability—is all-important when creating soft-edge or panorama masks. Here again; you want to slow down the development cycle by using the coldest temperatures and the most diluted chemistry. The reason is simple: it is easier to control agitation and total time accuracy in a longer processing cycle than a short one.

Let us say that the recommended processing time is 3 minutes. It takes you at least 10 seconds to get the film into the tank and at least 10 seconds to get it out. That is 20 seconds, or 10% (roughly) of the total processing time of 180 seconds. If the development time were increased to 10 minutes, that would be 20 seconds out of 600, or about 4%.

Our goal is to get the neg and pos softies to mate as perfectly as possible. If we process them in different batches, we will never get a perfect mate because each different processing run will produce different results—particularly in the mid-range grays. The greater the chemistry 'exhaustion rate' and temperature flux (as well as total processing time and agitation) the greater the differences will be from run to run.

Thus, the larger the chemical bath, the colder the temperature, and the larger the run (in terms of the number of rolls) the greater the chances of density consistency from roll to roll. For the average production run of softies; I recommend that you use 3.5-gallon 'box' tanks that can process up to 20 rolls of 36-exposure film per run.

I also suggest that you use the dip and dunk process of agitation. That involves pulling the entire 'basket' of film reels completely out of the processing solution and then dunking it back in, as quickly as possible. That should take about five seconds for one 'dip and dunk.' When initiating the development; immerse the film into the developer and dip-dunk continuously for the first minute (10 to 12 dip-dunks) Then dip-dunk once every 30 seconds for the duration of development.

Process all the neg and pos softies together; in one run. If you cannot process them all in one cycle; combine an equal number of neg and pos rolls in the same run; and tag the rolls so you know which negs and pos's came from which run. (A neg from one run will probably not mate perfectly with a pos from another run).

The primary advantage of producing your softies this way is that you are operating with the camera at the same field and focus as for all your other 7.5 field art. Thus, the masks, whether hard or soft-edged can be produced with the camera in the same position. That makes for better registration than would be the case if the different elements were shot at different camera elevations.

The ideal is shooting the entire show without ever moving the camera. Since this is rarely possible; the only alternative is to move the camera as infrequently as possible.

I have seen softie techniques that involve using black baffles and throwing the camera way out of focus. I have seen others that involve the use of airbrush art with or without lens focused (on the art). Still others involved using layers of ND gels on a 1:1 stage with the lens racked out of focus. All these are tedious to set up; and they yield less consistency than shooting 7.5-field (or 10-field) art using the glow techniques described above.

[*Editor*: As Multi-Image neared its zenith in the 1980s, AMI (Association for Multi-Image) international membership peaked at around 3,000. It was a burgeoning market for equipment and materials suppliers. Several commercial suppliers of soft-edge masks appeared on the scene; including Wess (New York); Stokes Slide Service (Texas); and DSC Laboratories (David & Susan Corley) in Ontario, Canada.

[Without question, DSC's softies were the best—way better than even the ones made by the blue-gel process I detailed, above. I guess that is fitting; because the Corleys were the ones who invented soft-edge-masks based on an idea of David Fellowes. How they did that—their production process—has remained a trade secret for a half century; it was long rumored to have been an aerial-image technique.

[It is unlikely anyone would need or want to produce film masks any more; so, the Corley family (progenitors Susan and Richard and their offspring, Patricia and Richard) have agreed to reveal how their *Fuzzies* brand soft-edge masks were made.

[I am pleased, proud and honored to bring their story to you, as written by Richard Corley, on the pages that follow.]

The Story of Fuzzies | by Richard Corley



Chapter 1 – The First Generation of Fuzzies

D and S Corley Limited, doing business as DSC Laboratories (DSC), was established by my parents, David and Susan Corley, in the 1960s. After working in the production of television commercials they saw a business opportunity in the delivery of excellent technical services in the production and duplication of slide and filmstrips for non-consumer markets (business, governments, education, etc.) which DSC has pursued from that time until 2023.

Photo of himself courtesy of Richard Corley.

My father David, who was extraordinarily good at fixing and modifying mechanical and electrical things of all types, obtained a number of WWII "army" surplus Bell & Howell 35mm Eyemo movie cameras. These were powered by a massive windup spring and were reportedly used, among other things, to record bombing runs in the Second World War. I remember that he would theatrically liberate the spring from these cameras by clamping down the body and then pulling at the spring (from a safe place) until it literally exploded from the body of camera (much to the amusement of his children)! Bell & Howell 35mm Eyemo movie cameras looked like this:



He opened up the aperture to enable the camera to shoot a full slide frame, adapted a 35mm SLR mirror and lens assembly to view and focus the image, and replaced the spring-driven mechanism with an electric mechanism of his own design which allowed the camera to be controlled from an electronic control box. The camera could be used to take half frames (for filmstrips), single slide shots, to make multiple exposures (or re-exposures), or to shoot up to 100 feet of film continuously.

[*Editor*: See *1970s-1980s | D & S Corley Laboratories Portfolio | Plates Nos 1-8.* The converted Eyemo camera appears on Plate 3.]

He built a number of these cameras, which were mounted on vertical stands (similar to Oxberry cameras) and served as the workhorses of the DSC business for the next two decades. From the 1960s to the 1970s DSC Laboratories scaled up its operations and brought in and built additional film printing and processing equipment (to enable it to better control the quality and repeatability of the images that it was producing) and acquired an excellent reputation in the production and duplication of high-quality film images. [*Editor*: See, *1970s-1980s | D & S Corley Laboratories Portfolio | Plates Nos 1-8*.]

As a result, DSC was approached, in the early 1970s, to assist with the production of slides for multi-image shows and to develop soft-edge masks to enable the creation of seamless wide-screen, multi-projector panoramas. DSC also developed and produced highly accurate alignment grids for use in the alignment of multi-image projectors (the design of which was later adopted as the AMI standard).

The first generation of Fuzzies were developed by my father, David, in response to a request from a multi-image producer by the name of David Fellowes (we understand these to have been the first successful multi-image soft-edged masks). I understand that the first generation of DSC soft-edged masks were created to have a linear (in transmission) gradient and were made only for panoramas. These masks were difficult to produce, were made in modest quantities in response to orders and were sold at premium prices. Over time a number of DSC mask customers either began to make their own masks or switched to lower cost, soft-edged masks from other suppliers including from Wess, the principal supplier of the slide mounts used for multi-image slide shows.

Chapter 2 – The Second Generation of Fuzzies

I graduated from a mechanical engineering program at Seneca College and joined DSC in 1976 to assist it with the development of new products and services.

The second generation of DSC Fuzzies, which I was responsible for developing in the late 1970s and early 80s, were a highly engineered system which was designed to provide multi-image producers with a wide variety of predictable and reliable soft-edge masking products (and other complementary masking products). (Unless otherwise noted, all references below, to Fuzzies, refer to the second generation of Fuzzies.)

The key elements of the second generation of Fuzzies included the following:

1. The use of an arithmetic progression (in transmission) gradient to minimize the appearance of any light or dark bars in the event of any misalignment.
2. Specification of the location and width of the gradient in terms of the AMI standard alignment grid fields. This facilitated the design of soft-edged multi-image effects and gave designers and producers greater control when combining different images using Fuzzies.
3. The use of the same batch of custom-manufactured Kodak 5302 black and white film on a high strength polyester (Estar) base (for greater dimensional stability, consistency and strength) for all Fuzzies.

4. Volume production for inventory to reduce costs and to enable the Fuzzies to be sold and shipped on the same day (to assist multi-image producers to deal with last minute panics).

5. Extensive educational outreach and support to assist multi-image producers to understand how to make use of the Fuzzies system most effectively.

I will discuss each of these points in further detail below:

1. Use of an Arithmetic Progression Gradient

One of the key distinctions between the second generation Fuzzies and the earlier Fuzzies (and other products) was the use by the second generation Fuzzies of an arithmetic progression gradient, rather than the linear transmission gradient (which was the design target of the earlier Fuzzies and other masks).

This gradient was designed and engineered to take advantage of the fact that human vision is most highly sensitive to differences in brightness between immediately adjacent areas in the field of view, and was designed to minimize such differences.

The implications of the difference between the linear transmission gradient and the arithmetic progression gradient are apparent in the following four figures.

Figure 1: Linear Transmission Soft-Edged Mask with Correct Alignment

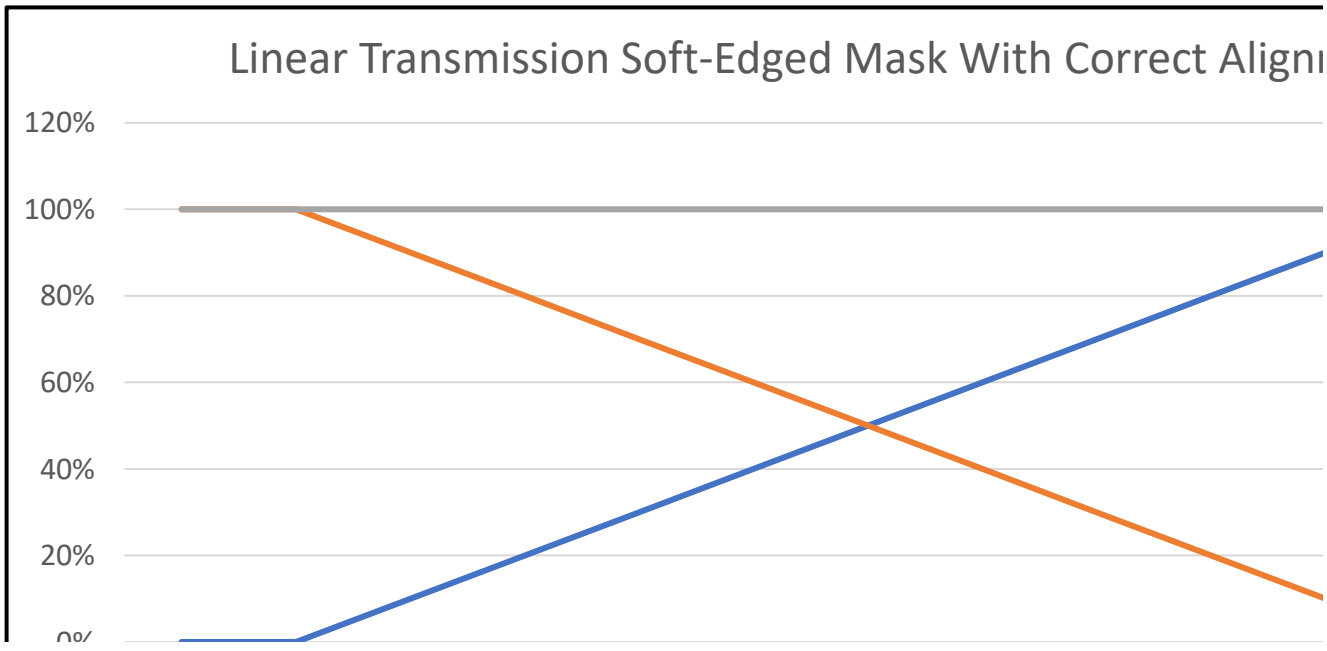


Figure 2: Arithmetic Progression Soft-Edged Mask with Correct Alignment

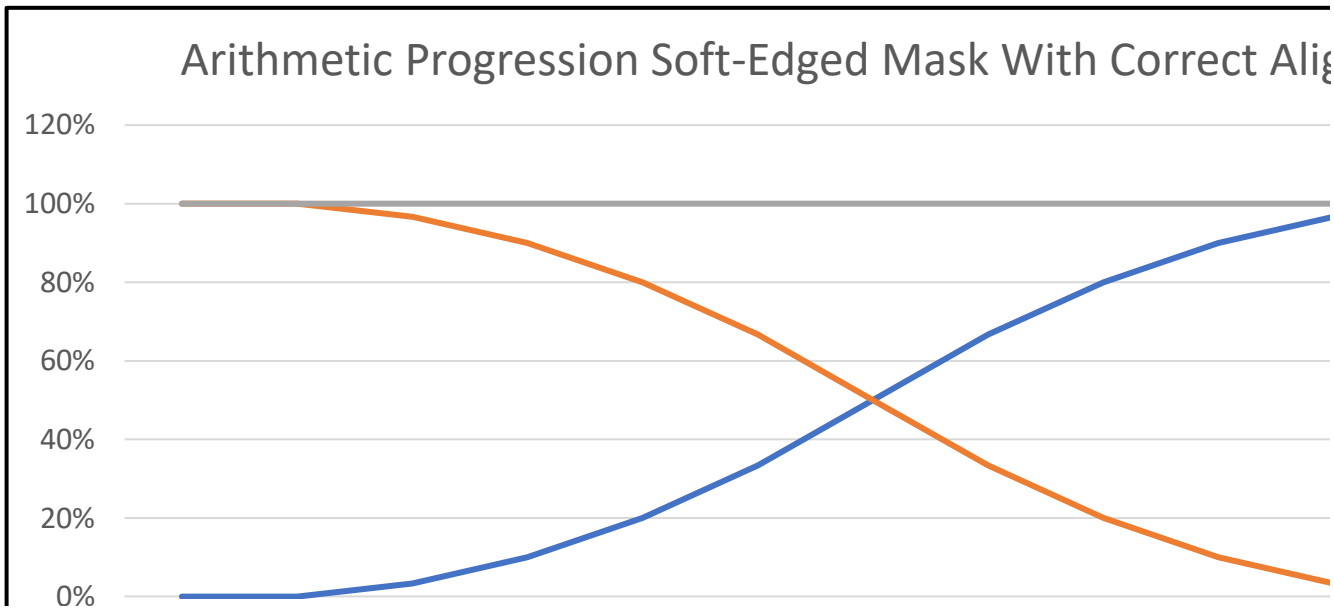


Figure 1 and Figure 2 show that either a linear gradient or an arithmetic progression will produce an excellent result when perfectly manufactured and aligned for projection.

Figure 3: Linear Transmission Soft-Edged Mask with One Field Misalignment

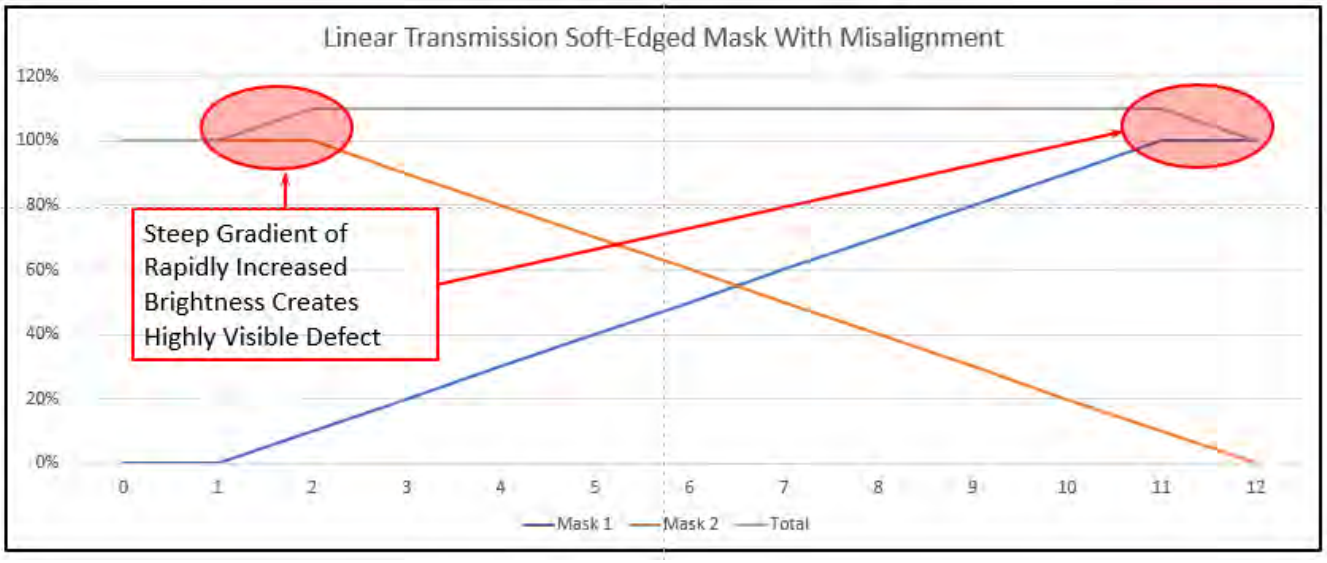


Figure 4: Arithmetic Progression Soft-Edged Mask with One Field Misalignment

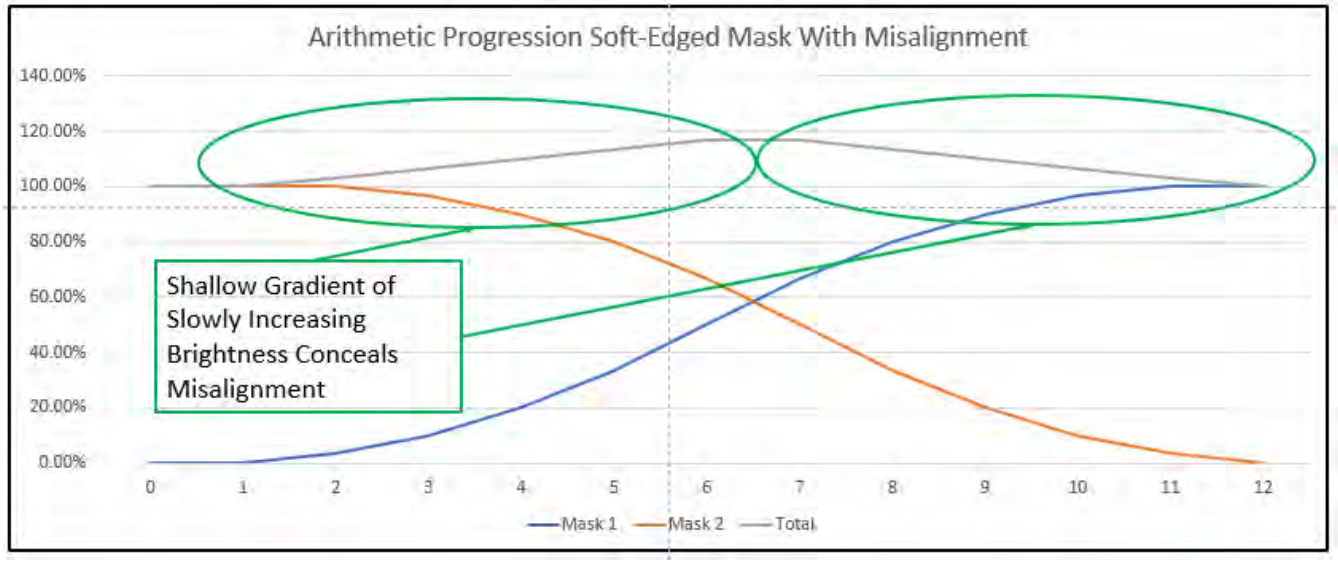


Figure 3 and Figure 4 show that any error in manufacturing or alignment of the linear gradient soft-edged mask would result in a highly visible bright or dark edge (at the edge of the linear gradient) but that the arithmetic progression soft-edged mask would conceal the difference resulting from any misalignment to the greatest extent physically possible by spreading the difference in brightness out across the entire width of the gradient.

The engineering differences between the first generation of Fuzzies and the second generation (with the arithmetic progression gradient) was a key feature which helped to drive the success of the second generation of Fuzzies.

The Fuzzies were shot in-focus from large format negatives which were engineered to produce the correct transmission levels at all points in the gradient of the final Fuzzie. The negative was created using a computer driven optical printer which controlled the exposure down to a thousandth of an inch at each point in the gradient. The exposures were initially set using a stair step exposure negative and print to establish approximate exposure levels. The subsequent negatives and prints were then fine-tuned by scanning the Fuzzies gradient using a narrow slit on a digital densitometer, and then adjusting the exposure of the negative to achieve the desired levels of light transmission at all points in the Fuzzies' gradient.

2. Specification of the Location and Width of the Gradient

The Fuzzies were designed with reference to and based on the standard AMI 12 field alignment grid. Both the location and the width of the gradient were specified in terms of the standard grid. The Fuzzies came in five gradient widths. The version most widely used for panoramas (the "Long" version) had a gradient which went from field 2 to field 10 (a total of eight grid fields out of the 24 fields in the alignment grid).

The Extra Short, Short, Medium, and Extra Long versions had total gradient widths, respectively, of two, four, six or ten grid fields on the standard AMI grid. These different gradients and the production of these gradients centered on different fields and in different orientations (vertical, horizontal, diagonal), and in a variety of shapes gave muti-image designers complete control of the placement and appearance of the soft edge effects.
The following charts, which were printed on 11- by 17-inch pages [~28 X 43 cm], provided visual representations and explanations of the different Fuzzies and other masking products which we produced. [*Editor*: See, *1980s | DSC Mask Portfolio | Plates Nos 1-15* (overleaf).]

3. Single Batch of Custom Film Stock

At that time, the fine-grain black and white film used to produce Fuzzies was manufactured on a cellulose acetate base which varied slightly in its characteristics from one emulsion batch to another. In order to obtain the benefits of the use of a high-strength polyester base (which was thinner and provided greater dimensional stability, toughness, and strength) and a consistent emulsion we had Kodak custom-manufacture, as a single batch, a large volume of 5302 black and white film on its Estar (polyester) base. This film which came in 2,000-foot [~610 meters] cans, in boxes of 10,000 feet [3,048 meters], was kept in a deep freeze to protect it from any heat degradation, until it was used to produce Fuzzies. The use of a single emulsion for all second generation Fuzzies enabled greater consistency and the use of the same master negatives over the years during which we produced the Fuzzies.

4. Volume Production and Same Day Shipping from Inventory

In order to be able to reduce the price and to help to drive widespread adoption of Fuzzies, we needed to increase the rate of production and to have Fuzzies in stock for immediate shipment. To do this, we used a continuous 35 mm film processor and multiple DSC cameras to produce thousands of Fuzzies a day, while continuously monitoring and adjusting all the temperatures, chemistries, and other relevant variables, and performing real-time testing of each batch of Fuzzies.

Instead of producing batches of Fuzzies largely in response to orders (as had previously been the case), with the resulting increases in lead times and costs, we produced for inventory and had tens or even hundreds of thousands of masks on hand and ready to ship. As a result of improved efficiencies (and reduced wastage) we were able to dramatically reduce the prices of Fuzzies, and, in high volumes, to sell them for a fraction of the prices charged for the first generation of Fuzzies. We also set up expedited shipping arrangements such that urgent orders would go out the same day for delivery anywhere in North America the next morning.

5. Educational Outreach and Support

We used a number of different strategies to assist multi-image producers to understand and appreciate the potential of the new Fuzzies system. The charts were a very simple, but effective, tool for assisting producers to visualize how a soft-edged mask could be used to enhance an image or effect. We would invariably see the charts stuck to the wall above the light boxes in production facilities around North America.

We had Brian Smith, a multi-image producer in Montreal, produce a single-screen, nine-projector show which demonstrated the potential uses of Fuzzies in a single screen format. (Being based in Toronto we couldn't use any one multi-image producer in Toronto without alienating a dozen others.) This show was transferred to video and was used as a portable demo at industry trade-shows and in meetings with producers.

We also bundled a variety of different types of popular masks together in "Starter Sets" which were sold from inventory and at AMI, and other audio-visual shows around the world. These Starter Sets would enable producers to test a wide variety of soft-edged effects in real-time from masks that they had on-hand.

My father-in law, who was a gifted artist, drew the little Fuzzies mascot which we had printed on bags and made into little fuzzy handouts which we distributed (along with the charts and starter sets) at festivals and trade shows.
As a result of these efforts, and the inherent quality of the Fuzzies, sales volumes grew rapidly and it seemed as though DSC became the principal supplier of soft-edged masks to the multi-image industry.

Chapter 3 – Other Multi-Image Industry Activities

As a result of our work on Fuzzies and multi-image lab services, I became involved in both the Canadian Association for Multi-Image and the International Association for Multi-Image (based out of the US). I was actively engaged with and was elected to the boards of directors of both the Canadian Association for Multi-Image and the International Association for Multi-Image, and was the President of the Canadian Association. Patricia Herron (then Patricia Corley) also served on the board of the International Association for Multi-Image and on the board of the AVC (Association of Visual Communicators).

In part due to my background in television standards and work with the Society of Motion Picture and Television Engineers (SMPTE), I was asked to head up both the Canadian Multi-Image Standards Committee and the International Multi-Image Standards Committee, and had the good fortune to be asked to judge shows at numerous AMI festivals.

At the 1986 AMI Canada awards dinner in Toronto, I was honoured to be presented with a lifetime achievement award by AMI Canada.

DSC was also involved in the production of custom masks and colour photographic elements in 35mm, 46mm and 70mm formats, including through the use of custom-built equipment such as the computer-controlled CAMI optical printing bench, and commercial film processors, cameras and high-resolution computer graphics equipment and film recorders.

1970s-1980s | D & S Corley Laboratories Portfolio | Plates Nos 1-8
1980s | DSC Mask Portfolio | Plates Nos 1-15

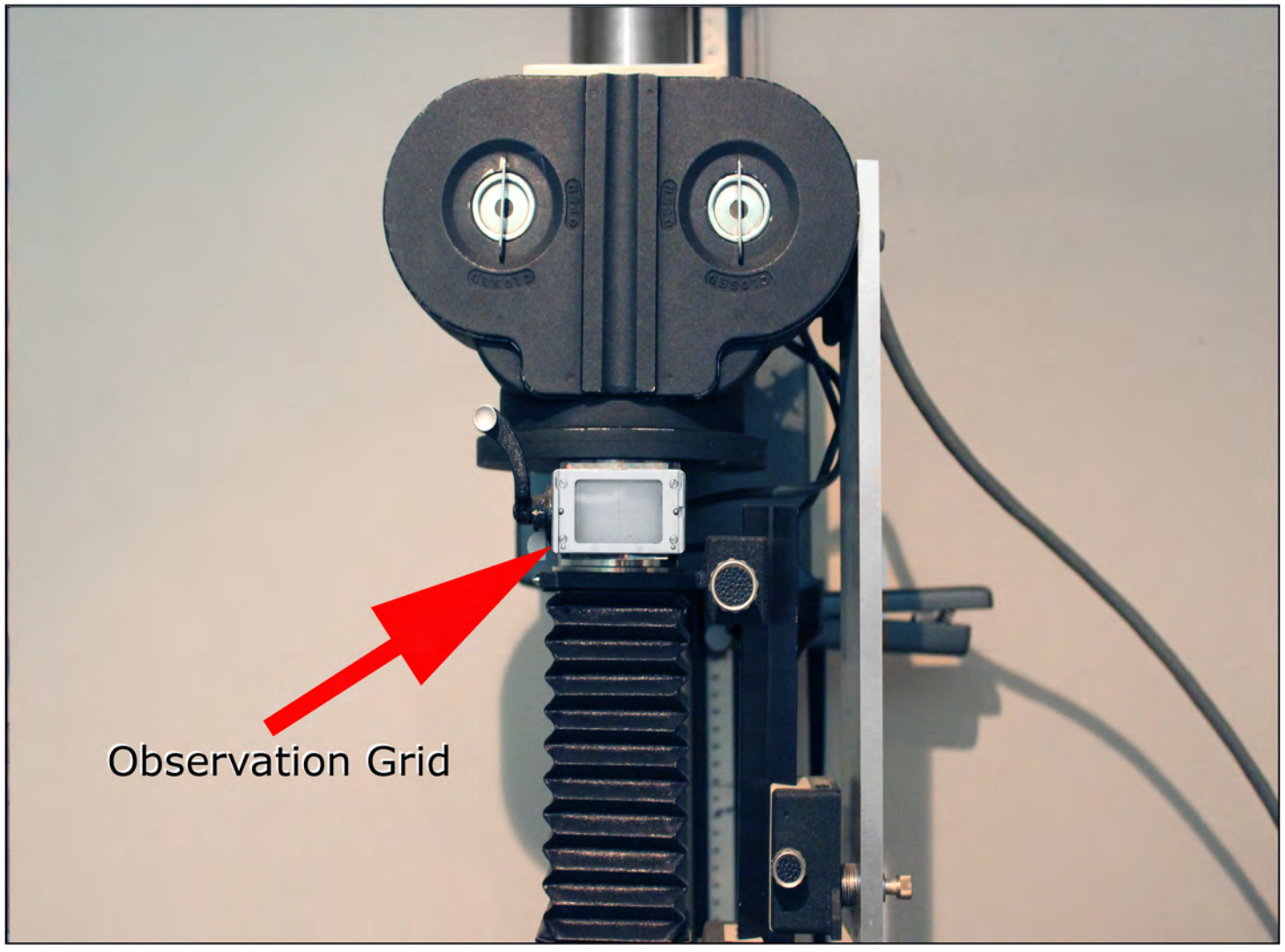




1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 1

Above: Canada Business Excellence Award | Below: Headquarters near Toronto International Airport.





1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 2

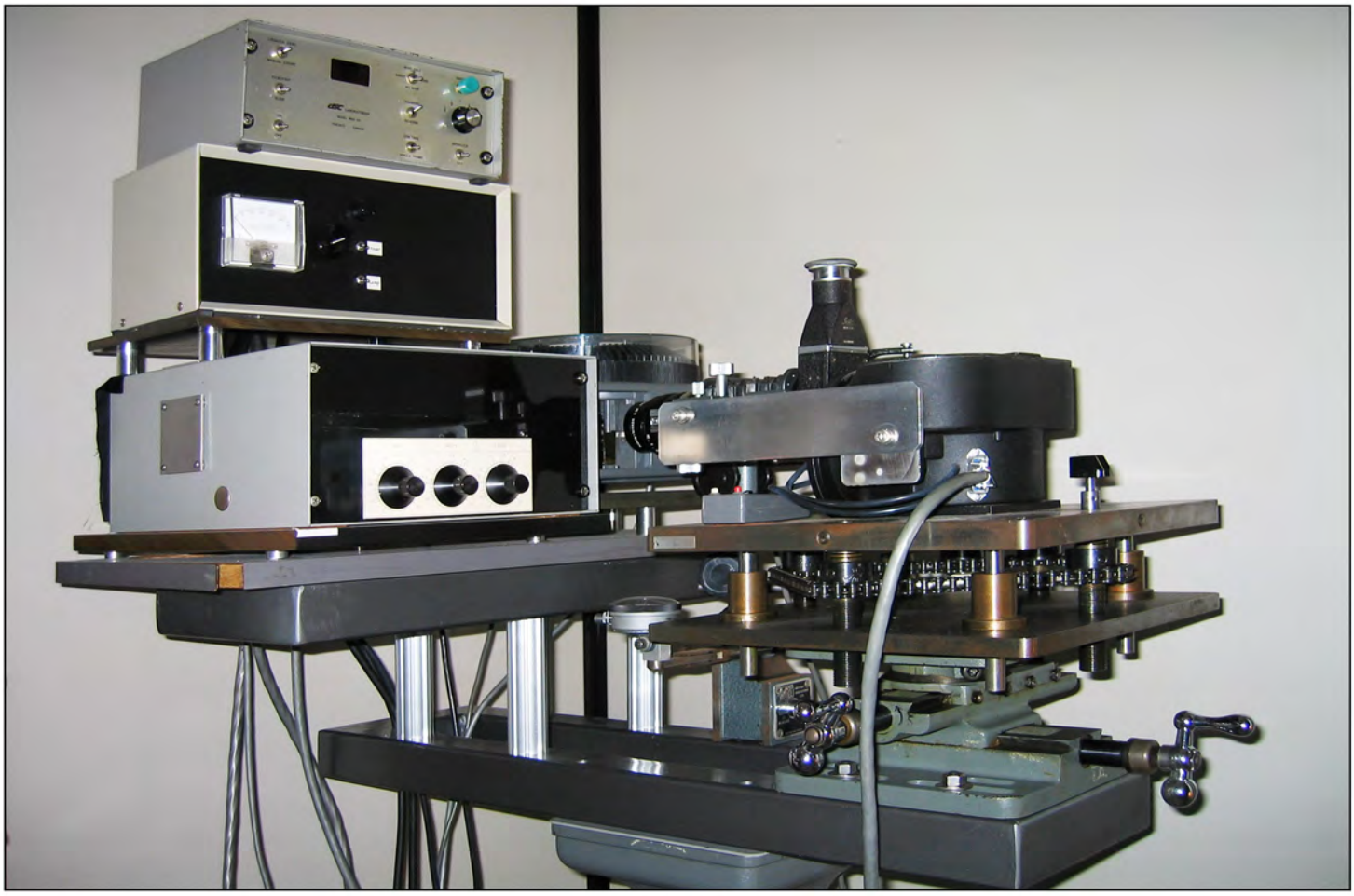
Above: David and Sue Corley in 1982 | Below: Camera used to shoot Fuzzies.

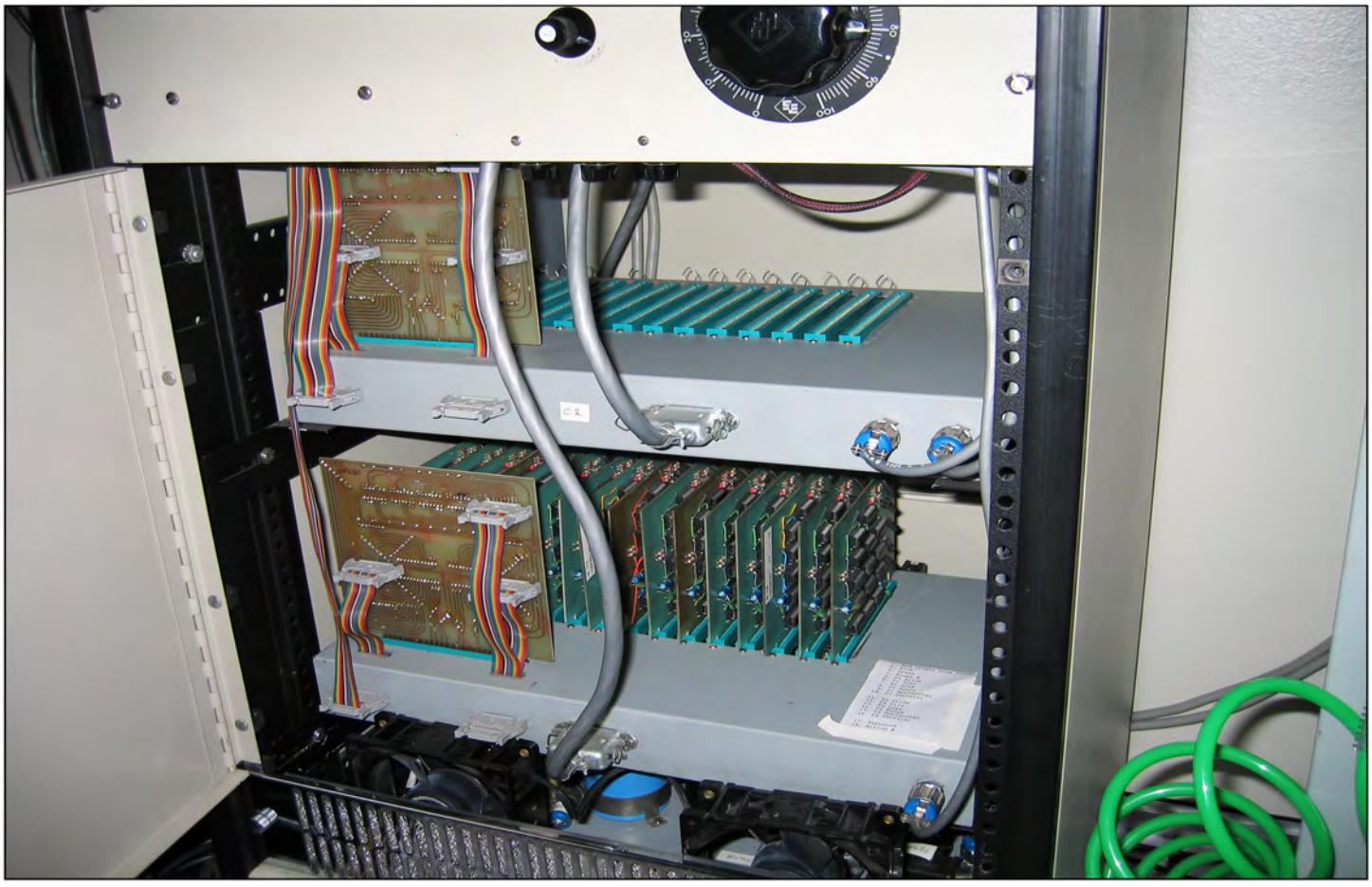




1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 3

DSC-built CAMI computerized optical printer for slide duplicating and optical effects (two image planes).



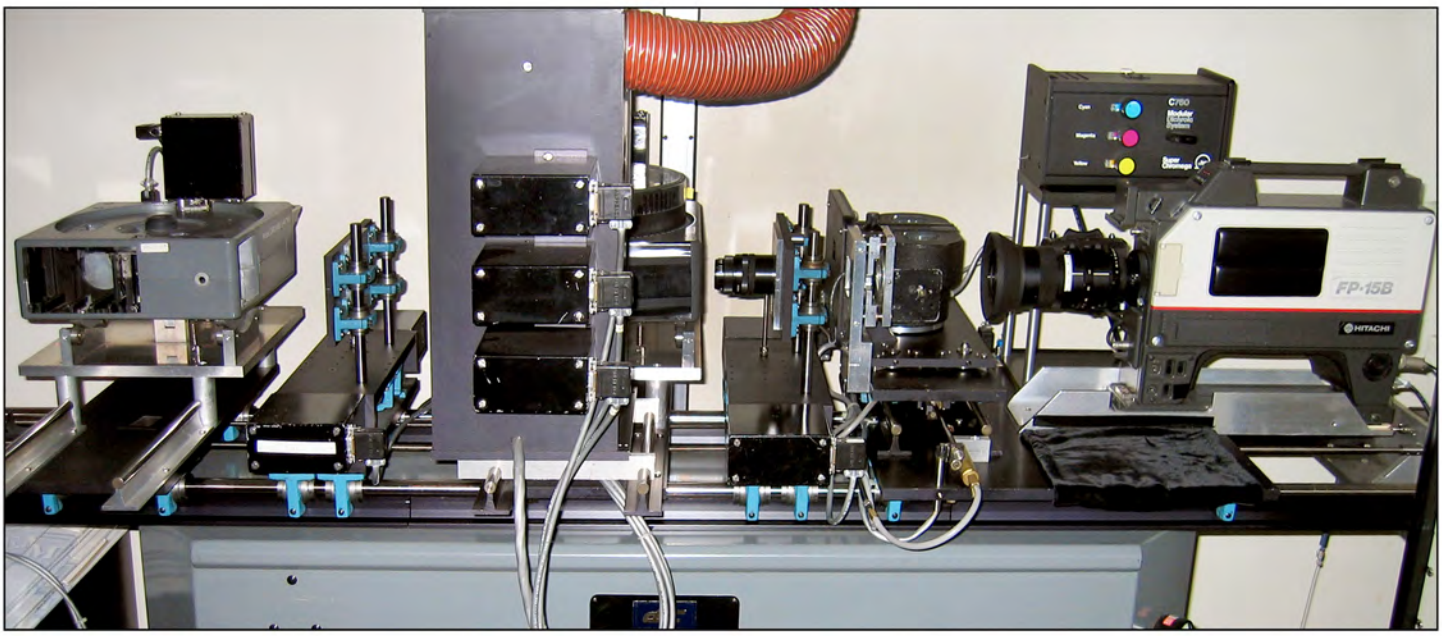


1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 4

Above: Camette 35 optical slide duplicator | Below: electronics chassis with motor-control cards for CAMI.

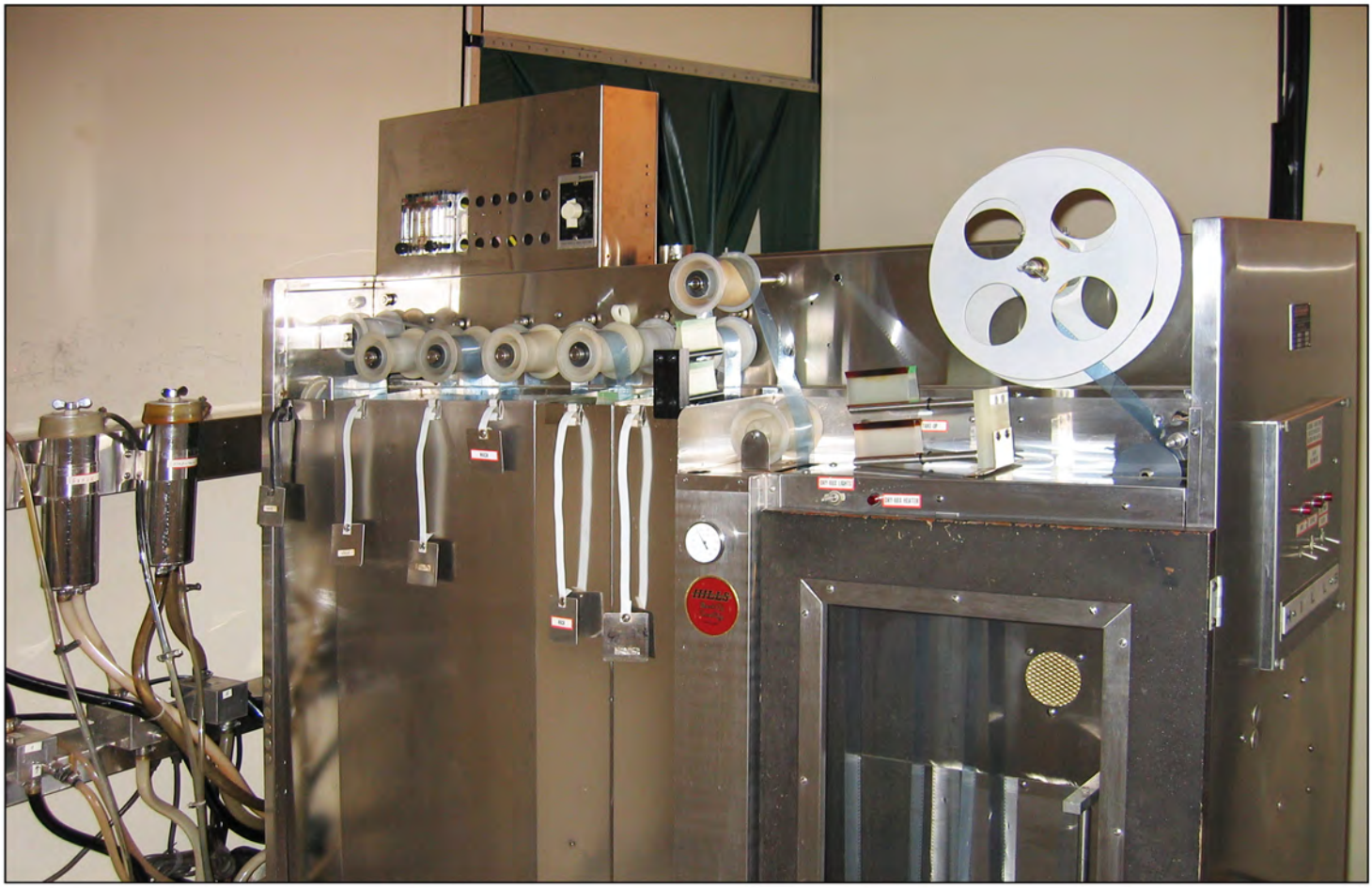


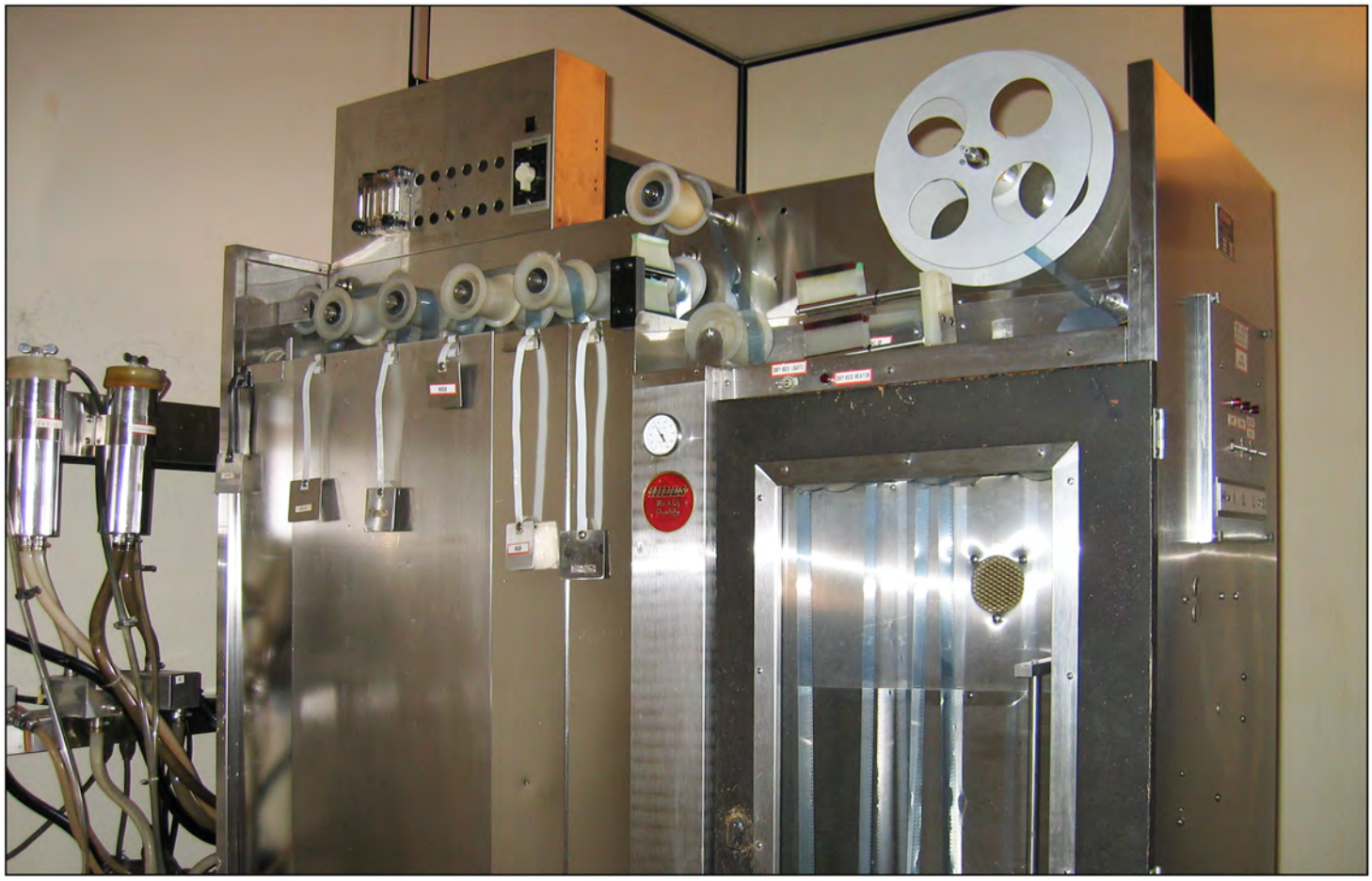




1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 5

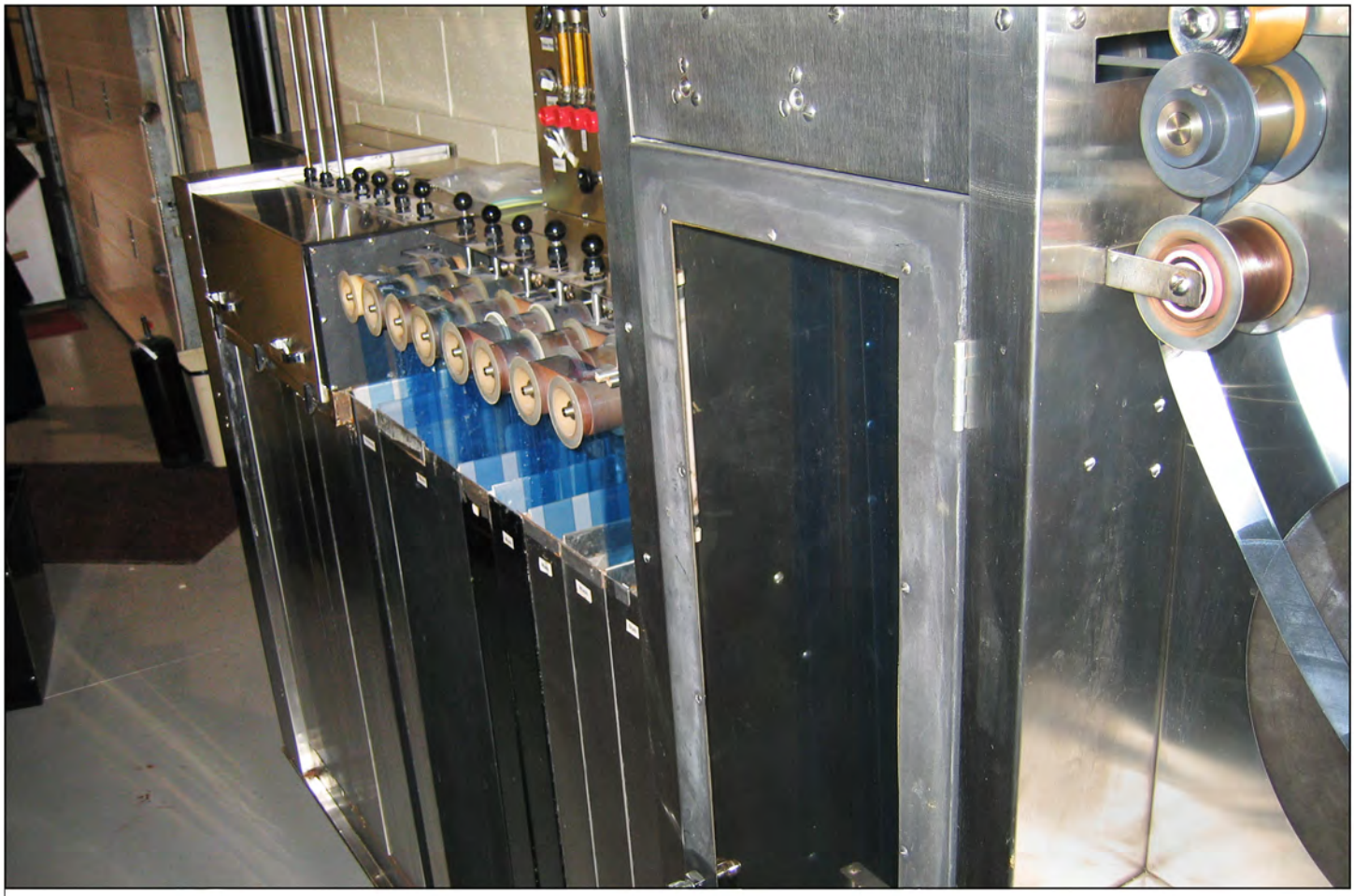
Top: Solitaire *high-resolution computer graphics film recorder & 70mm cameras | Below: CAMI optical printer.*





1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 6

Above: Color processor | Below: 70mm black-and-white processor.





1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 7

Above: 70mm Processor | Below: Color negative processor.

This grid is now incorporated in camera reticles and is available as an option on most stand-type cameras, either with a new unit or as a retrofit. It is also available in layout pads and as a slide for large-screen projector alignment. The grid is also being used in storyboard sheets and similar planning and documentation aids.

Why were the video and film fields included in the grid?

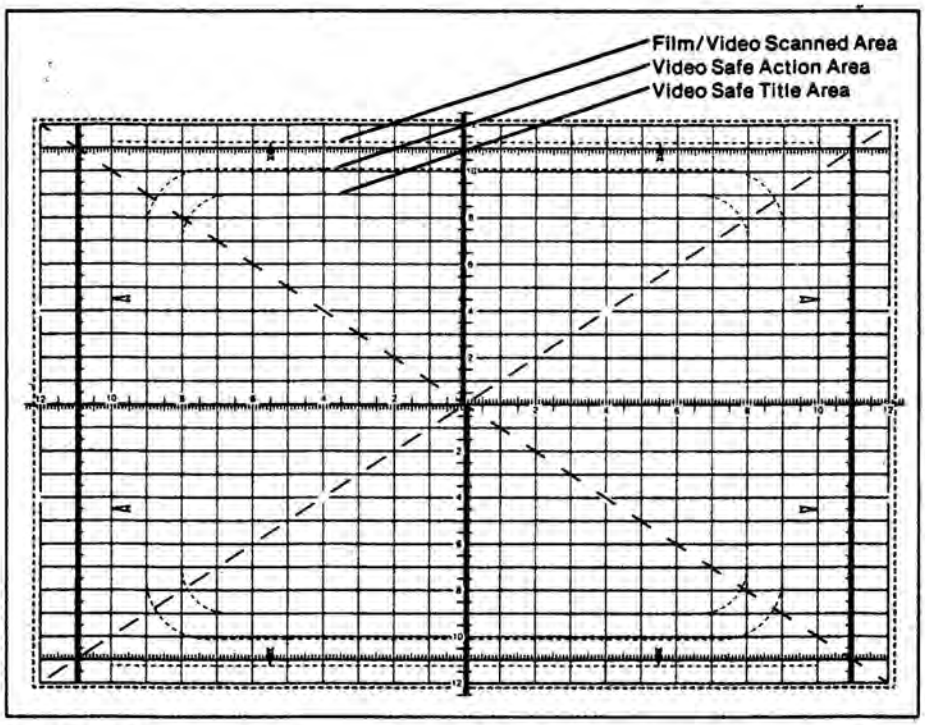
In recognition of the increasing importance of video and film, both as growing alternative methods of distribution for existing shows and as a discrete market for multi-image production, this 12-field grid incorporates television-scanned, safe-action and safe-title areas. Details are noted on the drawings of this pattern.

Why was a 12-field grid chosen?

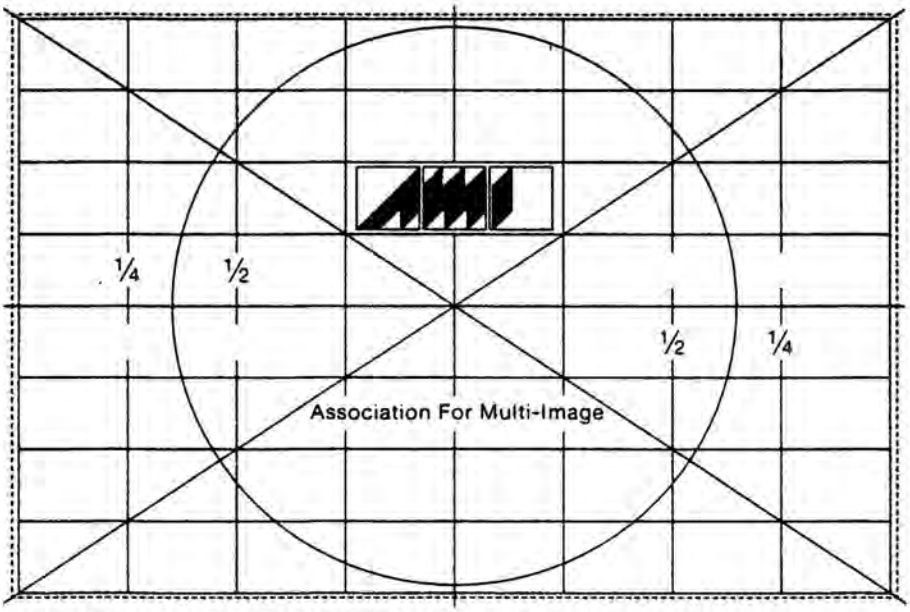
This type of grid has been commonly used for animation and similar work for many years. The 24 horizontal and vertical fields allow division into halves, thirds, quarters, sixths, eights or twelfths on field lines; the further subdivision of each field into tenths allows for precise positioning of pictures and graphic elements. The grid is also very useful in testing keystoning and may be used to critically adjust projection systems; this factor has acquired added importance with the advent of the PC lens.

What is the Alignment Grid and what is it used for?

The Alignment Grid is used for the alignment of small-screen shows. It is a combination of the previous version of the AMI alignment slide and a simplified version of the camera grid. It has lines at the quarter- and half-screen points. It may be used for the alignment of popular panorama and single-screen formats and for a limited test of keystoning. The full-length lines aid in the achievement of optimum projector alignment in critical image areas; for example, the crossover from one projector image to the next in a panorama. The extension of these lines also satisfies the common sentiment expressed by the members of the Technical Standards Committee that the Perspective Control (PC) lenses have radically altered the process of projector alignment, with the result that it is now possible to obtain extremely accurate alignment under very adverse conditions. However, to realize the full potential of this new equipment, the alignment grid must provide an increased amount of information, as does this pattern.



The AMI Grid System answers the pressing need of the multi-image industry for a solution to registration, alignment and interchangeability problems.



The revised AMI alignment grid for small-screen shows.

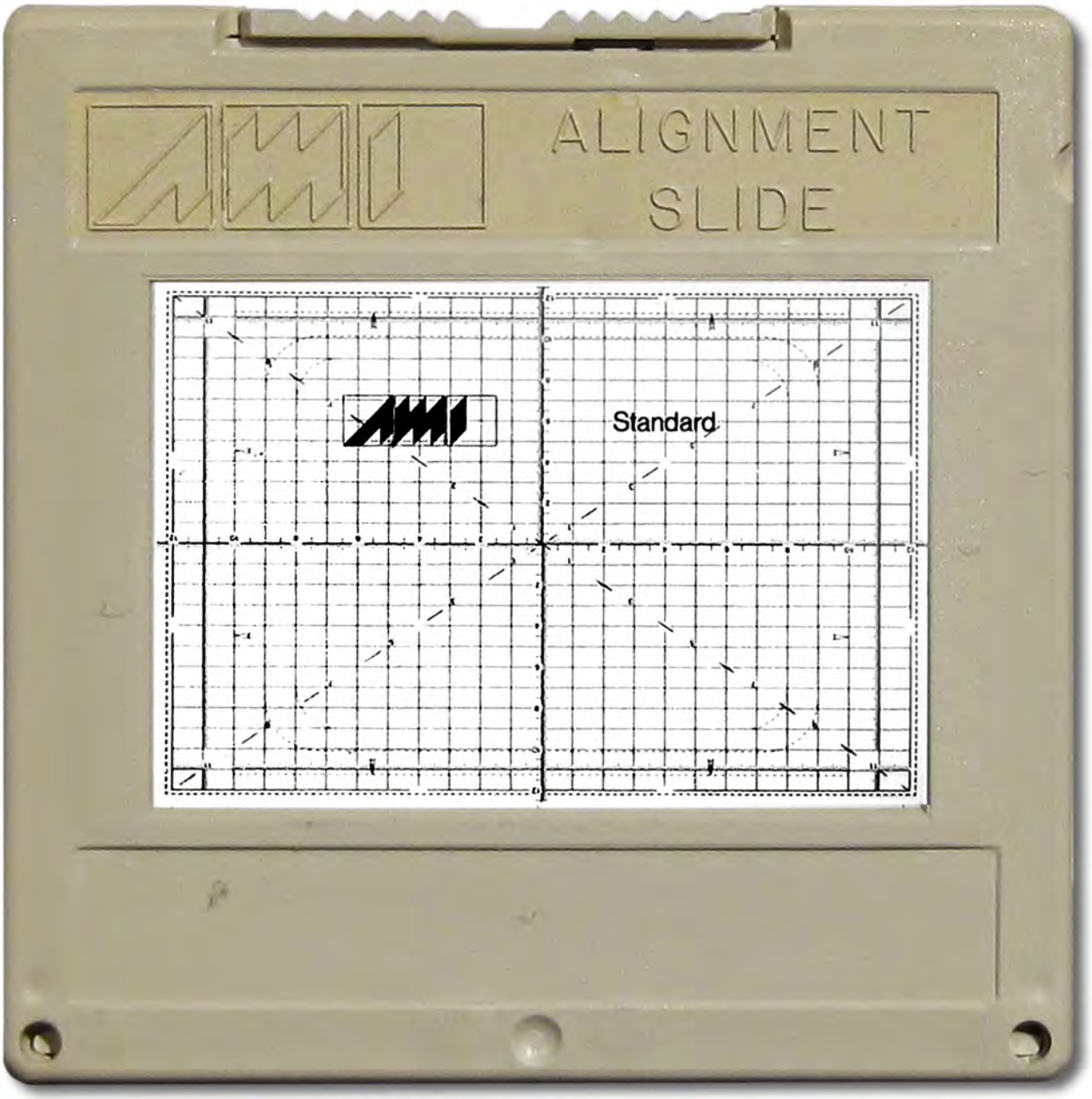
Why was width-to-height ratio of 3:2 chosen?

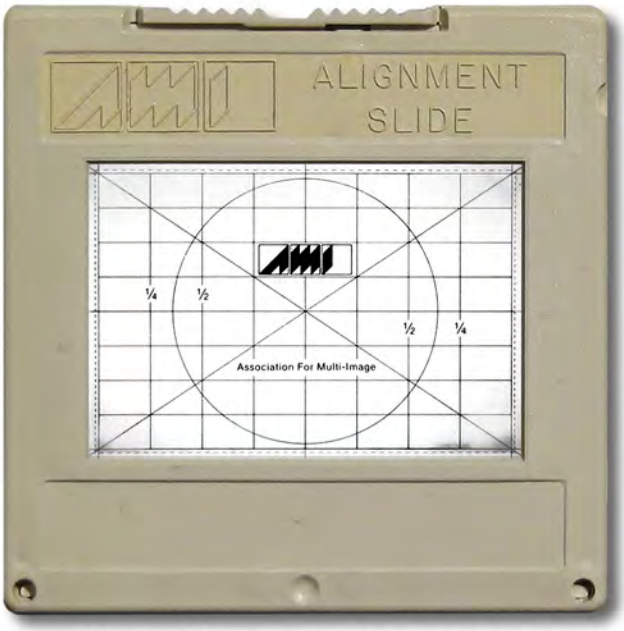
This ratio was chosen to simplify the accurate usage of the grid system. It controls the geometry of the screen and image areas and allows different projection configurations to be utilized with accuracy and flexibility.

Why was the width of 34.26mm selected?

There were a number of factors that led to the Technical Standards Committee's decision to fix the grid's width at 34.26mm, and many hours were spent discussing this subject at a number of Committee meetings.

Association for Multi-Image (AMI) alignment grids.







1970s-1980s | D & S Corley Laboratories Portfolio | Plate Nº 9

Association for Multi-Image (AMI) alignment slides

DSC FUZZIES MINI CHART #1

Fuzzies™

Introduction

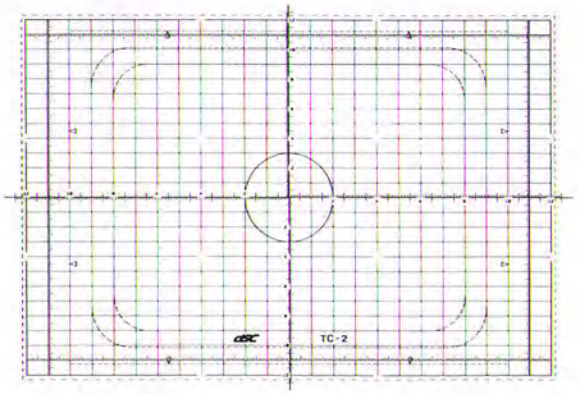
Big, bright images with invisible joins were the aim of DSC Laboratories in developing the first successful soft-edged masks. Since the debut of "Fuzzies" at NAVA in 1976, DSC has researched and expanded its soft-edged mask system to allow the creation of thousands of different dissolve, wipe, montage and window effects.

The fact that Fuzzies were first does not make them the best – the following features do!

- **PERFECT DISSOLVES BETWEEN IMAGES**
  – even on blue skies. Shot and measured with micron accuracy under direct computer control, Fuzzies feature DSC's exclusive minimum error gradient, making them very forgiving of projector mis- alignment.
- **CHOICE OF DISSOLVE WIDTHS**
  Only Fuzzies are available in five different crossovers, from extra-short to extra-long, specified in grid fields.
- **UNIQUE FUZZIES FILM STOCK**
  Fuzzies are produced on thin, high stability film, manufactured to DSC specifications. Advantages include added dimensional stability, resistance to damage, and an ideal gamma curve.
- **EASILY BI-PACKED**
  Thin Estar film lets you combine 2 or 3 Fuzzies for fabulous effects. The use of two Fuzzies with the same slide allows the creation of elaborate dissolves, montages, rotary wipes, etc.
- **LARGEST SELECTION**
  Over 300 stock Fuzzies – verticals, horizontals, diagonals and shapes; custom masks to your specifications are also available.
- **LOW MINIMUM DENSITY**
  Fuzzies low minimum density and clear base let your slides keep their sparkle, even when masks are bi-packed.
- **HIGH MAXIMUM DENSITY**
  Up to five stops darker in the blacks than other soft-edges – Fuzzies never make slides look muddy.
- **COMPETITIVELY PRICED**
  Fuzzies are economical.
- **PROMPT DELIVERY**
  With over 200,000 Fuzzies in stock, plus 40,000 masks per day production capacity, DSC offers one to three day delivery to major cities round the world.
- **CREATIVE POTENTIAL**
  DSC offers not only the largest selection of masks, but an entire creative masking system based on the standard AV grid. This scientific approach permits use of the same masks for single and multi-screen presentations. The limitless number of combinations allows every user to project a distinctive style.
- **STARTER SETS**
  Starter sets include many of the most popular masks as well as TC-2 precision alignment grids. These sets introduce multi-image producers to the enormous potential of the Fuzzies soft-edged mask system, and are also a very economical way of buying frequently used masks.
- **AND FINALLY...**

Soft-Edged Mask System

Fuzzies are keyed to the International Grid Standard



TC-2, the DSC multi-media grid, conforms to standards of the Society of Motion Picture and Television Engineers, the Association for Multi-Image, and the American National Standards Institute. This grid incorporates both 2:3 and 3:4 ratios and is invaluable when used in all stages of production from conception (layout grids) to projection (35mm alignment slides).

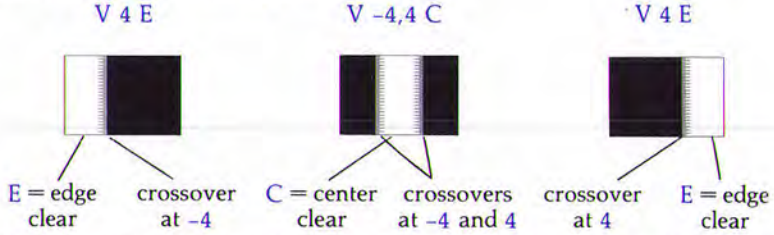
The Fuzzies masking system is designed around the TC-2 grid, identification coding being based on field positions of crossovers.

Fuzzies Coding System

Fuzzies fall into one of the following groups:

STRAIGHT EDGES	and	SHAPES
V – Vertical join		C – Circles
H – Horizontal join		O – Ovals
DR – Diagonal join		R – Rectangles
		S – Squares

All Fuzzies are identified first by group, then by a number and letter code. For example, a single screen 3-part wipe requires:



The letter "V" indicates that the masks are vertical soft-edges; the numbers refer to the TC-2 grid fields on which the centers of the crossovers fall.

All edge Fuzzies are coded in this manner; shaped Fuzzies are coded according to their size and center point.

Precisely specifying the crossover position and gradient width in grid field positions encourages the mixing and matching of masks to create thousands of different and exciting effects. Tightly controlled production ensures that masks purchased today will work with compatible masks purchased in the future.

DSC products are covered by one or more of the following p

– General Information

Gradient Widths

Fuzzies are available in five dissolve widths. While masks with a long or medium crossover provide a gradual blending of one image into another, masks with a short or extra-short crossover provide a more abrupt transition. Generally, masks with longer crossovers are more suited to panoramas and single images, while shorter crossovers are ideal when two or more images are to be combined within a small screen area.

Each crossover gradient width is precisely specified in terms of grid fields. Using a vertical 1/2 screen (V Ø) masks as an example, it can be seen that a V Ø XS completes the light to dark transition in the area between -1 and 1 on the grid (1/12 of the total screen width). In a V Ø S the crossover occurs between -2 and 2, V Ø M between -3 and 3, V Ø L between -4 and 4, and V Ø XL, between -5 and 5.



The Mini Wall Charts

- AS A PRODUCTION AID – Use the wallcharts and DSC grid sheets to streamline production on both single and multi-screen shows.
- FUZZIES CODING SYSTEM – Each Fuzzie soft-edged mask is identified by a descriptive code. These codes will help you both in production and when ordering Fuzzies.
- ILLUSTRATIONS – In the interests of accuracy, all Fuzzies illustrations are technical drawings rather than photographs; soft-edges are shown as alternate long and short lines, the tips of the short lines indicating the exact center of the crossover.
- SOME SUGGESTIONS FOR SINGLE AND MULTI-SCREEN – Illustrations showing the masks needed to achieve some simple single and multi-screen effects are given in miniature. A few effects are presented – literally thousands more are possible! Please call for advice or additional information about the Fuzzies system.

Other products from DSC Laboratories

- TC-2 35mm precision alignment grids
- TC-2 grid layout sheets, in single and multi-screen formats
- Acrylic peg boards — for layout and registration under slide/video cameras
- Windows Hard-Edged Masks — every Fuzzies pattern is available as a hard-edge too!
- Fuzzie Filers — interlocking organizer drawers for mask storage
- Gallery Dropped-Shadow Masks
- Hicon-pix Pixel and Pixette Mini-Pixel Masks

For further information on the use of Fuzzies masks and other DSC products, please contact your nearest DSC Dealer or:

DSC Laboratories
3565 Nashua Drive, Mississauga
Ontario, Canada L4V 1R1
Tel: (905) 673-3211
Fax: (905) 673-0929

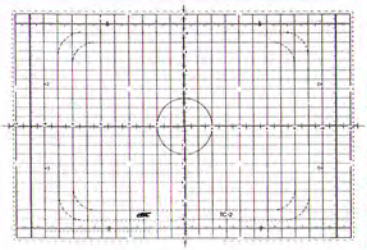
nts: US3482915, 3552288, 3572943, CDN904639 — other patents pending. © 1987 DSC Laboratories Printed in Canada

DSC ALIGNMENT MINI CHART #9

Alignment Materials

TC-2 Grid

for art layout and projector alignment



The TC-2 features:

- 12 field grid—20 subdivisions per field for greatest accuracy
- indicated 4:3 video ratio
- Field 10—scanned area (SMPTE RP 27.3)
- Field 9—video safe action
- Field 8—video and television safe title (corner radii 50% of SMPTE RP 27.3)
- circle for quick centering

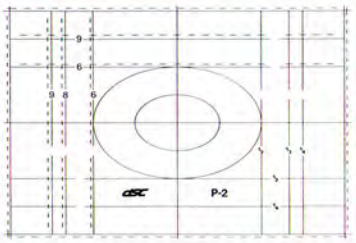
Designed to provide fast and accurate alignment in multi-image, all DSC alignment products conform to SMPTE, ANSI and AMI standards. Choose between two precision grid patterns for projector alignment, the TC-2 or the P-2.

Both patterns feature:

- exact 3:2 slide ratio
- Field 12—ANSI standard slide aperture (34.26mm)
- Field 9—25% overlap panorama (34.26mm format)
- Field 8—33% overlap panorama (34.26mm format)
- Field 6—50% overlap panorama (34.26mm format)
- broken line—Wess #2 aperture (34.8mm)

P-2 Grid

for projector alignment



The P-2 features:

- 12 field grid—simplified design
- Field 9—25% overlap panorama (34.8mm format)
- Field 8—33% overlap panorama (34.8mm format)
- Field 6—50% overlap panorama (34.8mm format)
- 3:2 ovals for quick centering

The TC-2 Grid

An invaluable 12 field multi-media pattern based on the ANSI standard slide aperture and SMPTE recommended practice RP 27.3 (television safe title and scanned area), the TC-2 incorporates both 3:2 (35mm slide) and 4:3 (video, television) ratios.

With dimensions conforming to the Association for Multi-Image standard reticle, use of the grid assures precise positioning and framing of images, and facilitates communications between client and all members of the production team, from artist to staging technician. The TC-2 is available in two formats, art layout sheets and 35mm slide.





Layout Grid Sheets

- Lay out titles and art for slides, video and film
- Perfect centering at a glance
- Use on a lightbox or with overhead lighting
- "Fade-out" blue grid lines invisible to most repro films
- 50 8" x 12" or double 4" x 6" (panorama) grids per package
- Use in conjunction with TC-2 or P-2 projector alignment slide

35mm Grids

- Projector alignment for single and multi-screen formats
- Evaluate video cut-off
- Check centering and level of titles and art
- Alignment of video or film transfer equipment
- Width tolerance +/−.02mm, level tolerance +/−.01mm

The P-2 Grid

While conforming to SMPTE, ANSI and AMI standards (34.26mm mount aperture) the P-2 grid can also be used to align panoramas to the slightly larger 34.8mm (butted Wess #2) configurations. The P-2 grid is available individually (black lines on clear), or in "Pro-Align" sets of 10 slides.

P-2 Pro-Align Grid System

In theory, perfect alignment should be attainable by using accurate, uniform grids in single mold, pinned mounts. But in practice, irregularities in the mount, variations in the glass and placement of the film chip, often sabotage alignment.

Pro-Align is a unique neg-pos projector alignment system that enables users to achieve perfect projector set-up—every time.

Each Pro-Align Grid Set contains:

- 5 positive P-2 grids (black lines on clear)
- 5 negative P-2 grids (clear lines on black)
- Grids precision cut and pinned into selected mounts
- Grid slides tested and matched into sets by skilled technicians using a computer-driven optical bench, and clearly identified with series number
- Complete instructions for use

Benefits of the Pro-Align System include:

- Precise matched grid sets guarantee perfect alignment used as directed
- Superimposition of positive and negative images provi greater accuracy and reduces eyestrain
- Use in single or multi-screen format, for 3 and 6, or 9 projector set-up—extra matched sets available for 18 projectors or more
- Match either neg to pos or pos to neg—always begin aligning with the grid in center position

DSC manufactures an extensive range of multi-image masking products, including Fuzzies Soft-Edges (35 an 46mm), Windows Hard-Edges, Gallery Dropped-Shade and Pix-it Pixel masks. For further information on thes products, and on the use of DSC alignment materials please contact your nearest distributor or;

DSC Laboratories
3565 Nashua Drive, Mississauga
Ontario, Canada L4V 1R1
Tel: (905) 673-3211
Fax: (905) 673-0929

DSC products are covered by one or more of the following patents: US3482915, 3552288, 3572943, CDN904639—other patents pending.

Printed i

DSC WINDOWS MINI CHART # 6

WINDOWS™ Hard-Edged Mask System

General Information

Use Windows Hard-Edged Masks for countless multi-image effects, on single or multiple screens.

Masking at the focal plane, Windows give your images a clean, professional look.

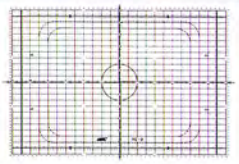
Windows are produced on a thin Estar-based film; brighter images and easier mounting are the result.

All Windows are available as soft-edged masks. Every effect shown on the Fuzzies mini charts (#2-5) can also be done with Windows.

Windows are identified by the suffix "W"; their coding is based on the same simple system as Fuzzies (see DSC mini chart #1). All masks are referenced to the AMI Standard Grid.

Maintain consistent narrow black lines between images with Windows. Line width between complementary masks equals 1/120th of the screen width (two increments on the horizontal axis of the TC-2 grid).

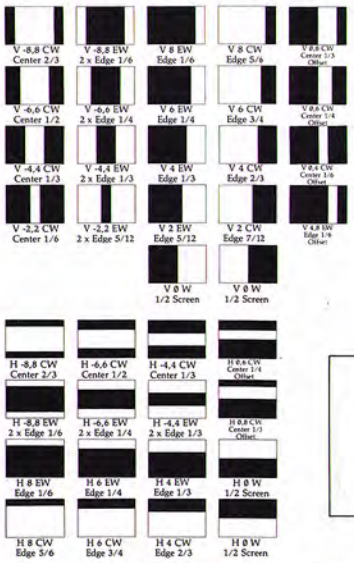
Full frame masks are used for hard-edged effects on multiple screens.

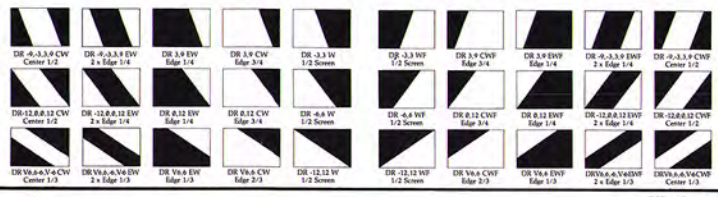


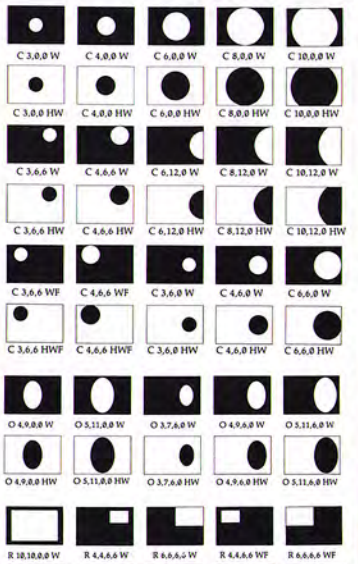
V -12,12 CW
Vertical-edge fullframe mask for panorama formats

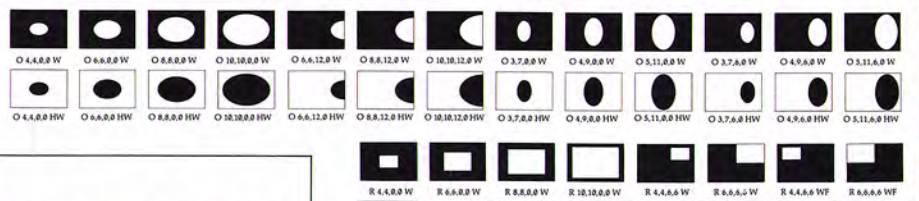
H -12,12 CW
Horizontal-edge fullframe masks for vertirama formats

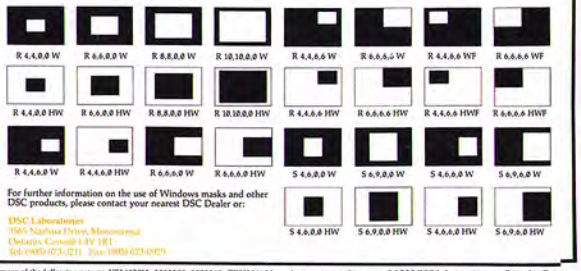
R 12,12,0,0 W
Fully masked for panorama/ vertirama formats











For further information on the use of Windows masks and other DSC products, please contact your nearest DSC Dealer or:

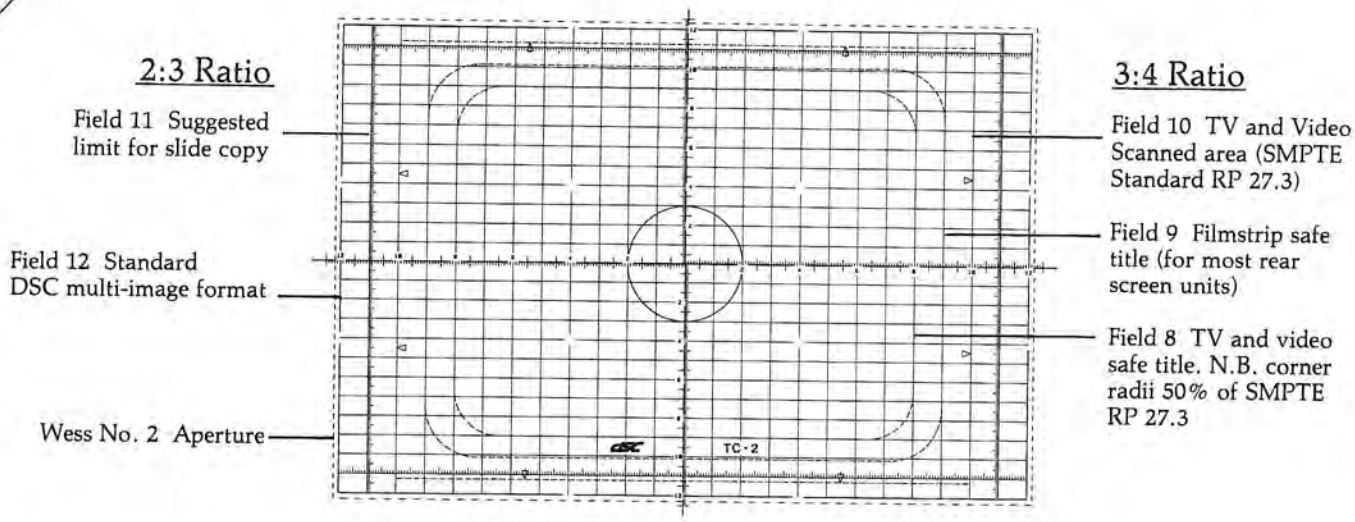
DSC Laboratories
3565 Nashua Drive, Mississauga
Ontario, Canada L4V 1R1
Tel: (905) 673-3211 Fax: (905) 673-0929

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MORE PRECISION AV PRODUCTS FROM DSC LABORATORIES

THE TC-2 STANDARD GRID

All dimensions conform to Association for Multi Image Standard 1-84



An invaluable multi-media pattern based on SMPTE recommended practice RP27.3 (television safe title and scanned area), TC-2 incorporates both 2:3 (35mm slide) and 3:4 (film, television, filmstrip) ratios. Available in two formats, 35mm slide and art layout sheets.

Use of the grid not only assures precision positioning and framing of images, but also facilitates communication between client and all members of the production team, from artist to staging technician.

LAYOUT GRIDS



- Layout titles for slides, film, video and filmstrips
- Perfect centering at a glance
- Saves time — reduces cost
- Use on a light-box or with overhead lighting
- Grid is invisible to orthochromatic film
- 50 8" x 12" or double 4" x 6" grids (panorama format)

35mm (2 x 2") SLIDE



- Projector alignment — single and multi screen
- Evaluation of T.V. cut-off
- Check centering of titles and products
- Precision set up of soft edged panoramas
- Alignment of film and video transfer equipment
- Available mounted or unmounted

Manufactured by DSC Laboratories, Toronto — Canada (416) 673-3211

PRINTED IN CANADA

The Makers of Fuzzies Soft Edged Masks
give you The Ultimate Edge with

WINDOWS and SHADES

Hard Edged Masks

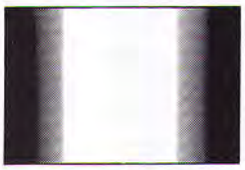
- Precision optical hard edged masks – on thin Estar-based film for stability.
- Use with Fuzzies for contrasting hard and soft effects.
- Windows mask at the focal plane for sharp, clean edges that are always in focus.
- Over 130 stock patterns.

Soft Shadow Masks

- Add the illusion of depth to your images – with Shades soft shadow masks.
- Use to frame Windows – give your hard edged pictures a lift!
- Use Shades with Fuzzies for separation of super-imposed and background images.
- Over 30 stock patterns.

- FUZZIES, WINDOWS AND SHADES ARE DESIGNED AND REFERENCED TO THE AMI STANDARD GRID – thus, compatible masks can be easily combined in both single and multi screen formats to produce thousands of new and unusual effects.
- ALL DSC MASKS ARE JUST A 'PHONE CALL AWAY – with over 500,000 masks in stock and a production capacity of 40,000 masks per day, orders placed before noon E.S.T. are shipped for delivery the next morning throughout North America (2 day delivery for overseas orders).
- USING THE BEST COSTS LESS THAN YOU MIGHT EXPECT – Fuzzies and Windows Starter Sets enable you to achieve many different effects for less than 75 cents per mask – ask about producers' and volume discounts!
- CUSTOMIZE ALL YOUR SHOWS USING DSC MASKS – call us today for wall charts and sample masks – there are over 500 Fuzzies, Windows and Shades to choose from!
- DSC MASKS FOR PICTURE-PERFECT RESULTS – FUZZIES' crossovers are computer engineered so that compatible masks always produce invisible joins. WINDOWS are made with the same meticulous precision – hard edges that always line up!
- PRECISION TC-2 ALIGNMENT GRIDS (AMI INTERNATIONAL STANDARD DIMENSIONS) – available in 35mm and grid sheet formats (both single and multi screen).

DSC Multi-Image Products Speed up Production and Reduce Costs



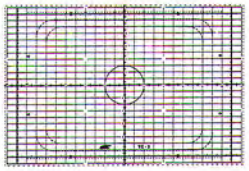
Fuzzies



WINDOWS



SHADES



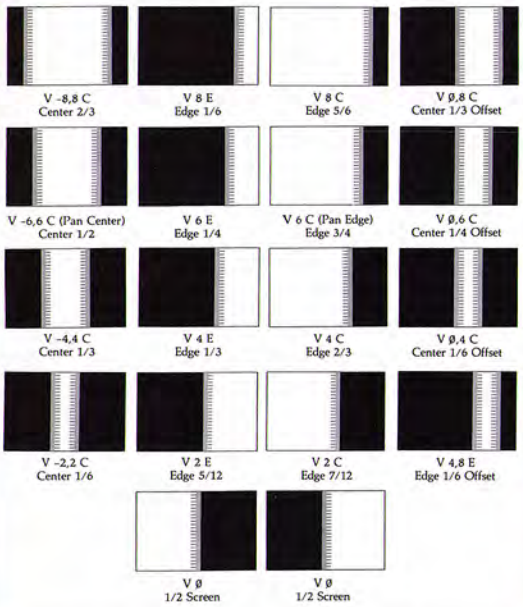
TC-2 GRIDS

For additional information and to place orders, call DSC at (416) 673-3211. Ask about our Bonus Starter Set Program – you could earn a Free Starter Set with your first order!

DSC Laboratories, 3610 Nashua Drive, Mississauga, Ontario L4V 1L2 Phone (416) 673-3211 Telex 06-983635

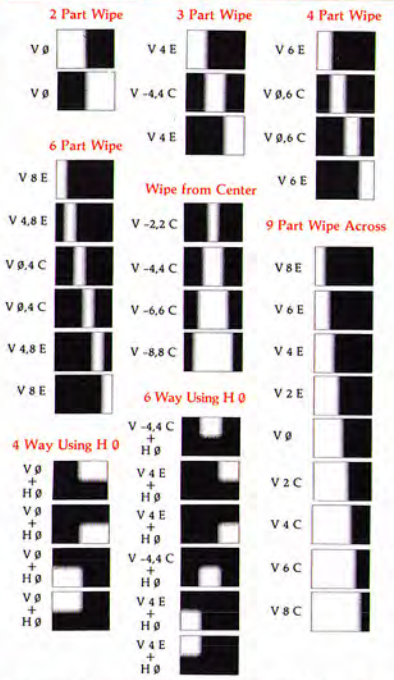
DSC FUZZIES MINI CHART # 2

Fuzzies™ Soft-Edged Mask System – Verticals



- To show the exact centre of crossovers, all soft-edges on the Mini Charts are technical drawings rather than photographs. Each soft-edge is shown as alternate long and short lines; the tips of the short lines indicate the centre of the crossover.
- All Fuzzies are designed and named with reference to the Association for Multi-Image International Standard Grid, but can be used successfully with other grid systems.
- Fuzzies soft-edges are available in five crossover widths. Available gradient widths are (XL) Extra-Long, (L) Long, (M) Medium, (S) Short or (XS) Extra-short.

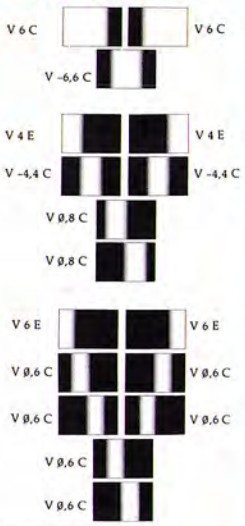
Single Screen Effects



- In general, the longer the gradient width the less visible the join will be. Shorter gradient widths are used to combine different images with less blending.

Multi-Screen Effects

50% Overlap Panorama Format



*Panorama may be extended to additional screens

- Fuzzies are produced on a thin Estar-based film made to DSC specifications. Ideally suited for soft-edged masks, it is very stable and bi-packs easily.

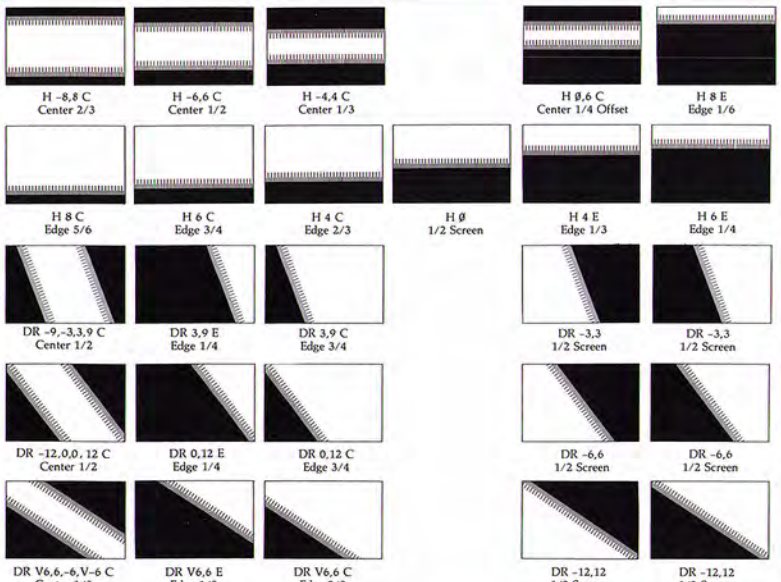
For further information on the use of Fuzzies masks and other DSC products, please contact your nearest DSC Dealer or:

DSC Laboratories
3565 Nashua Drive, Mississauga
Ontario, Canada L4V 1R1
Tel: (905) 673-3211
Fax: (905) 673-0929

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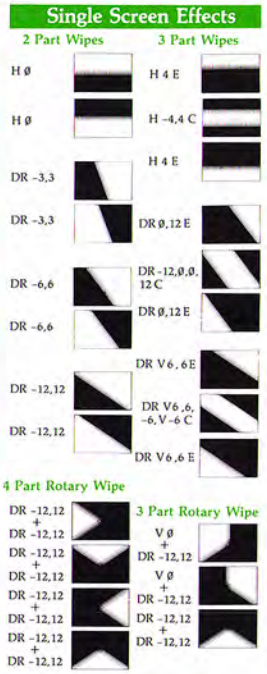
DSC FUZZIES MINI CHART # 3

Fuzzies™ Soft-Edged Mask System – Horizontals and Diagonals



- Combine different masks for exciting results – zooms, wipes, and other effects may be easily designed using two masks per slide.
- All Fuzzies patterns are available in a variety of crossover widths.
- When ordering Fuzzies, please indicate crossover width required by use of a suffix:
  XS (Extra Short) 1/12 screen wide, S (Short) 2/12 screen wide,
  M (Medium) 3/12 screen wide, L (Long) 4/12 screen wide,
  XL (Extra Long) 5/12 screen wide.
- Over 300 different stock Fuzzies are now available. DSC masks enable producers to create an almost limitless number of exciting effects in single and multi-screen formats.
- Fuzzies are inexpensive! They provide a cost effective method of enhancing your productions.
- Because of Fuzzies higher maximum and lower minimum densities, slides retain their original sparkle and contrast.

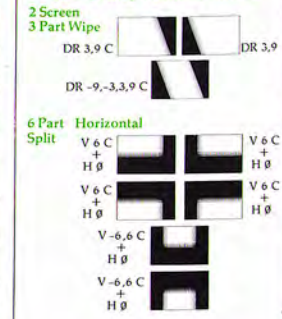
Single Screen Effects



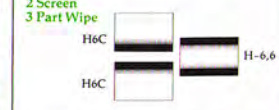
- DSC manufactures a wide range of precision AV products including TC-2 alignment grids and grid sheets, Windows Hard-Edged Masks and Gallery Dropped-Shadow Masks.

Multi-Screen Effects

50% Overlap Panorama Format*



50% Overlap Stacked Screens



*Format may be extended to additional screens

- DSC offers next day delivery to major cities in the United States.
- Call today with your custom masking requirements, in 35 and 46mm.

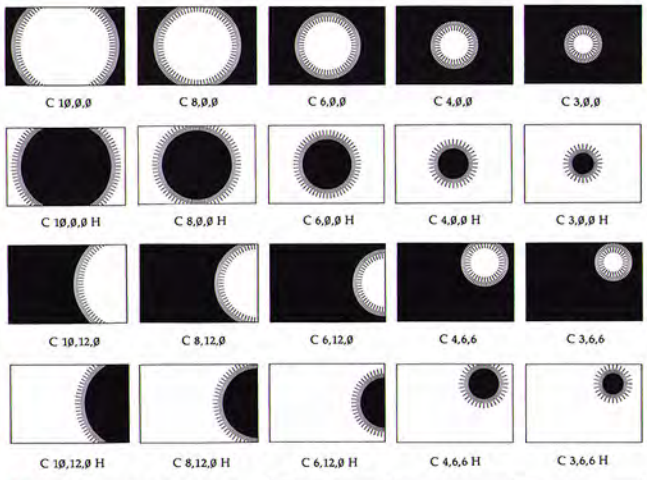
For further information on the use of Fuzzies masks and other DSC products, please contact your nearest DSC Dealer or:

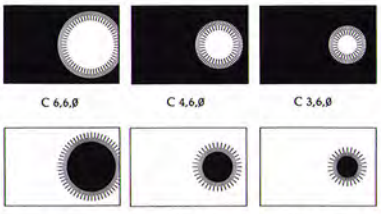
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Ontario, Canada L4V 1R1
Tel: (905) 673-3211
Fax: (905) 673-0929

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DSC FUZZIES MINI CHART # 4

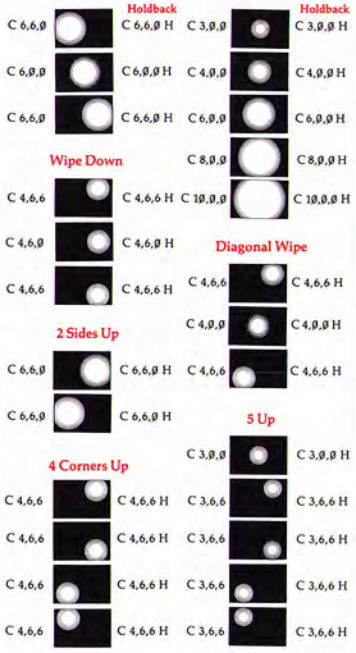
Fuzzies™ Soft-Edged Mask System – Circles





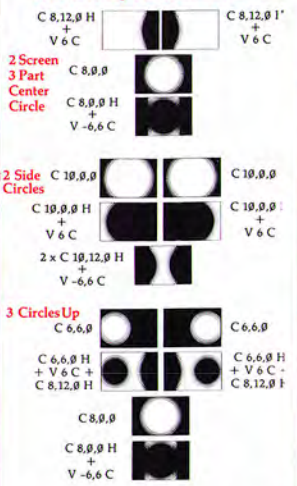
- Fuzzies are produced on a thin Estar-based film made to DSC specifications. Ideally suited for soft-edged masks, it is stable and bi-packs easily.
- All Fuzzies are designed and named with reference to the Association for Multi-Image International Standard Grid, but can be used successfully with other grid systems.
- Use Fuzzies to connect images and ideas for more effective multi-image presentations.
- To show the exact centre of crossovers, all soft-edges on the Mini Charts are technical drawings rather than photographs. Each soft-edge is shown as alternate long and short lines; the tips of the short lines indicate the centre of the crossover.

Single Screen Effects



- New products are constantly under development. Call your DSC dealer if the masks you need are not shown on the charts.

Multi-Screen Effects



- Combine different masks for exciting results — zooms, wipes, and other effects may be easily designed using two masks per slide.

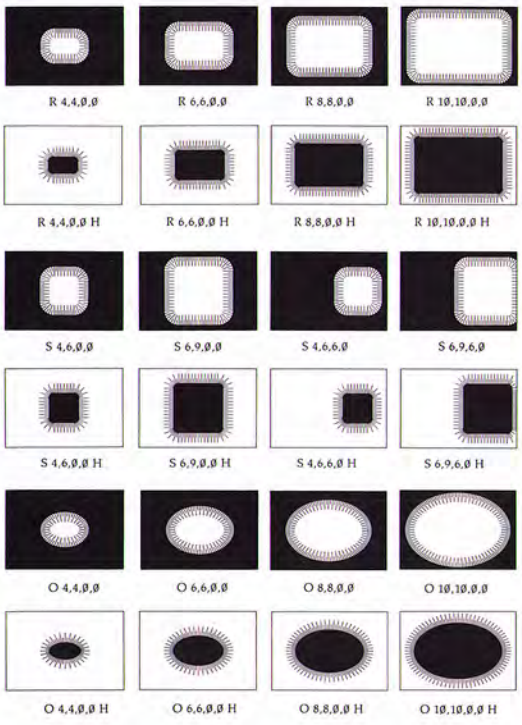
For further information on the use of Fuzzies masks and other DSC products, please contact your nearest DSC Dealer or:

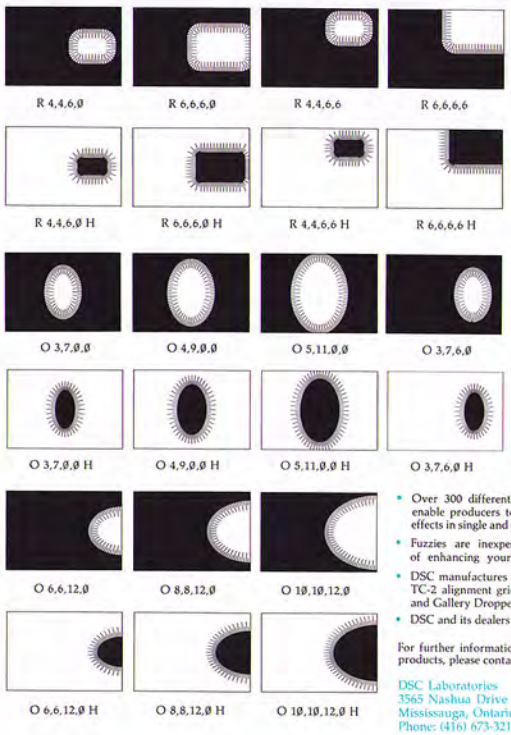
DSC Laboratories
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Ontario, Canada L4V 1R1
Tel: (905) 673-3211
Fax: (905) 673-0929

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DSC FUZZIES MINI CHART # 5

Fuzzies™ Soft-Edged Mask System – Shapes





- To show the exact centre of crossovers, all soft-edges on the Mini Charts are technical drawings rather than photographs. Each soft-edge is shown as alternate long and short lines; the tips of the short lines indicate the centre of the crossover.
- All Fuzzies are designed and named with reference to the Association for Multi-Image International Standard Grid, but can be used successfully with other grid systems.
- Use Fuzzies to connect images and ideas for more effective multi-image presentations.
- Custom soft-edged masks can be made to order. Call us to discuss your special requirements.
- Over 300 different stock Fuzzies are now available. DSC masks enable producers to create an almost limitless number of exciting effects in single and multi-screen formats.
- Fuzzies are inexpensive! They provide a cost effective method of enhancing your productions.
- DSC manufactures a wide range of precision AV products including TC-2 alignment grids and grid sheets, Windows Hard-Edged Masks and Gallery Dropped-Shadow Masks.
- DSC and its dealers offer next day delivery to major US cities.

For further information on the use of Fuzzies masks and other DSC products, please contact your nearest DSC Dealer or:

DSC Laboratories
3565 Nashua Drive
Mississauga, Ontario, Canada L4V 1R1
Phone: (416) 673-3211 Fax: (416) 673-0929

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DSC FUZZIES MINI CHART #14

Fuzzies™ Soft-Edged Mask System - 70mm

General Information

- The extraordinary quality of 70mm images, and increased availability of production hardware and software, are making 70mm a viable option for all kinds of AV presentations - and all kinds of budgets. Use 70mm panorama masks for projecting spectacular widescreen images. 70mm shape masks are terrific for adding variety and interest to single screen shows.
- To show the exact center of crossovers, all soft-edges on this Minichart are shown as technical drawings rather than photographs. Each soft-edge consists of alternating long and short lines: the tips of the short lines indicate the centre of the crossover.
- Fuzzies 70mm panorama masks have an extra-long crossover. Extra-long crossovers provide a gradual blending of one image into another, and are very forgiving of projector mis-alignment. Fuzzies 70mm shape masks have a short crossover. Short crossovers provide a more abrupt transition, making masks with short crossovers ideal for montaging images.

50% Overlap Panorama Masks


V -6,6 C


V 6 C


H -6,6 C


H 6 C


Circle

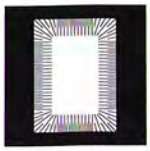

4:3 Oval


3:4 Oval


Square


4:3 Video Box

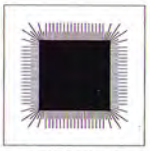

3:2 Rectangle

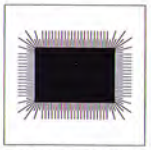

2:3 Rectangle

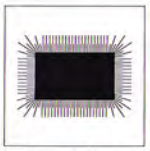

Circle Holdback

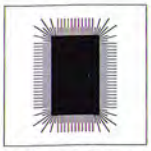

4:3 Oval Holdback


3:4 Oval Holdback


Square Holdback


4:3 Video Box Holdback


3:2 Rectangle Holdback


2:3 Rectangle Holdback

- Because of Fuzzies higher maximum and lower minimum densities, slides sandwiched with Fuzzies retain their original sparkle and contrast.
- Use Fuzzies to connect images and ideas for more effective multi-image presentations.
- If you can't find the Fuzzies mask pattern you need, call DSC. We manufacture special order masks - in 35, 46 and 70mm formats - cost effectively and quickly.

- DSC Laboratories manufactures the world's largest selection of precision 35mm film masks for multi-image, including Gallery Dropped-Shadow Masks, Windows Hard-Edged Masks, Pix-it and Pixette Pixellation Masks, and TC-2 and P-2 alignment materials.

For information and immediate delivery of DSC products, please contact:

DSC Laboratories
3565 Nashua Drive,
Mississauga, Ontario, Canada L4V 1R1
Tel: (416) 673-3211 Fax: (416) 673-0929

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DSC GALLERY MINI CHART #7

Gallery™ Dropped-Shadow Series

This series of masks is designed to give a sophisticated look to all your slide presentations. Use Gallery masks to highlight individual images and builds with a three-dimensional appearance.

Gallery masks are identified by a simple alpha-numeric code. A letter signifying the shape (R for rectangle, S for square, etc.) is followed by a four number sequence, giving the position and size of the aperture or holdback relative to coordinates of the AMI International Standard Grid.

The first and second numbers represent a mask's position on the x axis (left to right). Numbers to the left of center are negative (−), numbers to the right of center positive (+). The third and fourth numbers represent a mask's position on the y axis (top to bottom). Numbers below the center are negative, numbers above the center positive. The letter H is used to indicate holdback shadow masks.

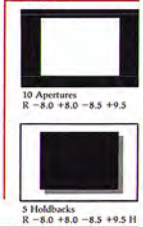
Set 1



10 Apertures
R −9.0 +9.0 −8.5 +9.5

5 Holdbacks
R −9.0 +9.0 −8.5 +9.5 H

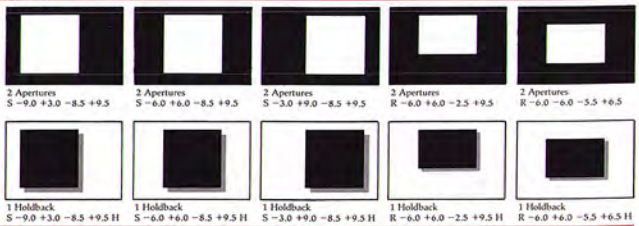
Set 2



10 Apertures
R −8.0 +8.0 −8.5 +9.5

5 Holdbacks
R −8.0 +8.0 −8.5 +9.5 H

Set 3



2 Apertures
S −9.0 +3.0 −8.5 +9.5

2 Apertures
S −6.0 +6.0 −8.5 +9.5

2 Apertures
S −3.0 +9.0 −8.5 +9.5

2 Apertures
R −6.0 +6.0 −2.5 +9.5

2 Apertures
R −6.0 −6.0 −5.5 +6.5

1 Holdback
S −9.0 +3.0 −8.5 +9.5 H

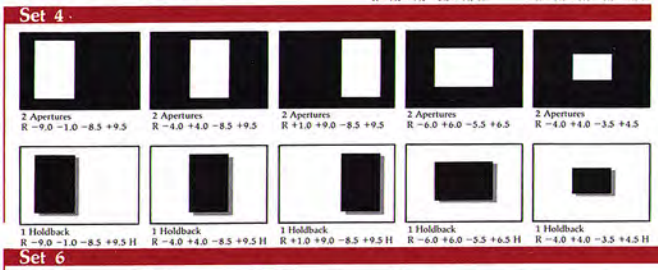
1 Holdback
S −6.0 +6.0 −8.5 +9.5 H

1 Holdback
S −3.0 +9.0 −8.5 +9.5 H

1 Holdback
R −6.0 +6.0 −2.5 +9.5 H

1 Holdback
R −6.0 +6.0 −5.5 +6.5 H

Set 4



2 Apertures
R −9.0 −1.0 −8.5 +9.5

2 Apertures
R −4.0 +4.0 −8.5 +9.5

2 Apertures
R +1.0 +9.0 −8.5 +9.5

2 Apertures
R −6.0 +6.0 −5.5 +6.5

2 Apertures
R −4.0 +4.0 −3.5 +4.5

1 Holdback
R −9.0 −1.0 −8.5 +9.5 H

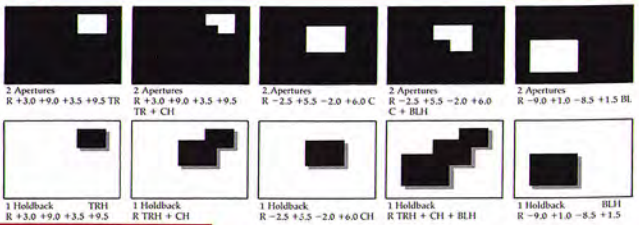
1 Holdback
R −4.0 +4.0 −8.5 +9.5 H

1 Holdback
R +1.0 +9.0 −8.5 +9.5 H

1 Holdback
R −6.0 +6.0 −5.5 +6.5 H

1 Holdback
R −4.0 +4.0 −3.5 +4.5 H

Set 5



2 Apertures
R +3.0 +9.0 +3.5 +9.5 TR

2 Apertures
R +3.0 +9.0 +3.5 +9.5 TR + CH

2 Apertures
R −2.5 +5.5 −2.0 +6.0 C

2 Apertures
R −2.5 +5.5 −2.0 +6.0 C + BLH

2 Apertures
R −9.0 +1.0 −8.5 +1.5 BL

1 Holdback TRH
R +3.0 +9.0 +3.5 +9.5

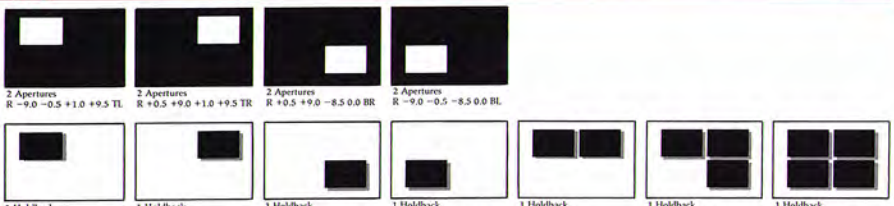
1 Holdback
R TRH + CH

1 Holdback
R −2.5 +5.5 −2.0 +6.0 CH

1 Holdback
R TRH + CH + BLH

1 Holdback BLH
R −9.0 +1.0 −8.5 +1.5

Set 6



2 Apertures
R −9.0 −0.5 +1.0 +9.5 TL

2 Apertures
R +0.5 +9.0 +1.0 +9.5 TR

2 Apertures
R +0.5 +9.0 −8.5 0.0 BR

2 Apertures
R −9.0 −0.5 −8.5 0.0 BL

1 Holdback
R −9.0 −0.5 +1.0 +9.5 TLH

1 Holdback
R +0.5 +9.0 +1.0 +9.5 TRH

1 Holdback
R +0.5 +9.0 −8.5 0.0 BRH

1 Holdback
R −9.0 −0.5 −8.5 0.0 BLH

1 Holdback
R TLH + TRH

1 Holdback
R TLH + TRH + BRH

1 Holdback
R TLH + TRH + BRH + BLH

- Each set contains 15 Gallery masks, a practical combination of hard-edged apertures and holdbacks with soft-edged dropped-shadows. Please refer to information under illustrations for quantities for each.
- All rectangles contained in these sets are perfect 2:3, 3:2, or 4:3 ratios.
- Apertures and holdbacks may be used in a myriad of different ways to produce exciting effects with a custom look.
- Gallery masks are manufactured on a thin Estar-based film for dimensional stability, and packaged in low-static material.
- Other products from DSC Laboratories include 35mm alignment grids, grid sheets for single and multi-screen, storyboard forms, soft and hard-edged masks and organizer storage drawers.
- For further information on the use of Gallery masks and other DSC products, please contact your nearest DSC Dealer or:

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Ontario, Canada L4V 1R1
Tel: (905) 673-3211
Fax: (905) 673-0929

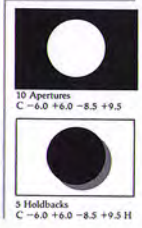
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DSC GALLERY MINICHART #11

Gallery™ Dropped-Shadow Series

- Give your slide presentations a three dimensional 'lift', with Gallery Dropped-Shadow Masks.
- Gallery masks are easy to use. Mount holdbacks with background images and apertures with foreground images in pinned slide mounts, for beautifully professional results. Use two or more projectors for attractive dropped-shadow effects.
- Each Gallery set contains 15 35mm film frames. Each set contains more apertures than holdbacks, so you can replace windowed images twice as often.
- Have fun, experiment! Try mounting both aperture and holdback masks with identical pin-registered slide duplicates for an enhanced three dimensional effect.
- All DSC masks are referenced to coordinates on the AMI Standard Grid (also DSC's TC-2 and P-2). For Gallery masks, the first and second numbers represent a mask's position on the x axis (left to right). The third and fourth numbers represent a mask's position on the y axis (bottom to top) Numerical references below and to the left of center are identified as negative (–).
- Gallery masks are produced on a thin Estar-based film for dimensional stability, and packaged in low-static, anti-scratch material.
- When cutting and mounting Gallery masks, be careful to keep the masks in the same orientation for a perfect match. Combining masks from different packages is not recommended.
- Gallery sets 1-6 (rectangles and squares) are shown on minichart #7, the chart with the burgundy border.
- Gallery masks are available individually. Contact DSC or your nearest distributor for information.

Set 7



10 Apertures
C −6.0 +6.0 −8.5 +9.5

5 Holdbacks
C −6.0 +6.0 −8.5 +9.5 H

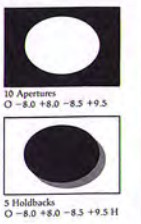
Set 8



10 Apertures
O −9.0 +9.0 −8.5 +9.5

5 Holdbacks
O −9.0 +9.0 −8.5 +9.5 H

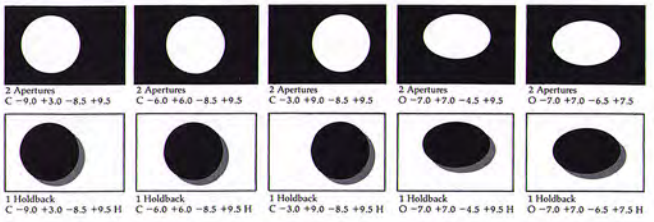
Set 9



10 Apertures
O −8.0 +8.0 −8.5 +9.5

5 Holdbacks
O −8.0 +8.0 −8.5 +9.5 H

Set 10



2 Apertures
C −9.0 +3.0 −8.5 +9.5

2 Apertures
C −6.0 +6.0 −8.5 +9.5

2 Apertures
C −3.0 +9.0 −8.5 +9.5

2 Apertures
O −7.0 +7.0 −4.5 +9.5

2 Apertures
O −7.0 +7.0 −6.5 +7.5

1 Holdback
C −9.0 +3.0 −8.5 +9.5 H

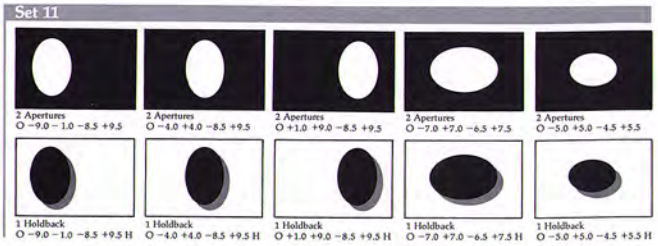
1 Holdback
C −6.0 +6.0 −8.5 +9.5 H

1 Holdback
C −3.0 +9.0 −8.5 +9.5 H

1 Holdback
O −7.0 +7.0 −4.5 +9.5 H

1 Holdback
O −7.0 +7.0 −6.5 +7.5 H

Set 11



2 Apertures
O −9.0 −1.0 −8.5 +9.5

2 Apertures
O −4.0 +4.0 −8.5 +9.5

2 Apertures
O +1.0 +9.0 −8.5 +9.5

2 Apertures
O −7.0 +7.0 −6.5 +7.5

2 Apertures
O −5.0 +5.0 −4.5 +5.5

1 Holdback
O −9.0 −1.0 −8.5 +9.5 H

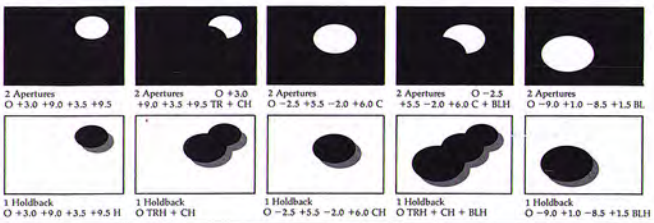
1 Holdback
O −4.0 +4.0 −8.5 +9.5 H

1 Holdback
O +1.0 +9.0 −8.5 +9.5 H

1 Holdback
O −7.0 +7.0 −6.5 +7.5 H

1 Holdback
O −5.0 +5.0 −4.5 +5.5 H

Set 12



2 Apertures
O +3.0 +9.0 +3.5 +9.5

2 Apertures O +3.0
+9.0 +3.5 +9.5 TR + CH

2 Apertures
O −2.5 +5.5 −2.0 +6.0 C

2 Apertures O −2.5
+5.5 −2.0 +6.0 C + BLH

2 Apertures
O −9.0 +1.0 −8.5 +1.5 BL

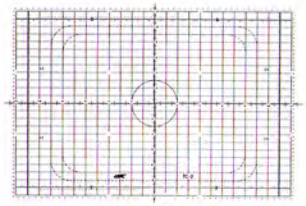
1 Holdback
O +3.0 +9.0 +3.5 +9.5 H

1 Holdback
O TRH + CH

1 Holdback
O −2.5 +5.5 −2.0 +6.0 CH

1 Holdback
O TRH + CH + BLH

1 Holdback
O −9.0 +1.0 −8.5 +1.5 BLH



DSC TC-2 Grid

DSC manufactures a range of products for the meticulous AV professional, including Fuzzies Soft-Edges, Windows Hard-Edges and Pix-it Pixel Masks. For precision projector alignment insist on DSC's AMI compatible patterns, the TC-2 and P-2.

For information and immediate delivery of DSC products, please contact:

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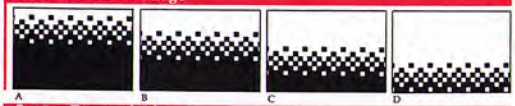
DSC PIX-IT MINI CHART #8

PIX-IT Series Pixel Masks

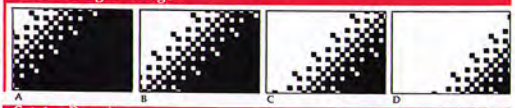
Set 1 — Vertical Edge*



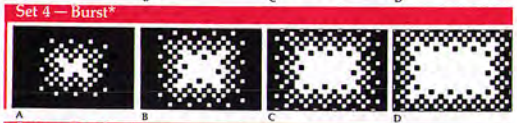
Set 2 — Horizontal Edge*



Set 3 — Diagonal Edge*



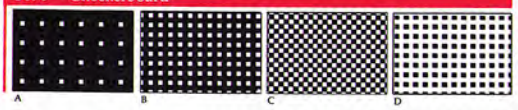
Set 4 — Burst*



Set 5 — Random*



Set 6 — Checkerboard*



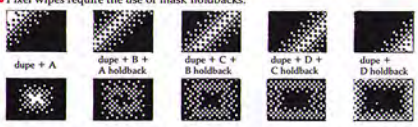
* Key elements of each set shown. Typical complete sets pictured on right.

Hicon-pix Black and White Pixel Mask Sets

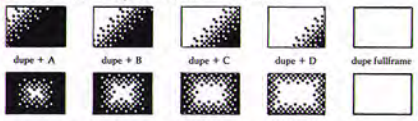
- "Pixel-ating" is an attractive way of making image transitions using two or more projectors.
- Use Hicon-pix masks to wipe on or reveal images. Choose from the six Hicon-pix sets shown. Two typical sets are pictured in miniature on the right.
- Hicon-pix masks are produced on thin, high clarity, polyester-based film. Mounting several film and mask chips together is easy!
- Have fun, experiment! Mount black and white pixels with pin-registered slide duplicates or brightly colored film chips.

Single Screen Effects

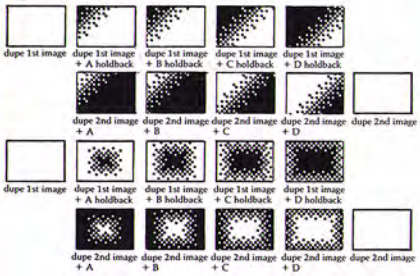
- Pixel wipes require the use of mask holdbacks.



- Pixel reveals do not require the use of mask holdbacks.

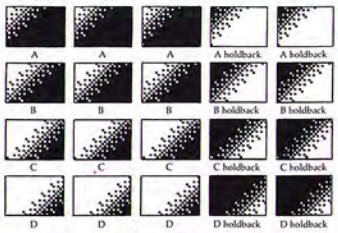


- Try pixelling in the second image while the first is pixelling out, mounting dupes and masks as shown below.

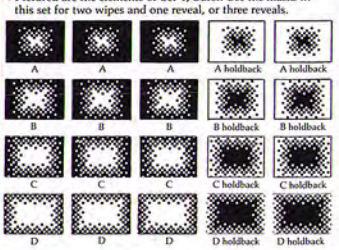


Typical Hicon-pix Mask Sets

- Pictured are the elements of Set 3, Diagonal Edge. Use the masks in this set for two wipes and one reveal. Or, rotate holdbacks and use them as A, B, C and D elements for five reveals.



- Pictured are the elements of Set 4, Burst. Use the masks in this set for two wipes and one reveal, or three reveals.



- Pix-it masks are also available in color — they're called Chroma-pix. Containing cyan, magenta and yellow film chips, the six Chroma-pix sets are similar to their black and white counterparts. The overlap between the film chips produces a kaleidoscopic mix of many colors.

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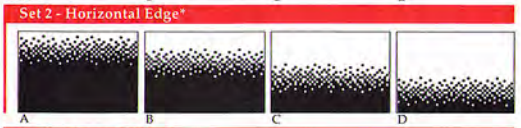
DSC PIXETTE MINI CHART #13

PIXETTE Series Mini-Pixel Masks

Set 1 - Vertical Edge*



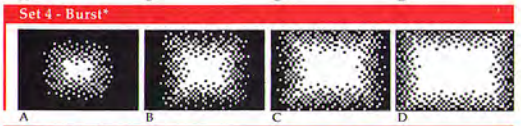
Set 2 - Horizontal Edge*



Set 3 - Diagonal Edge*



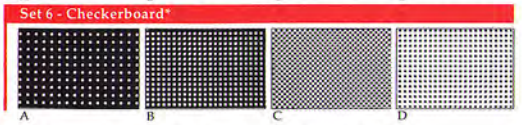
Set 4 - Burst*



Set 5 - Random*



Set 6 - Checkerboard*



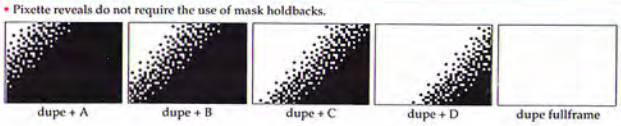
* Key elements of each set shown. Sets also contain matching holdbacks.

General Information

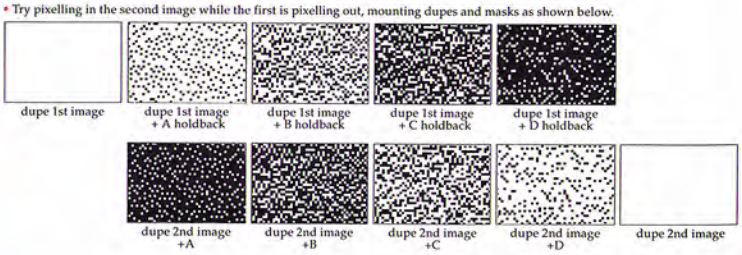
- Use Pixette masks to create with slides the same shimmering mini-pixel effects you've seen on television and video.
- Comprised of hundreds of tiny, randomly arranged squares, use Pixette masks to reveal images provocatively, using two or more slide projectors.
- Each Pixette set contains 20 35mm mask frames, three frames each of the four mask positions shown, and two frames each of their holdbacks. Use Pixette masks for dazzling effects, on one screen or many.
- The number of projectors you have per screen will determine the speed at which you can pixellate. A typical effect takes under two seconds. While you can pixellate with two projectors, a six to nine projector configuration affords greater design and programming flexibility.
- To pixellate in five steps, you'll need one each of the four mask positions and five pin-registered slide duplicates. With fewer projectors, consider eliminating one or more steps.
- Use Pixette mini-pixels for attractive reveals, either from black, or from another fullframe image which is dissolving out. Alternatively, use Pixette masks and their holdbacks to replace one fullframe image with another.
- For more pixellating options, please see Hicon-pix Pixel Mask Sets on minichart #8.

Single Screen Effects

- Pixette reveals do not require the use of mask holdbacks.



- Try pixelling in the second image while the first is pixelling out, mounting dupes and masks as shown below.



DSC manufactures the world's largest selection of precision multi-image masks, including Fuzzies Soft-Edged Masks, Gallery Dropped-Shadow Masks and Pix-it Pixel Masks. For precision projector alignment, insist on DSC's AMI compatible grid patterns, the TC-2 and P-2.

For information and immediate delivery of DSC products, please contact:

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PRODUCTION CHIPS MINI CHART #12

Production Chips

General Information

Like to have some of the finest special effects photography at your fingertips, without the cost and inconvenience of custom camerawork?

Then you'll love DSC Production Chips. Created and photographed by leading special effects designers, Production Chips are convenient sets of hyper-realistic metallics and marbles, star effects, and graded backgrounds. Each set contains a stunning array of 35mm film frames.

Transform titles, innovate with backgrounds, animate dazzling stars anywhere on the screen. Experiment, have fun! With over a dozen Production Chip sets, you'll never run out of exciting ways to dress up your multi-image presentations.

Super-Stars Sparkle Set

- Add sparkle to your multi-image presentations with Super-Stars. This 20 frame set contains all the elements you need to position and animate sparkles anywhere on a screen, including:
  20 four-point stars
  20 four-point diagonal stars
  20 eight-point sparkles
  20 sixteen-point sparkles
  clear (negative stars) positioning strip
- For sparkle effects, project four-point stars with corresponding diagonal stars. Program stars to fade and sparkle, for breathtaking results!
- Cut individual stars, diagonal stars and sparkles as you need them. Use the negative star strip for easy, precise positioning of effects.

Top-Grad Chips

- Top-Grad gradations are a practical way of giving backgrounds, titles, logos and other shapes an attractive and distinctive look.
- Choose from four Top-Grad sets. Each set comprises 25 frames, five frames each of five gradations. Gradations run parallel to film sprockets.
- Sets 1 and 2 have gradual transitions, making them ideal backgrounds for speaker support slides. Sets 3 and 4 have more abrupt transitions, perfect for projecting with titles and other liths.
- Combine elements from the different Top-Grad sets. The most versatile gradation, grey to black, is included in all four sets.

  Frames that go to black are ideal for speaker support — holdbacks of your type aren't necessary! Project color titles into the top darkened area and body type in white over the colored section.

Set 1 — Gradual

black to blue
black to green
black to light purple
black to orange
black to grey

Set 2 — Gradual

aqua to peach
light to dark blue
light to dark burgundy
red to yellow
black to grey

Set 3 — Abrupt

white to blue
white to green
white to grey
white to red
black to grey

Set 4 — Abrupt

aqua to peach
gold to yellow
light blue to mauve
peach to pink
black to grey

D

Hard-Rock Chips

- Create striking marble and other rock finishes instantly. Sandwich Hard-Rock Chips with titles, logos and other liths. Or, project frames as backgrounds with Gallery Dropped-Shadow and other mask holdbacks.
- Choose from four Hard-Rock sets. Each set comprises 25 frames, five frames each of five rock finishes.
- Hard-Rock frames are ideal for large, heavy typefaces or objects, including spheres. For the look of sculptured rock, project two or more custom liths shot from separated artwork and mounted with different Hard-Rocks, and vary projector cues.
- Use Hard-Rock in conjunction with Heavy-Metal frames, projecting gold chrome on peach or rose marble, silver reflections on iridescent Mother-of-Pearl. Have fun, experiment! Countless other stunning combinations are possible.

Set 1 — Marble

blue tint
grey tint
mint tint
peach tint
rose tint

Set 2 — Marble

black with white
blue with black
brown with black
green with black
sand tones

Set 3 — Assorted

clay brick
granite
porphyry
sand tones
slate

Set 4 — Assorted

fool's gold
grey pavement
grey pavement with water drops
Mother-of-Pearl
sand

Heavy-Metal Chips

- Project stunning metallic effects in an instant, with Heavy-Metal Chips. Just sandwich film chips with lith titles, logos and other shapes.
- Choose from four Heavy-Metal sets. Each set contains 25 frames, five frames each of five metallics.
- Try projecting brushed metal or the tints and metals in Sets 3 and 4 as backgrounds. They look great!
- For the most authentic metallic titles and logos, use a chip from Set 3 to reflect the same color as your background.
- For sculptured metallics, project two or more custom liths shot from separated artwork, mounted with Heavy-Metal Chips. Vary projector cues for greatest depth and dimension.

Set 1 — Gold

brushed
gold chrome
gold leaf
graduated
reflections

Set 2 — Silver

brushed
chrome
graduated
grey chrome
reflections

Set 3 — Silver Tints

blue reflections
green reflections
grey reflections
purple reflections
red reflections

Set 4 — Assorted

gun metal-blue
heated copper
patina
pitted iron
variegated steel

DSC manufactures a comprehensive range of precision multi-image products for the meticulous professional, including Fuzzies Soft-Edges, Windows Hard-Edges, Gallery Dropped-Shadow and Pix-it Pixel masks, TC-2 and P-2 alignment materials.

Call DSC or your nearest dealer for more information and immediate delivery!

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dsc FUZZIES MINICHART #10

Fuzzies™ Starter Sets

Fuzzies Starter Sets

Choose from five different starter sets containing our most popular soft-edges and soft-shapes. For first time users and experienced professionals alike, Fuzzies Starter Sets are an economical way of purchasing a variety of soft-edges for experimentation and use in AV production.

Single Screen Starter Set

Each set contains three DSC alignment grids (black lines on clear) and ten each of the following mask patterns. For three to six projectors in single screen format.

Verticals

V 0 M	1/2 frame clear
V -4,4 CM	1/3 center clear
V 4 EM	1/3 edge clear

Horizontals

H 0 M	1/2 frame clear
H -4,4 CS	1/3 center clear
H 4 ES	1/3 edge clear

Diagonals

DR -12,12 M	1/2 frame clear
DR -6,6 M	1/2 frame clear
DR -12,0,0,12 CS	1/2 center clear
DR 0,12 ES	1/4 edge clear

100 masks and 3 grids. Use the masks in this set to divide a single screen area into two, three, six or nine equal parts. Mask attractive three projector wipes using vertical, horizontal and diagonal edges. Or combine halves and thirds for soft-edged montages. (See "Single Screen Effects" on mini charts #2 and #3)

Multi-Screen Starter Set

Each set contains the masks in the Single Starter Set and ten each of the following patterns. For six to twelve projectors in two screen 50% overlap format.

Verticals

V -6,6 CXL	1/2 center clear (panorama)
V 6 CXL	3/4 edge clear (panorama)
V 0,8 CM	1/3 center offset clear
V -8,8 CM	2/3 center clear
V 4 CM	2/3 edge clear

Diagonals

DR -9,-3,3,9 CM	1/2 center clear
DR 3,9 CM	3/4 center clear
DR 3,9 EM	1/4 edge clear

180 masks and 3 grids. Mask stunning panorama wipes and montages, using three, five or six projectors. Use 2/3 masks to create three equal screen areas, and diagonal masks for distinctive angled panorama effects (three or five projectors). Extend panorama effects to additional screens by using more center masks. (See "Multi-Screen Effects" on mini charts #2 and #3)

Pro Starter Set

Each set contains the masks in the Multi-Screen Starter Set, and ten each of the following patterns. For six to twelve projectors, in single screen and two screen 50% overlap formats.

Verticals

Center Reveal

V -2,2 CS	1/6 center clear
V -4,4 CS	1/3 center clear
V -6,6 CS	1/2 center clear
V -8,8 CS	2/3 center clear

4 Part Wipe

V 0,6 CS	1/4 center offset clear
V 6 ES	1/4 edge clear

6 Part Wipe

V 0,4 CS	1/6 center offset clear
V 4,8 ES	1/6 edge offset clear
V 8 ES	1/6 edge clear

Reveal

V 8 ES	1/6 edge clear
V 6 ES	1/4 edge clear
V 4 ES	1/3 edge clear
V 2 ES	5/12 edge clear
V 0 S	1/2 frame clear
V 2 CS	7/12 edge clear
V 4 CS	2/3 edge clear
V 6 CS	3/4 edge clear
V 8 CS	5/6 edge clear

Horizontals

Center Reveal

H -4,4 CS	1/3 center clear
H -6,6 CS	1/2 center clear
H -8,8 CS	2/3 center clear

4 Part Wipe

H 0,6 CS	1/4 center offset clear
H 6 ES	1/4 edge clear

Reveal

H 8 ES	1/6 edge clear
H 6 ES	1/4 edge clear
H 4 ES	1/3 edge clear
H 0 S	1/2 frame clear
H 4 CS	2/3 edge clear
H 6 CS	3/4 edge clear
H 8 CS	5/6 edge clear

Diagonals

Assorted Masks

DR -3,3 M	1/2 frame clear
DR -6,6 S	1/2 frame clear
DR -12,12 S	1/2 frame clear
DR 0,12 CS	3/4 edge clear
DR V6,6,-6,V-6 CS	1/3 center clear
DR V6,6 ES	1/3 edge clear
DR V6,6 CS	2/3 edge clear

and Mask Samplers

550 masks, 3 grids and storage unit. Create the effects described above, the "Single Screen Effects" shown on mini charts #2 and #3, and countless other soft-edged wipes, reveals and montages. This set is the first choice of multi-image professionals worldwide!

Please note: The Pro Starter Set provides sufficient masks to create every effect described above. However, as some masks are used in several different effects illustrated on the mini charts, you'll need additional masks to produce all effects at the same time.

Circle Starter Set

This set includes three DSC alignment grids (black lines on clear) and ten each of the following patterns. For three to six projectors in single screen format.

Mask	Holdback Mask
Reveal	
C 4,0,0 S	C 4,0,0 HS
C 6,0,0 S	C 6,0,0 HS
C 8,0,0 S	C 8,0,0 HS
C 10,0,0 S	C 10,0,0 HS
4 Corner Montage	
C 4,6,6 XS	C 4,6,6 HXS

100 masks and 3 grids. Try this popular reveal sequence, beginning with the smallest circle and ending with a full-frame image. Use holdback masks when superimposing images on backgrounds, and corner circles for displaying several images attractively at one time. (See "Single Screen Effects" on mini chart #4)

Shape Starter Set

This set includes three DSC alignment grids (black lines on clear) and ten each of the following patterns. For three to six projectors in single screen format.

Mask	Holdback Mask
Rectangles	
R 6,6,0,0 S	R 6,6,0,0 HS
R 8,8,0,0 S	R 8,8,0,0 HS
Ovals	
O 6,6,0,0 S	O 6,6,0,0 HS
O 8,8,0,0 S	O 8,8,0,0 HS
O 4,9,0,0 S	O 4,9,0,0 HS

100 masks and 3 grids. Masks in this set frame inside video safe area, making them ideal for single screen shows to be transferred to video. (See mini chart #5)

Fuzzies Mask Samplers

If a mask illustration doesn't show you enough...and a Starter Set gives you too many frames of the same masks ...then you probably need a Fuzzies Mask Sampler!

Choose from two samplers, the Edge Sampler and the Shape Sampler. Each contains individually cut and labelled 35mm frames of dozens of different soft-edged mask patterns. Sampler film frames are packaged in archival slide pages in a binder, the pages interleaved with paper for easy viewing and use.

Use sampler film frames as a production tool when cropping and positioning visuals, and for shooting image composites on a pin-registered camera. Samplers masks are taken from regular production runs and are the same precision masks you purchase in quantity.

Edge Sampler—62 Frames

This contains an assortment of mask patterns and gradations—one each of the 55 masks in the Pro Starter Set. Also included are five vertical half masks showing the different edge gradations available, and two alignment grids for quick mask identification.

Shape Sampler—80 Frames

This contains one frame each of every shape pattern—circles, rectangles, ovals and squares. Also included are vertical half masks showing the different shape gradations available (short and extra-short), and two alignment grids for quick mask identification.

DSC manufactures AV masking and alignment products for the exacting professional, including Fuzzies Soft-Edges, Gallery Dropped-Shadows, Pix-it Pixel Masks, TC-2 and P-2 alignment materials.

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Printed in Can



Multiple picture assemblies vary in style over an enormous range. A "sixteen-screener" is one example. Another extreme would be a montage-style layout of odd-sized images. There are several ways to shoot such layouts. All involve some form of masking:

- In-camera masking
- On-stage masking
- Multiple-picture photo assemblies

In camera masking is the hardest method of the lot. It involves making precision 35mm masks that are mounted in the camera's aperture—that is, *inside* the camera. That requires a sophisticated and expensive camera. Forox, Marron-Carrel, Mangum Sickles and a few other major manufactures build cameras with special apertures that include pins for in-camera masking. For those of you who have such a camera; the following would be a procedural basis for experimentation.

First, make registered 35mm pos and neg masks in the usual manner. Then position the neg mask onto the camera's aperture-plate registration pins. Shoot scene A. Then remove the neg mask and replace it with the pos and shoot scene B. The masks can either be hard or "mezzo-edge" Kodaliths or soft-edge masks produced on 5302. It is important that the masks be clear-based so that they do not influence the color-balance.

(Panatomic X and most other black-and-white stocks have a slight blue cast to the film base, that will influence color balance; however, that blue cast can be corrected by filtering the light source).

Even with unbelievable care and precision, it is unlikely that you will ever achieve perfect registration using in-camera masking; there will nearly always be some sort of mask slip and an (un)acceptable "matte line" (especially in the case of hard-edged masks). The reason for that is simple:

The most expensive multi-image rostrum cameras cost what? $50,000? $75,000? The matte (mask) work in *Star Wars* was shot on a camera/optical-printing system that cost over a million dollars—and you can, nonetheless, see matte lines in the film. (!)

Even with such faults; one advantage of in-camera masking is that you can shoot any size or type of art. By placing the masks (mattes) into the camera's aperture, you create 'windows' (sub-apertures) thru which anything can be shot.

Other methods (described below) require the component pictures be pre-shot into position; thus the individual components of the multi-picture assembly are second-generation dupes.

Another method is on-stage masking; that is done on a 35mm 1:1 stage using the same type of masks that would have been used inside the camera. Shooting is accomplished by sandwiching the art (35mm slides) with the neg and pos masks and shooting into position. This method works if all your 'art' is 35mm. Thus, to position a large top-lit poster or similar oversized art into a small portion of a (masked) scene; you'd have to first shoot the poster 'into position' on a 35mm transparency; then use that slide as art for stage-masking.

Like the in-camera masking method; the stage-assembly procedure also creates windows thru which you photograph components of the multi-picture slide. Unlike the in-camera mask method, however, each mask (little window) and its component picture are bound together on the 1:1 35mm stage—so all the different window components must be shot into their respective window positions in the field. For a sixteen screener, that is sixteen exposures—on every frame.

This is easily done on the rostrum camera by using the mask-window coordinate points or by taping the mask onto the reticle and projecting it onto the art or photo to see the crops for each individual windows.

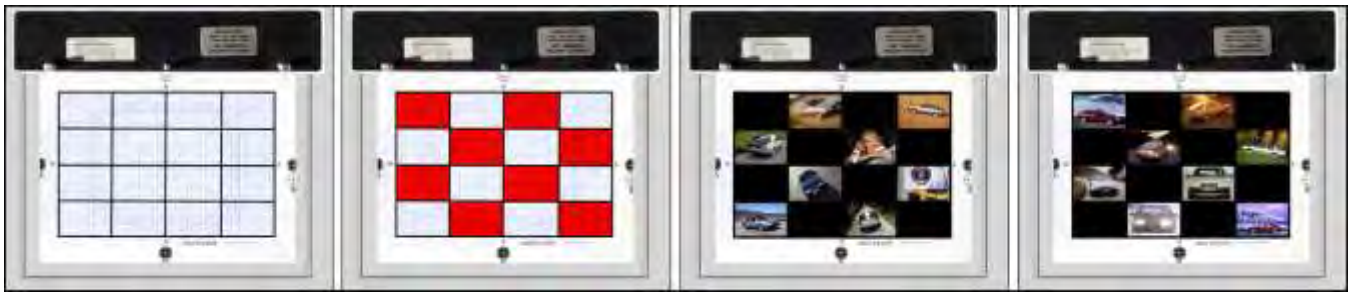
A similar approach can be implemented on location by taping a mask over the focusing screen of a Nikon (or similar 35mm camera that has removeable focusing screens).
For example: to shoot, say, nine pieces of art into one frame you would first shoot each piece of art, individually, into position, resulting in nine individual slides. These slides are successively sandwiched with their appropriate masks and DX'd together on the 1:1 35mm stage.

To hide any slight misregistration between the nine components, a Kodalith "grid line mask" (black lines on clear) can be bound in the finished slide along with the color chip of the nine-picture assembly; to 'clean-up' the mullions. No matter how precisely the sub-field images are positioned; there will be tiny differences in the thickness of the black spaces bordering them; that is, they are not all equidistant from each other; some will be fractionally closer to others; the line spacing will look uneven. Grid-line pos masks trim the sub-fields and tidy-up the appearance. Those procedures work well, except that is very tedious and ties up a lot of camera time.

One benefit is that; since each element is being shot into position; exposure, color corrections, and/or effects can be individually made for each sub-field element. That presents other problems, though; because it means that each individual exposure must be pre-tested; and when shooting the nine-exposure composite, there is plenty of room for error if different exposures, filtration adjustments or effects are required.

Making Assemblies

The simplest, most consistent, and most versatile approach to making multi-picture images is to make "assemblies." An assembly is basically a giant mask. To prepare and assembly you tape transparencies to clear cels placed under large-format Kodaliths that have 'windows' for the transparencies.



Left to right: 16-screener grid lines pos | Rubylith cut for 8-image Kodalith mask | Kodalith window masks with 35mm film chips taped to clear-cel underlays. Using two Kodalith masks in checkerboard style leaves plenty of room to tape film chips to underlays without tape being seen. Note: artwork is shown oversized for illustrative purposes. A 4 X 4 grid of 35mm images (including grid-line mullions) would be approximately 6.5 X 4.5-inches (~16.5 X 11.5 cm), which fits on the 7.5-field master grid.

Assemblies provide you with several benefits. First, they are large; that means you can make camera moves in, out, or across them, providing 'animation' possibilities for multi-projector shows. The biggest advantages, though, are that just about all the 'correction' work on individual component pictures is done before the assembled cels reach the camera. As an example, let us create a single slide with 64 images—a "sixty-four screener." There are two ways to do that.

Method one is to make giant-sized Kodalith masks with 64 windows for 35mm film chips. Begin by preparing a piece of Rubylith art with 64 windows, each slightly smaller than the dimensions of a 35mm slide—that is, 22 X 34 mm. Make two same-sized Kodalith negs of this art. On each of the two negs; mask out alternate rows and columns of windows. That is done to enable taping 35mm slides (unmounted) into the windows without having to cut-off the sprocket holes. By masking out alternate rows you have plenty of taping room.

(Needless to say, the two cels were previously pegged in register with each other). Now, the two cels of 'assembled' 35mm transparencies are DX'd together on duping stock. You will need an over-sized light box to do that; the 8 X 8 assembly is ~13 X 9-inches [21 X 33 cm]. (See picture of multi-tier lightbox on page 2985.)

When making such assemblies you should be particularly careful that the densities of the assembled slides are all about equal. Remember that the dupe is going to kick-up contrast a bit. You must have 'balanced' components in each assembly; or else elements above or below the 'mean average' exposure are going to be too 'hot' or too dark.

If some of the slides for the assembly are too light; dupe them darker and use the dupes in the assembly instead of the originals. If some are too dark; shoot them lighter. To judge such density differences; make a trial assembly by lining up all the slides on a lightbox. Cover the surrounds with black paper or Rosco *Tough Roscopaque*. View the trial composite through a viewing glass, ND96 filter, or by 'squinting' your eyes. Anything that seems too dark or too light will probably be unacceptable in the final assembly and should be duped to achieve a density which falls within the same range as the others. That would be impossible if the pictures were a mix of snow scenes and a coal mine; those kinds of extremes require masking and separate exposures for the light and dark windows.

While correcting densities, also correct any shots that are obviously off-color. Any color or exposure aberrations on individual elements will be intensified in the final slide because you will be making only two exposures of the entire assembly. And that is the beauty of an assembly like this—just two exposures and, *voilá …* a 64-screener!

Now, let us say you do all the above and one or two pictures are still a tad too dark. You can easily mask-out everything else but those elements on the shooting stage and give the offending images a little extra exposure; and vice versa for areas that are too light. You can also make color corrections and/or add effects by simply masking individual pictures in or out or in on stage.

Because the minimum field size for a 64-screen assembly is substantially larger than your 7.5-field master grid, you will have to use coordinate points to achieve exact registration with any 'normal' full field or 35mm masks.

A second method is to make four 16-screen assemblies and shoot them into position using coordinate-point registration. This is the method I prefer; because it is sized for our master grid.

The procedure just described can also be used to create 'quad' slides as well as 9- and 36-screeners—virtually any combination of elements that can be assembled form 35mm slides and/or larger formats.

Another benefit of the assembly method is that you do not have to use a mask to 'clean-up' the division lines (called "mullions") between the individual components. Normally the line divisions are quite accurate, by virtue of working off a large-sized field. However, a mullion mask will add density and thus contrast; for 'true black' grid lines.

Furthermore, if the client wants to change one or two of the shots in the assembly; they are easily and quickly swapped by simply taping in a new slide and reshooting the assembly cels.

The assembly method also enables you to make interesting layouts of different-sized images. Let us say, for example, that you want to start with a 64-screener; then dissolve-away 16 of the 64 images (one quadrant) and replace them with a single quarter-frame image. That is easily accomplished by shooting the quadrant image into position.

First prepare an overlay that is positioned on top of the 64-screener's cel assembly to block-out the 16 images in one quadrant. Shoot that assembly with the block-out-mask overlay in place. Then re-field the camera to the coordinates necessary for a 'quad-slide' (four images) and shoot the single 'quad' into position. If your mask art was prepared properly; the lines dividing individual picture components in a quad slide should be the same thickness as those in a 64-screener; everything should line-up in terms of mullion thickness.

You cannot use a close-up of a portion of a 64-screener to create a quad slide because as you focus closer on the 64-screener art, the mullions become much thicker. As a result, the division lines will look overly thick and horsey. This can be avoided by making special mask art for that purpose. The goal is to have standard-thickness mullions no matter how many pictures are on screen.

Assemblies for Split-Field Work

Assemblies can provide an enormous advantage when doing split-field work. Split-fields are 'composites' of images that are assembled over a wide-screen area by overlapping projectors. Normally, such composites are created by using hard-edged Kodalith masks so that by assigning individual projectors to elements of the composite, layouts can be randomly changed.

But what if you wanted to dissolve to a new hard-edged composite layout via a soft-edged dupe? If bind-in masks are used; you could be up 'shit's creek.' You would have to bind three film chips into Wess mounts deigned for one or two:

- the individual component's hard-edge lith mask
- the component picture that fits the mask's window
- the soft-edge mask

Wess mounts really do not 'like' three thicknesses of film squeezed inside them; they bulge. That extra thickness can inhibit or prevent slides from dropping correctly into a projector's film gate. However, using the assembly method all such problems are solved; because mullion masks are not needed. [*Editor*: You can do the wipe without mullion masks; and dissolve to a matching set of slides with mullion masks but no softies.]

Since all such splits involve stage movement there is always the possibility of losing registration. To minimize registration slip; shoot all your lefts; then all your centers; then all your rights (assuming you are shooting a 'two-plus-one' panorama). To do that; you should use a shooting log; because if you are doing a lot of splits, it could conceivably be two or three hours (or even days) between the times you shoot the lefts, centers and rights. By carefully logging; you will be able to retrace every step of your shoot from hour to hour or day-to-day and be completely accurate in terms of matching screen sections, exposures, colors, effects, etcetera. Be careful, though; process complete shoots (all three panorama components) in the same run to avoid processing inconsistencies between runs; that could alter the color or density of the left-, center- or right-screen elements.

As with color differences between paint or dye batches; it is virtually impossible to achieve an identical chemical composition in every batch of film manufactured. Thus, every batch of film manufactured has an emulsion number; and each emulsion number responds a little differently to a standard light source. What that means is that; measured against a hypothetically 'perfect' batch, other batches have a color cast that must be corrected.

On top of that, it is impossible to assume that each roll of film will have the same 'shelf life' between manufacturing, shooting, and processing. Simply put; some rolls are on the shelf longer than others and under different conditions (relative heat & humidity). From the moment it is made; film is degrading; getting older and older, and thus changing its color balance.

That, by the way, is the essential difference between Kodak's 'professional' and 'amateur' films. Professional films are manufactured to more exacting color standards; and immediately refrigerated to slow aging and reduce color changes.

Amateur films (without the designation "P" in the film code—for example EDP vs ED) are made to specifications that 'allow' them to age an average of 9 months on the shelf, at 68° F [20° C]. At that future time they 'arrive' at their best color balance. If you shoot a fresh roll of amateur film; you will get results that are too yellow-red.

If, on the other hand, you shoot a roll of old professional film; your pictures will come out too blue. The reason is; the yellow dyes age (degrade) first, followed by the red. Over the long haul; you will end up with blue pictures—witness pictures that have been left in shop windows for months or years. All that is left are the blue pigments.

If you use the professional film; keep it in the refrigerator or freezer and process it immediately after shooting; because with professional films, the longer you wait before shooting and/or processing, the more the color balance will change.

With amateur films it is a different story. With those, you never know how fresh the film is; how close to its 9-month 'use-by' date; until you use it.

With any color film, buy bulk batches and freeze it. By freezing it, you minimize aging and color shift. A simple series of tests will reveal how the film is shooting (i.e., what correction, if any, is required). I purchase large batches and shoot test rolls; to discover how the rest will trend; reddish or blueish.

If you are going on a prolonged shooting trip (up to several months); or if your film cannot be frozen; and/or will be subjected to high heat for prolonged periods (over an hour); use amateur films rather than professional because of their inherent 'aging tolerance.' Or, have fresh batches of film sent to you periodically; wherever you are. FedEx makes that easy.

Switching from one emulsion number to another will require a subtle adjustment of basic filtration to photograph colors the same way as your last emulsion number. Any emulsion number changes from one film batch to the next should be noted in a "caution" section of your shooting log, as well as on any camera film magazines.

Similarly, changing lamps in the light sources of your rostrum camera can modify your basic filtration. That, too, should be noted in log updates (or whatever your system happens to be) as well as on each of the camera's film magazines.

Another source of exposure and color changes is processing variations. Continuous-line processors are great machines that hold hundreds of gallons of chemistry. They offer very consistent processing when they are working right. Smaller, batch-processing methods are far less consistent. However, over the month or so that a freshly cleaned continuous-line machine is working, before being cleaned again, the processing will slowly change (aside from run-to-run changes).

When the processor is cleaned; there will be a sudden, 'drastic' change which will last for at least one day and up to three; depending on how much film runs through the new chemistry. Be sure you know when your lab is 'switching over' and never send them film during that period. Also; keep daily notes on how the lab is 'running.' Shoot a master roll of 'China girls;' keep the exposed China girl footage in the freezer. Every Monday; send two feet of this pre-exposed, frozen stock, to the lab. Compare your results with the originally processed specimen to note lab tendencies. Each time you change film emulsion batches, throw out your old China girls make new ones. Do the same for other major changes, such as lamp replacements in shooting-light sources.

Moving-Element Shooting



Step-repeat streaker zoom by Incredible Slidemakers for Van Alst jewelers.

This category of effects has two sub-categories: "stepped" shooting and "streaked." Streaked shots have trails of light emanating from the primary image giving the appearance of movement; such as a zoom shot, or a pan (a camera move, not a 'panorama'). Stepped shooting is simpler and involves the movement of a fixed element across or within the total field. Thus, for example, you could create a stepped zoom, or a streaked zoom, or a stepped-streak zoom (as shown in the picture, above).

Stepped-Element Shooting

There are two methods for shooting stepped-elements effects. One involves preparing multiple registered cels with the elements taped (or pasted, if using paper) into position on each cel. The other involves moving one set of cels across the camera's stage.

The first method, making multiple registered cels, is the most accurate. Especially when each shot involves complex effects shooting; because our goal is to minimize camera and stage movement to help ensure maximum registration throughout all shooting procedures. Even if you have marked precise coordinate points; most multi-image cameras are just not built with the precision necessary to achieve 100% registration all the time. Thus, you should restrict camera and stage movements to a minimum. Do that by making the moves on individual cels that can be shot without moving the stage or camera. That is, make the 'moves' in the art.

[*Editor*: In 1983, a year after the above was written; I was employed by Chris Korody at Image Stream, in Los Angeles. That was the first time I encountered a Marron Carrel MC-1600 rostrum camera. The camera and its compound stage(s) were computerized. The shooting accuracy was 99.9%—down to less than a millimeter on a 10-field grid.]

Another reason for using the first method has to do with 'human failure.' If you opt to make a single set of cels and 'imposition' them by moving the camera or stage; you run the risk of either missing a step, or lining up to the wrong coordinates. During a long, complex shooting session; it is difficult to maintain enough concentration to avoid the possibility of human error.

There have been times when, while shooting a stepped zoom, I have accidentally zoomed the camera in a tad too much; or forgotten which grid lines I was sizing my cels to. (That was when I learned to use a log and work with an assistant who's job it was to track the procedures against a checklist—like aircraft pilots do.)

When you use multiple cels, all pegged together, you are operating from a fixed camera and stage position. This helps to assure maximum registration of elements. In addition, there is 100% repeatability of exact positions in the event of any shooting errors or changes.

The multiple-cel method involves the preparation of more art; but it frees-up a lot of camera time. The camera operator does not have to concentrate as much on the details of lining-up elements to the grid; and/or repositioning the camera; and/or stage; using coordinate points—for every step—all of which takes time. Instead; all the camera operator has to do is switch cels on the peg bar and keep shooting. Since camera time is inherently more expensive than art-prep time, it is way cheaper to create all the movement steps in art prep, than on camera.

However, sometimes the art- and cel-prep for each step involves so much time that this method is impractical and uneconomical. Hence, step-shooting a single set of cels into position; by moving it across the stage; lining up to specific coordinate points; will be a more expedient method. This is particularly true if you are using a computer-controlled camera which takes all the worry out of remembering which coordinates to line-up to.

If you opt for moving the art across the stage, the best procedure is to shoot the sequence backwards. If, for example, you wanted a logo to step-pan into the frame from the East and arrive at Center field; then, while in center field, animate with a series of fixed-field effects elements (like glitter, glows, auras, spinning stars, or the like); shoot the final logo position and all the center field effects elements first; then step-shoot the logo while moving it from Center to East. The reason for that is, again, to minimize any possibility of mis-registration due to unwanted camera and/or stage movements. Hence, shoot all fixed-position elements before shooting the steps that require camera or stage movement.

The best practice in any shoot situation is to do all (or as much) of the fixed-field shooting before doing any work that involves camera and/or stage movements. That requires careful logging; because you may be shooting the fixed position elements for dozens of scenes before you shoot the moving elements for some of them.

I try to separate all my shoots into two lots: fixed field, and moving field. Thus, if I had a logo step-panning into position from East to Center (as above); and another sequence panning from West to Center; and a third step-zooming into the same center-field position from afar; I would shoot all three final, center-field effects, as well as their OP (over-projection) elements, before shooting any of the steps involving stage or camera movement. That helps ensure that all the center-field logo elements, from all three moves, will 'lock-up' in as near to perfect registration as possible. That can be a tedious undertaking; careful logging of the shoot is necessary; because if your shot has a lot of moves (which many do), it will be difficult to remember the correct shooting sequence without pre-planning the shoot and logging notes as you go.

Make Coordinate Plates for Every Scene

Repeatability is critical when shooting multi-image animations; it is very important to make coordinate plates for each step of any move involving stage and/or camera movement (unless you are using a computerized camera). Simply put; according to Murphy's law, the chances are high that one or more of the steps will not turn out as planned. Thus, you may have to either reshoot the step that is incorrect; or reshoot the entire sequence; if you can't get back to the precise position needed for the 'missing' step.

To get back into position for any given step, make a coordinate plate for every step, and number them sequentially. Thus, before shooting the final, Center-field position; place a punched sheet of white paper over the peg bars on top of the cels being shot. (Before punching, reinforce the paper with a strip of Scotch Tape over the edge being punched, to keep the punch holes patent.) Project the reticle grid onto the white paper cel and mark the intersections of at least three X and Y grid-lines. [You can also use a pre-printed master grid cel, as in the picture; left.]



Typeset-word, "Coordinates," can be seen through paper-cel overlay. Coordinate points (very) enlarged for illustrative purposes. Circle coordinate points in red, to make them easy to see.

Follow this procedure for each step in the movement of the camera and/or stage. Mark each overlay with the scene's TAB (or other ID) number and a brief description of the art.

Now; if step three of the move is NG; you can easily get back to the precise position by simply realigning the projected reticle field according to the coordinate points for plate three. In the case of moves involving rotation; be sure to also mark the degree of rotation on the coordinate plate; and for zooms, mark the camera's height for each step on the appropriate coordinate plate(s).

Shooting Full Effects into Position



Logo by Fred Cannizzaro, Incredible Slidemakers.

As previously mentioned; it is often easier to shoot a 35mm full-effect master into position on a 1:1, 35mm pin-registered stage than it is to shoot all the effects elements into each step of a move. For example, let us say the logo moving into Center-field position from the East, as above, is a complex effects shoot comprised of an outer aura, two-tone fill, large stars, and a glow. The shooting procedures for that 'look' are fairly tedious:

- First the aura is shot by placing the neg over a color gel; then placing a glass sheet over the neg; followed by a glow screen; the pos; and a cover glass—a total of six layers that need to be changed for every step.
- The cover glass and pos are removed to shoot the glow.
- The cover glass, pos and glow screen are removed and replaced with inner-aura cels; re-covered with glass; and exposed with a glow screen.
- Finally; all the above-mentioned cels must be removed and replaced with a star plate for the star exposure.

Each of the steps may also involve a color change. In all, this operation could involve up to 15 minutes for each and every step of the move from Center-field position to the East. If the step-pan involved 10 steps; that would add up to 150 minutes of shooting time and over 40 different cel-handling sequences. That is a lot of time; and a lot of chances for making errors.

It is far easier to shoot all the elements together and create a master 35mm slide of the logo with all its effects; then place that transparency on a 1:1, 35mm pin-registered stage and shoot the finished-look master into each of the 10 step-pan positions.

(If you follow this procedure, you do not use coordinate plates for each position because it is impossible to make a 35mm-sized coordinate plate. Rather you use the increments noted on the North-South, and East-West micrometers and/or camera height and stage rotation axis).

If the steps involved in the move are very complicated, you may find that it is a bit too difficult and imprecise to be operating on the 35mm stage. In this case, you should take the 35mm transparency of the finished look and blow-it-up to a full-field size on 8 x 10-inch (20 X 25 cm) sheet film and work in and/or around portions of that larger-format tranny (transparency).

Streaked and Other Moving Elements

Moving-field effects are best exemplified by streak-zooms and streak-pans which are created by moving the stage and/or camera while the shutter is open. When shooting moving-field effects; the use of coordinate points is crucial. Without coordinate-point references you will never know 'where you are' because the stage and/or camera positions are being changed.

Since these effects cannot be created without moving the camera or stage, it is imperative to be able to get back to the original position to shoot either another exposure bracket of the move or another effect element.

Coordinate plates will prove invaluable for keeping track of your moves, as well as getting back to any position.

In addition, a pantograph will prove helpful in terms of "plotting" the start and stop points of a given move.

And, as previously noted, all fixed-field elements should be shot first to ensure maximum registration among them.



Spiral streak zooms by Incredible Slidemakers.

When shooting streak effects; you will be moving the camera and/or stage a lot; and the likelihood of mis-registrations skyrockets. Slight mis-registrations in the streak elements will be (in most cases) less noticeable than in the fixed-field elements; which is why it is important to shoot the fixed-field elements before the moving elements.

While making the exposures involving stage and/or camera movements; the speed and smoothness of the movements are the two critical elements. The speed will determine the depth (density) of the streak colors and the smoothness will determine the evenness of the streaks. As the speed of the movement increases; the total time that light is 'smeared' across any portion of the film decreases.

It follows that faster speeds equate with shorter exposures. So, if you move the stage or camera quickly the streaks will be darker. Conversely, the more slowly you move, the lighter the streaks will be.



Changing speed during the move exposure will result in changes in color density of the streaks; that can create some very interesting results. in the streak trails. Such uneven movements can be beautiful if carefully thought out; or like mistakes.

Fluid-stage streak pan by Incredible Slidemakers.

Smoothness is an especially important consideration at the start and stop points of any given move. Let us say that we are panning East to West for about one-inch on the 7.5-field; to create a short-streak effect on some burned-in type. First, burn in the type in the fixed-field final position. Then, make a second exposure and while the shutter is open, slide the stage from the fixed-field position to the final position, one-inch to the left. Those start and stop points are marked on a pantograph coordinate plate.

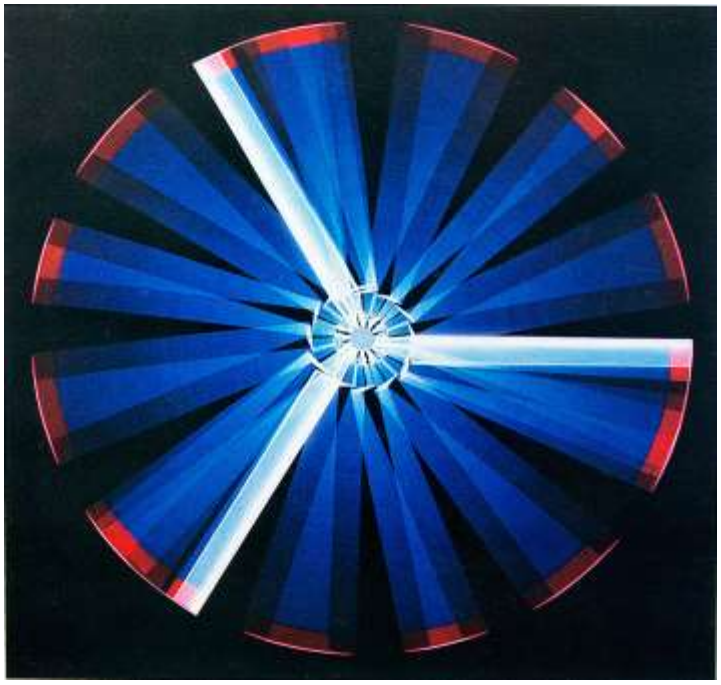


It is relatively easy to get a smooth start; but it is difficult to get a smooth stop, especially if you are moving the stage quickly on a short-streak move. Simply put, just like driving a car, you cannot go from flat-out to full stop instantly; it involves putting on the brakes and decelerating. Albeit that some cars can 'stop on a dime,' getting your stage to stop precisely at pantograph point B without a computer assist will involve 'putting on the brakes.' That slower speed will increase the streak exposure on the portions of the film being exposed while you are slowing down. You may even get some jerkiness as you get to the full stop position. "Practice makes perfect."

Ballerina, by Fred Cannizzaro and John Leicmon.

To avoid that, you can do two things. First, operate at as slow a speed as possible during the move. It is easier to stop on a dime from 10 miles (16 kilometers) per hour than it is from 100 MPH (160 kmh). Next, rather than try to actually stop the stage at coordinate point B, let the stage pass B and at the instant the pantograph needle intersects with point B shut off the light source (or close the shutter). This will enable you to maintain speed all the way through the stop point. This technique is especially effective for short zooms and pans, as well as for moves that involve high-speeds when stopping at precise points is virtually impossible.

High-speed movements of the camera and/or stage are often desirable for extra smoothness. This is particularly true in pans and rotations. Simply put; unless you are operating from a motorized or computerized stage; it is very difficult to be totally consistent in terms of speed when moving slowly. Sometimes, as with rotation moves, it is easier to give the stage the ol' 'heave-ho' than it is to move it slowly. Although I recommend that you move as slowly as possible for any given move; you will have to experiment to determine your most comfortable and consistent speed.



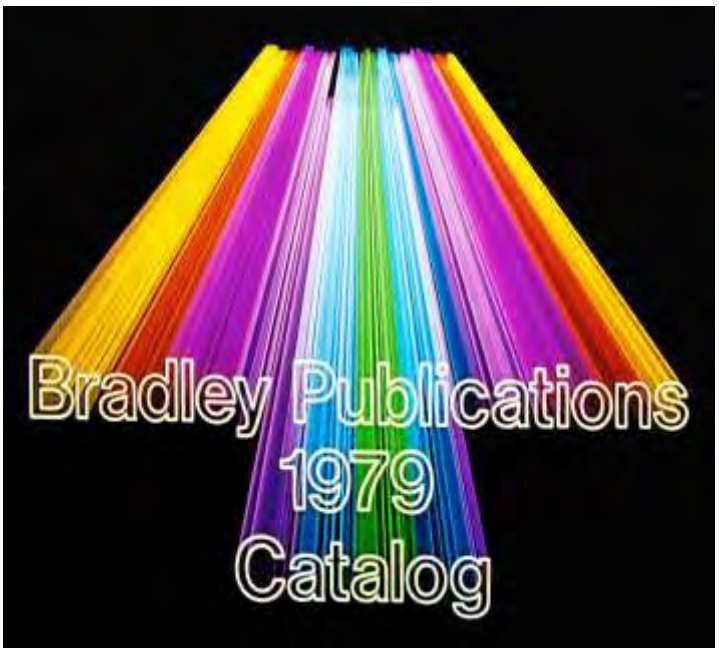
Stepped spin streak of Sikorski helicopter blades shot for Owens Corning Fiberglas by Incredible Slidemakers.

Use Line Art for Better Streaks

To create more pleasing streak trails, use outline versions of your type or artwork. With outline versions, the streak trails look more 'tubular;' more 'transparent.'

When using outline versions; it is important that they be in total register with the "'solid' versions of the type or logo; if those are used.

You can also create interesting striated "multi-color" streak trails by changing the color of the light source during the streak exposure. That can be done in several ways:



Rainbow streak zoom by Incredible Slidemakers was made using a multi-color-gelled neg of the outline type.

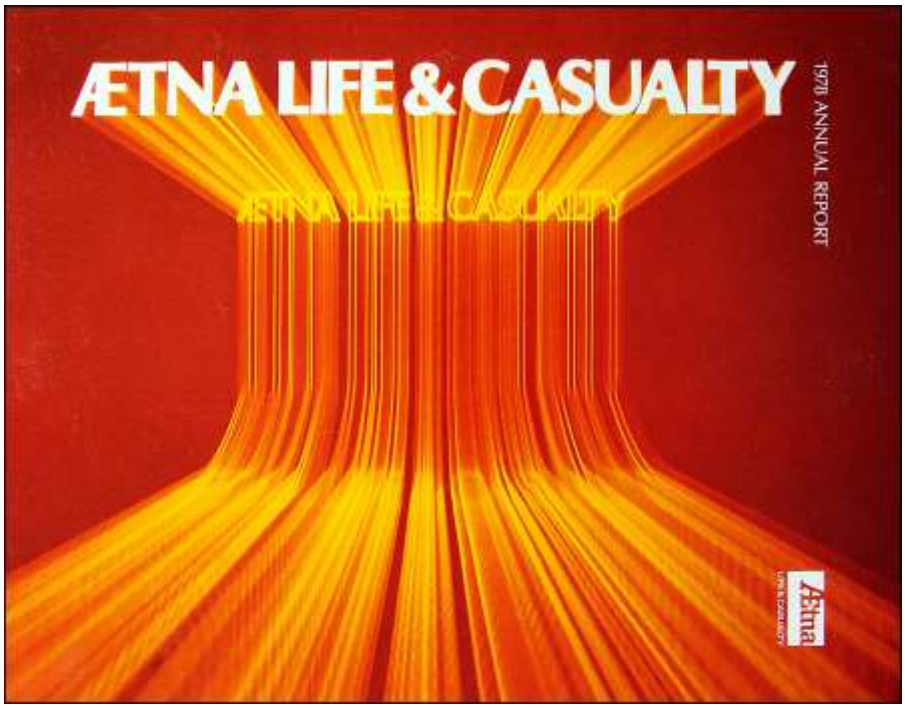
- If you are using a dichroic light source; you can simply 'dial-up' the new color while the exposure is in progress.
- If you are using gels; tape a series of gel-strips together with clear Scotch Tape. You can make a small gel-assembly to hold near the lens; or a large assembly that can be slid across the full-field at stage during exposure.

During the streak exposure, slide the gel-assembly across the artwork North-South, East-West, diagonally, back-and-forth; whatever direction(s) you like; to create a wide range of multi-color streaks. Larger, stage-level gel assemblies will give you more subtle color changes within the streak trails; as well as 'diagonal' color changes.

Using a small gel-assembly will create a 'grosser' effect; changing the total color of the streak trail (as will changing the color of a dichroic light source).

In addition to using outline type; you can also 'tape out' or use underlays or overlays to mask-out sections of the type. The remaining unmasked portions will create interesting partial-streak trails to emphasize specific art elements; letters; numbers; words; etcetera. In addition, a series of different masks can be DX'd together for a series of overlapping streaks; "rainbow" streak; and other effects.

Needless to say, a lot of care and precision is needed for streak shooting. Using a motor-driven stage and camera makes life a lot easier, as does the use of a computerized camera; when all stage and camera positions can be pre-plotted and programed for complete accuracy and predictability. Making streak moves by hand is tedious and it is virtually impossible to obtain anywhere near 100% repeatability of any given move; each will be slightly different.



Compound streak zoom by Incredible Slidemakers.

In addition, without the use of a computerized and/or motorized camera; you will need four or six hands to do complex streaks; you will have to carefully rehearse each move with your assistants. Then too, you will have to make a lot of experiments to see how the exposures and colors are 'behaving' in terms of your speeds and/or changes of direction in the streak exposures. Again, this is where your Effects Bible will prove invaluable as a reference for starting experiments—and all experiments should be added to the bible for future reference (unless they are utter flops).

Tips for Top-lit Shooting

Although most rostrum-camera special-effects photography is done using bottom light sources with line art, a lot of effects can be created using top-lit techniques. What is often 'forgotten' is that a rostrum camera is, basically, just a camera on a pole.

As such it is like a little photo studio stage turned on its side. Many tricks that you use in the studio or on location can be implemented on the rostrum camera—including 'product shots' of small items 'jazzed up' with effects.

A good basic set-up for top-lit work involves the use of polarizing filters on the light sources as well as on the lens.

For 'flat' top-lit stage illumination; all lamps should be equidistant and aimed at a 45-degree angle to the stage (see arrows, right).

In addition, all lamps should be of equal age and intensity to achieve perfectly flat lighting across the stage area. The farther the lamps are from the stage, the more even the lighting will be across the stage.

The reason for that is simple, the amount of light falling on any surface varies inversely with the distance of the light source from the surface.



John Leicmon at Incredible Slidemakers' #1 Forox camera.

You can observe that very easily with the following experiment: Place any light source about three feet (~1 meter) in front of a narrow coffee table, aimed at a 45° angle to it. Place a light meter at the front edge of the table and take a reading; then take another reading at the far edge. There will probably be about a one-stop exposure difference between the front and back-edges.

Repeat this process with the light source 10 feet (3 meters) away from the table, Although the exposure will be longer—because the lamp is farther away—the difference between the exposure for the front edge and rear edge will only be about a quarter of a stop; meaning that the light falling on the table is more even from front to back. Thus, the farther the light source is from your rostrum camera stage, the more even the stage light will be from edge to edge.

Although most camera manufacturers have taken evenness into consideration; do not feel as though their recommended lamp positions are 'Gospel;' you may want to rig-up your own lamps to get more even lighting; and/or use studio lights (strobes, possibly).



Conversely you may want uneven light sources. As you probably know; in studio photography you rarely use 100% flat lighting; there is nearly always some 'contouring' or "modeling' of light and shadow to illuminate subjects more dramatically. The same applies to top-lit work on a rostrum camera. Just as you change the color, direction, and intensity of studio lighting; you can likewise control your rostrum-camera lighting to create accents, or highlight a page of text.

Photo: www.thoughtco.com/the-bill-of-rights-721651

The colors, diffusion, and intensity of top lights can be controlled by application of any combination of Rosco *Cinegels* or *Supergels*. These come in a wide range of diffusion and color materials (including neutral density grades to control lighting ratios). The direction of the light source(s) can be easily changed by using auxiliary lighting; or by changing the stage position. Most rostrum cameras are built with two outboard lights. However, when doing 'creative' lighting, if you do not want 'even' lighting from the East to West sides of the stage; you can change the direction of the light source by either rotating the stage—which changes the position of the subject in relation to the direction of the light (s)—or use other lights positioned around the stage.

To accomplish the positioning of extra lights around the stages; you can either use *Pic Stands* or *Pole Cats* with lighting brackets; or other studio lights. For that reason; it is best not to install your rostrum camera in small, closet-like space (which most production houses end-up doing) Rather, the camera should be positioned in a large, open space which will allow for such 'creative' stage illumination; from all around the stage. Remember, the farther the light source is from the subject, the more even the illumination will be on the subject.

In addition; both the bottom and top light sources can be used in combination to achieve some very interesting effects when shooting small, 3-dimensional subjects such as jewelry, machine parts, packaging, etcetera. Such subjects, especially opaque ones, will be 'self-matting.' Any number of different backgrounds can be created behind the subjects—including most of the special effects we have been discussing up to this point. Keep in mind that the top-lit and bottom-lit exposures do not need to be made simultaneously; you can make the top-lit exposure first, then make multiple bottom lit exposures to create different effects.

When making such top and bottom-lit exposures; your subject will probably be placed on glass over the bottom light source. This glass stage can prove troublesome when making the top-lit exposures since it is highly reflective and will tend to reveal the camera staring down on the subject; as well, reflecting any brighter areas of the room or lighting above the stage.

To help prevent unwanted reflections there are several things you can do. First; use a polarizing filter over the lens; that will get rid of most unwanted surface reflections; but usually not all. Polarizing both the light sources and the lens will eliminate even more; but, again, not all.

To eliminate 99%, create a large, black velveteen 'background' board by applying black velvet *Contact Paper* to a 30 X 40-inch sheet of light-weight *Foam Core* board. Cut out a 3-inch diameter circle in the center of the board. Position the board over the rostrum camera lens so that the lens is sticking through the hole and the black (or white or any other color) side of the board is facing the subject. Now the glass stage will reflect the black or colored board. Some modifications of the overall size and/or shape of the board may have to be made to accommodate certain lighting set-ups; but this procedure, or a modification of it, will prove useful in many shooting situations where glass-stage reflections prove especially troublesome. Another way is to paint the camera room—and everything in it (including the lighting stands, wires, etcetera)—dark gray or black so as not to reflect onto the glass stage.

In addition to being able to make multiple registered exposures with different lighting set-ups; top-lit rostrum camera photography is an ideal time to use a wide variety of on-lens special effects filters; such as the Cokin series. 'Multi-image' prism filters, for example, are particularly effective for top-lit applications. By rotating the prism and shooting each step of the rotation, a sequence can be shot for programmed animation in which a circular pattern of four, five or six 'reflections' of a centered subject will spin around the subject. (See pictures; page 3003.) Or, to highlight a portion of a document or page of a book; use two Cokin graduated filters in opposition to each other to create a centralized area of clarity or brightness (see photo, page 2896). Similarly, the 'center spot' type of Cokin filters with either diffused or colored areas (or both) surrounding a clear, centered area, provide an effective means of highlighting pages of books, for example, or portions of 3-dimensional subjects. Glass and shiny metal subjects look good with a fog filter's soft highlights. Textured-silk materials, when shot close-up with a fog filter take on an ethereal, lustrous haze of 'richness.' The list of possible effects goes on and on; and when you start to combine such top-lit shots with registered masks, the possibilities start to multiply on a geometric progression.

Two of my favorite animated effects borrowed from studio work are the "Sweeping-Light Reveal" and the "Light-Up Reveal." In a sequence of slides, a directional light source is flagged to create a 'shaft' of light; and that is 'swept' (moved) across a subject. A variation of that is a shaft that expands to light up and reveal a subject. The beauty of using a rostrum camera stage for such shots is that you can use the camera's projected reticle grid to shoot top-lit objects into specific positions that register with masks or other effects. So, for example, if you want a diamond ring to appear inside its maker's logo, you position the diamond ring according to the logo's coordinates, as projected onto the rostrum camera stage by the reticle grid. Using that technique; subjects small enough to fit inside the master 7.5-field stage area can be positioned on top of neg and pos cels of artwork and through combinations of top-lit and bottom-lit exposures can be DX'd right into graphic special effects.

There are a host of other techniques that are 'easily' accomplished with top-lit rostrum camera photography. Cartoons are an example. You can either go the route of full-fledged animation cels of cartoon characters; or use 'cut outs' and do camera moves on them.

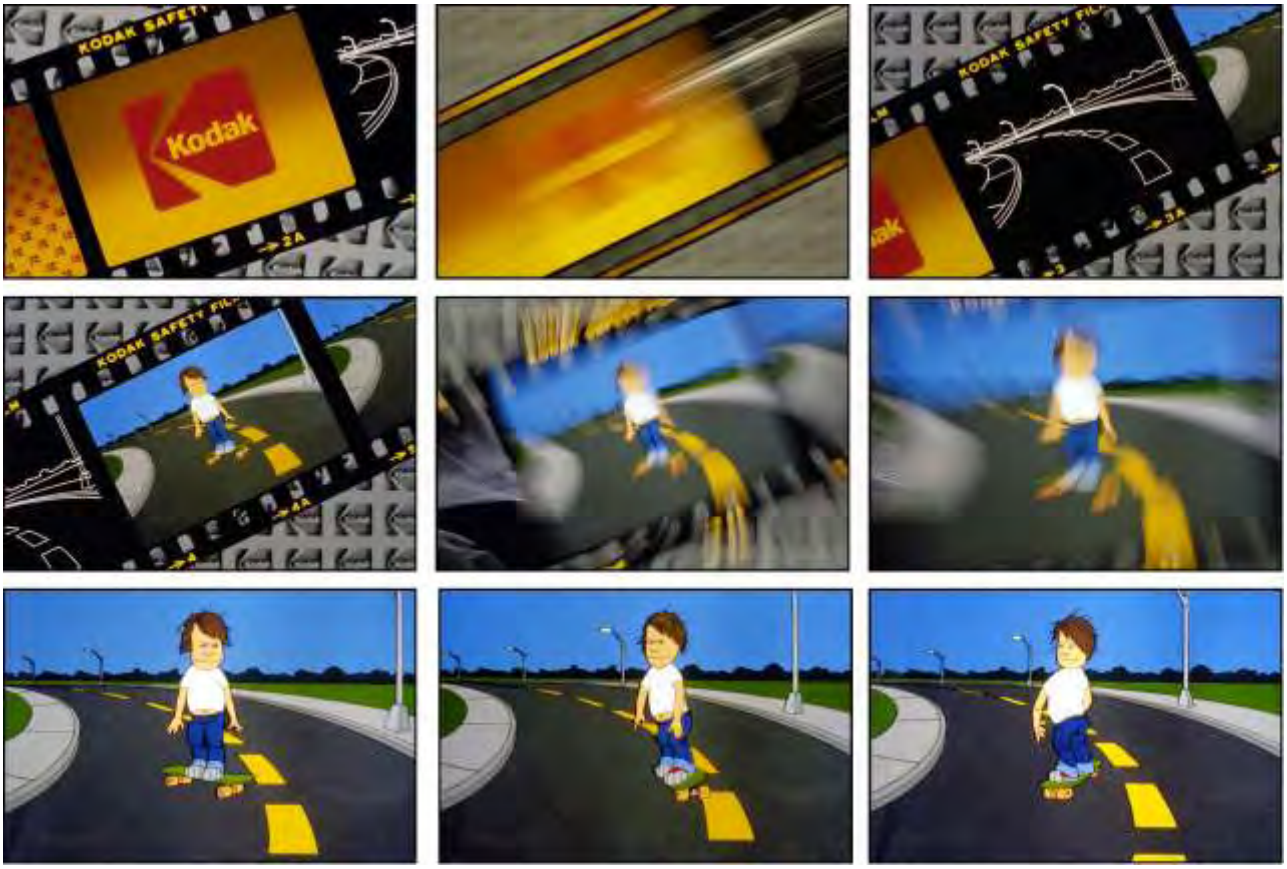
Making full-fledged cartoon cels is, of course, the best (and most expensive route). The cels are made by painting colors onto (the underside of) Oxberry clear acetate animation cels using an airbrush or applied by brushes or sponges.

Using cartoon animation techniques; subjects, or parts of subjects, can be made on a series of overlay cels to achieve animations such as the background passing by a 'moving' car; or a 'talking' mouth, etcetera. Stages with two or more moveable peg bars permit various 'levels' of cels to 'travel' in two different (or similar) directions at two or more different speeds. As I recall, the Walt Disney stage on which most of their elaborate cartoon features were shot, such as *Snow White* and *Bambi*, had 18-levels; with motorized North-South, East-West, and rotation on each level. (!) Rates and directions of movements could be controlled on each level; achieving Disney's realistic-looking animations.

Cartoon-style animation cels can also be used with many of the other special effects procedures we have previously discussed. One of the most dramatic (and early) uses of such combined effects in multi-image was Richard Shipps' *Eagle* computer demo show produced by DD&B studios (Detroit) for AVL. Painted animation cels of an eagle in flight were enhanced with registered, DX'd glowing-highlights. Richard's show used an elaborate series of painted cels to achieve many angles of flight, (including a vast, almighty swoop of the bird, passing by the lens in extreme closeup). There were approximately 150 slides projected at a rate of 9 per second to create a 20-second sequence.



Eagle sequence from Richard Shipps' AVL-demo show, *Freefall 77*. Photographic special effects: Rob Marklewicz
Animation: Tom Hitchcock, Richard Shipps and D.A. Bowen.



Incredible Slidemakers artist, Tim Sali, created the cartoon art for the *Loop-de-Loop* show. Shown above is a 1988 adaptation of Sali's art by John Emms at Incredible Imagers Stockholm studio, for the Kodak demo show, *Got To Be… SAV!.* Top row: In the Kodak show, a strip of film 'advances' to Sali's Kodalith outline version of the skateboard scene (one of the animation test slides). Center row: Colors fill the outline and the filmstrip twist zooms forward to full frame. Bottom row: three frames of Sali's repeatable, six-step-loop animation of the skateboarder.

Many effective animations can be achieved by breaking down a movement into 6, 9, 12, 15 (or more) steps and using looping programs of Alternates (no slide advance). In this manner, an animation can run infinitum with very few slides.

An example of simple loops can be seen in scenes from the Dove D show, "*Here We Go Loop-de-Loop*," produced for Audio Visual Laboratories (AVL).

The Dove-D, predecessor of the Dove-X, was a dissolve unit with a small internal microprocessor and sufficient memory to program loops involving up to 6 projectors with just one set of cues. The Dove-D would then keep repeating the loop until instructed to stop (with a single program cue). Since the object of the show was to reveal how simply you can program loops; we created a series of simple 3 to 6-step cartoon animations.

Because the finished, painted cels were tedious to prepar; careful pencil outline drawings were made of each animation step and tested for realism (using litho-slide copies of the pegged outline drawings) before the finished cel paintings were made (by filling in the outline drawings with paint).In addition to skateboarding, Sali drew animations of a juggler and other circus acts; as well as amusement park attractions including *Tilt-A-Whirl* and Ferris-wheel sequences

Another 'cartoon' approach that is cheap and easy to do—and highly effective on screen—is to carefully cutting out existing cartoon characters and/or scenes from publications; positioning them on overlay cels that are moved over background underlay cels; or colored paper; or black Flint paper. Thusly; a cartoon car might travel across a cartoon landscape; or a cartoon airplane fly across a 'real' (photo) sky; the list goes on and on. And, as with other top-lit rostrum photography; cartoon art can be combined with other bottom-lit special effects; by careful positioning via coordinate points



For a Microsoft show I produced at Watts-Silverstein, in Seattle, cut-out cartoon characters were simply affixed to black Flint paper[3], then zoomed and panned in a series of step-animations. The show was based on the fable of the Three Little Pigs; the story about building your house of bricks on a strong foundation. Using the moral (lesson) of that story as a metaphor; Microsoft pitched the strengths of its operating system.

We used a 15-on-one projection format. Very smooth 15- and 20-slide step-zooms and step-pans were programmed; for rapid-fire, one- and two-second moves on screen. This technique proved to be exceptionally cheap and easy to do; but it looked terrific on screen. The opticals were shot by Bruce Silverstein on an Oxberry Pro II rostrum camera. Microsoft supplied the screen shots of their software. Bruce says that Bill Gates took those pictures. I guess that is possible; Microsoft was still sort of a 'garage operation' then.

When shooting top-lit shiny acetate cels; or scenes on shiny Flint paper; reflections and dust are going to be your two chief enemies. The dust can be gotten rid-off with high-pressure air (be careful to tape the cels down so the air does not blow them off the pegs or "flap" them out of position).

[3] Flint paper has a glossy surface that is especially nice for slide backgrounds because the colors (including black) are more saturated due to the shiny surface. Matte-finish papers have a surface 'tooth' that catches light and makes the colors look flat.

The reflections can be gotten rid of by using diffused light that is polarized at the source and on the lens; and an over-sized "shadow board," as discussed above.

Other sources of aggravations are the white edges of cut-outs pasted on black or dark colored Flint paper. The edges of cut-outs 'catch' the lights, becoming visible.

To avoid that; black-out or color the edges of cut-outs using a black "Magic Marker" and carefully going over the entire outer edge. Since Magic Marker ink will tend to 'blot' into the paper; be sure to test ink absorption on a scrap of the same paper. Running the pen against the paper edge 'fast enough' reduces the amount of blotting. With colored papers, your edge-coloring will have to be far more precise and will have to closely match each color of the cartoon along the edge of the cut-out. For example, if you have a cut out of a man wearing blue pants and a yellow shirt with red shoes and a black hat, you are going to have to 'edge' the blue pants with closely matching blu; the yellow shirt with yellow; the red shoes with red; etcetera. If you simply use black; the art will appear to be outlined when shot against any other color except black.

Similarly, you must make sure that the cut-outs are firmly affixed to the Flint-paper; any edges that lift will also catch light and become visible flaws. To get good adhesion without glue-balls on the edges; apply spray-adhesive on the entire back side before cutting-out pieces of the illustration.

[*Editor*: There are two types of spray adhesives—permanent and the so-called 'workable' type which lets you lift-off and re-cement your cut-outs; that is the type I prefer. You can also use "One Coat" rubber cement; that also lets you lift-off and re-position cut outs. I dilute stock cement with 25-33% (by volume) of rubber-cement thinner. The thinner the coating, the tighter the bond; that means less-visible edges. If you use gobs of glue; the cartoon will stick too firmly to the surface of the cutting board and you will not be able to remove it without edge damage. Use only as much glue as necessary to keep the cut-outs in place. Incidentally, these techniques are also patent for making mechanicals.]

Do the cut-outs on a sheet of linoleum to which the adhesive will not stick. Also, use spray adhesive sparingly and/or thin out the rubber cement (as above). After edging the pre-glued cut-outs; you can position them accurately on the background paper by 'slip sheeting.'

Place a sheet of tracing paper (or vellum) between the cut out and the Flint paper in such a way that only a small portion of the cut-out hangs over the edge of the slip-sheet. Position the cut out where you want it and tack the exposed bit to the Flint by pressing down on it; then gently pull out the slip sheet and rub down the remaining portion of the cut-out. Tip: do not rub the cut-outs; cover them with tissue and rub them down using a burnishing tool; to prevent damage to the surfaces of the cut-outs.

Cut-out edges can also be visually minimized by using a 'ring light' around the camera lens; rather than the camera's side lights. The ring light projects light straight down on the subject so cut-out edges are not as visible. However, with shiny surface illustrations (or flint paper) the ring light will reflect. Hence, that lighting technique can only be used with matte-finished art.

Using those techniques; elaborate montages can be made by cutting out printed pictures in appropriate sizes and assembling them. For a show entitled "*Time,*" produced for Advanced Management Research, Inc. (AMR), we did an elaborate montage of 100 clocks; shot as a 'build-up.' The sequence illustrated how clocks have gotten more and more elaborate since the beginning of 'time' (sorry). On screen, during a six-second span, one little clock in the middle became two; then three; etcetera; ending with the screen completely covered with clocks. It looked great; the build-up was very dramatic; and it was 'simple' to shoot.

First, we bought just about every book published on clocks and collected dozens of magazine clock ads. From those, we culled 100 clock pictures that were all about the same size; 1-2 inches high (~2-5 cm). Then, we used the cut-out procedures outlined above; assembling all of them into their final positions on a 20 X 30-inch [~51 X 76 cm] sheet of Flint paper affixed to foam-core board (for rigidity). Color-edging was done on each cut-out clock to avoid seeing edges on the multi-layer montage.

The finished montage was placed on the camera stage and the camera fielded for the full montage. The board was taped securely into position and the sequence was shot in reverse. The first frame shot was the finished montage with all 100 elements in position. One-by-one; the clocks were removed and a new frame shot. The last frame had the single, centered clock.

The reason you shoot such a sequence in reverse is because it would be almost impossible to shoot the assembly while building it. You wouldn't know for sure where you'd end up on, say, the 80th, or 90th clock. Suppose there weren't enough clocks to fill the field? You would then be 80 or 90 frames into a scene you could not finish (nicely). Starting with the finish gives you the opportunity to perfect the full montage. It is far easier and more accurate to remove elements rather than to build them up. The same applies to studio or rostrum-camera product builds.

Panoramas and Split-Fields

For shows involving overlapped or butting screens; you will have to shoot split-screens and/or soft-edged panoramas. Accomplishing this is especially tedious and inaccurate if you attempt to shoot different sized pieces of art shot in random order (particularly if they are not grouped in size categories). Frankly, doing split-field and panorama shooting is a royal pain in the ass and usually requires twice to three times as long as it takes to do a single-screen show.

However. there are occasions when you must use an overlap format; and on these occasions, you will have to contend yourself with what could be called 'scientific photography,' because the tolerances in split-scene shooting are so slight (especially with soft-edged pans) that any misregistration of elements in your slides will look lousy on screen. How many times, for example, have you seen fuzzy 'lines' between the individual soft-edged slide elements? When they are not perfectly registered, they appear blurry or 'smeared;' or, worse yet, as 'double images.' Or; how many times have you seen multiple-projector montages or effects that do not line up from screen to screen?

To achieve the most accurate splits; they should all be shot at the same time and at the same field; that includes all associated masks and the line-up slides. The ideal procedure is to shoot all the lefts, then all the centers, then all the rights (in the case of a two-screen, center-overlap show).

All rostrum cameras have a certain 'intolerance' (manufacturers call it 'tolerance;' I call it 'intolerance')—usually 1- or 2-thousandths of an inch (< 1 mm). Well, when you are splitting a 35mm slide into three screens, you are operating a microscope camera. A slip of 1/1000th inch will appear as a 0.144-inch [0.365 cm] error when projected onto a 12-foot-wide screen—enough to be visible.

That is why you shoot all lefts; then all centers; then all rights; because if you slide back-and-forth for every split, think of the number of times you are moving the stage—and the number of possibilities for error; or for mechanical intolerances. By shooting lefts first, they will all be consistent with each other; as will all the centers and rights.

And; if the line-up slides and masks are also shot at the same time, all elements of the show will be totally consistent. That means; even if there was 1/1000th-inch intolerance between, say, the center and right screens; the projectors would 'automatically' be aimed correctly since the line-up slides would have the same error; as would all the masks.

To accomplish that; first shoot all scenes destined to be pans into 35mm format. In effect you create a complete 'single screen' show that could be masked for and projected onto a wide format screen. Then, all those 'master' 35mm chips are placed onto a pin-registered 1:1, 35mm stage and split via macrophotography.

Begin by taking a single 35mm line-up slide (you should prepare special line-up slide artwork of a multi-screen grid) and shoot Kodalith tests to determine the correct, micrometer positions on the 1:1 stage for the lefts, centers, and rights. Mount those slides and project them to determine accuracy before shooting the finished splits. You will probably have to dink around a little to get just the right micrometer settings. Once 'locked in,' go to the left-screen micrometer settings and shoot all lefts; etcetera.

For slides with bound-in Kodalith masks (or other) remove the masks before shooting the color scene; and shoot the Kodalith masks separately, on LPD4 reversal line stock. (Using lith film, you will get a negative mask that requires contacting to made a positive—an extra step that is unnecessary with LPD4.).

Obviously, such shoots must be carefully logged and slated since the processed film will come back with hundreds of elements which, if not clearly marked as to their TAB and tray position number, will prove to be a 'jig-saw' puzzle of nightmarish proportions.

Larger rostrum cameras are almost a necessity for shooting accurate splits. With smaller cameras that only take 36-exposure cassettes, frequent re-loading risks losing camera alignment. With the longer 100- and 400-foot film loads used in the larger (sturdier) cameras; you can likely shoot all color splits (on 5071 stock), then all masks (on Kodalith or LPD4) with a single film-cannister change. That means less chance of camera movement.

Shoot the line-up slides at the same time you shoot the other show material; shoot them as Kodalith slides or on color stock. I prefer to shoot the line-ups on Ektachrome; because color film is thicker than Kodalith film. If you focus the projectors using Kodalith line-ups; the color scenes will be slightly out of focus; because the extra thickness of the color film places the image in a different 'focal plane' (in the projector gate).



In addition; I make the line-up slides for the 'top' (Left) projectors in red; the bottom (Right) projectors in blue; and the center projectors in green; then bind the appropriate soft-edged masks into each line-up slide. That way; I get a soft-edged panorama of the line-up grid and can tell from the colors which projector is out of alignment.

Although all the spits are shot from 35mm master slides; do not shoot soft edged masks from 35mm masters. Those should be shot from full, 7.5-field masters to get maximum softness. As previously discussed, when you dupe a soft-edged master you gain contrast and risk 'striping' where the soft-edge-pan elements overlap. Since your 7.5-field master soft-edged-mask art has been pegged into position and tested; you know that it will create a perfect soft-edged blend. Thus, all the softies for the show should be shot at full-field—again, shooting all lefts, then all centers, then all rights. It does not matter that the softies are shot at a different field; all they are doing is 'softening' what's bound with them in the mounts. All that matters is that the softies are shot (and processed) as one batch.

Although this procedure will help ensure consistent registration of all splits in your show, it assumes a 'perfect world' situation—which is seldom the case. You will nearly always find that some scenes will have to be shot at full field or an 'oddball' field. You cannot always shoot everything down to 35mm because sometimes the image degradation you will incur by duping is intolerable. If that is the case, reduce (or blow-up) the original to full, 7.5-field size and shoot the splits of these scenes at the same time you shoot the soft-edged masks.

Multiple DX'd Exposures

Whether creating finished looks on EPY404 or assembling effects elements onto 5071; multiple-DX'd exposures can prove very tricky. As you start to add glows and auras and type burns together, for example, any exposure areas that overlap are getting more and more light; getting closer and closer to burning through completely to 'white' (clear). Thus, even though your Bible may give you specific exposures for specific elements; those exposures will vary as layer upon layer of exposures is laid down on the film. Because of that; you will have to test and retest multiple-DXs to determine the right exposures for the colors you want.

Generally speaking; the more exposures, the lower each exposure must be. For example: double-exposing a simple burn of blue into a blue glow requires about half the burn exposure of a blue burn onto unexposed film. If also adding blue glitter to the burn areas, the exposure for the burn will probably turn out to be up to two stops lower and the glitter exposure about half what would be required for 'stand-alone' blue glitter. (At the risk of being overly repetitious; keep adding all good test results to your Effects Bible, with appropriate notations, for future reference.)

Tone-Range Hi-Con Dissolves

This is an interesting effect that is easily crated. To make it, take any original 35mm color slide and create a series of "tone-range masks." After aligning the rostrum camera to a true 1:1; shoot a bracketed series of exposures on either lith film or 5302. On the processed negs; notice that in the low-end bracket, only the highlights appear. On the next bracket, some of the mid-range tones start to appear; and on subsequent brackets more and more mid-range tones appear. Select the number of steps you want from the brackets and reverse them on either lith or 5302 to create positives. Now you have a series of clear 'windows' against a black field that will successively reveal more and more of the original. Now, dupe the original and bind in a dupe with each tone-range mask. Program them with rapid cuts; or with 1-second dissolves that are 'stepped on' (by using only 1/10th-second waits with or without "Smooth Go" for a more blended, less 'staccato' effect. The last slide in the sequence should be the unmasked scene.

Using Panorama Cameras

There are several panorama cameras on the market which shoot on either 35mm or 70 stock. Some rotate a full 360-degrees, others 180 or less.

The cheapest is the *Widelux*, a swing-lens camera built by Panon Camera Shoho. It shoots about 140 degrees of rotation onto 35mm stock delivering a 24 X 56 mm neg or pos (a 'normal' 35mm slide frame is 24 X 36 mm) with little or no distortion. A medium-format, using 120-size film, has a 150-degree view and makes 50 X 120 mm pictures.



Another is the the rotating *Hulcherama* camera which uses 120- or 220-size film and a 35mm lens to shoot scenes up to 360-degrees. The pictures are 2.25 X 9-inches (~57 X 225 mm).



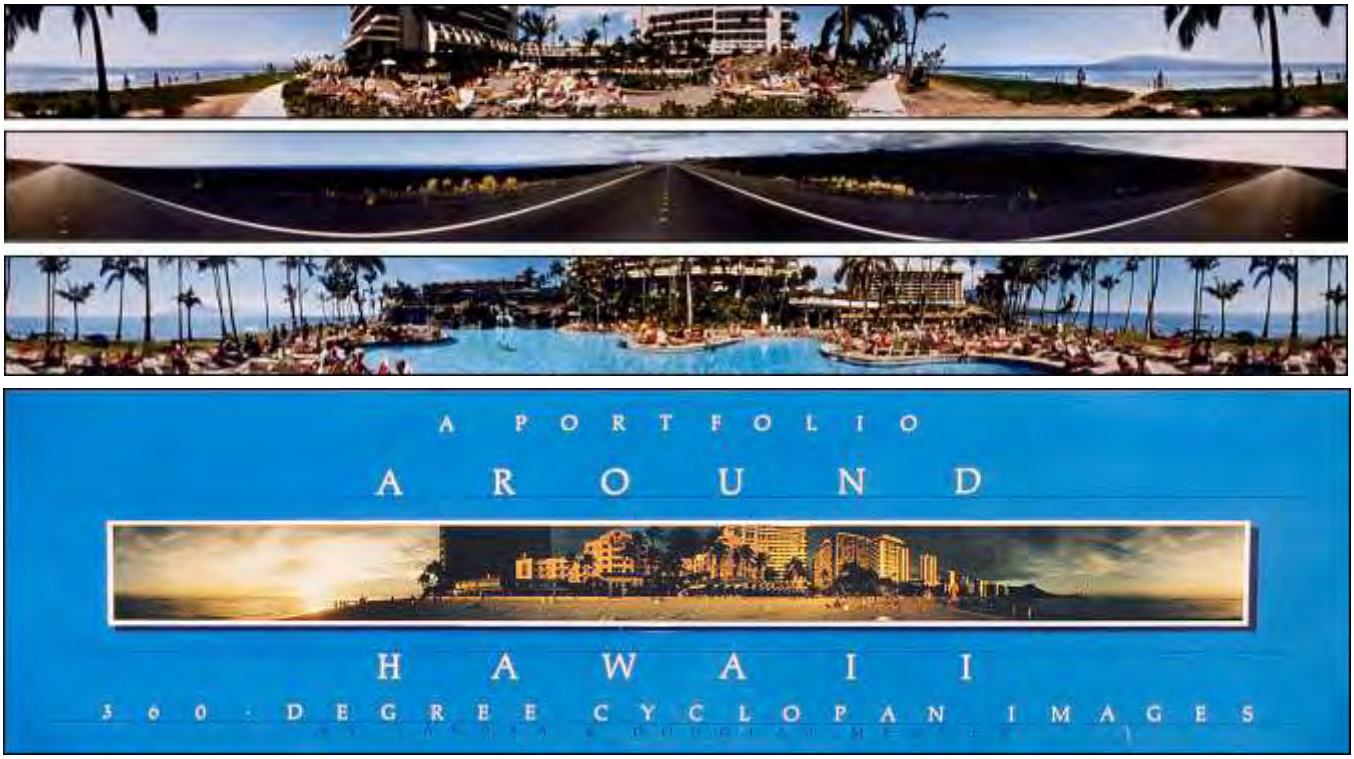


Finally, there is the Cyclopan, which I use.

It shoots 100-foot loads of 70mm film and has three Zeiss lenses—100-, 150- and 210 mm—that deliver pictures ranging from 19 to 52 inches long (~48 to 132 cm) for a full, 360-degree rotation.

With such long lenses, the images are free of 'distortion.' I place 'distortion' in quote marks because the camera rotates.

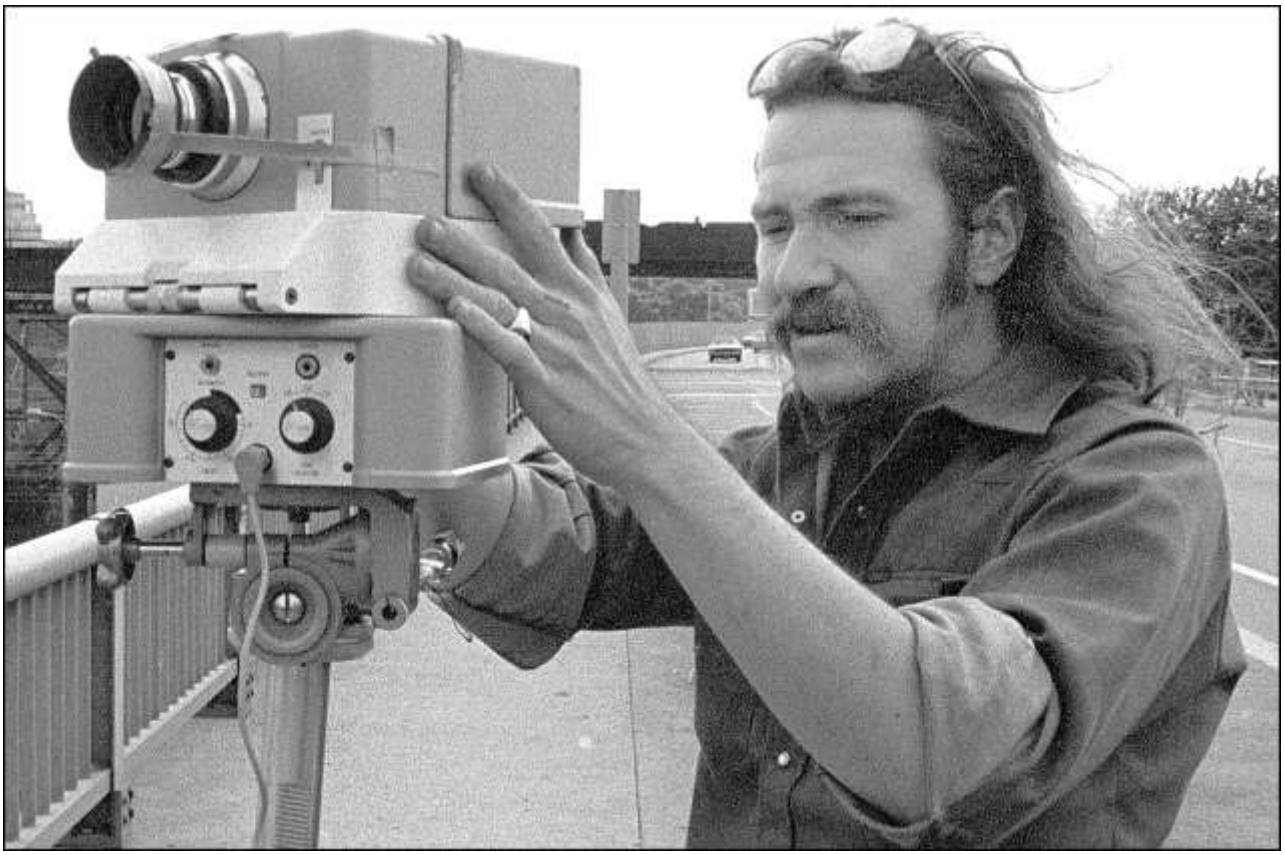
As it swings around, whatever is close distorts with curvature, as can be seen in the photos below; particularly the center one, of the highway between Mona Kea and Mona Loa volcanoes on the Big Island of Hawaii. The distortion is only noticeable when Cyclopan pictures are laid flat. However, if they were projected on a circular screen, there would be no distortion at all.



See all 47 Hawaiian Panoramas in Volume Four, beginning on page 572.

When projected against a flat screen, you get 'foreground bulge.' The only way to correct such curvature would be to project onto a curved-field screen in a perfectly circular 360-degree format that matches the camera's shooting field. The making of such shows is expensive and difficult at best. The extreme width of the long, skinny pictures is problematic from a production standpoint; because the East-West movement of most compound tables is limited to about 20 inches [~51 cm].





Yours Truly photographing the Philadelphia skyline in 1975. (Note lens cap held on with tape.)

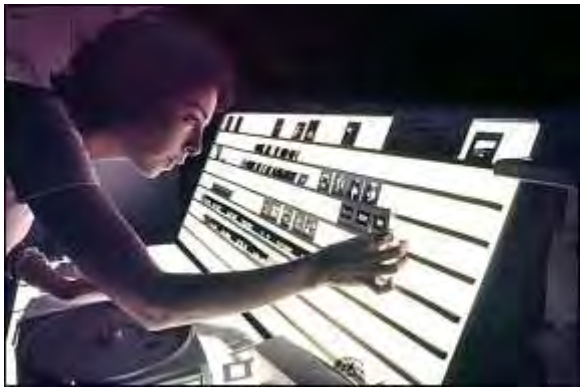


Yours Truly at Yankee Stadium; photographing the Sun Myung Moon rally in 1974. Pat Billings took the shot (or Dona).



Those were the days… photographing the Kauai coast in 1981; on assignment shooting condos for Vacations International.

SHOW ASSEMBLY PROCEDURES



Assembling a multi-image show can be a nightmare if not handled properly. There are so many little pieces to the puzzle that it is hard for anyone to keep track of them all. Especially with complex shows that have lots of over-projection elements; it is difficult to distinguish one from another; or which way is up. You might find yourself holding a slide of a little blob and asking yourself, "What is this and where does it belong?"

Catherine Kunicki pre-edits a show at Incredible Slidemakers studio.

Or, a complex animation might have fallen off the light table without having been numbered, requiring a lot of time to get back into order.

In the assembly of a show, it is the 'little' things that count. Those little things can be a real pain in the ass during production; but you will appreciative them during show assembly.

If you have done your production work properly; you have a write-on side version of the show and a very complete technical storyboard that accounts for every slide in the show and lists its components. That 'Show Bible' will be your single most important assembly tool.

The next important procedure is to slate each shot (or sequence) as it is produced; both location shoots and rostrum camera photography; including masks. The on-camera slate should list the TAB number as well as the individual component number. Note that there are three types of slates: one for location work; one for full-field rostrum camera work; and a third for 1:1 rostrum work and/or pans shot from 35mm chips.

When numbering each slide, include the TAB number; as in, TB37G. Also include the tray number as well as the tray position number; as in, 2C43.

Slates should be shot as often as necessary for complete understanding of what is contained on each roll of film. When a given roll comes back from the lab; it should go through a pre-editing process. The pre-edit identifies the correct exposure and sheets the transparencies in the order of the show; according to the Show Bible.

The very best frame for each slide is Wess mounted and labeled according to its TAB number and tray position (that information is detailed in the master technical storyboard). When cutting the film(s), the slate(s) will tell you which way is up and which sprocket holes to cut between. For those reasons, camera slates should be written on a light-colored background.

Slates should key back to the shooting log and the log should indicate any shooting errors. Thus, by counting the frames from slate to slate on the exposed film; and by referring to any error-box checks noted in the log; the film editor and/or mounter can identify shooting errors which may not *appear* to be incorrect. You might not easily differentiate an erroneous slide from a correct one on a roll with effects shot against a black BG.

The shooting log and master technical storyboard will allow you to accurately locate all slide elements of the show; and the pre-edit process will separate the best exposures for each slide element.

As slides are deemed 0K, pre-edited, and mounted; start to assemble the show in plastic slide sheets; in the running order of the show (according to the master technical storyboard). Each slide should be clearly marked, as detailed above. Extra exposures should be sheeted in the same order; clearly marked as to what components they are.

Arrange to cut your film so that the slates remain attached to the over-matter frames; that way the over-matter sheets can be filed in the running order of the show and replacement frames can be easily located if they are needed.

The worst thing you can do is just throw all the overmatter in a big envelope for filing 'later-on.' Later-on will almost certainly never happen; if and when it does, the over matter won't be in order; and finding an individual element will be all the more difficult.

I have had occasions where I spent hours and went batty looking for little unmarked over-projection elements for complex moves that were 'filed' willy-nilly; after a while all the elements look the same. As long as you are going through the process of marking the slides that are mounted, it takes only a moment longer to mark extras at the same time and sheet them in show order.

As the edited slides are mounted, labelled, and sheeted; check-off their readiness status in the master technical storyboard and immediately inform the camera department of any missing elements. It is rare that a show is entirely shot without some missing elements—usually obscure little things that are critical for an effect.

Since the masks for a given job are usually shot separately from the color material; mark in the master storyboard which slides need masks. That way you can go ahead with the pre-edit and sheeting of the base slides; then go back and bind-in the masks as they become ready. Masks should be slated as they are shot and filed in show order along with the color materials.

Part of the problem of assembling a show—and the need for a pre-edit—is the sheer volume of material that is shot. Usually, you will be operating on anything from a 6- to a 10-to-1 ratio. That is a lot of film; especially for a big, multi-projector show. Do not save it all up for one big mounting session at the conclusion of all shooting. You will go nuts if you do and will be less able to spot errors as they occur.

As individual sequences are completed and checked-off in the master storyboard, you may wish to drop them into trays and have a look at them to satisfy yourself as to their accuracy and impact. This is easily done if you have prepared a write-on slide version of the show—you simply replace the write-on slides. (Put the write-on slide in the color-slide's sheet pocket.) Or, if you do not wish to disturb the write on version; create a second set of trays. That is also easily done because the master storyboard lists the tray position for each slide in the show.

It is important that the assembly team for a given show remain consistent. In an ideal world, a single person would be the editor, show assembler, and quality-control manager. More realistically, you should assign one person to be the assembly team leader. That person supervises all mounters and reports back to the chief camera operator with any problems that are spotted or encountered.



Left to right: Nancy Pearson, Jan Irish and Pat Billings assemble a Burger King show at Incredible Slidemakers, New York.

In my shop, by the time a show was ready to be mounted and assembled, we often got just about everyone in on the act. Those were interesting times with many of the staff sitting around a large light table; rummaging through hundreds of feet of film. Some of the table gossip was priceless (and a real insight about how people were thinking). I often thought about not being present at those sessions; leaving hidden tape recorder to capture the commentary for later 'analysis.' I could have easily known what the staff was 'sore' about. (I never did that.)

In other instances; I used to employ freelance mounters on big jobs. On one hand, that was the worst of all worlds; and the best of all worlds on the other. The good part was that the freelancers wanted the employment and so they tended to do the job better—that is, with more attention to detail—than a member of my staff, who considered slide mounting a pain in the ass. On the other hand; the freelancers were not familiar with the show; they were slower than staff personnel.







There should be a chief assembler whose job is to supervise the others and create the necessary lists of problems, reshoots, etcetera. It is imperative that the chief assembler be totally familiar with the show and all its parts.

That person should preview all mask and exposure tests with the camera department to become familiar with the subtle photographic nuances in the effects and be able to identify them on the bulk rolls coming back from the lab, without anyone in the camera department.

The team leader/supervisor should also be thoroughly briefed by the creative director and programmer as to how the show is supposed to look and what the programing steps are for each sequence. The assembly supervisor should also be able to access the projection grid and pre-test any questionable sequences without the programmer.

As you can appreciate; the supervising assembly person's job is a bit more involved than it seems and requires a degree more 'intelligence' than the average client night suspect. It is not just slapping film into mounts; it is the final piecing together of the 'puzzle.'

Top: Grace Napoleon. Center, L-R: Rocky Graziano, Jim Casey, Grace Napoleon, Nicole Clark.
Painting by Chris McDevitt.

As in other aspects of materials sorting and storage; I use the red/blue method of separating masters from copies (either duplicate originals, or dupes per se). The master show is assembled in trays with red bands around them. That way, 'anyone' would know it is a master tray and treat it with all due respect.

When we knew that we were going to want a house copy of a show; that copy was simultaneously assembled along with the client's master. It is one hell of a pain to go back after the fact and re-assemble another copy of a show. It may not even be worth the effort. But when assembled simultaneously with the master, the pain is tolerable.

Sometimes we were asked to provide multiple copies of a show. In those instances; all copies were simultaneously assembled and all trays checked against the master set. That is easily accomplished by using your Eagle and projection grid.

Say you are making five copies of the show. Place six projectors side by side. Assign these projectors on the Eagle as 1- through 6-Left. Place the master tray on 1-Left and the copies on 2- through 6-Left. Program all trays for simultaneous advance—PF (projector forward) 123456-Left. In that manner; the original and all five copies of each slide are simultaneously displayed at once, side-by-side, on the screen. Not only can you spot any quality differentials; but also any tray-loading errors (there are always some of those).

That simultaneous tray-checking procedure will save you a lot of time; even if it does tie-up your master grid for a while. It beats the hell out of checking each tray against the master separately—think of the time. With a big enough grid and one Eagle you could simultaneously check 29 copies against the master trays.

Another major decision you must make is, what over matter (if any) you should save. My policy was to try to throw out as much as possible. Even with that policy, I have still managed to end up with a slide library of over a million images.

That archive is quite an albatross at this point. It occupies over 900 three-ring binders that, when stretched end-to-end, require over 300-feet of shelf space; and they are heavy books since a lot of the slides are in glass mounts.



In 1986, the image archive at Incredible Imagers' studio in Stockholm contained less than half of my original slide library, as of 1982. In 1985, I moved the archive from storage in Hawaii, to Stockholm. There, it was edited while I worked at AVC. (See Volume Thee).

If I had to go back through it all today, I would probably pitch at least 50%; maybe 75%. But that is the benefit of hind-sight.

[*Editor*: I did, in 1985, when half the library was purged. See picture caption; page 3051.]

I would suggest that you hold the overmatter of a given show into a six-month 'quarantine'—sheeted-up; in order; in ring binders. After six months; go back through the books and determine what slides are valuable enough to keep. If you have an on-going relationship with the client, you will probably want to save most of the material because it may have an 'afterlife' in another show for the same client. [*Editor*: Or maybe print promotions for which you might be able to collect additional 'use rights' fees.]

If the show was a one-off; determine whether you think the specific visual(s) or sequence(s) might have use in another show at another time (and if you have the use rights for those visuals). If so, keep them and pitch the rest. Or, consider whether a given visual might eventually have sone 'historical' value as a stock photo—in a quarter- or half-century hence, might you or your heirs benefit from the value of these historical photos? If so, save them; if not, out they go.

Creating a useable library from all your overmatter is its own challenge. As mentioned earlier; I once hired a professional librarian to sort things out and fired her six-months later when I realized the situation was hopeless. The Dewey Decimal System may be appropriate for published books; but it is way to complicated for a picture library.

Unless you want to be in the library business; simply number each book of over-matter, and keep a log of the contents of each book (possibly computerized). If you can afford to, keep a staff position open for library maintenance.

Along those lines; do not overlook the possibility of selling rights to your originals through stock houses. You will be collecting a lot of pictures over the years and those pictures can be earning you a small fortune in stock-picture sales to both print media and other multi-image houses. If you go that route; you will need some way of 'policing' it. Keep accurate records as to which shots are in whose hands.

Trying to run your own 'stock house' is super laborious. My friend, Allan Seiden, tries to do this with his own extensive collection of travel shots from around the world—and ends up spending about half his time just keeping after 'who has what;' to say nothing of who has *used* what.

If you are seriously considering doing that; link-up with a reputable stock house (such as Image Bank, if they will accept you). Let them do the work; they already have a clientele. For your own records, simply keep a tally of what you submit to them. The simplest way is to sheet all the slides and shoot a copy slide of each sheet (like a cheap microfiche). Have the stock house initial a Xerox'd 'microfiche' of the slide sheets they received. Easy peazy.

As far as slide mounting is concerned; some of my views are considered a bit heretical. For example: I recommend that you do not spend hours of time making sure that every slide you mount is meticulously spot-free and clean.

I have seen production houses that have hospital-like slide mounting facilities; dust-free chambers with people in white coats squirting air and surgically slicing film frames. All this is well and good—particularly for slowly-dissolving, multi-screen pans where folks get a good look at any possible dirt.

On the other hand, many of the sequences in your show may be high-speed ones when 'no-one' will see the dirt or dust; they will hardly even see each frame (hahaha). Because. of that, I recommend that you superficially clean all slides during the pre-edit session.

By 'superficially' I do not mean sloppily. You still (unfortunately) must hand wipe and blow each Wess mount; and you still must blow and wipe each frame of film; but you don't have to be fanatical at this point. Just get them basically clean and positioned in the trays. There is plenty of time for further cleaning later; and in the crux of assembly, an absolutely-clean slide is the least of your worries. Your main considerations are to get all the slides shot properly and the master trays assembled.

Once the master trays have been assembled; your next biggest job is to take a good hard look at the show and change any of the visuals or sequences that aren't 'up to speed.' Get those situations corrected right away.

With all the final corrections done and the show 'approved' internally; screen it for the client and (hopefully) get the client's approval. (Although I would not; you can point-out that the slides aren't yet cleaned, if you wish.) Deal with any client-specified changes, modifications, or other corrections. When the show is finally complete; go through it 'at speed' a few times with the assembly team leader and identify which slides need cleaning.

Notice that a certain 'priority' for cleanliness is determined by how long you actually see a given slide. After watching the whole show a few time; go through it and stop the program each time you see an offensive slide; mark the tray position as noted on the Eagle monitor. It is then a simple matter to go through each set of trays, find the offenders and clean the shit out of them.

After the cleaning process; re-screen the show to make sure the disassembled slides have been reassembled correctly and that the show still works.

A 'rationalization' for this philosophy is that dust is inevitable in multi-image work. Consider the slide-projector and slide-mount situation: essentially what you are doing is inserting non-airtight glass sandwiches into a machine which blows hot, dust-filled air over them. Without a doubt some of the air-borne soot, dust and dirt will seep into the Wess mounts; so will humidity, cigarette smoke and other air pollutants. And there is absolutely nothing you can do about that except periodically clean each show and try to have the projection rigs of permanent installations in rooms with filtered-air.

Considering that aspect; plus the fact that a show in the assembly stages goes through a lot of handling; it is pointless to try to get everything super clean up front; you'll inevitably end-up re-cleaning the show anyway; so why bother to be fetishistic; save your fanaticism until it counts—showtime.

Mark the last cleaning date on each set of trays; just as you would label each tape deck with the date of its last head-cleaning. That way you will be able to forewarn clients if they are seeing a 'dirty' show. It is better to forewarn them than apologize after the fact. Clients and prospects measure you on cleanliness. (Remember when some dumb-shit would ask the teacher if spelling counted on an exam?)

Finally; aside from numbering each slide as to its tray position, you should have a marking system on the top of each slide in the tray to indicate whether it is loaded for front or rear projection; together with a label on each tray to indicate how each tray is loaded (i.e., front or rear). The former serves to identify any slides in the tray that have not been 'flipped'. The latter indicates which trays have been completed.

The simplest way to do that is to take a Magic Marker and mark the outer-most edge of each slide in the *front* projection mode. The marks form a visible ring around the slides in the tray. When the slides are set for rear projection, the ring will appear on the inside; any gaps in the ring will identify un-flipped slides. And vice versa for an RP show, *naturalment*.



One night rather late—an evening spent with my old friend, Johnny Walker—I sat in front of our 30-projector grid; just watching it; the Eagle monitors glowing in the dimly lit projection room; the Doves, with their LED's aglow and twinkling; listening to the low roar of projectors ready to spring to life at the touch of my fingertips. That was usually inspiring; it gave me a feeling of control; a kind of 'security.' But that night my security melted into a black hole of *ennui*; a hopeless despair. I looked at the grid and saw it as a monster—a misfit in our modern world of (tele)communications technology; a dinosaur whose time was nearly up.



Who took this 1979 picture? Possibly, it's a 'selfie.'

For a moment, I experienced the fear that most clients must feel when they looked at great heaps of equipment and wondered: "Will—can—this really work?" I looked at all the wires; all the machines; and I said to myself: "This is nuts!"

The probabilities of getting from point A to point B are really touch and go in this business. There are so many machines involved that the chances of failure are almost too overwhelming to be considered practical, to say nothing of 'safe.' Sure, all through the last decade we saw amazing progress in the area of 'fail-safe' multi-image shows; but we are far from being fail safe; and every time I have had to recommend a communications package to a client who required a fail-safe show, I never felt good about recommending multi-image. Lately I have stopped such recommendations cold, in favor of multiplexed multi-image that is transferred onto other, more fail-safe projection equipment; e.g., film and video.

For a long time, I have also felt that multi-image is a bit of a 'fad' in the world of corporate communications. The fad began in the mid-1970s with the introduction of computerized slide-programming mechanisms. Suddenly the 'pain' of programming was removed and virtually anyone could easily perform screen trickery that was once the exclusive domain of a few, very few, 'pioneer' programmers; like David Fellowes and Richard Shipps, whose merciless bouts with earlier punch tape programmers and primitive dissolves produced screen effects that were nothing short of miraculous.

When AVL released the Eagle, David lamented to me one afternoon; that he expected to soon be out of work. (He was.) When I inquired why; he replied that, with Eagle, effects that he had spent days, perhaps weeks working out, were at everyone's fingertips. There would soon no longer be any need for a professional programmer, such as himself.




Left: Richard Shipps and Yours Truly taught at an AVL Institute in Manilla, Philippines, organized by Bryan King.
Right: a 1974 photograph of himself courtesy of David Felloes.

Indeed, David was not very far from the truth; and now it is a fact that virtually any bozo can program a show. That does not mean it will be a 'good' show—whatever that means—but at least there will be a show, and it will be 'reliable.'

With increasingly sophisticated programming gear and rostrum cameras came the birth of the multi-image industry. The rest is history. AMI, founded in 1974 by college professors; with a handful of academic colleagues and a few student afficionados; swelled to 2000+ members at of the turn of the decade; and they predict 4000 by 1985. I feel that the reverse will be the case. What will ultimately happen to multi-image is what happened to industrial filmmakers around 1970.

If you can find a copy of the New York City Yellow Pages for 1970; look up the category of "Industrial Filmmakers;" then compare it to "Audio Visual." You will see that there were scores of filmmakers and just a handful of AV producers. There was no such category as "Slide Shows." In 1970 the term "multi-image" was virtually unheard of; there were a few producers of multi-*media* shows; but that was it. AV, for the most part, was a communications medium for schools.

[*Editor*: See Ken Burke's extensive History of Multi-Image 1900-1972 in Volume Ten of *An Incredible Epic* and his book, *The Art of Multi-Image*, in (forthcoming) Volume Twelve.]

Then, lo and behold, multi-image came of age; with real price advantages for buyers of audiovisual shows. Whereas film production cost about $3,000 per minute to produce in the early 70s; a good multi-image show could be had for about 1/3 that cost. (That was before 'special effects,' soft-edged panoramas, and the like; those embellishments have driven the production costs for multi-image high enough to match or exceed film). In addition; back in 1970, multi-image was fresh and new; very few people had seen multi-image shows, so they 'automatically' had higher impact than film.

So, what happened?

The obvious. A scan of the 1980 New York Yellow Pages will reveal a handful of film producers and a plethora of AV producers. The industrial film became a dinosaur and gave way to multi-image. Just about every company had to upgrade from a single projector to at least two or three; just to be 'contemporary' in their presentation techniques. More and more multi-image production companies were spawned in this burgeoning market because the few producers there were could not keep up with the demand. Long days and endless weeks were endured by underpaid production staffs; making slide shows for the 'fun of it.'

Then, as happens in any industry, but particularly in the communications business; some of the employees left to start-up their own businesses; a second generation of production companies emerged; often proving themselves highly innovative and competitive against the established production houses.

Then a third tier developed as employees of the second-generation houses left to form their own studios. I reckon that today there are two producers for every available job.

Today the multi-image market is flooded with producers. The medium has also lost much of the 'magic' it once enjoyed; because so many companies have already used multi-image shows; they want a 'fresh' approach. That desire for 'something new' is relentless among my fashion- and beauty-industry clients.

To make matters worse; there are so many hungry producers—most of whom are quite capable of making an adequate show, if not a great one—that the price of services has generally declined (through competitive bidding) to the point where it is hard for producers to make good shows and make money. That economic hardship, by itself, is going to force a lot of production houses out of business. [*Editor*: It did. There was a monster recession in the early 1980s.]

Then, there is the 'freshness' and 'economy' of today's sophisticated video productions. And on top of that; keep in mind that the country's economic environment is very inflationary; on the verge of a major recession. All together, that sounds the death knell for multi-image as we know it today; as we knew it years ago.

Driving in the coffin nails deeper is the cost of staging a multi-image show; that is enormous compared to a film or video projection.

So, what will happen next? Will multi-image just fade away?

No, I do not think so. But I do not think it will ever be what it once was, either.

Video will win, hands down. The benefits of video production are so numerous and undeniable that it must win. The only thing holding back video right now is the inability to project a large, *quality* image. Aside from that single drawback; video has everything going for it. But who in the multi-image business has the capital to launch a major video production studio? Very few.

I reckon that by 1990 the average company meeting or new-product launch will be staged by 'multi-image TV'—a bank of video projectors hooked up to teleconferencing satellites; video-taped, 'canned' modules; computers storing all 'speaker support' graphs and titles; and 'live action' cameras on stage. The composite of all these video inputs will be projected onto vast screens by laser-powered projectors capable of creating four-color TV-scan lines using high-speed, rotating, variable-pitch prism wheels; or some other system. Slides will be virtually unheard of. At that point, multi-image will regress to what it was in the first place. A highly-imaginative 'artsy-fartsy' medium. [*Editor*: I was off by ten years; but that is pretty much what has happened.]

Hooray!?

There will always be multi-image shows, just as there will always be feature films; but they will increasingly become the exception, not the rule; and the few productions created by the surviving production houses will have to be exceptionally high caliber.

The dilemma for today is how to survive in a shrinking market.

One solution to the dilemma lies in "multiplexed" slides that are transferred onto film or videotape. Around the world; multiplexing is pumping new life into a lot of multi-image production houses.

In Australia, for example, the philosophy of Lindsay Rodda, Director of Sonargraphics Multimedia, is a bit ahead of its time; but starting to pay off. Lindsay is a true believer of multi-image's capabilities; he is also an accomplished motion picture producer.

Lindsay was one of the first to recognize the potentials of multiplexed slides; for a simple reason—he 'had to.' You see, in Australia, the population is only 15 million. That is like taking the population of New York City and spreading it across a continent bigger than the U.S.A. and Canada combined. Simply put, the Australian market is not large enough to support big-budget multi-image shows.

Australian budgets are generally about 1/5th as large as American. Given such meager amounts; Lindsay does not like to spend it hauling a lot of AV gear across the vast stretches of Australian wilderness to play to an audience of, say, 50 people. That would cut too deeply into the monies available to actually produce the show. Thus, he often produces a show in multi-image, then transfers it to film for staging. So have a lot of other producers.

However, Lindsay's productions are generally a notch above the average because he artistically intercuts between 'live' film footage and multiplexed slides; and, importantly, he conceives of the multi-image segments as parts of a movie, not as a multi-image show. On top of that; the show is usually transferred onto 35mm film; excellent image quality is maintained.

I share Lindsay's excitement about the benefits of multiplexed slides to create film sequences. One advantage is that the sequences can be completely OK'd by the client before committing them to film. That, Lindsay contends, is perhaps the single biggest benefit.

Then, from the stand point of staging; multiplexed slides win hands down over a full-fledged multi-image. show. Simply put, there is no 'cost effective' way of screening a twelve projector multi-image show 30-feet wide (on average); but that is 'easily' done using a 35mm motion-picture projector.

Lindsay's contention is that the new market for multi-image will be to provide a fresh new look for films and videos. Hooray for that, too! I would certainly like to be in on some of the budgets that are allocated for TV commercials and shows. And with some 800 or so new cable-TV stations opening, to say nothing of global TV hookups, can you imagine the residuals? So, I welcome the opportunity to produce super-high-class image sequences and shows for this burgeoning new TV market.

To summarize: the producers of today that want to be the producers of tomorrow had better recognize that multi-image will succumb to video and appropriately readjust their production philosophies, resources, and practices to accommodate the growing video portion of the communications industry.

Probably the hardest part of producing a show for multiplexing is the 'philosophical' difference between multi-image and film or video; actually, the differences between those media is psychological as well as philosophical.

The psychological element that once made multi-image the king of new media is now creating its downfall—it isn't 'new' anymore; people have seen it; they know what it can be; and they expect more all the time. But there are limits to what can be produced on a given budget.

In the 'old days,' it was easy to win-over an audience with multi-image. Folks would walk into the screening rooms, see a bunch of slide projectors, and expect to see a 'clunker' or 'two-second dissolve' show. When the slides started to flash and/or animate; they were amazed— "That's slides?" was a typical response. Today, audiences demand amazement.

People's expectations are different for film or video than they are for slides. For example: how many times have you seen a (badly produced) late-night commercial made with slides. Ever notice how it stands out like a sore thumb form the other film or video commercials and inevitably looks like a 'cheapy'? That is usually because it is slow, like a 'typical' slideshow.

When you see network TV you are exposed to productions funded by astronomical amounts of money (compared to multi-image). Likewise Hollywood movies. Their special effects are *special* effects. All the slide wizardry in the world cannot compare. It does not matter that a given slide sequence was created using 73 masks and 103 projectors; all that matters is what is on the screen.

Only another producer would be impressed by all the 'slide technology;' the audience would only be impressed by the image on the screen and its singular impact. If that image is better on TV or film; that is what will impress them.

However; multi-image can be an ideal video or film input. Commercials produced for MCA (record company) by Image Stream are a good case in point. Far from being the usual late night cheapy; those commercials are as good as any produced by conventional film or video methodology. I first saw them at AMI's West Coast convention in 1980; and I was blown away. I knew then that slides were 'made' for TV.

To produce the commercials; Chris Korody and his head cameraman, Ted Iserman, had little to work with. The only 'art' available for any of the commercials was a few record-album covers and some publicity photos of the featured artists taken by celebrity photographers. That was not much to go on, to say the least; but by effectively combining high-speed programing; camera moves; and special effects—in and around the album covers; highlighting their graphic elements—the slide-commercials took on an animated life of their own; and a 'new look' for video.

The key to success in that case was Korody's inherent understanding of the difference between a multi-image show and a TV commercial. TV commercials are fast moving visual feasts; they are linear presentations of a clear, easily discernable messages.

Virtually all video or film commercials are more or less like that; they are attempting to convey as much information as possible in the least amount of time and with the most possible impact. On the other hand; many multi-image shows are produced as 'think pieces' with 'stream of consciousness techniques.' Film and video are generally more 'informational' than multi-image.

Like Lindsay and Chris; the producer who wants to enter the film and video market has to undergo a mental shift and start thinking in film and video terms. Whereas this will be a relatively simple transition for most; many will not ever fully understand the differences between multi-image and film or video.

For example: I used to hire very accomplished print-media art directors to handle multi-image design assignments. But I found that print people are often so fixated on the single-image approach that they cannot cope with having to move from one image to the next. A television-commercial art director will rarely want to 'pause' more than a split-second on any given scene without something 'happening.'

The average slide show makes a 'dull' movie or TV show; because you expect the TV show or film to 'move;' to change frequently. It is precisely this ever-changing quality of film and video that must be assessed and understood fully before producing multi-image sequences for these media.

The bottom line of this 'philosophical' discussion is that to effectively produce multi-image for film or video you will have to pull out all the stops and produce shows full of special effects and camera moves. In a word, you will need all the 'pizzazz' that you can muster. And even then, you will likely be depressed when you see your multi-image film or video stacked up against 'real' film or video. Again, slide shows make dull films or videos.

However; you can combine slide sequences with 'real' film and/or video; employ the special-effects those media conjure together with your own slide imagery; a synthesis of both.

Consider your multi-image work as one more 'envelope' of video or film input. The same way a video special-effects generator can manipulate any image—creating flips, spins, wipes, impositions, multi-screen effects, etcetera, *ad infinitum*—it can create those effects using your slides.

Likewise; if a motion picture optical printer is employed in a multi-image film transfer; a whole new range of optical effects can be added; heightening the total on-screen effect. Thus; an animated slide sequence can be flipped, twisted, wiped, etcetera. Or; using an animation (rostrum) camera; a given slide can be panned across, zoomed into, or otherwise manipulated. All these film and video effects and more can be blended and mixed with multi-image work to create an entirely new style of multi-image-based film and video communications.

The main consideration is to 'keep it moving.' You should think in terms of synthesizing the total palate of effects provided by all the media. To do that you should take a tour of all the optical houses and video production facilities in your neighborhood and bone-up on what can be done at what costs.

You will probably be amazed to see how simple (and cheap) it is to create some of the same screen effects that are difficult and costly to create with slides. With multiplexed slides, however, all these techniques are at your fingertips. After gaining knowledge of what can be done using other media, you will also have to get used to thinking 'segmentally.'

In multi-image life is simple; if the soundtrack 'needs' eight seconds of visuals and we have only one slide we can always do an eight-second dissolve. Not so in film or video (if you want your audience to remain awake). By segmented thinking I mean analyzing every scene of the show in far more detail than you ever have before. What can you do instead of the eight-second dissolve?

Simultaneously consider the best production technique—optical printer (film), special-effects generator (video), or computerized slides? What will look the best and (hopefully) cost the least to get the desired effect? Do not be too proud of slides; when an optical printer or SEG (Special Effects Generator) may be able to do better effects.

Another more practical reason for segmented thinking has to do with maintaining slide registration. Having been involved in transfers since before Buhl came out with the *Project Six* multiplexer; I once designed an elaborate tunnel in which 15 projectors would shoot images through 12-inch lenses (30 cm) welded into position on a rack separated from the projectors (to avoid any lens shake); projecting their 'registered' images onto a tiny, 2 x 3-foot (60 X 90 cm) RP (rear projection) screen; that a film or video camera would shoot. The point of the tunnel was to use long, long lenses far, far from the screen; to achieve the best possible registration.

Earlier; I experimented with 'off the wall' transfers onto film. The results were never quite what was anticipated in terms of quality because the film camera was usually running 'wide open' and we were pushing the filmstock a tad to boot. We needed a brighter image to avoid reciprocity failure and get exposures to the point where pushing the film during development was not required.

In those days; I recall explaining to clients that the transferred version would not be 'quite the same' as the original slideshow for X, Y and Z reasons, (and a few more).

The worst phenomenon was (and is) misregistered slides. For some odd reason; we are more 'forgiving' of misregistration when we see a slide show than when we see a film or video version of it. Again; expectations are different with film and video than they are with slides; you simply do not expect to see misregistration in film or video; but are used to seeing it in multi-image.

With slides, misregistration is a fact of life which simply cannot be avoided or denied. It will always exist. The reasons for that were previously enumerated and the blame can be placed on equipment 'intolerances.' The fact is that one minute into any multi-image show you have lost whatever 'perfect' registration you started with. You have seen this happen; I am sure. If you have not already (or 'just for laughs'); check the registration *after* you screen a show. Basically, all you can hope for with multi-image projection is to be close. But that is_not close enough in film and video.

Most misregistration occurs because various portions of shows are shot at various times. Little slips in the shooting of special-effects art, dupes, masks, etcetera, all add up. Plus; separately-produced line-up slides are frequently used to aim the projectors. The result is, some sequences will be in register, others will not. To achieve the closest thing to perfect registrations throughout the show; all scenes would have to be shot by the same camera at the same time on the same roll of film. That is impossible; so, the best you can hope for is good registration in a given batch, or sequence. Hence 'segmented thinking.'

Do not think that you will be able to plop a show on a multiplexer table and 'lock-up' in perfect registration throughout. That will be far from the case.

While in Australia, working for Sonargraphics; my wife, Sandra, and I produced several 12-on-one slide modules for a Ford-Australia new-car launch. The modules were designed for transfer from the outset; you can be sure that every effort was made to keep registration perfect. Even so; there were slight mis-registrations as each module proceeded from section to section. And, sure enough, those misregistration's were 'magnified' in the transfer process.

We had to go back and reshoot certain sequences; lining them up individually and shooting them as a series of 'segments;' making sure that each segment was registered to itself. That is how you should approach the filming or videotaping of any multi-image show. You cannot just run the whole show from start to finish and expect everything to lock up; it won't. Shoot each scene separately—like any film or video producer would do—making sure that each sequence is as close to perfect registration as possible. Then; recompose all the segments using traditional film and videotape editing procedures.

You do not necessarily have to segment every slide sequence being transferred; but you will probably have to realign certain segments to achieve a more perfect result. How many sequences must be separated will depend on the subject material of the show. Animated elements of a technical diagram would have to be far more critically registered than a slowly dissolving sequence of different flower pictures. Similarly, a show involving soft-edged pans would need critical line-up.

However; I do not suggest you transfer panoramic scenes composed of multiple soft-edged slides. The reasons for that are two-fold: First, panoramic shows do not 'fit' film or video formats; they appear as a stripe across the middle of the screen; a lot of details are lost, making them hard to watch.

Secondly, any inconsistencies between the softies, the scene elements, and/or the brightness (or color) of the projector lamps will be exaggerated on the film or video transfer; you will notice the separate parts of a panorama more than you would watching the same material as a multi-image show.

Again; little flaws are more 'acceptable' in a multi-image show than they are on film or video. Just as it is not practical to dupe a soft-edged slide with the soft-edged mask in place; it is not practical to transfer these effects either.

That is because the exposure through the feathered edge of the mask will vary according to the slide sandwiched with the mask. The degree of feathering will not be as consistent as it is utilizing the original masks bound in with the slides. Thus, the areas of overlap become more noticeable and you will probably find that objectionable.

It is for that reason, too, that shows for multiplexing should be designed with the multiplex process in mind from the start. In other words; if you know that the show will be transferred, do not design any panoramic scenes where one continuous image is composed of several slides with feathered edges. Montages of different soft-edge elements look good; but continuous scenes do not.

While designing the show, keep the screen ratio of the final product in mind. Motion picture and video screen ratios are considerably different from slides. The slide ratio is, as you know, 2:3. Motion picture ratios are usually either the 4:3 "Academy" standard or 1.85:1; and video is 4:3

When shooting scenes for a multiplexed slide show; mark the screen ratio on your rostrum (and location) camera reticle grid (if they do not already show grid lines that are "TV safe"). With Nikons, for example, a 35mm lith of the final screen ratio can be trimmed and cemented to the camera's focus screen using clear nail polish.

That can also be accomplished on the Forox and other sophisticated rostrum cameras by either cementing or taping a lith or LPD4 positive of the screen ratio to the reticle grid. Such masks make visualizing the crop much easier.

Another way is by using an in-camera mask placed on registration pins on the aperture itself. Placing a mask of the final screen ratio on your focusing grids will prevent any possibility of accidentally shooting material outside 'live' area. Video apertures crop 35mm apertures on both the X and Y axis; more so than film.

Multiplexed shows look better when they fill the entire screen of the film or video format. How many times have you seen a transferred slideshow where the top and bottom of the film or video screen had to be left blank to accommodate the extra width of the slide ratio? Does not look too good, does it?

Multi-screen shows—the extra wide ones in particular—look even worse; you end up with a thin little ribbon of image across the TV or film screen; that looks ridiculous. You may be able to 'get away' with that for transfers made to simply keep a record of a show; or for transfers made to obtain a long-distance approval. But in terms of a final product, I find that transfers of wide-screen shows just don't hold up well enough to satisfy the average audience.

Again; if you know that you are going to be transferring the show and that the transferred version is important to the client; design the show for transfer right from the start. If you must have a wide-screen show for the original performance; perhaps design it so that the center screen area can be 'lifted' (as intact as possible) for the transfer without impinging on the quality or content of the wide screen show. That means 'subordinating' the extreme left and right screen areas to the center throughout the show; and keeping all titles and informational slides within the transfer ratio of the center-screen area.

A good screen configuration for such a show would be a 3/9/3 projection format—better yet, a 3/12/3 set up—for a two-screen, center overlap presentation. Or a 3/3/6/3/3 format for an even wider overlap show. The idea is to only multiplex the center screen material; and design that material to fill the film or video aperture(s).

Designing for such multi-ratio shows is not as easy as it seems. For Sonargraphics; I was asked to design a show that would simultaneously work as:

- Single-screen slide show with a 2:3 ratio
- 1:1.85-ratio 35mm motion picture
- 3:4-ratio videotape presentation.

That turned out to be a very ticklish situation since, on the one hand, everything had to look good in a wide ratio and simultaneously keep all important visuals cropped only for the center 'square' area that would be seen in the videotape version.

Any 'critical' portions of each visual had to occupy only the most central square. That would have been OK if we had budgeted for original shooting. But in this case; a large portion of the visuals were top-lit art 'borrowed' from a wide variety of books and magazines; cropped for vertically.

When designing a show for multiplexing, it is also a good idea to use as many projectors as possible; this relates back to the fact that your multiplexed show will have to be as lively as possible to make it visually 'acceptable' in its transferred form.

Use a professional transfer service and a true aerial-imaging multiplex system to make any film conversions of your shows. Video conversions can be made 'off the wall' because the video medium is inherently more 'forgiving' than film; but even in the case of a video transfer, the results will be better if the show is shot an aerial-imaging multiplexer.

Currently, there are three 'sizes' of professional multiplexing tables available: John Stapsy runs a 12-projector table at Aerial Image Transfer Service in Pennsylvania. Ed McTighe runs a 9-projector unit at Slide Transfer Service in New Jersey. And there are a host of 6-projector Buhl tables around, as well as a few custom-built jobs.



Photo of his 12-port multiplexer courtesy of John Stapsy, Aerial Image Transfer Service.

An aerial-imaging multiplexer is basically a solid table on which the projectors are 'locked' into position. Their projected images are gathered through a series of prisms and beam-splitters and 'collected' by one 'field' lens. Since, aside from the field lens, there are no other lenses involved, and since the projectors are locked into position, registration is considerably greater than any attempt to shoot 'off the wall;' or any light-reflecting or light-transmitting (rear-projection) surface; using projection lenses (most of which are not high-quality lenses by professional optical standards).

In addition; because there is no screen, aerial-image systems are totally optical: the light passes directly from the projector(s) into the camera. That delivers an image that is far brighter and sharper than it would be if it were projected onto a screen; photographed by reflected light. What that means is that the camera can operate at a higher f-stop; that gets the camera lens into a sharper 'zone' than operating wide open (as you often have to do with an 'off the wall' transfer). The contrast range will also be better.

Then too; with the higher light level, you can use a slower-speed film stock and won't have to push the film in processing. That results in a better image quality than with an off-the-wall process; when you are operating at the edge of reciprocity failure.

To digress, about reciprocity failure: "Reciprocity failure, also called the Schwarzschild effect, is the term used to describe photographic film's non-linear response to low light exposure. What it means is that once the light levels reaching the film drop below a certain threshold, the effective sensitivity of the emulsion decreases. This is most often encountered in night photography, or when long exposure times are desirable for artistic effects. Large format photographers often run into reciprocity failure problems due to the fact that view cameras are routinely used at f/22 or higher.

"Some films are better than others. There are emulsions like Fuji Acros that exhibit no reciprocity failure effects up to 2 minutes metered exposure. At the other extreme, Fomapan 100 requires 8x correction at just 10 seconds metered. For any film you use, you can consult the manufacturer's data sheet for reciprocity failure compensation factors.

"For most commercially available film, reciprocity failure kicks in at about the 1 second exposure mark. This means that if your light meter says you need to expose for anything above 1 second, you need to include reciprocity failure compensation. This probably sounds a bit abstract, so let's look at some examples.

"You are shooting a night cityscape from a tripod. You are using an SLR with a 35mm lens and Kodak T-MAX 400 film. You've decided that you need an aperture of f/5.6 to get the correct depth of field. Your light meter says that you need to expose the film for 10 seconds to get a proper exposure. According to Kodak's data sheet, T-MAX 400 requires 1/2 stop reciprocity factor at 10 seconds. This translates into a 15 second exposure to avoid reciprocity failure."

[https://lensnotes.com/photography/reciprocity-failure/]

For video transfers; a brighter light source means that you will not have to use the 6 or 12 db 'gain' function on the camera; or otherwise boost the signal strength—resulting in a better-quality image.

Finally; professional transfer operations are constantly 'tweaking' the light sources in their projectors to a level of accuracy that would be nearly impossible for you to match in your own studio. That means each projector is delivering an equal amount of light, at a consistent Kelvin temperature. As you likely know; projection lamps deliver less and less light as they get older; and the color of the light shifts toward red as the lamp ages. Making matters worse, the reflectors in carousel and SAV projectors are crappy little pieces of metal that are seldom 'aimed' to provide even light cross the entire slide field; they are almost inevitably mis-aimed, making their projections brighter on one side than the other. Or they may have a 'hot spot' in the center.
You rarely notice that in a projected show because your eye 'adjusts' for it. But this uneven light source will become very noticeable in a transfer.

To adjust for mis-aimed projector reflectors you must re-aim the metal reflector in each projector to get the light as centered as possible and/or glue a small mirror onto the metal reflector.

You can also slip a three-inch square of Rosco *Tough Rolux* diffusion material just aft of the collection condenser lens in the projector and before the reflector. This diffusion material will even out the edge-to-edge brightness of the light source and help prevent hot-spotting—it will also decrease the light source brilliance by about two stops.

Sound like a pain so far? It is.

But there is more!

The ELH and ENG lamps used in carousel projectors all deliver different colors of light; even when new. Again, you rarely 'see' this in a multi-image show; but you will see it in the transfer.

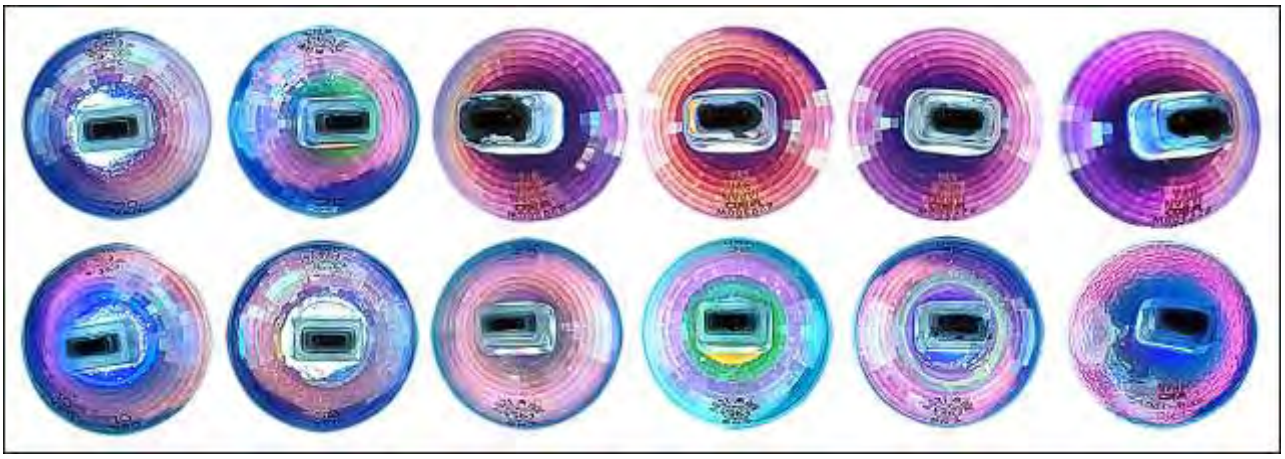


Photo of ENG and EXR slide projector lamps on an LED light table; by Steve Michelson.

To discover what colors your lamps are burning; remove them from the Carousels and place them upside-down on a light box. By looking 'through' the reflectors of the lamps, from directly above them, you will see how some will appear greenish, others pink, and still others blueish. What will startle you the most is the amount of difference between the lamps. For a better transfer you must use the same brand of lamps; all the same age; all the same color.

Once you have a matched set of lamps in your reflector-aimed, 'diffused-light' projectors; check the evenness of the field-illumination by scanning a spot meter across each projected slide field. Use Wess mounts into which you have bound pieces of Rosco *Tough Rolux* or *Tough Frost*. Slip those 'diffusion slides' into the projector gates and project them (one by one) onto the 'screen' (professional multiplexers have a small ground glass 'screen' that is inserted just ahead of the field lens, to permit alignment and focusing, then removed for shooting. Scan the spot meter across the entire shooting field and check for even il illumination; make whatever corrections are necessary. Tedious.

With even illumination achieved; run a color-balance test for the projector light sources by using both the diffusion slides and 'China-girl' slides. (China girl slides have a picture of a face (for flesh tones) as well as a grey scale and color bars. They are shot at the head of a roll to check exposure and processing accuracy. See pictures; page 2830.)

Mark the projector number on each 'diffusion slide' with a black pentel; similarly, mark the projector number on the China-girl slides. (To avoid damaging the China girls, bind-in clear-acetate chips with the number(s) marked on them.) Shoot several seconds of film or videotape for each projector using the diffusion slides first, then the China girls.

The resulting film or video will reveal any color and exposure differences between the projectors. Those are corrected by using Kodak three-inch (7.5 cm), gelatine CC (color correction) and neutral density filters. Slip the necessary filters in front of each projector's lens or 'light funnel.'

You will find that it will be necessary to test and retest for each transfer you make; because the light output and color of the lamps in all the projectors will constantly be changing with age. As previously mentioned, video is a lot more forgiving than film; in fact, it is so forgiving that you can usually simply project your show onto a front-projection screen and shoot it; with passable results.

The key to a good video transfer lies in the quality of the camera. Cheap cameras simply will not do; you must use a high-quality camera (usually priced in the $40,000 to $50,000 range). If you scrimp on that; your results will show it. We used to get passable results using an Ikegami; an $80,000.00 camera (rented for our transfer sessions).

You should consult with your own video production house to determine whether you should be shooting in 'Quad' or onto one-inch (2.5 cm) tape for subsequent editing and/or special effects applications in the video studio.

One-inch tape will provide a sufficiently good master for just about any applications you may have. But if your show is going on network TV; you may need Quad to obtain maximum "broadcast quality."

3/4-inch (~2 cm) tape systems are OK for cassettes being used by the client in small meetings; but they will not provide you with good enough quality for broadcast. It is far better to make a one-inch master then transfer it down to 3/4 or 1/2-inch (~1.25 cm) copies.

As for motion picture cameras; there is a wide range to choose from; but only a few will really do the job well. Here, your choice will depend a lot on what your final product is to be.

Image Stability

If you want to achieve the ultimate in image stability, you should use a pin-registered motion picture camera like a Mitchell (if you can get your hands on one). Image stability plays a more important role in a transferred show than it does in 'live-action' footage. [John Stapsy uses a modified Mitchell.]

'Instability,' which you see as image 'wiggle,' results from minor 'shifts' in the placement of each frame over the aperture at the instant of each exposure. Such shifting is result of 'intolerances' in the camera's film transport systems and/or the shutter/aperture gate tolerances. Face it, at 24 frames per second, there is no way that each frame will be exactly in the same position relative to the last one or the next without the aid of a pin-registered system to make certain it is in exactly the correct position.

Unless you use a pin-registered camera you will be able to see the instability of the image on the screen; it will tend to minutely jump up and down or back and forth; or both. You do not notice this as much in a 'real' movie since the subjects are generally moving around so much that you are distracted and do not see the image shifting. However, when you have a 'constant' visual element on the screen for any length of time, as you do when holding on a given slide, a shifting image position becomes more noticeable; not necessarily objectionable, but definitely noticeable.

The above should not necessarily scare you from using an Arri, or similar camera. That is what we used to make most of our transfers at Incredible; and they were all perfectly acceptable. However; having seen the results of a Mitchell (provided by Aerial Image Transfer Service) I am convinced that it is the better way to go.

Crystal Synch



Incredible Slidemakers' manager, John Bromberg, with a Nagra tape recorder in a 1980 promotional joke shot.

Basically. any good quality professional motion picture camera such as an Arriflex or Eclair can be used in the multiplexing process. The only critical stipulation is that the camera have "crystal synch;" to synchronize the soundtrack with the visuals.

Crystal synch is a method of keeping the operating speed of the camera and tape deck constant throughout the transfer process. This is accomplished with the aid of a crystal's vibrations.

By clocking the crystals' vibes; the speed of the motors in the movie camera and tape deck can be slaved together; running in perfect synch—at exactly the same speeds—during the filming process. Crystal synch also ensures that your camera is filming at the proper speed (24 frames per second); and that the speed will not 'drift' during filming.

While filming the show you simultaneously re-record the soundtrack onto a crystal-synch tape recorder, such as a Nagra (see picture, above). You end up with a ribbon of film and a ribbon of recording tape that are locked together with crystal-synch speed controls. The Nagra tape is then transferred to either 35mm or 16mm recording tape so that it can be synched to the edited motion picture; and finally converted to an optical track; 'printed' onto the film along with the visuals. Thus; the soundtrack goes through several generations before it gets onto the film; so it is important to make sure that you have a good, clear soundtrack before beginning the transfer process.

Soundtrack Preparation



As noted above, the soundtrack goes through several dubs in the production of a transfer. For that reason, you should start with a clean, 'flat' track that's had the shit compressed out of it.

The frequency response of the best optical tracks is nowhere near the response of a good tape deck, which would be 50 Hz to 20,000 Hz (cycles per second).

That means you are just not going to get any deep, deep bases or stinging-high treble; thus, when preparing your original track, go for a mix that favors the mid-range and avoid a lot of top and bottom.

[*Editor*: Incredible's audio studio evolved organically as we became more involved in multi-image. There was no plan; it was a learning process. It looks more disorganized than it was. Everything was interconnected through Teac patch bays using 'amateur' RCA cables; professional audio technicians would have been appalled; but it worked. This picture was taken in 1978, the year before the rig was moved across the room, to make room for more gear (see picture, page 2753).]

While mixing; use small studio monitors that allow you to hear a 'little' version of the mix, instead of the 'big' sound of the full-scale studio monitors. (I use Auratone desktop speakers.)

The dubbing procedures your soundtrack goes through subject it to myriad forms of distortions. Base frequencies (especially between 60 and 200 Hz) tend to build with each dub, eventually getting 'cloudy.' High frequencies, on the other hand, tend to get more 'distant' with each successive dub—except high-sibilance sounds, like the letter "S". 'Esses' can become sharp hissing noises that are distracting and annoying. It is a good idea, therefore, to us a Dynamic Syllabic Controller (aka, 'de-esser') when preparing the original track; and in the transfer buss.

Output your tape player (say, Teac) to the de-esser. Output the de-esser to a crystal-synch Nagra. It is also a good idea to use an equalizer in the same buss (between the Teac and the de-esser) to record the best possible sound on the Nagra. Generally, you will want to boost the top a little (in the 10K range) while holding back on the bottom (particularly in the 60-200 Hz range)

Although a compressor can be added to the buss (between the de-esser and the Nagra), most compression should be done when mixing the master show (though a little extra in the transfer process will not hurt).

These are the same kinds of signal processors that are used by film labs when dubbing your Nagra tape onto 16mm or 35mm tape stock; as well as when creating the optical track. Although the film lab can make a lot of the same adjustments (and will), you are better off going in with a 'clean' track that you're happy with rather than put up with variations based on someone else's ears.

In addition; correction of quality loss gets harder with each successive dub; so it is important to hang onto as much quality as you can at each dubbing stage. DBX and/or Dolby can also be utilized; however, there are not many DBX or Dolby projection systems around (except for major motion picture theaters); so discuss that with your film lab or transfer house before applying those 'cleansing agents' to your track.

'Balancing' Visuals

As far as visuals are concerned; the transfer process can be, at times, quite unforgiving and intolerant of extremes. Essentially, you will run into the same familiar problems that you encounter when duping; except that in the transfer process these problems are intensified because you have little or no exposure control.

A motion picture camera is 'locked' at 24 frames per second (fps); that equates to a 1/50th of a second exposure. It is impractical to think of changing f-stops while the camera is rolling—you likely cannot 'keep-up' with a show and adjust exposure smoothly enough or quickly enough.

If you film your show in segments, as recommended; then, of course, you can modify the exposures in any way you see fit. However, you will never have the same degree of controls you have when preparing a duplicate slide. In general, you must ensure that all the slides have mid-range densities that do not vary more than one f-stop.

Extremes of light and dark colors should be handled gingerly or avoided altogether. Dark colors, particularly dark blues, and greens, will tend to get lost. Medium dark greens and blues will get noticeably darker. Light colors will tend to get even lighter with very light ones bleaching out entirely. This is particularly true when making a video transfer where your available color palate is reduced still more due to the inability of television cameras and sets to record and/or playback all colors. Subtle shades outside the mid range will simply not be 'seen' by the camera.

You cannot use a camera's 'automatic' exposure either; because it will not be able to respond fast enough to slide changes and you will be able to 'see' it make adjustments; particularly on a fast-paced show that cuts back and forth rapidly between bright and dark scenes.

You are better off using a fixed f-stop and dealing with any particularly offensive slides by either duping them lighter or gelling them darker with neutral-density gels. The process of gelling slides that are too light and duping up ones that are too dark is a real pain in the butt that is a virtual necessity on all shows that are to be successfully transferred—unless they have been designed so perfectly that all the densities fall within the boundaries of the one-stop exposure variation required for a high-quality transfer.

Think of the transfer process as being like a super finicky slide duper that only gives you one exposure. Slides requiring anything but the 'normal' exposure when being duped will certainly require either gelling with neutral density or duping up to a lighter density to be successfully transferred.

For gelling, use Kodaks 3-inch square (~7.5 cm) ND gels. Those can be cut to size and registration-punched (with a Wess film cutter); then bound into the Wess mounts. You can get some idea of whether that will be necessary by previewing each slide; scanning it with a light meter of densitometer; making sure it is within an acceptable exposure range.

Sometimes, of course, you are going to have entire sequences made up of slides that fall outside of normal density ranges. In such cases you can film those sequence separately, with a modified exposure, then edit them into the transfer using standard film or video editing procedures.

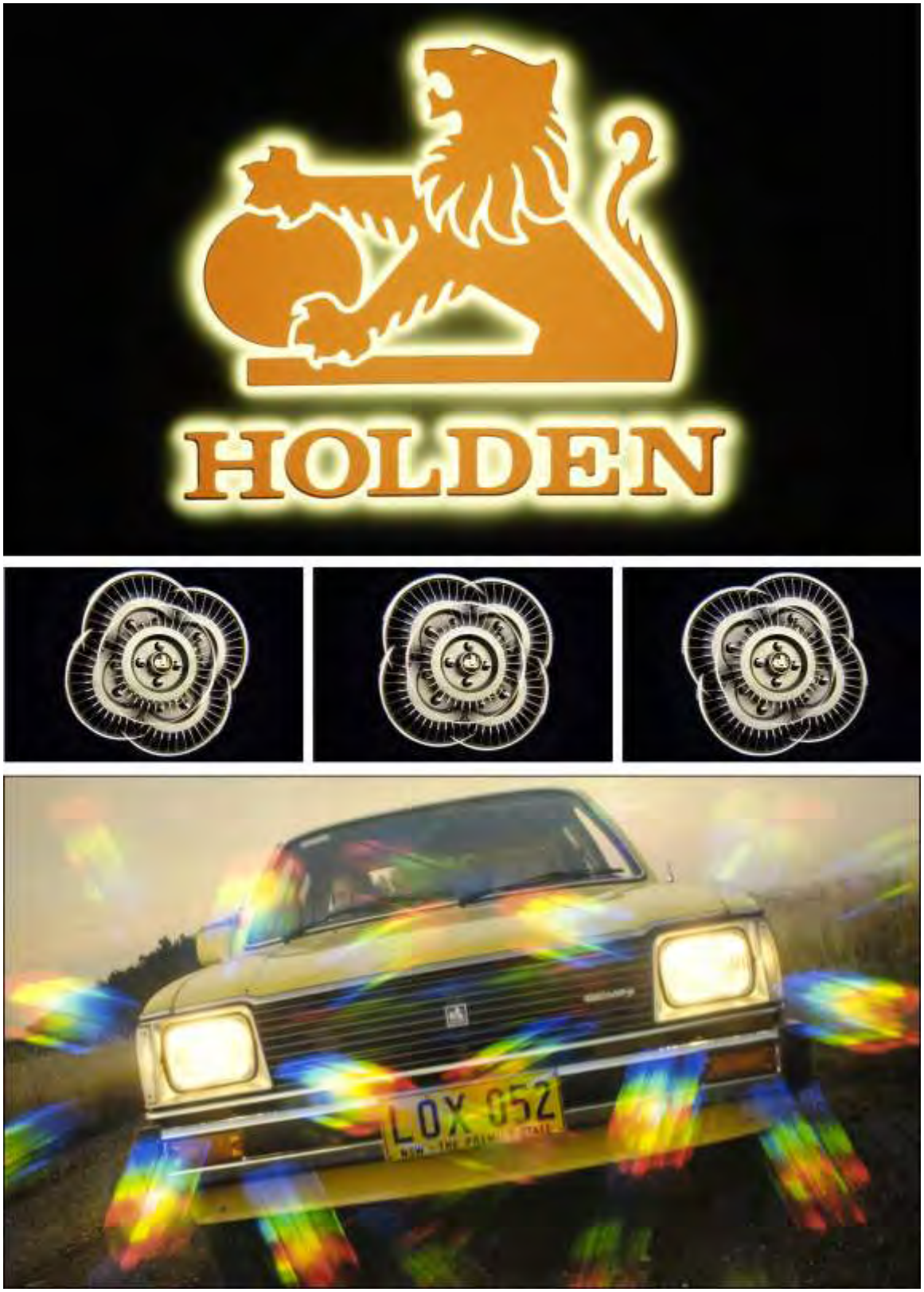
That will almost certainly be the case where you have special-effects sequences that involve numerous projectors. You might, for example, have a complex logo sequence in which there is a base logo on one slide, then nine others with flashing glows, glitter-fills, stars, and the like. In that case; the collective light of nine projectors is being exposed onto the film or videotape; the result will probably be overexposed (as compared to a single-slide exposure). Rather than gel-down all the slides in such a sequence, it would probably be easier to shoot the sequence separately at a higher f-stop and edit it into the film or videotape.

One such case was a show I worked on in Melbourne. It was produced by Sonargraphics Multimedia for Ford Australia to launch their new Laser, Fairmont and Falcon XE models. The main show was transferred in its entirety to 35mm motion picture film. (We also made panoramic content for the launch (see pictures).





Two screens were used for the launch show—an upstage scrim covered the entire proscenium and a panoramic, front-projection screen hung above the cars, downstage.



The Ford show's notoriety bolstered Sonargraphics reputation as a producer of events and a foothold on the automotive market. Holden (General Motors) soon hired Sonargraphics for their new-model launch event. We only got the car to shoot for one day. With unimpressive surroundings and overcast skies, I turned to my 'fruitcake' filters to save the shoot. Above: Holden logo; notice the misregistration due to sizing misfits caused by cel-thickness differences. Center: Spinning wheel covers effect done with Samigon 5-face prism. Below: Spiralite *Variburst* filter distracts from mundane background.

[*Editor*: John Emms did the rostrum-camera work for both the Ford and Holden shows. Before that, he'd never heard of a 'rostrum camera;' but he was a terrific photographer; a technical guy who shot pictures of things like a bullet stopped in mid air. I saw those pictures at John's job interview for the position of rostrum cameraman at Sonargraphics. Hiring a cameraman was my responsibility; in my position of consultant to Lindsay Rodda, da boss.

Lindsay and I made our deal over long-distance phone. It was only when I arrived in Melbourne that I discovered that 'dat boss' knew absolutely nothing about multi-image; nor did anyone on his staff of twelve apprentices. Lindsay was a delegator; a film producer. My job was to teach his acolytes how to make multi-image shows. What better way than to dive right into the deepest part of the pool—produce a car-launch show. I tried; but 'work ethic' (an oxymoron, in this case) was non existent; the employees assigned to me had chips on their shoulders. They left promptly at 17:00 (and nothing got done after 16:00); they weren't getting paid enough to stay longer (or learn), said they.

When I explained to Lindsay that his Ford show was at risk for lack of a rostrum camera operator—and camera (!)—a help wanted ad was placed in the *Age* (Australia's most prestigious newspaper) the very next day. That led to my meeting with Emms; and his employment. John was a joy to work with; Sandra and I befriended him right away. Rented Forox time at a commercial lab across town (CPL, 117 Thistlethwaite Street, South Melbourne); it was inconvenient; but our only option. I showed John some Forox basics—like how to shoot glows, auras and stars—and he took it from there.

When I left Australia and worked at Image Stream, in Los Angeles, I persuaded Chris Korody to hire John. Ironically, John arrived just as I was out the door, seeking greener pastures in Vancouver, BC; but finding them in Sweden; where John and I connected again for the Scandinavian iteration of Incredible. That story and more about Sonargraphics can be found in Volume Four.



John Emms and Yours Truly at the entrance to Hornsgatan 100; the Stockholm studio of Incredible Imagers.

The multiplexed Ford show involved major 'engineering' sections which detailed how the car's new engine and suspension features worked. The visuals for these sections were slightly glowed line-art drawings of engine and suspension components shot against a black field with a slight blue gradient tone toward the bottom of the field.

The 'base' car diagram was done in a low blue glow, and the new components were low-glowed amber lines. Overall, the slides were dark in appearance; had they been scanned with a light meter or densitometer, they would have fallen outside of 'range.' However, they could not be duped lighter or the blue and yellow glows would burn out and the background of the slides become greyish green.

What to do? Again, test.

Scenes such as this will often be found to dupe (or be transferred) at normal exposure since the glowed lines are within 'range.' The total slide may appear to be too dark; but isn't. However, if your film (or video) tests reveal that those slides are transferring too dark, you will probably have to film them separately using a slightly wider lens aperture.



Dirt and dust are the biggest bugaboos when transferring slide shows; it is very noticeable on the cine or TV screen. Slide-show buffs are accustomed to seeing a little dust now and then; they are 'forgiving.'

But we are making a movie (or TV show); dirt will not do!

However, dirt is almost impossible to get rid of.

We gave-away hundreds of *No Charge for Dust* buttons at NAVA exhibitions and AMI events; they were a much-sought-after item. Button shown is actual size.

The other nemesis—imperfectly exposed scenes—are equally frustrating; especially 'normal' scenes which, because they are normal, make it obvious if they are too light or too dark. Again; when you see a slide show, your eye 'adjusts' somewhat for exposure differentials. But the camera does not lie. [*Editor*: Oh, yes it can, these days.]

Murphy's Law was made for transfers. You will get bogged down on the smallest details. Like making sure all the slides drop on cue. Sound ridiculous? Believe me, shit happens and if you are using a multiplexing table that is an aerial-imaging system, you will not be able to see the show while a film transfer is in progress, so there will be no way to be sure that all the slides dropped and the show played correctly until after you get the footage processed and see your "rushes" (aka "dailies").

[*Editor*: You can see a film transfer in progress if the film camera has a video tap; then you can watch on a video monitor.]

And; since all the slides will probably be 'handled' for cleaning and/or gelling prior to transferring; there is a good chance that some of the mounts may not be fully closed. For that reason, it is a good idea to run the entire show and view it on the multiplexers focus/line-up screen prior to filming; to make sure that everything is running correctly. Of course, that is not necessary with a video transfer since you can watch the show in progress on the TV monitor.

Multiple Passes

As mentioned earlier; multiplexed shows should generally be quicker moving and more animated than shows produced exclusively for the multi-image idiom. For that reason; you need to use as many projectors as possible, and may consider 6,9, or 12 projectors insufficient to maintain the desired pace and tempo. Two possible solutions to that dilemma are multiple-pass shooting, and/or A- & B-roll printing of motion picture footage. In each case you can effectively double or triple the number of projectors; for example, a double pass on John Stapsy's table would enable as many as 24 projectors and three passes would permit 36. (I do not think you would ever need more than that.)

Double-passing, or A- & B-roll printing, involves shooting the show or segment(s) twice; once for the first 12 trays, and again for the second 12 trays. In the case of a double-pass, the second twelve trays are DX'd into the first twelve by backing up the camera to the same start-mark and rolling the show a second time.

With A & B-roll printing, you would not back-up the camera; rather, you would create two ribbons of film, one with trays 1-12, the other with trays 13-24. These two ribbons are then DX'd together during the printing of the film.

Of the two methods, the A & B-roll technique permits you the most accuracy and control of synchronization for all the elements; however, with this method you lose a bit of D-max (maximum optical density) and that could prove offensive on 16mm prints (although usually fine on 35mm).

In terms of cost savings; double-passing on one roll is best since you are printing a 'single strand negative,' rather than A and B (and possibly C) rolls, which costs a lot more.

A significant problem with the double-pass method is that you cannot see the show while it's being filmed. Thus, knowing whether things are in total synch is impossible until you see the rushes. With the A and B roll method you can move the position of one of the rolls relative to the other to obtain more perfect synch, if need be. You can even open-up or close-up 'spaces' between segments to tighten up synch even further (or modify synchronization in a 'creative' way).

However; with a double-pass; with everything is on a single strand; you have had it, if synch starts-off incorrectly or somehow slips during the show. That said, and not wanting to sound like an alarmist, the single-strand double-pass method can, and does, work nicely. Here is how to do it:

To accomplish a single-strand double pass requires a stereo crystal synch tape recorder (such as a Nagra). Your soundtrack is recorded onto one channel; the other channel is for AVL Clocktrak, SMPTE time code, or program cues. That provides a clock or cue track that is locked to crystal speed with the camera. If you must have a stereo optical track (most 35mm and 16mm projectors have mono sound) use two Nagras: one for the stereo soundtrack and the other for the program cues. (In the event you use a double-Nagra system; you must record the soundtrack onto one machine while *simultaneously* recording the clock or cues on the other; and the start mark for each tape must be precisely marked.

Start your master show tape with 'slide sticks;' to establish a common synch point for both the film and the audio tape.



Photos courtesy of jwlacey.com (right) and Wikipedia.

In motion picture work, sound tapes are synched to film footage using a clap-board-style slate appropriately called a "clapperboard;" but more commonly referred to as "sticks". They are marked with appropriate slate information such as scene number, take number, roll number, camera operator, etcetera.

The clapperboard is held in front of the lens and, while shooting, the sticks are clapped together. Back in the editing room; the editor synchs the audio 'clap' to the visual by advancing the film to the exact frame of the sticks clap; thus, the editor has a visual and audio cue to establish synch at the head of both the tape and film.

For slide transfer you must use 'slide sticks' to provide the editor with exactly the same sort of synch information. To do that; first prepare sequentially numbered Kodalith slides and place them in the number one tray slot. Slide projector number one therefore has a "#1" slide; projector two has a big "#2;" etcetera; all the way through #24, which will be used for our example.

On the audio tape; edit together 24 'beeps,' each ¼ second long and each followed by ¼ second of silence. Sequentially program each projector to Alt ON its ID-number slide for ¼ second, then Cut OFF and advance. In that manner; you get one number slide for each beep, followed by a ¼ second of silence and blank screen. After that 'clapper' sequence, leave about 3 seconds of blank tape before the head of the show. The sticks program should be included as part of the time code on the program tape and not an add-on element. What you want is one continuous time code for the entire show, including the clapper sequence.

To establish synch for the show; the editor can align each "beep" with its appropriate number-slide on the film footage. The editor can also determine whether all projectors were firing and in the proper start position (i.e., number slide). Programming each beep and number for a quarter-second provides the editor with a six-frame slate reference for each projector (24 FPS divided by 4 = 6 frames).

In the case of A and B rolls, they can be visually matched with precision because the A roll will have 1, blank; 3, blank; 5, blank; etcetera (all the odd numbers) and roll B will have all the even numbers.

Thus; for a double-pass transfer; the editor will be able to see, right at the head, whether synchronization has been achieved simply by looking for any overlap between the passes (revealed by 2 numbers DX'd together in the same frame); or, alternatively, the number of blank frames between the numbers which should be six. Sticks sequences should be included ahead of each segment where a show is being filmed for individual sequences (for which, perhaps, alignment was tweaked or the exposure modified).

Another (better) alternative to Kodalith-neg ID numbers is to double mount positives of the ID numbers with China Girl slides. That way you can see at the head of each film if there is any overall difference between the A and B rolls; that could occur if two different stocks were used or if the two rolls went through the lab separately. Color differences can be corrected in the printing process.

With the synchronization test completed; load the camera with sufficient stock for the entire show or sequence(s). After loading the camera; place a start mark on one frame of the film by punching a hole in it. Center that hole in the camera's aperture. Close the camera, but leave the hole in the aperture position. Do not advance past this synch point prior to filming. (Note, the synch hole does not have to be humongous, a little one will suffice; with a big hole you risk the film breaking in the camera or the processor.

With the film-start synch hole in position; roll the show. Leave three seconds of blank visual and audio before the sticks sequence to allow the camera to get up to speed and roll well past the synch hole into raw, unexposed stock. The three-second void is followed by the sticks-sequence (approximately 12 seconds, for our 24-projector example). That, in turn, is followed by another three second void before the show commences. [*Editor*: The clock track is never 'void.']

To assure that the camera starts shooting at precisely the same time for each pass; use the show program itself to start and stop the camera. This is accomplished by using an "Aux" cue and an AVL Remote Box, or other programmable on/off switching device. Because it is controlled by the show's program, the camera start is slated to the tape, so you can be sure that your camera start will be as perfectly synched as possible.

Once you have completed the first pass; back-up the camera (or rewind the exposed film) and reset the camera so that the synch hole at the head of the roll is once again centered in the aperture of the camera. Repeat the process using the next set of trays. If you are setting up A and B rolls; do not rewind the camera. Instead, reload it with a new roll or advance the first roll past the first take and make a new synch-hole.

The program for your pre-show camera starts and sticks should look like this:

Cue		Action
TM	Time 0.1	Time: 1/10th second
S20 G		20 cues per second; Go
TM	Time 3.0	Time: 3 seconds
Aux 1L	Aux #1 Left	Turn on camera
TM	Time 6.0	Time: 6 seconds
AT1L	Alt #1 left	#1 projector ON
W.15	Wait .15 seconds	Waiting time
HC 1LC	Hard Cut #1 Left and Center	#1 projector OFF; #2 ON
Etcetera		
At 8R	Alt #8 Right	#24 projector ON
W.15	Wait .15 seconds	Waiting
HC 8R	Hard Cut #8 Right	#24 projector OFF (with advance)
TM	Time 21.00	Time: 21 seconds
AT 2C	Alt #2 Center	Begin show on #2C

Following the show, you program another Aux 1-Left to stop the camera.

Murphy's Law: Don't forget to switch the "Screen Select" on the Doves before shooting the second pass—or else they will play the second set of trays with the first set's cues.

Using that method; you can shoot a third pass (or a C roll) if you wish. I would not recommend a C roll with 16mm; because your D-max is going to be quite disappointing. C rolls should be reserved for 35mm masters.

RP Methods for Video Transfers

Unfortunately, none of this double pass or A & B roll stuff works with videotape because you cannot make a second pass over the same strip of tape without erasing what you previously recorded.

However, all is not lost (necessarily). You can either shoot your 12+ projector show 'off the wall' or by using a little, 2 X 3-foot (60 X 90 cm) RP screen with long, long lenses on the projectors—a matched set of 9-inch lenses, or even longer ones, would be ideal.

Align the projectors with sturdy "stackers," such as Chief stands (by far, the best).

Use the 'overlapping-stack' method to keep all the lenses as close together as possible. (See picture; overleaf.)

With nine-inch lenses; your 2 X 3-foot screen will be 30 feet (~9 meters) from the front projector's lenses and 31 feet away from the rear stacker's lenses.

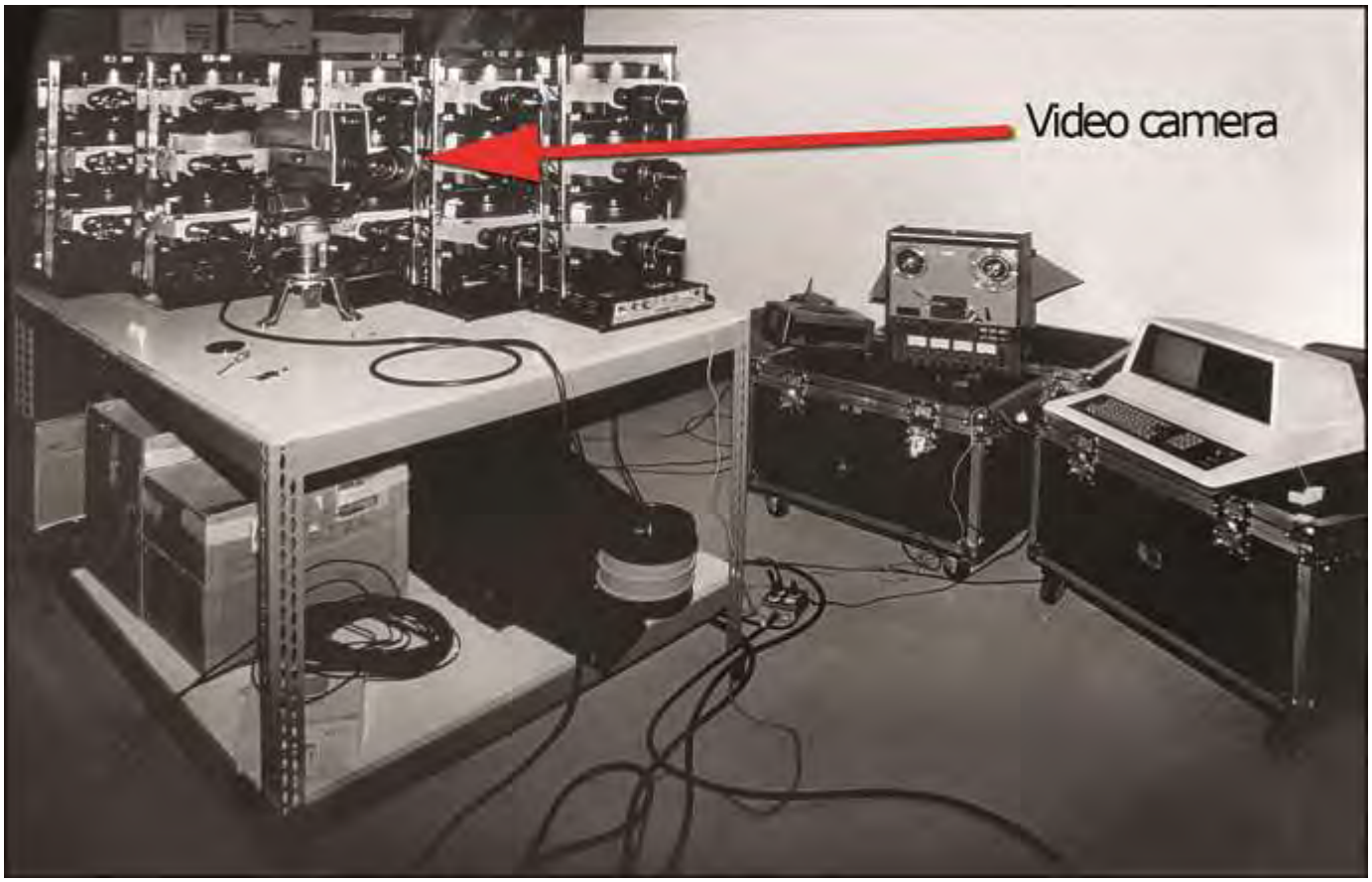
That one-foot difference is 3.33% of the total throw distance and will affect the size of the images (the rear stackers images being about 1/2-inch wider and higher in screen than the front stackers).

Overall, registration will be pretty good; but it will not be perfect. If needed, the size differences between the front and back stackers can be compensated for by using 6-9-inch zoom lenses, which allow for image-size control.

You can alternatively use even longer lenses and move the screen farther away, thus lessening the % of difference in each stacker's angle of projection relative to the screen.

However, another problem develops by using such extremely long lenses: the lenses are so long and so cantilevered that even the projector's slide advance creates shakiness that is noticeable in a transfer. Long-lens shakiness is difficult to control; even when outboard lens supports are used.

Your registration will never be perfect; because you will get some small degree of keystoning from the extreme left and right stackers. The worst keystoning will be the projector on top of stack one, and the bottom of stack five.



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The multiplexing rig at Image Stream, 1983. Photo courtesy Chris Korody. Note 'nested' camera.

Thus, if you are going to use an RP-screen for video transfers; it is best to keep slight mis-registration in mind when designing the show. Do not design any super-critical registration sequences. If you must have them; shoot those sequences separately or position those elements in the projectors that are in the center projector banks; those are in closer alignment than the extreme left and right banks. The projectors with the best alignment would be 2C, 3C and 4C.

When using a multiplexer and transferring directly onto videotape; remember that Murphy's law dictates at least one of the slides won't drop and the 'raw' projector light will burn-out the camera's vidicon tubes, requiring a costly repair.

To avoid that, only use projectors that blackout if a slide does not drop. Never shine a 'bare' projector light source into a video camera.

'Creative' Transfers

Multiplexing should not be considered as simply a copying technique; because the procedures can also be used creatively. You do not have to shoot on 5274 (35mm) or 7274 (16mm)—medium speed, tungsten-balanced, color negative camera film. You can shoot on any stock; and any sequences can be enhanced with standard motion picture or video trickery to obtain new and different effects.

For example: by loading the camera with Kodalith stock and shooting Kodalith masks; you can obtain quick and easy sequences to be used on a motion picture optical printer. Special optical-printer 'softies' can be made in this way; by the manipulation of hard-edged slide mask footage shot out-of-focus on the optical printer; or by shooting hard-edged slide elements out-of-focus on the multiplexer using 5302 stock; or by shooting soft-edged slide elements in focus on 5302; or by introducing a glow screen (Rosco *Tough Rolux* bound in glass) just ahead of the aerial-image field lens on the multiplexer; etcetera.

Another: using the RP method; try projecting a 'light-show' of gelled spotlights on the RP material while over-projecting white (or colored) art or lettering (black-and-white Kodalith slides; possibly color-gelled). Or; project a laser show onto the RP material while projecting Kodalith (or other) slides.

Still another example: To produce quick and easy white-burn titles for a movie, shoot your type negs onto Kodalith pos slides; program them for dissolves, flashes or whatever; and multiplex them onto Kodalith stock. That creates a B-roll to burn the titles into a color movie sequence. If you want black movie titles, reverse the lith-neg slide elements into positives which can be used to make opticals; or burn the original neg film into a CRI negative of the footage.

Following is an article about multiplexing authored by Yours Truly that appeared in the March, 1980 issue of *Audio Visual Communications* magazine.

"Unperplexing Multiplexing**"** **|** *Audio Visual Communications* magazine

Multi-Image:

Unperplexing Multiplexing, Or Right This Way to the Aerial-Image Show

by Douglas T. Mesney

"The multiplexer is a neat piece of hardware, but the technique is wrought with as many pains as slide programming for two reasons: slide shows generally make dull movies, and slide shows forgive minor technical errors; film and video do not."

With Buhl's introduction of the Project Six about a year ago, the world of multi-image was suddenly presented with a new software product to market: film and videotape versions of multi-image shows with exceptional quality and minimal production costs.

The idea of making films or videotapes from slide programs is not new. We see slides on TV every day, and there are numerous examples of slide graphics used by motion picture producers. However, for the multi-image producer and end user, there have always been basic production problems. The biggest problem was traditionally cost. In multi-image, we have always sold against video and film in terms of production cost. When a client would ask for a conversion, we were faced with offering a very expensive optical-bench transfer of high quality, or an off-the-screen transfer at far less cost, but with far less quality.

When Buhl developed a totally optical system of transferring slides to film or video, the market was ripe. It was an idea whose time had come. The Project Six solved the traditional problems, but created some new ones. It is now possible to obtain high quality transfers at minimal costs, but not without considerable aggravation.

The Project Six aerial-image multiplexer is basically a rigid optical stand onto which are mounted six slide projectors. The projectors' output is aimed through a series of prisms, emerging through a single lens, and is rephotographed by another camera (still, film or video). Because the system is totally optical, image clarity, color saturation and contrast are maximized and registration is infinitely better than an off-the-screen transfer (for example, using 7247 stock, you are operating at about f8, as opposed to shooting wide open and pushing the film to boot). And because the transfer is being produced in real time (while the show is running), costs are held to a minimum.

Knowing that, we jumped into this new market. Now, almost a year later, I would like to report the following observations.

If you are a serious producer with a good technical staff knowledgeable in optics and cine, go for a Project Six. It will expand your product capabilities infinitely. But be aware going in that it is no piece of cake. That is because of the general wacko nature of multi-image production. The Project Six is a neat piece of hardware, but the technique of multiplexing is wrought with as many pains as optical stand photography or slide programming for two reasons:

1. Slide shows generally make dull movies.

2. Slide shows forgive minor technical errors; cine and TV do not.

Even fast slide shows are very slow compared to what audiences expect to see when viewing a film or television show. Film and TV normally operate at real time—only occasionally do they go faster or slower than reality. In the multi-image business, we have been able to combat that by confusing audiences, to an extent, with multiple visual events happening simultaneously—a synergistic effect where the whole becomes greater than the sum of its parts. This technique works in large audience situations under controlled environmental conditions. However, the synergistic effect is difficult to recapture on a cold, small television screen or with films where the audience automatically expects "more" than slides.

Then (no, with all due respect, there always seems to be a reason why things are not perfect in multi-image. You constantly hear arguments about why things do not quite line up. When a producer finally does achieve image alignment, everyone actually applauds. Did you ever hear a movie audience applaud a successful reel change? The point is that if your slides are the least bit out of registration, or if your exposures are not consistent, or if your program timing is even a fraction off, all these faults will be emphasized on a transferred version of your show. As we all know from our high school yearbook portraits, the camera does not lie. Well, this time the camera is photographing your show.

Look before you leap. Here are some steps you should be aware of before jumping into this lunatic fringe of the market:

1. Align yourself with a very good cinematographer—one who knows his stock in trade technically, not necessarily the one who is most creative. He should know color balance filtration inside out and be able to judge exposures within a quarter stop.

2. Work with a very good laboratory

Confessions of a Multi-Image Maniac| © Douglas Mesney 1982-2025

so you know your film processing is correct. This will help you identify problem sources in exposure and color balance.

3. Be prepared to individually gel slides with neutral density and possibly CC filters to balance all of them in terms of color and exposure. Because you are taking your master show at least two generations away (in the case of film), you can expect jumps in overall contrast. Video is more forgiving, in a relative sense.

4. Make sure your show is in register. We find most complaints concentrated in this area. In fact, I have come to believe that many people never see their show in perfect registration until it is on a multiplexer. The multiplexer, once properly aligned, has truer registration than any show you have ever seen, and any misregistration of slides becomes immediately apparent.

5. The quality of the transfer you obtain is dependent upon the quality of the camera you use. We originally began multiplexing on a moderately expensive video camera and deck which proved inadequate. We have since upgraded to a high quality camera. In the case of video, a good camera is imperative to achieve good overall color and contrast as well as to avoid "lag" (ghost-like after-images). The better the camera, the less lag. The film camera must have a crystal-sync generator for speed control if you want your soundtrack to stay in sync.

6. Make sure that the slide projector bulbs are matched. Even new bulbs may not have the same brightness and color temperature. You can determine the color by placing the bulbs upside down on a light table and observing the color of the light passing through each bulb's reflector. You will notice that some will be reddish, others blue or green. Match the colors as best you can. The light output of the bulbs will even out after the first hour of use (the chance of a bulb burnout is maximum in the first hour), and the brightness can be measured by aiming a good spot meter at the focus stage on the multiplexer.

7. Due to the optical path of the six projectors' light sources through the multiplexer's prisms, the output of each at the field lens will differ by up to two f/stops. This difference must be balanced by inserting neutral density filters between the projector and the prism. For this purpose, a convenient gel holder is provided on the multiplexer. The same holder can also accommodate CC filters if color-correction of the light sources is particularly troublesome.

8. To achieve even illumination across the field in a given projector, it may be necessary to adjust the reflector mirror inside the unit. By adjusting the mirror, you aim the "hot spot" so that it is fully centered. Such adjustment must be accomplished with the projector off the multiplexer. Use a seven-inch lens with no slide in the gate, and while adjusting the mirror, you will see the spot move. Center it and you have it made. Otherwise, the transferred scenes may be dark on one side.

9. Another way to achieve even illumination in the field is to insert a small piece of Rosco's "Tough Frost." This is a diffusion material primarily used for photographic and stage lighting, and it can resist high levels of heat. The material is inserted inside the projector on the outboard side of the heat-absorbing glass, just before the mirror.

"Multiplexing will expand your capabilities infinitely. However, due to the general wacko nature of multi-image production, be aware that it is no piece of cake."

10. Keep the audio track within the limits of the playback equipment. In the case of a videocassette tape, your limits are higher than with an optical track on a motion picture. In either case, passing your track through a compressor and de-esser will not hurt. When making motion picture transfers, you must use a crystal-sync tape deck to ensure that the recorder is always running at the same speed as the film camera.

11. Know that film labs are, in many cases, totally unionized and that you can expect no favors. In the film and video industries, you get what you pay for. Period. In the multi-image industry, we are still on the "buddy system"—untrue of the older fraternities in the communications business where dog-eat-dog is the rule.

12. There is no magic. Placing the slide trays on the projectors and shooting is only the beginning. Your real start-up will take about 12 tries (which you pay for). After that you can say your feet are wet. My philosophy has always been that for every thousand dollars you spend on a piece of equipment, you can bank on another thousand or two in learning how to use it. Aerial-image transfers are no exception.

13. Never despair. But then, I would not expect you to—after all, anyone subscribing to this magazine and who is involved in this business learned not to despair a long time ago.

We have learned the potential possibilities and limits of the Project Six multiplexer. It is an invaluable tool for the producer or end user who designs and produces to maximize its capabilities, which are, quite simply, to make a film or videotape show. If you think in terms of what you see on television or at the movies, you are on the right track.

How big is it? Multi-screen shows or presentations that involve more than six projectors must be transferred by a multi-pass technique. Simply said, that means that the show is photographed in layers. You film the first six slide projectors, back up the camera and lay in the next six, etc., ad infinitum. This type of production mandates the use of a crystal-sync tape deck and camera, as well as a great deal of patience in lining things up. It can be done, though, and with no more skill or patience than you are currently applying to optical stand photography. Unfortunately, there is no way to make a multiple-pass videotape transfer because when you re-record for the second pass, you erase the first. The only way to accomplish a multi-pass transfer on videotape is to first make a film of the show and then transfer it to tape.

There are several companies across the country currently involved in large show transfers. These include Quantum Leap, based in Santa Ana, California; Aerial Image Transfer Service of Pittsburgh, Pennsylvania; and The AV House in Toronto, Canada. These lab services can take virtually any show and live through the agonies (and ecstasies) of getting it on film or videotape. So, should you decide to take the potentially profitable deep plunge into aerial-image transfers, you can at least be sure of good back-up services.

Your best bet. One thing is certain. With aerial-image multiplexing, a multi-image show of any size takes on added value for the end user, especially in terms of easy playback for field personnel untrained in multi-image staging. We normally recommend that the client use his original show for large audiences and distribute film or tape copies to sales reps or training agents to use with smaller groups. Recently, though, we have had many requests for shows specifically designed to be multiplexed—shows that will never be seen as multi-image productions. To my mind, these requests reflect the strongest reason for utilizing multiplexer services: in a day when our economy is uncertain, when inflation continues to cut into everyone's cost-effectiveness, clients across the board are looking for methods of creating dynamic presentations for as little cost as possible. The aerial-image multiplexer presents the multi-image industry with a dynamic new method of meeting those needs. □

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Confessions of a Multi-Image Maniac| © Douglas Mesney 1982-2025

Multi-Media Market

One of the areas where multi-image is upgraded to multi*media* is advertising agency new-business pitches. In those situations; the agency typically wants to show prospects samples of videotape commercials. To create added impact; they may ask to have the videotape commercials synched to multi-imagery of print campaigns and/or agency staff 'in action.'

Achieving synch in these situations is simpler than you might think. You simply slave the multi-image show to a pre-edited videotape; in other words, you let the videotape deck drive the multi-image show. This works like a charm and the only thing you lose is stereo sound (which few people can detect).

To accomplish the synch-link; pre-edit the videotape until you are satisfied with it. Then lay down AVL Clocktrak (or SMPTE time code) on one of the two audio channels of the videotape; and output that track to the Eagle. The videotape will now drive the Eagle and keep the slides in synch with the tape.

You can also lay own your program cues onto the videotape and feed that signal directly into the Doves; thereby eliminating the need for the Eagle. Accomplishing that is a bit more difficult, however. You have to 'parallel' the Eagle with the videotape; you cannot have time code on the videotape because you need that channel for your cue information (and the other for audio). So, you do not put clock on the videotape channel. Rather, you let the Eagle run off its own internal clock and record the cue data onto the second videotape channel.

Those procedures will probably require sone fiddling around to achieve good synch. Getting synch at the head of the tape is easy; simply output the audio test tone of the color bars sequence to the Eagle. The audio test tone will start the Eagle's internal clock rolling. Add whatever time cues are necessary to get past the color bars sequence and use a TOC (Time Offset Command) to adjust the program cues to the new start time.

BUDGETING FOR MULTI-IMAGE

How to budget a multi-image show? I wish I knew! And I am probably the worst guy to ask—forever pushing for a greater show; producing the most content possible for any given budget.

Rarely have I had a show come out on budget; and even more rarely have I made any significant amount of money from a show. That is because I seldom listen to my own advice: "Never experiment on a show."

What that means, in essence, is that you do not sell untested technology until it is ready to be released; otherwise, you will probably cost yourself a fortune on that job and risk not being able to deliver what was promised. Once you have successfully produced a new kind of software or content a couple of times on the 'test bench,' you get some idea of what it costs to produce and can therefore budget the effect (or whatever) with sone degree of accuracy.

However; for me, life is no fun unless you are constantly experimenting. I could never quite figure out whether it made any difference; keeping experimentation out of actual productions—the total amount of money you make in a given year will remain the same whether a given experiment is within the context of a show or 'on your own time.' At the end of the year you have spent the same amount of money and time; so who cares?

I have since concluded that you should separate experimentation from job situations; because when the experiment is on your own time and terms you can choose to stop when things get out of hand; on the job, once you have promised something, you've gotta deliver it. That can make you frustrated (and broke).

So; how can you budget enough money to pay for the experiments? Simple. Consider all experimentation as part of your overhead; your 'cost of doing business.'

What is Your Overhead?

Before you can even begin to budget a show; you must know what your overhead is, was, and could be. For the single, unmarried entrepreneur, calculating your overhead could be as simple as adding up your rent, film, and beer money. For the more advanced studio operation it includes the basic costs of all aspects of your business—assuming you have no jobs. In other words, what does it cost you to keep the doors open and the lights on; to have your operation staffed and equipped. What does it cost you to get new business? How much do time and materials cost, for experimentation? Do you want a raise next year? Etcetera.

A year goes by. How much did that year cost you? That figure becomes the basis for figuring your 'cost of doing business;' your overhead. Divide that figure by 52 weeks, then by 40 hours a week (an average business week; or so they say—ha!) and you have your cost-per-hour. That can be a scary number.

You can use that figure to establish how much of that cost-per-hour each employee must cover. Multiply that by 3.5 times and you have what each employee should bill-out for (when working). The 3.5 factor allows for unstable work periods—the usual ups and downs—as well as a 'reasonable' profit. (What are you in business for anyway? For love *and* money, I hope). It also considers that you are going to get 'weathered out' on some photo assignments; or lose an important piece of gear the day before the show is due, requiring the rental of another. Many such mishaps are endemic to multi-image production.

I learned the 3.5-times system from Burson-Marsteller, a prominent New York PR agency. They do not incur costs or expenses anywhere near those of a multi-image production company, in terms of percentages. Their 3.5-times principle was applied to every show I produced them. My invoices were marked up 3.5 times to arrive at the agency's selling price. I used to ask myself: "How can they charge 3.5 times what it cost me to make the show; and they did nothing?"

Well, they did not do 'nothing.'. What they did was find and select us to work in behalf of their client; and advise us what to do and (too often) 'how' to best do it. To do that, they require a staff of hundreds, world-wide; incurring so many expenses that it literally requires their clients to pay 3.5-times more than a show would have cost if the client had dealt directly with us.

However, that is not why clients employ agencies. *Au contraire*. They are seeking the agencies overall advice as to whether the answer to their communications problem is a multi-image show or some other form of 'edutainment.' And if multi-image turns out to be the favored medium, which producer can do the best job? That is what agencies are employed to do; as well as to coordinate our work with their other communications efforts.

Unfortunately, such advice often becomes 'dictats' based on multi-image *naïveté*; and we are ~~muscled~~ 'persuaded' to producing either impossible tasks or amateurish productions based on the agency's lack of multi-image expertise.

I should not bitch about that; because what agencies do falls into the category of 'consultancy.' That I can understand; that's what I do—analyze problems and try to solve them; with knowledge that my clients don't have; but that I do and can therefore charge for. The eye-opener for me was that Marsteller could mark things up 3.5-times and get away with it. Wow. I used to tack on a few thousand to my theoretical costs and figure I was making money. I was not. And I did not until I applied Marsteller's practice to my own productions.

Their formula worked for me; but I determined that, in multi-image, a 5-times factor is more appropriate; especially if you do a lot of experimentation. Do not be embarrassed about that either; if you're on the leading edge of technology, the client should pay for the privilege of benefitting from your consultancy and capabilities.

The only way to survive in the multi-image business is to generate a high cash surplus that can be used to experiment; to keep up with the times in terms of hardware.

We are in a business that requires numerous kinds of high-priced gear—audio, photography, projectors, programming; the list goes on. And, the chances are that equipment you purchase this year will be technologically out of date in about 24 months; maybe 12, if it's AVL (hahaha).

In addition, you are in a volatile business in terms of staffing. Your crew knows, as you do, that multi-image is 'hot.' They think that you're making money hand over fist; and they want a piece of the action; or else they'll "walk" (with your technology) in hopes of earning more elsewhere.

Unlike 'yesterday,' when you were providing the only apprenticeships possible for neophyte multi-image trainees; such is no longer the case. There are scores of quality multi-image professionals now, all seeking employment; and cross-pollinating 'trade secrets' among shops. To protect yourself against those risks; you are going have to offer salary increases annually, perhaps semi-annually; adding to your overhead.

Simply put; you need all the money you can get your hands on. You are in a 'new' business where the technology is not 'stabilized,' as it is in cine, audio, and photography. You therefore have a greater cost of doing business and should not feel like you are chiseling anyone; with substantial mark-ups of outside services and 'fair' hourly billing rates for your staff.

Determine how much of the total budget will be allowed to go out of the house; buying products and services that cannot be generated within. That percentage is called "margin" and should be about 40% —that is, at least 60% of the budget stays in your shop.

I have always been amazed at the fact that most successful multi-image businesses have very few creative people; they all seem to have two accountants and/or producers for every set of hands that 'does' something to get the show on screen.

Shops in that category buy talent in much the same way that you and I rent cars. They fit a given free-lance talent to a given job and use them for that job only. On paper it is not a bad concept; especially if you plan to retire early (and rich).

Their plan seems simple: they know how much you cost (and everyone else on the team) and they mark that up by whatever percentages; then add overhead and job-related costs; then mark that total up by a profit margin which can vary from 10 to 30% (on average) and presto: a money-making business! Unfortunately, you, working on the show, are locked-in to very precise budget parameters which usually preclude any possibility of error (or creative experimentation). In fact, you may end up with about 20% less than you need.

OK, that is one way of doing it; and it probably turns out to be the most profitable. However; by constantly changing teams you risk losing a continuum of experimentation; never having a consistent 'house style.' In addition, you by-pass the 'tight-team' approach that I favor. I prefer knowing who the players on the team really are; what they are (really) capable of. That is impossible for a producer working with freelancers.

Not knowing your staff's true limits—when players might 'break'—means you cannot push them too hard. And without some degree of "push" there is little progress.

So, the bottom line is:

- To make money; 'rent' your creative staff.
- To make progress; hire your creative staff.
- To make both; charge a fortune.

Knowing that multi-image is a 'unique,' high-cost, technologically-volatile, problematic business… now what?

It goes back to the margin of money kept in house versus what goes out. Your margin should be about 40/60; that is: 60 cents out of every dollar of the project must be spent under your own roof; the other 40% can be spent outside. This is an arbitrary amount and is not 'gospel;' the actual percentage will have to be modified to your own situation and needs.

Obviously, the more you can produce in house, the greater the percentage that is kept in house; and the more opportunities to offer a discount on a package of services. However, if you are the kind of shop that dreams up the idea and produces most of it out-of-house, then you should at very least apply a 40/60 margin factor.

Given all the above, you will know approximately what you need to earn to profitably produce a show. But *which* show?

What Are You Producing?

That question is probably the number one nemesis in budgeting multi-image shows. How can you budget a show if you do not know what the show will be?

These days, God bless the producer who will stand up and say, "You give me 10K and I'll make you a show" without some idea of what that show will be. Yet, almost universally, I see producers estimating what it will cost to do shows without having a clue what they are going to produce. That is simply impossible; a fool's errand.

Aside from overhead; the second key to budgeting a multi-image show is knowing *what* you are going to produce. Without a show concept you are lost. Realizing that, a lot of multi-image houses are now charging a fee to prepare a concept (from which they can also establish budget parameters).

Like advertising agencies and PR firms; they offer clients several types of pitches.
A capabilities pitch (that is, a demo of what you have done for others) may be free; but a creative pitch (which includes the essential show idea and what it will cost) should command a fee ranging from $1,500 to $5,000.

Such fees are only fair. After all; you must come up with your basic idea to be able to accurately budget the production costs.

If you are incapable of coming up with an idea, you are going to have to hire someone to do that for you; and that is going to cost. So, just for coming up with an idea you deserve at least a little 'motivation' (aka money). And, considering that a lot of clients ~~steal~~ borrow your idea and have another shop produce it (at less cost); you had better copyright the hell out of your idea and be sure you get paid for it up front.

That happened to me, in my favor, with a show I did for a major computer firm. They got an idea from another multi-image shop and came to us asking how much we would charge to produce it. We did not know the idea was from another house, or we would have tromped on the client and given them the 'bum's rush.' However, as it turned out, we handed in the 'right' budget and got the job. Small matter the producer that originated the idea went bust; but I jest.

How can you estimate a job without having some idea what you are going to do? And how can you know what the client would be willing to spend? Ultimately, the answer lies somewhere in between.

If a client comes to you and says: "Help, I have problems," you can say in reply: "I think I know the solution and it will cost you X." In that case you are like a *maître d*'; it is up to you to recommend the menu and the wine selections.

On the other hand; if the client walks in and says, "This is what we have in mind..." then you are only a waiter taking an order. Price the job according to what the client wants and what you can produce it for.

Usually what happens is that there are a series of two or three meetings. The first meeting is a brief by the client stating the problem. If you are fast on your feet, which you should be if your job is new business, you will probably have some on-the-spot ideas which will either be accepted or rejected. If accepted, you have hit pay-dirt. If rejected, all is not lost; at least you know what will not be accepted.

The second meeting is is best done informally over lunch. Your idea is slipped into a Q & A session designed to obtain further details; supposedly to enable you to come up with something. In other words, you test your idea at that session.

The third meeting is usually a formal pitch at which the big idea is presented.
This is essentially the idea 'teased' and hopefully accepted at the second meeting.
Knowing that your essential idea was deemed 0K, you can detail exactly what will be produced; when; and for how much. Any client that tries to get you to do all the work necessary for such an in-depth proposal and budget without paying a fee should be made to walk the plank.

However; today there are many 'little' production companies prepared to take risks beyond their wildest imaginations to get a foothold in the business. It becomes downright scary for a full-fledged production house to competitively bid in earnest; the established houses know that a 'young' house is often ready to lose money on a job just to get in.

How to cope with that? Who knows. It is a very vicious cycle. And until multi-image 'matures' and becomes as standardized as, say, motion picture production, there is almost no way to be assured a winning position in the game of selling ideas. Isn't it interesting that our latecomer competitors, the video producers, can more accurately estimate, production costs than most multi-image producers can?

Part of that, I think, can be chalked up to a kind of 'inferiority complex.' We are, after all, *only* making a slide show; thus, we feel somehow obligated to give the client more 'value for money' than is provided for in meager slide-show budgets. That attitude must change if we are going to survive in this business. You cannot be in denial about what things really cost. Rant over; on with budgeting:

If you know what your overhead is and if you have some idea of what your show will be; then, and only then, will you be able to make a budget that is somewhat accurate.

Of course, the real trick to budgeting is knowing how much is too much; or too little. That is when the client can be an enormous assist to you.

Clients generally fall into two categories when it comes to budgets; they either send out a general RFP (Request for Proposal); or they narrow down their bidders to two or three. They may know they want you to do the job, but need to know how much it will cost to produce; or be required to come up with at least three different supplier's bids to satisfy the bean counters at their company.

If you get stuck in the first category, God bless you; because your chances of winning are few. The more bidders, the lower the percentages in your favor. Hence, the less time you should spend on doing anything in the way of a substantial budget analysis. That is because substantiating a budget requires a great deal of time; and with so many people bidding on the job, you cannot afford to spend a lot of time on a speculative proposal that may very well not hit pay dirt.

The best bet is to ask the client how much they intend to spend. Work-up a rough concept and budget for something you know you can produce within that budget parameter (and still make a few bucks). Most clients will be willing to offer you that information; of course they will always give you a low figure (most will actually spend more than they tell you; some a lot more).

If they refuse to give you a figure, tell them to get stuffed; there's no way you should spend a lot of time dreaming up a show and a budget with absolutely no idea what the restrictions are (and there are always restrictions). Also, try to get a true fix on who is producing the show—you or the client? If they are using you as a production facility for their idea(s), add a 20% 'aggravation factor' to your budget; because many clients are never pleased; they think it's their job to bitch; and they have a host of 'helpful' suggestions that are demands in disguise; that are going to cost you extra bucks.

David Fellowes told me his approach to that conundrum. It went something like this: Fellowes to client: "The show will cost $100,000. If you help, the price is $150,000."

If you are more fortunate, you will be in a limited-bid situation; that is far more advantageous. I once heard about an IBM show that was on open bid. We lost count of the number of producers soliciting the job; there were more than a dozen. Bidding on jobs like that one is risky. By revealing your ideas and prices, you put yourself in a position to be ripped-off by a client. They may take everyone's ideas, select the one they want, then give it to the lowest bidder. "We loved your idea; however, we are wondering how much you'd charge to produce this other idea?" It happens every day.

More than likely, you will be in the limited-bid situation; that is far more advantageous. The client is more likely to have a clearer idea of what they need to accomplish and what they want you to do. They will also be more inclined to give you some hints as to what they want to spend—all critical to preparing a budget and concept. However, those clients will also give you an 'idealized' figure which is often lower than what can actually be 'extracted' if the idea you come up with is 'good enough.'

If you are in that situation, apply the ol' Gene Butera trick—offering them three solutions (not all at once):

- First is an outlandish budget for a wild concept
- Second is a stripped version of the show that is too emasculated
- Third is the show you originally conceived and want to produce

You present the "wild" idea at the first meeting; go over the chopped version at lunch; and submit the refined, fully-budgeted version at the final pitch.

The third situation is reserved for the few shops who have very intimate relations with a client; or who have a product that is so specialized that the client must come to them for the technology and expertise. That, obviously, is the best of all worlds and what you should be striving to achieve. Here, you simply take the client's brief and prepare a concept/budget.

If the client bitches; demonstrate why your idea is the perfect solution and moan a lot about any budget cuts. Again; use the Gene Butera approach—go in high; cut back 'too much,' and arrive at what is perceived as a 'balanced compromise.'

Unfortunately, these days the migration of multi-image technology occurs so quickly that few producers can keep pace with it all; to say nothing of clients. The complexity of effects is increasing at a staggering rate, too; as is the sophistication (and cost) of newer and better equipment.

Few clients are really aware of what's happening. You should have periodic 'update pitches' to make them aware of 'where you're at' both in terms of production techniques, new gear, and prices. Everyone appreciates when someone is trying to better their lot in life; and they appreciate that improvements cost more.

The usual bitches that I hear do not stem from a client learning that something costs more; they stem from client learning that too late.

Especially with big shows, the budgets that you are working within usually are determined up to a year or eighteen months ahead of when you get the job.

Let us say that you pitch a prospect tomorrow. They say: "Suppose this or suppose that?" You say: "That'll cost X or Y". They go back and put their ideas and your costs into 'the system.' By the time the approved idea comes out of the hopper, it could be a year later; your costs have gone up and you may have a whole new way of doing things that you must sell for a higher cost; but that the client isn't aware of. Having periodic update sessions with clients will help keep that problem in check; the clients will be made aware of your new and costs and can factor them into their budgets, before it's 'too late.'

When you are budgeting; take into account when the show will likely be produced and factor the inflation rate into your estimates. 1982 inflation ran at 14%. Also, set a time stipulation in your bid which specifically states that the numbers quoted are good until a certain date; otherwise, you might find a client coming back to you three years later, expecting you to produce as quoted; and they might have a case, legally, that would cost you a lot to fight, even though you would be fully justified in not wanting to produce the show for the 'out of date' price quoted.

Other things to consider are the human and 'extra-human' factors necessary to produce your show. By 'human' I mean people. People make mistakes no matter how experienced they are. The more talents that you employ (who are not on staff and therefore possibly unknown to you) the more you must add to the budget for time and materials spent 'getting to know them.' When people are involved, there are always fuckups that cost you.

"Extra-human" refers to his almighty self, God. You cannot control the weather. If your show concept is weather dependent; be sure to keep enough money in the budget for both weather contingencies and weather insurance. Yes, you can buy weather insurance, negative insurance, any kind of insurance if you are willing to pay the Piper.

If your show is in the high-budget category; and you have a concept totally dependent on specific talent and/or weather; you had better insure your production and inform your client that you are doing so (the client might want to 'self-insure' it).

With all these considerations in mind as 'umbrella' perspectives, you should start to prepare your budget using a thorough checklist. There is no way that you can ever remember all the little things that crop up in the building of a show; especially when you are excited by an idea that you are dying to produce. Given your enthusiasm to produce your idea, be careful not to build a "Procrustean Bed," budget wise.

[*Editor*: Procrustes was a legendary innkeeper whose beds were all one size. If a guest's legs were too long, they were cut to fit the bed.]

When approaching the checklist; you should apply 'real' numbers; that is, what it would actually cost at the moment. 'Fudge factors' will be applied to the sub-total figures for various cost categories. That is because some categories are more 'volatile' than others, cost wise; subject to more drastic change; because of your own plans; or because of trends in various markets.

I recall one incident when, several years ago, I hadn't updated my film & processing costs for about a year and a half. During that period, Kodak had been increasing their film stock costs about 10% every six months, or so it seemed; likewise, the lab had increased their processing rates by about 7%; plastic slide sheets had also increased, from 27 to 33¢ each; and I had handed out a few staff raises. I discovered that I was losing about $3.50 per roll of film shot, processed, and sheeted.

Since you will hardly ever be producing a show without waiting about a quarter to half a year between bid and production; keep any such inflation adjustments in mind and apply them to the categories of subtotals in your budget.

The checklist should also be considered an internal budgeting aid. There is no need for you to break down any budget for a client; because, again, you might subject yourself to being ripped off. When you buy a car, you do not ask how much the seats are, or the wipers, or the gas tank; you ask, "How much is that car?" You may be quoted a little more for certain upgrade options; but those are clearly labeled as options. You should budget your show in a similar manner—a basic show, with optional effects and the like. Options can make you profitable.

Clients sometimes ask for a budget break-down. Those are usually sleazy, el-cheapo clients that should be forgotten; you do not need clients like them. From my experience(s), the more a client is spending, the more they will allow you to be a professional. The less they spend, the more they "chintz" you on every little detail and make changes up the kazoo. It is the same in any business. Think of yourself. When you go to an expensive tailor, you take the tailor's advice on your new clothes; when you go to the bargain basement, your careful to pay attention to every detail convinced that someone is having you. Well, the same applies to your show. The less you charge, the less respect you will get. Undercharging can turn out to be a disaster on many counts; the most frustrating being the lack of respect you will get. When is the last time you said "thanks" to the counter clerk at a MacDonalds?

The above is not to say that you should not 'justify' your budget. This is, in fact, a great way to get bonus points in a pitch; by making the client think that you are revealing 'secrets;' whereas you are simply stating the facts.

Any such breakdowns should be done verbally and not committed to hard copy that the client takes away; there is no need for the client to know all the gory details. Did you ever ask your film processing lab to explain why it costs 'X' to process of role of film?

On the other hand; sometimes it can prove beneficial to have a sample category broken down for the client to analyse—mostly to demonstrate that you are cost-conscious and thorough; and to infer that all the other categories have been gone over in similar meticulous detail. The category chosen for such revealing detalia should be one in which your 'critical' concept elements are divulged; so, the client understands your pricing rationale.

The worst situation is when a client comes in and asks you for a 'ballpark' figure. That is like someone asking "how much is dinner?" What? Where? For How Many?

There is no way in hell you can quote a 'ballpark' price because there is no such thing as a 'ballpark show.' However, what you should answer are questions about the shows that you demo. For that reason; I have divulged the costs for shows demonstrated, along with sample 'case histories' that help put the costs into the context and anomalies of each situation. That approach 'answers' the client's questions before they are even asked; it gets everyone 'off the hook.'

If the client asks how much you think it will cost to solve their problems; that is a perfect excuse for you to reverse the question and ask them what they think the solution 'is worth.' Tat will inevitably lead to some sort of an answer about how much they are prepared to spend—and that is what you need to know in the first place to bid successfully.

You should be prepared to present costs in a series of drafts. For that reason, it is a good idea to keep the checklist in a computer so you can easily amend figures and get instant updates; all printed out nice and neat, so everyone can understand them (and maybe even be impressed). That can 'easily' be done on an AVL Eagle or similar computer, for which accounting and estimating programs are available.

I dare say that; on the first draft, when all your 'wishful thinking' gets priced; you will probably be somewhere between twice to three times what you can affordably spend to produce the show. Then will come the big showdown between the concept and the price. If the price wins, then the concept must change. Can it change enough to withstand the pressures of the almighty dollar? If not, change concepts. I have had to do this on innumerable occasions where the cost of my ideas was more than the client could bear.

Often, though, a good idea is just that—a good idea. There should be ways you can 'chop' a little and get equal (or better) results. *Lawrence of Arabia* could have been 'tightened up' by at least 20 minutes; I'm not sure about *Gone With The Wind*. Keep chopping; eventually you will have a show that you can afford to produce.

Sometimes the process is bizarre and amusing. While budgeting a show for Sonargraphics, for example, I had an exceptionally tricky situation. The client, Ford Australia, had stated a budget parameter; and we had inside information about the product being launched; so, we could make accurate theme and concept assessments. Those called for show that would cost twice as much as the budget allowed.

Well, we chopped and chopped and chopped until it was clear that the original idea could not be produced. Everyone lamented because the idea was so good, so perfect. But from despair comes inspiration; we ended up proposing a show that was not multi-image at all—it was a video show; and we won the pitch. Even though a video show generated minimal in-house dollars; it provided the client with a dynamite show; and one which we could produce with a 40/60 margin.

The long and short of it was that the only way we could make money was by producing a video. *C'est la vie*, multi-image!

The bottom line on all this is that you should be prepared to go through the budgeting exercise frequently on any given project. Set yourself up in such a way that this process is painless, speedy, and accurate. A word processor or computer accounting program will provide you with the most painless method of being painfully accurate. You can input base costs; the computer can do the totaling—without your 'biases.'

Whether computerized not; the following checklist will provide the basis for you to accurately estimate a show's production costs; as well as your profit (or loss). The trick to using this check list is to not let any biases interfere with your estimating. If you bias your input; you will get a biased output. Remember what those computer people say, "Garbage in, garbage out."

What do I mean by a bias? Well, if I were doing a fashion show about bathing attire; and if I wanted to photograph models in Hawaii; I might underestimate how long it would take and/or underestimate travel costs. The models could just as well be shot in the studio, with "green screen" background shots of the Islands.

Budget Check Lists

Before we begin, refer to the Budget Check List on pages 3101 through 3110. [*Editor*: An updated Checklist can be found on pages 3116 to 3127.]

The list can be used three ways: estimating costs before production and tallying costs after production. By comparing the two, you can determine where you made money, and where you lost it. This is also an effective way to keep tabs on what you are spending. If you input numbers during production, you will know where you need to adjust current and future budgets.

Since you are likely a producer, let someone else handle budgeting operations. You should, of course, get the budget supervisor excited with your idea; then leave it to that person to determine what can be spent. The decisions about a show's costs (and 'worth') have to be made using cold, hard reasoning based on facts. You are not in this business to lose money, no matter how great your idea is. If you lose money too often, you die; and that is not what being in business is all about. You can argue with your budget manager, but ultimately the budget wins (or loses).

Arrange your system so that you get weekly (or daily) cost sheets that compare what you estimated with what you spend. That will allow you to put the brakes on where you need to (if you can). If you cannot, and if that endangers the show, you will know that as it happens and will be able to inform the client. Most clients are not sadistic; they recognize when you have a problem and are usually prepared to help you—it is in their own best interests to do so. What they do not like are 'surprises,' after the fact.

Some problems are caused by the client; often by their incessant changes. For those problems you should have an official cost-overrun form that you submit to the client with every one of their change requests. After discussing the cost overrun(s) with the client, the terms are summarized on a cost-overrun notice, which the client receives by messenger or mail.

Pitching Costs
- Concept
- Script
- Audio
- Art and Typeset
- Production
- Video
- Photography
- Slide Production
- Programming
- Facilities used
- Clerical and Admin
- Travel and Transportation
- Entertainment
- Theatre (Studio)
- Administrative

Consultancy
- Salaried Staff Time
  - Executive Producer
  - Creative
  - Director
  - Production Manager
  - Technical Services
  - Production Coordinator
  - Other
- Value of Ideas:
  - Television
  - Audio Visual
    - Local (or internal use)
    - National
    - International
- Print Usages
  - Local (or internal)
  - National
  - International

Concepting & Scripting
- Research Time
  - Conceptual
  - Audio
  - Video (Locations, sources, stocks, etcetera)
    - Outside costs & petty cash
  - Concept Development & Refinement
    - Internal (Total time)
    - External (Total time and changes)
    - Other

Concepting & Scripting (continued)

- Visualization
  - Technical Storyboard
  - Sketch Board
  - Full Storyboard
  - Finished Art Samples
  - Special Effects Samples
  - Location Photography Samples
  - Write-On Slide Show Preparation
- Audio Track
  - First Draft Script
  - Second Draft Script
  - Final Script
  - Rough Tracks Preparation
  - Rough Music Mixes
  - Rough Voiceovers
- Programming
  - Rough Programing for Samples
  - Write-on slide Show Programming
  - Final Tweaks

Photography (Location)

- Photographic Crew (Time and/or Hire Costs):
- Film stock
- Processing
- Studio Time (or Hire Costs)
- Special Equipment Hire
- Lighting Hire
- Props
- Make-Up
- Stylist
- Models/Talent
- Photo Assistants
- Vehicles
- Location Costs
- Meals and Out of Pocket
- Crew Travel & Lodging
- Special Location Rentals
- Special location effects
- Special Location Vehicles & Equipment

Photography (stock)

- Purchase Rights
- Rephotograph of Originals
- Insurance
- Shipping & Handling or damaged
- Add 15% "Loss Factor" for lost/originals

Photography (Rostrum camera)
- Cells Preparation (Time & Materials)
- Mask Preparation (Tine & Materials)
- On-Carrera Tine
- Crew
- Special Lighting
- Special Materials
- 25% "Experimentation" Surcharge
- Films Stock
- Dupes
  - Entire Show
  - Specific Scenes

Artwork Preparation (Time & Materials)
- Typeset
  - Briefing Time
  - Specification Time
  - Basic costs
  - Extra repros
  - 10% Contingency on above
  - Negs or Positives from Typesetter
  - Graphics Modification (Outlines, drop shadows, etcetera)
  - Custom Lettering or Swashing
  - Airbrush
  - 50% Contingency on above
- Cartoon Art
  - Briefing Time
  - Roughs
  - Animation Trials
    - Art
    - Slide Dupes (Kodalith)
    - Programming
    - Rough Track
    - Finished Cellular Art
    - 30% Contingency
- Illustrations
  - Briefing Time
  - Roughs
  - Rotoscoping (Time & Materials)
  - Stats
  - Finishes
  - 20% Contingency
- Charts
  - Roughs
  - Finished Drawings
  - Overlays
  - Rotoscoping (Time & Materials)
  - Mechanical In Type
  - Stats

- Charts (continued)
  - Kodaliths
  - Pegging
  - Gelling
  - 20% Contingency
- Type Mechanicals
  - Rotoscoping
  - Base Mechanicals
  - Overlays
  - Stats
  - Liths
  - Pegging
  - Gelling
- Enhanced Photographs and Art
  - Rotoscoping
  - Posterization Art
  - Graphics Modifier
  - Neg-Pos Stats (Bromides)
  - Airbrush
  - Dupes
  - Color Prints
  - Retouching
  - Special Masks
  - Special Processing
  - 20% Contingency
- Art for Location Photography (Props)
  - Briefing
  - Scenery
  - Props (Large)
  - Props (Hand-held)
  - Model Making

Audio Production

- Briefing time
- Scripting (Internal; rough & finished)
- Scripting (Special Talent)
- Custom Music
  - Writer (Melody & Lyrics)
  - Orchestrator/Arranger
  - Talent Search
  - Musicians
  - Singers
  - Studio Time
  - Signal Processing
  - Special Equipment
  - Special Facilities
  - Talent Travel & Accommodations
  - Long-Distance Phone Tape Stock
  - 10% Contingency

Audio Production (continued)
- Stock Music
  - Final Search Tine
  - Purchase of Rights
  - Studio Record Time
  - Studio Orchestration Time
  - Final Mix Time
  - SFX
  - Signal Processing
  - Tape Stock
  - 20% Contingency
- Final Mix
  - Studio Time
  - Tape Stock
  - 5% Contingency
- Clock track (AVL or NTSF)
- Dubs
  - Programming Copy
  - Special Equipment Mixes
  - Show Copies
  - SFX
  - Signal Processing
  - Tape stock
  - 20% Contingency

Cine Post Production
- Cine Opticals
  - Mask or Titles artwork
  - Shooting (Optical Bench or Printer)
  - Processing
  - Integration
  - CRIs (Color-reversal internegatives)
  - CRNs (Color-reversal negatives)
- Workprints
- Answer Prints
- Sound Master
- Other
- Filmstock
- Processing
- Special Programming (Raven, etcetera)
  - 200% Contingency
- Special Reel Configuration (Assembly)

Presentation Copies of Show(s)
- Copies of Slide Trays
- Copies of Film Reels
- Copies of Audio Tapes

Presentation Copies of Shows (continued)
- Videotaping
  - 3/4-inch
  - 1-inch
  - Quad

Multiplexing
- Review of Show
- Technical Analysis
- Corrections for Transfer
  - Dupes (to lighter)
  - Gel-Downs (to darker)
  - Slide Cleaning
  - Audio reconfigurations (for segmented shooting)
- Tests for exposures
- Realignment time for segments
- Total Camera Time
- Social Equipment Hire
- Filmstock (Video Tape Stock)
- Processing
- 40% Contingency
- Alignment of Table or Grid.
- Special Video Editing to Assemble Segments
- Special Cine Editing to Assemble segments
- SFX & Opticals (Cine or Video)

Staging
- Architect fees
- Special liaison
- Site check(s)
  - Surveyor time
  - Travel & lodging
  - Other
- Set Design
  - Roughs
  - Design Fee
  - Finished Miniature Art
  - Models of Sets
  - Costume Mick-ups
  - Special Equipment and Materials
- Set Lighting
  - Design Fee
  - Grid Matrix Technical Drawings
    - Rough
    - Finish
  - Special Equipment and Materials
    - Purchase/Hire

Staging (continued)
- Set Construction
  - Models
  - Finished Work
  - Transportation
  - Storage
- Props
  - Build
  - Rent
  - Purchase
  - Storage
- Costumes
  - Fabricate
  - Rent
  - Purchase
  - Storage
- Lighting Contractor
  - Crew
  - Equipment
  - Transportation & Lodging
- Screen
  - Rental
  - Purchase
  - Special Screen Requirements
- Audio
  - Crew
  - Equipment Hire & Insurance
  - Crew/ Equipment Travel/Lodgings
  - Special Audio Equipment Hire & Insurance
- Seating
  - Construction
  - Hire
  - Arrangement
- Projection Equipment
  - Hire
  - Purchase
  - Transportation & Insurance.
- Projection Contractor
  - Crew
  - T and E
- Projection Lamp Replacement
  - Cine
  - Slides
  - Other
- Laser Projection
  - Special Art
  - Special Programing
  - Special Rehearsals
  - Special Location Facilities (power and Water)

- Staging (continued)
  - Laser Projection (continued)
    - Equipment Hire
    - Crew
    - Transportation & Lodging
    - Equipment Transportation
    - Special Bureaucratic Clearances'
      - Time to arrange
      - ~~Payoffs~~ Expenses
    - Extra Insurance
    - BRH (Bureau of Radiological Health) Approval
    - 100% Contingency
  - Special Theatrical Effects
    - Search Time
    - Extra Insurance
    - Fire-Code Approval
    - Design
    - Rehearsals
    - Travel Transportation
    - Materials and Supplies
    - 20% Contingency
  - Show Talent
    - Special MC's or Announcers
    - Dancing Girls (or Guys)
    - Location Band or Orchestra
    - Rehearsal Time (For Music/Dance Warm-ups)
    - Rehearsal Time (Full Crew Including AV)
    - Travel & Transportation (Talent and Equipment)
    - Extra Rights (Videotaping?)
    - 50% Contingency
  - Outside Labor/Stagehands
    - Union Fees
    - Crew
    - Meals
    - Accommodations
    - Payoffs & Overtime
    - 50% Contingency
  - Venue
    - Rental
    - Tips & Gratuities
    - ~~Payoffs~~ Special expenses
    - Special Facilities
    - Venue Survey & Analysis
      - Travel
      - Crew
      - Analysis Reports
      - Briefing & Meetings
      - Long Distance Phones
      - Liability Insurance

Staging (continued)
- General Travel
  - Customs Clearance
    - ~~Payoffs~~ Processing Fees
  - Equipment Registration & Documentation
  - Export/ Import Regulations Research
  - Special Packaging
  - Special Transportation Equipment
  - Packing and Handling Crews
- Personal Travel
  - Visa Processing Time and Fees
  - Medical Requirements
  - Travel Arrangements
  - Special Clothing
  - Special Luggage
  - Special Transportation (Learjet, etcetera)
- Logistics Planning:
  - Development of Staging Scenario
  - Integration of A/V & Cine
  - Staging Director (Time)
    - Assistants (Time)
    - Travel & Accommodations
  - Final Logistics Plan
  - 20% Contingency

Retail Purchases and Sales in Behalf of Client
- Hardware
- Airfares (+ Markup)
- Accommodations (+ Markup)
- Talent (+ Markup)
- Peripherals (+ Markup)
- Other
- Insurance / Security

Clerical
- Total Long-Distance Phones
- Total Local Phones
- Total Typing
  - Scripts
  - Schedules
  - Correspondence
  - Memos
- Total Copies
  - Scripts
  - Storyboard
  - Purchase orders
  - Memos
- Total Clerical Supplies
- Total Telex

Clerical (continued)
- Total Office Usage
- Special Communications (messengers and air deliveries)
- Cabs and "Regular" Messengers
- Budget Checking
  - Analysis
  - Weekly Updates
  - Cost Overruns
- Time Sheet Analysis
  - Tally
  - Allocation
  - Management
- Petty Cash Management
  - Disbursements
  - Processing and assignment
- Bill Paying
  - Payment Schedule
  - Money Management

Client Entertainment
- Breakfasts / Lunches / Dinners
- Gifts (or other payoffs)
- Awards
- Still Photos
- Others

TOTAL BUDGET CONTINGENCY (20%)

TOTAL CONCEIVED OVERTIME

PROFIT MARGIN (ON TOTAL)

TOTAL PRICE TO CLIENT

- AGENCY DISCOUNT
- COMMISSIONS PAYABLE

TOTAL PRODUCTION COST (TO HOUSE)

TOTAL OUTGOINGS

TOTAL MARKUPS

TOTAL INTERNAL DOLLARS

MARGINS

SPECIAL FACTORS (IF ANY)

Having gone through all that; the only things not included are the costs of a birthday card to your grandmother and the costs of new carpet for your summer home. (Although there are categories where such costs could be included, with a little 'creative thinking'—haha!).

The checklist presented is intended to be used internally and should be kept under lock and key. It is not supposed to be released to the client. The client gets a summary sheet. As stated earlier; if you get a client that digs too deep, you have a chintz on your hands which you should get rid of ASAP. With trusted clients you *may* wish to go through the detailed internal price analysis. But again, I ask you: when is the last time you asked a car dealer to justify why it costs $10,000 to buy a Chevy? There is no need for you to feel compelled to make the inner workings of your company public knowledge. In addition, those inner workings, as revealed by your internal budget analysis sheets, should be made privy to only your most trusted employees; preferably ones with whom you have contractual arrangements and/or who have signed an NDA (Non-Disclosure Agreement). Every one of the employees on your payroll could, conceivably, take a walk tomorrow, to a competitor offering them a larger salary and/or benefits. It happens every day.

Note also: it is a checklist of expense *categories*; summaries of all the specific costs involved in the production of a multi-image or multi-media show. While preparing the tabulations, you will be more detailed in your break-out of costs.

Now, let us discuss some individual categories:

Consultancy

Into this section goes all your staff time spent to come up with the big idea and make it happen. I call it "consultancy" because you should consider the items in this category to be separate from 'production.' That is, even if you don't produce the job, you should still get paid for your ideas and advice. If you do produce it, you should still get paid for time spent 'thinking.'

It is surprising how many producers (and clients) think that the idea is sort of automatically given to the client as a way of getting to produce the job, where the money is made. That is nonsense; and no way to run a business.

Often, too, you may find yourself in a position where outside help is sought to either come up with the big idea, or to support the fact that it is viable and reproducible. You may, for example, get involved with market research to substantiate your idea—or even to find it. As discussed earlier; it may be necessary to find out more about your client's competition than even the client is aware of. In fact, that will likely prove to be the case; because most clients are like ostriches; that keep their head firmly buried in their own turf. All that research time and the costs of any outside consultants should be included in this category.

This checklist assumes you are a medium-to-large shop and would have a production manager from whom you could collect a summary of costs derived from your crew's time sheets and expense reports.

If you are a small shop; some of these categories might change. For example: instead of 'production manager,' you night substitute photographer, programmer, or slide assembler.

Time estimates are compiled by the number of hours that are needed (or spent) coming up with the idea and the necessary 'think through' of the idea to determine its viability and production costs. It is everyone's time spent coming up with and estimating the production costs of that idea. The category's total value is determined by multiplying everyone's time with their billable cost per hour.

Also keep in mind that the category "Creative" does not assume (at this point) the *value* of the idea; that is an intangible that should be separately priced and budgeted. Coming up with an idea requires "X" time. If you are of a creative bent, you realize that coming up with a winning idea sometimes takes just a matter of seconds; other times it takes days or weeks. Sometimes, you never get inspired. The time spent does not necessarily equate with the value of the idea. It might take you five minutes to some up with an idea that could become the focal point of an entire campaign. God knows, the ad agencies do this day by day; and multi-image is a form of advertising. An ad agency might come up with an idea in a single meeting; but that idea might have a million dollars or more spent on it.

Although our ideas are usually a bit lower on the budget scale, there is nonetheless a scale of relativity. An idea for a one-time show is worth less than an idea for a show that will tour 50 cities—even though it took the same amount of time to think-of and produce. The bigger the idea's 'play'—the more eyes that see it—the more it is 'worth' and the more you should get paid. Thus: a creative fee is in order; that is above and beyond the charge for the time it took to intuit, prepare, and justify the idea.

[*Editor*: Julio Campos—who I taught programming at Image Stream and who went on to build one of Los Angeles' biggest meetings and events companies—told me about an idea he came up with for car-launch show that was 'borrowed' by the ad agency and became the focal point of an entire ad campaign. They spent millions on an idea for which he got paid virtually nothing. Such is the nature of this business.]

The category "Creative" should be broken out into the services which you and your company provide which are A.) involved in the jobs your produce and which are B.) sold as advice to your customers. The very idea of *selling* is 'new' to some multi-image producers; even though professionals in other communications media have been doing it for a long, long time.

Did you ever consider walking into a lawyer's office asking for free advice? Or a doctor? Or even a veterinarian? Sure; if you have an ongoing relationship with a client who's feeding you the bulk of your business; who you can count on as a regular customer; then you're going to offer advice and some of it may be 'free.' But the rest should be charged a monthly consultancy fee; or a retainer; that is exclusive of production costs.

We live in a pragmatic, 'dog-eat-dog' world; nothing should be free. Indeed; free ideas are considered less 'valuable' than the ones that cost; and the more an idea costs the more it is valued. My experience has been that if a client is made to pay a fee for an idea, that idea is more likely to fly than if I just spout it out during a pre-production meeting and someone latches-on to it.

Before discussing ideas; let the client know that the meter is on.

Needless to say; much depends on whether you are in an 'exclusive' position with the client or competitively bidding. If bidding, you might have to swallow some of the costs; but not all of them. In the eyes of the client, the 'cheaper' you seem to be, the less respect you will get and the more aggravation you will have. Think of the jobs you have already done; I am sure I am right; that in most cases, the more the client spends, the more respect and less aggravation you have. It is pure psychology and it works every time (as long as you deliver everything you said you would, retaining credibility.)

Credibility plays an important part in the process of budgeting. The minute you lose credibility you are lost. You must never promise to deliver more than you can. You must also never promise a client a budget that is so low that you cannot produce the job for the amount quoted. Every cost-overrun you submit (unless absolutely caused by the client) will diminish your credibility. After a while, the client will not believe anything you say—and word travels fast in this business. You will get a reputation for inaccurate estimates. I am sure you have suppliers like that; ones that promise the world and always end up costing you more than you anticipated; more than they quoted you. The same way that pisses you off, it will piss off your client.

Conversely, if you can deliver a job for less than budget, you will achieve total credibility. It is always a good idea to come in a bit less than you said you would. That helps insure an ongoing relationship with the client. To accomplish that, always budget a bit higher than you think the job should cost. That way, you can come in a bit lower and still make money. It's a delicate balance, to say the least. But, if you can do it, you will have a client who is convinced of your honesty; and thus, be assured of an ongoing relationship.

As mentioned earlier; the only way you can do that effectively and realistically is to know exactly what things cost; especially internally; factoring-in your experimentation and all other variables. With these figures in hand; you should calculate what you think things will really and truly cost. Then virtually double that figure as a contingency. I found that when I applied such a 'doubling factor,' things would tend to work out more or less on budget.

Just about anyone in pursuit of a job is likely to do two things: underestimate and pad the budget. However, underestimation rarely equals the pad factor. Thus, you tend to break even or lose money on any given job. It is better to estimate using 'real' numbers and pad a realistic total. For that reason, assign the estimating and budgeting roles to someone other than a member of the creative team.

The budgeter should consider doubling any estimates given by 'creative types' who invariably underestimate. What do the creatives know about numbers, not to mention profitability? An executive creative director can sometimes solve that problem; since the job of an executive creative director is to 'execute' ideas; and know what things cost.

Other, non-creative aspects of the business are easier to estimate; they are more 'cut and dry.' Typing, for example, costs 'X' per hour and there is little that will go wrong. Stats (bromides) are another example; they are 'black and white,' so to speak, not shades of gray. Anything creative is a shade of gray and it is for such 'gray matters' that Murphy developed his law—what can go wrong will.

Take programing. How long does it take to program a show? Well, that depends. (See what I mean, about 'gray'?) It not only depends on how good the programmer is; it also depends on the state of the show when you give it to the programmer. Did you involve the programmer up front? Did you follow my advice and make a write-on-slide version of the show before preparing art & shooting? Or did you hand the programmer a pre-loaded set of trays and a storyboard that is written in hieroglyphics? The latter inevitably takes longer than the former.

Everyone tends to be overly optimistic and underestimate costs. You may have called your local freelance programmer and said you have a five-minute show; and the programmer may have responded something to the tune of, "Nothing to it; it'll cost y'a 'X.'" But, when the programmer arrives on the scene and discovers a disaster zone, their charges could double--hence, the doubling factor. Better that you overestimate and come in under—based on 'real' figures.

When it comes to something like programming; still another reason for doubling is that there are factors outside of your control that will influence your ultimate costs. Will the projection grid function flawlessly throughout the programming process? Probably not. My experience is that the more critical things are, the more likely it is that you will have a technical failure. Who pays for that lost time? The programmer? No. You do. So, you better have a "Murphy contingency" in your budgets. You are in the "Walter Mitty" zone—the wonderful world of multi-image (*multi-problemo*).

Or, take slide mounting. I recall one episode when we had just finished shooting a very elaborate Forox sequence. The film came back from the lab quite late at night (a night which had already cost me Chinese food for ten). We had hired a freelance slide mounter, and because we were rushing the job, insufficient slates had been made on the 200-foot roll of film. As a result, the freelance mounter mis-cut one of the most complicated shooting sequences; and that required a reshoot because it was miscut by two sprockets. Sometimes, you can make do with a one-sprocket miscut, if it involves scenes with a black BG. But there is no saving a two-sprocket miscut; especially for an entire sequence. Errors like that are 'inevitable,' you might say; they are not anyone's 'fault.' Actually, they *are* someone's fault; but at that point who cares; the question is moot; and you 'eat' the added costs.

On the other hand; there are numerous examples of a client's 'faults.' That is particularly the case with speaker support slides and other informative material where the client may have given you copy that was not final; that hadn't been cleared by legal or the C-Suite. In such cases; you should calculate your costs and then multiply by at least four. The average client is used to spending double for last-minute corrections; so, they likely 'won't mind.' But, these types of last-minute changes can wreak havoc to an already tight production schedule, requiring 'all nighters' and weekend work. They can push people close to the breaking point—especially since such changes usually involve elements of the show considered to be 'bullshit' by the creative types; the bane of their existence. So, you must be prepared pay a king's ransom in overtime to get the changes made.

Try to discourage any such changes by making the client aware that changes are going to cost a fortune; that you should be given accurate, approved copy before even beginning the job.

Akin to that is the process of getting client approvals. What determines an AA (Author's Alteration) from a 'real' error? That is an entire area that we will consider in more detail later. At this juncture, let me point out that in terms of informational slides, I require the client to sign off on all type proofs before they are committed to mechanicals. They must approve all spellings as well as all numbers, initialing gallies and proofs. The reason for that, which may seem annoying to the client, is simple: My associates and I cannot be expected to be as fully versed with the information as the client. If I cannot rely on the client to help me root out potential problems, then God bless everyone involved.

Finally; you should also factor into your total budget the amount(s) it costs you to get the job in the first place; or is going to cost you to get. Some clients require large, formal, agency-type pitches which can take weeks of staff time to prepare and cost you bundles. That is money you should get back; it must be factored into your budget. Use the checklist to estimate the pitching costs and add them to the budget.

The following pages are a later version of the Budget Check List. It is more concise than the original and laid out for a spreadsheet, with right-hand Sub-Total, Mark-Up, and Totals columns. [*Editor*: Those columns do not appear on these pages.]

After that (page 3127), there are also examples of the budgeting forms used by Sonargraphics. (See, *1982 | Sonargraphics Budget Sheets | Plates N^{os} 1-4*.) Those were done by Lindsay Rodda's administrative assistant, Malcom Sinclair; a smart money who oversaw the multi-image department before I arrived. Amusingly, categories that Malcom wasn't fluent in are abbreviated, with fewer sub categories; which is understandable but unrealistic although nonetheless 'real.' They reflect the company's primary products: film and video.

PRODUCTION BUDGETING FORM

SUBTOTAL MARK-UP TOTAL

PITCHING COSTS

CONCEPT
SCRIPT
AUDIO
ART & TYPESET
PRODUCTION
VIDEO
PHOTOGRAPHY
SLIDE PRODUCTION
PROGRAMMING
FACILITIES USED
CLERICAL AND ADMINISTRATIVE
TRAVEL AND TRANSPORTATION
ENTERTAINMENT
THEATER (GRID)
ANINISTRATIVE

CONSULTANCY

SALARIED STAFF TIME:
- EXECUTIVE PRODUCER
- CREATIVE
- DIRECTOR
- PRODUCTION MANAGER
- TECHNICAL SERVICES
- PRODUCTION COORDINATOR
- OTHER (SPECIFY)

VALUE OF IDEAS

TELEVISION
- LOCAL (INTERNAL)
- BROADCAST
- NETWORK

AUDIO VISUAL
- LOCAL (INTERNAL)
- NATIONAL
- INTERNATIONAL

PRINT USAGE
- LOCAL (INTERNAL)
- NATIONAL
- INTERNATIONAL

CONCEPT & SCRIPTING

RESEARCH TIME
- CONCEPTUAL
- SCRIPT
- AUDIO (MUSIC)
- VISUALS (LOCATION/SOURCES/STOCKS/EFC,)
- OUTSIDE COSTS
- OTHER (SPECIFY)

CONCEPT DEVELOPMENT & REFINEMENT
- INTERNAL (TIME)
- EXTERNAL (TIME & COSTS)

CLERICAL
LONG DISTANCE PHONES
OTHER (SPECIFY)
VISUALIZATION
- TECHNICAL STORYBOARD
- SKETCH BOARD
- FULLY ILLUSTRATED STORYBOARD
- FINISHED ART SAMPLES
- SPECIAL EFFECTS SAMPLES
- ROSTRUM CAMERA SAMPLES
- LOCATION PHOTOGRAPHY SAMPLES
- WRITE-ONN SLIDE VERSION

AUDIO TRACK
- FIRST DRAFT SCRIPT
- SECOND DRAFT SCRIPT
- FINAL SCRIPT
- ROUGH TRACKS PREPARATION
- ROUGH MUSIC MIXES
- ROUGH VOICEOVERS

PROGRAMMING
- ROUGH PROGRAMMING FOR SAMPLES
- WRITE-ON-SLIDE VERSION
- FINAL TWEAKING

PHOTOGRAPHY (LOCATION)

PHOTOGRAPHIC CREW
FILM STOCK
PROCESSING
STUDIO TIME
SPECIAL EFFECTS EQUIPMENT HIRE
OTHER SPECIAL EQUIPMENT HIRE
LIGHTING HIRE
PROPS
MAKE-UP
STYLIST
MODELS/TALENT
PHOTO ASSISTANTS

PHOTOGRAPHY (LOCATION) continued

- STAFF LIAISON
- STAFF SUPERVISION
- VEHICLES
- LOCATION COSTS
- MEALS AND OUT-OF-POCKETS
- TRAVEL AND LODGING
- TRANSPORTATION
- SPECIAL LOCATION RENTALS
- SPECIAL LOCATION EFFECTS
- SPECIAL LOCATION VEHICLES AND EQUIPMENT

PHOTOGRAPHY (STOCK)

- PURCHASE RIGHTS
- RE-PHOTOGRAPHY OF ORIGINALS
- LARGE FORMAT CHROMES OF ORIGINALS
- INSURANCE
- SHIPPING AND HANDLING
- ADD 15% LOSS CONTINGENCY

PHOTOGRAPHY (ROSTRUM CAMERA)

- CELLS PREPARATION
- MASK PREPARATION
- ON-CAPERA TIME
- CREW
- SPECIAL LIGHTING
- SPECIAL MATERIALS
- 25% EXPERIMENTATION SURCHARGE
- FILMSTOCK
- PROCESSING
- DUPES
  - SOME FRAMES
  - ENTIRE SHOW
  - HOUSE COPY

ARTWORK PREPARATION

- TYPESET
  - BRIEFING TIME
  - SPECIFICATION TIME
  - TYPSESET COSTS
  - EXTRA REPROS
  - 10% CONTINGENCY
  - NEGS OR POS'S FROM TYPESETTER
  - GRAPHICS MODIFICATION
  - CUSTOM LETTERING OR SWASHING
  - AIRBRUSH
  - 20% CONTINGENCY

ARTWORK PREPARATION continued

- CARTOON ART
  - BRIEFING TIME
  - ROUGHS
  - ANIMATION TRIALS
    - ART
    - SLIDE DUPES (LITHS)
    - PROGRAMMING
    - ROUGH TRACK
  - FINISHED CELL ART
  - 30% CONTINGENCY
- ILLUSTRATIONS
  - BRIEFING TIME
  - ROUGHS
  - ROTOSCOPING
  - FINISHED ART
  - 20% CONTINGENCY
- CHARTS
  - BRIEFING TIME
  - FINISHED ART
  - OVERLAYS
  - MECHANICAL-IN TYPE
  - STATS
  - KODALITHS
  - PEGGING
  - GELLING
  - 20% CONTINGENCY
- TYPE MECHANICALS
  - BRIEFING
  - ROTOSCOPING
  - ROUGHS FINISHED ART
  - OVERLAYS
  - RUBIES
  - STATS
  - LITHS
  - GELLING
- ENHANCED PHOTOGRAPHS
  - ROTOSCOPING
  - POSTERIZATION ART
  - GRAPHICS MODIFIER
  - NEG-POS STATS
  - AIRBRUSH
  - DUPES
  - ENLARGED CHROMES
  - COLOR PRINTS
  - BLACK & WHITE PRINTS
  - RETOUCHING

ARTWORK PREPARATION continued

- ENHANCED PHOTOGRAPHS
  - SPECIAL MASKS
  - SPECIAL PROCESSING
  - 20% CONTINGENCY
- ART FOR LOCATION / STUDIO PHOTOGRAPHY
  - HAND-HELD
  - SCENERY
  - DROPS
  - MODEL MAKING
  - OTHER (SPECIFY)

AUDIO PREPARATION

- BRIEFING
- SCRIPTING
  - FIRST DRAFT
  - SECOND DRAFT
  - THIRD DRAFT
  - FINAL SCRIPT
  - SPECIAL SCRIPTING TALENT
- CUSTOM MUSIC
  - WRITER (MELODY & LYRICS)
  - ORCHESTRATION/ARRANGER
  - TALENT SEARCH
  - MUSICIANS
  - SINGERS
  - STUDIO TIME
  - SIGNAL PROCESSING
  - SPECIAL EQUIPMENT
  - SPECIAL FACILTTIES
  - TRAVEL AND ACCOMODATIONS
  - LONG DISTANCE PHONES
  - 10% CONTINGENCY
- STOCK MUSIC
  - FINAL SEARCH TIME
  - PURCHASE OF RIGHTS
  - STUDIO RECORDING TIME
  - STUDIO ORCHESTRATION TIME
  - FINAL MIX
  - SFX
  - SIGNAL PROCESSING
  - TAPE STOCK
- ANNOUNCER OR SPECIAL TALENT
  - BRIEF
  - STUDIO TIME TO RECORD
  - NARRATOR FEES
  - MANAGEMENT FEES
  - AGENCY FEES
  - SPECIAL TALENT FEES

ANNOUNCER OR SPECIAL TALENT continued
- RESIDUALS
- STUDIO EDIT OF TAKES
- FINAL VOICE TRACK ASSEMBLY
- SIGNAL PROCESSING
- TAPE STOCK

LOCATION RECORDING
- CREW
- SPECIAL EQUIPMENT
- SPECIAL EFFECTS
- TRANSPORTATION & LODGING
- DUB TO STANDARD STUDIO FORMAT
- SFX
- SIGNAL PROCESSING
- TAPE STOCK
- 20% CONTINGENCY

FINAL MIX
- STUDIO TIME
- TAPE STOCK
- ADD CLOCK TRACK
- 5% CONTINGENCY

DUBS
- PROGRAMMING COPY
- SPECIAL-EQUIPMENT MIXES
- SHOW COPIES
- SFX
- SIGNAL PROCESSING
- TAPE STOCK

CINE POST PRODUCTION

CINE OPTICALS
MASK OR TITLES ART
OPTICAL STAND PHOTOGRAPHY OF MASKS/TITLES
PROCESSING
CRIs
CRNs
INTEGRATION
SPECIAL EFFECTS
WORK PRINTS
ANSWER PRINTS
SOUND MASTER
OTHER (SPECIFY)
FILMSTOCK
PROCESSING
SPECIAL PROGRAMMING (RAVEN/OTHER)
SPECIAL REEL CONFIGURATION

PRESENTATION COPIES OF SHOW

- MOUNTING OF SLIDES
  - CREW
  - MOUNTS
  - OTHER (SPECIFY)
- EDITING OF SLIDES
  - CREW
  - PLASTIC SLIDE SHEETS
  - RING BINDERS
  - OTHER (SPECIFY)
- ASSEMBLY OF TRAYS
  - CREW
  - TRAYS
  - COLLATING
  - NUMBERING
  - LABELING
  - TRAY MATCHING
  - TRAY TESTING
  - SPECIAL CLEANING
  - SPECIAL GELLING
  - OTHER (SPECIFY)
- MULTIPLE SETS
  - COPIES OF TRAYS
  - COPIES OF CINE REELS
  - COPIES OF AUDIO TAPES
  - VIDEOTAPING
    - FOR CLIENT
    - FOR HOUSE

FINAL PROGRAM TWEAKING

- CREW
- GRID TIME
- SPECIAL EQUIPMENT
- OTHER (SPECIFY)

MULTIPLEXING

- REVIEW OF SHOW
- TECHNICAL ANALYSIS
- CORRECTIONS FOR TRANSFER
  - DUPES (LIGHTER/DARKER/POSITION)
  - GEL-DOWNS
  - SLIDE CLEANING
  - AUDIO RECONFIGURATION (SEGMENT/MULTI)
- EXPOSURE TESTS
- REALIGNMENT TIME (SEGMENTS)
- TOTAL CAMERA TIME
- SPECIAL EQUIPMENT HIRE
- PROCESSING
- ALIGN GRID

MULTIPLEXING continued

- SPECIAL VIDEO EDITING
- SPECIAL CINE EDITING
- 40% CONTINGENCY
- SFX & OPTICALS

STAGING OF SHOW

- ARCHITECTS FEES
- BRIEFING
- SPECIAL LIAISON
- SITE CHECK
  - CREW
  - TRANSPORTATION 8 LODGING
- SET DESIGN
  - ROUGHS
  - FINISHES
  - DESIGN FEE
  - FINISHED MINIATURE ART
  - MODELS OF SETS
  - COSTUME PICK-UPS
  - SPECIAL EQUIPMENT & MATERIALS
  - OTHER (SPECIFY)
- SET LIGHTING
  - DESIGN FEE
  - GRID TECHNICAL DRAWINGS
  - FINISH
- SPECIAL EQUIPMENT & MATERIALS
  - PURCHASE
  - HIRE
- SET CONSTRUCTION
  - MODELS
  - FINISHED SETS
  - TRANSPORTATION
  - STORAGE
- PROPS
  - BUILD
  - RENT
  - PURCHASE
  - DESIGN
  - STORAGE
- COSTUMES
  - DESIGN
  - FABRICATE
  - RENT
  - PURCHASE
  - STORAGE

STAGING OF SHOW continued

- LIGHTING CONTRACTOR
  - CREW
  - EQUIPMENT
  - TRANSPORTATION & LODGING
  - OTHER (SPECIFY)
- SCREEN
  - RENTAL
  - PURCHASE
  - SPECIAL EQUIPMENT
  - OTHER (SPECIFY)
- AUDIO
  - CREW
  - EQUIMENT (HIRE & INSURANCE)
  - TRAVEL AND LODGINGS
  - OTHER (SPECIFY)
- PROJECTION EQUIPPENT
  - CREW
  - EQUIPMENT (HIRE OR PUCHASE)
  - TRANSPORTATION & LODGING
  - OTHER (SPECIFY)
- SEATING
  - CONSTRUCTION
  - HIRE
  - ARRANGEMENT
  - CREW
  - OTHER (SPECIFY)
- PROJECTION LAWP REPLACEMENT
  - CINE
  - SLIDES
  - OTHER
- LASER PROJECTION
  - SPECIAL ART
  - SPECIAL PROGRAMMING
  - SPECIAL REHERSALS
  - SPECIAL LOCATION FACILITIES (POWER/WATER)
  - EQUIPMENT HIRE
  - CREW
  - TRANSPORTATION AND LODGING
  - EQUIPMENT TRASPORTATION
  - OFFICIAL CLEARANCES
  - PROCURMENT TIME COSTS
  - PAYOFFS
- EXTRA INSURANCE
- BRH APPROVALS
  - TIME & COSTS
  - SUBMISSION OF PLANS

STAGING OF SHOW continued

- SPECIAL THEATRICAL EFFECTS
  - SEARCH TIME
  - EXTRA INSURANCE
  - FIRE-CODE (OTHER) APPROVALS
    - PROCUREMENT TIME
    - ~~PAYOFFS~~ PROCUREMENT FEES
  - DESIGN
  - CREW
  - REHEARSALS
  - TRAVEL & LODGING
  - MATERIALS & SUPPLIES
  - 20% CONTINGENCY
- SHOW TALENT
  - SPECIAL ANNOUNCERS/MC'S
  - DANCING (SINGING) GUYS & GALS
  - LOCATION ORCHESTRA
  - REHEARSAL TIME
    - SINGERS/DANCERS/TALENT
    - TECHNICAL CREW
    - SPEAKERS
    - DRESS REHEARSAL
  - TRAVEL & LODGING
  - EXTRA RIGHTS (VIDEOTAPING)
  - MANAGEMENT FEES (TALENT)
  - STAFF LIAISON TIME
  - OTHER (SPECIFY)
- OUTSIDE LABOR/STAGEHANDS
  - UNION FEES
  - CREW
  - MEALS
  - ACCOMMODATIONS
  - TRAVEL & TRANSPORTATION
  - ~~PAYOFFS~~ ARRANGEMENT FEES
  - OVERTIME
  - 50% CONTINGENCY
- VENUE
  - RENTAL
  - FEES
  - GRATUITIES
- SPECIAL FACILITIES
- VENUE SEARCH AND ANALYSIS
  - TRAVEL
  - CREW
  - BRIEFING TIME
  - CLIENT MEETINGS
  - LONG DISTANCE PHONES
  - CLERICAL

VENUE SEARCH AND ANALYSIS continued
- ANALYSIS REPORTS
- OTHER (SPECIFY)

LIABILITY INSURANCE
GENERAL TRAVEL EXPENSES
CUSTOMS CLEARANCE
- PAYOFFS
- EQUIPMENT REGISTRATION
- EQUIPMENT DOCUMENTATION
- EXPORT/IMPORT REGULATIONS RESEARCH
- SPECIAL PACKAGING
- SPECIAL TRANSPORTATION EQUIPMENT
- PACKAGING/HANDLING CREWS
- OTHER (SPECIFY)

PERSONNEL TRAVEL
- VISA PROCESSING
- MEDICAL PROCESSING
- TRAVEL ARRANGEMENTS
- SPECIAL CLOTHING
- SPECIAL LUGGAGE
- SPECIAL TRANSPORTATION (LEAR JETS/LIMOS)
- AIRFARES
- RENTAL CARS
- OTHER (SPECIFY)

LOGISTICS PLANNING
- DEVELOPMENT OF SCENARIO
- INTEGRATION OF AV/CINE
- SPECIAL EQUIPMENT/VEHICLES
- STAGING DIRECTOR
  - ASSISTANTS
  - TRAVEL & ACCOMMODATIONS
- FINAL LOGISTICS PLAN
- 20% CONTINGENCY

RETAIL SALES & PURCHASES

HARDWARE
AIRFARES
ACCOMMODATIONS
TALENT
PERIPHERALS
OTHER (SPECIFY)

INSURANCE AND SECURITY

HOUSE
LOCATION
LIABILITY
SECURITY
OTHER (SPECIFY)

CLERICAL

LONG DISTANCE A-IONES
LOCAL CALLS
TYPING
DICTATION
TELEX
TELEGRAMS
OFFICE USAGE (XEROX/OTHER)
SPECIAL DELIVERIES
- MESSENGERS
- AIR COURIERS
- OTHER (SPECIFY)

CABS & REGULAR MESSENGERS
MANAGEMENT (BUDGET/TIME MANAGEMENT)

CLIENT ENTERTAINMENT

MEALS
TRANSPORTATION & LODGING
GIFTS
PHOTOGRAPHY
OTHER (SPECIFY)



Editor: Before you can visualize a concept, you must have a concept to visualize. But what is a concept? I have a story that explains that; a story told by Julio Campos.

His company (Campos Creative) was hired to produce a weekend corporate event to be held for a company's super-sales people at a resort in Hawaii; it was a to be good old fashioned 'junket.'

Julio Campos at the 1987 AMI convention; flanked by Jon Bromberg (left) and Yours Truly.

Campos was attending a 'creative session' with the company's marketing and advertising people; you know, to 'coordinate' and 'interface.' They were charged with coming up with a concept for the event; some mistakenly call it a 'theme' (which is something quite different). There was a dozen or so of them; it was a real free-for-all. Everyone was invited (expected) to 'contribute.' All morning they threw ideas at the wall, to see what stuck. "What kind of show should it be?" "When should we have it? Before or after the Business Session?" "Definitely not after the golf tournament; hahaha."

Then someone remarked, "Julio, you haven't said a word. What do you think?" After a pregnant pause, during which his eyes made split-second contact with everyone else's, he began: "You've all presented some good ideas; but they are 'ideas,' not concepts. I would charter a 747 airliner; have it painted in the company's colors; re-arrange the seats; use the flight time for the business session; give everyone a real holiday weekend; and during the flight back, have a motivational speaker followed by closing festivities. (Pause) *That* is a concept." And with that, he got up and left.]

Storyboarding

Visualizing your concept is an important category in show estimation that is often forgotten and ends-up costing you a fortune; particularly storyboarding. I have found that different production houses have different ideas about what constitutes a storyboard. Some think that a basic board should be as snazzy and 'accurate' as an ad agency's board for a $500,000 set of commercials.

I have seen some boards that were so good they should have simply been copied to make the show. Others have varied between a 'technical' board and hieroglyphics supported by doodles. Certainly, different types of storyboards have different needs; but there is one important function common to any type of storyboard: its purpose is to accurately communicate the visuals sequence of a production. For that single reason, a storyboard should be only as complicated as it needs to be to communicate the visuals proposed.

Thus, if you are only using the board internally, or with a client who is very familiar with multi-image, a simple, abbreviated, 'technical' storyboard may be all that is needed. On the other hand, if you are dealing with a totally naïve client, or have a corporate "committee" for a client; you'll most likely have to prepare carefully-drawn storyboards; then match them as closely as possible.

If you work for agencies, you will probably have to do some pretty tight boards, too; they are the ones who invented them; they go by them daily in their own internal production and approval procedures.

For purposes of estimating; a precision-drawn, full-blown storyboard can cost a fortune; perhaps as much as $5,000 or more for a big show.

That is a lot of money; especially considering that there will probably be myriad changes; the attitude of many is, "That is 'only' the storyboard; it's 'meant' to be changed."

There are other problems, too. It is very difficult to storyboard certain aspects of a multi-image show; especially special screen configurations, programming moves, and visual effects. The latter is an endless source of frustration; how do you storyboard a glow or a glitter-fill? You would have to spend hours air-brushing; and might as well use the airbrush drawing for the show. Instead, attach sample slides showing effects which are 'loosely' illustrated on the board; those samples are keyed to, and are referred to, by the Bible's nomenclature.

Or; how do you illustrate a complex, multi-screen dissolve; or the separated elements for a multi-projector effect. If you separate-out each slide, only a sophisticated multi-image expert could fathom the complexity of the board. I doubt your client is that sophisticated.

Thus, the best approach to a storyboard is to illustrate the finished, assembled 'look;' the screen layouts; and try to verbally talk-through the dissolve transition in a written caption. Personal presentations are helpful; you can 'lead' the client through the board (a good idea, in any case).

A technical storyboard is a 'horse of another color,' as my British father used to say. That storyboard is designed for internal use and is the actual blueprint of the show. It breaks-down the show into each of its components—slide by slide—including the masks and photographs contained in each and every (numbered) slide mount. It also documents the programming TABS and moves.

That type of board must be made at some point; so you might as well make the tech board your starting point; then, if needed, go back and make an illustrated board based on the technical storyboard's notes. Make the illustrations as simplistic as possible; just enough to convey your idea to colleagues and clients.

The best time to prepare a technical storyboard is while making the write-on-slide version of a show. As we discussed earlier; the write-on-slide version is the complete show, programmed using the master soundtrack in conjunction with write-on-slide versions of every slide in the show. It is prepared with the programmer and writer/director. From the standpoint of estimation; that version of the show is quite costly to produce (although it ends-up saving you a fortune).



Building the write-on slide version of a Nike spectacular at Sound Images. "BG" means background.

Calculate that up to 15% of the total production budget will be spent on the write-on slide version of the show. That seems like a lot; but it is an invaluable step in production; from it comes an incredibly detailed technical storyboard (the show's blueprint) as well as a 'flow' version of the show. Programming style and choreography can be seen; the soundtrack heard—like a 'sneak preview;' for purposes of edification and approval.

A naïve client might not be able to imagine the final visualization from the write-on slides; but you will get some early indications of whether the client objects to the tempo; or thinks that there are "too many slides;" or that the show is too fast—or too slow. Those objections can be dealt with before going into final production.

The most important aspect of the technical storyboard is, however, internal communications among members of the production team. If anyone has questions about any particular slide in the show; or how many are involved in sequence; or what the programing moves are; or whatever; everything is detailed in the technical board.

Bear in mind; this master technical board is not 'illustrated.' It has sketches of the subject and any animation moves, over-projections, masking, etcetera; along with notations for each slide underneath each sketch. For multi-screen shows involving complex layouts; each move might require an entire sheet. The benefit is knowing what each individual slide must be.

Technical storyboards also serve as a final check against the estimated budget. For example: flipping through the technical board will enable you to quickly assemble a list of the final quantities of masks, pictures, cels, artwork, camera shots (time), locations, etcetera. If you are way over (or under) budget in any areas; you will be able to spot them and make any changes or amendments as needed before they go into production.

While the technical storyboard is a very important part of the production of a show; you may need two or three different types of boards to get your concept and budget approved; and get it through production on budget.

The combined costs of all those boards can add up to 20 or 25% of your entire budget; but once established, you'll know exactly what you have to produce and everyone involved will have a very clear idea of what they are going to see on-screen in the final version of the show.

You may also need to prepare specific samples of special artwork or photographic effects to accompany the storyboard; where an important technique might be impossible to sketch or describe. Likewise; you might have to include samples of location photography to justify needed location shoots.

Audio Track

This category is a shorty, and basically designed to cover scripting costs and rough tracks as necessary to get you over the script approval hurdle. A more extensive "Audio Preparation" category comes a bit later.



Yours Truly in 1974; editing tape for the Owens Corning *Hear Yourself Think* show; with my first TEAC 3340 deck.







Most of your programing costs will be incurred very early in the total production cycle. To operate with maximum efficiency in the visuals production area; you must have a fully-programmed, write-on slide version of the show.

That accounts for 50-60% of all programing time. The 'tweak' sessions can be easily budgeted as equal to the value of the rough-cut, write-on-slide version.

I usually spend about one hour tweaking each hour of rough programing. I might spend twice the original time or more on shows that I love; but an average show can usually be tweaked on a 1:1 ratio with rough-cut time.

Above: Yours Truly programming an AVL dealer meeting using a prototype Eagle. The red light is plugged into an AVL Power-Control Box; it was programmed to signal (to a presenter) a tray change in progress. Another box, with a green light, signalled completion. Center: Håkan Hansson programming an AVL Eagle II, at Audio Visual Centrum (AVC), in Stockholm. Below: Lars "Lasse" Billingskog programs with a first-generation Eagle at AV-Huset, Stockholm.

Photography

Most of the items in this category are fairly self-explanatory. However, there are a couple of things that bear some discussion; particularly in terms of estimating.

First; it has always been my view that, a bit too often, photography suffers at the hands of multi-image shows. It is natural to suppose that; because the images are moving by so rapidly; the inherent 'quality' does not have to be as good as, say, a page of National Geographic; that is going to be appreciated a lot longer than your show. Although that is a partially viable argument; it does not make for a great show.

You would have to agree; virtually everyone has an affinity for good photography. Audiences of multi-image shows, especially, like good photography and appreciate the overall visual quality of a well-put-together show. But they (too) are often presented with crap.

Good photography costs money. That is why the checklist in this area is so long.
I advise you to always have an 'overstaffed' photographic crew; plenty of assistants to help the photographer(s) at every step; to save overall production time. Employ plenty of experts; like professional stylists; make-up artists; hairdressers; location researchers; and the like. They cost money; but your end product will be infinitely better; so, will the audience appreciation. People are more likely to remember shows they like.

The costs of outside talent or supplies can be rather easily budgeted. Some things to consider are:

- Include the producer and/or creative director and/or art director as part of the photographic crew.

- Any of your own equipment used on the job should be estimated on the basis that you had to hire it to shoot the job (if yours goes down on the job you may indeed have to hire it after all).

- Likewise, your studio facilities. All your own resources that are plugged into the production of any show or job should be estimated on an equivalent outside rental cost.

If you wish; you can always subsequently offer a "package deal" for all the equipment and facilities; but do not give them away as part of the 'good service;' because they a.) cost you a lot of money to obtain; b.) are getting obsolete and antiquated by the hour; and c.) will need repair and eventual replacement. They should pay for themselves.

Stock Photography

Here, again, the categories are fairly self-explanatory. However, I recommend that you try to obtain insurance covering any possible loss or damage to another's photography. I am certain that large portion of any stock-house's money comes from collections against lost or damaged originals.





Yours Truly photographing hairdos at Hair Surgeons, Cincinnati, for a 1977 Zotos show about permanent waving.

Face it; photographs are perishable and easily damaged. On top of that; the U.S. Post Office (and a lot of others) do not function with precision or regularity. [*Editor*: That was 1982. We are still complaining about the same poor postal services forty years later.]

While the photographs are in transit; your money is on the line. A good insurance policy can be obtained that will cover you against any contingencies when shipping the originals back and forth. I prefer the small jet-couriers, like Federal Express and Airborne. You get overnight delivery; signed receipts at the receiving end; an accurate tracking system; insurance options; and careful expediting. Certainly; those are the best transportation services available; however, they are not infallible.

I had a record shipped to me, in Australia. The sender thought that because the package was going by a well-known small-package airline, it would be automatically 'handled with care.' Wrong. I got the record in about two dozen pieces. I glued them back together; but it did sound very good (hahaha). The moral of that story is to make sure that pictures are well packaged and padded.

Transparencies should be individually sheeted and the entire contents of the box packed into a plastic bag (against water damage); with packets of silica gel to absorb excess internal moisture (which occurs as jets descend from high altitudes into warm climates).

The best possible way to ship films (and/or audio tapes; and/or computer discs) is to ship them in water-tight, rigid containers; like aluminum or fiberglass suitcases or boxes. Your package should be strong enough to avoid being ruined if it gets creamed by someone's 100-pound mega-box. It happens every day.

Note that I have also included a 15% contingency. This covers loss or damage to someone else's originals by your own staff. That also happens every day.

For example: on one recent show; the producer had ordered over 500 shots. Even though a production assistant was specifically assigned the task of tracking all the incoming stock photos; two were lost internally somewhere along the line; during selection, approval, and re-photography.

Think of it: 500 originals being handled by up to six or ten people on multiple occasions in multiple locations. The odds for safe return of all them were staggeringly poor; and the cost ($3,000) for the two we lost had not been budgeted for. That cost came straight off the 'bottom line.' The 15% contingency should help to cover the cost of your insurance policy's 'deductibles.'

Another note on jet-freighting originals; magnetic materials should always be wrapped in aluminum foil to avoid the damages of X-Rays and RF signals (Radio Frequencies) to which your stuff is subjected to in heavier-than-normal doses when you ship by air.

On a show that I did almost entirely from stock (the AMR "*Time*" show, previously discussed); I went over on my shipping budget by about 2000%. The Federal Express bill was staggering; because I could not quite find what I was after and ended up with ten-times as many stock-image sources as I had originally intended. The phone bill was likewise breathtaking. And the clerical; keeping track of it all was horrendous. Finally; as I recall, we lost about five originals on that job; that had also not been budgeted.



John Leicmon lines up top-lit artwork to shoot a 3-screen panorama on Forox #1 at Incredible Slidemakers, New York.

Some of the categories you see in this column may seem inappropriate. However, there are certain aspects of art preparation which overlap rostrum-camera photography. Including them in this section will help prevent loses from cost overruns.

For example: making cels. That is the process of assembling all art elements (film negs & positives of drawings, type, etcetera) into registration-pegged cels. Although this function will likely be done by the art department, it is camera-related.

Thus, a member of the rostrum-camera crew should oversee the process. That final step, being a camera-oriented procedure, is budgeted in the Rostrum Camera Photography category.

It is a good idea to have certain people who are dedicated to that function. Not everyone is a good camera-prep person. All the precision of the artwork is lost if the elements are not accurately pegged. Yet only a certain few people can peg accurately and expeditiously on a day-in/day-out basis. Since it is the rostrum camera photography team that is going to have to deal with the cell pegging; keep that function under the supervision of the rostrum-camera-department supervisor.

The same applies to mask production. That is another camera-related function. Although the idea for a masked effect may be a product of the art or programing staff; determining whether to use a bind-in or in-camera masking will be made by the camera department. Thus, the camera department should supervise the mask-making process, as well.

You should always estimate your rostrum camera charges on an hourly or daily basis. If a client orders a single slide; you add-up all the individual charges for the effects in that one slide. But; if you try to extend that principal to each slide in every show—that is, add up all the individual charges attributable to each and every slide—you will go nuts (and price all your shows out of the ball park).



Yours Truly shooting for a Saab launch show on the Forox camera at Audio Visual Centrum (AVC), Stockholm, in 1984.

I once made a 'magic' pricing chart. It stated that a glow effect was $10; stars were $5 each; auras $30; etcetera. I used that chart to 'analyze' each slide on the storyboard. First, I counted-up all the glows; then all the stars; then all the auras; etcetera. From the totals, I calculated the entire price of the job. That was about three times what the job was 'worth' (or that the client would pay for).

So, I switched to an hourly rate on major productions. Based on that, I came up with daily and weekly prices. I also used 'sliding scales.' For example: basic Forox time (with an operator) was worth $100 an hour—the amount we needed to earn to be profitable. If the job included a logger, the Forox time was worth $130.00 an hour; and so on.

Other functions like photographic studio time; or audio processing time; or programing-grid time; were similarly rounded-up into hourly, daily, and weekly charges. That provided a relatively quick and accurate way to estimate the costs involved in show production. The older way of estimating, using lists of per-unit costs, took endless hours; wasn't particularly accurate; and always 'over-priced.'

The hourly/daily/weekly method will get you well within the ballpark. However, if you are obtaining your camera-time estimates from a 'creative' camera operator; do yourself a favor and double that estimate. Creatives invariably underestimate; they are so caught-up in the idea(s) that they tend to 'overlook' some costs. A 25% experimentation contingency is intended to help finance your R&D; on the job and otherwise. It helps the rostrum camera pay for itself and should be added into the budget to allow for 'playing;' taking known techniques 'one step further.' I am not, as I mentioned before, recommending wholesale experimentation within the context of a show; on the contrary, you should include in a show (for a client) only what you know how to do.

However, it is inevitable that you will think of certain offshoots (such a pun) to basic-techniques that provide a little '*je ne sais quoi*' without incurring too much risk to the show or your budget. The 25% contingency will help encourage that sort of experimentation. In addition; it will help to cover your ass for camera down time and lab screw-ups. Those happen every day, too.

Finally; most folks simply do not estimate the amount it will cost to produce a duplicate copy of the show for their own use. Sure; if the client says two or more copies are necessary, then you figure it in. But if the client says they only need one copy; do you deliver the original to them? You are crazy if you do.

Calculate the costs to make 'show' copies of the master presentation. (In like manner, motion pictures are printed from a master negative.) You should also calculate the costs of making a house set; to have samples for presentation to prospective future clients; to enter in festivals and contests; or send to your mother for her birthday.

And/or calculate the cost of duplicating those sections of the show that you might contemplate using for future reference or in sales presentations. Factoring these charges into your original budget will ensure that you will have enough money to do it; you won't have to dig into your own pocket for the samples you need (and earned).

Art Preparation

This is a wild and woolly area that too often gets out of control in the production of a multi-image show. That is because there is often too little input; not enough briefing time; so, the art director or illustrator goes off and produces finished art which is either inappropriate or technically incorrect.

Then too; the more people involved, the more chances for a first-class fuck-up. Considering the entire spectrum of procedures in the preparation of art for multi-image shows; there are plenty of opportunities to go broke on a job, given the high cost of materials. Every time someone makes an error, poof; your costs skyrocket.

Art prep is painstaking and requires a lot of work; meaning more payable (billable?) hours spent readying jobs for camera.

Some Tips

- Keep the art production teams as small as possible; to help communications effectiveness between team members high.
- Make sure that your briefs are thorough and complete; do not leave a lot of 'loose ends.'
- Either make the team subservient to a production coordinator or assign the most capable member of the team to a supervisory role.
- Operate out of an in-house inventory of supplies that is managed by the production coordinator or a member of the clerical staff; do not give everyone a freehand in ordering whatever supplies they want.

Communications breakdowns are the most frequent cause of error in the production of artwork. First and foremost; you must determine who, in fact, is designing the show or the artwork for it. Is it you? Someone else? A committee? The client? Who is responsible for what?

After establishing who is the designer, follow up by establishing the 'pecking order' within the team. Who is production manager? Who oversees mechanicals production? Who is on stats? Who is spec'ing the type? Who is illustrating? Who is the 'gopher'?

At the meeting to brief the job—preferably at a screening of the write-on-slide version of the show—have as many members of the art production staff as possible on hand; the more the merrier. At subsequent meetings you can involve fewer members of the team. But for this initial go through it helps to have everyone involved on hand. That way everyone gets a sense of the job 'from the horse's mouth;' working as a team.

Go over the roles each member will play; the requirements of the budget; the schedule; as well as the show itself. To review the show, first screen the write-on-slide version. Then pass-out copies of both the technical storyboard as well as the illustrated board (if there is one) and/or any other samples used to illustrate the contents to the client. Review each of these with the entire team. Discuss the show's (and your) 'philosophy.' Answer questions from team members. Make sure that each member leaves the meeting with a true idea of the show and its complexities, as well as what his or her individual responsibilities are from that point forward.

Operate on a 'need to know' basis. After the initial brief; include as few members of the team as needed at any given meeting. Having everyone on hand costs you a fortune and is not necessary to go over details of the job or any problems; those usually relate to just one or two members of the team. On the other hand; if the entire team is having problems, hold as many total-team meetings as necessary to resolve them.

Go through your established chain of command to deal with problems; alert both the production coordinator (or manager) as well as the art director. Let them figure out who else needs to know what.

The whole idea is to keep the flow of communications (and motivation) on a high level. To keep it high; insist that each production team have at least one weekly meeting to go over the production and discuss any problems incurred or foreseen.

Whenever you have a meeting, whether with one person or twenty, be sure to have done your homework. Have your materials ready and make your explanations as simple and logical as possible.

Do not rely on your creative types to take notes; chances are they will be daydreaming while you're talking and miss a few salient points. [*Editor*: Or, these days, futzing with their smart phones or laptops.] Prepare notes for them.

Have checklists available that detail everything; who does what; the production schedule; a working budget that details how much time has been estimated for their contribution(s), as well as the materials allocation.

Get the consensus of everyone involved in the project; agreement to parameters set at the first meeting or shortly thereafter. Consider any advice offered; it is often the low man on the totem pole who will have good ideas about solving the problems that come up in any job.

Assemble your documents sets into ring binders; personalize them, with each person's name. Include the master storyboard; a script; a production schedule; a break-out of everyone's responsibilities (a who is who of the show production and client teams); budget parameters; and time allowances. Leave room for folks to make their own notes. Those bound volumes become each person's own Show Bible.

During production, update documents should be given to whomever needs them; and periodic meetings should be held to go over the contents of all updates or change notices.

Make sure that each member of the team understands that if there is a question or doubt about something, they should start with the lowest-level of authority needed to resolve it. Questions should never be discouraged; no matter how busy people are.

If, as is almost inevitable, you have a lot of 'loose ends' at your first (or any) meeting; have a checklist available of what you 'owe' the team as well as what you expect the team to pick-up.

If you find that too many answers are missing, do not hold the meeting. There is nothing more confusing than having someone who is briefing you repeatedly say, "I'll have that one for you in a few days..." or, "the client will be supplying us with further details ...."

This is where the production coordinator (PC) comes into play. The production coordinator is the executor of the production schedule and budget. It is imperative that the production coordinator be very familiar with all aspects of production. The production coordinator ain't just a gal with a clipboard and calendar.

That 'gal' has to know every bloody thing that's going on—why; how; and who is making things happen; when it's needed; by whom; and how much it costs to do. That is one hell of an important job that should be well paid for when properly done.

[*Editor*: The best coordinator I worked with was Cindy Bauscher, at Image Stream; she was a sharp cookie; you couldn't pull anything over on her; and friendly as can be.

The PC gets input from you (assuming you are the producer or director); 'digests' it; and passes along to appropriate crew members whatever parts of your input they need to know. It is the PC's role to clean up everyone's loose ends or at least make sure they clean up their own; on schedule.

That person must ultimately be the bitch that everyone is 'afraid' of; or at least takes seriously. Nobody likes cleaning up loose ends. Loose ends are always 'in the way' of progress. Un-weeded fields yield inferior crops.

A prominently positioned bulletin board posting of job progress will also help. It will be a constant visual reminder of where a job is at. If the production schedule is people oriented and color-coordinated, folks can see who is having problems; or sloughing off. For sloths; there will be 'peer- pressure' to shape up; that is the best 'incentive.'



John Emm's administrative bulletin board was prominently posted in the Marron Carrel camera room.

The PC should also monitor the use of all supplies. If you are a large enough shop that can afford to inventory them, I suggest that you do that. Sourcing and acquiring needed materials and supplies is a time-consuming job; the efforts for which should be centralized and minimized. Big companies have purchasing managers, agents, and staffs; that spend their time optimizing acquisitions. Supplies are distributed through a requisition system. Department heads must sign-off on requisitions above certain amounts.

If materials and supplies management can be organized into a single person's role, great. Make that person your purchasing agent (just like big companies do) and use whatever paper work is necessary to keep the supply lines running and accounted for. More often than not, though, someone else has to usurp that role. The next most likely person is your VP of operations; or possibly, in a very small shop, the Creative Director.

Lesser members of the team should not be allowed to shop independently, because the chances of them keeping the necessary paperwork in order are zilch. Instead, employees order their materials using forms that list what they want. One color is used for 'house supplies' that do not specifically relate to a job; another color is used for job-related costs that should be offset against a budget. Have a regular day for all the materials and supplies orders to be processed.

Even house jobs or major experiments should be given job numbers and budgets. The budgets for those undertaking should be adhered to as stringently as a 'real' job. Have the supplies manager approve the weekly allocations before they are carried out by either a clerical functionary or the PC. That will serve as a check against 'unusual' supply demands.

Be sure to use a purchase order system. The PO's will serve as a protection against going broke on supplies. Your accountant and/or bookkeeper can use those documents to give you weekly trial balances of what you have spent for each and every budget. And time sheets will provide a tracking system; for the time allocations of specific projects; per applicable billable rates for each person's hours. Your purchase order system should differentiate between supplies and equipment. These need to be identified and segregates for taxation purposes. Some types of equipment are 'capital expenditures' that have different rates of depreciation.

It is likely to your advantage to write-off as much equipment as you can, as 'supplies.' Supplies are straight costs of doing business; they do not have to be depreciated. However, large inventories of supplies do have to be depreciated; as does equipment. How far you can go and what options are available to you should be subjects for discussions with your accountant and/or tax consultant. They are probably not very savvy about the 'strange' equipment requirements for multi-image shows.

My accountant used to be shocked at the amount of equipment we would buy each year; and how much of it I wanted to write-off. My attitude was; if it cost $2,000 or less it was an 'expense.' Equipment was not categorized as 'equipment' unless it was worth more than $2,000. That astounded my accountant—until I educated him; about how our business operates in a rapid cycle of technical migration and obsolescence; that a programming machine I buy this year will likely be technologically obsolete by next year; that Carousel projectors are so cheaply built they only last a couple of years before requiring so much maintenance that they are no longer cost-effective; and that there is no market for yesterday's programming systems.

Take a close look at your equipment; decide which pieces are not likely to be used next year; write those off as expenses (if you can). Consider each type of equipment in terms of its second-hand value one year after purchase. If there is no resale market for that gear; write it off.

Perhaps you should not own any equipment at all. Lease it all and deduct the lease costs as an expense. It may cost more to lease; but that extra amount may be more than made up for by not having to pay the taxes imposed on ownership.

If you choose the PO route; your paperwork will have to be structured to allow for inventory control and cost assignment. Rather than issue POs to everyone; use a requisition form for supplies coming out of company stock, as mentioned earlier. Use requisition forms the same way you use Pos; assigning costs to jobs where applicable; and keeping tabs on supply costs.

Those are only suggestions. Only a good CPA (Certified Public Accountant) can advise you about their applicability to your own situation, tax-wise. Sometimes, depending on your current and long-range needs, a CPA may not be the 'right' financial consultant. You may need to upgrade to a certified financial advisor. Certainly, your advisor(s) should become very familiar with your operations—how your company works and what multi-image is all about.

The relationship with my CPA has lasted over a decade. He knew me when I was 'only' a photographer; he visited the studio; I made a portrait of him. Then, for about three years, while the studio morphed into a multi-image production company, he was amazed at our rate of growth; but he never bothered to stop by and see what was going on. Finally, he did and, boy, was he surprised when he walked-in and saw a thirty-projector grid firing away. Suddenly, our numbers 'made sense.'

I think that is probably a common problem in our business. It is hard to define exactly what multi-image is (try explaining what you do for a living at a cocktail party). It is likewise difficult for outside financial consultants to understand our business unless they see samples of shows and are lead through the entire production process—so they understand what goes into a show; and why it costs so much to produce.

Your CPA should not just be a bookkeeper; that is only one part of the CPA's job. He or she should also have financial contacts; be able to negotiate and arrange special financing, if and when you need it; advise you on taxation laws and regulations; provide inventory controls and billing procedures; calculate depreciation schedules; and a host of other services. The CPA should also be legally qualified back-you up when your books are examined; or, God forbid, you are hauled into Court.

Multi-image shops are prone to tax examination because their profit & cost ratios are out of whack when compared to other, more conventional businesses. My balance sheet always looked bizarre when you scanned the total for supplies. It was astronomical in comparison to what a 'sane' CPA thought the balance should be. But then, we did a lot of experimentation; our supplies were used-up fast; and some equipment was listed in that category.

I had to continually educate my CPA about the unique aspects of the multi-image business. CPAs tend to be conventional and conservative. They simply do not understand 'creative' mentalities at all. Their job is to make you legally profitable. My CPA once advised me to stop experimenting. He said that would make us more profitable. Perhaps. But it would also have squelched motivation in the shop and we would most certainly have lost our leading-edge in the industry; our discernable difference; our USP.

The same CPA also advised me to stop buying equipment. I reminded him that our equipment could be likened to a painter's brushes and colors; you cannot make a very good painting without them. If we stopped acquiring equipment, the whole operation would be technologically obsolete in no time at all. If you can, find a CPA who also handles photography studios, sound studios, video production shops and/or movie studios; maybe an ad agency or two. That CPA is at least familiar with the media you are using; with expertise in the laws that cover those specific fields (and there are many).

Depending on the size of your shop; you can either keep a major accounting firm on a perpetual basis; or simply buy consulting time with a financial advisor as you need it; and hire a bookkeeping temp for your day-to-day operations. Note that CPAs' and bookkeepers' functions have nothing to do with your own budgets management. That should be handled by a separate clerk who is solely responsible for managing the budgets and preparing cost and time allocation updates for all your jobs.

Let's now move on to some categories that have more specific cost and estimating requirements:

Type Specification

Type specification is a category full of potential cost overruns; because very few really understand how to do it. Sures everyone gets the basic idea; but very few are proficient in type specifying. It is an area that can either cost or save you a bundle.

I recommend that straight off you offer your chief art director, or whoever does your type spec, a 10% raise if they complete a type-specification course administered either by a reputable school or by your typesetter of choice. Maybe even a 20% raise if they get good at it. That's because typesetting is so expensive that errors cost you a fortune in comparison to some other areas of art prep.

Certainly, specifying type is one of your most consistent needs and should therefore be thoroughly understood by whomever is ordering type. If they have doubts, consultation with a typesetter is in order. Along with learning the latest methods (which are changing so fast that it is hard to keep up with them) they should learn what 'type' of type to order—handset, computer, film assemblies, etcetera); how to spec it, and how much each method_costs.

In some instances, for example, it may be more expedient for you to set everything as galleys and have someone make mechanicals. That was certainly true in the old days, when having a typesetter set things into position cost a fortune compared to the costs a 'mechanical man' who would sit there for hours pasting-up type.

With computerized type, those days are almost done; now it pays you to spend a bit more time accurately specifying the sizes and styles for each word as well as any special kerning, leading (pronounced "ledding"), ragging (left, right, or centered), or justification (aligned on both left and right sides).

The computer will do it all and save you hours of paste-up time as well as the costs of producing enlarged or reduced stats to correct for improperly specified sizes; those can cost you a small fortune too.

Keep in mind that all type specification should be done to your master grid. The sizes of type should be 'measured' by the lines of height on your grid. For example: 36-point type occupies the height of 4 lines on our grid. Thus, a single line equals 9-point type, or 8-point type with 1-point leading.

Sometimes the point sizes will get too small when working with the master 7.5-field grid. If they do, I suggest that you might have too much copy since type should not get any smaller than 9-point on our master field (or it might be illegible to the viewer; especially the poor schmendrick in the last row).

Where you must work up in size, do it in groups of percentages. In other words, if you must prepare a set of elaborate charts where, say, production on the standard 7.5-field size would make the artwork to 'gross' (not enough room for detail work) and the typeset so small as to risk obliteration when photographed into slides; then work on a 2X field (15 inches wide) or 3X field (22.5 inches wide).

If you decide to make your art using those larger field sizes; bear in mind that, in the case of a 2X field, 18-point type will repro as 9 points. If you are working to a 3X field, 28-point type will repro as 9 points. Just because you're making a bigger mechanical doesn't mean you can use small type and 'pack it in.' Remember that guy in the last row.

Another way to save money in type spec is to establish categories of typestyles for each show. Rarely is there a show where each scene has a new look. Usually, a more restrained stylistic 'harmony' is needed. That means relegating your visuals to a few master styles. Think of magazines. Some take a 'wild' approach and have entirely different looking styles for pages, spreads, or sections. Others make it hard to tell one article from the next; their style is so consistent.

I suggest that under 'normal' circumstances the best bet is to 'categorize' the different graphic styles in your show. By categorizing them, you will reduce the type spec time. The type specifier need only spec the type and sketch of the layout once (for each category). From then on, batches of type can be set according to category numbers.

A 10% contingency should be applied to all typesetting jobs. This will help to account for any errors that even an expert will make. Perhaps you should add 20% or 30%; if your specifier is naïve. If you have a client that is prone to making corrections and changes that are of their own volition (not your fault); make sure that all copy sent to the typesetter is clearly marked as to its version: "Producer's Original;" "Producers AA (Author's Alteration) #1", "Client's AA #1" (etcetera). Have the typesetter label each galley with your version references and keep those reset costs separated from the original typesetting charges. This will help you get paid for client changes; as well as identify any potential or real type specifying problems.

Did you ever notice how typesetters invariably stamp each copy-sheet you give them as "Clients Copy"? Do the same. Stamp everything with its origin, date, and version.

A further note, about the Production Coordinator: If you are in a 'creative' position, one of life's biggest curses is that everyone thinks they have access to you. You get everyone's opinion and it can be hard to filter out 'fact' from all the 'opinion.'

Part of the PC's job is, therefore, to 'shield' their creative types from the necessity of having too many 'discussions' with too many people. The PC must sort out the necessary information and get it it to whomever needs it, when they need it; sparing recipients from details that are superfluous and/or unnecessary.

Still another consideration is whether you should order your type-set in film instead of ordering traditional paper proofs (that you would need to convert to film, anyway). A lot of larger type shops offer this service. After all, the typesetter (if they are using computer techniques) will be preparing a film neg version to print the galleys you receive. If you are accurate in your type specification, you might as well get film negs rather than galleys. You can contact them directly into film positives and peg them; bypassing the negative making stage. Shop around, to see if setting on film is more cost-expeditious.

Sometimes your basic typesetting will have to be enhanced; by a Graphics Modifier (to create an outline, inline, drop shadow, or the like); by airbrushing; or by custom swashing. All those are creative functions subject to lots of misinterpretation. Thus, they should be estimated with a 50% contingency.

In addition, your brief should be as specific as possible on those customized aspects of type production; and some money should be set aside for experimentation or samples.

Cartoon Art

With cartoons, briefing time will become very intense; because you are working in the world of fantasy. Who is to say what is good? Why are you using a cartoon, anyway?

The very fact that you are using a cartoon suggests that the 'message' cannot be illustrated otherwise; that nothing exists in 'reality.'

Be sure to get 'roughs' of all characters, scenes, actions, and other salient elements. Get the necessary approvals before these imaginative figures and situations become 'real.' For animations, have entire sequences drawn up as roughs and shoot them on litho stock; program the black-and-white slides; watch them. If the animation isn't what you want, it is way less expensive to make changes at the rough stage.

Provide for a 20% contingency; maybe 30%. Cartoons are hard to visualize 'realistically;' everyone's imagination goes hog wild; it's hard to get agreement on the cartoon style; everybody has their own idea of what looks good.

To sum it up: Specificity in the original brief is paramount to success. Trials of animations are critical. And a contingency is imperative.

Illustrations

Illustrations should be treated the same as cartoons. Here however, there is usually more style specificity; that is, you hire a specific artist for his or her style.

You will probably end up buying illustrations from outside sources; since it is virtually impossible to keep such specialized talent(s) on staff. Indeed; it probably is not wise to, either; given that illustrators have individual styles; and you do not want your shop to get 'style-cast.' More likely, you'll hire different freelance illustrators for different jobs.

Like cartoon artists; have the illustrator(s) prepare roughs before going to finishes. Test the roughs for any animation as required. The best test is against the actual sound track, whether cartoon art or full illustrations.

Charts

Why, in this day and age, anyone bothers to go through all the hassles of preparing chart art when Genigraphics and similar computerized systems are available, is beyond me.

Far and away, it is chart making that breaks the spirits of more creative people than any other single aspect of multi-image art production. I have seen more fights, more despair, more aggravation in the preparation of charts than I would care to mention. In my own shop, I issued an edict about six years ago: no more chart jobs. They were well paying, to say the least. But they made everyone upset because they were too tedious and boring for creative people on a day-in, day-out basis.

When I first heard of the Genigraphics system I scoffed. "That will never replace the skill and judgement of real people," I reckoned. Sone time later, I realized that the computer could easily pull-off charts and graphs that would take us hours of art prep and camera time.

Charts are very vulnerable to change. I cannot think of a chart job that I've ever been personally involved in, or have observed others produce, that didn't involve seemingly endless changes. The changes usually involve the data that the chart is visualizing.

No matter who the client is, it seems they always come up with an entirely new set of figures the night before the show. That is where the computerized chart-making system has it all over conventional methods; you simply key in your new data and *voila*, the slide is shot.

So, when budgeting your show, think about whether you really want to make your own charts. Why not design other show elements around the computerized charts? Or, if you are not totally happy with the look of computerized charts; use them as base elements and DX other effects or backgrounds that are easily done by rotoscoping the Genigraphics charts; or positioning them as insets to other BGs.

If you do decide to go the route of making your own charts and graphs, I suggest that you design them in such manner that the information that is most subject to change(s) can be shot in lith and over-projected onto an attractive background.

In that way, changes can be made with relative ease, and without jeopardizing the look of the graph or chart. For example: if you are doing a car show; design your graphs and charts to fit into 'dead' spaces in close-ups of the car. Emphasis can be given to graph components by over-projecting glows where needed. Using over-projected white type (or black type made with bound-in positives) corrections are easily made; the total look is sophisticated; and a lot less work is needed than creating elaborate, multi -color charts that required lots of cels.

No matter which way you go—the computerized route or preparing your own art—it is imperative to make one, possibly two or more sets of roughs to show the client how the data will be depicted. Clients are very particular about their charts; more so than with other, more 'creative' elements of the show. It is important that they have a very clear idea about how information will be plotted, and how the finished slides will look. This is one area where a full-blown, illustrated storyboard may well be in order. Be sure to allow money in the budget to prepare 'enough' roughs; and have enough meetings; to facilitate accuracy and revisions. Also, be sure to indicate to the client that any AAs will cost bundles.

If you get a big chart making job; it may be expedient for you to hire an expert chart maker (a 'mechanicals man'). Charts are a specialty. Witness the charts that appear every week in *Time, Business Week, Forbes*, or similar magazines. Those are creative charts. Even if you are only going to make simple bar-graphs or pie charts, there is an art to figuring scales and spec'ing type to the right sizes. You could spend hours just figuring out what you need to do; whereas a chartist already knows and can save you a lot of time.

No matter who ends up doing the artwork; the areas that you are most likely to underestimate will be mechanical-making time, enlargement and reduction stats, and gelling time. The latter is a particular nemesis; elaborate charts take interminable gelling time. (Imagine a chart with two dozen bars, each a different color.) Another area of typical underestimation is the number of neg and pos cells that must be made; these can be voluminous.

Because of all these factors; and because you are dealing in an area that concerns the depiction of cold, hard facts; there is a lot of room for error and therefore a 30% contingency should be applied to this area of the budgets. You probably will encounter *that* many errors. Remember; clients are more critical of your charts and graphs than any other single element of the show (unless you really blew it on the creative).

For a major car launch show that I worked on, tremendous effort had gone into preparing creative "Engineering" modules; those sailed through approvals. However, for virtually all the speaker support slides—particularly the graphs and charts—the client had interminable changes; right up to the day the show was going to be presented. (!)

Because the production house had not organized the chart/graph visuals in a way that could accommodate changes; and because changes had to be made; the resulting slides suffered a bit from the rush. The upshot of it all: the client felt that the quality was not up to snuff. Unfortunately, because the graphs and charts were not all they should have been, the client held the rest of the modules in equal demeanor. Unfair, yes. But also, true. And all the explaining in the world would not help. It is like having a bad bottle of wine with your meal, or no salt in the salt shaker; everything else becomes suspect.

Enhanced Photographs or Artwork

Now, here is an area that can really blow your budget from here to Kingdom Come. That is because this is a 'gray' area; a creative one. Who is to say what 'enhanced' means?

Not only do you have to contend with subjective evaluation of the *type* of effect wanted; but also, with the *degree* of enhancement. You also must contend with the challenge(s) of maintaining critical registration throughout the production steps of any enhancement.

If your enhancement is for a purely 'creative' section of the show, then your problems are minimized. But if your enhancement has anything to do with 'reality,' that could be troublesome.

Earlier I discussed a special-effects section of a show done for Clairol where a lady's hair changed color before your very eyes. It was all done through filtration. In this instance, though, the colors shown on the screen had to closely resemble actual Clairol hair colors; making it a bit trickier to shoot than most enhancements.

A quick look at the list of procedures in that category will reveal that each is a costly and painstaking process where things can (and will) go wrong. Hence the 30% contingency.

Art for Location Photography

This is an area of theatrics that you may not be versed in and should hire expert help. You could probably handle the creation of a small-product-packaging mock-up in house. But if you had to have scenery painted, or special drops, or big, complex models—perhaps of a futuristic building, or of an existing building that you wanted to get angles on that were impossible to shoot in the 'real world'—then you'd better get some experts involved and budget for their fees, materials costs, travel, and lodgings.

I have not included a contingency in this category since I am assuming that you will be dealing with outside experts and will therefore be able to hold them to their quoted prices.

Audio Preparation

This category is perhaps more 'cut & dry' than some of the others; thus, not much comment is required. The audio industry was around before film or TV; they have their part of the act more together than any others'. In addition; the checklist for this category can be fairly easily estimated using 'standard' studio rates.

The areas that you are likely to come into problems with have to do with location recording—when you do not know what you will be up against until you get there. Other bugaboos are: using naïve talent—like members of the client's staff as spokespersons; special audio effects—that need to be defined before production (a hard job); and original scores—those also have to be defined before production.

With regards to location recording, do not think you can get away with just any deck and microphone. You will run into all sorts of problems.

I recall one show where we were to interview the president of a leading department store in Washington, DC. Everywhere we went, the store's *Musac* ('elevator music') was in the power lines and could not be gotten rid of without special filters and microphones.

In industrial facilities there will always be the low rumble of the process machinery and equipment. There is always *something*. So, you must travel with a shitload of special microphones, pads, filters, etcetera. All that equipment is worth serious money; that should be figured into the estimate.

I used to have 'audio kits' for location recording that included about three times more equipment than we would ever use. I calculated location-recording equipment costs on a per kit basis; I knew that, for example, case #1 had X contents and should therefore rent for X per day; I think it was fifty dollars.

With naïve spokespersons you can really get out of whack on your budget. I recall a show where the entire narrative was to be done by company employees. So many takes were required that the transfer, signal processing, and editing time was nearly thrice what was estimated. That is how we learn, eh?

With special audio effects and custom music tracks you have the additional burden of 'definition;' that is, explaining what the effect and/or track should sound like. These verbal descriptions of what something is supposed to sound like are necessary not only for client approval; but also for the benefit of the talent(s) that will be creating the 'soundscape.'

When you are looking for' something new; it is always a good idea to have something old on hand to provide reference points; examples of what you want, or do not want.

It is hard for most folks to even whistle a tune, let alone come up with a good original musical score. Orchestration is another matter altogether. This is an area where you will almost invariably want to get outside expert help; but who? Which outside expert is best qualified to deliver the sound you want?

Allow plenty of time for rough tracks and edits. Audio (music in particular) in unbelievably intangible and subjectively perceived. We all hear things quite differently from one another. Who is to say what's 'right' or 'wrong'?

Suppose you had an entire custom music track completed and the client nixed it? Who would be right? Maybe the client just did not like it; perhaps thinking it was not in keeping with the 'image' of the company? That is when samples can help to limit the choices and zero in on what is acceptable, and what is not.

Another category that is typically underestimated is the number of dubs that are needed during show production. You need rough mixes up the kazoo just to get the soundtrack 'right.' Dubs for programming. Dubs for special equipment. Dubs for show copies. Dubs for etcetera. Whenever we had to make a show for an AVL Traveller III, for example, I would always add at least $200 more in the budget just to get dubs that would sound ok on that cheap shit piece of equipment. Albeit that the basic idea of a Traveller III is a good one (it is an idea that AVL originally 'borrowed' from an Incredible Slidemakers 'product' called the "Idiot Box" (see Volume Three, page 424); the audio sucks.

AVL compromised the audio ingredients for the Travler III. To make anything sound good you had to significantly flatten the base while heightening the treble; all those special mixes and dubs cost money; that should be budgeted in from the start.

Cine Post Production

Like audio, this category is fairly easy to estimate since cine has been around a lot longer than multi-image and they, as an industry, have their act together (pun intended). It is highly ironic that you can buy the American Cinematographer Manual and fairly accurately estimate the production of a movie; whereas the production of a multi-image show remains partly a mystery throughout the estimating process.

Perhaps that is because we are a young industry and we try to pack more into each show than a movie maker who knows the economic parameters? That is speculative at best; but it remains an irony.

If you are going to involve the integration of movies into your multi-image show, I suggest that you hire a cinematographic expert to head-up those functions for your show. Films are (obviously) quite different then traditional still photography and multi-image production. They are more 'fixed focus' in terms of production; very organized; very unionized.

Visit an optical house and see what can be done and how much things cost. There are a surprising number of 'stock' effects which can be employed without extra effort on your part—and which can be accurately estimated. However, you may have some other ideas which will require the advice and consultation of movie-making experts to get your ideas on screen.

One area that will probably disillusion you is the cost of making the CRI's and/or CRN's necessary to create optical effects. (CRI = Color Reversal Internegative, CRN = Color Reversal Negative.)

Also, you might find yourself having to create special masks; that would involve shooting original art on optical stands (rostrum cameras). In addition; the very ratio of a slide show (2:3 for standard slides, or any other number of special screen configurations) does not jive with standard cine formats; so, it's likely that anything you do will be considered 'special' by the cinematographic crew working on your show.

Ravin' About Raven

Perhaps it was inevitable; that AVL would add motion pictures to their repertoire of audio visual control. They had tamed slides and their equipment dominated the multi-image market; but AVL faced (rapidly) increasing competition from the likes of Arion, Electrosonic, Clearlight, AV Stumpfel, and a Brazilian outfit whose name I have forgotten. They needed a 'breakthrough' product to reinforce their leadership.

Besides that; multi-image slide shows were nothing new anymore. People had seen plenty of multi-image productions; many of them elaborate. The bigger shows incorporated motion picture sequences (I am thinking of shows like Rusty Russel's *New York Experience*, and *Where's Boston*?). AVL's plan was for multi-image producers to migrate into multi-media, via a film controller called *Raven*.

The Raven gives AVL programmers the same kind of control over movie projectors as they have over slide projectors. At least, that is AVL's claim. But the device is 'not ready for prime time,' as the saying goes. Let me explain:





Bruce Silverstein (right) is certainly one of the most experienced Raven programmers in the world. I tried and gave up, because attempting to program shows with the Raven was not 'cost-effective.' If you know what you are doing with a Raven, you may be in OK shape. But if you are naïve, hang on to your wallet; the Raven eats up prints (and your money).

The Raven—in combination with the special movie projectors it requires—is not totally reliable either while programming or in playback.

For example: while programming a Raven with an entire controller/projector package supplied by AVL's head office in New Jersey, I managed to chew-up three prints of a 16mm film in less than one hour. At that rate, I calculated my total print costs would be about 30X those estimated; and programing time would multiply by a factor of six or more. That was absolutely out of the question, budget wise.

Another example: Bruce (who is a very capable programmer) actually managed to get Raven-based shows to work; though he was plagued by phone calls from nervous clients whose Raven shows, "…didn't look quite right."

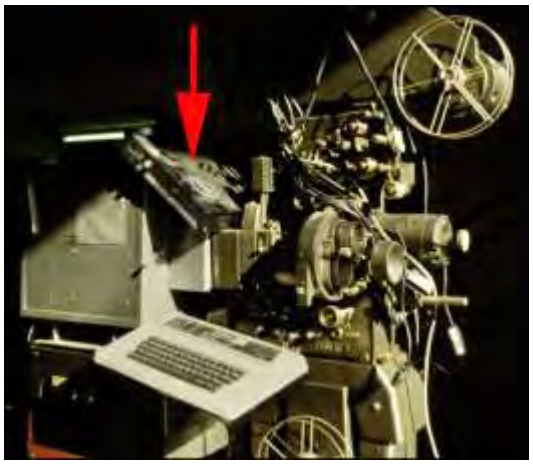


Still another expert Raven programmer who produces brilliant shows is Alan Kozlowski (right). He turned up at AVL's dealer meeting at about midnight on the night before the first Raven demo, with programming still to be done ("tweaking," he said). Geez, talk about 'cavalier.'
In the few hours left before show time, he diligently set forth and finessed the movie programing. (Little change was observed between the original version prior to tweaking and the final version screened.)

Alan Kozlowski in 1979 for the *Inner World of AVL* show.

In fact, Allan had to tweak the show on innumerable occasions during the three-day NAVA event where Raven was launched; to compensate for slow projectors and myriad other 'difficulties.' Why do you think AVL has stopped promoting Raven? Why haven't they made the same sort of 'improvements' in Raven as they have with their popular slide equipment, like the Dove? The bottom line is; if you are using a Raven—or any other 'leading edge' (experimental) equipment—add a 200% contingency and cross your fingers.

Finally; no matter which cine-synch method you choose, your final film reel will probably be a strange configuration. It may have lots of black-leader sections; or magnetic-foil inserts to activate other equipment and functions; it may be specially notched; whatever. Those kinds of prints cost a lot more to assemble than the average reel of 'straight' footage. Take those extra reel-assembly costs into special consideration when budgeting.



Before Raven, MediaTech used an AVL Road Runner and Dove To 'control' a 35mm cine projector. The rig could start and stop the projector; but could not 'GoTo' specific frames.

Presentation Copies of Show

This is a category that begs the question; are you going to give the master copy of the show to the client? If not, you must deliver a "show set"—a 'print' of the show. Consider availing yourself of the services of a growing number of photo labs that specialize in duplicating multi-image shows; because a show is only as good as the quality of the print screened. (One that comes to mind is Stokes Slide Service.)

It may seem attractive to sell a client copies of a show; reckoning that you can make the copies yourself and make a fortune doing it. Actually, it doesn't work quite that way. The problem is threefold:

- You likely do not have the expertise to make show-quality dupes.
- You will drive yourself crazy trying to learn.
- Duping is not cost-effective unless you do it on a volume basis.

Duping shows requires employees of 'different' (non-creative) mentality and cleanliness that would be the envy of a hospital administrator. For budgeting purposes, take the estimates of your duping suppliers and add 25% as management and creative supervision fee. You may make money doing it that way.

Multi-image shows contain a wide variety of slides—one may already be a dupe; another slide might be a triple-film sandwich of two masks and an effect element; etcetera. It requires lot of technical expertise to correctly dupe those different kinds of slides. 'Straight' dupes just will not do for complex shows; especially ones involving overlap formats. Masks must be reproduced, separately; multi-layered slides have to be disassembled, their layers individually copied; then re-assembled; to match the originals. That is, if you want to do it right.

There is really no way in hell you can maintain the sort of technical duping expertise you need on an in-house basis. Yours is a creative house, not a dupe house (or maybe it is?). Your duping should be for 'creative' purposes that will ultimately earn you fame and fortune. Leave the duping (printing) aspects to the experts in that business. If you try to 'duplicate' their efforts (hahaha) you will re-discover all the myriad things that can go wrong (and will). It is no way to make money. The same applies to virtually any duplication aspect of a show; let the experts handle it. If you insist on doing it; make yourself an expert.

Budgeting for Multiplexed Shows

Budgeting for shows that are to be transferred onto film or video is tricky; because it is exacting and meticulous to the proverbial 'Nth degree.' Things that you can get away with in a live multi-image show may not be acceptable when it is transferred.

To begin with, is it your own show that is to be transferred? Are you going to do the transfer or is someone else? Both factors play an important role in estimating. If it is your own show, then you are going to have to be very careful in each stage of production to make sure that the audio is mixed to cine standards. Likewise, the visuals should be designed and photographed with the transfer process in mind. You may well have to dupe a lot of visuals into proper balance; you may have to experiment a little with colors and contrast balances; you will have to be very attentive to line-up and registration.

For those reasons, if you are producing a show to be transferred, I would recommend that you add 25% to the entire show-production budget. That might cover you for the extra finessing you will have to do to make the show look good in the media for which it is being transferred.

If you are doing the transfer work; you will have extra opportunities to shoot to the highest possible quality level and reshoot until you get it right. This extra multiplex 'tweaking' will cost you extra dollars for all the necessary testing.

However, if someone else is doing the transfer; you can get a 'locked-in' cost estimate, since they are an outside supplier. Allow a 10% to 20% contingency on their estimated costs.

The problem with letting someone else do your transfer work is that they do not know show as well as you and/or your staff. For that reason, it is incumbent upon you to;

- Make a member of your staff available to the multiplexing organization to monitor the process
- Make doubly sure that all your slides are in perfect multiplexing condition and that your audio track is clean and ready for the multiplex process. (Reshoots are not free.)

One way to avoid catastrophes is to do an 'off the wall' video transfer of the show beforehand, using a cheap video camera. Errors will be noticeable immediately. This cheap preview method will help you get everything in line for the real transfer. Problems that will occur in the final transfer will show up in the trial transfer.

That method takes the guesswork out of, "Gee, will that transfer well?" If your show looks good on the cheap system, it will look great when the final product is shot. That is particularly true of overall slide-contrast compatibility, as well as for spotting possible 'burn outs' from multi-projector effects and a host of other nemeses (including dust). Those were discussed earlier (see page 3080).

On the other hand, you have the same problems if you are transferring someone else's show, but in reverse. If the show does not look great on the transfer medium, the client might complain, "Hey, that's a crappy copy." Little do they know of the complexities of setting a show up properly for transfer. You live with their problems.

That is when you'll want to do the el-cheapo transfer using an inexpensive video rig—even black-and-white. It will help you and your client identify problems and either do something or 'live with' them. It 'covers your ass,' so to speak.

You can pick-up a cheap color-video rig inexpensively these days. The technology is changing fast and anyone in the business must 'keep up.' There is no market for yesterday's video equipment. Often you can pick-up used gear for as little as 30% of its original cost. It is worth the investment if you are seriously considering doing a lot of transfer shows. But whether or not you own such a trial-transfer system; you should budget for a lot of tests to make sure that you're on the right track, color and contrast wise.

Also; budget enough for high-quality equipment to be used for the final transfer. Take video, for example. Ask to see a test of what the results will look like using key portions of your show. Include the darkest scenes and the lightest ones in the test (especially the ones using the most projectors to create effects; piling-up image-elements on top of one another—which cheap cameras don't handle well).

If you see a lot of 'after images' when a bright scene is being shot, that is called "lag" and it is inherent in cheaper-model video cameras. Lag is a no-no. Either you will have to correct your slides, or you will have to employ a better-quality camera; or both. Similarly, if dark scenes appear too dark, they will have to be duped lighter to the point they appear as they should.

Another thing to consider is whether you're going to try to shoot the whole show straight through; or shoot it using the recommended 'segmented shooting' approach. Using the latter, you will have to add cinematographic or video editing costs; and possibly other effects offered by those media.

Of course; like any multi-image production technique, you cannot budget effectively unless you know what's involved in the process. If you are naïve about transfers; invite yourself out with a sales rep (or better yet, the technical rep) of a transfer company and explore the possibilities and costs. Have them arrange a facilities tour so you can see for yourself what is going to happen. Offer such a tour to your clients. Everyone likes to know what is going on behind the scenes; it makes them feel privileged and helps them justify the costs in their own minds. In transfers, particularly, such little tours and briefing sessions will play an invaluable role. You need to know not only how a show is transferred, but also what transfers best; what corrective and 'creative' solutions are available using the techniques and skills inherent to the medium of transfer.

The most important thing to remember is that your final product is the transferred show—a film or a videotape. Get to know all the possibilities in each of those media; how they relate to each other. Use appropriate sections of the Budget Summary Sheet to log all the costs you are likely to encounter along the route to producing your movie or video program.

If you still feel naïve or nervous, add another 10% contingency on the entire budget.

By now you have got to be saying to yourself: "With all these contingencies, what happened to my original budget?". That may be true; but it is better than saying: "Where's my profit? How did I lose two grand on this show?"

A case could be made that there are too many contingencies; that it would be impossible to have that many things go wrong in a single production. OK. So what? At least your covered. You can always reduce a budget; there is no law against that. It happens every day.

The idea behind the contingencies is to provide a series of 'signposts'—like using No-Ops in an AVL Eagle program; to flag things. If you wish; depending on your experience(s); you can lump-together all the contingencies and reduce their total by 50%; you can do anything you like. But I suggest that on the initial budget analysis you include them all and see where you end up.

I used to find that on the first tally of any budget I would be over by at least 100%. I did not care, because I knew that I was making a 'perfect world' budget; one with which I would get everything I wanted. Then I would start paring things down, one by one; 'separating the wheat from the chaff,' so to speak. I would stop doing that when I got within 'acceptable' budget parameters. If I could not get within the target parameters without spoiling the 'wheat,' I knew I had much bigger problems; ones that probably affected the entire concept; calling for a complete re-think.

Perhaps the most important objective of the multi-image game is not to lose money; even if you are a masochist and 'work-a-holic.'

Staging

One Christmas, way back when; my sister, Barbara, gave me the biography of P. T. Barnum. It might have been when I upgraded my 'brand' from Mesney's Mad Medicine Show to Mesney's Third Bardo. I read the book with interest; Barbara is very astute.

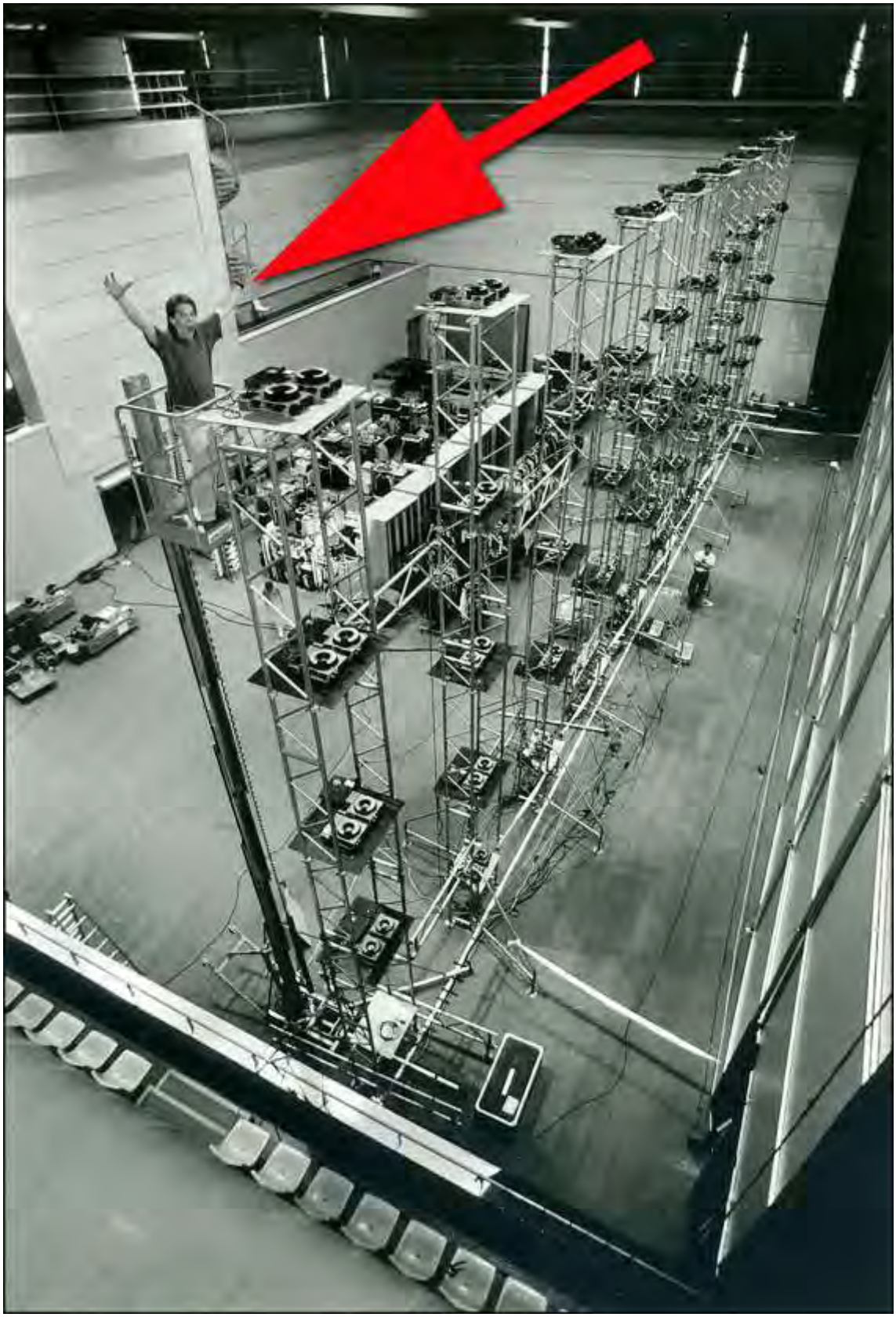
One of Barnum's famous sayings was, "There's a sucker born every day." (But you know that.) I would say, "Life is an illusion."

More appropriate to this tome, perhaps, would be the adage that: "A show is only as good as the version the audience sees."

Shows become memories that mark special occasions in the passage of time we call our lives. That gives shows "magical" powers.

Sloppy staging can ruin the best of shows. Chinsing on the staging budget can ruin your reputation; even if you made the world's best show.

That is ironical, too, since most of the producers I have worked for—to say nothing of their clients—are totally naïve when it comes to staging. I readily admit to being a bit naïve too; I have never been professionally involved in the theater and do not have professional expertise in that area. But I have learned that you really must have those attributes to be able to properly plan for and budget the staging of a show.



Steve Farris stands atop a towering grid of 72 projectors at a Barcelona screening of a Nike spectacular produced by Sound Images (Portland, OR). To the right, the monumental, 24 X 72-foot screen composed of 36 RP screen panels.

I am reminded of an advertising campaign that I saw. It was sponsored by a travel service. The headline was: "You can't plan a convention from a catalogue." How true that is. Nor can you plan staging your show from a catalogue; or over long-distance phone.

There are too many particulars which the average hotel employees (or whomever) does not know. For example, if the brochure says that the ballroom measures 150 x 210-feet:

- Where will the tables be placed?
- Could you have a say over that placement?
- Are there any chandeliers hanging down. If so, how far?

Those, and myriad other questions need very specific answers before you can adequately plan and budget for staging in that room. A site check is basically imperative; even if it requires considerable travel. You cannot afford the risks of a staging failure after you have spent thousands of dollars creating the show. So, straight-off, I recommend that you provide plenty of budget funds for site check and the selection of possible alternate venues (and trips there as well). On one show; the original venue was Manila; but because their customs officials were on the take and the amount asked was a bit too steep, the client said "Fuck-off Philippines." The result was that a mad search was created to an alternate, suitable venue. Those things happen, every day. Make provision for such contingencies in your staging budget.

Another fate worse than death is being under-staffed to adequately stage a show. There should be enough brains and enough brawn; and those two functions should not be combined.



Back a few years; we used to stage all our own shows. The staff was small; the same people ran the show that lugged the gear—including Yours Truly. The problem was; we were so exhausted from schlepping that our brains were not 'up to speed.' Nothing terrible ever happened; but the risks were heightened. There should be a separation of functions. In the 'brains' department, there should be an account executive present as well as a staging director. The account executive deals with the client; 'manages' the information given them; and serves as an intermediary between the client and the staging team, led by the stage manager.

Don O'Neill and Yours Truly set up a 1976 Burger King rally show at the Rochester, NY, town hall.

Clients are particularly nervous around staging people. They feel so helpless; that they should be *doing* something. They inevitably have a million little suggestions and picky changes. Those can be frustrating to the staging crew.

The account exec can be helpful; holding the client(s)' hand(s); keeping them occupied; giving them things to do. The latter point, giving them something to do, is a crucial one. If you can find some legitimate and beneficial way to involve the client in the set-up of the show, that is to everyone's benefit; they feel involved—and leave you to your assigned tasks.

One way is to have them (go away and) rehearse their parts. Another is to constantly barrage them with a lot of stupid little requests—like, could they arrange to have the air-conditioning turned up or down; could they see to the lunch arrangements for the crew; have they doubled-checked with the banquet manager about seating arrangements for banquet? Where are the flowers? Etcetera.

Do not get the client involved in the show until all your technical glitches are ironed out.

- Dry-run the show without broadcasting sound; listen though cans and make sure it works.
- Do a separate sound check of all audio elements.
- Check your lighting cues against the equipment.
- Have your own technical rehearsal before inviting the client to see the show

Clients are especially nervous when things go wrong in rehearsal; especially technical glitches. Things do go wrong in rehearsals—that's what rehearsals are for; to double check against things that go wrong and get problems ironed out. Every member of the team should be on hand for rehearsals.

For most rehearsals; do not bother to have the slides critically aligned. A 'loose' alignment is sufficient and could even be considered 'beneficial' in terms of the 'psychology' of staging. That is; the show should keep on improving; it is a sign of progress. It should look its very best during the actual performance. (Plus, it gives the client a way to be involved—albeit complaining about the alignment. Ha!) It makes the client nervous to see you repeatedly adjusting alignment; especially since every screening will reveal some other mismatch. Fiddling calls attention to misalignment; that is not a good idea. You could spend your life re-aligning projectors during each rehearsal; especially if there are tray changes involved. And; as you are probably aware; the chances of an a given set of projectors holding perfect alignment from performance to performance is virtually nil. Instead; get a good basic alignment, rehearse like mad, and be sure to reserve the last hour before show time for alignment purposes. That may require special prior arrangements.

I recall a classic: We were staging a show for Clairol. We had made special arrangements with the client to have the last hour free for slide alignment. However, Clairol's staff did not communicate with each other; they scheduled the same time slot for the tables to be set-up by the hotel staff.

Since we were doing an RP show; and since the house lights had to be on for the table set-up crew; there was a big s problem—we could not see the line-up slides. (!) After considerable compromise between the unionized hotel staff and our own non-union people; we mutually agreed that the tables could be set-up under low-lighting conditions. We were able to see enough of our line-up slides—using walkie-talkies between backstage and the center of the audience section.

Unions are another snake pit of problems. Being in a union is basically a license to steal. Chances are more than likely that you are a non-union shop. Unions do not like that. Not even a little. As far as they are concerned, you are an enemy.

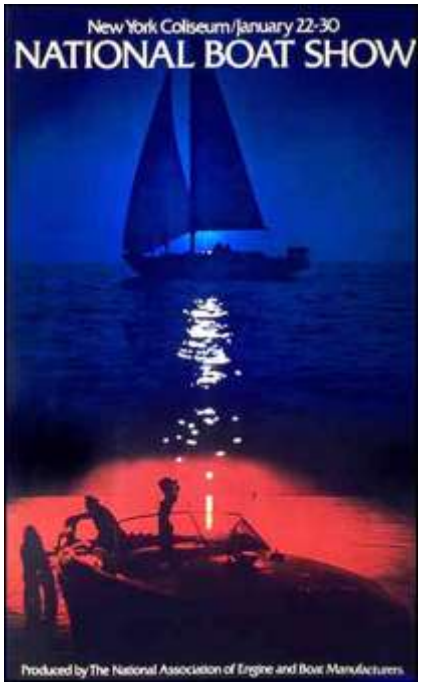
The craziest example I can recall was an episode in the New York Coliseum about 10 years ago. I was displaying a bunch of prints and had gone there to hang them—on union-installed panels. [*Editor*: It was for Nikon and The National Association of Engine and Boat Manufacturers (NAEBM). Two of those panels are seen in the picture below; they flank the AV screens; on the left and right.] When I was seen with a screw-driver in hand attaching the pictures to the panels, I was politely told by a union guy to stop. When I asked why, I was told that it was for insurance purposes; that they were not covered if I was hurt, or if I damaged some other property.

That seemed logical to me. I rhetorically asked in reply: "What happens if you damage one of my photographs? They are worth $10,000 apiece." The union guy thought about that for a little while and replied that, because of 'special' circumstances,' I could continue hanging my own pictures.



At the same exhibition (discussed earlier; see page 2986); Nikon's show was a 15-projector set-up—a grid of 24 X 36-inch [61 X 91 cm] Motiva RP (rear-projection) boxes stacked 3-high by five wide (shown left).

After the show was over, producer Bob Schwartz was sent a bill from the union (forwarded by NAEBM) for the services of one projectionist for each of the fifteen projectors for each day of the show. The bill was thousands of dollars! Just about what the show cost to produce!



It was not paid and that led to other hassles. With Nikon's assistance, a mural-sized, backlit transparency of our theme visual (left) was hung from the ceiling above the exhibition-hall entrance. (It was the visual motif of the show; on the cover of the show program as well as NAEBM's print promotion, which we also designed.)

After the backlit 20 X 30-foot transparency was up and lit; we were hit with a $5,000 invoice for 'architect fees'—supposedly to figure out how to hang the thing—and an additional $5.000 for the union crew necessary to hang it.

Nikon's display experts had previously figured that the thing could hang with "no problems" from piano wire attached to the ceiling's main truss ... a $250.00 job.

So, while budgeting the staging; be sure to make certain whether unions are involved and 'how much it will cost' to do it yourself.

Another time; Pat Billings, Don O'Neill (our agency client) and I arrived at a theatre in Knoxville one morning about four hours late for an afternoon show (thank you TWA). The heat was on. Our specially-arranged-for messenger van pulled-up within four feet of the stage door. The installation site was a mere 20 feet beyond. There were only eight cases; which we could easily handle ourselves. But, no way. We were informed at the door that the theater's staff had to handle the cases and the charges were $25.00 per case.



If you really want to hear union stories, talk to Randy Will of Staging Techniques; he can tell you so many stories you will need a week off just to have him give you a summary. [*Editor*: Randy Will passed away a couple of years ago.]

Hint: Union guys don't know anything_about multi-image—many are still trying to figure out how a slide projector works; few that I've run into even knew that it is possible to change slide projector lenses.

You may end up with a lot of union men on hand 'watching.' That's OK. Just know how much it costs and shell it out. Also; budget in lunches and other goodies to keep the union guys happy.

Outright payoffs are demanded sometimes. Pay them. With union guys it is just like looking straight in the eyes of an airport Skycaps with a handful of twenties and asking whether the baggage must go 'inside' or possibly handled 'between us.' A mere instant in time—a flash of the eyes, as it were—will tell the tale; unless your being conned. That also happens … every day.

Union guys (err, 'people')—and any government inspectors (fire inspectors; health department inspectors; maybe even police, God forbid)—all those guys want is a piece of the action. Ask them about 'alternatives;' let them know you are prepared to deal with any 'special requirements.' Basically, tell them—'in so many words'—that money is no object. Establish limitations on your generosity (somehow).

Because there are so many things that can go wrong; anything to do with staging should be treated as a separate job with separate liabilities. Don't give the client a package deal that includes both show production and staging. Be sure that you are going to get paid to produce the job—even if it fucks-up during the performance. If you take on the production and staging of the show in a single contract, you are playing multi-image Russian roulette. There are so many ways a show can fail that it isn't funny. And if your client is 'irrational,' they could take the position that since a portion (or all of) the show screwed-up at the one-and-only (or percentage of) show(s), they should deduct a compensatory amount from the invoice(s).

Not so fast. You could be wiped-out by the union on one performance. Or the airlines. could have 'forgotten' about your tape-deck replacement. Anything can happen … and eventually will.

There is no reason why you must pay for other's errors. Deductions from your invoices are unacceptable. I used to explain it to my clients this way: That we will take on the responsibility of staging the show only if you agree to separate that liability from the total show package.

As an alternative; you can, if you wish, select an outside staging company to do the job (and let the client sue them if it fails). However, by doing that you run the risk of having people who are unfamiliar with the show and who may not 'care enough' to set it up with precision and run it attentively (see notes about unions, above).

I would suggest that the people who build the show are the most desirable stage hands in terms of having the show look as it was intended. However, for the benefit of having our people do the staging, you (the client) must be prepared to sign-off on staging as a totally separated job.

Negotiations like these are delicate; because they must at some point deal with the cold fact that multi-image shows are fallible. Face it: you are in a bifurcated business. All your production efforts can become meaningless if the show fails during a performance—albeit that the equipment manufacturers have been beefing-up their 'reliability' (re: liability) standards for years and have become almost 'fool-proof.'

That does not matter. There are so many machines involved that the odds of Murphy winning are on his side. All the machines are hooked-up by humans and run by them.

Use "Act of God" and/or "Force Majeure" provisions. Explain that there are times when something happens that is so far out of your (or anyone else's) control that it could be considered an act of God. That is a 'reasonable' approach that most clients can understand. They may still sue y'a; but a least they will 'understand.'

You may someday have to defend yourself by 'proving' that a failure was an "Act of God." If you go to court; make sure that every member of the knows about multi-image production and staging. Be prepared to educate the jurors. Drag a show into the courtroom and scare the hell out of the judge and jury by demonstrating how tenuous your business really is. Explain that you pointed out the fallibility of multi-image to your client up front.

There is also a need to have adequate liability insurance. A million-dollar liability umbrella policy is nice to have if you can get it. You will be taking on responsibility for the well being of a lot of people, equipment, and facilities. God forbid something will happen; but if it does, you could be 'up the creek without a paddle,' as my father liked to say.

Suppose, for example, that your hired forklift bashes a hotel chandelier? Suppose that a lighting instrument falls on someone's head? Even while producing the show, it is good to be covered for such contingencies. You can also buy "production insurance;" it costs a fortune (up to 20% of the budget) but it is worth having for big shows where a lot of responsibility and liability is placed in your hands.

In the production and staging of a given show; you may well have to do some traveling. Those arrangements can take a lot of time to work out. If you are going to be doing work out of the country, you will possibly have to arrange for visas and inoculations. Equipment will have to be documented for customs clearance in the country you will be working in, as well as when returning to home base. You may have to get a Carné.

Carnés are great; but they can cost you. You must post a bond of up to 25% of the equipment value. When all the equipment is returned to the country of origin, the Carné department can take up to six months to return the bond money. Yikes! That means they can tie-up thousands of your dollars for months at a time. Get the client to post the Carné-bond fee. That was a practice I undertook in the past and by and large it was accepted by the client.

Be sure to also check into any possible import duties and fees that will be required by the country you will be visiting. I arrived at the Canadian border one time with about $50,000 in equipment to do a photo assignment. I was informed that I would not only have to pay a tax of 45% of the stated value; but that I would also have to get a special temporary work permit. The work permit was not too hard to get since I was doing the assignment for a Canadian company. But I ended up having to leave all my own gear at the airport locked-up in Customs; renting replacement equipment in Canada—none of which was the type I normally use.

On another occasion; when Don O'Neill and I were taking a show to Aman Jordan for their national airline, ALIA; we arranged to ship in all the necessary equipment through Mediatech's Inter-Rent system. We brought with us a lot of photo gear from along with the software for the show. All the AV hardware was flown in from London. After spending an entire day finding our equipment cases—scattered willy-nilly throughout a vast primitive warehouse—it took another week and a half to sort things out with Jordanian Customs officials.

In the first round of 'negotiations,' we were told that we would have to pay a tax of about $30,000—even though the equipment was going to be shipped out a week later. The rigmaroles of the negotiations were classics too. Back and forth, back and forth, from one official's office to the next. No one would make a decision. We were advised to try Mr. X; only to find that he was on vacation. Then we were referred to Mr. Y. He advised us that Mr. Z had forgotten to initial one of the boxes in the forms. So, back we went to Mr. Z, who was in another office miles away. It was really a joke; a bad dream come true.

The bottom line on all that is: you must make adequate provisions for the import and export of equipment and that will cost you a lot of time and money which should all be duly budgeted.

It is advisable to hire a customs broker in the countries you will be visiting; they can advise you of likely charges and time delays; and take care of all the necessary 'arrangements' for you. You will still have to spend a lot of time making detailed lists of the equipment being imported and/or exported; and you may have to get special insurance for certain legs of the trip.

In addition to all that; you may have to have special packaging or crates built and arrange for airfreight. The good ol′ days are almost over; when you took everything on the plane as excess baggage. These days, especially with international air travel, the excess baggage costs are extraordinary. On a recent trip to Australia, Sandra and I took along thirteen cases of photo gear. The excess baggage weighed about 200 pounds and cost $1080—one way. We also airfreighted another 400 pounds of equipment (a Buhl Project-Six Multiplexer) in a huge crate, for only $650.

The old scam of paying off the skycaps to avoid excess baggage charges is not advisable anymore either, especially in overseas flights. Sure, you may get away with it. But if something gets lost or stolen, you have no recourse with the airlines, since you were ‘fraudulent′ in not paying the excess baggage fees. On top of that; even when you pay the excess baggage, you are only covered to the maximum of $750.00 per case; even if the contents may be considerably higher in value.

You can buy excess-valuation insurance, and I suggest that you do that—even if you have other policies insuring your equipment. It is relatively cheap, and a good way to make sure that you are covered.

For example, one of our Magic Lasers machines was stolen on a return flight from Texas. It was part of the contents of a Braniff Air Freight truck that got stolen at Kennedy airport in New York. We had arranged for extra insurance on the shipping; thank goodness. That insurance covered us for most of the value of the machine (about $25,000). The airline′s insurance made good on their part of the deal But, if we had not taken out the excess insurance, we would have had to collect against our own policy. You can imagine what a claim like that would do to our base rates.

[*Editor*: when you make a claim, most insurance companies will charge you back the amount over ten years by virtue of rate increases equal to 10% of the claim payment.]

While we are on that subject; security is another factor which may occupy a line or two of your budgets. You may need to hire security guards just to be able to buy the insurance you need.



For example: when photographing DeBeer′s diamond jewelry for an awards presentation; we had to have security guards on hand 24/7. Without the security guards, the insurance company would not cover the million dollars′ worth of jewels we had in the studio for a week).

Or, if you are shooting a secret new product on location; you may need security guards to keep prying eyes away.

Kathy Nissen models a diamond friendship ring for the 1979 *Diamonds Today* awards show produced for DeBeers; world′s foremost diamond producer.

Lindsay Rodda of Sonargraphics told me about a shoot for Ford Australia; of a new model that was very hush-hush. Normally, all footage was shot on Ford's own test track; to keep the car out of public view. However, it was decided on this occasion to shoot the new car in coastal scenery that was more spectacular. To get the shots without anyone seeing the car; Lindsay had to hire special security guards to close the road (the car was transported to the site in a covered truck).

At the shooting location and/or show site; you may need security guards on hand to make sure that your equipment does not sprout legs in the middle of the night. This is especially true when staging shows at trade fairs in large convention halls. I recall one NAVA show when the entire contents of the Teac booth 'disappeared.' That is ballsy, to say the least. But it happens.

Even with security guards there is still a risk; they are not all totally honest. But at least with the guards, you have covered your ass with the insurance company. They cannot turn around and deem you to be negligent; leaving equipment unguarded.

Security and insurance can cost you a small fortune. If you have not accounted for it, your production and staging budget may suffer heavy deficits when all the costs are added up.

Sales and Purchases in Behalf of Client

This is another area of budgeting on which you can either make or lose a lot. Some of the larger multi-image shops make more money on event management and travel commissions than they do on the production and staging of the show. They are glorified travel agents who also happen to produce multi-image shows. You can well imagine how profitable that is, seeing as how travel agents earn commissions on everything.

If you have the opportunity to make all the hotel and travel bookings for your client; consider that undertaking seriously. Perhaps hire a specialist to make the arrangements for you. On the other hand; if you 'only' spend a lot of time consulting with the client on these matters; make sure you get a consultancy fee, at very least.

You may find yourself purchasing equipment in the client's behalf. You should receive a consultancy fee for the selection and acquisition of that equipment; plus you should mark-up the equipment costs by an appropriate percentage (at least 10%). You are functioning as a purchasing agent and should get paid for it.

If the client says they can get the equipment cheaper elsewhere, let them. The AV business is rife with ~~chisellers and cheats~~ those willing to 'bend the rules.' Even though dealers are supposed to hold the line on list-price discounts, few actually do; most are ready to make deals; money talks.

Some manufacturers have even been known to bypass their own dealers and work directly with customers making large purchases. So, it is very likely that your client can get a cheaper price when shopping around. But that should not involve you. Your relations with your suppliers should be based on fair prices and excellent service.

What did Doug Ethridge say, "Good. Fast. Cheap. Pick any two"?

One cannot get great service and bargain basement prices; the two just do not mix. If you go for the rock-bottom price, God bless you when the equipment must go back for service. Point that out to your client.

Remind them that if they make their own acquisitions, they will have to make their own arrangements for servicing the equipment. Whereas, if you make the arrangements and get paid for it, you will bear the responsibility of making sure everything works.

Clerical and Administrative Costs

This is an entire category of 'hidden' costs. They are not 'project-related' in a direct sense; they frequently get overlooked. To run your shop as a business, you are going to need clerical- and administrative-type people to keep tabs on the production schedule and budget allocations versus actual costs.

As mentioned earlier; I have often been surprised by the people who populate some of the larger multi-media shops. They always seem to have about two or three producers or managers for every person doing the actual hands-on work of show making. However, you cannot deny that these large shops are financially successful. Some of the biggest have even gone public; you can buy their stocks and bonds.

To my way of reckoning; you should have as few administrative types as possible; just enough to keep accurate tabs on things. The same applies to clerical; only as many as needed to answer the phones and keep the paper work flowing.

The smoothness of the clerical flow, and the accuracy of cost accounting, will be the result of your procedures—their simplicity and ease of use—more than a battalion of bean counters. There is a delicate balance that must be worked out between too much and too little paperwork.

Client Entertainment

Finally; there is the 'business' of keeping the client happy. Aside from maintaining a satisfactory record of performance related to the job itself; there are always the little extras that you take care of for your client, as well as general entertainment.

Those costs should be factored into 'other' costs so they do not appear (as such) on the budget submitted to the client. Allow for about 3-5% of the budget to be spent on such 'little things;' that make your handling of their business that much more attractive to the client.

It is a little game. Most clients are aware that they are paying for those little extras; but they do not mind it and will appreciate the fact that you're looking after them (even if it is at their own expense).

The Totals Columns

With all the specifics of the budget in place; you should break apart all the totals to get a clear picture of what the show is going to cost you to produce and stage; how much do you stand to make? That ratio should be within your predetermined margin (of 40%). If it is not, you better re-assess your budget; and possibly your concept.

Assuming that all is OK with the budget; prepare a summary sheet with category totals for submission to the client. Make sure that the production schedule is attached and that your contract includes a section regarding delays to production caused by the client. Some clients tend to sit on proposals and budgets for so long that time runs out to produce the show and you are stuck with a lot of overtime that was not budgeted for. Inform the client; that unless approved by X date, the budget is null and void. Or, that for every day's delay in approvals past such-and-such date, the client will incur an additional cost of X. That usually helps speed things along in the approval process.

Some clients may feel that you are railroading them a bit. Your counter-argument to that, if it creeps into the discussions, is to simply point out how delays will affect your production costs and schedule. That is an honest defense.

With the budget approved; the show and staging arrangements go into the works. It becomes necessary to track production of the show in terms of cost accruals and disbursements. Those should be tallied daily and a weekly report issued to appropriate managers or other members of the team to keep them posted as to how they are doing, in terms of budget and time allocations. Danger zones can be spotted immediately and the client kept informed of any possible cost-overruns before they are incurred.

As mentioned before; most clients can live with justified cost overruns; but they get very annoyed when they hear about them after the project is finished. *You* need to know about problems too; to move money around within the budget; covering areas where costs are getting out of hand. You need to know how much the show is costing as it is being made; not a month after it is finished. Some producers never know what a show actually cost them to produce; since they don't tally costs against budgets. That is, obviously, courting financial disaster.

The function of keeping tabs on the budget is largely a clerical one. You should set-up a system of procedures which allows for daily posting of all disbursements.

- Purchase orders
- Materials requisitions
- Telephone toll-call slips
- Messenger slips
- Time sheets
- Equipment- and facilities-use logs.

All those and more should be gathered and posted against the budget on a daily or weekly basis. The use of a mini computer can be invaluable in this function; but even if the process is done 'by hand' it is critical to the success of business. Be sure that you do not cheat yourself; not allowing for sufficient clerical and administrative time in your show production budget.

MULTI-IMAGE AS A BUSINESS

The way multi-image shops are run as businesses is as varied as the shows they produce. Some shops seem to have no systems and procedures at all. Others are so organized that they have manuals detailing administrative and clerical procedures that everyone must follow to the letter. Still others require so much paper to be moved around that it is a wonder any work at all gets done on the show.

For example: In a shop where I worked; it took me (and three other people) two hours and four argumentative discussions to buy a dozen rolls of scotch tape. Seriously.

That company was administratively divided into two entities; one paid sales tax and the other did not. One division would make all outside purchases then resell everything to the other—with separate purchase orders. Making any acquisition required a purchase order. To fill out the form completely required the precise amount; a job number; an accounting-category 'code' (materials and supplies were categorized; for example, the category of photography had six subcategories, each with their own code numbers); and an approval, over a certain amount.

To order the Scotch tape; I had to fill out one PO; then hand that over to someone else to make a second PO. Since the tape was not for a specific job, one division's POs didn't have a 'category' for 'general use.' An argument ensued as to which 'company' should actually make the purchase. As well; the tape 'fit' into any one of four accounting codes; which was more appropriate?

Finally; the store, when queried about the costs of the tape, was not sure whether the tape was on sale that week, or what the actual discount break-off point was; so, I couldn't get the 'precise cost' required.

The latter episode became the subject of yet another 'discussion' and two more calls back to the store to get a firm price for the tape —that ended up being about $25.00. But there was another $100 or so in the staff-time needed—wasted—to figure out the who, what, when, where. and why for the acquisition of a roll of tape. Incredible? Yup. But true.

I quickly learned to bypass the system entirely. When I needed something, I would go out and buy it with own funds; then submit a petty cash slip at the end of each week. That worked fine; no discussions, no arguments, no multiple POs and no delays. After a while, I got my ass chewed out for submitting so many petty cash slips. So, I simply saved up the receipts and submitted them all at the end of each month.

The obvious point is that a system is only good if it works; if it helps people get their jobs done. If you want to have a super-tight system, like the one just described; hire a purchasing agent.

There is no way that 'creative types' are going to put up with strict systems requiring a lot of paperwork. After a while they will either figure out how to bypass the system; or they will become apathetic. In that company, apathy extended throughout the entire staff. A few found the system so constrictively frustrating that they left the company.

Nonetheless, there is a need to know what is being spent externally and internally. The best way to do this is to centralize the purchasing functions as much as is practical. This may be an actual purchasing agent, or it may be handled by department heads. The use of a microprocessor is invaluable. A spread-sheet program will give you instant tallies on any job or any categories as well as sort daily trial balances on any job; or the company in general.

Although some form of purchase-order system is necessary, it should not be constrictive. That is, it should be fast and easy to fill out. All you really need to know is what has been ordered; whether it is equipment or supplies; whether it is assignable to a specific job; and an approximate cost. One of the staff keeps track of all purchases and posts costs according to job budgets. The POs cross the desks of appropriate department heads; to keep tabs on potential cost overruns. The same clerk should also receive copies of all time sheets and petty cash vouchers; for the same purpose of posting the amounts against specific project budgets.

All work should have a job number and budget; even house jobs. Assign values to the work to be done. Ride herd on those budgets. Employees sometimes think that house projects have never-ending budgets. Your costs for R&D experimentation can skyrocket.

There should be a "General" category; for times when someone is working at something that does not relate to any jobs. Things like aligning the camera or making lab checks do not apply to any particular job. Likewise, equipment-repair and maintenance work are 'general.'

It is nice to know how much time is spent on those 'generalities;' but it should not become a fetish. That is non-billable time and thus should require less valuable accounting time be spent on it.

You may wish to include sub-categories to the General category; such as accounting, administrative, sales, repairs, etcetera. But do you really need a breakdown? In general, those types of breakdowns start to get so detailed and require so much time that the system itself starts to malfunction. Along with your cost breakdown, you get a system 'breakdown.' What do they say, "KISS—Keep It Simple, Stupid"?

What do you do with all the totals anyway? Although I required time sheets to be filled out in my own shop, I rarely referred to them; usually only when I was having a 'problem' with an employee; that was seldom (and I did not need the time sheet to tell me).

Rather than having petty-cash vouchers or even a petty cash box—which tends to get dipped-into a bit too frequently—I required each employee to make small purchases with their own funds and submit a petty-cash listing at the end of each week. That did two things: first, it kept petty cash expenditures small (since the folks were spending their own money); and it made dealing with the expenses faster and easier. The payment forms were the only accounting needed. Paying totals once a week was way more efficient than reimbursements made in dribs and drabs, day by day. A bonus was that it was easy to spot the offenders by the totals on the sheets—especially for non-billable, 'general' expenses; that was money out of everyone's pockets.

On the time sheets; I only required 'bulk' time allocations. I did not care about quarter and half-hour increments; only full hours. Again, all I was interested in seeing was the larger figure; the overall picture of what was going on.

Employee Incentives

Overtime is inevitable. I had a few ways of dealing with it, with varying effects and affects. In the beginning, I offered compensatory time off; that is, if someone worked an extra ten hours one week, they could take off ten hours another week. They were not allowed to save-up time and go AWOL; as in, "See y'a in a month!"

Rather, it was expected that everybody would be 'fair' to themselves and to the company. That compensatory-time arrangement is commonly practiced in the multi-image community; but the system breaks down eventually; because if you are a busy shop, there is never a good time to go on leave. As we became increasingly busy, there was *never* any time off.

Another problem with the time-trading system is that some employees are naturally going to work longer and harder than others. There is also a disparity between job functions; as to their time requirements; as well as between people's ambitions, motivations, and levels of skill.

One employee might be 'overzealous' and spend inordinate amounts of time experimenting or polishing and perfecting (I am thinking of you, Mark). Another might have to work late because he or she fucked something up. Maybe the whole staff had to be kept late because the client did not deliver the goods on schedule.

There are myriad reasons why the compensatory time-off system did not work. It made some employees feel 'cheated.' So, as the shop began to grow, I switched to a 'bonus system.'

Everyone got a Christmas bonus (the amount of which varied for each employee according his or her 'value' as reckoned by me). Certain employees were also given periodic 'incentive bonuses' based on good performance.

That system worked rather well; but a drawback was that folks got used to getting bonuses and then came to expect them (again, feeling 'cheated' if they did not get bonuses frequently enough).

That was 'countered' by giving frequent pay raises (in smaller increments) for those who did well. Sometimes I handed out up to three raises in a year. No one raise was that great; but the frequency of small raises kept the specific folks aware that they were progressing and getting rewarded for it. And, it helped keep salaries high enough to ward-off potential pirating of my employees and technology by competitors.

There was an 'understanding' between myself and each employee that their job required long hours and that such hours were 'expected' in terms of the salary being paid. That worked well at the 'upper levels' but failed miserably at the lower levels. It is the low man on the totem pole who gets hit hardest in such an arrangement.

For example, the stat-camera operator was initially one of my lowest paying 'trainee' jobs. But every time a big special-effects job came through, that poor guy had to work countless hours of overtime to get the job ready for cel preparation. Clearly, he was not getting paid 'enough' for all his toiling. Similarly, when a many of shows were being screened, the staging crew had freaky hours. For those 'lower echelon' employees I made the ultimate mistake: I paid overtime.

When you start paying overtime, you court disaster. First, it fosters a union-mentality. People start working less hard during normal hours; to be able to cop a little 'OT.'

Overtime tends to reward incompetence. The skilled employee will get the job done in the least amount of time. The least skilled employee takes the longest; and ends up possibly getting paid the most.

That system got things so out of whack in my shop that it was absurd. The payouts, if measured by a talent-for-dollar ratio, were ridiculous. The total amounts being paid to the employees got way out of line in terms of industry 'norms.' As a result, overhead skyrocketed and profitability fell; eventually leading to the company's demise.

I was prepared to live with that situation as long as we were making creative progress; maintaining a leading-edge position in the industry; with a discernable product superiority. But overtime led to underperformance; it was costing me so much to let the kids play that I had to curtail a lot of the experimentation that they formerly did for the 'joy' of it.

Things got so bad; I recall taking periodic walk-throughs; finding my Forox crew sitting around singing songs to guitar accompaniment. Another time I found my chief stage director playing computer games on the Eagle; he protested that he was "becoming more familiar with the machine."

The tempo would begin to pick up in late afternoon. As the overtime hour approached, everyone went to work. That made me feel 'cheated.' I was not in business to feel that way.

Thus, and so; avoid paying overtime. Instead, pay decent salaries and provide incentive bonuses. Those bonuses should be aimed at motivating profitability on jobs. By disbursing, say, 20% of a show's profit as incentive bonuses scaled by salary level, everyone is happy and everyone stays in 'economic size places.'

Exceptional workers should be given raises; but bonuses should be scaled equally amongst the team according to their salary level. That maintains a team spirit and makes everyone cost-conscious. They come to realize that every dollar of the company's money they spend could be money taken out of their own pocketbooks because of lower profits.

Crew members tend to monitor each other. If one sees another spending to liberally, a comment will be passed that will usually stop the practice. This self-policing is a real asset if it can be achieved.

In these economic times it can be difficult to hand out raises that are meaningful, because each raise pushes the employee into a higher and higher tax bracket.

[*Editor*: 1982 saw the beginning of a major recession caused by FED Chairman, Paul Volker's snuffing of inflation with sky-high interest rates.]

Other ways to reward employees include:

- Health, medical and disability insurance
- Stock in the company
- Gasoline allowances; for their cars
- Use of company cars
- Liberal policies about "expenses"
- Other legal and extra-legal incentives

In terms-of vacations; my policy was to be given at least a month's notice and preferably two or three. Each department was advised to work out their vacations so that the department could keep functioning smoothly.

Even with financial and vacation policies in quasi working order; motivational problems were still sometimes encountered. Usually by one of the team members feeling that they were not 'progressing,' or wanting to learn and do a different job.

For example, just about everyone wanted to learn how to program, and/or how to shoot on the Forox; at east, they professed to. I often wondered about the sincerity of those requests since we had five Eagles stationed around the office—one for every three employees—and no-one ever took the time to really learn much about programming. After-hours training did not work either; everyone always had something else that was more important to do.

My method of dealing with job-change requests was to ask the person to 'clone' themself. There was always a trainee of some sort. If an employee could 'upgrade' the trainee to handle their job; they could move into a new position. The key was that each employee had to replace themselves; so that their current functions would continue to be covered while they went on to bigger and better things.

To be honest, that approach only worked partially. It broke down in two areas:

A few were so good that they could not 'replace themselves;' they were caught in a trap; they could not change functions. Some were so dumb or unmotivated that they could not progress. Others professed to want to learn, but never did. Still others learned so fast that there was no place for them in the areas they wanted to expend into; those aspects of production were already 'covered.'

[*Editor*: The company went out of business before any job changes took place.]

Sales and Representation

Any business must have an ongoing sales and promotion program to stay alive and healthy. You cannot just sit on your reputation and wait for the phone to ring.

We are in a rapidly growing industry where there are more and more competitors every year. As fewer and fewer jobs become available (as video slowly but surely takes over) the competition for jobs will get even keener.

Even if your dance card is full and you are going flat out; you should still make sales calls and do pitches weekly, if not daily. Makes sure that you have sufficient jobs lined up to carry you well past your current obligations. You should be selling six to twelve months ahead.

Not everyone is a good salesperson. In fact, very few are really good at it. That is particularly true in multi-image. There is so much involved; it is difficult to find a salesperson familiar enough with production processes to talk sensibly and convincingly.

There is nothing worse than a dumb sales rep. Think of the times you have been pitched. If the salesperson knows what they were talking about, you listen. The minute you suspect they do not 'get it,' you are turned off and the sale is lost.

What makes a good salesperson? The two chief ingredients are honesty (integrity) and comprehension of 'scope' (the needs and capabilities of both client and production shop; awareness of the 'gestalt' of multi-image).

I have spent time with and talked to a lot of multi-image sales representatives; dismayed at how little they knew about the processes of production or the marketing and promotional needs of their prospective clients.

Good sales representatives quickly discover a client's needs; a show's purpose; what it needs to do, to be; while also knowing what the shop can produce—in terms of productions schedules and talent/facilities availability.

If the sales rep is not familiar with all that, you run the risk your rep will sell something you cannot produce; or over/under estimate the studio's capabilities.

However, if they are intuitive and can see the scope; the ideal rep might come-up with some initial suggestions on the spot; at the very first meeting with a prospect.

If one or two of their chromosomes were slightly altered; the ideal rep would have become a creative director. Thus, the best person to 'sell' a job would be *your* creative director; maybe that is you?

The creative director's job is to come up with feasible, do-able solutions to problems; and have a good idea of costs and production time. Unfortunately, you cannot 'waste' your CD's time in perpetual pitching.

Incredible Slidemakers' promotion and selling program included the following:

- Print Promotion
  - Magazine advertisements
  - Publicity releases
  - Client newsletters
  - Personalized "update" letters under my own signature.
  - "Limited edition" photograph posters as "gifts"

- Multi-Image Trade Shows & Conventions
  - Competitions
  - Trade show booths
  - Tie-ins with equipment manufacturers (demo shows)
  - Involvement with AMI affairs

- Videotape samples
  - Mailed to long distance prospects
  - Carried into client's facilities

- Cold Calls with follow-up letters

- In-house Pitches
  - Capabilities pitches
  - Creative pitches

- Speculative submissions

- Sample strips (35mm filmstrips) of new effects; sent by direct mail

Our print promotion was a broad-based 'shotgun' approach designed to give us 'visibility.' So was participation in competitions and trade shows. Such visibility made sure that we were in on the bidding for big jobs and generated a lot of inquiries from prospective customers (and talents as well).

Cold calls were made to customers we wanted to work for. The target was ten calls per day; with follow-up letters.

The real selling, though, occurred at in-house pitches. Those were broken down into two types: capabilities pitches and 'creative' ones. A capabilities pitch is when you run through your samples with a prospect. You explain what you have done for others and are 'capable' of doing for them.

A creative pitch is made when you are responding to an RFP (Request for Proposal) from the client; with specific recommendations.

Our sales presentations were about 80% capabilities pitches (to clients who were either just shopping around or keeping abreast of who was doing what). The remaining 20% were presentations of our ideas to prospects with a firm date and budget in mind).

For capabilities pitches I used a sales representative—Doug Sloan. He was a salaried member of the production team who could double as an associate producer. He scheduled and performed all pitches.

Being involved in production gave Sloan an awareness of what jobs were in the shop at any given moment; promises were not made that could not be kept.



Doug Sloan (left) rehearses a pitch with Incredible Slidemakers studio manager, Jon Bromberg.

When a 'real' prospect was identified; I would usually be called-in on the pitch to meet the client and arrange for a time when I could be briefed on their specific needs.

I ran all creative pitches to prospects pre-qualified by Doug Sloan; calling in other members of the staff as needed to hear the briefing and/or make suggestions. In those situations, I would always try to get some conceptual ideas on the table for discussion and present examples to back up the recommendations.

Presenting specific ideas helped me zero-in on clients' preferences and prejudices; they also helped me get a keener fix on what clients were prepared to pay.

Based on the creative pitch; I would prepare and submit a speculative concept for the show we recommended, along with a rough budget and production schedule.

Those speculative submissions varied in depth and intensity depending on a.) how much we wanted the job, b.) what the client asked for, and c.) pure whimsy—sometimes you 'know' what the show should be.

Sometimes the client knows what is needed and can be clear about it. Other times you may have to take the Gene Butera approach and present three or four ideas before finding one that the prospect buys. It varies all over the lot.

Your in-house pitching, whether creative or capabilities, should be as specific as possible in addressing the prospects needs.

For example: you would not necessarily want to show an automotive manufacturer a show done for a cosmetics company; although you might screen a portion of the cosmetics show to demonstrate your versatility and perhaps make a point or two about how the show solved that client's problems.

But you will be more successful if your samples relate to the prospective client's areas of interest. For example, a real estate developer wants to see shows done for other real estate companies; they want to know that you are skilled in their market.

We used B*umbles* as a 'warm-up' because it showed a wide range of our graphics capabilities while presenting our client list. Then we would show the prospect an example of another show built for a client whose needs were like those outlined by the prospect. After demonstrating actual multi-image shows, videotapes of other presentations were used to provide other appropriate case histories and/or examples of effects and techniques.

Do not rely on videotapes exclusively during a pitching session. Although tapes are a good way to point-out specific examples of effects or sequences that would be difficult to screen, they lack the full impact of a multi-image show.

The prospect should always be shown some real multi-imagery before screening videotaped shows. If possible, simultaneously run a videotape of the multi-image show you are screening; or immediately after the show. That way the prospect will see the difference between slides and video; and be able to better make the mental adjustment necessary to judge shows presented on videotape.

That is particularly important if you are selling the prospect a show that will be used either as, or in conjunction with, a video-transferred version. More and more these days, clients are asking for transferred shows as a way of simplifying the staging of them; particularly for small audiences where it is simply not cost-effective to troupe around a big multi-image rig. For those clients, it is important to demonstrate what shows look like in their transferred mode. The very best way is to show a side-by-side comparison.

In our capabilities pitches we took a case history or problem/solution approach. We would explain to the prospect what each show's goals were; how the show solved the client's problems.

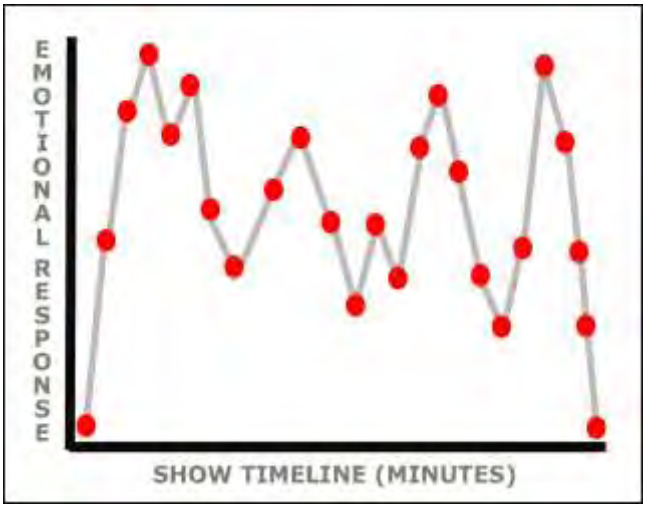
At a creative pitch, great care would be taken to outline our understanding of the prospects needs. Case histories shown were shown as examples of solutions to problems similar to the prospect's own requirements.

On really big pitches, I've even gone so far as to make custom, client-specific speaker support slides and run through a speculative submission in much the same way an ad agency would pitch the client. Those presentations are costly to prepare; but they are guaranteed to impress.

The hardest part of any speculative submission—but the most important part—is to justify to the prospect *why* your idea works and how it solves all the problems identified. This justification process will test your abilities to smooth talk and bullshit.

That is difficult is because the value of a show's concept is as subjective as one's taste in colors or styles. As noted earlier: some people like red, and some people like blue. It is hard to convince a guy that likes blue that he should choose red; even if red is the 'logical' choice. You must convince the client that red is the *only* choice; and the way to do that is by demonstrating why—and how—your idea addresses identified communications problems, accomplishes specified goals, and solves problems.

One of the best techniques I have seen to accomplish such 'justification' is an emotional-response graph that Duffy and Sherry White use when selling prospects on a show concept. This highly imaginative 'device' plots how a viewer's emotions should swing during the show, plotted along the show's time line. During the pitch, they explain the 'significance' of the overall curve, calling particular attention to the location of specific peaks and valleys that are 'correlated' to the sound track, copy content, and visual choreography.



Sketch of the White's elaborate Emotional Response graph.

Although I consider such an exercise to be pure fantasy, it does help sell; it makes the client think that there is something 'scientific' about all this multi-image stuff; and makes the concept in question appear to have been thoroughly researched and tailor-made for the prospect.

Anything you can do to make the client feel that you have gone way out of your way to please them will help get you bonus points in the pitch. For important pitches, we animated the client's logo with effects for a personalized, 'walk-in' room setting. The customized logo slides were loaded into the 81st (gate) position of the 15-projector "Bumbles" section of the grid; programed with repeats to loop during the walk-in and introductions. The client could not help being impressed seeing their logo dancing away with a 15-projector, looping effect. That always 'wowed' them.

Another technique that 'shows you care' is to have custom tee shirts made for the pitch team; emblazoned with the name of the show; or the proposed theme graphic.

Such personalized touches will help win the heart of the prospect. But your pitch also must win their minds. You should discuss what separates your shop from the competition; what makes you uniquely different and better qualified to meet the challenges of producing the show you are proposing.

If you wish, take your client on tour of your facilities; to show off your crew and equipment. On the other hand; if your ashamed of same, or feel that the client might get nervous about a lack of equipment or whatever, make a slide module or a videotape about your production process; one that will serve as a 'guided tour.' Identify your staff; particularly those who will be on the production team for the prospect's show.

Have the account executive and/or production coordinator available at the pitch to be introduced to the client; prospects like to know who they will be working with. They get particularly nervous when they suspect that the "A" team will only be pitching and that the show will be produced by the "B" team. Introducing the team, either personally or via slide or tape, helps to alleviate that fear and gets any questions about qualifications, skills or expertise out in the open for discussion right up front.

Contractual Obligations

At some point in any pitch, you should go through your basic production procedures and relate them to your contract. By doing this you are making the client aware of all the 'rules' by which you will produce for them. Since I basically wrote the 'standard' AMI production contract (based on input from New York attorney, Robert Cavallo, who was hired as a consultant), that is what I use. [*Editor*: The next pages are reprints of articles that appeared in *Audio Visual Communications* and AMI's *Multi-Images* magazine.]

The contract touches on a lot of areas that the client might not have considered. For example, reproduction rights to the visuals in the show. Or, limitations on your liabilities. Or, approvals ... who will approve what, when. Those areas, and others, are sure to invoke a lot of questions from prospects; and that is good; to get those sorts of questions out in the open and discussed in the 'friendly' setting of a pitch.

What will come out of the discussion are any problems the client has with any areas in your contract. Usually, the big shocker is that you are retaining the copyright to the show and that the client will have to pay extra for subsequent usage of the show or any of its components. Most clients seem to think they own the show and can do whatever they wish with it or any of the pictures in it. This requires some careful discussion and possibly some compromise on your part.

The only 'problem' I have come up against with the AMI contract is that it is so detailed and thorough that, in and of itself, it boggles the prospect's brain; here they thought they'd just have a little show made and boom, this huge contract appears on the scene that seems to make the client liable for everything and the producer liable for nothing. From the client's point of view it is a scary document. Some may balk entirely at signing it; preferring a hand-shake arrangement. (Beware of prospects like that!). Others may send it to their own lawyers, who will go to town on it. That can be a problem, time wise. The bloody contract could be in "legal" for weeks; maybe months; but the show might have to be produced next week. That is a real problem. A letter of intent on the part of both you and the prospect can help solve such problems; each signatory agrees to adhere to the basic intentions as outlined in the document, with any amendments discussed in the pitch and recapitulated in the Letter of Intent.

Needless to say, before beginning work on any job, you should have a purchase order from the client together with your first payment. Be sure to read all the fine print on the PO and make certain that none of it is in conflict with the 'rules of the game' as spelled out in your contract or Letter of Intent. Also make sure that the person signing the PO is an authorized purchasing agent for the client. I have heard of cases where producers did not get paid because the client's representative wasn't authorized to make such a large expenditure (or so they said). Make sure that the PO says, "...per the terms of the contract dated X and signed by X", or "...per the letter of intent dated X and signed by x."

It should be pointed out that when I wrote the AMI standard contract, its intent was to function as a master-contract 'checklist;' a guide to what could be included in a given production contract. It was never implied or stated that the total document had to be used. In fact, you should use only the parts that are absolutely necessary for the job you are doing. That is, you should eliminate as much as possible from the contract without putting yourself in Jeopardy.

You should not use the AMI standard contract or any part of it without consulting with your own legal counsel. Laws change from time to time and vary according to state and locale. Various sections of the document may not jive with your lawyer's thinking or the laws, or their interpretation, in your area. You may also want to rewrite the basic contents into friendlier language; again, consult your own lawyer before submitting any contracts to the prospect.

Maintaining On-Going Relationships with Clients

Once you have won the client and gotten the job, next is maintaining a healthy relationship throughout the production process. That can be a tricky since there will inevitably be differences of opinion or other such problems to resolve.

One of the easiest ways is to assign as account executive someone that the client likes and respects; and someone who likes the client. That can be a process of 'natural selection.' With new clients, if the selection of an account executive is arbitrary, some personality-related problems may develop that require a change. Some clients are particularly fussy about who they want to deal with; others are a bit more pliable.

Try to centralize all communications with the client through a single spokesperson who is armed with all the facts and figures about the production of the show. Involve other staff members only as needed, to answer specific queries. Do not allow the client free access to any members of your staff; and instruct your staff not to call the client directly.

If that procedure is not followed, chaos will break out since the client will get differing 'versions' of the information requested, depending on the biases of the staff member(s) queried. Similarly, a given staff member might not relate the information back to the account executive who, unaware of the update, might be running in the opposite direction.

The account executive should maintain frequent and regular contact with the client. Clients hate feeling they have been forgotten about. They also love to be 'involved.' Such involvement can choke to the production process if it is not 'channeled' by the AE.

As stated in the standard contract; approval sessions should be limited to three or four people and held at major junctures in the production of the show; although that is hardly ever the case; there are scores of little things that need technical or judgemental approval to make the job run smoothly.

Frequently there are schedule or budget changes; just as frequently there will be internal reassessments depending on how well the shop is keeping within the confines of the budget parameters or schedule; and those may require cost-overruns on the client's part, or revisions of the shows content or concept, requiring discussion with the client and an official OK before they can be implemented.

Clients thrive on meetings and an effective AE will schedule as many meetings as necessary to make the client feel involved and comfortable with the production process.

Any important issues discussed at such meetings, such as policy changes, procedural alterations, changes of budget, schedules approvals, etcetera, should be summarized by the AE in a 'Call Report' or letter which summarizes the AE's understanding of the meeting and the information discussed. Call reports reassure clients that actions specified in meetings are taking place; that all is 'in order.'

Of course, if the AE failed to understand completely or 'forgot' anything, the call report or letter summary to the client will bring any such omissions or inaccuracies to the forefront right away.

Besides those official functions; the most important thing the AE can do is keep the client reassured that everything is progressing smoothly—even if all hell is broken loose. Rarely is job produced without some problems; the client should never have to be burdened with them; they get really nervous (and there's nothing worse than a nervous client).

The AE should also arrange to periodically entertain the client. Whether it be a business lunch; dinner; theater tickets; going to the ball game; whatever. Social occasions help buttress the relationship and can provide glimpses into what the client is really thinking. Such warm and personal occasions will also give the AE an open channel to discuss future business and learn first-hand from the client about any other departments or divisions of the company that could conceivably need some multi-image (or other) communications services.

Further; at such meetings the AE can learn more about 'who's who' in the client organization; that information can be a tremendous assist in terms of getting things done within the company.

While doing a series of training modules about hair coloring for Clairol, I was assigned the resident hair-coloring research director as a script consultant. Unfortunately, she was rarely available due to a busy schedule and whenever we did meet, she would hand me a pile of documents that were so long and technical I could hardly understand them.

At a luncheon with the client, I learned that an alternate information resource was one of the staff colorists who was quite adept and well versed in the day-to-day language of hair-colorists in 'real' salons. With that colorist's help, the entire series of scripts was quickly and 'easily' written (and the director of research *thought* she was actively involved).

From an internal standpoint, the AE must function as a surrogate client, taking the client's position with regards to the show and its elements as they are created. That can be rough; sometimes the AE must disagree with members of the creative or production teams based on factual or 'interpretive' understanding of the client's likes and dislikes. As such, the AE will inevitably be considered a 'bitch' (or other epithet) within the shop.

It is important that the AE not become, or be viewed as, merely a "yes" man for the client's every wish. Likewise, with the client, the AE must 'fight' for the team's efforts. In order to do that the AE has to be fully familiar with the rationale and justification for all creative (and other) decisions.

There should be regular internal meetings between the AE and team leaders to update the AE on what is happening, and why. At those meetings, the AE can relate back to the team what the client is thinking.

Although such meetings should be regularly scheduled, they should only be as frequent as necessary to keep the production team up to date on the client's point of view and any changes in the works.

If everything is on the right track and no internal meetings are needed, great. However, the AE should still have frequent meetings (at least once a week) with the client; to keep them up to date on what the production team is up to and where the show currently stands; or just for the client' reassurance.

Targeted Marketing

In later years (1986 onwards) my promotional efforts were targeted at specific prospective clients, with 'Big Ideas.' You know how it is; ideas come out of nowhere all the time; once in a while, you dream-up a big one; that can be associated with things you like.

It happened to me in 1988, during one of the more affluent periods of my life. Being in Sweden, I started collecting crystal *objets d'art* almost as soon as I got there (1984). My love affair with glass actually began long before that; I bought my first crystal *objet*—an octagonal paper weight—at New York's exclusive, Fifth Avenue, Scandinavian glass shop, Jorge Jensen, in 1964.

Austrian crystal pyramids became an obsession; I bought them at airport gift shops on every trip outside of Sweden.

After a while, they became a kind of jigsaw puzzle.

When I had a near-perfect square, I bought a special, glass-top table for them (right).

The biggest ones were acquired as props for the wrap-around cover of a brochure produced for EQ Financial, in Stockholm, 1988 (overleaf).



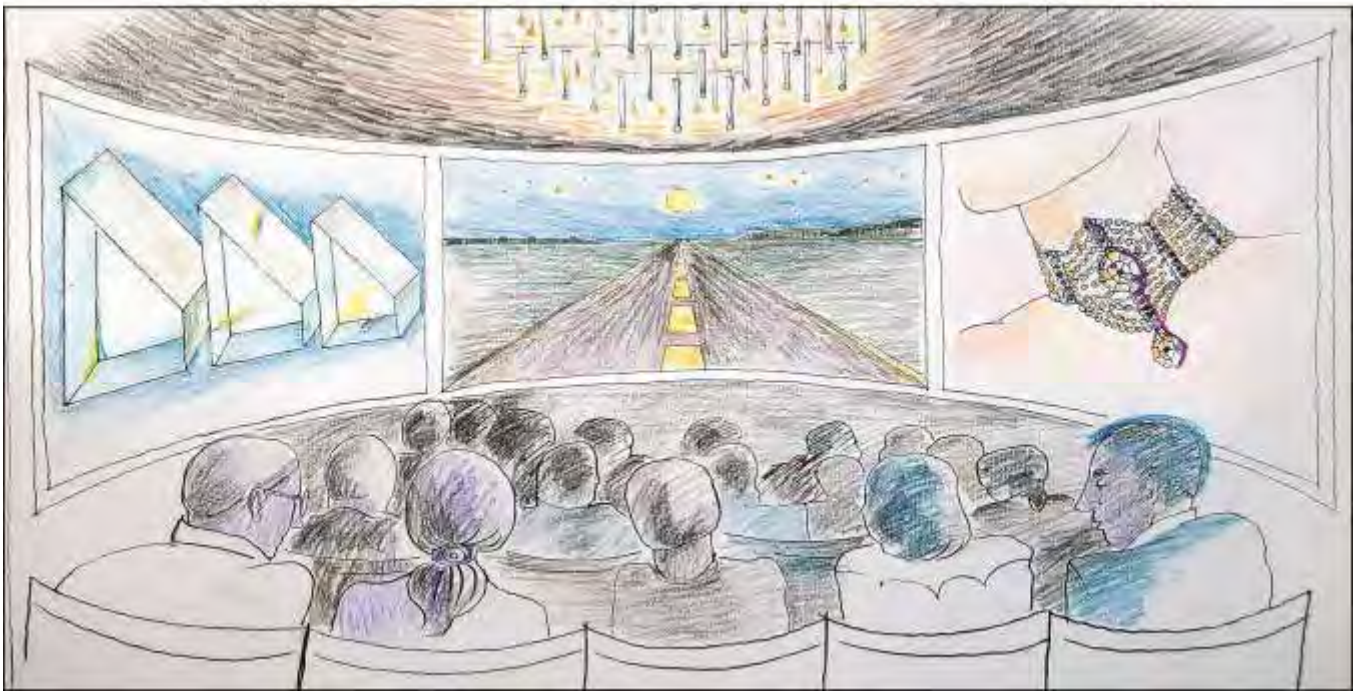


The big idea was to win Austria's preeminent crystal maker: Swarovski.

When I discovered that their centennial anniversary was coming up in 1995, the idea for the *Crystal Pavilion* materialized in my mind; I could see it—a Visitors Center in the shape of a diamond.

I made sketches that my sister, Barbara, turned into proper illustrations (below).





Incredible Imagers was on the cusp of change at the time. We moved from Stockholm to Brussels just after I made an initial contact at the company and secured an appointment with Gernot Langes-Swarovski, the big Kahuna.

I wrote one of my more 'epic' proposals; illustrated by my sister, Barbara, who was staying with us, at the studio. And John Emms contributed a super-sophisticated logo treatment for the cover (below); check out all the different colors. Armed with all that, I flew to Wattens, Austria, to make the presentation.

Straight off, I knew I was wasting my time when Swarovski was unavailable and I was shunted to the advertising department's new hire, Cherry Crowden; she was only interested in selling the company's new jewelry line, that she desgned. You can read the whole story in *Volume Four* starting at page 770.



The moral of the story is: "Easy come, easy go." (Hahaha.) More seriously, you cannot win them all. You must be prepared to lose whatever you gamble with speculative, targeted marketing.

It takes time to build a 'war chest;' to stash enough discretionary cash to spend a few thousand 'Benjamins' ($100 bills) chasing dreams. Spend wisely.]

Cash Flow Management

When you are running a multi-image business; one of the biggest problems is the 'spiky' nature of the cash flow. When you get a big show, you will have lots of money to play with. But there are usually slack periods between major projects that make you cash poor; and who wants to borrow money (particularly these days, at nearly twenty percent).

One way to avoid extreme fluctuations in your cash flow is to offer your clients smaller product packages in addition to big shows.

At Incredible Slidemakers, we had a profitable trade in single slides—special effects prepared for other producers as well as graphic designers and ad agencies to use in print promotions.

We also made such special effects slides for TV stations; those were usually deluxe logos or station-break illustrations. In addition, we found magazines a lucrative buyer of special effects slides as cover pieces or lead illustrations for articles.

'Little' jobs do two things: they help fill-in the chasms of your cash flow chart; and they give you an entrée into other media that might someday want a multi-image effect—particularly TV stations and other broadcast media.

In addition, that work provides an ideal opportunity for the creative staff to work-out new effects and camera techniques that are 'different' from multi-imagery since they are usually single-slides that will likely be used in a print or TV applications.

Our small jobs usually sold for between $250 and $1200—although sometimes they were pricier. That may seem like 'small change,' but if you have five or ten jobs like that, they can gross you $1,000 to $5, OOO each week; that adds up to $250,000 per year.

What do they say, "That ain't hay"?

Following is an article that appeared in *Photomethods* magazine, as well as a commemorative portfolio of Incredible Slidemakers print work.

POSTSCRIPT

My thanks to J. Walker and R.J. Reynolds, without whose ‘help,’ writing this book would not have been possible.

ADDENDA

My involvement in AVL and Multi-Image | by Ed McTighe

[*Editor*: As a founding partner of Audio Visual Laboratories, Ed McTighe was a prime mover of the audio visual industry. His story parallels mine. We were both 'pioneers' of multi-image. Ed describes the world I lived in, too—the same people, events, and circumstances. This is an "inside baseball" piece; an autobiographical peek into the *Zeitgeist* of multi-image. Minor punctuation changes were made to Ed's manuscript.]



I am the middle child of a 5-sibling family, Born October 8th 1940. I had two older sisters and two younger brothers. I was a bit of a wild child and never a very good student in school. From 7th grade on, I grew up in Monmouth County NJ. During high school I spent a year and a half in military school (for disciplinary reasons) where I joined the Naval Reserve and graduated from Rumson High School. Although my father was capable of sending me to college, we agreed it would be a bad investment. So off to active duty I went and served two years on a ship. As a kid although I was not a good student, I believe I had pretty good street smarts. I could always get along with the preppy set and the motorcycle jacket set having friends in both groups and adjusted well while on active duty. After serving the required two years active duty and seeing some of the world I started working for my father and his partners in a Foundry, Industrial Ferguson Foundry. I had grown up enough to feel a responsibility to my father for all the trouble I had been as a kid and worked very hard in this business for 10 years. It was a very dirty business and I learned all the jobs in the business, how to work with employees, how to work with customers etc. It was as good an education as college. I was working extremely hard from early morning till late at night (I even ran a night crew after hours so my day started at 8am and finished at 9pm.

However, my father was the oldest of three partners in the business and his health was failing. I knew like all good partnerships the partners had a buy sell agreement and insurance to cover a buyout of any partner if they passed. I approached my father's partners and asked what their intent would be if my father passed and they become the owners. I wanted to be able to have an agreement to be able to buy into the business and be a full partner. I was told not to worry they would take care of me. This was unsatisfactory as an answer and I decided unless we could come to some sort of an agreement, I was ready to quit and explore other options. I had learned everything I could about the business and realized it was a dying industry in the North East. Many of these types of business were going south to get a better employee pool and less regulations.

During my time working, I had taken up the sport of skiing and fell in love with the sport. In the winter I spent most weekends first in Vermont and later in Lake Placid skiing. When I quit the foundry, I had saved up some money and was dating a girl who I had taught to ski. I told her I was going to spend the next winter as a Ski Bum. She also quit her job and for the next two winters we were ski bums. In the spring I would come back to Monmouth County NJ and I would bartend till the next winter.

The second winter I married my girlfriend in Lake Placid NY and we went out to Aspen CO on our honeymoon. Having a taste of Rocky Mountain skiing I become more in love with the sport. During that time my father passed and I was left with 1/5 of his estate which when divided by 5 children was a nice amount but by no means a large amount. So, the next spring my wife and I spent time traveling around the west looking for a business that would allow me to enjoy my sport and make a living. During this time my wife got pregnant and we had twin boys in November. Well, that killed my next winter of skiing and my dream of moving west. I was a father and had this new responsibility.

During the time as a young man, working in the Foundry, the weekends were filled with life at the NJ shore and the bar hopping that goes with it. We had a favorite bar in Sea Bright NJ called the Quay. I met two people in that bar that changed my life, my wife of 52 years (a saint) and Charlie Kappenman, an engineer from Bell Labs. One summer Charlie, I and a few other guys rented a house together and although we all went our own ways, we got to know each other. One guy was a worker in a sport place, Charlie was an engineer with Bell Labs and I worked in a Foundry so we had very little in common. We were all young guys trying to find girls. Although we lived together that summer, I would say Charlie & I became friends but not really good friends. The summer after my wife and I traveled the west I ran into Charlie in the Quay and he told me he had quit Bell Labs and was building his own business. He knew I was unemployed except for bartending and he was looking for some business to advise him. He knew I ran a business (the Foundry) and although he was an excellent engineer, he had very little business savvy.

He told me he was bored with his work at Bell Labs and most things the engineers created never went to becoming a real product. So, he decided to start his own business. He was an engineer for hire and the only thing he was asked to build was a dissolve and a programmer for a multi-media dealer just outside of Atlantic City.



Charlie Kappenman in a 1978 picture for the Inner World of AVL show.

As I remember the company was United Audio Visual. It rented and sold equipment to the convention industry in Atlantic City. I don't know how long he was working with this guy but I could see the guy was ripping him off. He was developing the equipment and selling it to this guy who in turn was either renting it many times or selling it to other dealers. He was a dealer and the other dealers who he sold too were selling it to creative producers and end users.

Chuck was designing and manufacturing the products but getting very little profit. United Audio Visual was making money, renting these products, marking them up and selling to other dealers and producers or end users. United Audio Visual was making the lion's share of profit.

After looking over Chuck's situation I told him to either see if he could get his job back at Bell Labs or he had to cut this guy in Atlantic City out and sell directly to the AV dealers, producers and users of his products. Untied Audio Visual had kept him cash strapped with only enough money to order the parts and wait to deliver the product to get paid. He was designing and building products on his kitchen table in a small apartment in Highlands NJ.

Charlie knew my father had passed and that I had a little money from the estate. He asked me to go with him to a multi-media show where manufactures were showing audio visual products. This was all new to me and I remember two companies running slide projectors.

One company had created a large screen by putting screen boxes with a slide projector in each box and being able to make a larger screen out of the slides in each induvial box. It was very impressive. The other company, Spindler, had a programmer and three dissolve units running a three-screen presentation with two projectors focused on each of three screens running off a punch tape reader. I found it a pleasant media with the use of 35mm slides.

Charlie said he had ideas that could be much more productive if he could develop the equipment but he did not have a way to break away from his deal with United Audio Visual due to his cash and business savvy. He asked if I would be interested in investing with him to develop a new line of products and help develop a marketplace.

After seeing this new industry and learning about what Charlie had in mind I decided to see if we could put together a profitable working relationship; and I would invest $10,000 dollars but wanted to be a full 50% partner for the investment; and I would help him develop the business. He agreed and we moved the business from his one-bedroom apartment to the basement of a new home I had purchased to raise my family. We installed an outside entrance to the basement and were able to hire a few workers to do assembly of our products.

Charlie & I then went to United Audio Visual and told them we were no longer going to provide the programmers and dissolves they were buying from us and we would no longer make these products for sale to anyone else. However, we did plan to develop a new line of AV products to sell to this AV industry. The owner of United Audio Visual was upset but I told him he was ripping off Charlie and that was over. He asked if we would produce one more order due to the fact he had promised to deliver these products to his customers.

We agreed to make one last order and he ordered a large number of products from us. We ordered all the parts and started building the units he ordered. We were going to deliver on a COD agreement but when we delivered about 1/3 of the order, he abruptly cancelled the order, I assume in an attempt to leave us holding the inventory and hurting us financially.

Charlie had been smart enough to keep a record of some of dealer and user names whenever equipment came back to him for repair. So, we quickly contacted these people and offered them the equipment at a price below what United AV was selling it to them and got enough orders to cover the inventory and double the profit we were making from United. Our first win!

This was in 1972 and we officially formed Audio Visual Laboratory with Charlie Kappenman owning 50% and Edward McTighe owning 50%. Charlie had already been developing a new programmer (the Show Pro) and the electric punch unit (that was nothing more than using existing technology and making it interface with our programmers). Chuck also had most of the design done on the Mark IV, as it was an idea he had been working on for a while; but he did not want to sell these new products through United Audio Visual due to the lack of profit he was making with that arrangement.

My small investment in the company allowed us to try to develop the market on our own. At the time I knew very little about the audio-visual or as it was called then multi-media marketplace. Chuck and I would have discussions on how to proceed. Weather we should try to sell direct to producers and end users or to go the dealer route. We calculated the cost to build each product and added our overhead to try to determine what the selling price for the equipment that would allow us to sell at a discount off list price to dealers and have a profit that would allow us to grow.

Since we were the new company, Chuck wanted to price our products below any of the competition; but he had convinced me our products were far superior to Spindler and any other competitor; so I wanted to price our equipment higher than the competition with the idea that a higher price showed we felt our equipment was superior. We compromised by pricing it about the same as others similar products on the market. From what we could see, most equipment was sold through dealers at a discount of 1/3 off the list price and I figured if we sold at that price, we would make a very nice profit on the all sales. The Dealers would stock the product and either sell it or rent it. We decided we would give that a try and I started contacting dealers to see if they would be interested. We quickly found out unless the dealers had a demand for our products, they were not willing to stock our equipment. We even would send them a dissolve unit on loan to see how they liked it. Well, that did not work! In fact, most of the loaners came back and we could see that the box was not even opened. It was going to be up to AVL to develop a marketplace so the dealers would begin to get a call for our equipment and then come to us to request dealership.

The first Programmer AVL was mostly a controlled by a circuit board controlling a bunch of relays. Not unlike the programmer that was sold to United Audio Visual but it could be expanded to a 40-channel system by the add-on of an expander. I think this type of design came from his work at Bell Labs as they were part of the phone company and the phone company did a lot of switching of lines to complete circuits.

However, Chuck's design of the Mark IV was due to his understanding of the need of people trying to create more dynamic visuals using 35mm slides and slide projectors. He understood that the more flexibility in the creative process the better the end product (what was shown on the screen) could be. The quality of 35mm slides on large screens was exceptional. The problem was it was limited by the mechanical use of the slide projector and the time it took to advance to the next slide.

The concept of the Mark IV was to give independent control of each projector and its lamp. The first dissolves allowed you to focus more than one projector on the screen and switch between visuals instead of using a single projector that made the screen go blank between visuals. The dissolve would blend one image in slide projector "A" to the next image in slide projector "B" in a timed transition, much more pleasant than just advancing a single projector. It would do an instant cut or a pre timed dissolve. The Mark IV was a new concept in dissolves that gave independent control of each projector and its lamps. He knew it would allow producers much more flexibly with the creation of their slide programs. We had shown it to a few creative people and got very positive feedback.

We had established a relationship with a large dealer in NYC, Reliance Audio Visual, it was managed by Charlie Spataro and he was very involved in the rental and sale of all types of audio-visual equipment and staging.



Art Milanese (Milanese Associates), Charlie Spataro (Audio Visual Workshop) and Kevin Bull (AVL Sales Manager) at the 1979 NAVA show.

He not only became our first dealer but also someone we would consult with as to how to market our equipment. Later, he left Reliance Audio Visual and started his own dealership, Audio Visual Workshop. He became our largest dealer; sold and rented a lot of AVL equipment; and became a good friend.

Not long after we moved the company into my basement, we got a contact from a guy that had done some staging on Broadway plays and he knew a new play was being produced that wanted to have slide projection included in its effects.

They wanted to be able to control several projectors during the play at various times during different scenes. It was perfect fit for AVL and could lead to a big payday (for that time in the start of the company).

They wanted to come down to our facility to see the equipment but since we were working out of a basement, we convinced them to meet us at Charlie Spataro's dealership in NYC. Thankfully they agreed and after seeing the equipment they gave us the contract. The Broadway Play was called "Seasaw;" it opened in NYC March 1973.

The projectors needed to have a stronger light source than the typical Kodak slide projector. I believe Bell & Howell made the larger projectors that were nothing more than a Kodak projector sitting on a larger light source with extra fans for cooling. These projectors were to be hanging from the balcony and after testing they found the fan in the projector made too much noise. We had a problem! Chuck engineered the problem solver by designing a box to cover the projector that would allow enough air flow yet cut down the noise.

It worked and we added the cost of developing and making these box covers. The deal we made was we got 50% of our money up front, another payment when we delivered and the balance of about $10,000 on credit.

Everything went well until we tried to collect the balance of our money. Sometime after the play had opened and had been not fully successful, I was told there was to be a meeting of all the creditors in NYC. I arrived to the meeting hoping to resolve the money we were owed. A slick lawyer met with all the creditors with a speech for the producers of the play (Kipness & Kasha). He explained that to keep the show going the producers were going to move the play to a smaller theater to save on the costs of the theater rent and then they would be able to pay all the creditors. Most of the others in the room seemed ok with this arrangement but I was not.

They were mostly Broadway people with "the show must go on" mentality. I was a hardware company (underfunded) and needed to be paid. I got this lawyer aside and told him I needed to be paid or I would turn it over for collection. He agreed to send me a check every week for $500 until we were paid and I agreed. The first few checks came then they stopped. I kept calling to see if I could get paid but could not get anyone to answer me. Then I got a call from someone telling me they were moving the theater and that during this time they wanted me to come and pick up all my equipment and do any maintenance it required. I was astounded. I sent our truck up and picked up the equipment happily. A few weeks later I got a call to return the equipment back to be installed in the new theater. Of course, I said I would be more than willing to return the equipment as soon as I was given a cashier's check for the balance of what I was owed. The next call I got was from the lawyer asking if we could work something out. He told me Kipness was in Israel and Kasha was in Miami and could not be reached.

I had learned that these producers own both these theaters and had been paying themselves rent while screwing the creditors so I refused to work anything but payment in full plus a charge for pick up and delivers and maintenance. I collected!

During this time, I was also acting as a bank for AVL and lending the company money to keep the ability to pay for supplies and the few employees we had doing assembly of products.

Chuck and I had changed our original idea, of selling through dealerships, to a two-tier system of selling to dealers at 1/3 list price and selling to producers directly at 25% off list. We were getting more interest from producers than dealers and started to understand that we needed to create the demand for the product if dealers were going to purchase it for sale and rent. To do that we needed to demonstrate the features we had over the competition (mainly Spindler).

A trade show—NAVA [National Audio Visual Association]—was coming up and we took a 10 X 20-foot booth [~3 X 6 meters]. The show was in Los Vegas and it was the start of what I came to believe [was the way] to sell this type of equipment; it had to be seen by people who produced these slide shows. As of that time it was still being called multi-media equipment. Our little booth got lots of attention from people from the creative side of the business; not so much from the dealer side. We were demonstrating our programmer, the Mark IV dissolve, and the electric punch.



Ed McTighe (left) and AVL Sales Manager, Bryan King, at the 1979 NAVA show. King was a formerly a Canadian slide show producer. Mike Ruther introduced him to Chuck Kappenman.

We had lots of users of Spindler equipment come by and ask us to duplicate old punch tapes that had been worn from making corrections by hand. They were amazed by how quickly we could run their old tape through our reader on our programmer and spit out a brand-new tape. They started noticing the other features of our programmer and the superior features of the Mark IV dissolve.

A producer from South America came by our booth and became very excited about all our equipment. He told us he had just placed an order with Spindler for a lot of equipment and he asked if he cancelled that order would we allow him to take all the equipment we had in our booth. It amounted to around $15,000. We told him we would sell him the equipment but since we had no credit with him it had to be a cash deal. He told us he had to go back to LA but he would return the next day with the cash. He did and gave me $15,000 cash and said when the convention was over, he would pick up the equipment.

I took the cash and gave Chuck $1,000, took $1,000, and put the balance of the money in a safety box in the hotel. Being in Vegas I gave my wife the key to the box and told her no matter what I said not to give me the key until we were ready to go home.

As luck would have it another producer, who worked with a Canadian audio-visual [company], also saw the advantages of our equipment and shortly after the show we were contacted by The AV House, a Canadian production company who had started working with our equipment. They asked us to visit them; to speak to them about them representing us in Canada. When we arrived at their location, we were taken into a projection area and were shown a 6 projector two screen show. [It showed] all the features of our equipment followed by a quick, animated, fast-pace show using the features. Chuck and I were blown over. This was exactly what we needed to be able to demonstrate the features of AVL equipment. Now I understood that we made good tools but it took creative producers using our tools to create a demand.

That little two screen show showed me the way to be able to create a market for our products. It took the merging of our hardware with the creatively of producers to not only make us successful but [also] to grow this industry as a whole. When we gave the creative people the tools to make great shows more demand was created for these types of shows and it was the start of a big growth in the multi-image revolution.

We quickly agreed to giving The AV House a dealership in Canada and they allowed us to use the show they created to demonstrate our equipment. We definitely hit it off with the people who owned the AV House. It was very satisfying to see our equipment used creatively.

As you see in my last paragraph, I now used the word multi-*Image* not multi-Media and I remember when working on designing brochures for our equipment we started calling it multi-image not multi- media and I can't prove it but I do believe this was the start of the use of this description of our industry. In the past multi-media was used because many times in these shows 16mm projectors or other media were also used to show motion. Our equipment had a black box to turn a film projector on and off as well. I think with the ability to use our equipment to do more sophisticated animation the need for film projectors became less important. Therefore, multi-image became the norm.

With this two-screen, 6-projector show in hand; I asked Charlie Spataro of Reliance AV if we could set up a demonstration of AVL equipment in his facility. He saw the advantage of doing this as it would create a demand for both rental and sales of not only our equipment but also sales and rental of all the other staging equipment that went along with these programs. The show was scheduled for two days and we invited many of the AV producers in the NY, NJ area to come.

It was a successful few days as people in the industry were hearing good things about this equipment and its capabilities. AVL was growing very fast, almost too fast as we were out-growing our ability to finance our growth. To grow we had to get an inventory of equipment so we could deliver our products quickly. This took money. I had been the bank but my finances only went so far.

Both Chuck and I were not taking large salaries because we needed to grow the company. It was easier for him but I had twin babies and a wife to support. I decided to approach a bank for a business loan. I went to a local bank and told him our story. They visited us in my basement we showed them our equipment and how quickly we were growing I told them if we had the finances, we would easily double our business this year and they decided to give us a small loan.

As we continued to grow, we were getting too big for my basement even though the rent was good (free) we needed more space. We found a building a few miles down the road on highway 36. We did some renovation and moved in.

I now had an office, a small demo room and a separate production area where are employees were growing. Charlie also had an office but spent most of his time at home thinking up new products and ideas.

This was a time of very fast growth and I was swamped trying to handle the sales, run the business side of the company, handle employees, make sure we were properly insured, etcetera. I was the first person at the office and the last to leave. On top of that we were asked to become a preferred supplier to the U.S. Government as they became interested in this type media.

To become a preferred supplier took the filling out of a great deal of paperwork but when finished and approver the government would be able to order equipment at a set price (25% off List) without going out on a quote.

It became a very profitable part of business and we found many times at the end of a fiscal year we would get large orders from government departments that had extra money left in their budget and had to spend it.

I was also tasked with writing the instruction manuals, and helping with creating advertising. And I was starting to go to dealerships or hotel suites in cities to demo our equipment with our demo slide show.

Our most successful Ad was a two spread of the top and keyboard of the first Show Pro V [*Editor*: It was the Show Pro II; the Show Pro V was a digital programmer.] [It] was still a tape run programmer but anyone in the industry with a knowledge of programming could quickly see how it worked by just looking at the keys. We ran the AD on a two page spread with only a close up of the keyboard there was no copy.

About this time The AV House with the help of an outside freelance programmer/producer [David Fellowes] were developing another multi-image program. It was a 15-projector program overlapping on 3 screens and it was a work of art.

It was called “Life in America” and was a fast-moving history of events in America from the 30s to present. It was a live multi-image show of what may have been seen in life magazine during that time. It was sometimes very fast paced black and white images and sometimes just beautiful panoramic visuals of our country and its history. The equipment used was the Show Pro V and five Mark IV dissolves. When you saw, you felt it.



David Fellowes at Incredible Slidemakers in 1979; for the *Inner World of AVL* show.

[*Editor*: "Life in America" was the show that 'sold' me on multi-image. I met David Fellowes at one of those screenings and said to myself, "I want to be him."]

They had produced it to show their multi-image capabilities and for us to use as a demo. It was the most helpful multi-image program for us at that time and was just what we needed to show off our equipment; but more so to build the multi-image concept as a communication tool.

I knew if we could grow the use of multi-image as a communication tool, we would get the lion share of the hardware business.

We designed a new booth for the upcoming convention that I believe was in Disney World. We took a large section on the floor of NAVA. Our booth [was] a closed-in treater taking up 80% of the area with a front counter to display our products and for doing business. AVL was the hit of the convention and I remember writing lots of orders at that show. We also had a hospitably suite at our hotel every night of the convention and the booze flowed freely.

We had gone from the little new guy in the multi-media business to the biggest multi-image hardware company in just a few years. It was amazing. I never understood why Spindler never even tried to compete with us. Instead, they were working on some type of new projector to compete with Kodak.

Many other great multi-image shows were produced for us to demonstrate the capabilities of the media and the power of our equipment. Many of the top producers wanted to work with us to show everyone how powerful multi-image shows can be. Doug Mesney and Richard Shipps were two of the best and help[ed] in developing this industry.

In a very short time AVL had become the largest manufacture of this type of equipment. AVL was also now traveling around the country with great demo shows and I think that allowed more people to see the power of this media.

We had out-grown our new building and moved again to a much larger space a few miles away. We had nice offices, a large projection demo room and plenty of production space to design and build our products. We had 90% of the programmer and dissolve business worldwide.

While still in our second location I had gone back to the bank where we got our first loan and had requested a new larger loan to finance our growth and was put off when they came back with a proposal of another loan but a higher interest rate. We had not only doubled but were growing at a much faster rate.

I told them I'd let them know and went to another bank a friend suggested. When they came in and saw what we were doing and how fast we were growing they told me they were very interested in being our bank. They said they would give us not only the loan but a line of credit we could use when needed.

We were a real business. We had a bank working with us; we had a lawyer that had drawn up our corporate books [and] issued Chuck and my stock. We had a buy-sell agreement and life insurance to cover a buyout, if one of us passes; and a top-of-the-line life insurance agent (I knew from my father's business) and he had recommended a casualty insurance agent that covered our liability insurance.

I was swamped and Chuck suggested we hire someone to help me in sales. I agreed and we wound up hiring a guy that sold AV programs for the AV House in Canada. He was leaving the AV House and was an American who wanted to come back to the states.

His Name was Mike Ruther and [he] had a very open personality. Fun loving, good in front of an audience but with no business or understanding of the hardware side of the business. He certainly helped because I could let go of some of the easier tasks I had taken on.

He was good working with our Ad agency and was a big help on the road shows we were doing almost monthly by either setting up demos at a dealership or renting a conference room at hotels in major cities to put on shows and demo our equipment. At this time of fast growth, we were all drinking fairly heavy but Mike liked the booze a little too much. He would sometime come back from lunch in his cups and I would need to send him home. At this time, we were all working very hard and playing hard but not during business hours.



Mike Ruther (left), Art Milanese and Bryan King at the Vail Multi-Image Festival, 1978. Art was a so-called 'manufacturer's rep.' His job was to enlist dealers and manage them; his territory was the Eastern third of the country, up to the Mississippi River. Bryan King was AVL's sales manager. A year later, he moved to the Philippines and took over Asia.

I really liked Mike and he was a big help but he became the first stumbling block to my relationship with Chuck Kappenman. He wanted to give Mike a small bit of stock. I had felt now that things were going so well Chuck started to resent my being a 50-50 partner. He had no idea how much of the work I was doing and as a typical engineer his ego made him feel that all these sales were just because he designed great equipment. I reluctantly agreed to let Mike have 5% stock in AVL with Chuck & I retaining 47.5% each.

Our Show Pro V programmer (still punch tape [sic]) was a hit running the Mark IV dissolves but the next product became the Mark VII dissolve with the idea of incorporating a third projector so we could speed up the time between slides. The Mark VII like the Mark IV also had independent control of each projector and its lamp. Producers were starting to focus several projectors on single screens or overlapping screens because they could independently control each projector and speed up the time from one visual to the next and create very animated sequences. This allowed the feeling of motion using 35mm stills and gave them freedom to create more spectacular multi-image shows.

The Show Pro V programmer with the Mark IV and Mark VII was the bulk of the business. Yes, we did have other products to fill in the line but the amount of sales of these products was dwarfed by the sales of the Show Pro V, and Mark IV & Mark VII. There was the Acuetone, a 12 Channel audio programmer, the Mark II dissolve, a simple dissolve unit. A Roadrunner was a playback unit only.

But all these products we a very small part of our sales as most producers wanted our top-of-the-line equipment. They had seen some of the demo shows we had and believed if they had the equipment, they could also create these dynamic types of shows. I knew it depended more on their creative ability but the equipment would allow them to be as creative as their ability.

A what could have been disaster hit us in the new building when we had a fire in our production area. The damage was bad but not complete. We quickly found out we did not have loss of business insurance (my fault for not getting it when we got insurance but in the early days, we could not afford it). We were continuing to grow fast and knew that it would be important to be able to keep delivering product.

We found out that our old building was still available and we quickly rented it on a month-to-month basis. Our insurance agent suggested we hire an adjuster for the loss and recommended a guy that helped us pull out of this set back even stronger. He got the insurance company to agree that it was a total loss of our inventory and lots of equipment and got us a very good settlement. We were then able to recover a lot of our inventory and start assembly in our old location almost at once. And we got a fat check from the insurance company. It not only saved the day it made us a tidy profit; we made money on the fire.

We were finally in a good cash position and I decided that I would take the money back I had lent the company over the first few years. I don't know why this upset Chuck but it did. After all he had the use of this money with no interest for quite a while. I knew company politics were starting to happen and I wanted to be sure my money was out of the company.

The next big breakthrough was the Show Pro III, Chuck had seen the coming of the micro-processer and its power. [*Editor*: The sequence of AVL programmers was: Show Pro > Show Pro II (both punch tape) | Show Pro III > Show Pro V (both digital)]



That was when we hired Garry Kappenman because he was more in tune to writing software where Chuck was more of a hardware guy. The Show Pro III became the first computer driven programmer on the market and it allowed so much more flexibility and reliability.

Jan and Gary Kappenman at the 1979 NAVA show. In the background, Allan Kozlowski (left), producer of AVL's Raven film controller demo show, *The Power*, chats with AVL Production Manager, Hans Falkenburg.

The older programmers ran on punch tape and as these multi-image productions became more complex the tape got longer and longer. It became a problem to be sure the tape stayed clear of being snagged or stepped on. We even designed a plastic holder that would hold the tape and allow it to freely be fed into the reader. If a show got out of sync for any reason it had to be stopped and reset and run all over. Because the Show Pro III had computer memory it needed no tape and it knew exactly where all the projectors should be at any time during the program. If for any reason it got out of sync it would correct itself. This was a major breakthrough and made these shows much more reliable.

[*Editor*: The 'self-correction' Ed refers too was called Positrack; but that feature came later; with the Eagle and Doves.]

The Show Pro III was closely followed by a new Show Pro V with its own micro-processer. AVL entered the computer world and equipment was flying off the shelf. I was amazed at how successful AVL had become but wondered how long this type of media would last. It was expensive; it took a lot of equipment and staging to put on these shows.

Several dealers were asking us for other products that could be used in boardrooms, exhibits and communication rooms. I had noticed a few small companies were designing this type of equipment on a case-by-case business. It occurred to me this would be a natural business for AVL. We were a control company but we only controlled slide projectors. When I approached Chuck with this concept, he showed no interest.

He was still stuck on the fact we were equal partners and had started speaking with Mike Ruther who owned 5% on how to gain more control. Without my knowledge he started another company a lighting control company to put computer lighting into discos. After spending a good deal of his own money to get this company started, we had it out. I told him he was not working in good faith and spending his time on this new venture and not on AVL. He was struggling to get sales and proposed to me that he would fold this company into AVL if AVL would spend some of its resources to see if we could market his new product. To try to keep the peace I agreed but after several attempts to try to get a market going, I didn't see much of a future. It did not fit our dealers, they had no interest, going to the places (discos) to try to get them interested was time consuming and not productive. I told him I had no interest in continuing down this line.

In the meantime, Chuck was trying to use Mike as a wedge between us. Mike felt he was in a no-win spot and didn't agree to side with either of us. At that point Chuck had been bitten by the power of the micro-processer and was having big dreams. The company sales were steady and growing. We were very profitable but I could see us not continuing to create products or other avenues of sales to our worldwide dealer base.

Chuck and I were no longer speaking. He approached me with an offer to buy me out or have me buy him out. I decided that the company was running smoothly at that point and it needed someone more to continue to create new products. I knew he was interested in building a computer company and I thought it was a mistake. AVL was the big fish in the small pond and getting into computers would be going against some big companies.

I agreed to a fair buyout and resigned with the understanding that until the full amount of my buyout was made the company would forfeit all the stock back to me. He was to send me a check monthly until it was paid off. I started a small company called MCT and had the payments made to that company. My two boys were just starting school and with the money I was receiving I could send them to a very good private grammar school. After many years of working late being away on sales demos and many late nights, I was able to spend quality time with my boys.

It gave me the chance to coach the baseball teams they were on. I wound up coaching even through there freshmen summer high school team. It also allowed me to send them both to private school through high school and both to Boston College. I am proud to say they both turned 50 this year and both have great kids and very successful careers.

Just as I was enjoying my unemployment another group from Canada approached me about transferring these slide shows to film and video. One of these guys built a transfer table by using a series of prisms that allowed you to focus 12 slide projectors to a point in space and by focusing the film or video camera to the exact same spot you could transfer the slide show to 16mm – 35mm film or video tape. I found it interesting but it lost the effect of the 35mm large screen slide shows. They told me they were getting interest in Canada to perform these services and wanted to know if I would be interested in being their contact in the USA. I explored the interest and found several producers were interested in this service. I told them I would start a company called Slide Transfer Service and see how large the interest would be. The problem was all the programs had to be sent to Canada and go through customs and then returned.

From my time with AVL I had a good name in the industry and that was why they had approached me. After doing a few transfers with them I told them that the shipping and customs problem was a stumbling block for me and I did not want to continue. The next thing I knew the guy who invented the multiplexor wanted to come and do it in the USA. To be honest I was still not sure this business was for me but I spoke to my old sales reps from AVL and they said they would be interested. I didn't want to rent space to hold the table and equipment and they had room in their office to hold it in PA. [*Editor*: Was it Art Milanese's place?] We started a partnership and he built a 9-projector multiplexor in their office. I was the front man and made contacts around the industry showing the concept of transferring these complex shows to film and video. [*Editor*: That explains the 9-projector format of the *Nightmares* show; produced to promote STS transfers. The story of that show begins on page 2794.]

I was surprised by the amount of calls we were getting to perform these services. The Reps I was in business [with] were also supposed to spend time selling these services; but I found I was doing most of the work and after a year or so I wanted to break away from them.

The Canadian guy that built the multiplexor wanted to move to the U.S. and suggested he build a 15-projector unit in a new location where he would do all the transfer work for a salary and a small portion of the new company now called Slide Transfer Service. That worked for a short time until he decided he wanted to buy a sailboat and sail to the islands. He agreed to train someone on doing the transfers and I gave him a small piece of the profit of each transfer. He left the company and we continued to get a nice amount of transfer business.

Also, during this time AVL continued to sell AV programmers and dissolves but Chuck was trying to turn the company into a computer manufacture company. He had opened an office on the West Coast and had hired a hotshot who had taken one of the larger computer companies public. Through the grapevine I heard that they had taken venture capital money and were close to going public. I also heard that several of the AV dealers were taking product on consignment to boost the sales of the AVL computers. I know the company went public but the hotshot they hired got killed in an auto accident. Then I heard IBM sued the company for a patent infringement and not long after the computer company went bankrupt.

The venture people took over AVL and hired a man to oversee AVL. He was told to try to keep selling equipment make as big a profit he could and work to sell the company. About the same time a Swedish company had also started giving AVL competition. In fact, through Doug Mesney's recommendation they contacted me to see if I would be interest in selling their equipment in the USA. I went to Sweden and met with the company but never reach an agreement with them.

Chuck, after being removed from AVL by the venture Capital people started working on a graphics computer. He invited me to come see what he was developing (I believe in the hopes he could interest me in his new venture) but I had learned my lesson and had no interest. In the meantime, Marty, [Mardy O'Hanessian] the guy who was running AVL contacted me for a meeting.

I went to a meeting and he told me he had no knowledge of the AVL marketplace he was just a numbers guy. He wanted to know if he could hire me back to AVL as he was told by most of the dealers and users, I was a trusted person in the industry. They were getting ready for going to a large show oversees and wanted the dealers to know I was back with the company.

I think the Swedish Company was making inroads in the AVL marketplace. He offered me a nice salary and I agreed to give it a try if he would be open to my input into suggestions I would put forward. I also told him if he wanted me to travel oversees to run the international show, he would need to send me first class and give me a good budget to travel to see some of our dealers and sales reps. He agreed and also promised he would explore AVL getting into the control business. It was something I could tell the dealers we would be working on in the future and would sell through our dealerships.

As the transfer business was basically running itself, I could split my time with AVL and STS. I went off to Europe and met with customers and dealers and assured them AVL was in good hands and would be designing new products. I think most were happy to see one of the original AVL owners back with the company. Not long after returning from Europe, Marty told me he had a buyer for AVL and the company was being sold.

[*Editor*: By the mid-1990s the multi-image market had devolved into a turf war between the entrenched hegemon, AVL, and über Swedish upstart, Dataton. The two competing ads shown on the next pages appeared in the autumn 1995 edition of AMI's *Muli-Images* magazine. There was nothing left of AVL; the winning team members had long since scattered; their last ad (page 3206) was pathetically naïve; slides were dead.]



Jim Kellner had been AVL's Vice President of Sales; his move to Dataton was a seismic shock (I introduced and recommended Jim to Bjorn Sandlund).



According to Margaret Cooley, AVL's last marketing manager, this 1995 ad was a 'tribute' to Yours Truly. Positioning Incredible's video-demo tape in the center of the pile is a clue; another is the golden slide tray, which became a kind of trade mark when my gold-trayed, 30-projector, *Xanadu* show played in the festival circuit. But why? In 1995 I was about to open a restaurant; the slide business dried up for me after the *Malasia Fantasia* show, for Malaysia Airlines.





Above: 1989 "Slides Are Dead" ad, for Dataton. Below: 1991 scene from my farewell-to-AV show *Swan Song*; the darkest show I ever made; an epitaph for slides (and a 'poor-me' sob story made by an ego-maniacal narcissist). Such hubris takes hutzpah.

Project Your Best Image.

In today's presentations, getting your message across is vital. Show it effectively. Project it clearly.

Project it with slides.

Slides give you clear images, concise colors, and bright, sharp pictures without large pixels, interface concerns, and annoying wash-out.

Multiple slide projectors give the illusion of animation without the boredom of yet another corporate video.

Superimposing images can invoke the emotions you need to reinforce your point and make it memorable. And editing slide shows is as easy as moving your slide to another tray slot.

AVL

Presentation Excellence

I

Project Slides.

See the Best Projected Images at INFOCOMM!



Stop by AVL's INFOCOMM booth, #1809, and witness the NEW Annie Leibovitz slide show, "*Impressions*". Photographed with Mamiya cameras and projected with Goetschmann projectors - you will see images like you have never seen before. You'll come back to slides.

Impressions sponsored by

Mamiya/Goetschmann

AVL

Audio Visual Laboratories
50 Barnes Park North
Wallingford, CT USA 06492
(203)269-8410 (800) 223-0213
Fax (205)284-8414
http://www.usa.net/icia/avl

A V L. The Leader in Slide Presentation Systems for 25 years.

AVL's last ad, in the 1996 (AMI Convention) issue of *Multi-Images* is pathetically naïve. It reads like a 1960s ad promoting slide shows. Annie Leibovitz, although well known, knew nothing about multi-image. Nor was Goetschmann a name that producers were familiar with; Goetschmann's high-intensity projectors were made for extra-large slides (up to 70mm, like Hassleblad's PCP-80) used for super-sized screens in large venues like auditoria and stadiums. Back to basics? Ha!

FOUR-FOR-FOUR WIN WITH AVL









Douglas T. Mesney,
International Producer/
Consultant
Stockholm, Sweden.
"As an international producer/consultant, I always feel secure knowing my shows will play on AVL gear. Consistently, around the world, I have found that the reliability and availability of AVL equipment can't be matched. Plus, it's so fast to program that I can deliver more show per dollar – an important economic factor outside the continental U.S.A."

Richard Shipps,
DD and B Studios,
Birmingham, Michigan
"AVL and I go back 15 years. They've always been the best: the consistent innovator attuned to the needs of the professional. I see proof in the field, when my shows, regardless of size, run flawlessly, time after time. I appreciate products that always work well, stand up to rough use, and keep on performing. That's why I use AVL."

FOUR TOP PRODUCERS THAT MADE MULTI-IMAGE HISTORY

They are the first four professionals named to the "Hall of Fame" of the Association for Multi-Image International. They have been chosen by their peers for outstanding creative contributions, and each is an AVL user.

Creative use of AVL Multi-Image Presentations Systems is the role of the AV professional. Providing the technology and support AV professionals need is the role of AVL.

Christopher Korody,
Image Stream,
Los Angeles, California
"AVL's fast, efficient software works as superbly in the field as it does in the programming studio. It's straight-forward and smooth, and, with a few keystrokes, I can fine-tune a show with ease and precision. AVL equipment is reliable and so is the company. They've done more to advance multi-image than any other company."

Duffie White,
Photosynthesis,
Dallas, Texas
"AVL Systems enable me to take graphic and photographic design into the "new dimensions" that put me in the forefront of my industry. Before AVL, producers were severely limited by unreliable equipment. We were still "inventing our medium" as we went along. I credit AVL with making multi-image a legitimate communications tool...and freeing me to concentrate on creativity!"

AVL
Presentation Excellence

GET IN TOUCH WITH AVL FOR MORE INFORMATION.
AVL offers total systems and support for multi-image presentation, programming, and playback with the Genesis family of products. What you can conceive, AVL can help you create.
Call us now, at **1-800-223-0213**
(In NJ **201-544-8700**) TWX 710-722-9499
AVL, 56 Park Road Tinton Falls, NJ 07724

Happier days: 1986 was the pinnacle of AVL's arc. "*The Professional Team in AV"* disbanded soon after, one by one, when Bryan King left for the Philippines and Chuck Kappenman's attention morphed from AV to Big Tech.



Wednesday, December 08, 1999

Douglas Mesney
Incredible Freelancer, The
16004 121st Ave SW
Vashon, WA 98070

Dear Doug:

Thanks for the use of the shows.

I am returning them as promised.

It's been a pleasure knowing you over the past 9 years. I wish you well.

AVL will still be doing service and support. If you hear of anyone who might buy the product line, let me know.

If you have any further questions I can be reached at 800-223-0213, Monday through Friday, 7:30 AM to 5:00 PM EST, or by fax at 203-214-8414.

Sincerely;

John F. Nelson
AVL Technical Manager

Above: AVL trade-in promotion at the 1988 Swedish Multi-Image Festival; the sign reads: "Toss your old gear here [arrow right]; take $500 there [arrow left]".Yours Truly was AVL's Swedish dealer. I sold so much to myself that I won a Jamaican cruise with other AVL super sales~~men~~ people. (more in Volume Four; *1987 – AVL Dealership – Carnival Cruise*, page 697. Below: the day AVL died, for me.

I was surprised but asked to meet the new owners. When he refused to introduce me but told me who the company was, I looked them up and was surprised to find they had no experience in AVL market place. I could not understand why they were interested and when I found out the price they paid I was shocked.

Marty also told me that because of the sale they would not be moving forward with and new product. Upon hearing that I told him I had promised our dealers and customers we were moving ahead to develop these products. He told me it was out of his hands. He was hired by the venture capital people to get the best price he could for AVL and he would be moving on. I picked up my things and quit that day.

When the new owners called me, I told them that they paid far too much for the company and they could cut their losses if they would consider selling it to me for about 25% off what they paid. That was my last interaction with AVL.

I went back to STS and because I had already invested in some video production equipment, I decided to build a video production facility. But that's another story.

I must admit I loved the time I spent in the multi-image business. I met many creative talented people and being part of that industry with a company that grew so fast was exciting and rewarding.

I know a lot of this is disjointed but at 82 I am doing my best to give you my recollection of the events.

When I found out Chuck would end up working for a control company, I thought what an irony. If AVL had followed that path it would still be in business. At its top AVL was about a 12-million-in-sales-per-year company. I know of two companies that went into the control business. If we had chosen that path we could have dominated. The last I heard they were both were doing 10 to 12 million each.

I was very sorry to hear Chuck had passed away and became a recluse when older.

[*Editor*: AVL presidents after Chuck Kappenman were:

- Mardy O'Hannesian ~1982-1985
- Ray Sozzi ~ '85-89
- Edmond Branger ~89-91. In 1991, AVL became part of Data Products New England at which point it did not have a president.

[See *1979 | Inner World of AVL | Plates 1-70* in Volume Nine for more pictures.]

AVL Timeline | By Gary Kappenman

From GK's perspective with best guesses/approximate years.



[*Editor*: CK = Chuck Kappenman; GK = Gary Kappenman]

1963 CK Graduated from SDSM&T in Rapid City, SD with a BS in EE

1963-1966 CK Full ride scholarship to Rutgers University MSEE program from Bell Labs in exchange for working for them in NJ, NYC, Chicago `& co-owner Ski Shop with Peter Duffy
GK didn't see CK between mid 1966 when GK graduated with a BS in Physics from SDSM&T & was drafted into the Army until early 1972 when GK left the graduate program in EE/Computer Science at University of New Mexico for a job with Digital Equipment Corp (minicomputer manufacturer) in Maynard, MA when GK made a few trips from Boston, MA to NJ to visit CK Not sure who CK worked with during 1966-1972 or when he officially started AVL (sorry…...) [*Editor*: For AVL history, see Ed McTighe's story, page 3187.]

1972 – AVL was up & running, GK visited him in NJ and CK/GK discussed how using a computer to control slides could be very useful but still too expensive

1974 – Intel microcomputer kits became available for < $500

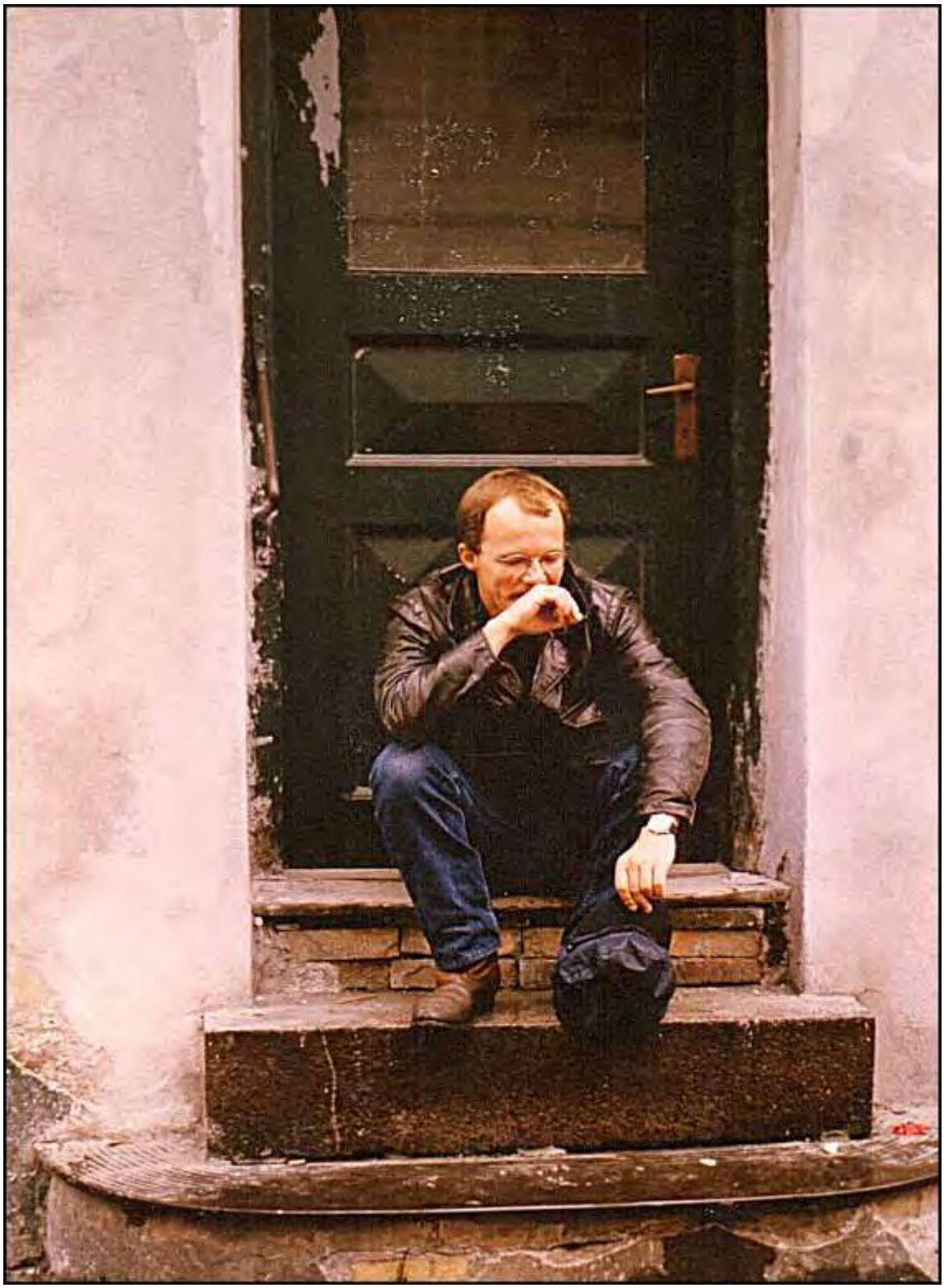
1975 – GK joined AVL designing the computer hardware & software for the world's first microprocessor controlled multi-image system. AVL was in an old Atlantic Highlands, NJ house with CK/GK sharing a room as their lab/offices with CK designing slide projector control portion & GK designing computer hardware & software

1976 – After completing the Show Pro 3 design, GK left AVL & moved to California with an arrangement for receiving AVL royalties on Show Pro 3 in exchange for limited technical consulting if/when necessary

1978 – GK left TRW Validata Division in Hawthorne, CA to start AVL West R&D + AVL Support facility near GK's home in Santa Ana, CA to design the first AVL Eagle Computer

1978 – 1982 AVL West's designs for AVL Eagle / Golden Eagle/ Eagle II were introduced along with networked computer control units for slides & film

1982-Eagle Computer, Inc. / AVL West split with Eagle Computer no longer in multi-image business (focusing on emerging small business computer market using Eagle II…. as its first small business computer product)



“At the end of the story—that four-days-without-sleep adventure, in 1981—I mentioned that this project paid for my first trip to Europe. I found one pic from that trip-- me sitting in a doorway in Copenhagen—taken by the girl I was traveling with.”

John Grinde and I met at AVC, in Stockholm. We had both just arrived, to start work. [Read more about that in Volume Four, on page 616.] Actually, Sandra and I got there a little before and were already well at work on Saab projects.

As you will read, John was an AVC veteran; he had worked there before. Between gigs, he liked to explore Europe and Scandinavia on his motorcycle. He was returning from Germany, if I recall. During the overlap of our respective tenures at AVC, I came to learn of John's prowess.

Working at AVC, one became part of a network; a family; that lasts to this very day*. Thus, John became a 'logical' choice to proofread the first eight volumes of *An Incredible Epic*; that's when we became 'pen pals;' when I learned that our lives had parallel trajectories—work and travel—although we went in different directions. I was a 'fixed-base operator;' Grinde was the ultimate multi-image freelancer; a gig man; a globe-trotting road warrior; an "Easy Rider." His entire career in multi-image was spent working at AV studios around the world.



"The bike I had in Sweden was a CB400N Honda. A great bike. I have only one shot of me and that bike; someone (I can't remember who) took this photo on Hornsgatan in the summer of 1983."

In the four short stories that follow, John writes about some of his highest adventures; they are 'inside baseball' exposés about the multi-image business and the life of slide makers. John is a gifted writer, as you will discover.

* [*Editor:* See, "Vi som jobbat på AVC," a Facebook group, at https://www.facebook.com/groups/115127841833621]

I was an
AV Slut from Hell!

John Grinde

(The following adventure happened a long time ago, using technology that no longer exists, working with people I no longer know. But it seems like yesterday. And even after all this time, I get tired just thinking about it…)

It's a beautiful morning in early May. The phone rings. It's a media producer I recently worked with on an industrial film project. She has a new client, and they need an AudioVisual presentation to open the sales conference she is producing for them. Great, AV is what I do. What's the deadline? Early June. We have a month. The client's expectations sound reasonable, as does the budget. She wants me to be the job manager for the show plus do a lot of the artwork, and is happy to pay my usual day rate. When do you want me to start? Tomorrow? Sign me up!

* * *

In that bygone era most audiovisual presentations (AV shows to me, and now you) were produced for use at business meetings. These presentations consisted of motivational messages, product launches, sales training and other mundane subjects. The audience was often hungover, because the primary draw at these events was not the presentations themselves but rather the serious sales force socializing that went on outside the ballroom and breakout rooms. And most of the content at these meetings, whether on screen or stage, was forgotten as soon as the meeting was over… if in fact it was remembered at all.

But a lot of people made a living doing AV… and I was one of them.

Who did we create these shows for? All sorts of clients. Some were better than others. The perfect client had big budgets, realistic expectations, and responsive staff. Unfortunately there weren't any clients like that. We would be lucky to get two out of three… or one. Or none! I did a lot of work for agricultural cooperatives, they weren't too bad. Car companies weren't bad either, the stress levels on their projects were mitigated by the vast amounts of money they spent. Museums and other non-profits could be tolerable as long as you recognized that their decisions were made by committee and thus took a long time to make. Medical device manufacturers were a pain in the ass… even their big budgets couldn't make up for the intense levels of lunacy on the client side.

But then there were the really bad clients. No names will be mentioned, but doing work for multi-level marketing charlatans, cosmetics companies, or (the absolute worst) big pharma was No. Fun. At. All.

Who else did we produce AV shows for… insurance companies, medical associations, municipal organizations, churches (!), appliance manufacturers, companies that made fire hydrants, lawn mowers, microwaves, motorcycles… and thankfully most of the people at these places were OK to work with. I learned early on that in almost every company, our client contact's primary goal was not to create the best possible presentation. Their goal was to look good to their boss. Once that was understood, life in AV got simpler.

One thing these clients all had in common: they had money to spend. And I wanted some. **I was an AV Slut from Hell.** I didn't care who I worked for. Good money could be made in AV, and that was good for me.

AV seemed to attract misfits. No one I knew had planned to do this for a living… it just happened. And people who couldn't handle the stress or the hours or the craziness didn't last long. But for people (like me) who had no interest in the 9-5 world, AV was a good place to be. Good for some other people I knew as well:

- One AV guy I knew used to be a photographer for LIFE magazine
- Another AV human used to be a ticket scalper on Broadway
- A couple more were dancers
- Plenty of starving artists got into AV
- And musicians, too… I even knew one AV guy who turned into a semi-famous performer creating semi-legendary songs

Others got in through advertising, or marketing, or from the client side… and still others considered AV a business just like any other. A wacky business, though…
I once worked on a really gigantic project and two weeks before deadline, when the entire production staff was running out of both time and energy, the client brought us a $3000 bag of cocaine and said **"Here! Hope this helps!"** (It did.)

This did not mean I had a staff job, though. Fuck that. You had to be insane to have a staff job in the AV industry. Staffers were completely fried all the time. That's why I was a freelance AV Slut. A production company would hire me for a particular project; I would do whatever it took to get the job done on time; and when the show was over I'd walk away.

Then I would wait for the phone to ring with the next project, while thinking

What if the phone doesn't ring?

What if there are no more projects?

What if I never work again?

Some people couldn't stand the thought of being freelance. They needed a schedule and a regular paycheck. That's exactly what I didn't want. Routine. Regimentation. Fuck that. And the break between projects also let me recharge my mental and physical batteries after what were often 60, 70 and even 80+ hour weeks.

Luckily there was always another project. I stayed as busy as I wanted to be. Plus - because I was a freelancer, I could turn down jobs if I wanted to (my excuse would be **"Sorry, I'm already booked on those dates"**) and have adventures instead. Can't do

that if you're on staff. And no matter how berserk a project became, I always knew what the deadline was - and an AV Slut could put up with almost anything as long as they knew when the job was over.

The key word there, of course, is **"almost."**

Because sometimes an AV project could almost kill you.

* * *

Deadline > 30 Days from now

The producer who hired me on this project will be producing the entire two-day sales conference - I only need to work on the AV module that would open the first day. Thankfully most of my work would be 'behind the scenes' and I would have very little client contact. Excellent. Just the way I like it.

The crew on this project is small - the producer, some members of her company's staff, and a variety of freelancers who will provide services as needed. I am the only freelancer who will be working on this project every day, so I will have plenty to do.

> 26 Days

Within the first few days I meet the other freelancers who would be working on the opening module.

The scriptwriter had worked with this client before and had already completed a first draft of the script, so we were in good shape there. He didn't expect too many revisions, as this module was light on content and heavy on ~~motivation~~ / ~~critical messaging~~ / ~~unique selling points~~ BS.

To my surprise, however, there didn't seem to be anyone in charge of designing the show. When hired by the producer I was led to believe that she'd hire someone to storyboard the show based on the script draft we had. When I asked her how I was supposed to do graphics without a storyboard, she said **"Just base the art on the branding the client is already using."** Hmm. Looks like I'll be designing the show myself. Not the way I'm used to working, but she's the boss…

The script called for a lot of product photography; most of that would be supplied by the client. I talked to the freelance photographer we were going to use, and he said he was confident that he could deliver the rest of the product shots needed. This shooter would also be be our Forox camera operator; he'd use this animation camera to shoot the slides used in our show. Once again, he said this wouldn't be a problem.

The producer had already chosen the narrator and audio engineer we'd be using for the soundtrack, so I didn't have to worry about that either.

I also met some of the people who would be working on the conference itself - developing the speaker support, coordinating with the venue, keeping the client under control etc - but that wasn't my problem. All I had to do was get the opening module done.

> 24 Days

I've been on the project for a week now and we're making real progress. The producer is hardly ever in the office so she's leaving me alone to produce the opener. This is a very 'hands-off' approach and if that's the way she works it's OK with me.

The client approved the final draft of the script yesterday, so I can now get going on more of the art and image prep.

I am noticing, however, that the shooter isn't as responsive as I'd like. His images will be a key part of the show, of course, and to my surprise he's been very slow in supplying photography to me. I have a big screen to fill up, this show will be about eight minutes long, and I need images!

> 22 Days

At last, more photography. Now I can start preparing art for the Forox. Oddly enough, the producer does not seem concerned about the shooter's unresponsiveness. Maybe she knows something I don't. All I know is that the deadline is approaching and it's not changing. It never does.

> Day 20

I am spending a LOT of time every day creating graphics and prepping it for camera while simultaneously keeping production on schedule. Everyone is working hard and feeling the pressure. It's easy to tell - coffee and cigarette consumption is going up every day! (I sometimes think that when a person is considering a career in AV they should be asked **"Do you smoke? If you don't, start!"** Almost everybody in this industry smokes like a chimney, including me.)

There was a client meeting today. Just heard they are making changes to the script. Shit. Hope this doesn't come back to bite me in the ass. And - suddenly they want a lot more stuff added to the meeting itself. Stuff that was in the producer's original proposal but but was turned down because it cost too much. Now they want it and will pay for it. The producer calls this 'scope creep.' I have not heard this phrase before. I thought it was just clients being dickheads.

> Day 19

The shooter keeps making excuses and I don't care. I need slides. Where's the fucking pictures? How can I make this show if he's not getting the slides done?

So far on this project I have averaged 10 hours a day… but the days are getting longer. I've worked both Saturdays too. I'm beginning to wish I'd have insisted on an hourly rate rather than a day rate.

> Day 18

The script was finally approved by the client yesterday. When I was pissing and moaning to the producer about this delay, she gave me a useful piece of business advice:

"We pay the bills by producing what's in the proposal.
We make our profit by charging the client for the changes they make."

Today the producer is in the sound studio with the narrator and audio engineer.

Back in the real world: I am glad the weather's been nice. I sold my car recently and haven't gotten around to buying another one, so I am relying on my motorcycle to get back and forth to the office. Riding in the rain would be a complication that I just don't need right now.

> Day 17

Some more product photography arrived from the shooter today. Not enough, but some. I've already had to create extra graphics to cover parts of the show that we might not have images for. I can't understand why the producer doesn't lay down the law with the shooter, because his lack of productivity is becoming a real problem.

> Day 16

Today I had lunch with one of the other freelancers; she's working on the sales meeting side of the project, on coordinating the speech support. Ah, the usual litany:

- The client is always late
- So the speeches aren't ready on time
- And the client cannot commit to storyboards
- And after they do, they will soon change their mind
- And they don't seem to understand the concept of 'rehearsal'

When you are a freelancer you often do not know (and usually don't want to know) the internal politics at the production company where you are working. This ignorance is usually an advantage. Not always. At this lunch I also learned more about the producer's 'hands off' philosophy with the photographer. It's simple: they hate each other! They worked together on a past project and things did not go well, and they haven't been able to stand each other since. That's wonderful.

But if that's the case, why is he working on this project? Because the client loves his work, and having him do the additional product photography on this project was a condition of the producer getting this project. She must have figured **"I'll only have to work with him for a month, how bad can it be?"** Not bad for her… but it's becoming painful for me because the shooter, knowing he's locked into the project per client 'request', is delaying delivery of his work just to piss off a producer he can't stand.

Well shit, that explains a lot. But it puts me in a very awkward position. How am I supposed to get this module finished if the producer can't keep the shooter under control? My lunch companion's scary answer:

"Easy. You're supposed to do it."

Fuck.

So I am still job managing the project.
And I am also doing the the art and camera prep.
Based on a design I came up with because no one else did.
And now I have to babysit a seriously fractured yet vital vendor relationship?

Double Fuck.

Then I asked her how the sales meeting side of production is going. Not much different than how things are going with you, she told me. Why? Another surprise… our fearless producer has a strong background in film and video, but she's never actually produced a sales meeting before. She's making it up as she goes along.

Triple Fuck.

> Day 15
With my newfound political knowledge I now understand why my workdays are getting ever longer, as the disfunction on the project increases and the deadline gets ever closer. All I can do is work harder and deal with these issues as they arise. After all, there are 24 hours in a day… and I'm already working 14 of them.

But despite the problems I know about (lack of photography, the usual production delays) and those I didn't know about (the producer's lack of experience, and a seriously fractured vendor relationship) we continue making progress.

> Day 14

We have two weeks of production time left and, as is often the case on a job like this, life is getting simpler. It is divided into two parts: Work and Sleep. Work and Sleep. As the deadline approaches we have more of the former and less of the latter.

Project update:

- Most of the graphics are done
- Most of the product photography is done
- Forox photography is proceeding by fits & starts
- Most importantly, the narration and soundtrack are done, so soon we can start programming the opening module

It took a lot of long days in the office to get this far. I sure hope that the show side of the project is making equivalent progress.

But I am tired.
Tired of working every day.
Tired of putting in so many hours.
Tired of the show stress and the office drama.
Only two more weeks…

> Day 13

The producer was on the phone with the shooter yesterday. She wasn't actually screaming - but you know she was NOT happy when you hear her yell **"Where are my fucking slides then goddammit?"** into the phone.

I am a mushroom… just worrying about the other 101 things I have to do.

> Day 12

When did I last have a day off? I can't remember. I've only been working on this project for about three weeks but it seems like forever…

Just about the only time I can relax is when I ride my motorcycle to work. All that speed and wind just mellows me right out. Of course once I walk through the office door I'm in the shit again…

> Day 11
Good news: The remaining product photography arrived this morning.
Bad news: This means another 14- or 16-hour day.

I haven't reached the point where I'm lighting a cigarette with one already burning in the ashtray… but I'm close.

Somehow found time to start programming the opening module. I have not worked with this programmer before… seems like a good guy.

> Day 10
Talked to my friend on the show side last night. She said it's absolute chaos over there. After weeks of not making decisions, suddenly the client has all these changes and they need to see them ASAP and the crew is already maxed out just keeping up with the show the way it was before the changes came in.

I am beginning to think that a person has to be insane to work in AV.

Semi-humorous observation: Every time somebody returns from a client meeting they say the same thing: **"There's no way I'd ever work at THAT company."** Our AV mantra.

> Day 9
I was going to order lunch from a place. No one answers the phone. Then I remember that this place isn't open on weekends. And that's when I realize that I have no idea what day of the week it is.

Good thing I had already finished most of the graphics, as prepping the shitload of photography we now have is enough work for two people.

Production management? What's that? Everybody is so busy they don't need managing.

Shit. I have no clean clothes. How am I going to find time to do my laundry?

I can't remember the last time I opened the refrigerator in my apartment…

> Day 8
The sales conference is being held at a resort hotel 20 miles west of town. The plan is for us to go onsite to the hotel two days before showtime. That means we go onsite in six days. No way we will be ready. No fucking way. Just too much to do. Too many loose ends.

Only one thing to do. Put in more hours.
Did 17 yesterday.
Today? Who knows…
Tomorrow? Don't want to think about it.

A production meeting. Everybody attended. Made many To Do lists of EVERYTHING we need before going onsite. Even though we are all insanely overworked and exhausted the producer does not think it's practical to bring in more freelancers at this point. Hate to admit it (I'm SO tired) but she's probably right. We'd spend too much time getting newbies up to speed and looking over their shoulder and then checking their work, and not enough time getting through our To Do lists.

But it can always get worse. I learn that because the clients have been late with their speeches, and are making changes after we've received the 'final' (ha ha) draft, production of the speech support slides is way behind schedule.

So… since the graphics for my opening module are in good shape…
maybe I can help get the speaker support done too?

OK, if that's what it takes. At this point I don't give a shit. How much more work could it be? I make one demand: I want NO client interaction. Somebody else deals with these geeks. All I do is the graphics.

The programmer says he can move ahead on the opener without my help.
At least for a while.

> Day 7
I can't believe how far behind schedule the speaker support is. How did the producer let this happen? Oh yeah… she's never produced a sales meeting before.

Had no idea I could drink so much coffee. I don't even like coffee that much.

18 hours yesterday.

Lately I've been riding to work on the side streets. So tired I don't trust myself riding my bike on the freeway.

> Day 6
Show crew did a run-through of the whole conference today. Kind of like a pre-rehearsal rehearsal. No clients, just us. The result? Many more To Do lists. Many.

Have that sandy feeling in my eyeballs all the time now.

Not much consolation, but the show crew looks almost as toasty as I feel.

Opening module is in good shape at least. The programmer's great.

Another 18 hour day.

> Day 5
Three days until we go onsite.

Glad we did run-through yesterday… there IS light at the end of the tunnel.
If we live that long.

Client review tomorrow.
Good news: I do not have to attend.
Bad news: Programmer and I have a LOT of work to do by then. Speeches.

20. Hours. Today. What. Is. Sleep?

> Day 4
Two days and we go on site. I have stopped going home. What's the point?
Crashed in the office last night. Glad I brought extra clothes in.
Boy Scout. Be prepared.

Every hour gone is one hour closer to being done.

If I live through this gig I'll do something nice for the programmer. He's a lifesaver.

AV diet plan: Totally stressed out so I'm not eating much.
I've never smoked so many Camels in my life. Cigarettes are great.

Producer said the review went OK. People on client side are almost as fried as we are.
All they want is to be done. Get this fucking show over with.

> Day 3
Go onsite tomorrow. Will be the first time I've left the office in a while.

Opening module is done. Looks good considering the lunacy required to get here.
Any further tweaks can be done onsite.

Most speeches done too - except the one we just got. Shit. Client added one.
Fucking assholes. But this speaker is big shot VP so producer won't say no.
Can we do speaker support in two days? Guess we'll find out.

Thankfully show crew have worked this venue before. Good staff & no union issues.

I just want this show to be OVER.

> Day 2
No sleep at all last night. My first all nighter ever. Amazing how much coffee you can drink when you don't sleep.

Crew's packing up to go onsite. I'm not helping. Working on that speech.
Will have to program on site.

Stuck my head out the office door. Thankfully this early June weather is perfect for motorcycles. I'll ride the bike out to the hotel.

* * *

The half hour ride to the hotel almost wakes me up. It's a beautiful day. For the rest of the human race.

* * *

At hotel. Check in. Room for two night. Don't go to room. Might lie down and sleep. No time for that. Go straight to ballroom. Work work work.

Work.

Crew setting up show rig.
Run opener. Apply tweakage. Now it's done.
Work on last speech. Gotta finish before rehearsal.

Clock is ticking. 40 hours to showtime.

It's always 70 degrees and fluorescent in the ballroom. And we don't leave the ballroom except to pee. More coffee. More cigarettes.

I haven't slept in a long time. Not hungry either.

30 hours to showtime.

Going thru last speech one more time. Programmer almost as fried as I am.

> Day 1
Morning before show day. Clients just walked into ballroom. Producer wrangling them. Prepping for rehearsal. Shows are in good shape…

Fuck.

SHIT.

Client now wants changes they could easily have given to us days ago.

FUCK.

I am too tired for this bullshit.

The programmer and I get to work again.
Everything is in slow motion.
Like living in jello.

Look at clock. 15 hours to showtime.

Must be middle of the night.
How long has it been since I slept? Two days? Three? No idea.

Show Day
At 6am producer says "Stop. That's it. We are as ready as we will ever be."

No shit, because ballroom doors open in an hour and a half.

We clean up our production chaos.
Move all this crap behind the tech table.
I collapse into a chair.

7.30am. Ballroom doors open. Our audience, several hundred corporate sales warriors, wander in. I wonder how many of them have hangovers…

8am. House lights down. Programmer presses 'play.'

And the opening module I have dedicated the last month of my life to runs.

* * *

And then it's OVER.

I don't know if the audience liked it, and **I don't care.**

There's the rest of the meeting to come, and all those speeches, but **I don't care.**

I am DONE.

Try to figure out when I last ate. Can't remember.

Or slept! I never even saw my hotel room. Never left the ballroom.

Look at my watch again.
Work backwards.
Think…

*Fuck me. **I haven't slept for 97 hours.***

So it's time for this AV Slut to go home.

Oh yeah, two days ago I rode my bike out here. Let's see… clothes, helmet, jacket, gloves, keys, where is all this shit… I slip out of the ballroom, stumble through the lobby, and stagger outside…

Into the morning of a beautiful June day. I had no idea.
There are no windows in a hotel ballroom.

Start bike.
Stand there.
Stare at bike.
Tired Tired Tired.
Helmet. Put it on. Jacket. Gloves.

Slowly ride out of parking lot.

Oh yeah, freeway's that way.

30 minutes I'll be home…

Then

I wake up

On my bike

On a freeway

FUCK!

I fell asleep!

FUUUUCK!

Going 70 miles an hour!

FUUUUUUUCK!!!!!!!!!

On my fucking motorcycle!

Take next exit.

Calm down. Stop shaking.

Let the adrenaline drain out of my system.

Then - VERY carefully - I get back on my bike and ride home.

As soon as I walk in the door I fall into my bed.

18 hours later, I wake up.

Now the show's over.

Postscript 1:

Later that year I did a two month backpacking trip through northern Europe. This show paid for that trip. So being an AV Slut from Hell was worth it after all …since I was lucky enough to live through it.

Postscript 2:

The adventure you just read is exactly the kind of insanity that inspired the legendary t-shirt below, created and produced by an AV lunatic in Chicago (I think) sometime in the 1980s…



Do you still have yours in a drawer somewhere?

The AV Slut meets
The Minions from Hell!

John Grinde

(The following adventure happened a long time ago, in an industry far far away…
or so it seems. Except when it seems like yesterday.)

A•V Slut:

n. **1** *A workaholic freelancer in the AudioVisual industry, best known for his or her ability to work endless hours under high pressure without murdering, maiming, or otherwise compromising the client's ability to pay dearly for all this nonsense.*

2 *An eccentric oddball who doesn't fit into the 9-5 working world.*

3 *Both of the above.*

It's a cold February morning. The phone rings. It's Mollie, the co-owner of a production company I'd worked for a while back in New York City. They were producing a sales meeting - a big one - and were closing in on deadline. A key freelancer on the gig had just left unexpectedly. The job would require ten days production in NYC and then ten days onsite in the Bahamas. Was I available?

Hmm, this sounds scary. I'd be diving into the depths of a project already in the throes of AV insanity. But I'm an AV Slut, and bullshit is my business, so I add 50% to my day rate and told Mollie that's what I'd need. I half hoped she'd choke on that number and call someone else.

Instead she said "Yes, that's fine, we need you to start first thing tomorrow morning, can you come out here tonight? There will be a ticket waiting for you at the airport."

I told my wife that I'd be gone for three weeks and would be leaving in a couple of hours. The Girl is an AV slut herself and she's worked for this company too, so she knows the routine. "Have a nice time! Don't work too hard!" she said.

Ha ha, The Girl sure is funny. And off I go.

Another corporate client.
Another sales conference.
Another murderous schedule.

When you're an AV Slut you go where the money is, so a few hours later I am in NYC, and the next morning at 9am I arrive at the production company. Mollie takes three minutes to welcome me back to New York and then throws me at the project.

By noon I know: I'm not just in the shit, I'm in the sewer. This client is totally out of control. Two big tech companies had just merged into one ginormous tech company. This is their first sales conference since the merger. Unfortunately the two halves of the company weren't communicating with each other yet. No 'economies of scale' or 'synergistic integration' here. Nope, it is just a load of corporate geeks desperately guarding their territory… and they are so busy doing that, they couldn't bother cooperating with their production company.

Speech scripts are late.
Visuals are late or nonexistent.
Review input is late, or doesn't arrive at all.

By the end of my first day on the job I figure we need three 80 hour weeks to get the show ready. Problem is, we are going onsite in nine days.

Damn, I should have **doubled** my rate.

But I won't complain. No one forced me to be an AV Slut, or to say yes to this project. So I'll just put in the hours, soak up the stress, and look forward to:

- The **deadline**, less than three weeks away, and
- The **paycheck**, a few weeks after that!

This multi-day sales conference will be held at the Paradise Island resort, near the Bahamas' capital city Nassau. Our audience? Hundreds of company salespeople.

Many AV modules are being produced.
Many speeches are going to be supported.
Much time will be spent coordinating with the venue.
More time will be spend developing activities for our sales heroes, and
Massive amounts of time will be devoted to keeping the client under control.

I know some of the people on the crew from past projects, but others are new to me. But, as is usual in the AV diaspora, this motley crew of misfits is working together as though we've been colleagues for years.

Tech notes:

- Though PowerPoint is making rapid inroads into the business communication world, this show is being produced using 35mm slides. (I did not know at the time that this would be the last slide show I'd ever work on.)
- One of the line producers on the show was using a Powerbook 100, a portable Macintosh computer. I had never seen one before. (Little did I know the massive AV change that laptop represented…)

This show has a big budget. Proof? It includes a custom-written theme song, 'Heroes in Paradise' written and performed by some well-known NYC studio musicians. Not only that, the band is going down to the Bahamas with us, to perform at the party scheduled near the end of the event. Holy shit, money is flying around like crazy. At least I'm getting some of it.

I'm a quick learner and a hard worker, so I am asked to track down loose ends in production and resolve them. There are plenty of them. And I know there will be

an endless succession of loose ends onsite. There always are. I had quit smoking years before, but by day three in NYC I wanted to buy a pack of Camels.
But I never did. A miracle.

The days fly by. We're doing client meetings, speech storyboards, art production, slide shooting, soundtrack development, band rehearsals, hundreds of phone calls, a thousand cups of coffee. And (of course) each working day is a little longer than the one before. At the end of the first week I am as trashed as the rest of the crew. Now we're all in the shit together.

Then it's time to go onsite. AV requires lots of projectors, stands, sound gear, cables, light boxes etc. And we want to eliminate any variables that might compromise us onsite, so we are not going to source anything locally. Packing all this crap is more time-consuming than usual because -
1) This is a BIG show and requires a LOT of equipment, and
2) We are going to another country, so
3) All this gear needs to be clearly labeled and manifests written so that we can get through customs in the Bahamas, and that will…
4) Enable us to leave, too, as we must be able to prove that we are leaving the country with exactly as much gear as we arrived with.

All this takes time and energy. But we all dive in, and late in the evening the day before departure we're packed and ready to go.

In the office.
Early the next morning.
Gear into the freight elevator.
Down to the street, into the truck.
Drive thru rush hour NYC traffic.
The Midtown tunnel to the LIE.
The Van Wyck expressway to JFK.
Find the terminal for our flight.
Unload all this crap on the curb.

Find a redcap. Start with a BIG tip.
He facilitates check-in and loading.
Then into the terminal. Check in.
To the gate. Sit down.
Flight's called.
Off we go.

Now we're flying down to Nassau. I am asleep almost as soon as we take off.
I awake as we begin our descent. NYC was grey and cold, and as we approach the Bahamas I see cloudless skies and the beautiful blue water of the Caribbean. For a few minutes I forget how tough the last ten days have been, how tired I am, and how traumatic the next ten days are bound to be.

As we start descending for landing at Nassau I see the Bahamas from the air, lots of sand & scrub, not particularly scenic, and **HOLY SHIT** a grip of iron on my left forearm! Mollie, my seat mate to the left, has clamped my arm with her right hand and is holding on for dear life. She looks *terrified*.

"Are you OK?" I ask.
No response. She's staring straight ahead.
"Mollie, are you all right?" No answer. She is *strong*.
Soon we touch down. Her grip relaxes. She looks at me.
"Sorry, John" she says. "I don't mind flying, but I hate landing."

Once in the terminal I spend plenty of time wrangling all of the stuff we had shipped down here. It takes a while to clear customs, but eventually everything we brought was jammed into a truck and we were on the way to Paradise Island. I don't remember having to smooth the process with any cash, either.

Once at the hotel we get all the gear into the ballroom and start setting up. We have a tech rehearsal scheduled tomorrow morning, so the AV rig needs to be up and running tonight. Let's see… I got to the office in NYC this morning at 6.30am.

The rig is ready by 12.30am. 18 hours. A typical AV day. And of course our call time tomorrow is 7am.

Some onsite anecdotes:

- I've never been to the Caribbean before, and thought I might have some free time down here. Maybe I'll rent a moped and ride around New Providence (the small island that Nassau is on). I mentioned this idea to the hotel concierge, thinking he'd know a good rental place. "Oh that's a BAD idea" he told me. "A nice white boy like you does't want to be riding around New Providence all by yourself." Oh. Never thought about that. Paradise indeed.

- One morning a load of lumber is brought in to the front of the ballroom. What's that all about? For the next few hours I'm busy elsewhere, and when I return to the ballroom that evening I see a carpenter building the set! He's from upstate New York and he makes his living building sets at corporate meetings. He says the hours are long and the stress levels are high, but the money is good, he gets to see the world, and "It beats the shit out of building houses!"

- Sometimes I need to take the rental car and run errands. In the Bahamas they drive on the left. No problem, I've worked in other countries that drive on the left. But in the Bahamas they do it in left hand drive cars. Now *that's* strange.

- Culinary update: conch fritters are *excellent*.

- This morning I'm in the ballroom solving more problems. I finish up just after noon. I've been onsite for a week. 16+ hour days. It's February. In the Bahamas. Wouldn't it be nice to enjoy some of this warm weather? I have nothing scheduled this the afternoon. Wow! For the first time since arrival I have a few hours off. I can walk around on the beach! I leave the ballroom. Go to the lobby. Look out the window. It's pissing down with rain. Just pissing down. This continues all afternoon. Well shit fuck. No walk on the beach for me.

- When onsite I'm usually too busy to interact with the outside world. That's why it's nice to have some local guys help us out too… like Nello the photographer and Leo the videographer. It was fun working with these guys. Didn't have time to hang out, though, not with my insane hours. Too bad… talking to the locals is the best way to learn more about how the world really works.

- I did have a chance to meet the people in the band. One of them had a steady gig playing with Joe Jackson. Another had done a couple of tours with Southside Johnny & the Asbury Jukes. It was a real hoot hearing some of their stories. What did they think about this corporate gig? "The money's good. The weather is too!"

- On the event agenda, one afternoon is designated as a golf event. I make sure to avoid the hotel lobby that day. Seeing hundreds of winter-pale salespeople dressed for a golf was something my traumatized mind could not tolerate.

- "Island Time." It's a cliché. Thankfully we didn't have any issues with island time on this gig. Well, maybe once… we had a photocopier in the production office. It stopped working. A tech showed up. He disassembles the top of the copier and then says "I need to go get a part" and leaves. We never saw him again. The copier remained disassembled. We did without.

The week flies by. There is always something to do. Sometimes I go to the airport and pick up slides sent down from NYC. At other times I am helping prep the many activities planned for the attendees. But most of the time I am in the ballroom helping Paul the Programmer put the finishing touches on the many, many presentations and speeches we've produced for this event.

At a show run-through, late in the evening. This is the only time the clients could make time in their schedules. I'm there to wrangle any changes, though by this time any changes should be minor. Nope. During the run-through the fucking clients percolate and obfuscate and vacillate and the running order of the show changes. Oh shit. And they want to run through the show again at 8am tomorrow. Oh fuck. And changing

the order of the slides in the trays is a lot of work because there are a LOT of trays and it's already 11pm. Shit *and* fuck. After the geeks leave I say to Paul the Programmer: "I am trashed. We are trashed. Let's come down here at 5am tomorrow and change the show. I think we can still be done by 8." He agrees, so I stagger off to my room and collapse.

4.50am the next morning. I stumble back into the ballroom. Paul's already there.
I take a giant swig of my coffee and say "OK, let's get started."
Paul says "Don't worry about it."
I reply "But we've gotta re-order the show by 8!"
Paul says "I stayed late last night. It's done."

Holy shit. Paul the Programmer, **you are my hero**.

It's late afternoon, the day before the general session kicks off the meeting. I am trashed. The last three weeks have been brutal. But there's still a ton of shit to do, so I'm walking down a hall to deal with another crisis…

…and coming toward me I see one of the executive vice presidents, followed by three of his minions. I met this guy in passing sometime during the last few days, and he remembers me.

He says "Hey John, can I ask you a question?"
"Sure" I reply. (I can't say no, I'm a Slut and we always say 'Yes'!)
"I get the feeling there's a lot of stress backstage" he says.
"Is there anything going wrong with our show?"

I pause.
I breathe deeply.
I am SO fucking tired. I say

"Do you want me to tell you what I think you want to hear, or do you want me to tell you the truth?"

And the minions **FLINCHED**.
All three minions **FLINCHED** as I said that.
Obviously **NO ONE** has ever talked to this guy that way before.
And these Minions from Hell look like they want to murder me for what I just said.

But the VP says "I really want to know, John. Whats going on?"

So I told him.
"Your show is in the Bahamas, not New York.
So we wrote a realistic production schedule for your show.
Because every single thing we bring down here - your entire show -
has to be shipped down from New York and then go through customs.
That takes time. And our schedule took that into consideration."

Pause.
Jeezus I'm tired.
I don't care what he thinks.

"But every single one of your presenters missed every single deadline we set.
Multiple times. So our production people in New York are going crazy making all these last minute changes. And then they have to be sent down here. So it's been a nightmare for our crew to finish putting your show together. And it's all because the people on your end don't understand deadlines. Because they don't give a shit.
So our crew is totally stressed out.
As you've noticed."

Interesting… I have never seen corporate minions flinch simultaneously.

"But don't worry. Your show is almost done and tomorrow it will run like clockwork."

The VP doesn't say anything. Am I in the shit now? He IS the client, after all.

Then he says "Thanks, John. That was very helpful. I needed to know that."

And he continues on his way down the hall, followed by his three Minions from Hell - none of whom, I noticed, would look at me as they departed.

Damn, that felt good. Sometimes even an AV Slut has principles. Now back to work.

We've been though production and travel and set up and tech rehearsal and client reviews and rehearsals and offsite activities and more reviews and lots and lots of changes and dress rehearsals and the Minions from Hell… and now it's 8am and there are hundreds of corporate sales warriors in the ballroom and

It's **SHOW DAY #1**.
And everything goes perfectly.

Good: At one point the CFO announces from the stage that the company has posted its first quarterly profit since the merger. The audience goes wild.
Bad: Of course, the reason that the previous quarter was profitable is that the company had just fired 10,000 people. Corporate America. Gotta love it. Or not.

And then it's **SHOW DAY #2**.
And everything goes perfectly.

The keynote speaker is blathering on about how it's important for everyone in the audience to bring an entrepreneurial spirit to the job every single day. Ha ha. If the people in the audience had a drop of entrepreneurial spirit in their veins they wouldn't be corporate drones, they would be out on their own doing something interesting. But if the keynote speaker said that, no one would hire him.

And now it's **SHOW DAY #3**.
The last speech is heard and the last module runs and suddenly it's OVER.

The house lights come up.
The audience wanders out of the ballroom.
And the adrenaline that's fueled me for three weeks evaporates.

We're not done, of course… Now it's time to organize our gear in the ballroom and at the tech table and backstage and in the production office… pack it all up… label it exactly the way it was labeled when we came down from NYC… cross reference it against the manifests… oh yeah, don't forget to go back to the room and pack my personal stuff… get all this shit to the hotel's loading dock, and into the vans. We probably look normal to an outsider who might be watching, but by AV standards we are moving in slow motion. We are tired. Post-show letdown.
It's this way at the end of every big show.
I have almost no energy left.

A few hours later. At the airport.
In the departure lounge, talking to Mollie.
She thanks me for my hard work in on the show.

And then she asks "Are you sorry you picked up the phone?"
"What do you mean?" I replied.
"When I called about this project I was going to hire you or your wife, whoever picked up the phone. You picked up the call, and here you are."

Damn! If The Girl had picked up the phone, she would have been able to have all this fun. But then I'd never have been able to write this story…

The AV Slut says
"Bara en vecka? Det tar hus i helvete!"

("Only a week? This project's going to hell…")

John Grinde

(Why has the AV Slut decided to title this episode in Swedish?
Be patient, dear reader, and all will be revealed…)

A•V Slut:

n. **1** *A hard-working communication professional who learns that the AV industry is insane no matter what country you're working in.*

2 *An irregular person unemployable in the regular world.*

3 *Both of the above.*

Sweden - a civilized nation inhabited by good looking people, powered by globally-respected companies and cursed with dismal weather. One might think that the chronically crazy audiovisual industry wouldn't even exist here… and if it did, the projects would be calm and relaxed and thus unlike AV everywhere else.

But if you thought that, you would be wrong.

Stockholm is the largest city, the political capital, and the business center of Sweden. That's why most of the Swedish audiovisual industry was located there. And that's why I spent so much time in Stockholm, freelancing at a big Swedish AV company off & on for six years. Stockholm was 'mitt andra hem' ('my second home') though back then I was a *global* AV slut and didn't even have a *first* home anymore. There were 20 or 30 people working for this company at any one time, producing multiple projects staged in Stockholm, across Scandinavia, and all over Europe. This place was busy busy busy.

Being a global AV Slut had its advantages. I would work at a production company for weeks or months, putting in lunatic hours and doing whatever it took to get the show(s) done. When the gig was over I'd wander off around the globe to learn more about the world. Every time I returned to Stockholm I'd transform myself from a global adventurer into a workaholic AV Slut dodging the rain that was pissing down as I made my way to work. I'd stop at the bakery, buy a couple of canalbulle, and walk into the office - usually with no idea what time that workday would end.

I got paid by the hour in Stockholm, and worked there for up to six months at a time, so the hours - and my billing - really added up. AV Sluts pride themselves on not worrying about who the client is or what they do… they are in it for the money. And there was plenty of money flying around this place - though I'm not sure if the AV company itself ever turned a profit. But they always paid me… not always on time, but they paid me. And that's why I kept coming back to Stockholm.

Who were our clients? The usual suspects… car companies, insurance companies, agriculture cooperatives, travel specialists, municipalities, labor unions… they had money, so we made AV for them.

Swedish clients were like clients everywhere… it took them a long time to make decisions. (The best way to survive in a large organization is not to be noticed, and the way to do that is to avoid making decisions. This is true of clients everywhere.) This meant we didn't get input from them until deadlines approached; then suddenly they want all sorts of changes and our hours got longer and the client starts spending money on parts of the project that they didn't want earlier because it cost too much

and our coffee and cigarette consumption increased exponentially and at a final client review they have just a few more 'requests' and holy shit AV in Sweden is just as crazy as everywhere else! But the people I worked with were great and we were all in it together and this was an interesting place to work… at least until my wanderlust kicked in again.

* * *

Sweden is the largest nation in Scandinavian in both population and size… but with only nine million people it's still a small country. It plays a larger part in world affairs than its modest size might suggest; one reason is the political neutrality that its national policy was based upon (at this point in time - this was the 1980s). Perhaps that's why Svenska Röda Korset (the Swedish Red Cross, hereafter referred to as the SRC) plays such a dominant role in the global Red Cross empire. To quote their website:

> *"The Swedish Red Cross is a non-profit organization that was founded in 1865. Today, we are the largest humanitarian volunteer organization in Sweden, with about 25,000 volunteers in 722 local branches, scattered across the entire country. We are an important component of the International Red Cross and Red Crescent Movement and a major contributor to National Societies in other countries."*

Like many other large organizations, the SRC held many meetings. Local meetings, for the Swedish chapters. Big events, with participants from across Europe. And some monster meetings, with attendees from all over the world. To produce these meetings they hired AV companies, who in turn hired people like me.

One autumn the SRC was hosting a huge meeting, with attendees from national Red Cross societies from around the globe. They hired the AV company I worked for to produce the General Session that would open the meeting. What made this project very interesting was the venue chosen. Not just a hotel ballroom, or the local convention center. This event was going to be held in Sveriges Riksdag - that's

'Sweden's Parliament' for those few of you who do not speak Swedish. Wow, what a venue! As the Riksdag seated 349 delegates from all over the country, this was a big room. And a big challenge.

* * *

Every AV show starts with an idea. Hopefully it's a *good* idea. Kurt, the guy who owned the AV company I was working for, was an idea guy. He was overflowing with ideas. He had a hundred ideas a day. He was the living proof of the adage "To have a good idea, you must first have a lot of ideas." This saying infers that not all ideas are good. That was as true of Kurt as is is of everyone else (myself most definitely included). Some of his ideas were just too wacky to consider. Some of his other ideas might have been good, but the rest of us had a hard time understanding what he was talking about. But once in a while Kurt would come up with a great idea that the client would really go for, and this SRC project was one of them.

This combination of a prestigious client, global attendees and impressive venue got Kurt's synapses exploding; his concept eventually included actors on stage, dancers, original music, lighting effects, and other show elements. Your favorite AV Slut came into the picture as the producer of a small AV show that would be part of this extravaganza, shown on the single AV screen in the center of the gigantic front wall of the Riksdag.

Kurt put together a proposal, presented it to the client, and they approved it in short order. (In AV there's no such thing as a good idea unless you have a client that's willing to *invest* in that idea.) Good thing, as the event was only a month away. Work soon commenced on the project. As I was only working on the AV show, I was not involved in the creation of any of the other show elements Kurt had come up with, but things were moving along as well as could be expected considering how many other projects the company was producing at the same time.

But then - a week and a half before show day - we got The Phone Call.

Our client at SRC called Kurt to say they had just run the show proposal past the Riksdag's security office. (They should have done this a couple weeks before, but you know what clients are like…) They had bad news. None of Kurt's event ideas would be permitted. The Riksdag did not want ANY actors, dancers, musicians or lighting techs in the Riksdag. None at all. And how much time do we have before show day? This is what Kurt said when he heard the news:

"Bara en vecka? Det tar hus i helvete!"

(And now you know where this story's title comes from!)

Well shit, this sucks big time. The whole project's down the drain. Well, not completely. The security people said that our AV show would be permitted, as AV was used regularly in the Riksdag.

So Kurt asked me if I could somehow expand my simple AV show (that had been planned as only a small part of the event) to become the stand-alone event opener.

- Make it **big**! (There are people from all over the world!)
- Make it **unforgettable**! (After all, it's the Riksdag!)
- And can you **do it in a week**?

Holy shit, I have a LOT to do.

My original approach for the AV show was to just provide eye candy, because Kurt's proposal called for so much other activity onstage. Now my AV has to provide some sort of optimistic opening message. And because there was no time to write a script (and because there were so many languages in the audience) I would have to do this with only images and music.

Where do ideas come from? No one knows. But as I percolated on this situation an idea popped into my head. I would present images from a series of conflicts, followed by images of the Red Cross helping the victims. So I was going to need photos, and lots of them. Thankfully the SRC had a huge photo archive at their Stockholm HQ, with visual documentation of almost every disaster on earth since photography was

invented in the mid-19th century. So I spent what was probably the most interesting - and depressing - day of my professional life looking through the SRC's photo archive, selecting images that would enable me to tell the story I had in my head. Battle after battle, war after war, death, destruction, dismemberment, bodies blown up all over the place… every time I saw a horrific photo and thought "It can't get any worse than this" I'd open another manila envelope full of photos and find another even more gruesome shot proving that yes, it can get worse. (If I had ever thought that human beings were basically good, that day in Stockholm changed my mind.)

But - there were also plenty of positive images of Red Cross staff and volunteers doing what they could to help. I specifically focused on the children that the Red Cross helped all over the world. I often say that an AV Slut will work on any project at all… and I have had some clients that were real turkeys. (Multi-level marketing, anyone?) But working on a show like this helped make up for all the bullshit shows I'd worked on in my AV career.

Now that I had the photos I needed, it was time to go back to the office and produce an AV show. The next few days were interesting:

- Edit the photos into a comprehensible chronology
- Crop each photo for our AV show format
- Send them to the camera department to be made into slides
- Design additional graphics for intros, transitions and outros
- Incorporate the event's theme logo (this is how you keep clients happy)
- Have the board artist create these graphics and prep for camera

That's one day gone…

- Send all this art to the camera department
- Meet with the audio engineer and outline the story
- Find suitable music for each of the five chapters
- One evening *(with the help of beer)* the engineer and I create the soundtrack
- Holy shit, our show is over seven minutes long!

Another production day I'll never get back…

- Review the slides that have been shot so far
- Do a further image edit based on the soundtrack
- Prep these images for slide mounting
- Organize slides on light box in programming room

This was a long day…

- Find time to make my first site visit to the Riksdag
- Oh No! The screen is much smaller than I thought!
- My show will get lost in there!
- What to do?
- Hmm…
- There are huge beige walls on either side of the screen…
- I could use them as projection surfaces…
- Then the phrase 'doves of peace' popped into my head…
- Birds! I will project animated birds on the walls!

At least I got out of the office today…

- Add a bank of projectors on each side of the hall
- Design bird animation, flying away from and then back to the screen
- The board artist creates the art based on my storyboard
- The audio engineer and I add bird effects to the soundtrack

Only 11 hours today, almost like a vacation…

- This morning the programmer and I start putting the show together
- Thankfully this concept seems to be working
- Finish at two o'clock the next morning

18 hours, a long AV day…

- Kurt reviews the show that morning; he loves it
- He implores the client to come see it ASAP
- Which the client does, that afternoon
- We run the show from the programming room
- *(Then Kurt and the client talk)*
- They ask us to run the show again
- *(Programmer and I are getting worried)*
- Please run it one more time
- *(Shit I hope there are no changes)*
- And… the client LOVES it!
- He wanted to play it three times because he LOVES it!

Ahh…I can start breathing again. After the meeting we put some final touches on the show. Next morning our staging crew installs the show at the Riksdag. By mid-afternoon the tech rehearsal is done. They call and tell me **the show looks great!**

The next morning is Show Day - and the event kicks off at 9am with my AV show.
A few hours later I get a call from one of the show techs. I ask how it went. He says:

"You should have been here!
At the end of the show the audience stood up
and gave your show a standing ovation!"

Damn! The only time I got an ovation in my decades as an AV Slut…

…and I *missed* it, because I was in the office working on my ***next*** show!

The AV Slut asks
"Where the Hell am I, Anyway?"

John Grinde

"He did not think of himself as a tourist; he was a traveler. The difference is partly one of time. Whereas the tourist usually hurries back home at the end of a few weeks or months, the traveler, belonging no more to one place than the next, moves slowly, over periods of years, from one part of the earth to another."

Paul Bowles
from 'The Sheltering Sky'

A•V Slut:

n. **1** *A workaholic participant in the most labor-intensive communications technology ever invented, who will work insane hours as long as the money is good.*

2 *A masochist who chooses to do AV for a living.*

3 *Both of the above.*

True Confession: I wasn't *always* an AV Slut. I was trained as a commercial artist and spent a few years designing and producing educational and then industrial publications. Like everyone else in AV, I discovered the industry by accident… and soon realized that despite the chronic insanity it entailed, making AV shows was much more interesting than making publications. On a page, content just lays there like a dead dog. In AV there was narration, music, animation… these shows moved right along in the three to ten minutes they usually lasted. I liked that. Story and movement. An interesting way to make a living.

Little did I know when beginning this adventure that movement would be the dominant theme of my AV career. During the course of my career I lived, worked and traveled all over the world. At the end of a stressful project, though, the show I was working on would blend together in my mind with all the other shows & places I'd worked and I'd start wondering "Where the hell am I, anyway?"

Here are some of the places I've been:
Alabama, Alberta, Arizona…

Milwaukee *1982*
What personality trait did all AV people share? Not insanity, though we were close. No, AV people were *masochists*. We subjected ourselves to these lunatic projects *voluntarily*. And half the time we didn't even complain about it. We even bragged about our ability to abuse ourselves. Toward the end of a gigantic three month project in Milwaukee I recall this conversation:

AV Slut #1: **"I did 94 hours last week. You?"**
AV Slut #2: **"I did 99. Gotcha!"**
AV Slut #3: **"You are both weeds. I did 112 hours last week."**

Yes, we actually bragged about how many working hours we could cram into a 168 hour week while creating corporate crap. Ah, to be young. And amazingly, many of us are still alive to tell the tale.

…Arkansas, Australia, Austria…

The North Sea *1982*
It's early November. I have just finished six months freelancing in Sweden, and now I'm on my way to the UK for more AV adventures. One of my travel maxims is 'Always try a different route if possible' and since I'd already traveled between Stockholm and London by rail and air, why not try the water this time? Conveniently, there was a ferry running from Gothenburg (on Sweden's west coast) to Harwich (on England's east coast). Perfect!

Holy cow, this boat is huge! No wonder, this crossing is 24 hours long. I board, find my modest accommodation (I'm cheap) and then start exploring. Being November the ferry isn't crowded, but we do have a celebrity of sorts on board… Ingemar Johansson, world heavyweight boxing champion in 1959 and 1960.

Time passes, darkness falls, and I'm getting hungry. I make my way to the cafeteria, where to my surprise I see… nobody. This place seats hundreds and I'm the only person in here? I check my watch. It's dinnertime. I ask the guy at the cash register:

> **"Why isn't there anybody else eating in here?"**
> **"Because they're probably all down in their cabins"** he says.
> **"Why?"** I'm totally baffled.
> **"They're probably puking. The sea is pretty rough today"** he replies.

It is? I hadn't noticed. The boat's moving around a little bit, but it's no big deal. This is how I discovered that I don't get seasick.

…The Bahamas, Belgium, British Columbia…

London *1982*

One would think that if a person had enough on the ball to be a globetrotting AV Slut he'd also have a firm grasp of business basics. You would be wrong.

The first time I was in London looking for work I didn't have any local contacts, and thus had to cold call AV companies to find work. My thought process went like this: 1) most people in AV are really busy, 2) there are usually plenty of emergencies to resolve first thing in the morning, 3) then there's catching up on all the active projects, so 4) the best time to call is probably right after lunch. This would also, I hoped, give me the chance to stop in and meet the person I called later that same day if they were fascinated by my wonderfulness.

So that's what I did, calling AV companies a little after 1pm. To my dismay, none of the people I was calling were ever in the office. Damn! Eventually I learned why… though

the USA and Sweden generally do lunch from 12-1pm, in London lunch is 1-2pm. So all these people were literally out to lunch!

What's the lesson to be learned here? If intent on being a global AV Slut, find out how business works where you are, not where you've been. Don't take *anything* for granted.

…California, China, Colorado, Connecticut…

At an Airport *1983*

Back when AV was a growth industry I used to fly across oceans all the time. Any flight less than 6 hours long hardly felt like flying at all. Most of these flights were on Boeing 747s. What a plane. It held 400+ passengers, and most of them flew economy class. This meant that the check-in lines at the airport were long. Sometimes REALLY long. And I hate waiting in line. Especially as I usually travelled carry-on only.

At one airport (after all these years I cannot remember which one) the airline I was flying had a separate line for passengers with only carry-on baggage. Wonderful! Now I don't have to waste time in line with hundreds of other people. I'm using this line on all my international flights from now on!

As my AV career progressed I learned that this brilliant innovation was not common. Matter of fact, I never saw a separate 'carry-on only' check-in line again. Ah well, back to the long lines.

But wait… there's always that first class check-in line, and hardly anyone uses it! Nothing ventured, nothing gained… I walk over to that counter, put on my patented 'humble supplicant' persona (as perfected in many AV show client reviews) and say to the clerk:

> **"Excuse me, I'm an economy class passenger and some of the airlines I fly have a separate check-in line for people with carry-on only."**

Now's the time to hold up my tiny carry-on bag.

> **"I don't see a check-in line like that here. Does your airline have one?"**
> The clerk said **"No, we don't have a separate carry-on line."**

Then she looked over at the looooong economy class line. And then looked behind me, at all the people that aren't in this first class line. Then she says:

> **"But I can check you in here, no problem!"**

Two minutes later I'm checked in! I did not get bumped to first class unfortunately (I must have seemed too humble for that distinction) but at least I didn't have to stand in line with 300 other people.

I started trying this approach on all my international flights, and it worked about half the time. Saved me a lot of aggravation over the years. I never did get bumped to first class, though, so I guess it doesn't pay to seem too humble.

…Delaware, Denmark, East Germany…

Stockholm *1980s*
As a freelance globetrotting AV Slut, I had more motivation for the long hours and high stress this industry was (in)famous for. Many of my on-staff colleagues just worked themselves into the ground. Not me. Sure I worked hard but (as an example) I knew that every two or three more hours I worked in Stockholm was one more day I could spend having adventures in an inexpensive place like Portugal. Knowing that kept me going through a lot of 14+ hour days.

…Finland, Florida, France, Georgia…

***London** 1983*
One of the executives at the production company I'm working for is a friend of Ozzy Osbourne's road manager. (Yes, *that* Ozzy.) One thing leads to another and suddenly

we are producing AV support for three of Ozzy's songs, to be incorporated into his next tour. One of the songs we worked up was "Mr. Crowley" a tune about that legendary master of black magic Aliester Crowley. I was only doing art on this project, so my participation was minimal… but I do remember creating art for the cemetery scene, all gravestone silhouettes with dramatic red backlighting. At the time I thought it looked pretty good. I wonder what I'd think now? It's not on YouTube so I'll never know.

Musical note: as I was writing this paragraph I went online and played 'Mr. Crowley" for the first time in almost 40 years… wow, that is one lame tune.

…Gibraltar, Hungary, Iceland, Idaho…



Summer 1983:
Your AV Slut, working hard in Stockholm.

(Years later my wife, also an AV survivor, would say "We were all whores." But the guy in the photo looks too nice to be amoral, doesn't he?)

Arlanda *1984*

Another freelance gig in Sweden is over. I have lived in northern Europe for a few years now, and I sure miss the sun. Where can I go to 1) find work and 2) see the sun? How about Australia! So I buy a ticket from Sweden to Sydney, and on a gloomy November day I make my way to Stockholm's Arlanda airport.

There's hardly anyone in the airport today, so I walk right up to the check-in counter. The clerk looks at my ticket (lots of stops - SAS to Copenhagen, then a Singapore

Airlines flight to Zurich > Athens > Abu Dhabi > Maldives > Singapore > Melbourne > Sydney) and then says -

> **"OK, you have a six month open return round trip ticket to Sydney. Now, about your baggage?"**

I hold up my half-full carry-on bag.

> **"Yes, that's your carry-on"** she says. **"Now, your checked baggage?"**
> **"This is all I have"** I say, pointing to the carry-on.

I will never forget the look on her face. She is confused. So she looks at my ticket again. Then my bag. Then she says -

> **"You are traveling halfway around the world for six months and all you have is a carry-on bag?"**
> **"Javisst!"** I say. "**All the books say 'Travel light.' So I do.**"

Minimalism is popular these days. Bah humbug. I invented minimalism, back in 1984.

…Illinois, Indiana, Indonesia, Iowa…

Sydney *1984*

I fly from Sweden to Australia. I don't know anyone here, and nobody knows me.
I look in the Sydney yellow pages. Pick two listings at random from the AV category.
Call them. Arrange interviews with both of them. And both places offer me a job.
Ah, the glory days of AV.

…Ireland, Italy, Kansas, Kentucky…

Thailand *1980s*

When working at an AV company in Sydney I got to know Rob, an AV guy who was a real road warrior. He went onsite all the time. AV production is stressful enough in the office; add onsite stress and it can be murderous.

But Rob told me it's all a matter of degree. Doing a gig in Sydney or Brisbane or Auckland was easy enough. It's when you did shows more exotic places that things could get interesting. For some shows in Bangkok, he said, they always added a stand-alone generator to the equipment list. Why? Because you couldn't trust the electricity in the hotel. The voltage could surge all over the place, if not fail completely. With the AV rig running off a generator the crew could at least be confident that the show would run, even if the hotel power failed.
Wow. Suddenly my projects seemed a whole lot easier.

…Liechtenstein, Louisiana, Luxembourg, Maine…

Canberra *1985*

One of my more engaging projects was producing an AV show about the history and future of Canberra, Australia's capital and one of the world's planned cities. The production company I worked for in Sydney had been awarded this project, and I was chosen to produce it. (Perhaps because the architect who designed Canberra, Walter Burley Griffin, was an American.)

The script had been written (it was a long one, almost 10 minutes) referencing the huge architectural model of Canberra in a museum down there. My storyboard relied on photography of this model for visualization, and my shot list was very detailed. There would be a lot to do on this photo shoot. No problem… I would be working with a good photographer and his assistant, and we had two days for the shoot. We'd fly down to Canberra the morning of Day 1, shoot like crazy for a couple of days, and return to Sydney late on Day 2.

But then the gods of AV came along to bite us in the ass. Only days before our scheduled departure the client says:

- The show is still on **BUT**
- There are budget issues **SO**
- There will be no assistant **AND**
- Your shoot is now only **One Day Long**!

Oh fucking hell, they must be kidding. Hah, I wish. When I tell the photographer he's happy too. Oh well, it's not like similar things haven't happened before - in every single country I have ever worked. So our shoot in Canberra gets interesting:

- Wake up REALLY early
- Taxi to Kingsford Smith (Sydney's airport)
- Meet photographer at 6.30am
- Help him check gear
- Fly to Canberra - a 50 minute flight
- Collect our gear and take a taxi to museum
- Unload & bring gear inside
- Holy shit this model is huge!
- Compare shot list to model
- Start shooting - fast
- With no assistant I help with lighting as much as possible
- Shoot nonstop for hours; this is taking longer than expected
- Inhale a sandwich for lunch
- Shoot shoot shoot, keep checking things off the shot list
- Shit we're only half done. Shoot faster!
- Finish the shoot in the early evening, an hour before our return flight
- Pack up the gear at a supersonic pace
- Our client contact drives us to airport, also supersonically
- We get to the Canberra airport 15 minutes before departure
- Good thing, too, it's the day's last flight to Sydney
- Relax for first time in 12 hours while flying back
- Land, help photographer with gear
- Taxi home. Get there 9.30pm.
- Collapse…

There it is, another low stress 15 hour AV day! Thankfully the shots looked great… as did the AV show I produced with them.

…Malaysia, Manitoba, Maryland, Massachusetts…

Wellington *1986*

One of the great things about being an AV Slut is that you can have adventures anytime you want. So when my gig in Sydney ended I thought "There's never going to be a better time to go to New Zealand than right now!"

A few days later I was in Wellington having a beer with my friend Forrest. I had worked with him in both Stockholm and London, and he had moved back to New Zealand a couple year before. Perfect timing for my visit! During the course of this conversation Forrest said -

> **"You know, John, I've known you for a while now but I don't actually know where you live."**

I thought for a moment and replied -

> **"Right now, I live here in Wellington."**
> **"No"** he said, **"not where you are, but where you live."**

I thought further. Hmm, I'd never considered this before…

> **"I know what you're asking, Forrest… but I really don't live anywhere in particular. I haven't lived in the USA for years. While I'm working in Sweden or the UK or Australia I live there, but when I'm done there, I'm gone. And if I'm between jobs - like I am right now - then I live wherever I am. That might be in a resort town in Spain, or on a 747 over the Indian Ocean, or right here in Wellington talking to you."**

That's quite a concept. Even though I'd been living this way for years, I'd never realized how rootless I'd become until Forrest asked me that question.

…Mexico, Michigan, Minnesota, Mississippi…

Everywhere *Always*

One thing all AV people will agree on - the hours in this industry could border on the insane, and sometimes did. Luckily, everything - even working 100+ hours a week - has a silver lining. When all you do is work and sleep, you don't have the time to spend the money you're making. So no matter how much of a spendthrift you are in real life, you end up saving money by default when engulfed in AV stupidity. That comes in very handy when financing your between-gig adventures. It sure worked for me. I traveled to 32 countries (and worked in nine of them) during my AV career.

…Missouri, Montana, Nebraska, the Netherlands…

Berlin *1986*

Go *anywhere*. Work for *anybody*. That's what being an AV Slut was all about. And that's what I did. I didn't worry about the client… I just wanted money to pay for my global adventures. And AV was much less boring than other ways I'd made a living.

But (as always seems to be the case) there was one exception to this philosophy.

I've been a history fanatic my whole life, and though I'd been traveling for years there was one place I hadn't made it to yet - Berlin, both West and East (as it was at the time). So in Amsterdam one day I thought "Time to go east," got on a train that evening, and the next day arrived at Zoo Station in West Berlin. The next few days were filled with many history-related adventures that I will not bore you with here (including a day trip to East Berlin that was a real eye-opener, as was my afternoon jaunt on a double-decker bus to the suburb of Steinstücken).

I really liked Berlin and thought "Hey! I should try and get some work here!"

So I start poking around, and make some calls (my almost non-existent German was only a slight hindrance as Berlin was truly one of the most international cities I'd ever seen) and soon wrangled an interview with an AV company near the Kürfurstendamm, West Berlin's shopping street. The first interview went really well. It was apparent that my skills would be of use to them, as they were really busy. I was asked to come back the next day for another interview, where we'd go into more depth on the possibilities of working together. Wow! This couldn't have gone better. I spent the next few hours daydreaming about how great it would be to live in Berlin.

When I arrived the next day our discussion moved into more client-specific areas. How could I be of most use to this production company? Well, I'm an American. And one of their biggest clients - perhaps their biggest in terms of annual billing - was an American organization. So if working at this production company I would be spending 100% of my time working on projects for the US Army.

You have to remember that at the time West Berlin was still officially occupied by American, British and French troops. So the US Army being a client wasn't all that surprising. But you should also know that I grew up in the Viet Nam war era, and the last fucking thing I wanted to do for a living was make propaganda for the US Army. So for the only time in my career I turned down work because I didn't like the client. Even AV Sluts have their principles. This one does, anyway.

…Nevada, New Brunswick, New Hampshire, New Jersey…

Stockholm *1987*

I am finishing up a multi-month set of projects in Stockholm. Just for the hell of it I phone a production company in London that I've been trying to get work with for a couple years. Lew the owner is soon on the line.

"John! Where are you?"
"In Stockholm. Why?"
"I've been trying to find you for weeks. I have a project that's perfect for you!"

That's the best news an AV Slut can have! I don't even ask who the client is… after all, by definition I'll work for (almost) anybody.

Lew wants to discuss the project in person. OK! So the next day I fly from Stockholm to London. We talk. The project is for a science museum in Taiwan. Very interesting. I'm in! So I fly back to Stockholm, take a couple days to wrap things up there, then fly to New York City to wrap up some loose ends (I had settled there late the year before), then fly back to London. A couple days later I start writing the Taiwan project.

Stockholm > London > Stockholm > NYC > London. In seven days. I *love* this.

…New Mexico, New York, New Zealand, North Carolina…

Everywhere *1980s*
I worked all over the world. When I wasn't working I was traveling. I had friends and colleagues in many places and felt at home everywhere and nowhere. But what baffles me today is - how did I do all this traveling and stay in touch with all these people *without an internet*? I simply can't remember.

…North Dakota, Norway, Nova Scotia, Ohio…

Singapore *1989*
Some of you might think that because an AV Slut leads such a high stress life s/he must be a complete asshole. Nothing could be further from the truth! Not with this slut, anyway. Need proof? I was at Changi airport in Singapore waiting to catch another long flight to who knows where. I'm early as usual, and being peckish decided to have a bite to eat in the departure lounge's cafeteria.

The great thing about international travel is that you see people from around the world. In line in front of me was an elderly Indian lady, all by herself, with a plate of food on her tray. English is the lingua franca in most of the traveling world, it certainly is at Changi, but this woman didn't have any English, and the person behind the register was having an impossible time trying to make this woman understand how

much the food cost. At first it was amusing - then it was a sociology experiment - then it became annoying (I'm hungry!). So out of the goodness of my heart I paid for this Indian lady's meal. My good deed for the day, week and month. Maybe this helped make up for all the evil thoughts I've had about clients over the years.

…Oklahoma, Ontario, Oregon, Pennsylvania…

Kuala Lumpur *1989*

AV is a very labor-intensive process, it takes money to create these shows. So one thing most AV projects shared was a decent budget. Not that the budgets were ever high enough… we always wanted more money to play with. But for the most part, project budgets were adequate for the needs of the show.

Not every show had a big budget, though. Or even a decent one. I recall working for a small production company in Kuala Lumpur, Malaysia. They were just starting out, so their projects were modest. I learned just *how* modest at the end of yet another ten hour workday. I was waiting for Thomas, the owner, to give me a ride home… but he was busy revising a project budget yet again. On this revision he was trying to figure out if he could do the required location photo shoot with eight rolls of film instead of the twelve called for in the original budget. When the producer has to worry about the cost of four rolls of film, you *know* the budget's tight!

…Polynesia, Portugal, Prince Edward Island…

New York City *1996*

I knew an equipment tech who told me his father only drank coffee. No water, no beer, no soda, nothing but coffee. This guy would have been perfect in AV!

…Québec, Rhode Island, Saskatchewan, Singapore…

Toronto *2000*

Neurosurgery. Not something you usually associate with AV. Unless it's a cry of desperation at the end of a very stressful gig:

"Doctor! Please save my brain!! AV is destroying it!!!"

But there are other, less frenzied connections. I once worked a meeting for the AANS – the American Association of Neurological Surgeons. Thousands of very smart docs flooding into the Toronto Convention Centre. (I was not one of the smart people, but showed up anyway.) In addition to the usual general sessions and breakout sessions and poster sessions, the AANS meeting also featured… formaldehyde. Huh?

One morning at 6.30 I see a large group of video technicians gathering outside a big meeting room. A union steward is addressing them. "The procedures that will be videotaped in this room today will be… interesting. Go in and have a look. If you don't want to work this room, don't worry, we can find another job for you today."

Then the door opens. OMG that room reeks of formaldehyde! What's in there? I don't have the kind of event badge that will let me into the room, but that's no problem as within a minute or two half the techs who went in there come out… very rapidly, and looking a bit… unhinged. A few minutes later I ask one of them what's up.

> **"Just have a look in there"** he said.

By now there's nobody's around (it is *really* early in the morning, after all) so I open the door a crack. I see many gurneys draped with plastic. There's a video camera + tripod + tech at each gurney. On some of the gurneys? Human heads. No bodies, just heads. This is where the brain guys will demonstrate their procedures, and have them videotaped for training purposes. On the other gurneys? Heads *and* spines, for procedure demonstrations by the spine docs. No wonder the room reeks of formaldehyde! Later that day I spoke with one of the techs who'd worked that room.

> **"What was it like in there? It must have been gross!"**
> **"You got used to it"** he replied. **"Once you got used to the smell. And got used to the head laying there. It only got wacky when the doc turned the head and I saw those dead eyes staring up at me."**

Ever since, these Toronto techs have been in my personal AV Slut Hall of Fame. They truly did anything for money!

…South Carolina, South Dakota, Spain, Sweden…

Atlanta *2002*

My experiences as an AV Slut had taught me that the brain is the most abused part of the human body. One of my road gigs proved to me that the second most abused part was at the other end of things.

I'm onsite at the Georgia World Congress Center. This huge venue is shaped like the letter 'U' and the rooms I was working in were at the extreme ends of both hallways. Unfortunately for me, the genius who designed this building did not provide a walkway between the two ends of the 'U' - and what did that mean for me? I walked 10 or 15 miles a day, every day, on the cement floor of the Congress Center, for the entire week the show ran. My feet were sore by the end of the first day. By the third day my feet were nuclear. And I brought two pairs of shoes, and swapped between them the entire time!

You know your feet are suffering when you begin every day like this:

- Wake up,
- Put feet on floor,
- Cringe in pain!

…Switzerland, Tennessee, Texas…

Toronto *2004*

On this medical association gig the entire AV crew was booked into the Royal York Hotel in central Toronto. A huge old place - we were told that it was the largest hotel in the British empire, back when that empire existed. The crew was from Dallas, a bunch of hard-working good old boys, though as this was AV most of them were young not old. Given the 16+ hour days on site, you also had to be hard-working.

But as I learned on this gig, being hard-working didn't necessarily mean they were well-traveled.

Late one afternoon four of us were in one of the hotel's suites. Three of the guys were setting up for an executive party taking place that evening; I came along because with a couple hours to spare I didn't have anything else to do & thought I'd help out. The crew is busy setting things up, and in about a half hour one of the guys came over and said **"You guys have gotta see this, I've never seen anything like it!"**

So we follow him into the very palatial bathroom and the guy says -

"So what the hell is that thing, anyway?" as he points to… the bidet.

…The United Kingdom, Utah…

Philadelphia *2006*
Here I am working another week-long medical association meeting. This is one of the big ones; the general session is set for 7,000 people. I had been working on the media content for this meeting for a few weeks, and now it was time to be on site and help stage the show.

The first day's general session went smoothly. Now it's the morning of the second day, and we're set & ready to go. I take a break by sitting in one of the back rows in the hall. Who knows when I'll next have a chance to get off my feet? Then the doors open and the docs start coming in to take their seats. One of them sits down in the row in front of me. He settles in, then turns to me and says -

"I sure hope today's meeting doesn't start
with the same pretentious bullshit they opened with yesterday."

Being the AV Slut that I am, I of course agreed that this would be a good thing. (Onsite, I agree with *everybody*.) As he turned back to the front of the hall I got up and sneaked away. I didn't want him to read my badge and realize that I was on the

AV crew and was not one of his medical colleagues. And I *certainly* did not want him to discover that I was the writer and co-producer of both yesterday's AND today's show-starting bullshit!

…Vermont, Virginia, Washington…

Minneapolis *2007*
OMG I've been in the AV business for a long time, no wonder I'm getting bored. How much more corporate crap can I create? It's especially painful these days, because now I have a staff job; freelancing isn't cutting it when the mortgage must be paid and the kids want to eat at least once a day (and sometimes more).

But damn, this is boring. And I start to wonder why. Then it comes to me… everybody I work with is an American. White middle class Americans. Same viewpoints, same expectations, same everything.

AV didn't used to be that way. Let's see… there was that place in Sydney, working with Australians (of course), Brits, New Zealanders, Canadians, an Austrian, a German. Quite an eclectic bunch. You can always learn something new from a mix like that. And what about Stockholm? Plenty of Swedes, and some American freelancers, but also people from Finland, France, the UK, Poland, Japan, Switzerland, New Zealand, a Canadian, there was even a guy from Latvia working there for a while. Again, a very enjoyable and eclectic mix.

The best way to learn how the world works is to work with people from around the world. Sure, I'm an AV Slut. I'm in it for the money. But I might as well learn as much as I can *while* I'm shamelessly debasing myself for a paycheck!

…Washington DC, West Germany, West Virginia…

London *2018*
At Heathrow airport, in Terminal 2, waiting for my flight to Reykjavík. I am on the balcony looking out over the main floor of the terminal. I look out the floor to ceiling

windows and see planes from all over the world. Every airline logo you can think of. Then I get antsy and take a walk through the terminal, and see people and hear languages from all over the world. One of the reasons I did AV for a living? It was not boring. This short time in Terminal 2 reminds me how true that can be, even after all these years.

…Wisconsin, Wyoming and Yugoslavia. Ahh…

Minneapolis *2019*

August 22. I retired today. 40 years of AV Sluttery are over. At last. But I have no complaints. My career enabled me to work, live and travel all over the world; and since travel is the best education, AV enabled me to be less stupid than I would have otherwise been. Plus I have friends all over the world.



Your AV Slut at his retirement lunch >

And I met my wife in AV, too. For all that, I'm thankful. Though at my age I could sure use some of the brain cells that AV destroyed over the years!

One final thought after 40 years of adventuring:

"Travel is fatal to prejudice, bigotry and narrow-mindedness and many of our people need it sorely on those accounts. Broad, wholesome, charitable views of men and things cannot be acquired by vegetating in one little corner of the earth all one's lifetime."

Mark Twain


Professional
Sports Publications
Takes You Where
The Fans Are
THE BOSTON BRUINS

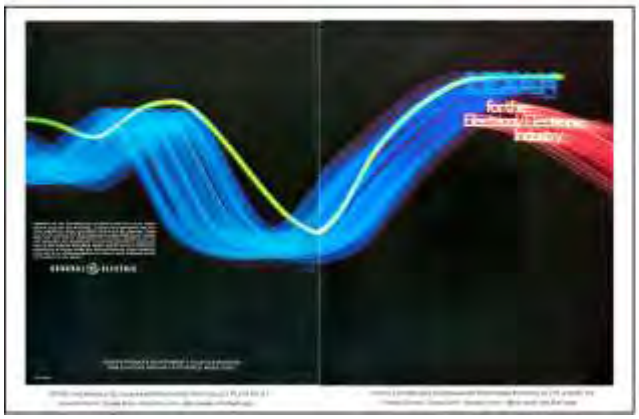

audio visual
directory 80


Marsh &
McLennan
THE ROYAL GAME...

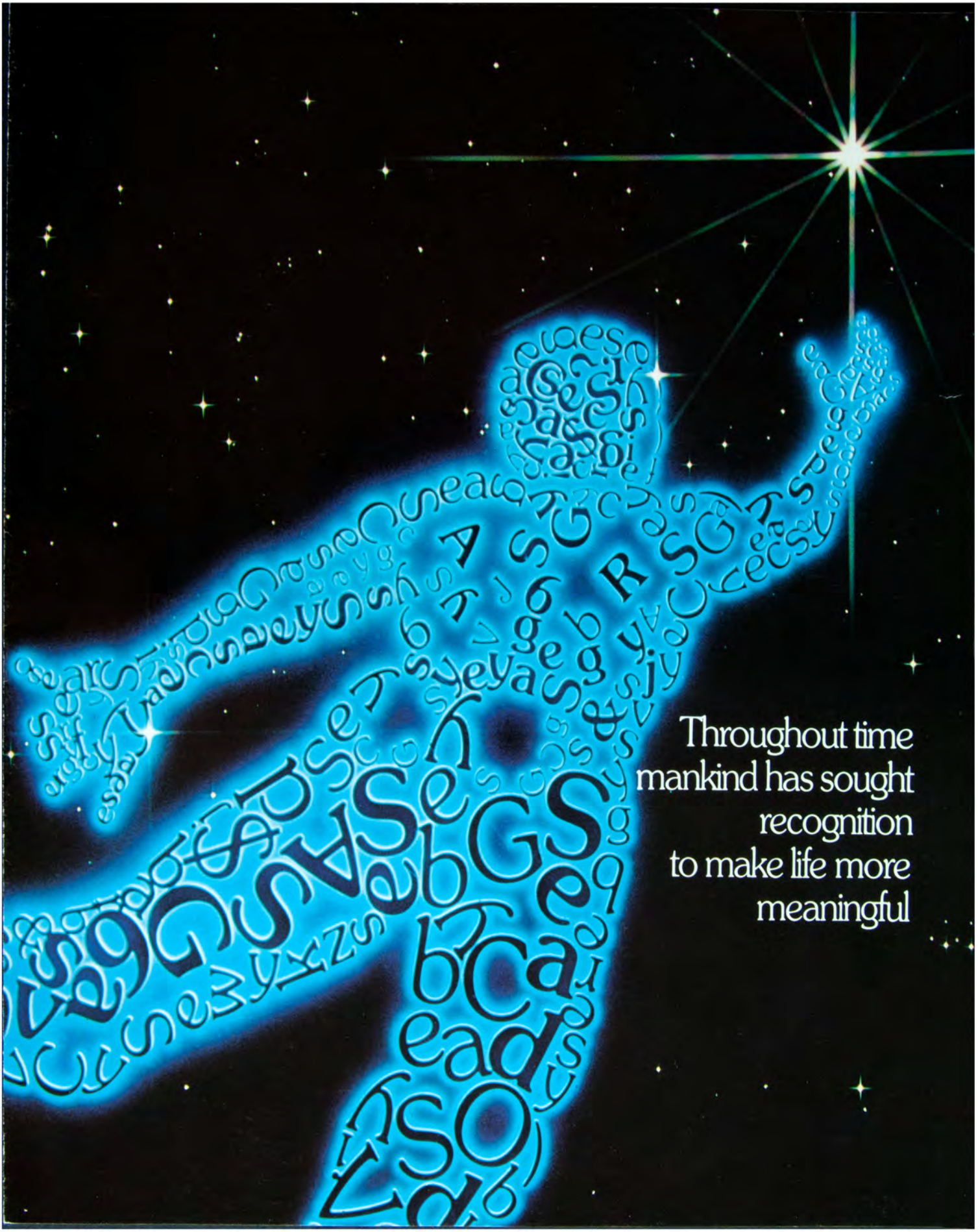



update
PROCALL


Magic Lasers

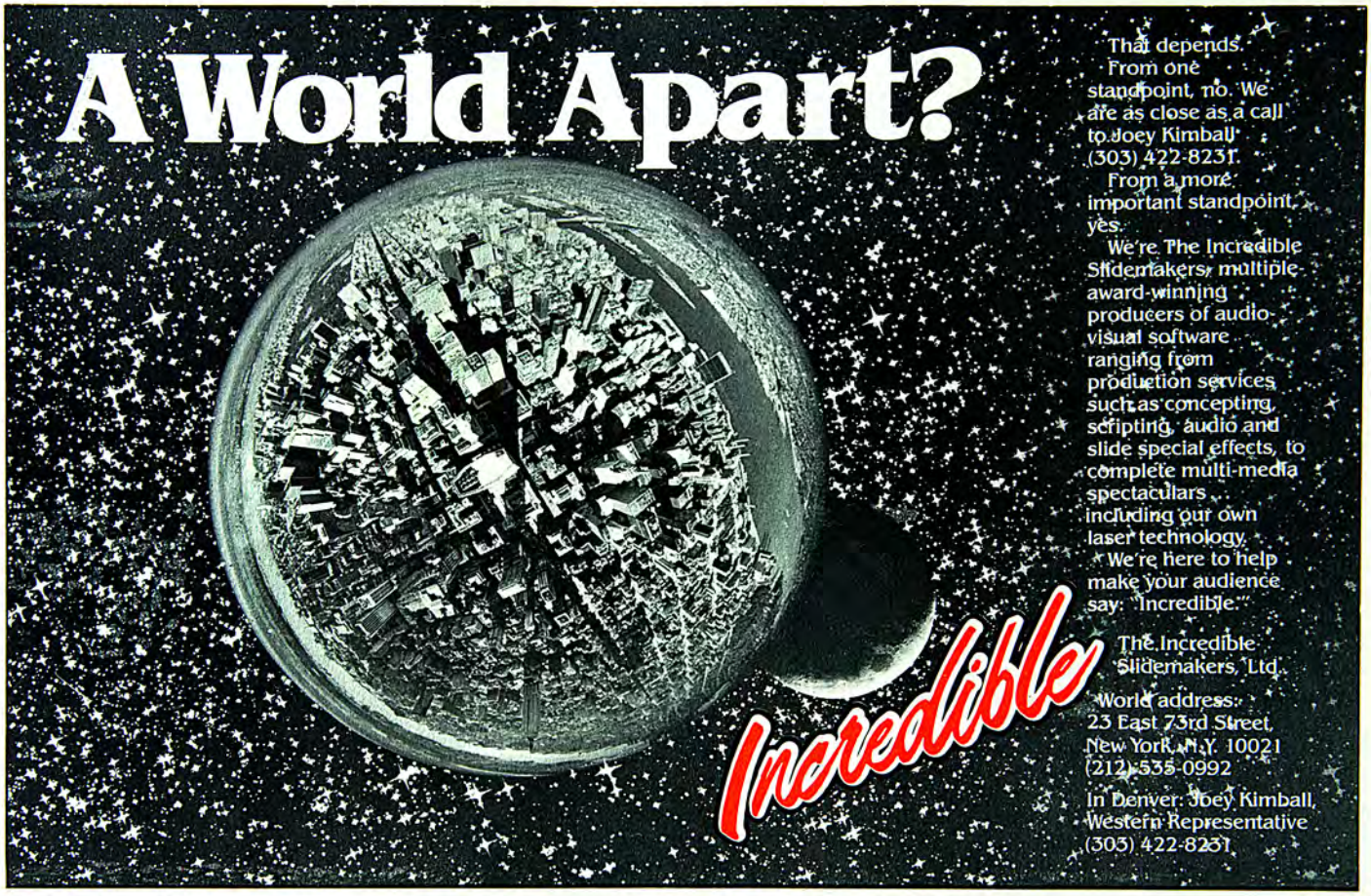



AV
SHOW GUIDE



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 1

New York Type Directors Club | awards competition | brochure cover.

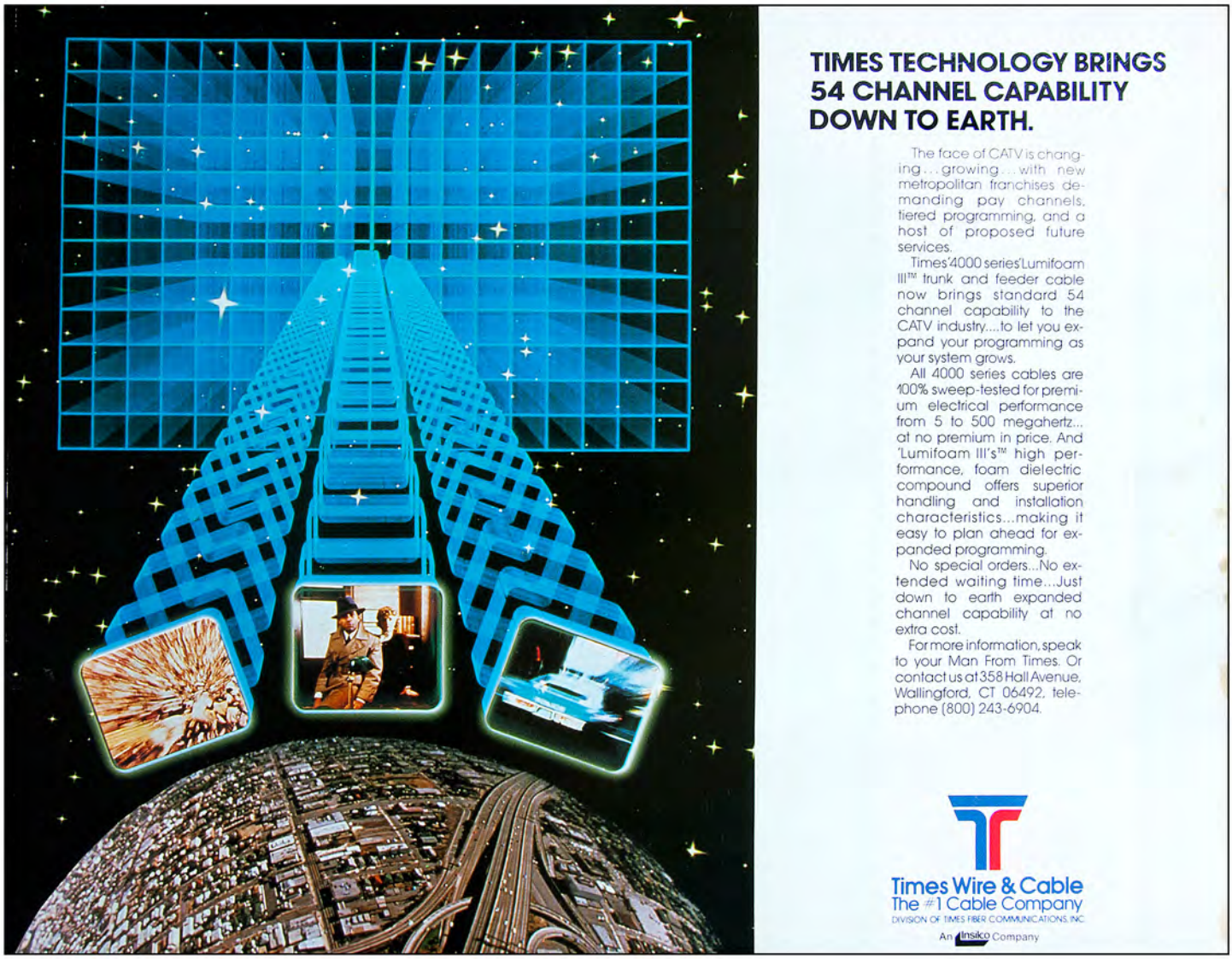


1970s | Incredible Slidemakers Printwork Portfolio | Plate № 2

Incredible Slidemakers | self promotion | image ad | Manhattan Island fisheye photo by Yours Truly.

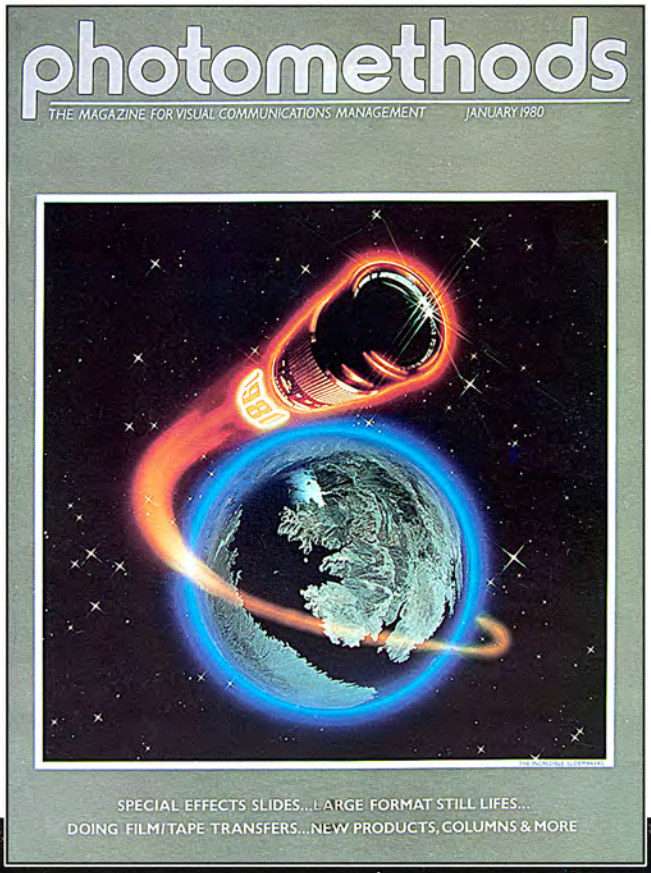


GAF | GAFMED *Rarex System* | *brochure cover.*



1970s | Incredible Slidemakers Printwork Portfolio | Plate Nº 4

Insilco | Times Wire & Cable | trade magazine ad.



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 5

Photomethods | magazine cover | Lake Mead [Nevada] fisheye photo by Yours Truly.

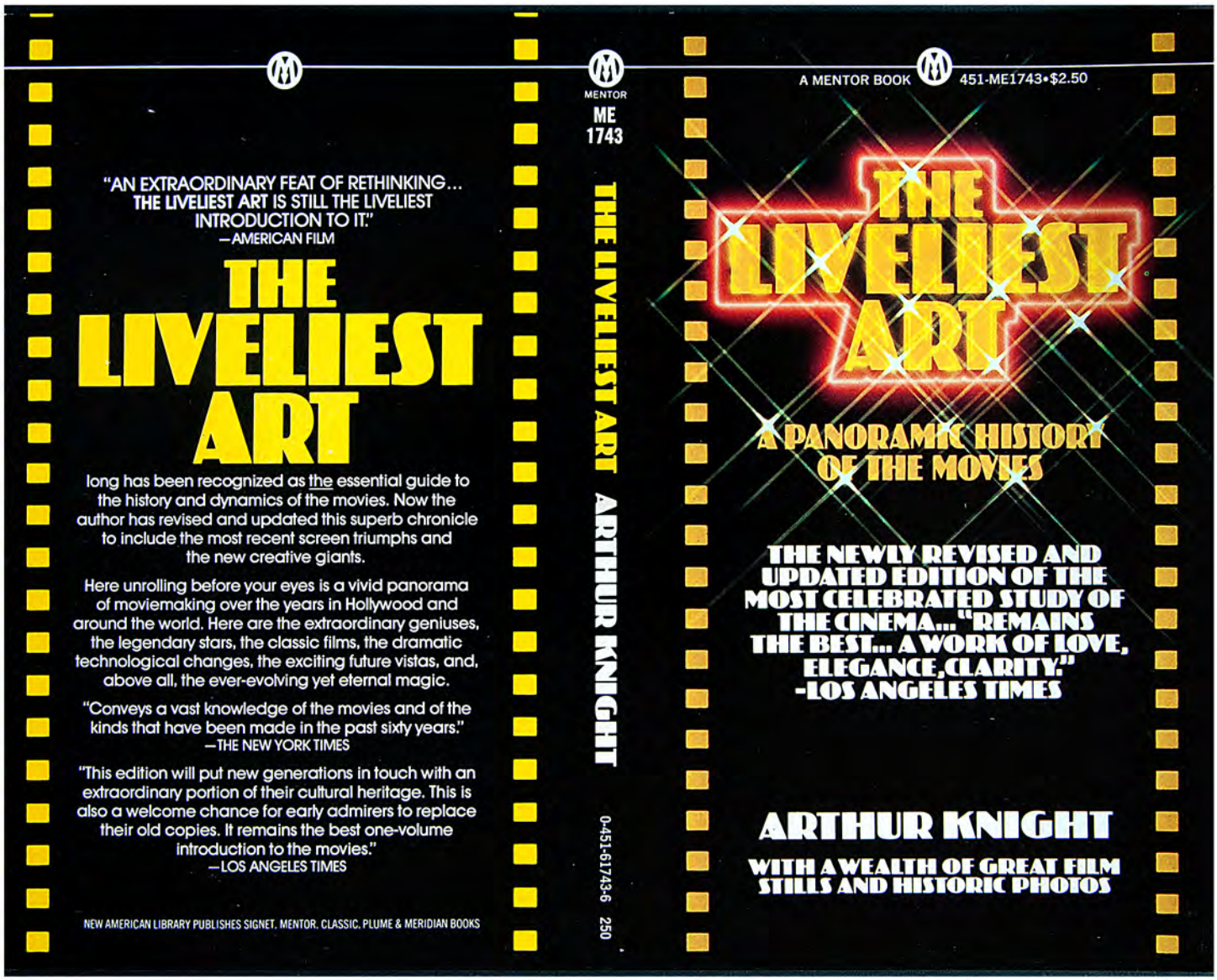
Medical Marketing & Media

June 1980



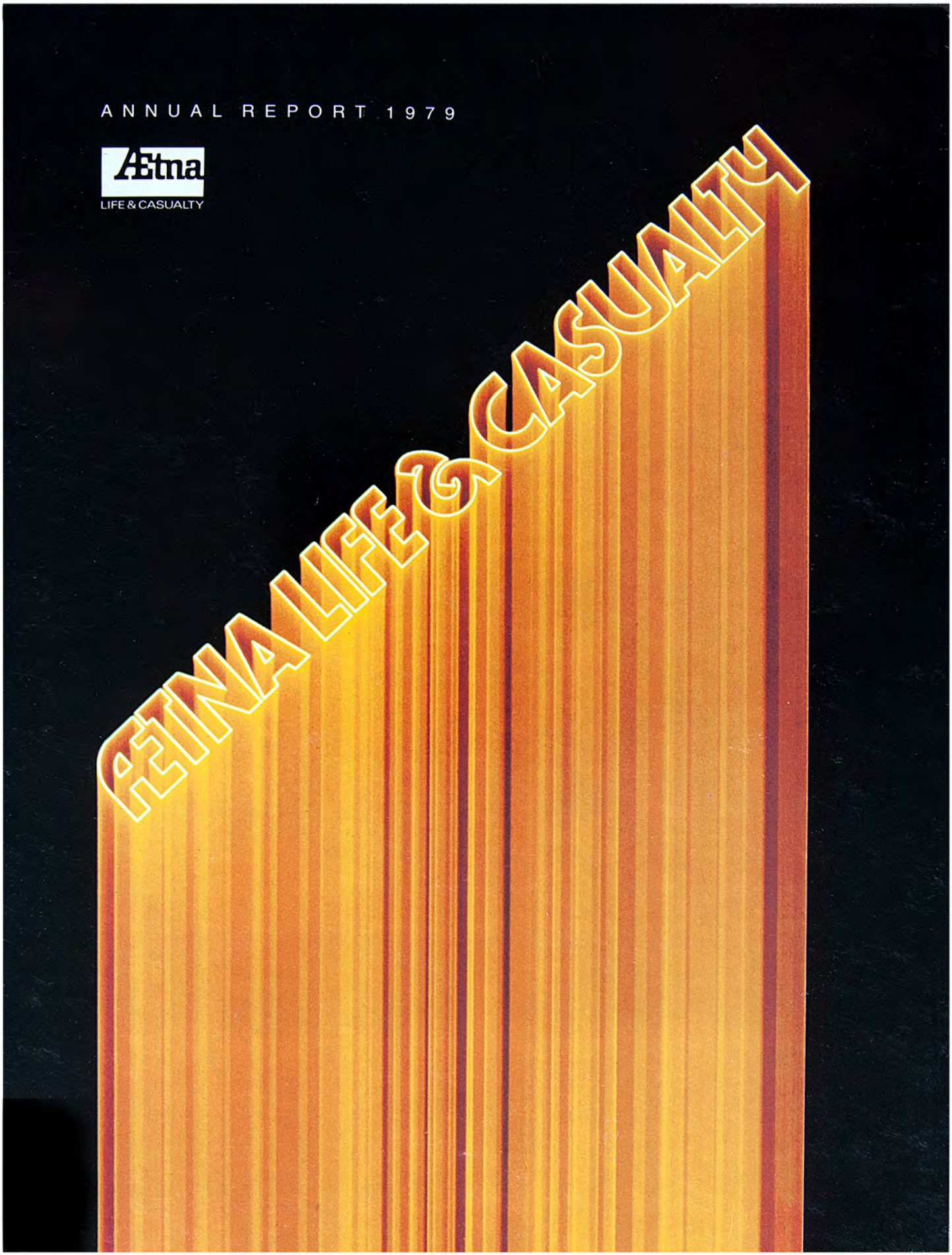
Burroughs Wellcome marks its 100th anniversary this year.

- Origin of Species
- Rx Services — XIII Winter Games
- Nurse's Role
- Market Strategy
- UPDATE



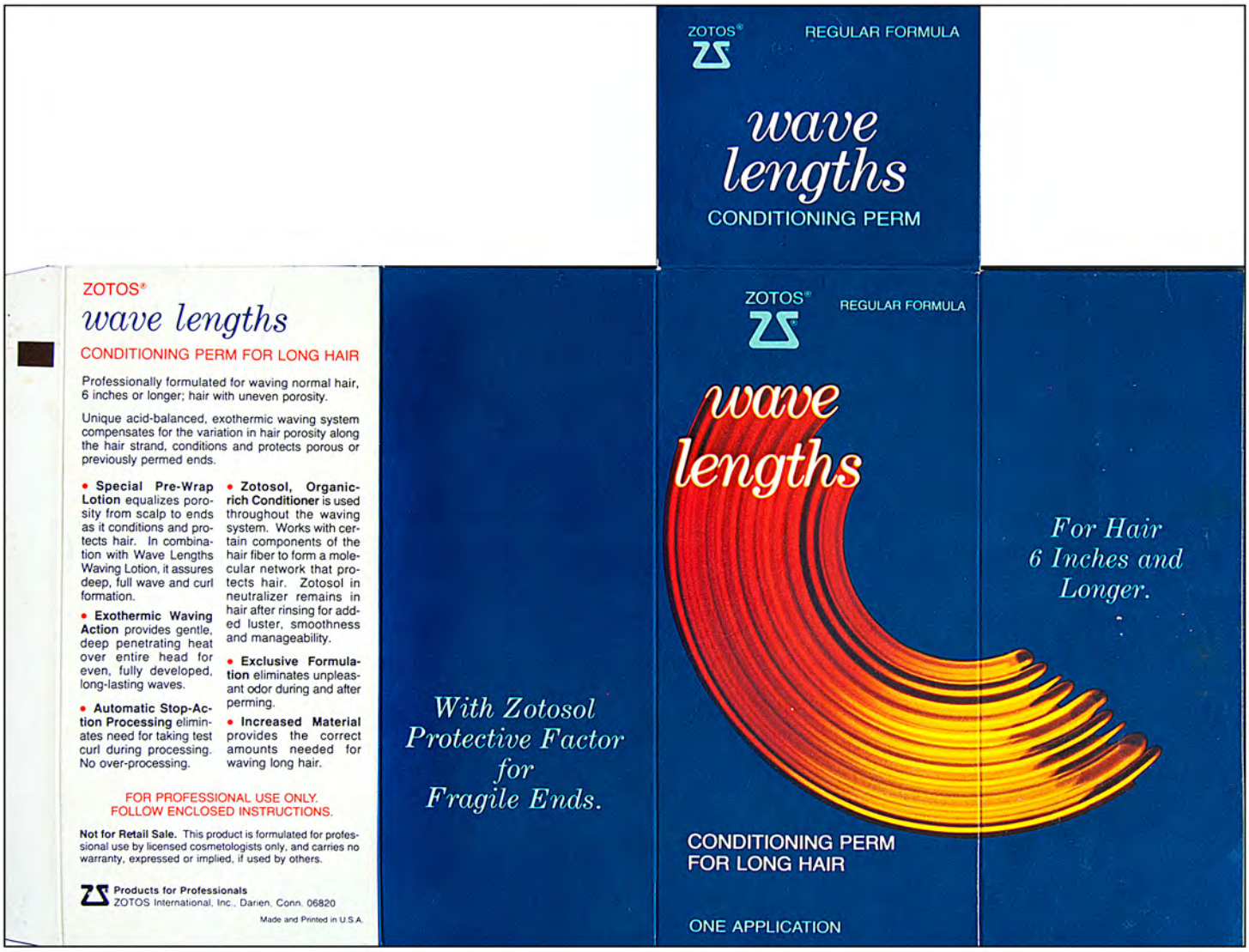
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 7

New American Library | *Mentor Books* | The Liveliest Art | *paperback book cover.*



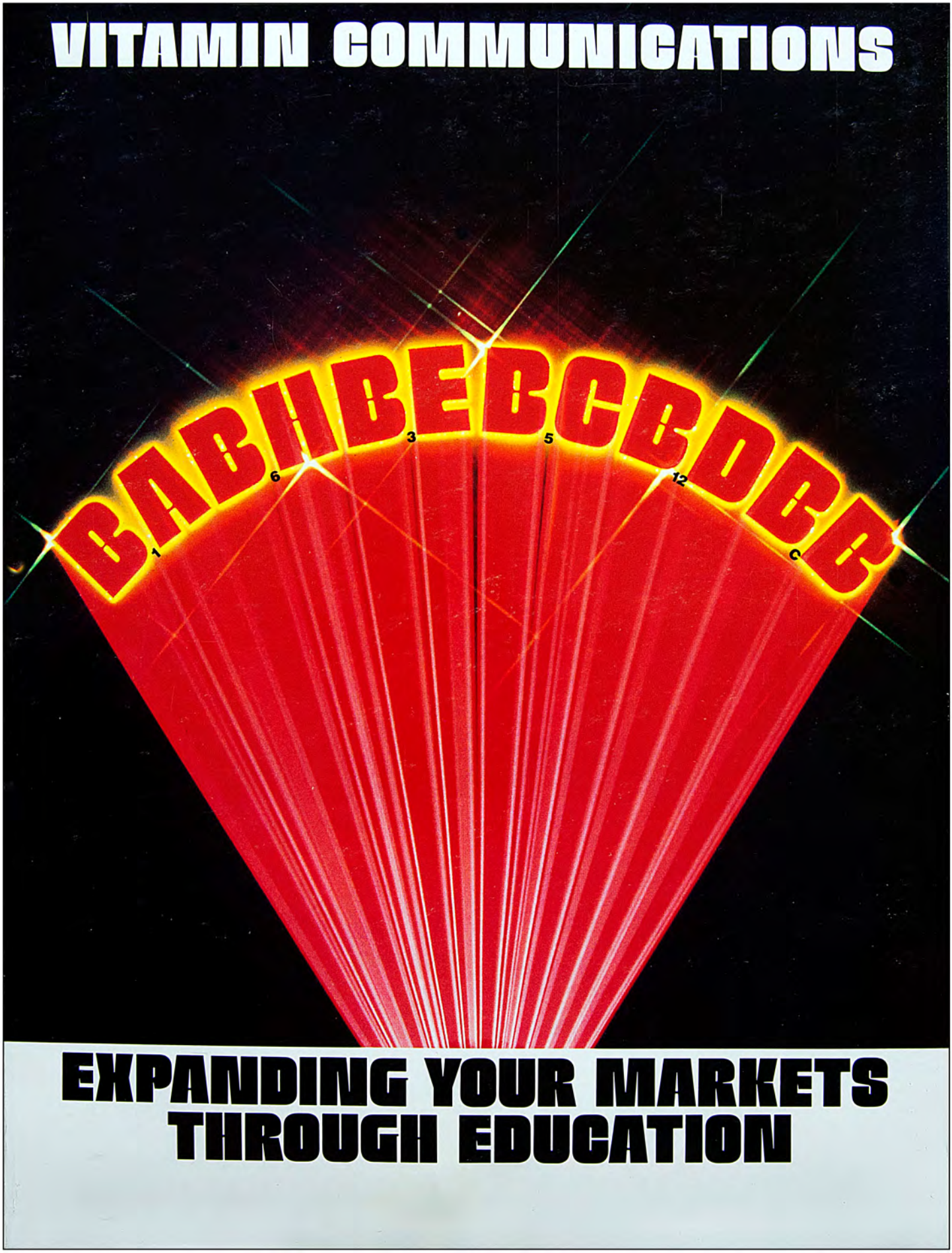
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 8

Aetna Life & Casualty | annual report cover.



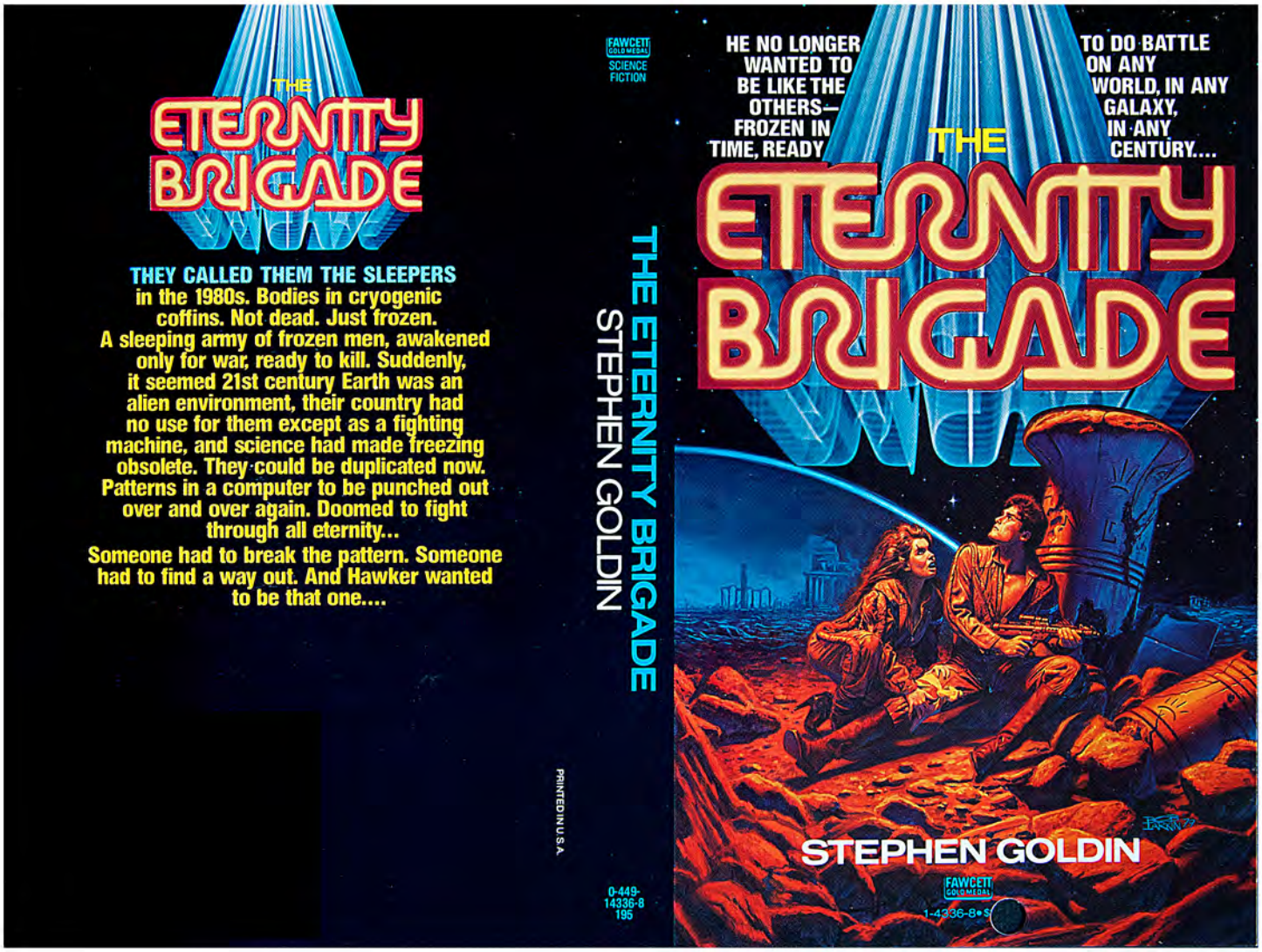
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 9

Zotos | Wave Lengths | *box cover.*



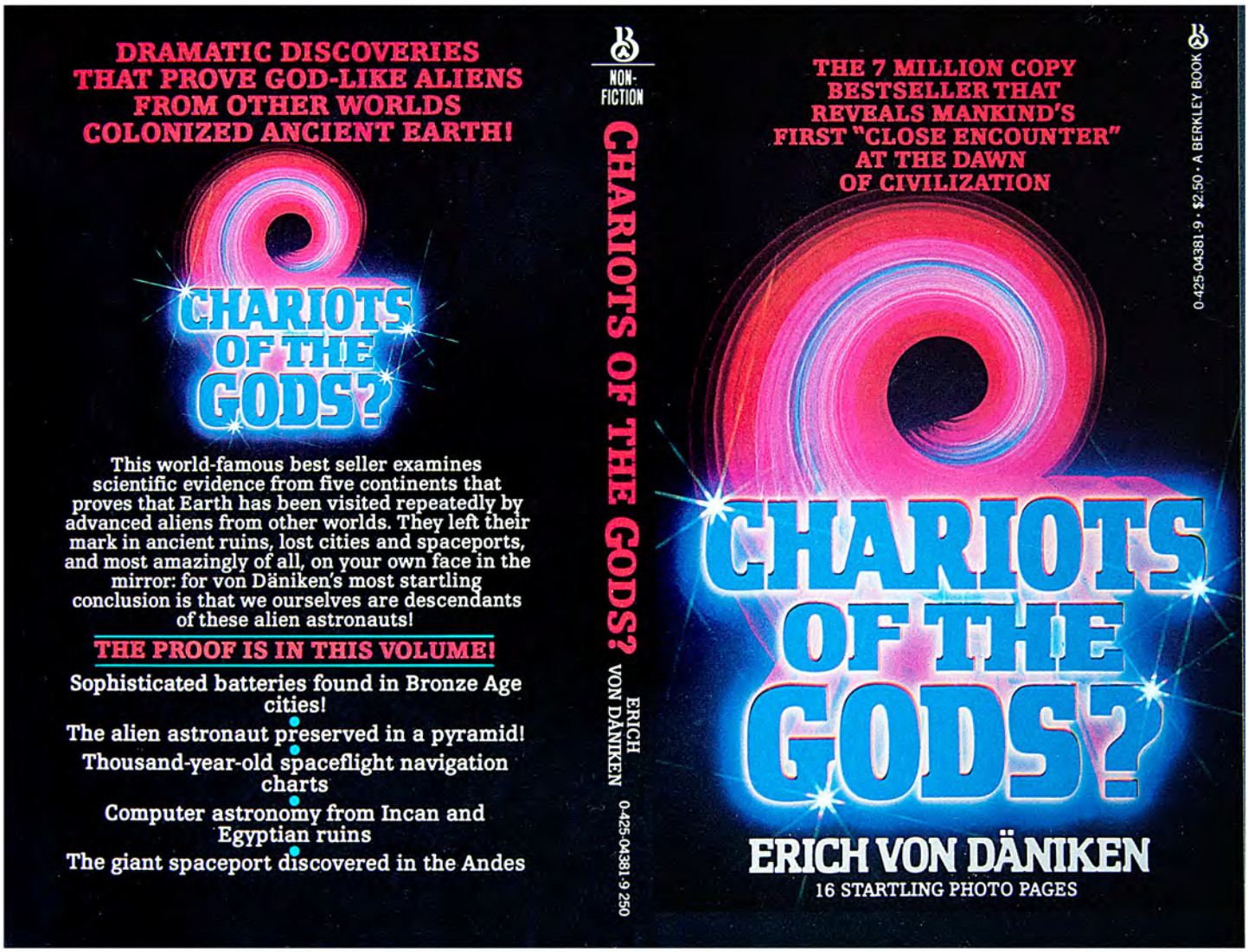
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 10

Hoffman-LaRoche | Vitamin Communications | *newsletter cover.*



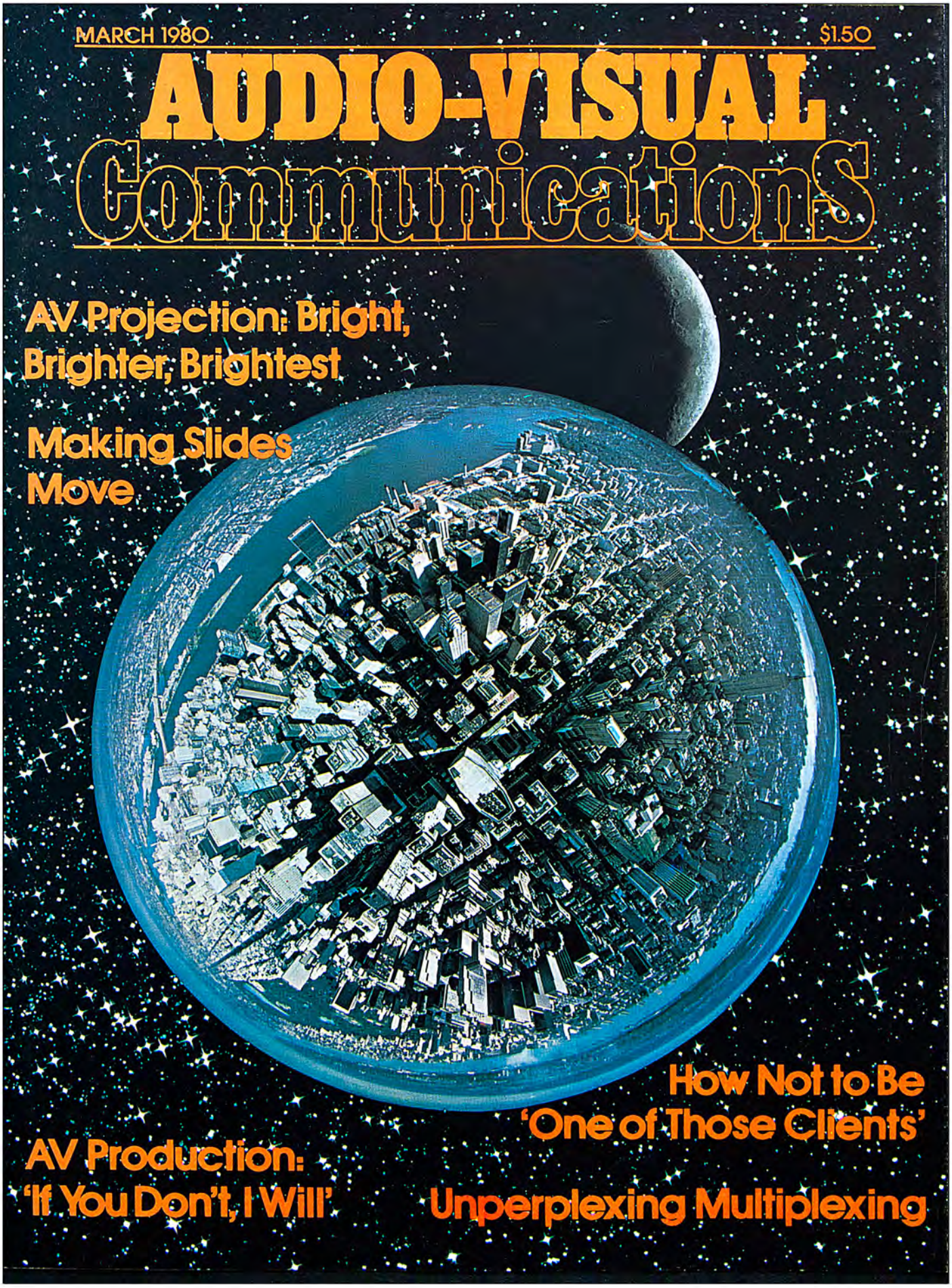
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 11

Fawcett Publishing | The Eternity Brigade | *paperback book cover.*



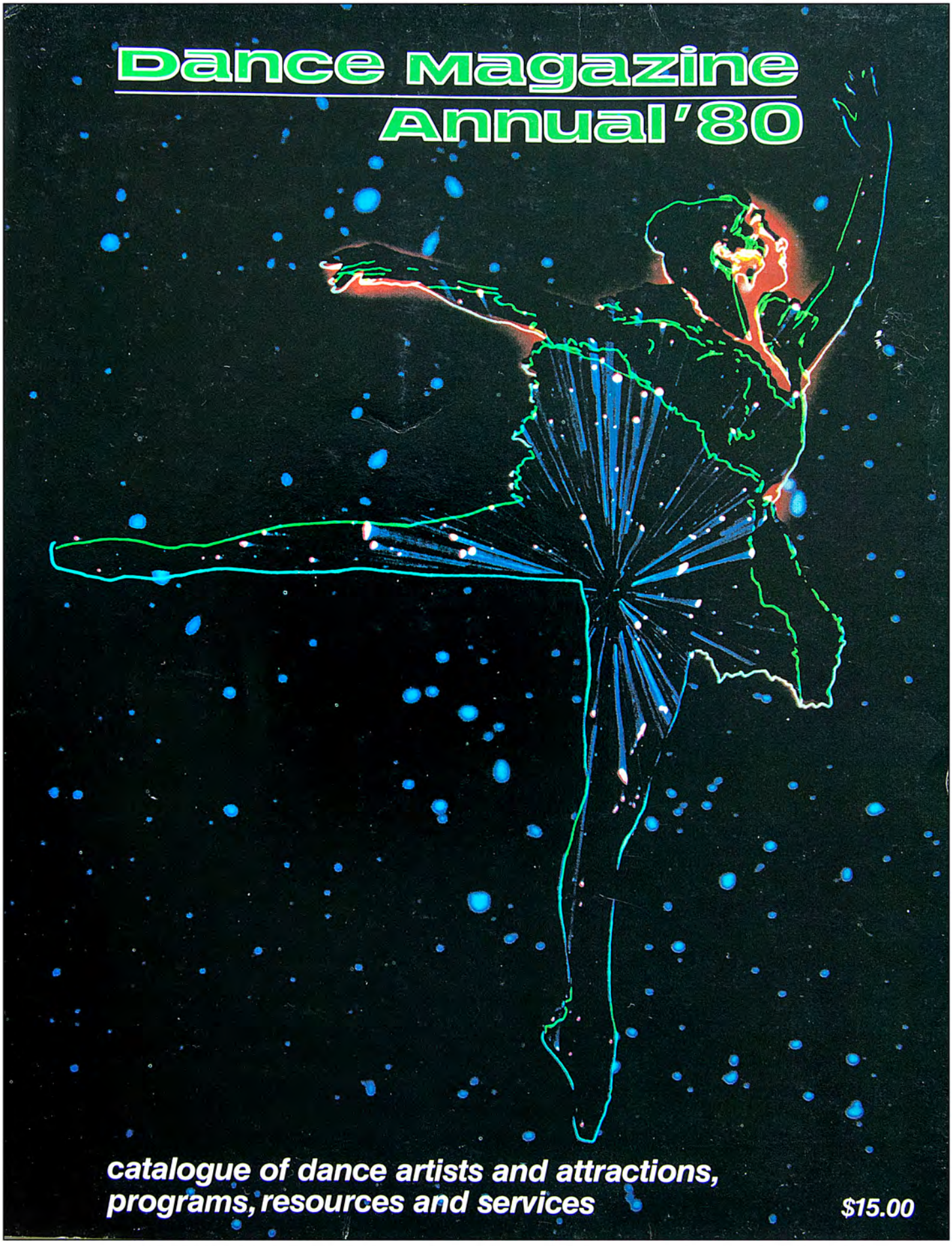
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 12

Berkley Books | Chariots of The Gods | *paperback book cover.*



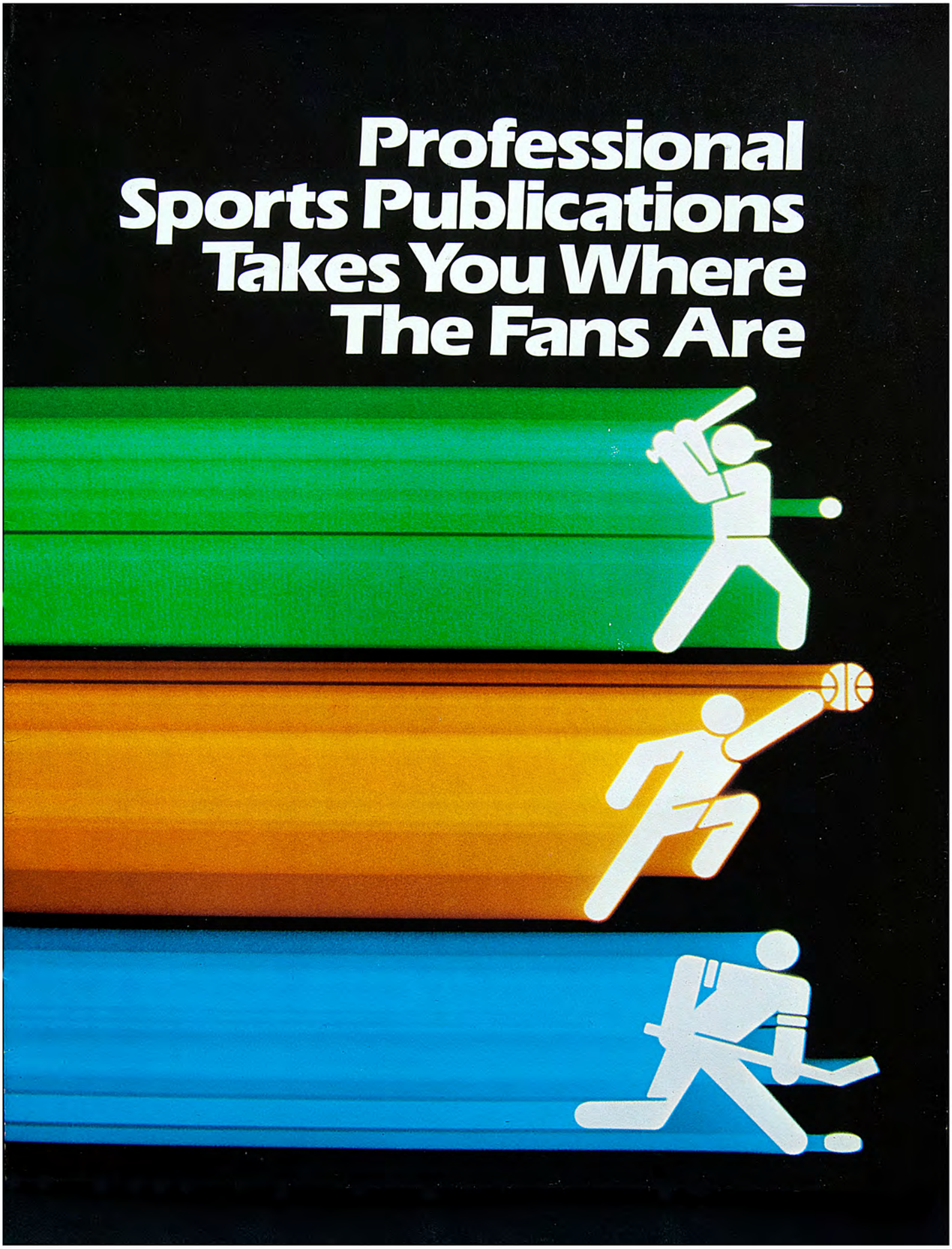
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 13

Audio-Visual Communications | magazine cover | Manhattan Island fisheye by Yours Truly.



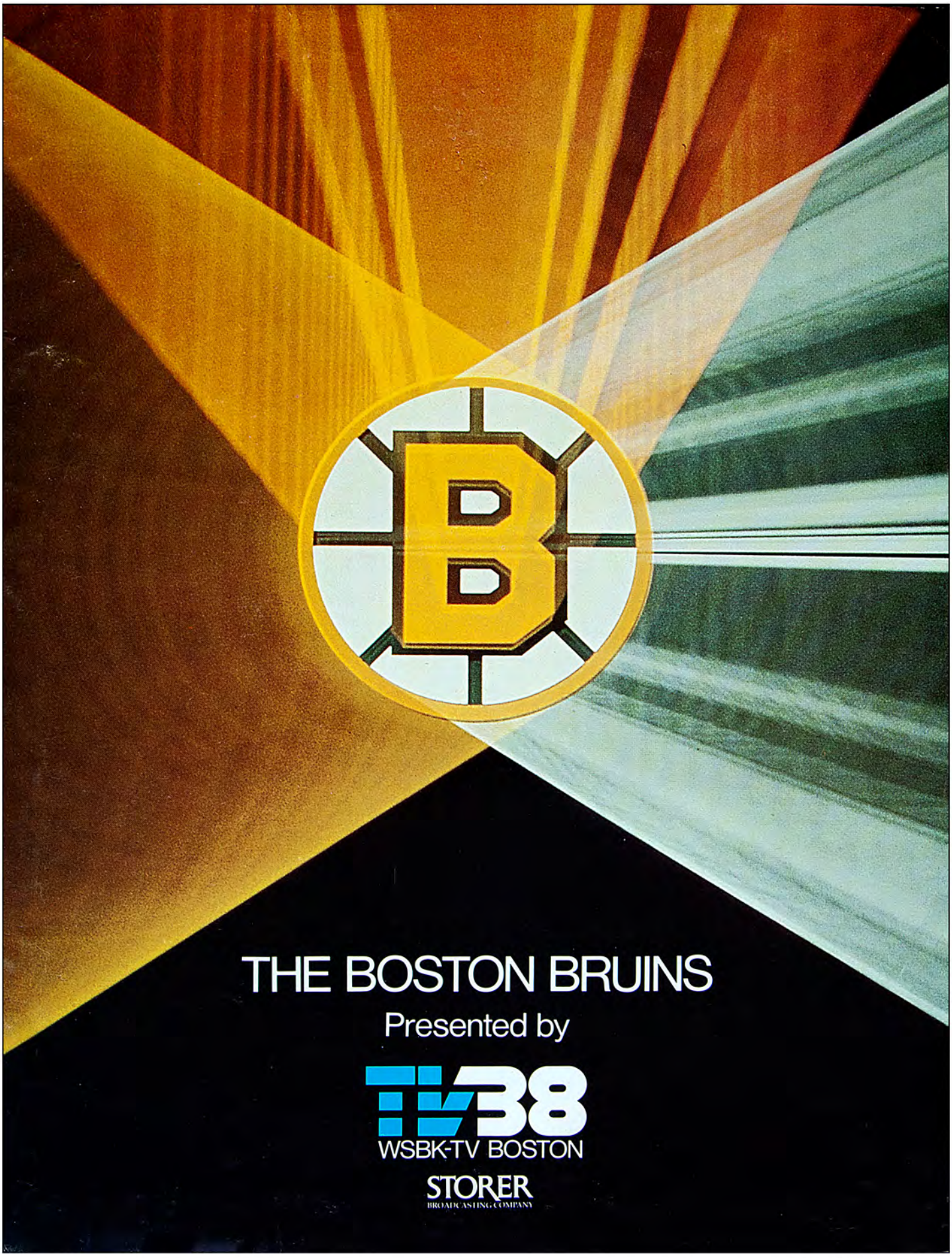
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 14

Dance Magazine | 1980 Annual | magazine cover.



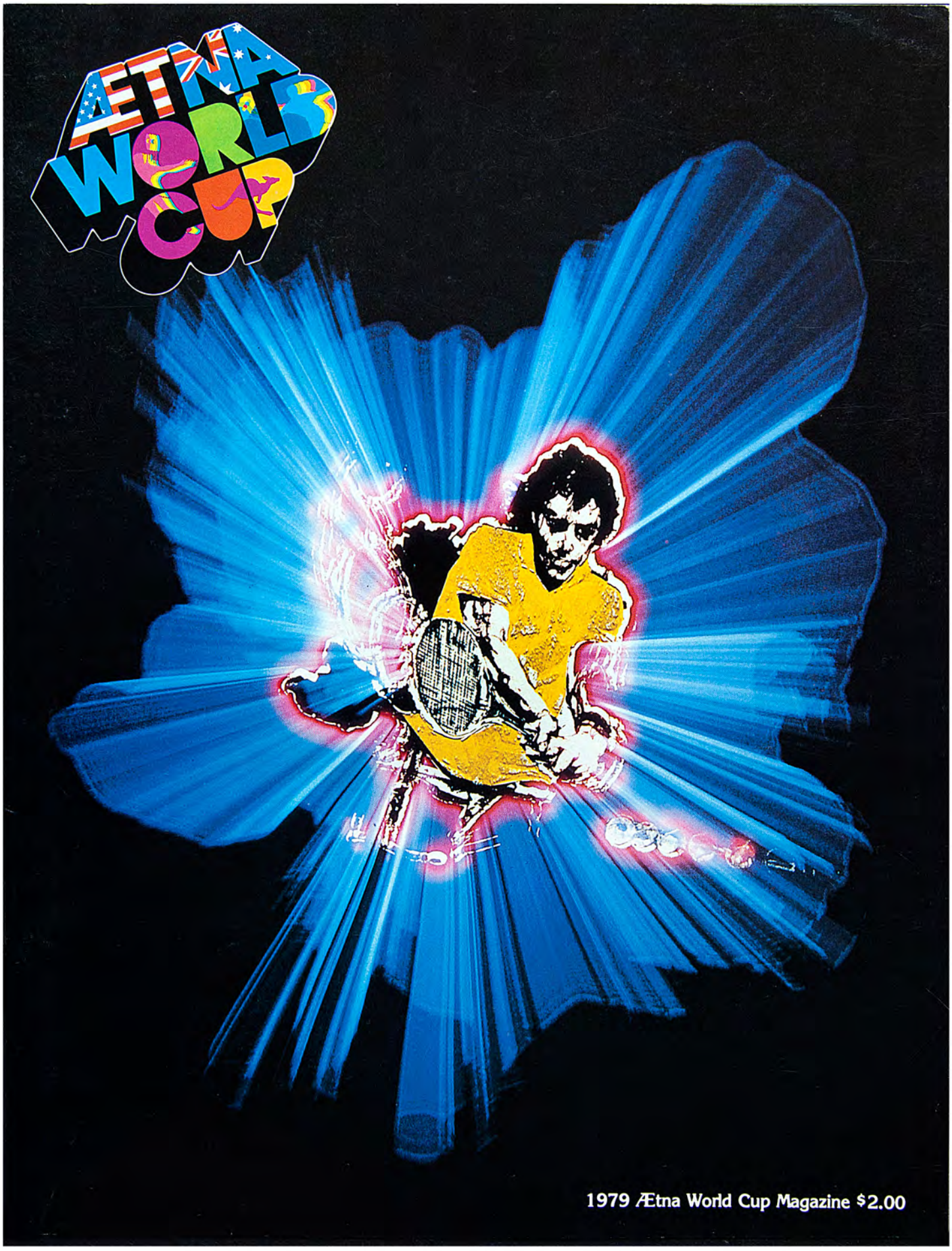
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 15

Professional Sports Publications | brochure cover.



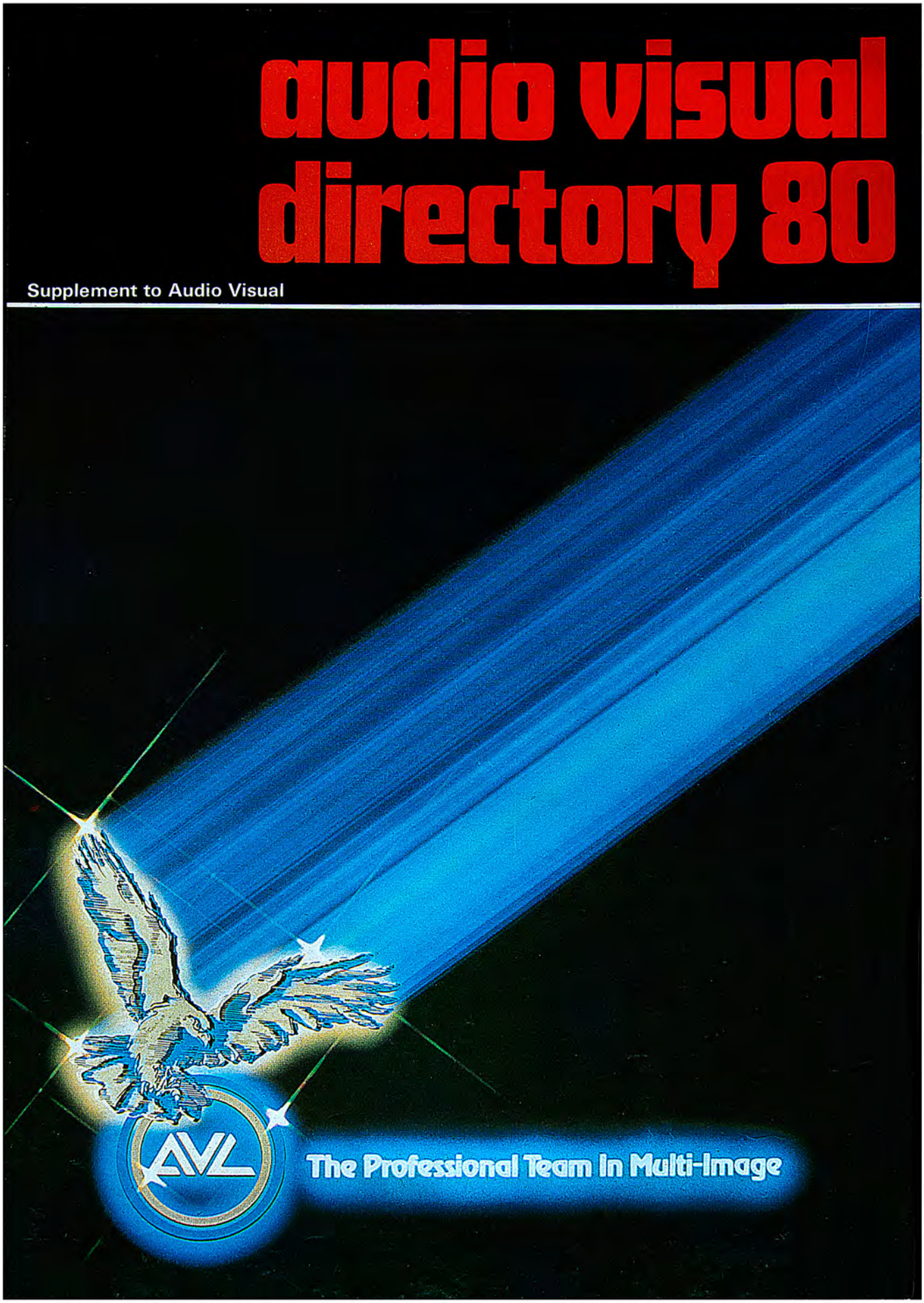
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 16

WSBK-TV | TV38 | Boston Bruins | consumer magazine ad.



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 17

Aetna Life & Casualty | *1*979 World Cup Magazine | *cover.*



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 18

Audio Visual magazine [UK] | AV 80 Show | directory cover.



A Moving Statement

After we bring it all together for you, watch it move–out of your display case and onto your customers' hands.

All of this activity will require little effort on your part, for the hustle and bustle is over when you receive the finished piece: the tasteful designing, the searching for quality stones, the molding of gold, the skillful plying of a master's craft–all the painstaking details have been seen to.

You have only to show it to sell it–because the finest in design was never meant to rest quietly on the shelf.

Van Alst

641 Ave. of Americas, N.Y., N.Y. 10011 (212) 691-1900

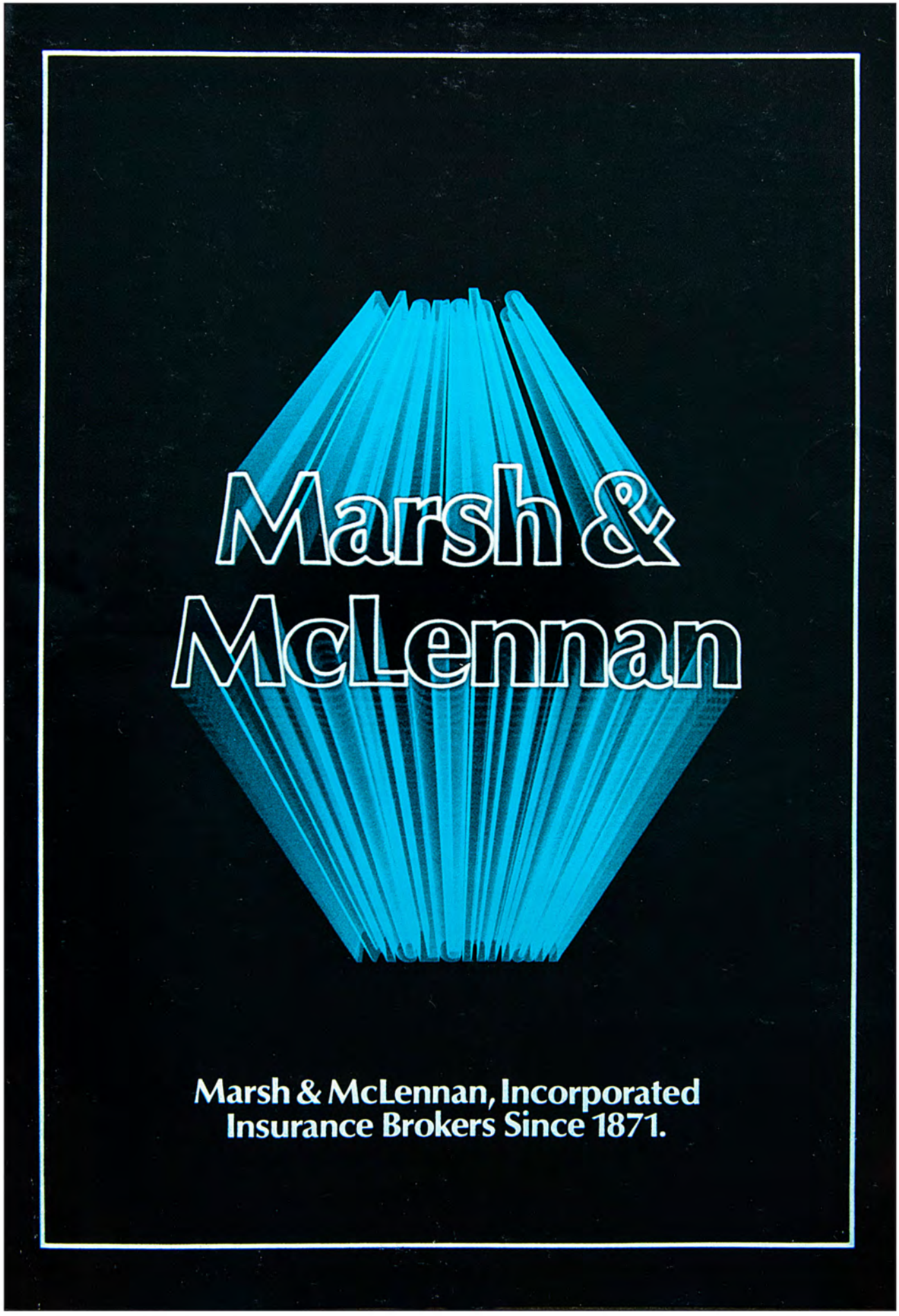
See us at the RJA Show
New York Hilton
Suite 736/737/738/739/740.

Circle No. 190 on Reader Service Card



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 20

Val Alst | RJA Show Directory | trade ad.



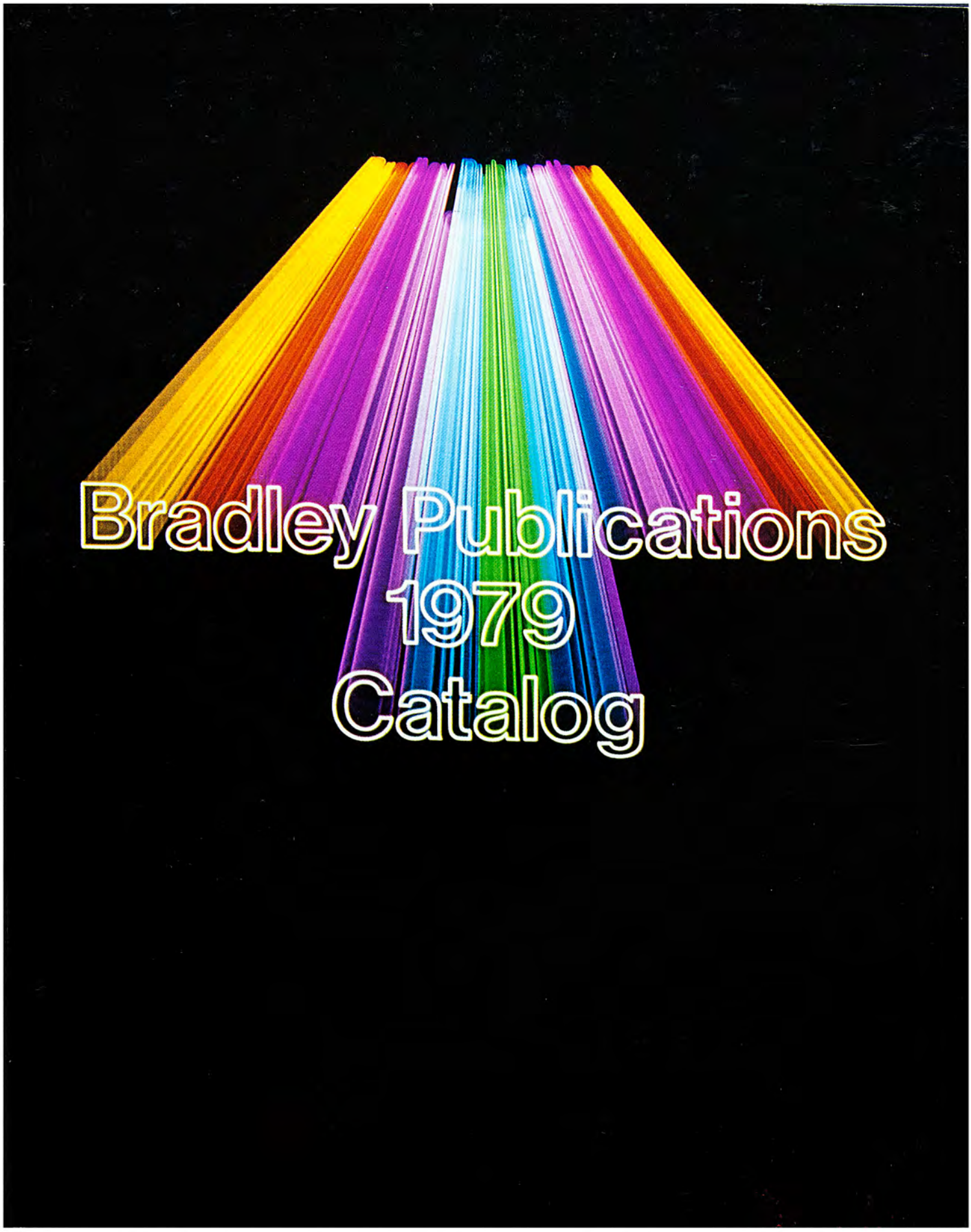
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 21

Marsh & McLennan | annual report cover.

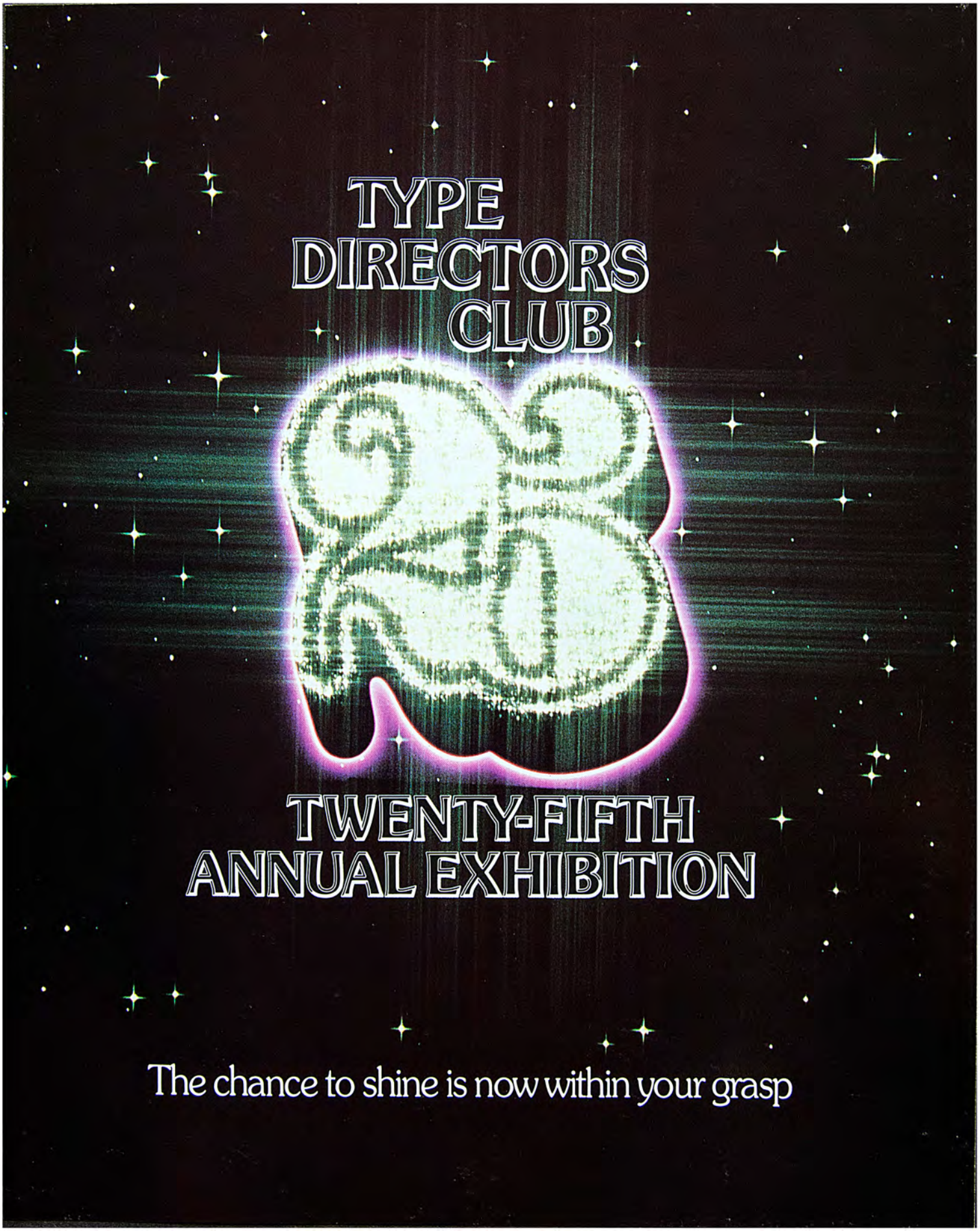


1970s | Incredible Slidemakers Printwork Portfolio | Plate № 22

Fawcett Publishing | package cover.

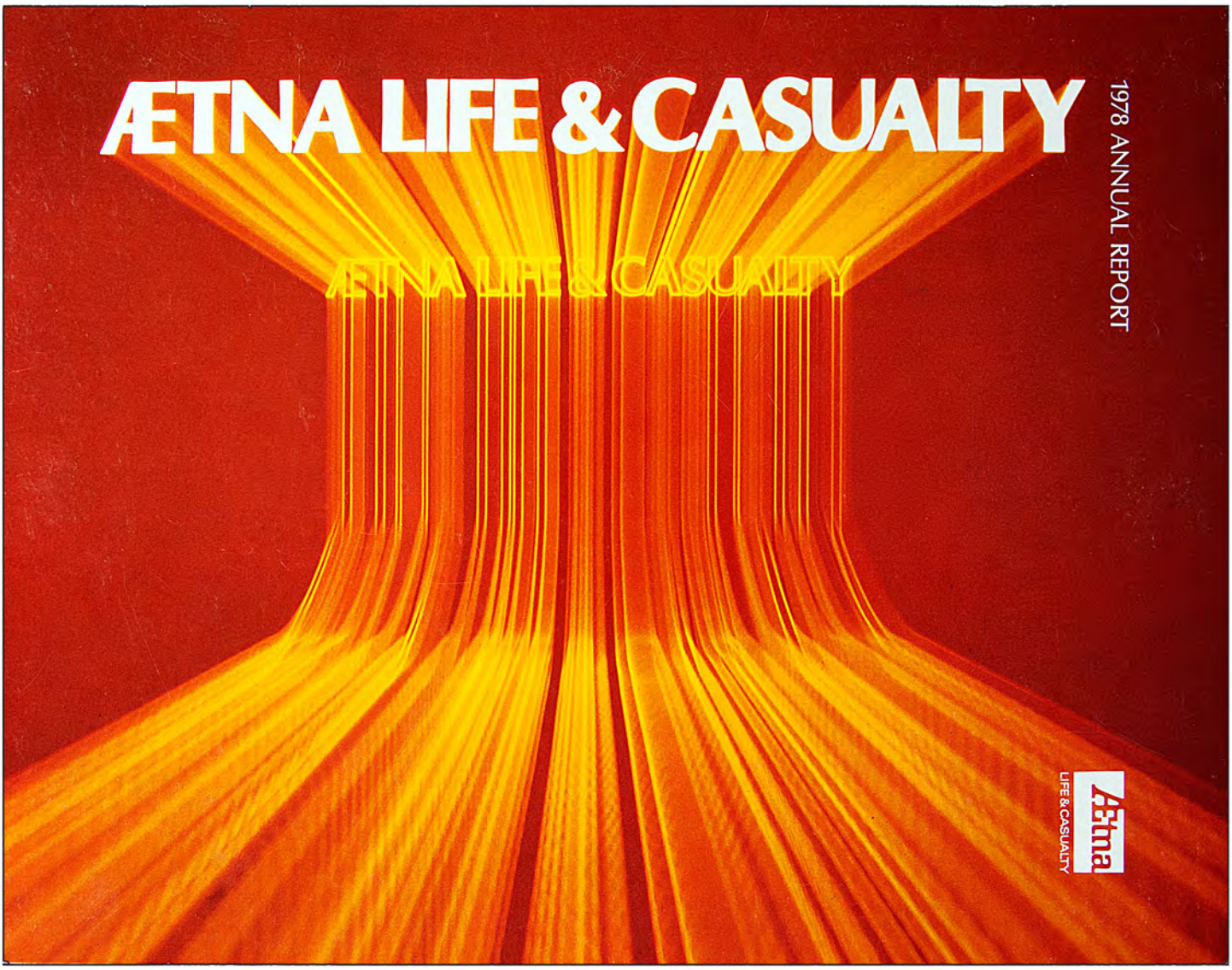


Bradley Publications | catalogue cover.



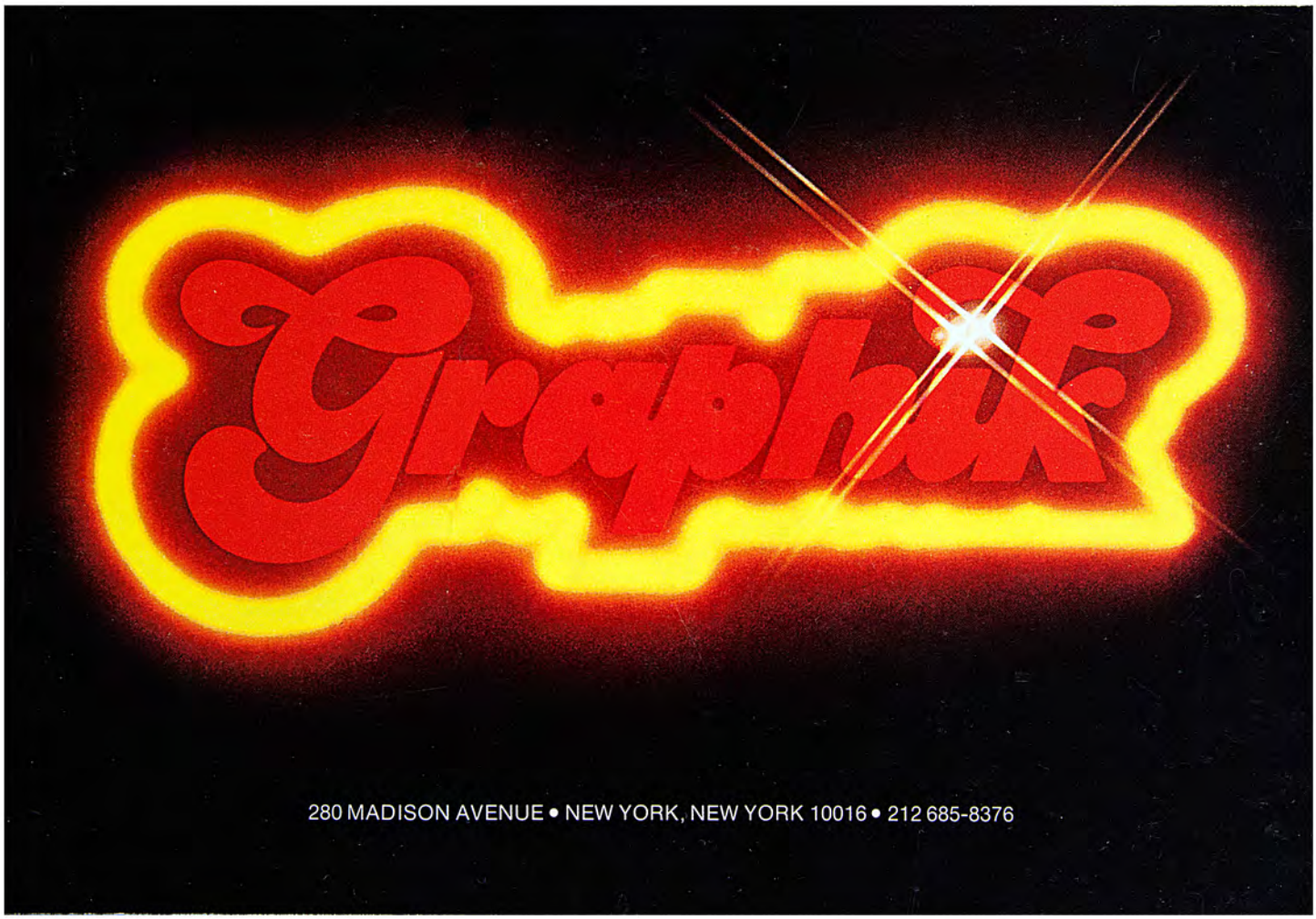
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 24

New York Type Directors Club | 25th Exhibition | invitation cover.

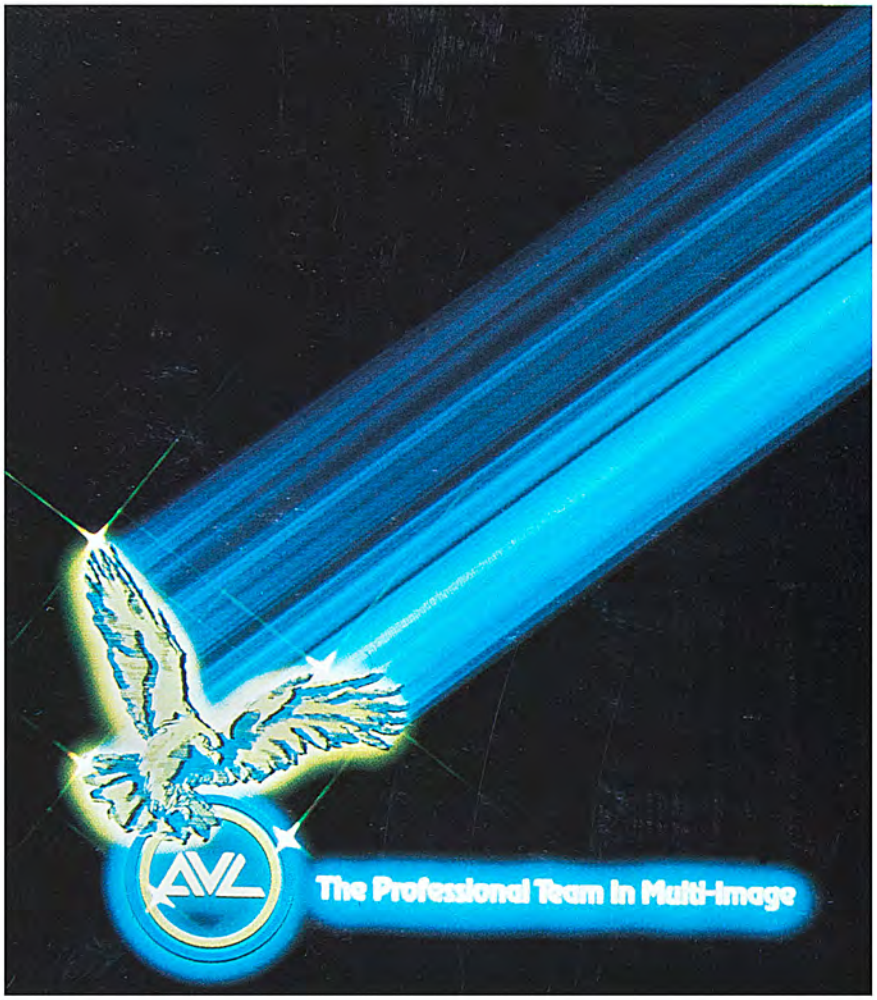


1970s | Incredible Slidemakers Printwork Portfolio | Plate № 25

Aetna Life & Casualty | annual report cover.



Graphik | boutique logo.





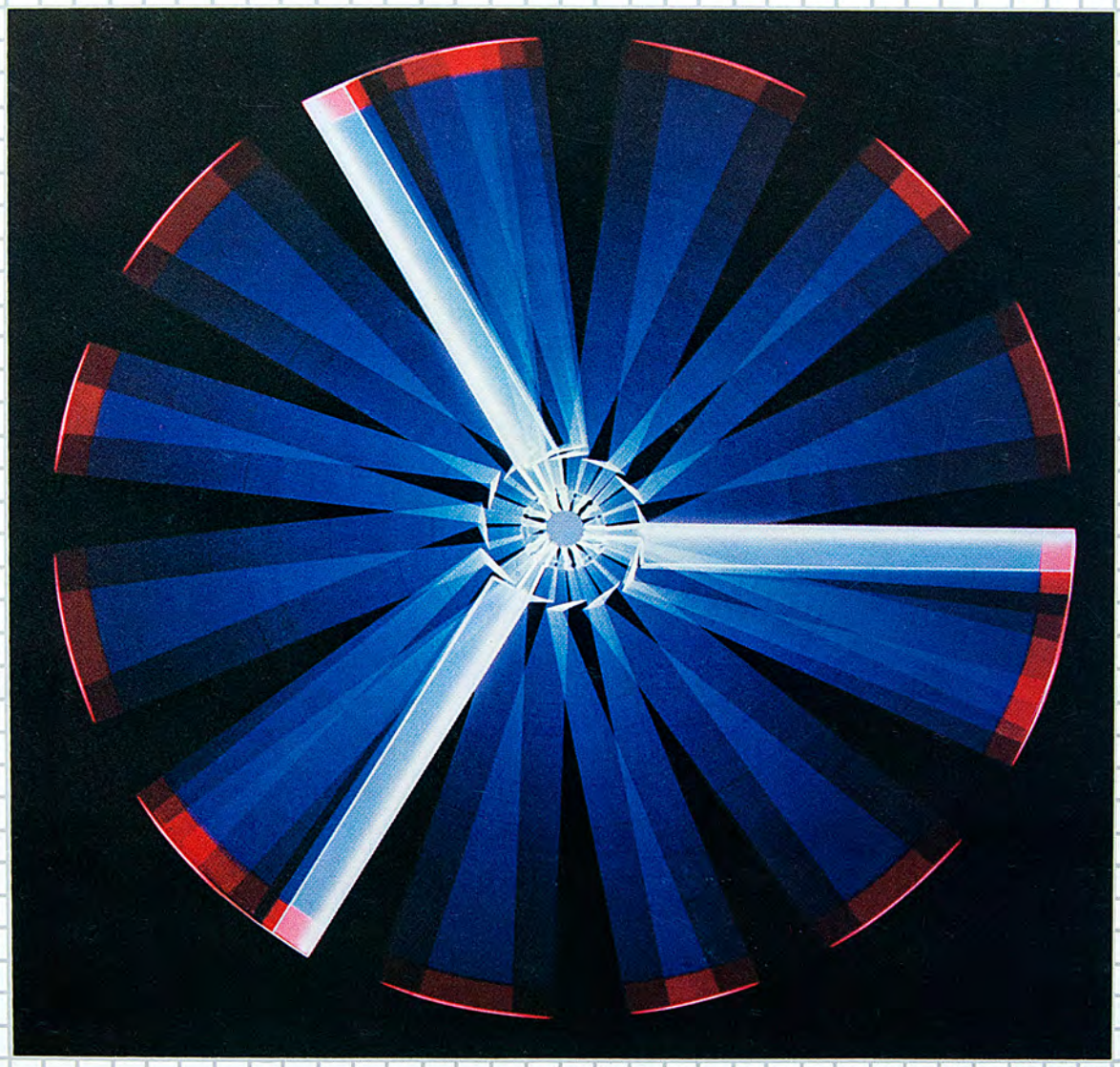
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 27

AVL | Procall Quick Reference Guide | cover.

FRP=PRODUCTIVITY

update

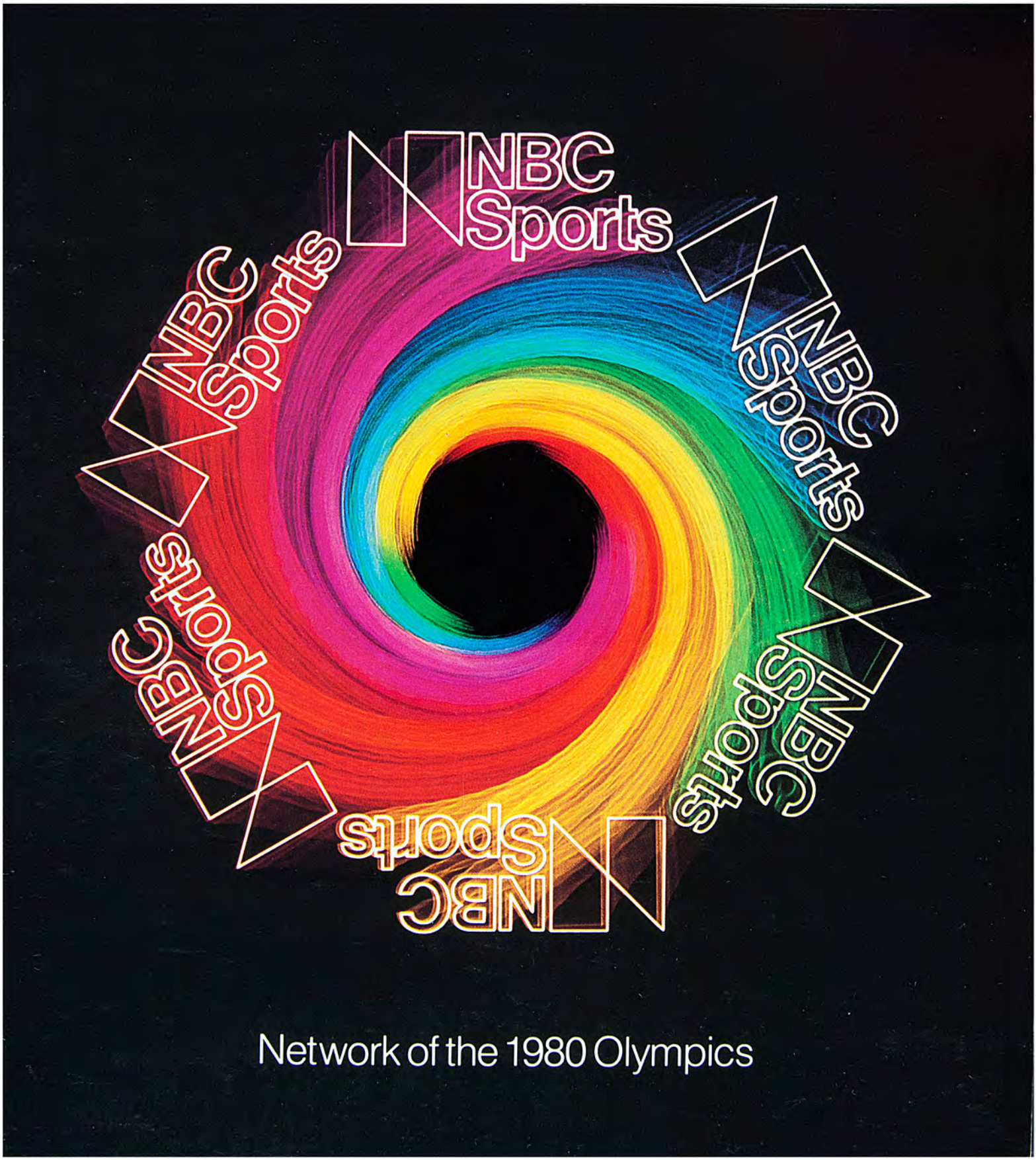
VOLUME ONE/NUMBER EIGHT



OWENS/CORNING FIBERGLAS TRADEMARK

1970s | Incredible Slidemakers Printwork Portfolio | Plate Nº 28

Owens Corning | FRP=Productivity | news magazine cover.



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 29

NBC Television | program directory cover.

Magic Lasers



Magic Lasers® packs a powerhouse of high-technology laser projection capabilities into a surprisingly compact and economical system capable of visually striking laser effects ranging from simple patterns to animated writing, logos, and figure drawing.

The effects can be created in realtime through "joy dials" or programmed and stored on magnetic tape.

Image sizes can be enlarged or reduced to fit virtually any screen size.

The system meets Federal BRH requirements, is warranteed for one year, and comes equipped with a rugged case suitable for air shipping.

$23,995.00

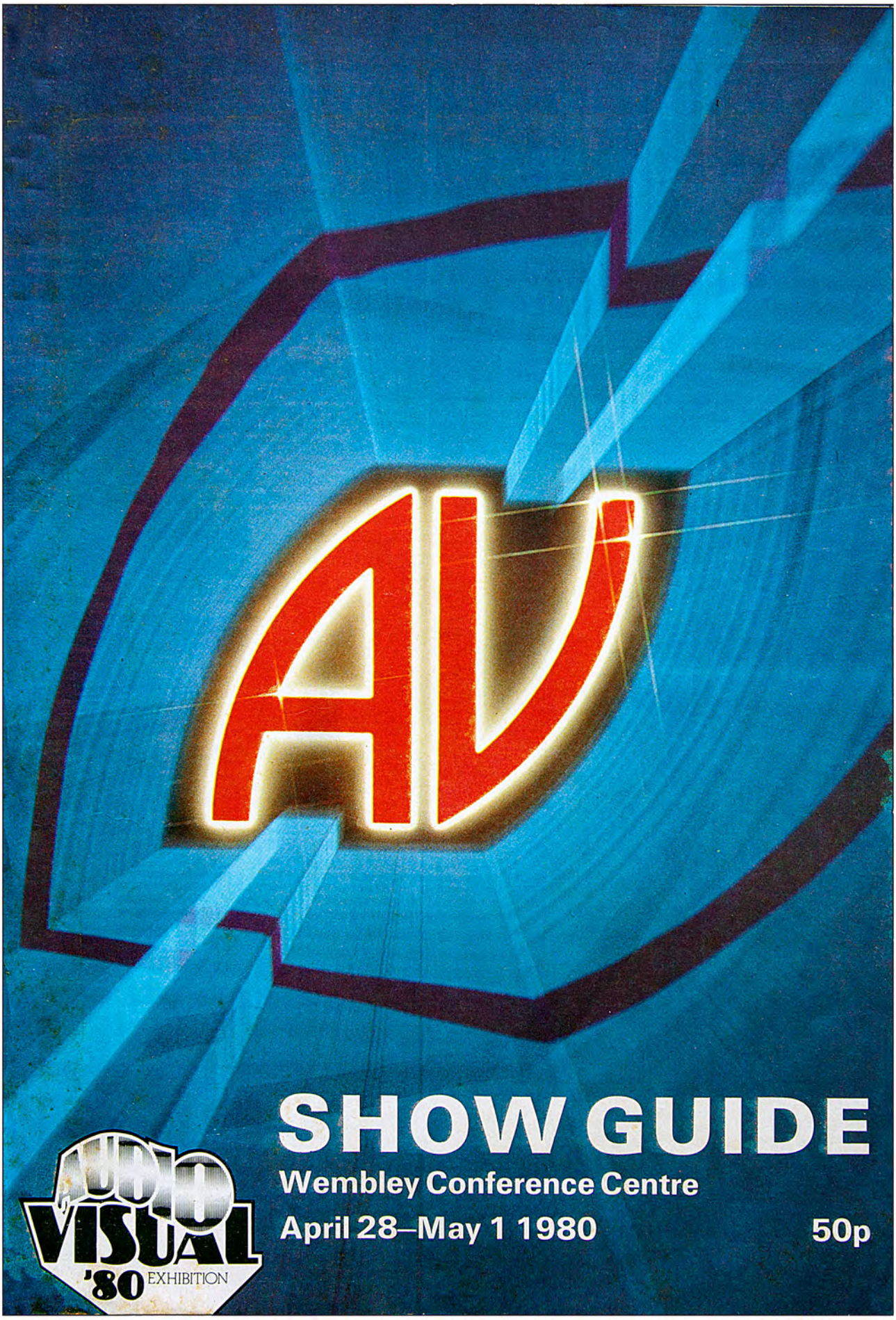
Incredible

The Incredible Products Co./23 East 73rd Street/N.Y. 10021 ***(212) 535-0992***



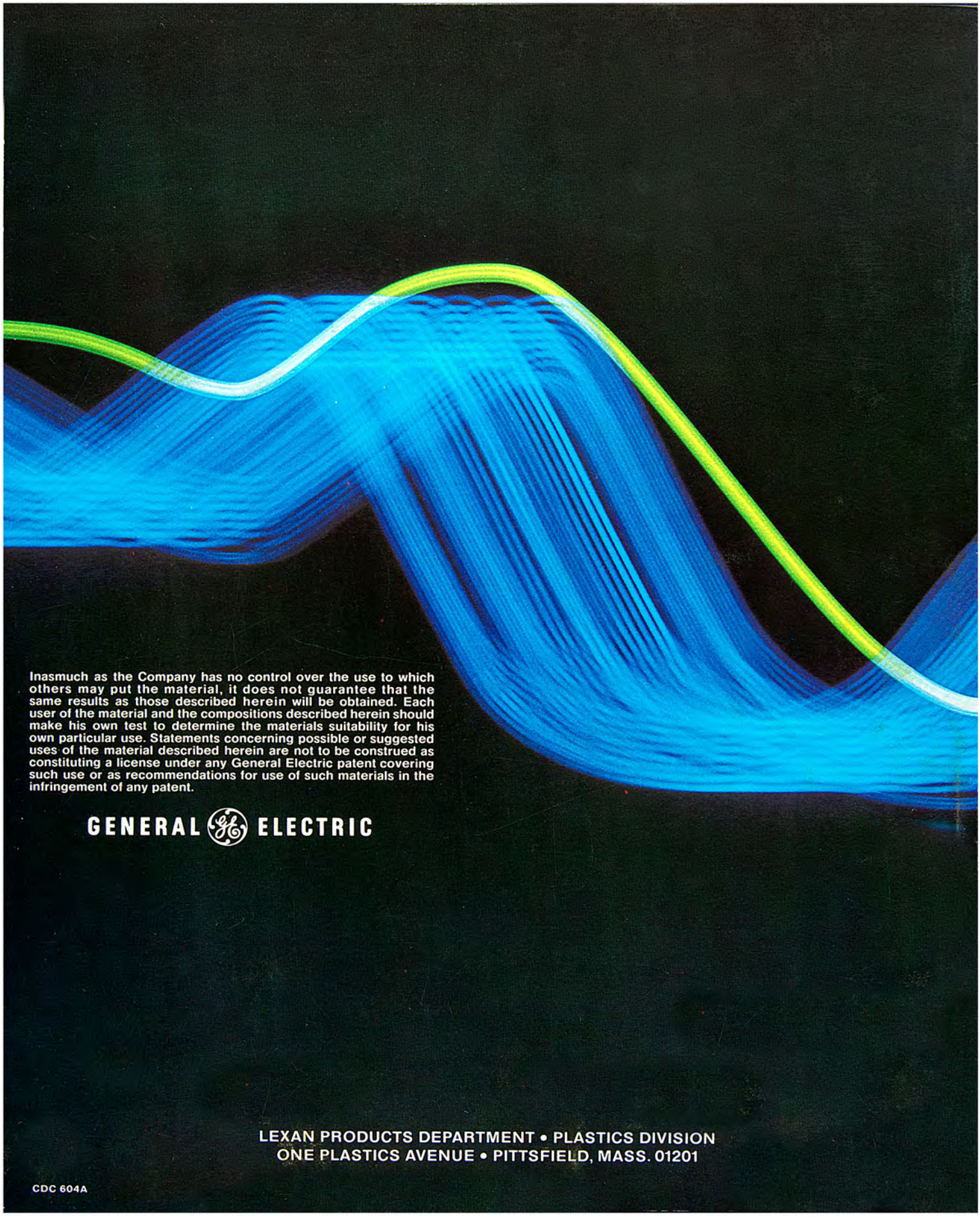
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 31

Incredible Slidemakers | Magic Lasers | *trade magazine ad*



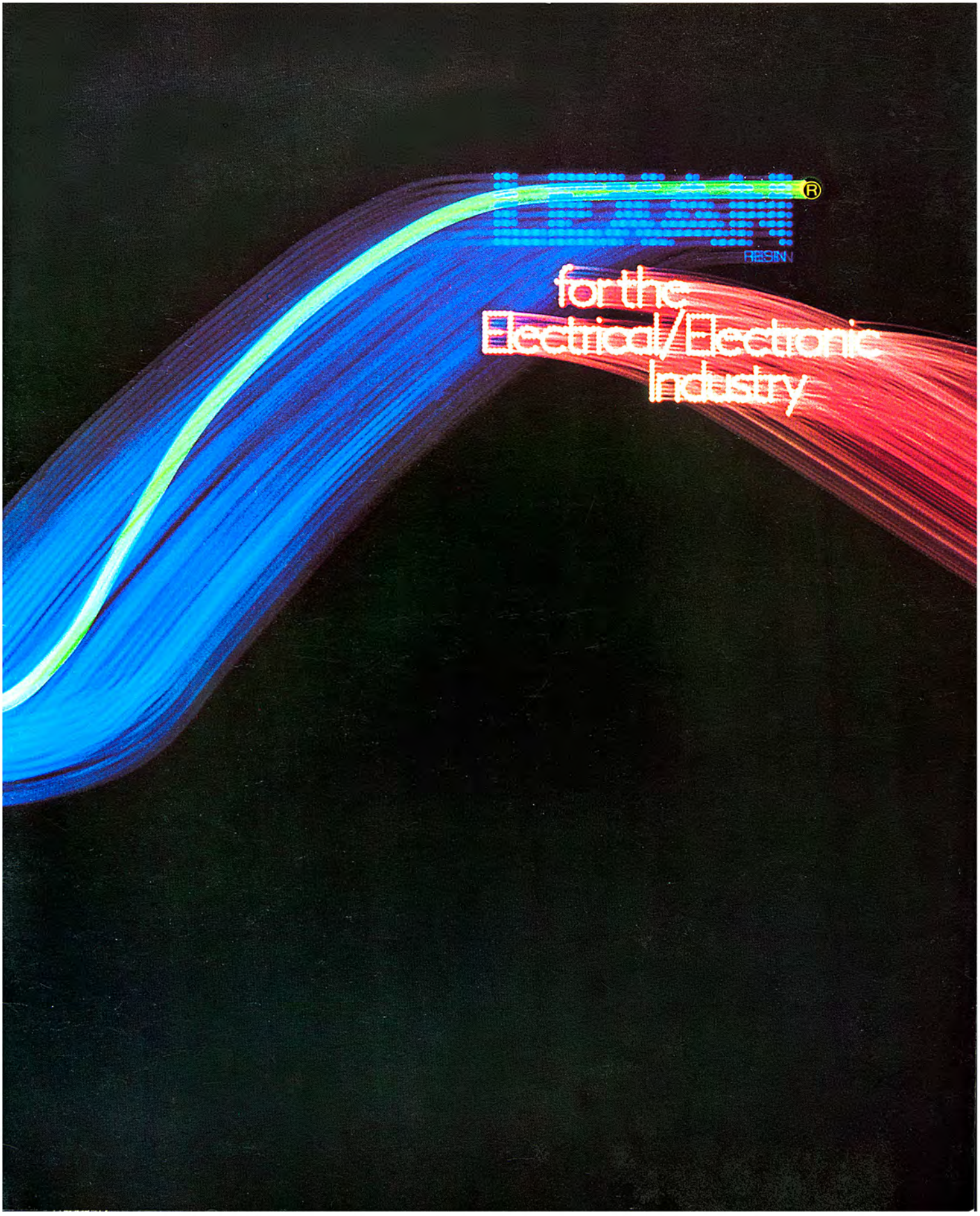
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 32

Audio Visual 80 | show guide cover.



1970s | Incredible Slidemakers Printwork Portfolio | Plate № 33

General Electric | Lexan *Resin \ brochure cover | effects made with fluid stage.*



1970s | Incredible Slidemakers Printwork Portfolio | Plate Nº 34

General Electric | Lexan *Resin \ brochure cover | effects made with fluid stage.*

Properties that satisfy the most demanding design requirements.

PROPERTY	ASTM TEST PROCEDURE	LEXAN STANDARD GRADES 121, 141, 101, 123, 143, 103 RESINS	LEXAN 940 RESIN	LEXAN 500 RESIN	LEXAN 3412 RESIN	LEXAN 3414 RESIN
PHYSICAL						
Specific Gravity	D792	1.20	1.21	1.25	1.35	1.52
Water Absorption % 24 hrs. 73°F	D570	0.15	0.15	0.12	0.16	0.12
Equilibrium 73°F		0.35	0.35	0.31	0.29	0.23
Mold Shrinkage, in./in.	D955	.005-.007	.005-.007	.002-.004	0.002-.003	.001-.002
Transmittance, %	D1003	86-89	85	—	—	—
THERMAL						
Heat Deflection Temp.,°F 264 psi	D648	265	270	288	300	310
Flammability						
UL Standard 94 1/16"	UL94[2]	V-2	V-0[1]	V-0	V-1	V-1
UL Standard 94 1/8"	UL94[2]	V-2	V-0	V-0	V-0	V-0
Oxygen Index	D2863[2]	25.0	35.0	32.5	30.5	30.0
ELECTRICAL						
Dielectric Strength v/mil Short time 1/8"	D149	380	425	450	490	450
Dielectric Constant 60 H	D150	3.17	3.01	3.10	3.17	3.53
10^6 H		2.96	2.96	3.05	3.13	3.48
Power Factor 60 H	D150	0.0009	.0009	.0008	.0009	.0013
10^6 H		0.010	.010	.0075	.0073	.0067
Volume Resistivity ohm-cm 73°F, dry	D150	8.2410^{16}	$>10^{16}$	5.6×10^{16}	4.6×10^{16}	4.0×10^{16}
Arc Resistance, sec Tungsten electrodes	D495	120	120	120	120	120
MECHANICAL						
Tensile Strength, psi Yield	D638	9000	9000	9600	16,000	23,000
Elongation, % Yield		6-8	6-8	8-9	—	—
Rupture		110	90	10-20	4-6	3-5
Flexural Strength, psi	D790	13,500	13,200	15,000	19,000	27,000
Flexural Modulus, psi		340,000	325,000	500,000	800,000	1,400,000
Izod Impact Strength Notched 1/8" ft. lbs./in.	D256	12-16	12	2	2.0	2.5
Unnotched 1/8"		no break	no break	40	19	24
Tensile Impact, ft. lbs./in²	D1822	225-300	250	75	30	35
Falling Dart Impact ft-lbs. 1/8" thick		>125	>125	>75	2.5-5	3-6
Fatigue Strength, psi 205	D671	1000	1000	2000	5000	7000

[1]Opaque only Transparent grade, V-2
[2]This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

LEXAN RESIN

If you've got us in mind, we've got a mind to help!

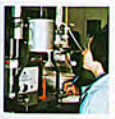
















When you establish a LEXAN resin program, you're never alone. The LEXAN Products Department's technical marketing team will help develop your ideas into finished products by providing the most sophisticated technical support in the plastics industry.

Our design engineers are ready to help with print reviews, feasability analysis and stress-strain calculations. And they can assist in prototyping to demonstrate the optimum use of LEXAN resin in your application. Our agency specialists help you select the correct LEXAN resin grade to meet UL/agency codes.

Our processing engineers can assist your molder in mold design, start-up procedure, and optimum processing conditions.

And when you reach a finished part, our performance specialists will review secondary finishing, assembly, shielding/grounding and electrical performance procedures.

Total support—when you want it. That's how LEXAN resin helps.

If we've convinced you that LEXAN resins can solve some of your design problems, we're not going to stop there. We're ready to help you get into LEXAN resin. Additional publications detailing the full range of LEXAN resin grades, their use in a wide variety of application areas, plus complete technical information are available through your GE Plastics representative or by writing to the LEXAN Products Department at the address shown on the next page.

LEXAN resin's broad combination of engineering properties make it possible for creative designers and engineers to create products which are, at once, functional, practical, economical and aesthetically attractive.

LEXAN resin gives the designer a lot to work with:

- Its high impact strength can mean economical thin wall construction without sacrifice of quality or physicals.
- Its high gloss means attractive appearance.
- Low creep and high fatigue resistance allow clamshell design with integral parts consolidation.
- Its electrical insulation provides for sole support of current-carrying parts without need for additional insulators at additional cost.
- Broad UL recognition allows common designs to readily pass tough agency tests.
- Tight, repeatable tolerances mean LEXAN resin can be designed to replace—and improve upon—the most demanding metal components.

While design, molding and finishing information is available from General Electric Company in detailed brochures and technical specification sheets, the following general design guidelines are presented for your use:

- Design in uniform wall sections, generally between .070"-.125"in thickness.
- Radius all inside corners (.015"minimum) to minimize stress concentration.
- Check the compatibility of oils, grease and other materials that will come in contact with LEXAN resin.
- Design internal ribs and bosses to be 70% of wall thickness to eliminate sinks.
- Use thread-cutting screws for assembly to minimize hoop stress in LEXAN resin bosses.

LEXAN RESIN

It's only limitation is your imagination!



LEXAN resins shrinkage is low and consistent, and as a result it won't warp, bow or bend. It produces tight tolerance parts like connectors no matter where it is gated—unlike crystalline materials. For best results, it is advised to keep all wall sections uniform.



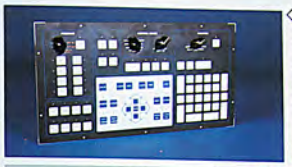
LEXAN resin enables you to use clamshell design to reduce the number and complexity of parts within your product. As a result, you can attach many components—wires, connections, switches, transformers, motors and the like—directly to the LEXAN resin housing, saving component cost and assembly cost. When using clamshell design, it is always advisable to use the same grade of LEXAN resin, and to keep the mating parts of the same general physical size to help insure identical matching dimensions.

When FMI/RFI shielding and grounding is necessary to protect sensitive electronic parts from radio, electronic and electromagnetic interference, LEXAN resin can be metallized through vacuum metallizing, frame spraying, cathode sputtering, silver reduction, painting with metallic paints or applying foils. For specific details on conductivity, economics and performance of grounding/shielding systems, request the LEXAN resin shielding publication.





LEXAN resin's fatigue resistance is dramatically demonstrated in electronic pushbutton assemblies. Designed to deflect from .010" to .030" within LEXAN resin's elastic limits, the pushbuttons can be cycled several million times. These simple yet efficient pushbuttons can be utilized in a wide variety of applications with outstanding durability—from calculators to microwave oven controls to telephones and television selectors.



Control panels molded from LEXAN resin can substantially cut production costs by making it possible to attach switches and controls directly to the panel through one-piece molding. LEDs installed behind silkscreened panels provide illuminated instructions and backlighted effects. Additionally, internal circuitry can be metallized for continuity and elimination of wiring.



Proper design of molded-in hinges can eliminate hardware and assembly by enabling rugged hinges to be molded with the part and assembled at the molding press. They are best designed with generous radii on inside corners and minimal interference fit. In addition, one piece latches can be designed to secure the hinged component when closed.



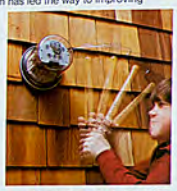
Certain part designs call for the incorporation of metal components—contacts, bearing assemblies, machined guides, other special metal inserts—and these can be attached to LEXAN resin parts by ultrasonic welding, heat-staking, molding-in-place or even secondary assembly. The point is LEXAN resin is as versatile as your designs need to be.

General Electric | Lexan *Resin \ brochure interior | effects made with fluid stage.*

LEXAN RESIN

Over the last two decades, LEXAN resin has been used with great success to replace metals in a wide variety of applications, from internal assemblies to external housings.

With impact strength four times greater than die-cast metal, lighter weight, a unique combination of vital engineering properties, plus lower overall cost, LEXAN resin has led the way to improving thousands of products. Like metal, LEXAN resin is dimensionally stable with tight, consistent dimensions, part after part. Its excellent heat resistance allows it to be used under the most difficult conditions while still holding its shape and retaining functionality.



Unlike metal, LEXAN resin won't rust, chip, oxidize or peel, and its rich, glossy molded-in colors eliminate the need for painting. LEXAN is also a natural electrical insulator, making it the perfect choice for so many electrical/electronic applications.

LEXAN resins flammability characteristics qualify it for many tough uses. Its broad agency recognition helps assure its success.

While die-cast metals and sheet metals historically have been specified where tight tolerances are critical, glass-reinforced grades of LEXAN resin are now providing a better alternative. Engineers, in fact, are finding that with today's tooling and processing technology, LEXAN resin's dimensional stability is more consistent and more repeatable than can be obtained through die casting or sheet metal fabrication.

PROPERTY	LEXAN RESIN	LEXAN 500 RESIN	ALUMINUM	ZINC
LEXAN HAS THE ADVANTAGE				
SPECIFIC GRAVITY	1.20	1.25	2.73	7.13
TENSILE STRENGTH psi x 10^3	9.0	9.6	8-26	10-25
IZOD IMPACT STRENGTH ft. lbs. per in. notch	16	2	4	4.3
COEFFICIENT THERMAL EXPANSION in. /in. °F x 10^{-5}	3.75	1.79	1.3	1.5
HEAT DEFLECTION TEMPERATURE °F at 66 psi °F at 264 psi	280 270	295 288	600 NA	210 200
UL CONTINUOUS USE TEMPERATURE °C	115	115	NA	100
FLEXURAL MODULUS psi x 10^5	3.4	5	100	60
% LOSS FLEXURAL MODULUS 2000 psi 1000 hrs. 73°F	16%	10%	NA	20%
% LOSS TENSILE STRENGTH 2000 psi at 200°F	18%	10%	NA	50%
DIELECTRIC STRENGTH VOLTS PER MIL	380	450	Conductor	Conductor
U.L. STANDARD 94 RATING	94V-2	94V-0		
CLARITY				
GLOSS				

DIMENSIONAL STABILITY COMPARISON CHART

PROPERTY	LEXAN 500	LEXAN 3413	DIE-CAST ALUMINUM	SHEET METAL FABRICATION	MACHINED STEEL
DESIGN TOLERANCES (in./in.)	± .002	± .0015	± .002	± .005	± .0001
REPEATABLE TOLERANCES (in./in.)	± .001	± .0005	± .001	± .005	± .0001
THERMAL EXPANSION (10^{-5} in./in. °F)	3.4	1.8	1.2	.8	.6

LEXAN 3413 resin (30% glass reinforced) can be designed to ±.0015 in./in. over six to 12-inch spans; however, repeatable tolerances from shot to shot and run to run under controlled conditions can be as low as ±.0005, a value tighter than that of die-cast aluminum or zinc and considerably tighter than that of sheet metal.

When tolerances tighter than ±.0005 in./in. are desirable, they can be achieved only through machining. Many times, however, machined stock—typewriter carriage index bars for example—can be fastened to frames molded from LEXAN resin to achieve the economics of LEXAN resin with the tolerances of a machined part.

Because LEXAN resin is non-conductive, it does not suffer from thermal conductivity expansion like metal under short-term operating exposures. As a result it can outperform most metals on an equivalent scale throughout a wide range of operating temperatures.

A metal replacement material that's stronger, lighter and more economical than metal.

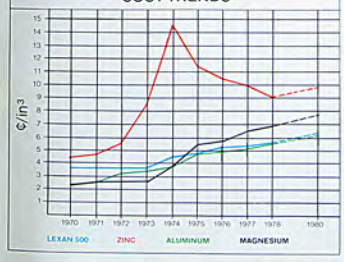






Of course, in switching from metal to LEXAN resin many designers will want the assurance of prototyping to evaluate the performance of finished parts. And, in this area, too, LEXAN resin excels, for it can be molded in existing die-cast tooling following a quick, simple and inexpensive conversion of the tool. It enables you to produce an almost unlimited number of dimensionally accurate molded parts for specific evaluation. And at the conclusion of testing, the tool can be returned to its original condition, without damage, for continued die-cast production.

COST TRENDS



ENERGY EXPENDITURES

	Lexan	Zinc	Aluminum	Magnesium
Density, lb./cu. in.	.043	.240	.097	.065
Energy Consumption, BTU/lb.	71,000	26,500	61,800	156,900
Energy Consumption, BTU/cu. in.	3,050	6,360	6,000	10,200
Energy Ratio Consumption, (LEXAN = 1)	1.0	2.1	2.0	3.3

Most important, LEXAN resin costs less than metal. Less in its raw material form. Less to process. Less to arrive at a finished product.

In fact, LEXAN resin's cost position vs. metals can only improve, for two key reasons. First and foremost, die-cast metals—zinc, aluminum and magnesium—once abundantly available, now face critical long-term supply problems, adding upward cost pressure. Second, metals consume twice as much energy to produce and twice as much energy to process than LEXAN resin. So as long as energy costs continue to rise, and they will, LEXAN resin's advantage can only increase.

LEXAN RESIN

LEXAN 940 resin replaces metal in CRT terminal shrouds because LEXAN resin's light weight combined with high impact strength saves 1/2 the weight while providing equivalent durability. Additionally, its high heat distortion temperature enables it to survive even the most severe overload tests.



Electrical switches use LEXAN 940 resin for its flammability rating and low moisture absorption. But the fact is, LEXAN 940 resin's insulative properties mean an added bonus: wiring can be terminated directly to the LEXAN resin body, eliminating the need for extra parts assembly.



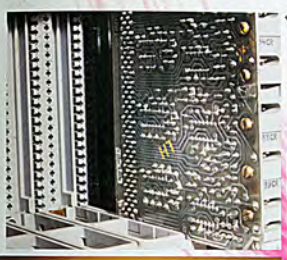
Exit signs, molded from LEXAN 143 resin in translucent colors, are vandal-proof. The end caps also can be of LEXAN resin, making the sign 100% rustproof. And, of course, LEXAN resin is stable to ultraviolet exposure.





LEXAN 143 resin replaces magnesium in railway signal/housings and greatly lowers the final product cost. It can't dent, won't rust, and resists impact abuse even at sub-freezing temperatures. Lens and housing are molded as one unit using a second surface finishing technique to achieve the required opacity for the housing.

Engineering properties to meet today's toughest applications.



LEXAN 940 resin replaces die-cast aluminum in card racks and back panels with greater functionality at lower cost. Its thin-walled rigidity characteristics end sagging problems and provide lighter weight and corrosion-resistance. Its insulative factors also result in a better product —425 volts/mil dielectric strength and 255 volts IEC Continuous Tracking Index. And with 940 resin's superior impact strength, it is able to handle the 100 pounds per square inch connector insertion force necessary for this job.



LEXAN 940 resin is specified for TV crystals because in addition to its flammability rating, its insulation factors allow the controls to be directly mounted to the crystals, saving parts and assembly costs.



Outdoor junction boxes depend on LEXAN resins low temperature impact strength (to −40°C) to withstand day-to-day rugged use. And LEXAN resins UV-resistance means solid performance for more than 15 years of exposure. Of course you expect corrosion resistance, molded-in color, excellent electrical insulation and agency recognition (in this case UL 94 V-2); that's all part of LEXAN resin's contribution to the industry.



LEXAN 500 resin provides new design avenues in data transmission modems. LEXAN's clamshell design facilitates functional support of the components while providing metal-like rigidity at .090" thickness. The UL 94 V-0 rating allows the unit to be plugged directly into a standard 110 volt wall outlet and telephone circuit.

LEXAN 940 resin proves its versatility in the computer room. With a 270°F heat deflection temperature and a UL 94 V-0 rating, it provides for distortion-free, rust-proof computer grills. 940's easy flow and release properties eliminate processing problems, too.



In hospitals where a UL 94 V-0 rating is important, LEXAN 940 resin fills the bill for plugs and receptacles. Crystal clarity aids electrical inspection.



LEXAN 141 resin, in disk-packs, provides several advantages over other materials. Rich, molded-in colors allow for easy color coding and aesthetic appeal. High impact strength and dent resistance prevent costly damage from dropping accidents. LEXAN 141 resin holds tight tolerances and maintains flatness for extra-tight seals. A UL 94 V-2 rating meets industry standards.





For the designer of electrical wiring devices, LEXAN 940 or LEXAN 141 resins easily surpass traditional materials. With outstanding strength for rugged applications, molded-in color for easy identification, excellent dielectric strength and arc properties, LEXAN resin is a natural. And both grades are UL approved for hospital use at 110 or 220 volts. Crystal clarity makes continuity checking fast and simple, and low moisture absorption makes for outstanding outdoor properties.



Telecommunication protector blocks of LEXAN 940 resin offer high impact strength for automatic wire wrapping, tight consistently repeatable tolerances, and a 270°F. heat distortion temperature. LEXAN's outstanding creep resistance helps hold the contacts where they belong, and its oxygen index of 35 and UL 94 rating of V-0 meet industry standards.





Projector frames are being designed in glass-filled LEXAN 3412 resin

Disk-pack covers of LEXAN 141 resin demonstrate greater cost efficiency, superior impact strength to protect vital contents, glass-like transparency, and a UL 94 rating of V-2.

The cost efficiency factor is hard to ignore—half the cost of die-cast aluminum. Performance? Lexan 3412 resin boasts tight, repeatable tolerances that surpass die-cast aluminum's by far, a UL 94 rating of V-1, excellent creep resistance, and, where optimum performance is a must, a 290°F. heat deflection rating.

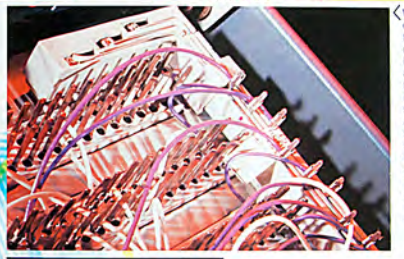
Projector housings of LEXAN 500 resin exceed UL requirements with a UL 94 rating of V-0. LEXAN 500's low creep and high fatigue resistance, outstanding thin-walled rigidity and dimensional stability help keep delicate internal parts accurately in place, help maintain consistent focus. And the 280°F. heat distortion rating survives the heat of projection lamps.







What traditional material offers the kind of advantages that LEXAN 940 resin gives terminal boards? Built-in dielectric strength and arc resistance make them excellent natural insulators. Superior dimensional stability makes automatic wire-wrapping simple, and high impact strength makes them virtually indestructible. In addition, they feature low moisture absorption necessary for consistency in electrical functions, and a UL 94 V-0 rating.





LEXAN 103 resin provides meter covers with the ability to survive over 15 years in direct sunlight, as well as transparency equal to glass for quick inspections. And they retain 75% of normal impact strength at temperatures as low as −40°C.

LEXAN® RESIN

Versatility. Functionality. Aesthetics.

LEXAN® RESIN

A complete family of resins allows complete freedom for functional design.

LEXAN resin keeps pace with industry's continually-developing technology. In fact, there are now over a dozen different grades of LEXAN resin suited to a variety of different applications. The following grades are those best suited for electrical/electronics designs.



For the best combination of the most necessary physical properties, choose standard grades of LEXAN resin. These resins boast a combination of the highest attainable impact strength, crystal clarity or brilliant molded-in colors. They're corrosion-resistant, and offer superb outdoor weatherability, low moisture absorption, dimensional stability and a UL 94 rating of V-2. The combination of this wide variety of properties makes standard LEXAN resins the logical choice for wiring devices, meter covers, disc-packs, and a multitude of other external applications.





For extra-tight dimensional specifications and 300° heat resistance, choose glass-reinforced LEXAN 3412, 3413, or 3414 resins. These resins are 20, 30 and 40% glass reinforced, respectively. As a result, they offer high tensile strength and flexural modulus as well as the tightest repeatable dimensions for die-cast and sheet metal replacement applications. These resins are unsurpassed for use in frames and bases needing metal-like tolerances, and offer the designer a UL 94 rating of V-1.



For high modulus high impact requirements, choose LEXAN 500 resin. Without a doubt, the best choice for metal replacement, it works well under rugged outdoor conditions, such as cable spacers, and, with its UL 94 rating of V-0 and 280°F. heat distortion limit, it works equally well internally as a functional chassis, frame or support.

For optimum flammability characteristics, choose LEXAN 940 resin. With its UL V-0 rating (per Standard 94), an Oxygen Index of 35 and a UL continuous use rating of 110°C., LEXAN 940 resin presents the perfect materials choice for functional internal parts, such as connectors, terminals, plugs and receptacles. Moreover, its metal-like performance and outstanding processability make it ideal for external shrouds and panels for business machines, where aesthetics are important.



For large-part rigidity, choose foamable LEXAN resin which combines a UL 94 rating of V-0 with high structural rigidity for substantial design freedom as applied to large work stations, peripheral panels or communications repeater housings like the one shown here. Foamable LEXAN FL-1800 resin extends foamable plastics to computer room applications containing greater than ten square feet of exposed surface area. LEXAN FL-1800 easily exceeds the requirements of UL 478 with a radiant panel rating of less than 25.



LEXAN special grade resins

New Release Agent
All LEXAN resins are now available in a new, non-silicone mold release grade. The release agent won't interfere with electrical contacts or terminals and aids processing and flow.

Extrusion Grades
LEXAN 150 grades exhibit exceptional hot melt strength and are especially suited for blow molding or extrusion processing.

U.V.-Stabilized Grades
The entire line of LEXAN resins is available in U.V.-stabilized grades for outdoor and lighting applications. U.V.-stabilized grades will withstand in excess of 10 years' continuous exposure without sacrificing properties.

LEXAN 2814 Resin
A specially formulated grade, LEXAN 2814 resin is made to surpass the UL 478 radiant panel requirements for applications that demand higher flammability ratings for computer room environments with a radiant panel rating of less than 15.

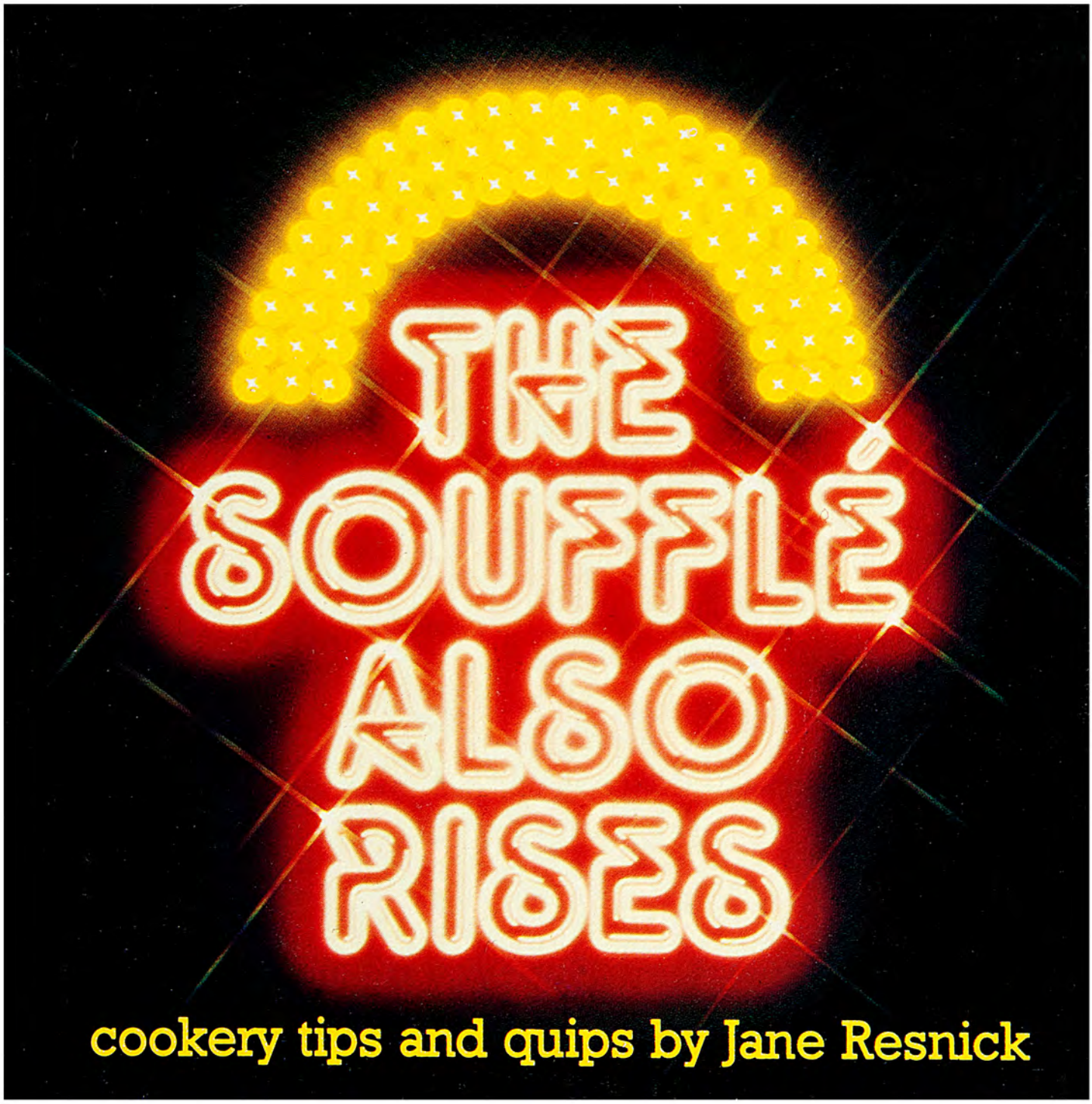
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 37

General Electric | Lexan *Resin \ brochure interior | effects made with fluid stage.*



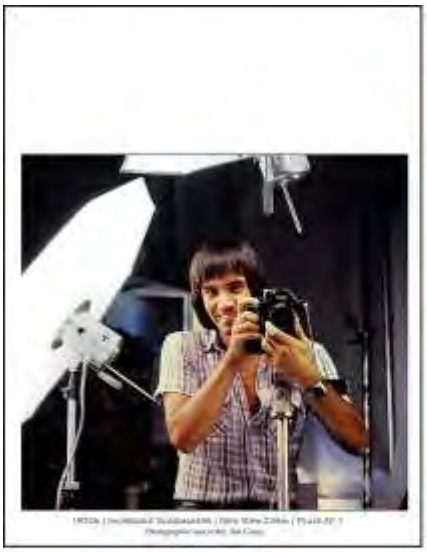
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 38

Sony | Compact Stereo | brochure.



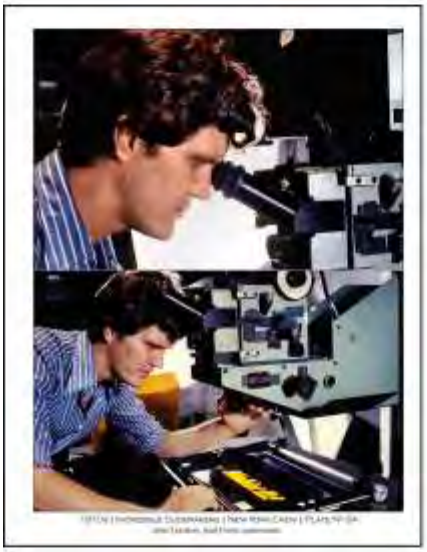
1970s | Incredible Slidemakers Printwork Portfolio | Plate № 39

Jane Resnick | book cover.









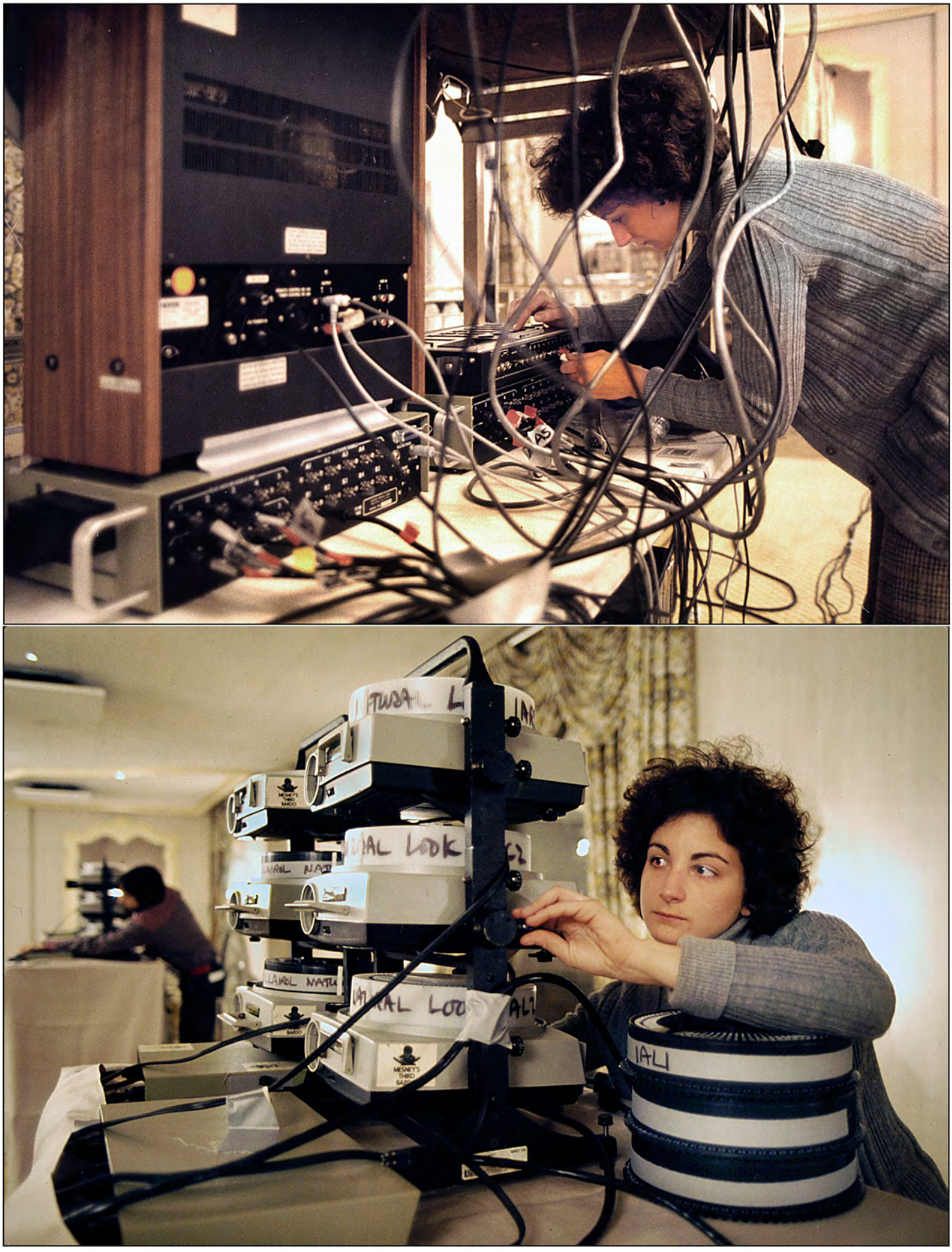












1970s | Incredible Slidemakers | New York Crew | Plate № 1

Pat Billings setting up the Clairol Natural Look *show | Jim Casey is in the background.*





1970s | Incredible Slidemakers | New York Crew | Plate Nº 2

Above: Pat Billings (right) with Jan Irish (center) and Nancy Pearson | Below: Pat checks sound against script.



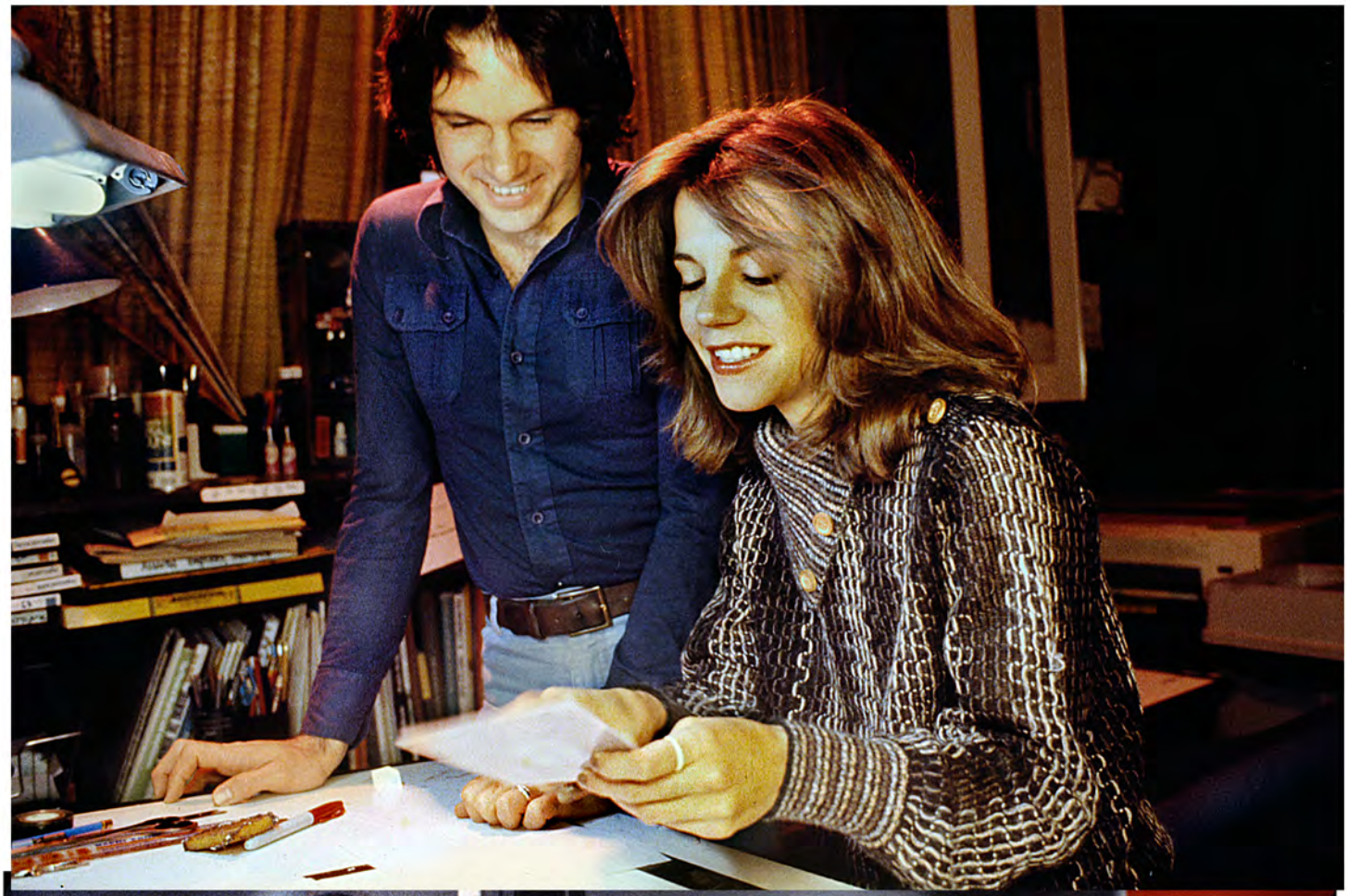
1970s | Incredible Slidemakers | New York Crew | Plate № 3

Office manager (and prankster), Jon "JB" Bromberg.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 4

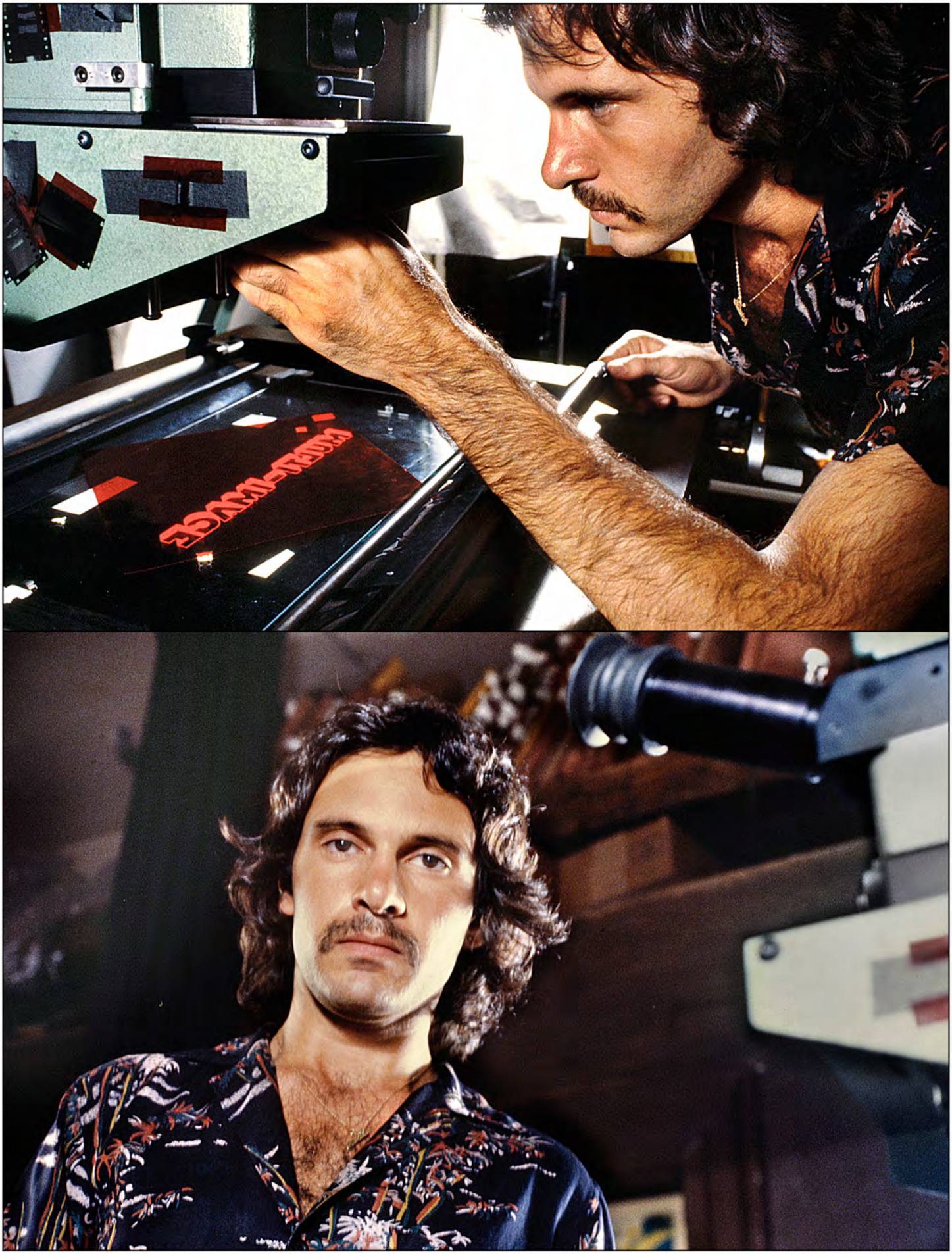
Jon Bromberg (right) with sales manager, Doug Sloan, in third floor theater.





1970s | Incredible Slidemakers | New York Crew | Plate № 5

Above: Fred Cannizzaro with artist, Nancy Pearson.



1970s | Incredible Slidemakers | New York Crew | Plate № 6

Fred Cannizzaro, head of the Forox crew.



1970s | Incredible Slidemakers | New York Crew | Plate № 7

Photographer and artist, Jim Casey..





1970s | Incredible Slidemakers | New York Crew | Plate Nº 8

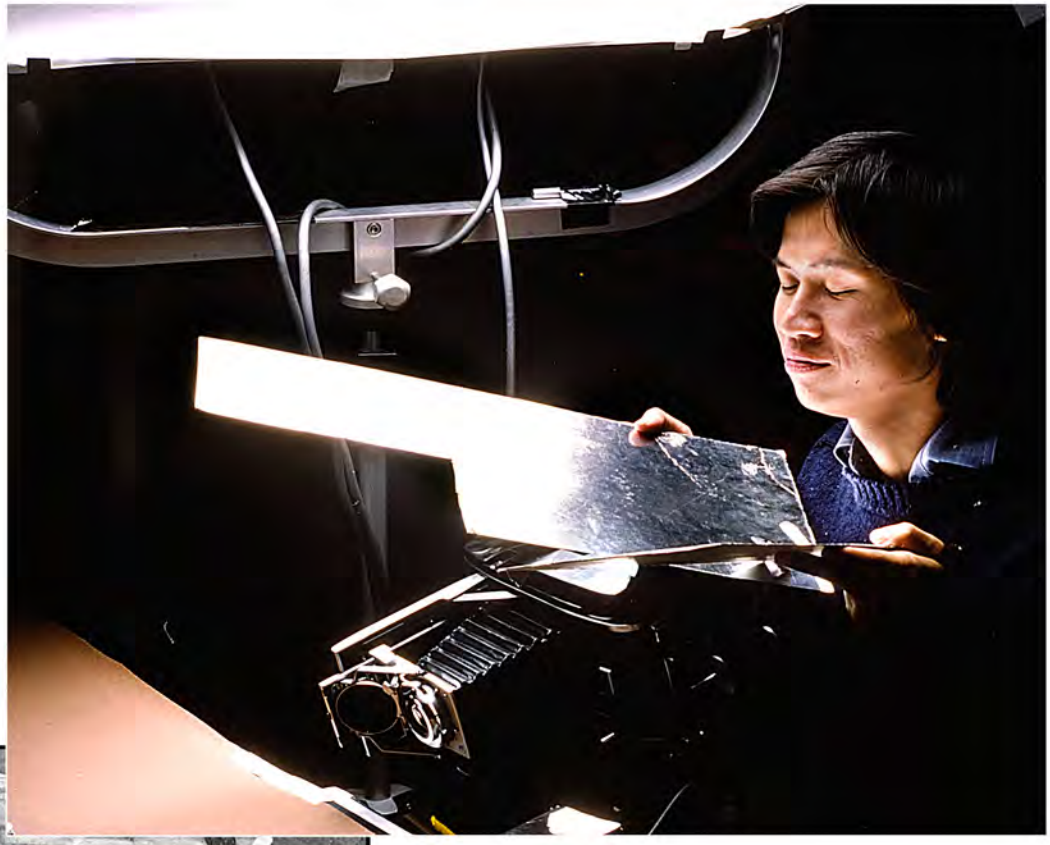
Photographer and artist, Jim Casey.





1970s | Incredible Slidemakers | New York Crew | Plate № 9

Photographer Michael Chan | Studio equipment inventory.





1970s | Incredible Slidemakers | New York Crew | Plate № 10

Photographer Michael Chan | Studio equipment inventory.





1970s | Incredible Slidemakers | New York Crew | Plate № 11

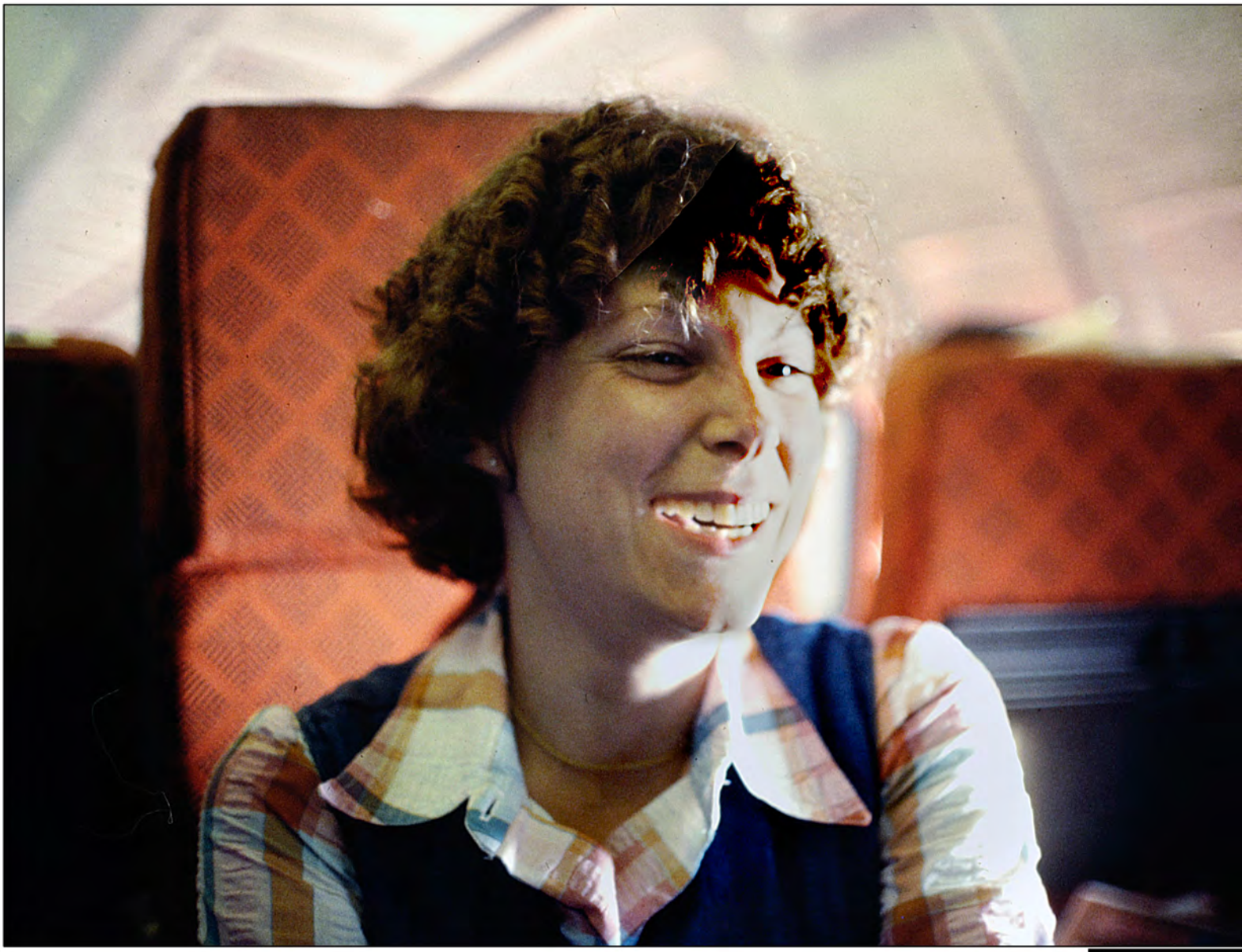
Mercedes Christ mailing E=MC² *posters in the fourth floor office.*





1970s | Incredible Slidemakers | New York Crew | Plate Nº 12

Mercedes in her original, second-floor office | It doubled as an annoucer's booth when recording voiceovers.



1970s | Incredible Slidemakers | New York Crew | Plate № 13

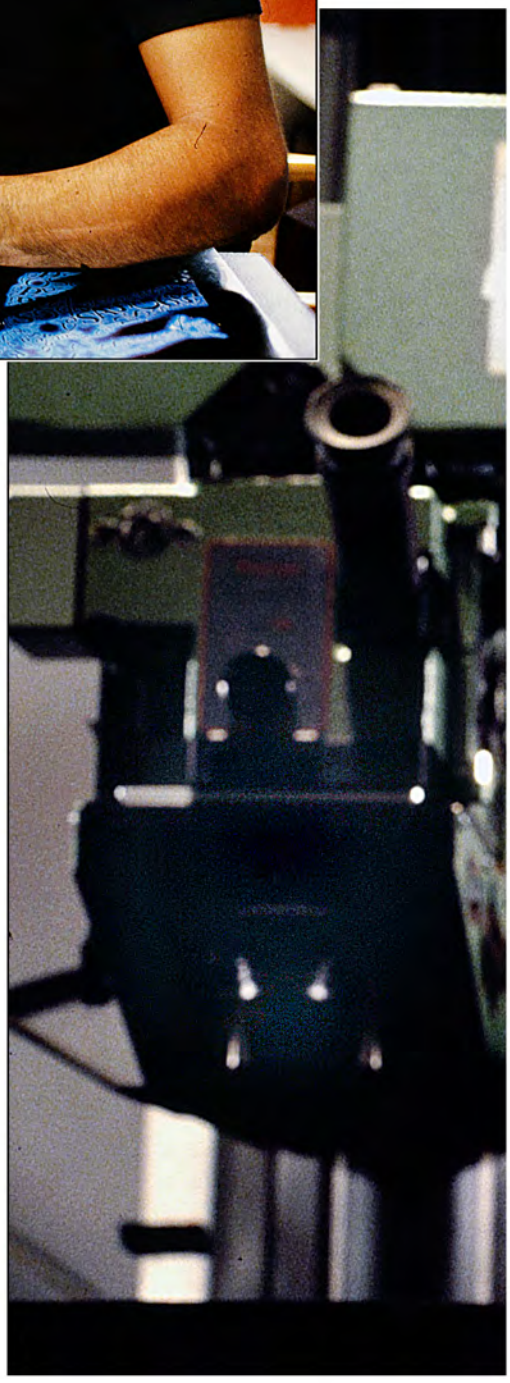
Sally Cooney on return flight from Burger King show in Buffalo, New York.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 14

Forox camera jockey, Nicole Clark.





1970s | Incredible Slidemakers | New York Crew | Plate № 15

Claire and Jim Casey reviewing the Forox printwork portfolio.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 16

Forox artist, and assistant Forox operator, Claire (sorry, nobody can remember her family name).



1970s | Incredible Slidemakers | New York Crew | Plate № 17

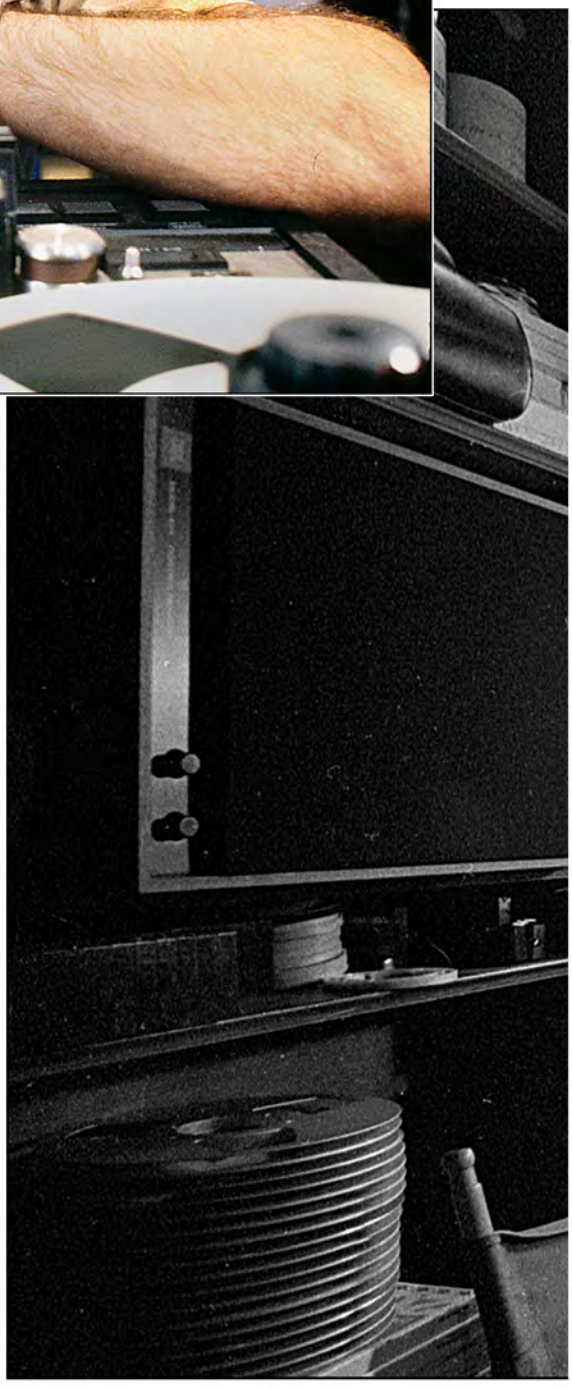
Dan Collins, staging & equipment technician.



1970s | Incredible Slidemakers | New York Crew | Plate № 18

Doug Sloan (left) kibitzes with Chris Hoina at NAVA '80 show.





1970s | Incredible Slidemakers | New York Crew | Plate № 19

Audio technician and Magic Lasers *programmer, Rocky Graziano.*





1970s | Incredible Slidemakers | New York Crew | Plate Nº 20

Above: Rocky in original audio-production area | Below: 1980 audio production and laser programming suite.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 21

Photographer and production coordinator, Jan Irish.

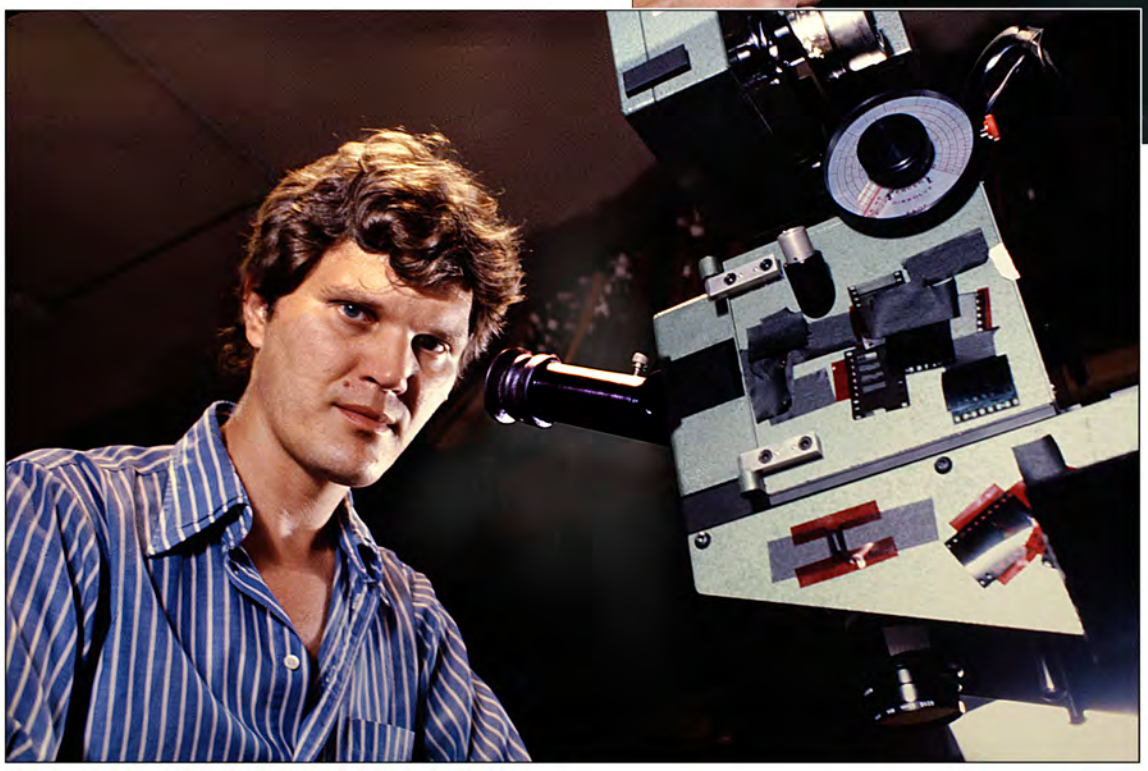


1970s | Incredible Slidemakers | New York Crew | Plate Nº 22

Above: Jan Irish with Chocolate Moose, aka Coco".

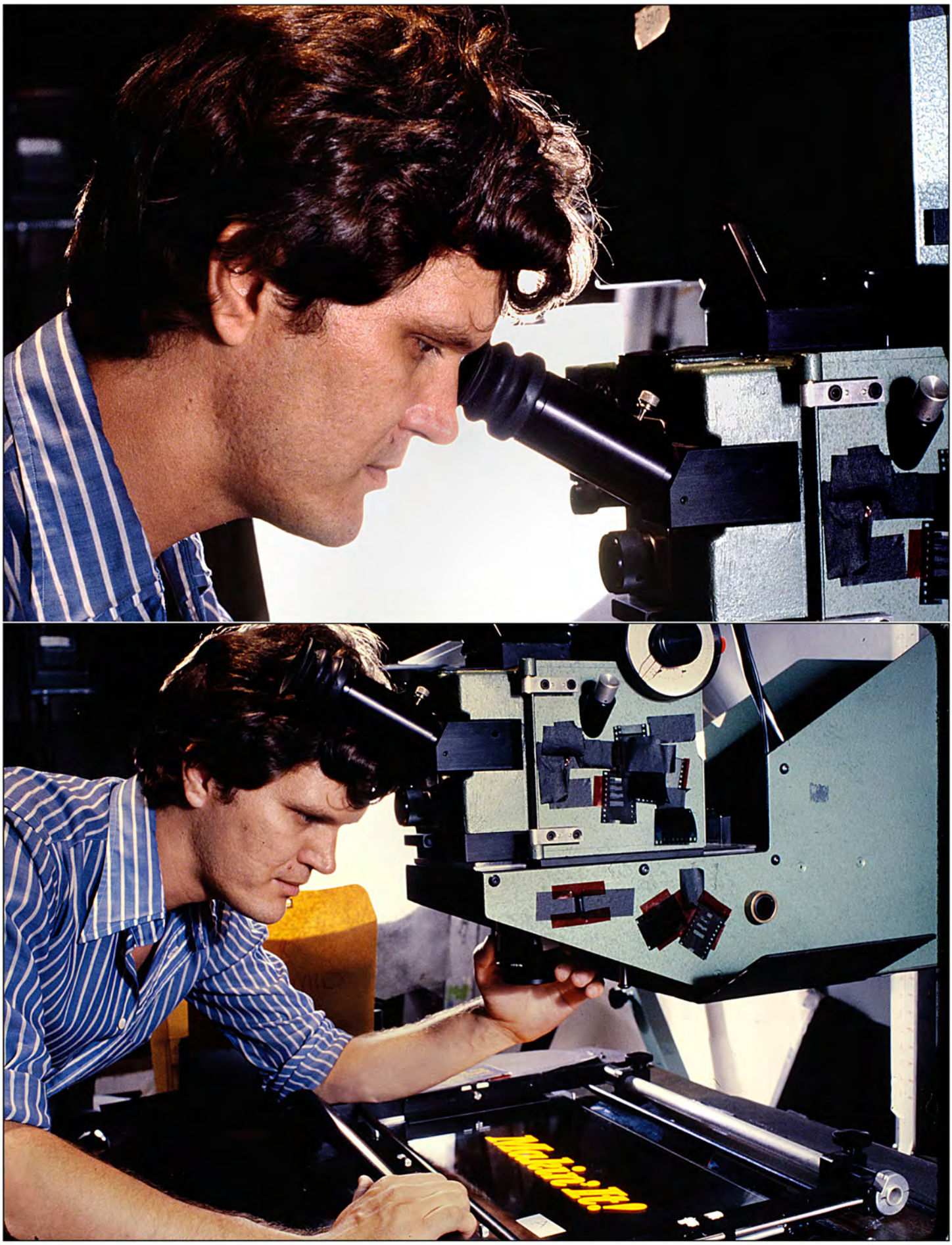






1970s | Incredible Slidemakers | New York Crew | Plate № 23

John Leicmon, lead Forox cameraman.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 24

John Leicmon, lead Forox cameraman.





1970s | Incredible Slidemakers | New York Crew | Plate № 25

Grace Napoleon (right) reviewing processed film strip with Nicole Clark and Jim Casey.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 26

Forox artist, Grace Napoleon prepares to color Kodalith negs with Roscoe Cinegels in Forox cel prep room.





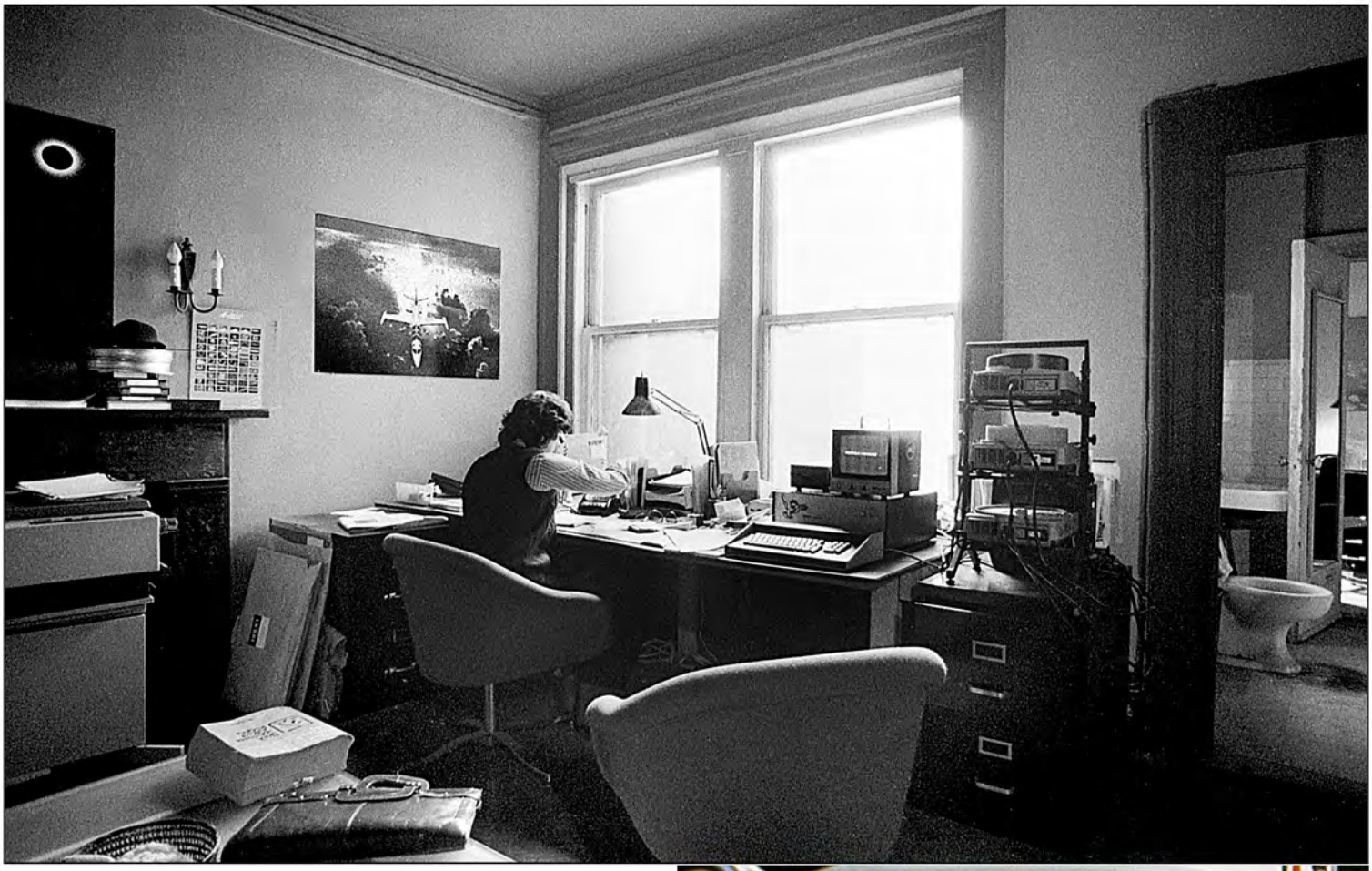
1970s | Incredible Slidemakers | New York Crew | Plate № 27

Above: Tim Sali | Below: Mark Strodle's design station (he's wearing black jacket).



1970s | Incredible Slidemakers | New York Crew | Plate Nº 28

Tim Sali's design station in the second-floor art studio.





1970s | Incredible Slidemakers | New York Crew | Plate № 29

Doug Sloan, account executive, in fourth-floor office.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 30

Doug Sloan customizes Makin' It *show with slide of client's logo.*

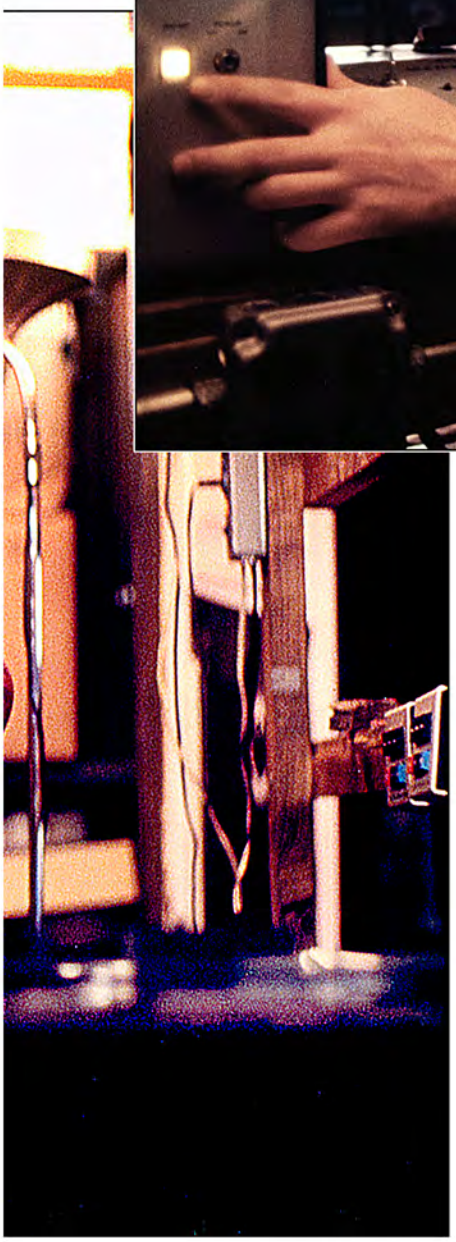




1970s | Incredible Slidemakers | New York Crew | Plate № 31

Staging technician John O'Connell with photographer, Michael Chan, in second floor studio theater.





1970s | Incredible Slidemakers | New York Crew | Plate Nº 32

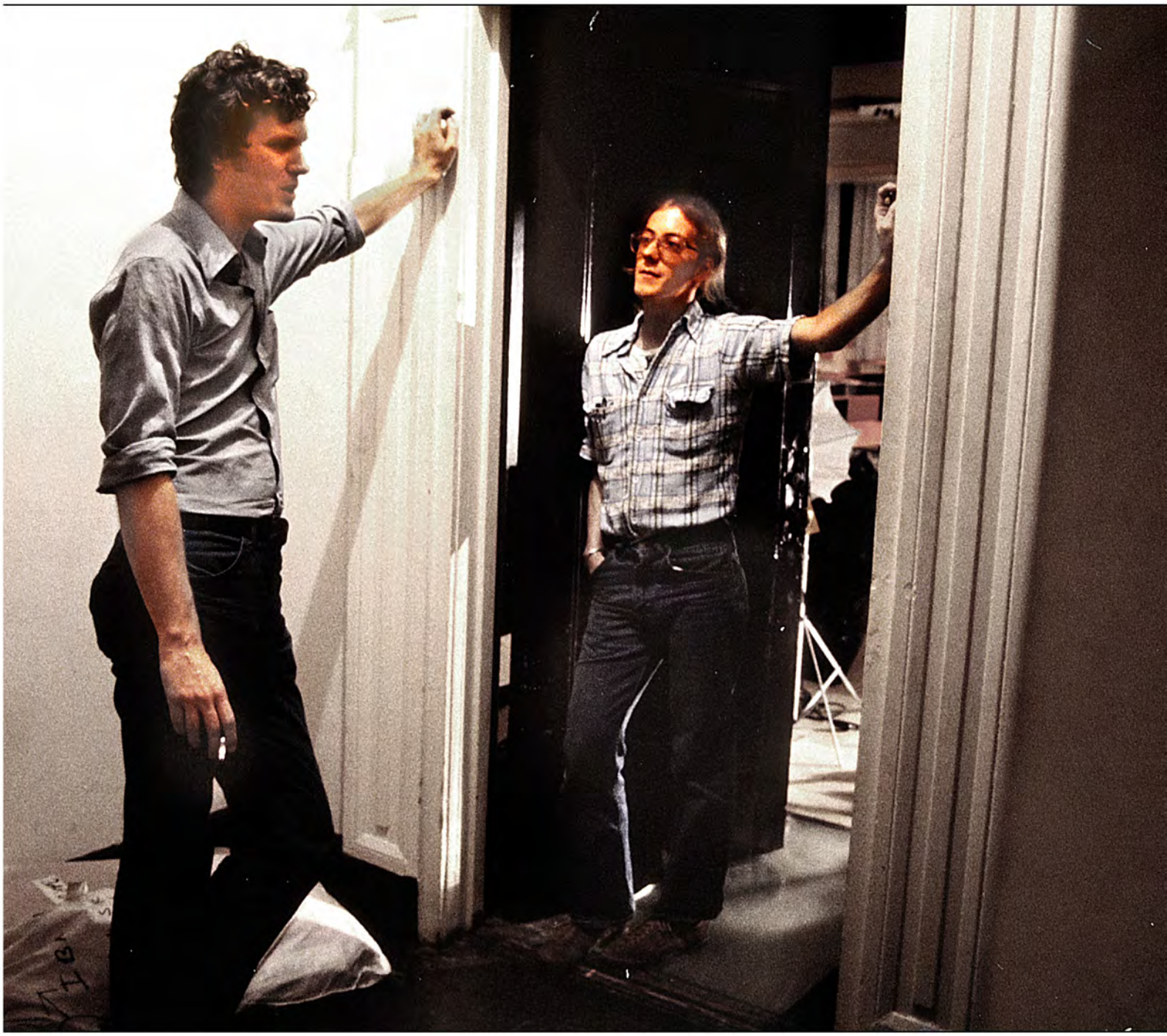
John "OC" O'Connell starts an AVL Eagle programmer in third floor theater.





1970s | Incredible Slidemakers | New York Crew | Plate № 33

Forox artist Mark Strodle with cameraman John Leicmon (right).



1970s | Incredible Slidemakers | New York Crew | Plate Nº 34

Forox artist Mark Strodle with cameraman John Leicmon (left).





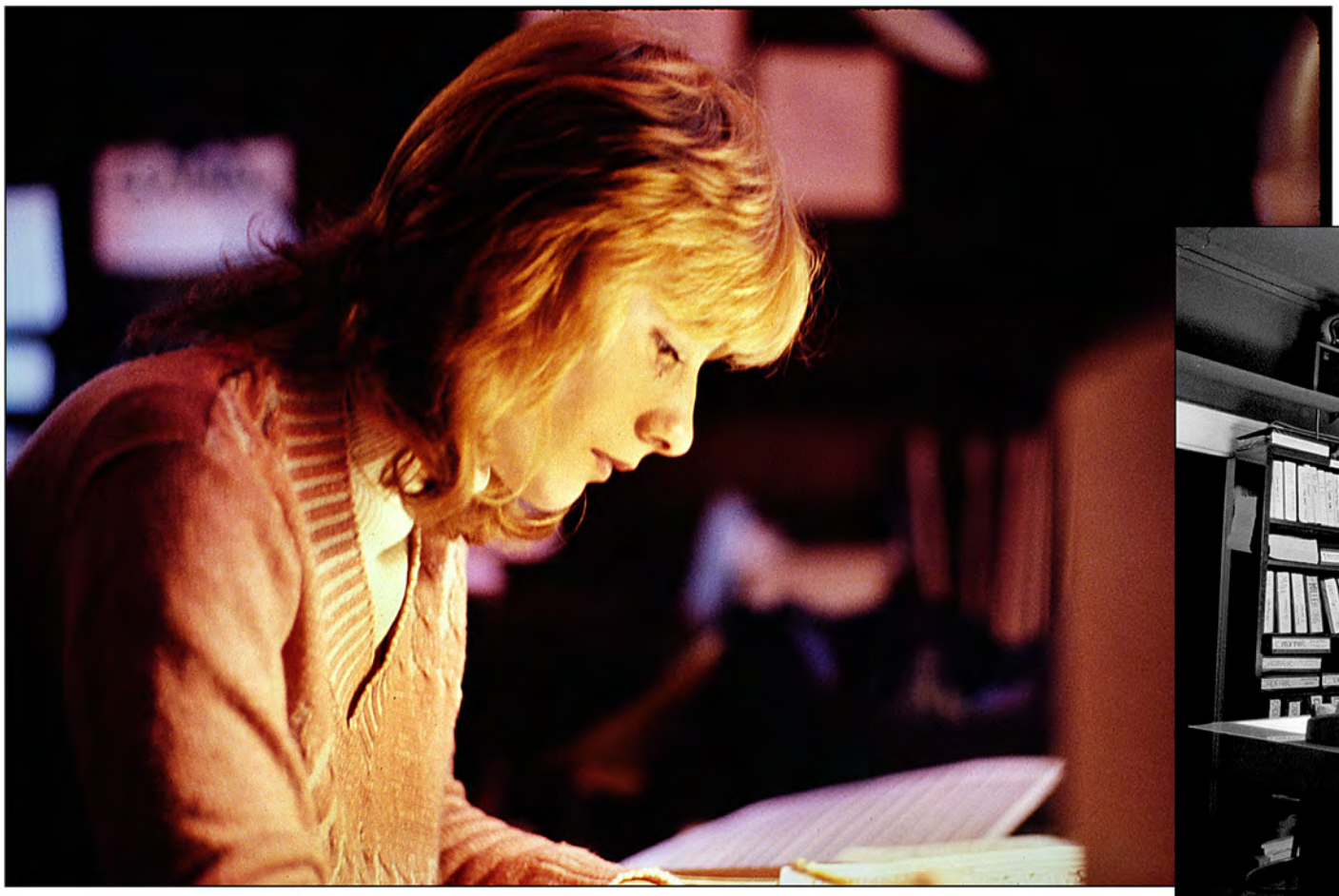
1970s | Incredible Slidemakers | New York Crew | Plate № 35

Scott Weintraub, darkroom technician, with Nicole Clark, Forox-camera operator.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 36

Scott Weintraub processing Kodalith negatives in the satellite-office darkroom.





1970s | Incredible Slidemakers | New York Crew | Plate № 37

Anonymous crew members | Nobody remembers their names.





1970s | Incredible Slidemakers | New York Crew | Plate Nº 38

Anonymous crew members | Nobody remembers their names.



1970s | Incredible Slidemakers | New York Crew | Plate № 39

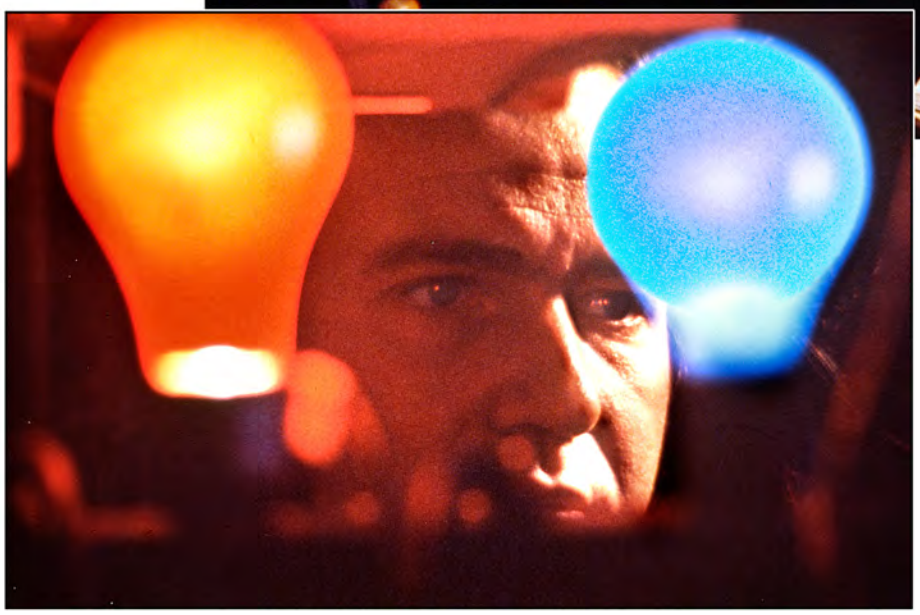
Primary programming and show assembly grid in third-floor theater. 1979.



1970s | Incredible Slidemakers | New York Crew | Plate № 40

Primary programming and show assembly grid in third-floor theater, 1979.





1970s | Incredible Slidemakers | New York Crew | Plate № 41

Yours Truly programming "signal lights" (used for tray changes & speaker cues) with AVL Eagle computer.







1970s | Incredible Slidemakers | New York Crew | Plate Nº 42

Working with AVL ShowPro II punch-tape programmer | Below: coordinating with cameraman Fred Cannizzaro.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 43

Yours Truly photographing a Bricklin at Farber Limestone quarry for Gallery Magazine | by Michael Parish.



1970s | Incredible Slidemakers | New York Crew | Plate Nº 44

Yours Truly photographing a Bricklin at Farber Limestone quarry for Gallery Magazine | by Michael Parish.





1970s | Incredible Slidemakers | New York Crew | Plate № 45

Above: assembling a Fast Fold *screen at a Clairol show | Below: Clairol hair-color shoot in 73rd Street studio.*





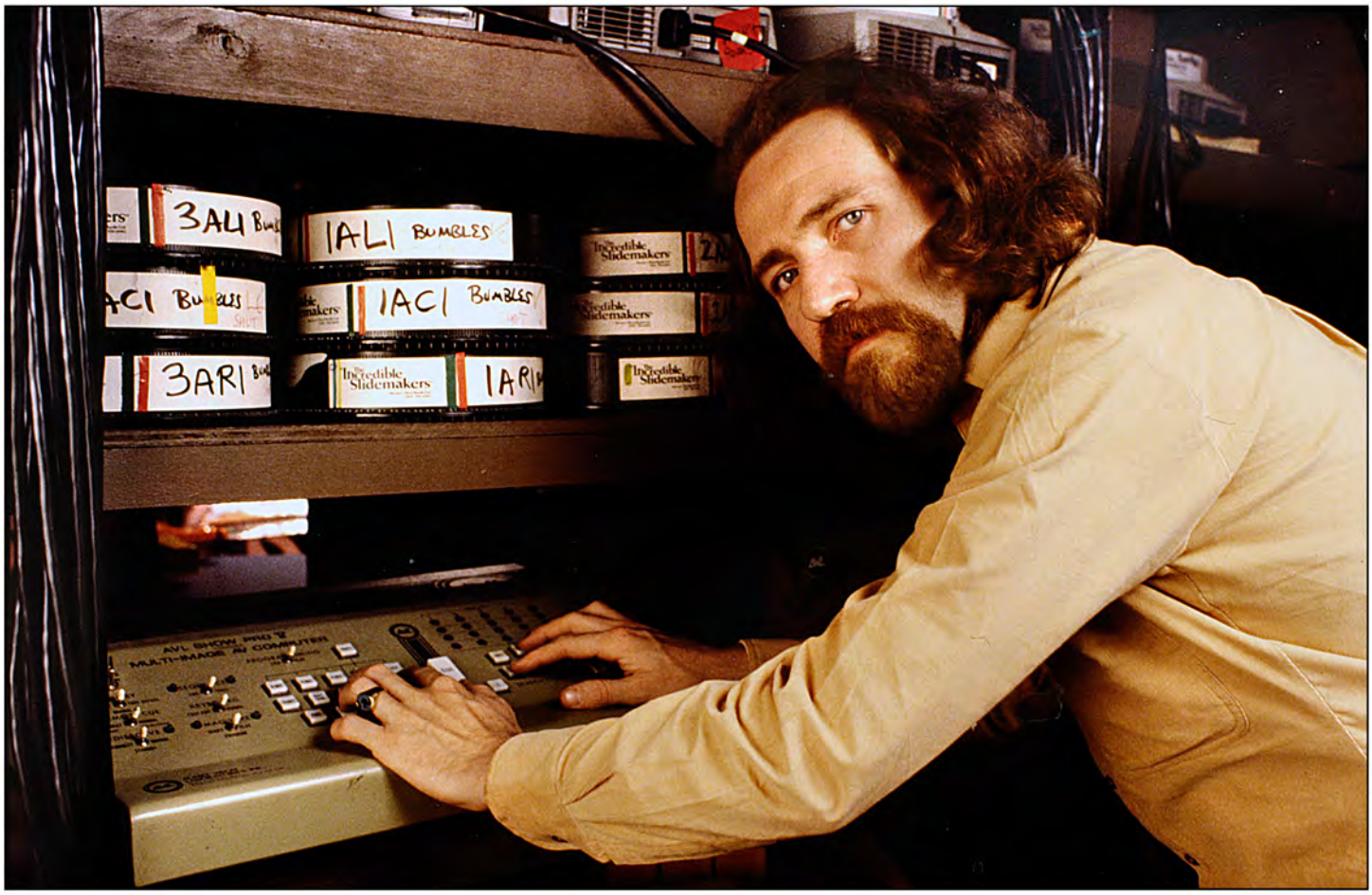
1970s | Incredible Slidemakers | New York Crew | Plate Nº 46

Above: labeling film rolls | Below: Piper aircraft shoot in Vero Beach, Florida, by Pat Billings.



1970s | Incredible Slidemakers | New York Crew | Plate № 47

Incredible crew at Method In The Madness *conference | Rocky, Grace, JB, Joey, OC and Yours Truly.*



1970s | Incredible Slidemakers | New York Crew | Plate Nº 48

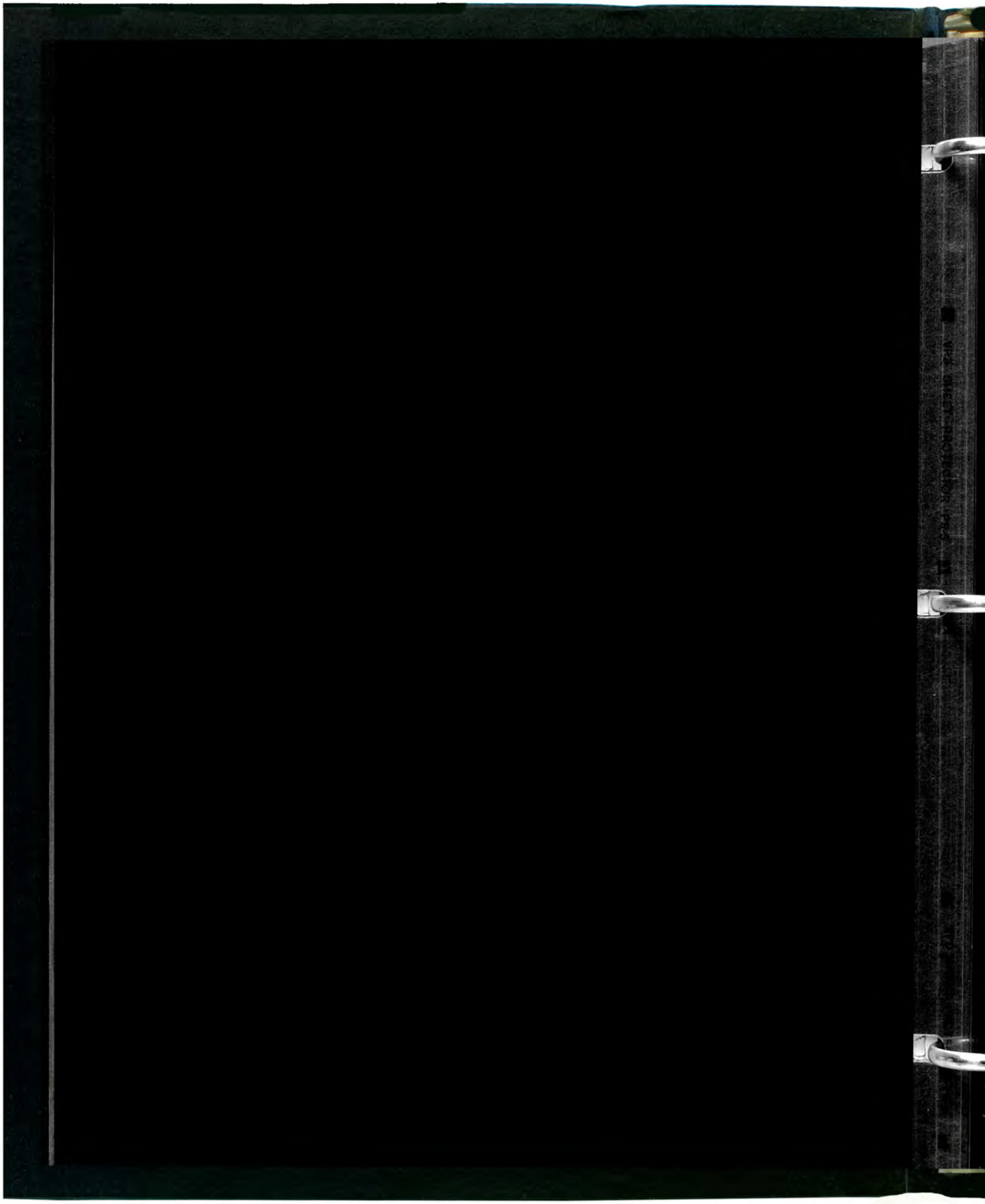
Yours Truly programming an AVL SpowPro V, the first memory programmer offering reverse and home cues.



The last iteration of Incredible's stationary was made in 1989; it cost a fortune. The press/sales kit covers were printed in five colors—CMYK and silver; on Chrome Coat cover stock; and the logo was embossed; so were the stationary logos. For a while, I thought I was cursed; because every time I printed in color, the company went bust shortly after. Turns out I was 'right;' Incredible Imagers went out of business six months after the expensive new stationary was printed.



[*Editor*: See more press clips in Volume Four, *1980* | *Incredible Slidemakers Press-Clip Book* | *Plates Nos 1-40*]



1980 | Incredible Slidemakers press-clip book selections | Plate Nº 0

1979 Incredible Slidemakers press clip book.

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Douglas Mesney
Fred Cannizzaro
(212) 535-0992

Incredible

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company: _____
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1979 Incredible Slidemakers production services advertisement and mailer.

We entered 12 shows in the Vail International Multi-Image Festival. ***11 won top honors:***

- **Three Gold**
- **Seven Silver**
- **One Bronze**

We entered 3 multi-image shows in IFPA (Information Film Producer's of America) "Cindy" competition. ***All three won:***

- **One Gold**
- **Two Silver**

There's a reason…one which we hope you'll want to find out more about.

It's a reason known by our clients, who include:

- **ABC-TV** (on-air photo-illustrative titles & graphics).
- **Aetna Life & Casualty** (special-effects slide sequences for shows produced in house).
- **AT&T** (new product intro.).
- **Audio Visual Laboratories** ("entertaining" new product demo shows).
- **Burger King** (crew rally motivators and speaker support).
- **Burroughs-Wellcome** (corporate portrait).
- **Cadillac-Fairview** (real estate sales).
- **Chevrolet Motors** (billboard advertising illustration).
- **CBS Records** (album covers).
- **Clairol** (training films).
- **Eastman Kodak** (dealer meeting).
- **Great West Life** (sales meeting).
- **Hoffman LaRoche** (customer/press meeting).
- **IBM** (recognition events/awards presentations).
- **Kal Kan Pet Foods** (sales meeting).
- **NBC-TV** (on-air titles/graphics & print promo.).
- **Owens Corning Fiberglas** (product/concept sales).
- **Photomethods** magazine (cover design).
- **The Washington Post** (advertising space sales).
- **USI** (corporate portrait).
- **The Village People** (disco/rock concert entertainment).
- **Xerox** (new products introduction).
- **Yves St. Laurent** (in-store POP slide/video new fashion line intro).

The reason: our slides, shows, programming, and print graphics turn on audiences…whatever the message.

Because only we can make your message "Incredible."

The Incredible Slidemakers
23 East 73rd Street
New York, N.Y. 10021
(212) 535-0992

Incredible



1979 Vail Festival awards advertisement and mailer.

Multi-Image:

Rocky Mountain Highs and Lows

"So many sunrises and sunsets, snow-capped mountains, skylines, fireworks, skies full of stars and surf crashing against the shore, from sea to shining sea . . . Some should have been films or filmstrips; others would have made beautiful color brochures."

The scenery outside was picture postcard perfect. Inside the first Vail International Multi-Image Festival there were far more changes in the visual climate.

Attending the event as Editor of *Audio-Visual Communications*, the good news was the festival was the first 100 percent multi-image competition per se, staged to recognize and promote the medium as a communications and art form. (The AMI will be holding its first competition in L.A. this September). There were no film or video competitions or audio-visual equipment expositions to distract from the business at hand. Both commercial and in-house producers had their first real opportunity to meet and exchange ideas with their peers and view "some" of their competitors' work (their biggest beef was that they could not see all, but more on that later). As a new rallying point for multi-image, the showcase succeeded.

The festival, held June 18-23 at the Studio in the Rockies complex in the Lionshead section of Vail, Colorado, had seven competition categories: sales, instruction, public relations/image, religious/spiritual, entertainment, motivation/recognition and documentary. These categories were divided into "simple" (five projectors or less) and "complex" (six projectors or more). There were 84 entries employing anywhere between two and 30 projectors. The youngest producer was 16-years-old; the oldest producer was not telling. Approximately 250 people attended the festival.

Now for some of the bad news. Serving as a festival judge in three categories, I was pleasantly surprised a few times, but mildly disappointed by the overall similarities (and quality) of the presentations I scored or saw as an interested spectator. Guarding against a critic's cynicism and not allowing myself to overdose on multi-image visuals, I still saw too many sunrises and sunsets, snow-capped mountains, skylines, fireworks, skies full of stars and surf crashing against the shore, from sea to shining sea.

Too many of the shows were too, too long—and wordy. Perhaps producers forgot they were working with the most visual media, and let their scripts say too much. Many of the shows ran well over 20 minutes and appeared to be edited to conform to the 30-minute maximum presentation time. I expected more short, punchy, visual eight- to ten-minute shows, but the presentations did not follow this obvious multi-image form. Instead they played as long, sometimes tiring narratives. They should have been films or filmstrips; others would have made beautiful color brochures.

It also sounded as if some of the large format shows, which were presented in the main theater, were narrated by the same deep, sonorous male voice-over. The theater's bassy sound system did not help to change the tempo. (I heard only two soundtracks employing female narrators.) Multiple voice-over tracks and sound effects were not used extensively, and the background music was all too familiar—disco, country/western, folk and your basic movie themes, "Star Wars," "Rocky," etc.

Some of the multi-image effects and techniques did work well. Discounting the redundant galaxies of stars, seamless wide-screen panoramas were used to good advantage. So were an AV presentation taboo—vertical slides. When used three or five abreast, the verticals were impressive; when alternated with horizontal images on one-screen surface, they failed.

There were also some 16mm film segments that helped the multi-image action in certain shows. There were clips shot from helicopters and a segment on the Space Shuttle taking off and landing. Although special effects and graphics were not employed extensively, there was a spinning logo or two, several well done starbursts, and some unique masking techniques.

I expected the sales presentations I judged to be more exciting. They were not. There was nothing that different or new. No sparkle, no splash, no dash. The photography was predictable, the programming not that imaginative. All six shows seemed to be marching to the beat of the same drummer, i.e., the same dissolves, cuts, sequences, and the programming hardware did not appear to be pushed to its maximum capabilities.

There was a noticeable improvement in the motivational programs I scored. These presentations achieved their program objectives more readily than the sales shows by using the medium much more effectively. Scripts were more sensitive to their task, thus more successful. It was this category that proved the persuasive communications power of multi-image. I was disappointed that I did not experience this more often in the entertainment and sales categories.

Show times. Considering this was a first effort, the Vail International Multi-Image Festival accomplished most of what it set out to do. With less than six months to plan and prepare for the event, the festival did receive over 80 entries which, according to executive director Sylvia Allen, was the projected target. She reported that there will definitely be a competition next year and that she expects more entries as well as international producers to participate.

As can be expected with a first-time venture in such a complex presentation medium, there were problems. There were tales of pre-festival entry hassles and producers being shut out. New York producers were conspicuous by their absence as were several "big name" multi-image designers. ("I guess Richard Shipps is tired of having his stuff ripped off," commented one industry observer.) This left mostly Midwest and a few West Coast producers to enjoy a virtual sweep in the awards competition.

There were also equipment breakdowns, one or two last-minute disqualifications and interminable breaks between screening the large-format shows in the main theater. Too often there were countless Wess and a variety of home-made registration slides on the screens for endless minutes (producers flocked to a cash bar to wait out the long intermissions). It appeared that some producers were allowed indefinite periods of time to set up their shows; some even projected lengthy dry-runs before the judges were called in. We also saw a few

1980 | INCREDIBLE SLIDEMAKERS PRESS-CLIP BOOK SELECTIONS | PLATE Nº 3
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who were aided by manufacturer's reps which was supposedly contrary to the set-up rules.

The smaller-format shows were played in small curtained booths in the downstairs area of the studio. The three or four judges for each show were provided with headsets, so there were no noise levels to contend with, and these presentations went off rather smoothly. However, only judges, technical staff and the competing producer were allowed in this area. This aided presentation logistics, but sorely upset other producers and visitors who could not see their fill of multi-image programs.

Discussing these complaints, Walt Blackwell, chairman of the festival's board of directors, admitted that "the lack of communication between the board and producers was the chief problem." He said that the board members, which held an open meeting after the competition to listen to grievances and suggestions, will be working to smooth the rough edges for next year's show.

Judgment days. The 84 entries were screened and scored during the first four days of the festival (the award-winners were available for public showings on the last two days). Each show was judged for its script, audio track, graphics/photography and programming on a 1-12 point basis, while the degree of achievement of program objectives was rated on a double point system, 2-24. If a show was given the highest mark in each of these five categories, it would have had a total of 72 points.

To win a first-place award, a show had to receive 55 or more points, 45 or more for second place and 35 or more for third place. Following this system, certain categories did not have a full slate of winners in the first, second and third positions. Following is a complete list of the award-winning multi-image presentations by category, along with the producer and/or production company.

The winners. Entertainment/complex: 1st, "To Race the Wind," Alden Butcher, Alden Butcher Productions, Hollywood, Ca.; 2nd, "Images of Your Mind" (AVL demo show), Duffy White, Photo-Synthesis, Inc., Denver, Colo.; and 3rd, "Visions," Jim Oles, Englewood, Colo. Entertainment/simple: 3rd, "Superstitions—13th Annual Pyramid Awards," Charles Tigrett and Barbara Booth, Imagery Audio-Visual Productions, Memphis, Tenn.

Sales/complex: 1st, "Ahead of Time," Alden Butcher; 2nd, "Tomorrow's Office Today," Donni Magid, Photo Communications Corp., Jenkintown, Pa.; and 3rd, "Las Vegas Hilton: The End of the Rainbow," Patrick Sherman, Greyhound/Creative Services Div., Las Vegas, Nev. Sales/simple: 1st, "Break the Rules," Raymond Seliski, Calliope Productions, Minneapolis, Minn.; 2nd, "Hanson," Sherry White, Photo-Synthesis, Inc., Denver, Colo.; and 3rd, "The Barbizon School," Donna Lawrence, Donna Lawrence Productions, Louisville, Ky.

Public Relations-Image/complex: 1st, "The Process," Bruce Clark, Russell-Manning Productions, Minneapolis, Minn.; 2nd, "Images Through the Air," Gerald Gregg, Eastman Kodak Co., Rochester, N.Y.; and 3rd, "Old World, New World," Raymond Seliski. Public Relations-Image/simple: 1st, "Al Cohen Construction," Michael Brownlee, Photo-Synthesis, Inc.; 2nd, "Vetter," David Inocencio, David Inocencio Multivision/Johnson Design Associates, San Francisco, Ca.; and 3rd, "Memphis," Charles Tigrett and Barbara Booth.

Instructional/complex: 1st, "It's Your Turn," Raymond Seliski; 2nd, "Visions," Glenn Wolfe, Film Unit, University of Wisconsin, La Crosse, Wis.; and 3rd, "Energy," Jack Silver and Bruce Jones, Silver Image Inc., Washington, D.C. Instructional/simple: 1st, "Living In A House," David Inocencio and Minnette Siegel, David Inocencio Multivision; and 2nd, "Every Other Person," Jack and Susan Pederson, Multi Image Systems Inc., Monument, Colo.

Documentary/complex: 1st, "Wednesday," Bruce Clark and Mark Youngquist, Russell-Manning Productions; 2nd, "Rough Rider Time Machine," Jack and Susan Pederson; and 3rd, "Blue Grass Living," Joe Ruggiero, Ethan Allen Inc., Danbury, Conn. Documentary/simple: 1st, "Young Audience," Bruce Clark and Lee Synder, Russell-Manning; and 2nd, "The Old Dominion," Cassandra Hall, a 16-year-old high school student from Shreveport, La.

Motivational-Recognition/complex: 2nd, "Cycles," Walt Blackwell, IBM Corp., Boulder, Colo.; and 3rd, "Plexiglass: When You Can't Risk a Substitute," Robert Hunsicker, Pharos Studios, Inc., Princeton, N.J. Motivational/simple: 3rd, "The Paramount," Stamats Publishing Co., Cedar Rapids, Iowa.

Religious-Spiritual/complex: 3rd, "Alleluia," David Brady, Lakeview Productions, Marion, Ind. Religious-

(continued on page 32)

Supply Lines

If you are thinking about holding your own multi-image festival, be advised that it takes people and equipment—lots of people and equipment. Doug Mesney of The Incredible Slidemakers, New York City, was chairman of the logistics committee at the Vail International Multi-Image Festival, and the man responsible for screening the multi-image presentations. Doug forwarded us the following lists of technical personnel who helped stage the shows and the AV equipment that was employed at the Studio in the Rockies. Be forewarned that Doug offers some of this information with tongue firmly in cheek.

The logistics committee included Ron Fundingsland, Ned Shevelson, Karen Discert and Glen Thornburg, Colorado Visual Aids, Denver; Bob Stimson, Electrosonics, Minneapolis; Jerry Loomis and Peter Zajiachek, Spindler & Sauppe, N. Hollywood; John Bromberg, G&T Harris, New York; John Seleski, Arion, Minneapolis; Chuck Knuth, San Francisco; Jerry Hurd, Cal West (AVL), Salt Lake City; Jack Elliott, Cal West (AVL) and president of WTI Corp., Santa Ana, Ca.; and Andy Kaufman and Mike Teach, Studio in the Rockies, Vail. Not to be forgotten was Mr. Sluggo, representing Snafu AV of Pacific Lowlands, Tex., who made a special guest appearance.

Programmers and dissolves included 8 AVL Show Pro V's, 1 AVL Eagle, 27 AVL MK-VII's, 1 Arion Omni Loc and 20 faders, 4 S&S D-24's, 2 S&S Mini-Cues, 2 S&S Quadra-Cues, 9 S&S Selectro or Dynamics, 2 Wollensak Pro-9's, 1 Clearlight Star 3, 1 Electrosonics 3069, 1 Trius and 1 homemade. There were 75 Kodak B2/E2 slide projectors, 6 Buhl Hi-Lites, 1 B&H MK300 16mm unit, 4 Eiki 16mm projectors and a Kodak 16mm Pageant. Projection lenses totaled 109 from Buhl and 70 from Kodak along with 33 projector alignment stands.

There were 12 Teac and 4 Wollensak tape recorders, 21 Koss headsets, and miles of AC and audio patch cords. Special effects equipment included 2 strobes, 10 spotlights, 1 mirror ball, 1 laser, 24 3-D glasses, 5 remote boxes, 1 baby powder smoke gun, 1 snowman and 2 mousetraps. There were 137 total screenings in six days, with 2 shows disqualified (software) and 5 shows blown (equipment).

Companies donating equipment were Arion, AVL, AV Workshop, Brand Projection Service, Colorado Visual Aids, DD&B Studios, Eastman Kodak, Electrosonics, G&T Harris, The Incredible Slidemakers, Spindler & Sauppe, Staging Techniques and Wollensak.

According to Doug Mesney, miscellaneous statistics included one fight, lots of overtime, sufficient suntans, one drink/hour/day, one motorcycle, no single women and 250 single men. □

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Audio-Visual Communications magazine | August 1979

tion, 375 Commonwealth Ave., Boston, Mass. 02115, (617) 267-9425.

26-31: 10th Int'l. Exhibition of Modern Educational Aids and Equipment, Belgrade, Yugoslavia. Contact: Belgrade Fair, Bulevar Voj. Misica 14, POB 408, Belgrade, Yugoslavia.

NOVEMBER

4-7: Business Graphics Conference, Marriott Twin Bridges Hotel, Washington, D.C. Contact: Society of Photographic Scientists and Engineers, 1411 K St., N.W., Washington, D.C. 20005.

5-8: Photolab Expo, Alexandra Palace, London, England. Contact: British Information Services, 845 Third Ave., New York, N.Y. 10022, (212) 752-8400.

7-9: 22nd Annual International Film & TV Festival of New York, New York. Contact: IFTVF, 251 W. 57th St., New York, N.Y. 10019.

8-10: Budgeting for Media Services Conference, Stouffer's Denver Inn, Denver, Colo. Contact: Information Futures, 2217 College Station, Pullman, Wash. 99163, (509) 332-5726.

14-18: Houston International Film Festival, Houston, Texas. Contact: HIFF, Festival of the Americas, P.O. Box 27574, Houston, Texas 77027.

26-30: Instructional Programming Seminar/Workshop, Valley Hilton, Sherman Oaks, Ca. Contact: Practical Management Associates, 6910 Owensmouth Ave., Canoga Park, Ca. 91303, (213) 348-9101.

Send news of your organization's audio-visual seminars, workshops, conferences, expositions, etc., to: The Editor, Audio-Visual Communications, *475 Park Avenue South, New York, N.Y. 10016.*

(continued from page 21)

Spiritual/simple: 3rd, "SCL People," Alden Butcher, Alden Butcher Productions.

Behind the scenes. The festival was incorporated as a non-profit organization in Colorado last January. Running the show as the paid executive director is Sylvia Allen, an independent marketing and media consultant in Fair Haven, N.J. A voluntary board of directors, which is comprised of in-house and commercial producers, users and manufacturers, is chaired by Walt Blackwell of IBM, Boulder, Colo. Board members include Vince Bonacci, DD&B Studios, Detroit; Carl Faller, Wren Associates, Princeton, N.J.; Doug Mesney, The Incredible Slidemakers, New York; Rick Baker, Photo Communications Corp., Jenkintown, Pa.; Huib Broekman, Holland Business AV, Lelystad, Holland; Sven Liabeck, AVC, Stockholm, Sweden; Brenda Cross, Kodak, Rochester, N.Y.; Joe Ruggiero, Ethan Allen, Danbury, Conn.; Marsha Gewirtzman, AT&T, Morristown, N.J.; Paul Starzynski, International Communications Agency, Washington, D.C.; and Roger Gordon of the AMI.

The Manufacturer's Advisory Panel has an elected representative who serves in their behalf on the board of directors. They include Art Milanese, AVL; Bud Mickelson, Arion; Don Andreson, Clear Light; Paul Kuran, 3M; Norman Sauppe, Spindler & Sauppe; Bob Stimson, Electrosonics; John Stokes, Stokes Color Slides; and Bruce Wessinger, Wess Plastics.

A site for the second annual multi-image festival was not set as we went to press. In addition to Vail, the board is reportedly considering three other locations. We would miss the scenery, but not Rocky Mountain Airways' roller-coaster Denver-to-Vail flight. □ **my**

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International Multi-Image Festival

by jan cain

Nestled in the Rocky mountain snow and sunshine, the first International Multi-Image Festival was held at Vail, Colorado - June 18-21. Six brief months before, the festival was organized as a non-profit corporation to recognize "multi-image as both an art form and viable communications medium." Sylvia Allen, Executive Director of the event, effected a showcase for producers modelled upon the Cannes Film Festival.

Eighty-four shows from the U.S. and Mexico competed in seven categories: sales, instruction, public relations/image, religious/spiritual, motivation/recognition, entertainment, and documentary. Entries were sub-divided into **simple**, 5 projectors or less, and **complex**, 6 projectors or more.

In spite of the short lead time the Board honored its deadline. Though many late inquiries and international delays occurred, they managed prompt entries equitably. With long range preparation for 1980, participation will expand.

Held in the Studio of the Rockies, judging and viewing spanned a week. The main theater area screened complex shows and seven small booths aired others via headphones. The booth facilities prohibited producers from seeing other smaller format entries. (As Curry and Rowan pointed out in Spring '79 **Multi-Images**, the main interest and predominate market lie there.)

Paul Starzynski, International Communications Agency, Washington, D.C., supervised the judging. Twenty professionals in teams of three evaluated all the shows in a given category for consistency. Their tabulations of 55 points and above have yielded first place; 45 and above, second; and 35 and over, third. This criteria resulted in some divisions having only one or two winners. Rick Baker, Photo Communications Corp., Jenkintown, Pa., devised a coding system so that producers remained anonymous to the judges, and their products appraised irrespective of their reputation.

Highlights for this observer included the three dimensional and laser effects in "The Process," (Russell Manning) and the young efforts of sixteen-year-old Cass Hall's "The Old Dominion." Alden Butcher's aesthetic portrait of horses and Duffy White's revamped Eagle promo were sterling. Ray Seliski took home the most honors.

Contributions of Doug Mesney — Logistics and Sound, Jack Eliot, Ned Shevelson, and Chuck Knuth as

Winners are:

I. Sales
A. Simple
Third Place — Donna Lawrence, Donna Lawrence Productions, "The Barbizon School"
Second Place — Sherry White, Photosynthesis Inc, "Hanson"
First Place — Raymond Seliski, Calliope Productions, "Break the Rules"

B. Complex
Third Place — Patrick Sherman, Greyhound Creative Services Division, "Las Vegas Hilton — The End of the Rainbow"
Second Place — Donni Magid, Photo Communications Corp, "Tomorrow's Office Today: The Pomeranz Experience"
First Place — Alden Butcher, Alden Butcher Productions, "Ahead of Time"

II. Instructional
A. Simple
Second Place — Jack and Susan Pederson, Multi-Image Systems, Inc, "Every Other Person"
First Place — David Inocencio, David Inocencio Multivision, "Living in a House"

B. Complex
Third Place — Jack Silver, Silver Images, "Energy"
Second Place — Glenn Wolfe, University of Wisconsin, Visions
First Place — Ray Seliski, Calliope Productions, "It's Your Turn"

III. Public Relations/Image
A. Simple
Third Place — Charles Tigrett and Barbara Booth, Imagery Production, "Memphis — The Epitome of the New South"
Second Place — David Inocencio, John Design Associates, "Vetter"
Michael Brownlee, Photosynthesis Inc, "Al Cohen Construction"

B. Complex
Third Place — Ray Seliski, Calliope Productions, "Old World — New World"
Second Place — Jerry Gregg, Eastman Kodak Co, "Images in the Air"
First Place — Bruce Clark, Russell Manning Productions, "The Process"

1980 | INCREDIBLE SLIDEMAKERS PRESS-CLIP BOOK SELECTIONS | PLATE Nº 6
Association for Multi-Image | *Multi-Images* magazine | Autumn 1979



photograph by lynn hoyt

Technical Staff carried the festival to greater heights. Their unselfish time and energy were incredible. Spotlights must also shine on the Manufacturer's Advisory Panel, Vail Associates, and all other supporters who made the event a reality.

Next year's location will be announced September 1, and it must accommodate viewing space for each entry. Plans are in process to provide a feedback vehicle from the judges to the producers. At the open Board meeting near the close of the weeks, many expressed a desire for this critique as well as an education interface and equipment exhibit. Walt Blackwell, Internal Producers, solicited written suggestions from participants; and Rick Baker, Organization and Finance, reported a $4,000.00 balance. Sylvia Allen again will be Executive Director and invites those interested in serving, entering, or donating to contact her at P. O. Box 272, Fair Haven, N.J. 07701, 201-741-8658.

It was a good beginning. Overall, the professional integrity and credibility of the first International Multi-Image Festival were a certainty. Your participation will make it so again. ■■■

Jan Cain and Lynn Hoyt are with the Scott Elementary School, Arvada, Colorado, and are free lance writers/producers with Rainbow Productions.

IV Religious/Spiritual
A. Simple
Third Place — Alden Butcher, Alden Butcher Production, "VCL — People"
B. Complex
Third Place — David Brady, Lakeview Productions, "Alleluia — A Praise Gathering for Believers"

V Motivation/Recognition
A. Simple
Third Place — Tom Hedges/Jim Hidinger, Stamats Publishing Co., "The Paramount"
B. Complex
Third Place — Robert Hunsicker, Pharos Studios Inc, "Plexiglas: When You Can't Risk a Substitute"
Second Place — Walt Blackwell, IBM Corp, "Cycles"

VI Entertainment
A. Simple
Second Place — Barbara Booth and Charles Tigrett, Memphis Publishing Company, "13th Annual Pyramid Awards Presentation"
B. Complex
Third Place — Jim Otes, Englewood, Colorado, "Visions"
Second Place — Duffy White, Photosynthesis Inc, "Eagle Images"
First Place — Alden Butcher, Alden Butcher Productions, "To Race the Wind"

VII Documentary
A. Simple
Second Place — Cassandra Hall, Shreveport, Louisiana, "The Old Dominion"
First Place — Lee Synder/Bruce Clark, Russell Manning Productions, "Young Audience"
B. Complex
Third Place — Joe Ruggiero, Ethan Allan Publishing Co, "Blue Grass Living — Shaker Style"
Second Place — Jack and Susan Pederson, Multi-Image Systems, Inc, "Rough Rider Time Machine"
First Place — Mark Youngquist/Bruce Clark, Russell Manning, "Wednesday"

signed to be compatible with most standard dissolve units.

Lenses

Projection lenses are made by a number of optical companies, including Kodak, but the two most commonly used are Navitar and Buhl. D.O. Industries which makes Navitar, offers a line of seven lenses: a 1" focal length, with speed of f/2.8; a 1½" at f/2.8; a 2" at f/2.8; a 7" at f/2.8; a 9" at f/2.8; a 2¾" to 5" zoom with speed of f/3.5; and a 6" to 9" zoom, at f/3.5.

Buhl's selection includes fixed focal length lenses from 1" to 9.5", and variable focal length lenses from 2.4"-3/6" to 5.6"-8.4"; special rack-mounted lenses with built-in mirrors for rear projection; an auditorium system; a screen filler system for close range; plus various mounts and assemblies for the major projector types.

Screens

Da-Lite Screen Company Inc. makes screens of all kinds and sizes, for both front and rear projection, for temporary and permanent installation. These include lace and grommet type theatre screens, portable tripod-mounted screens, electric, rope and pulley, wall and ceiling screens.

D.O. Industries has introduced a front-projection screen called Navilux, with a washable silver surface that is brilliant enough for lights-on or daylight applications.

Rosco Labs offers custom screens in 4 vinyl film styles—light transparent, twin white, grey, and black. Priced by the square foot, the custom screens are grommeted, seamless, and portable.

Racks, stands, and cases

Obviously, where dissolve is being used, projector alignment is highly critical, and the use of dissolve stands is important for accurate image registration. The Chief Manufacturing Company makes Micro-Set stands featuring micrometer adjustments for roll, pitch, and yaw; projectors can be locked in place in their cradles and quickly positioned by turning a few knobs. There are 2-tier and 3-tier models, as well as an add-on module for expandability. Their travel cases enable you to pack an entire dissolve system, already equipped and set up to run.

(Continued on page 66)

The Incredible Slidemakers

Today's multi-image presentation is a highly evolved and constantly evolving stepchild of late 1960's multi-media (Theatre Crafts, Jan/Feb 1970) and the roughly 40-year old audio-visual industry. For years audio-visual technology has been used in education and in corporate meetings, training sessions, and product demonstrations. With the surge of interest in light shows and projected imagery accompanying the psychedelic rock of the 60's, and the accession of photography by artists and designers, a whole new direction was indicated for the display uses of electronic media. (Around the same time, portable video was beginning to receive wide use among educators, documentarians, and artists, anticipating a wave of interest in electronic image processing.)

By the mid 1970's, slide shows and multi-media presentations were in wide use and lacked only one significant development to create the phenomenon of multi-image as we know it today. Introduction of the micro-computer has propelled multi-image programming into a major business serving industry and theatre, and with the potential to develop an entertainment status comparable to film and video. What follows is a brief profile of one of the successful production groups, The Incredible Slidemakers, who are responsible for, among other things, the slide show which accompanied a recent tour by the Village People.

"Shows at the speed of light" is the slogan of The Incredible Slidemakers, a multi-image production company working out of a 3-story upper Eastside Manhattan house. It is an appropriate description of the work turned out by Doug Mesney and his staff of 15. During a recent visit, I sat in front of Mesney's 3rd floor "rehearsal grid" and watched 1,200 slides go by in 6 minutes, at rates of up to 10 per second. It was like watching film or video animation, in brilliant color, with stunning special effects—but somehow with more impact.

Fifteen slide projectors in a bank of 30, aimed at one area of a huge screen, were registered and set in motion to a specific program, controlled by the latest in micro-computer technology. Images passed by rapid-fire, in programmed sequences, punctuated by type graphics also spinning, zooming, and changing colors—all cued to a fast-moving musical soundtrack. Occasionally I would glance away from the hypnotic presentation to the projector grid flashing images from its 15 guns, almost as if to make sure that what I was seeing was really slide projection.

My first question to Mesney was, "Why slides instead of film?" He answered, "Because it's more magical. Film and tape have a different set of expectations. When an audience walks into a room and sees a bunch of slide projectors, they don't expect *this*. In the last five or

(Continued on page 62)



For a recent Village People tour, the Incredible Slidemakers produced a multi-image show that required 4 projectors to be installed in a special unit for aerial projection. The projector pod was hoisted into place (left) in the lighting grid. Final image alignment was simplified by pre-aiming and fixing the projectors while on the ground. Image size, indicated by grid on the screen, was designed to balance the visual scale of the slide show with the scale of the Village People on stage.

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Spring but never had. On the road, Ralph Holmes notes, "*Appalachian Spring* has about two light cues and the TV version has 23. You know you've done something they like when they ask 'now how are we going to do this in the theatre?' From day to day we are able to do things with lighting that they cannot do in repertory.

"It's interesting," Holmes says, talking about this close coordination between the designer and the choreographer. "In a way it's a teaching process. We're both learning from each other. The choreographer wants to see certain things and you have to teach him how to go about getting those effects. You might create the effect and he looks out on the stage and says 'Oh, that's not what I want at all.' But then he looks at the monitor and says 'Oh, that's marvelous, can we do that? 'You cannot trust your eyes entirely. You have to depend on the monitor to see how the colors will come out. We promised Balanchine that by the next time he came down to Nashville we would have taught the lighting computer Russian so that he could talk to it directly."

SLIDEMAKERS (Continued from page 41)

so years, the technology of slide programming and even of making slides has grown enormously. We are now operating off full-fledged microprocessors. It's computerized. Because of this you can make slides do things they never did before. For the customer, the cost and simplicity make it far more advantageous than film or videotape. If we don't like a sequence, we can take it out and put something else in easily. A lot of companies who use these presentations want to be able to make changes—a new product label design, for instance. With slides, we just shoot the new product and drop in new slides. It's flexible, audiences like it, and it's reasonably economical."

In the past, the "traditional" way of doing a multi-image show was to use a wide screen format with a string of, say, 3 or 5 (or more) images across, all changing in a predetermined pattern. While The Incredible Slidemakers have done and continue to do that kind of presentation—depending upon what a customer wants and who the audience is—they are tending very strongly back to the single screen because "it allows a

much faster moving show." Mesney explained that, "The same 15 projectors, separated, three to a screen, couldn't do the show you just saw. The whole tempo would slow down dramatically. In this presentation, there were times you were watching slides at 10 per second. With three projectors to a screen the fastest you could possibly go would be 1.5 slides per second, which is one tenth the speed." Then he interjected, "That's not bad, it just makes a different kind of show. We like the fast tempo, but if a client walked in and wanted us to do an essay on ballet, then we might slow the whole thing down and do a wide screen format."

Which brought us to the question of who uses multi-image. Who are the clients? Mesney replied, "In the past we have worked mostly in industry. The whole slide business really started with corporations, or industrial types of presentations, and they are still the single largest buyer of slides and slide services." Observing the recent trend toward theatrical use of multi-image programming, Mesney continued, "Now a lot of Broadway shows are using slides. We just finished a show for the rock group Village People which was our first major stab at theatrical application. Last week I met a fellow from Disney World where they are starting to use more slides in a purely entertaining fashion. Another producer on the West Coast just finished doing a 60-projector, purely theatrical, purely entertaining show for one of the major film companies. "Soon," he projected, "one of the big companies will open a theatre specifically for multi-image entertainment."

What has made all this possible in a few short years is, simply, the computer. Pointing out how the micro-computer revolution has affected theatre lighting, Mesney observed that, "Now the lighting effects get a chance to work with the slides, and designers can coordinate much more complicated kinds of things than ever before. Suddenly, it's a whole new way to communicate."

The computer used by Doug Mesney is the AVL (Audio Visual Laboratories) Eagle, the top of the line in programmers and recommended by most professionals as the finest in state-of-the-art equipment. Other brands which Mesney praises are Spindler & Sauppé and Clear Light. The next piece of hardware down the line from the computer itself is the dissolve unit. "The micro-processor tells the dissolve units what to tell the projectors. The dissolve unit is the translator—the interface—between projector and computer." Mesney's system employs the AVL Mark VII dissolve, which runs three projectors. A grid of 30 projectors has 10 dissolve units. The show I saw had 5 working the 15 projectors.

The slide projectors are all Kodak Ektagraphic, equipped with either Buhl or Navitar lenses. For purposes of the rehearsal grid, Mesney had his 15 projectors fitted with Buhl 7" lenses to obtain a relatively small image over a short throw. The only 15 were equipped with 9" lenses to get an even smaller image in the same space. This allows him to switch very quickly from a multi-screen to single-screen demonstration.

The Village People show, designed for only 4 projectors, presented a whole different set of problems and solutions. Because the image has to project hun-



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dreds of feet and compete with concert lighting, a high intensity light source is required to make the images as bright as possible. What is used in such a case is the standard Kodak body with a Xenon light source built into a box underneath—the whole thing generally referred to as a Xenon projector. An aluminum housing, specially built to contain the projectors, was hoisted up into the lighting grid for the performance. Once it was installed, the projectionist no longer had access to the slides, 250' away in the lighting grid.

With only 4 projectors, the total number of available slides could not exceed 320 (80 per tray). So, to achieve the kind of fast-paced show he likes, with constantly changing imagery, Mesney had to design a program that would make repeated use of the same slides. In a sense, the trays function as "a library of visuals," and the program causes the trays to go forward and backward, choosing slides according to what sequence is desired.

There are other interface devices which, according to Mesney, can tell the computer to turn on or off spotlights or special effects such as a mirror ball or bubble machine, to raise or lower screens, turn house lights on or off. "You could walk in in the morning, hit one button and walk away from it, and the entire show would run itself."

In a show with pre-recorded music, the cueing becomes "a giant timing exercise." The soundtrack has to be precisely timed out so that the computer can then be programmed to show the desired slide at the correct moment. For the Village People show, which is live on stage, the program had to be designed with pauses to allow an operator to cue up for each number. Bill Flanagan, the Slidemakers' publicity director, reports, however, that the show functions so smoothly that it could almost be done without a live operator.

A crucial part of the slide presentation, obviously, is the visuals. All the slides are prepared in-house at The Incredible Slidemakers, in an operation that matches film animation for precision and care. Using a stat camera to prepare the artwork and two giant Forox 35mm cameras capable of precise registration and multiple exposures, the Slidemakers are able to produce an unlimited range of effects. Images are built up on the film as well as on screen, so that there is great flexibility and access to all layers at once.

Patience and Organization

Basic Techniques for Special Effects Slides

The rule is to keep accurate records of all tests and experiments. It's no good to be amazed at your results if you can't remember how you achieved them.

FRED CANNIZZARO

Movies like "Star Wars" and the network TV station breaks have raised the visual standards of most people in this country. Practically no one these days is impressed by a title slide where the type is simply laid over a solid background or a photograph. For visual impact today you need special effects.

Why Special Effects?

For me special effects offer new and exciting outlets in multi-image photography. The results shown in this article are not hit-and-miss methods. This system for doing effects comprises a precise and controllable series of photographic techniques. It allows you to mix composites of photographic transparencies, type, illustrations, graphics. Within a multi-image show, the results can be sensational. Art directors are also finding these techniques quite useful for solving print needs.

Any effect that can be projected as a color slide can also be printed in color. Black-and-white prints can be made from color slides. The retention of original quality is very high when printed properly. An art director can get more variations through bracketing glow effects than can be achieved with an airbrush. Special-effects photography is definitely a medium that art directors can turn to when all others fall short. The key to developing your own effects is a willingness to experiment with film and light. The only limit is imagination.

A special-effects slide is built up of several exposures which together create a new image, one that may not exist except in a person's mind. This newness is what gives these slides their visual strength. People don't see images like these in consumer magazines or while out shopping, so the special effects attract and hold attention, which lets you get your message across.

Here's how you can get into special-effects slides with the basic effects.

Minimum Equipment Needed

The basic piece of hardware is the copy stand or special-effects camera. Forox makes the machine in the illustrations and designed it specifically for slides. Oxberry has a smaller stand available, and their larger animation stands, while intended for motion picture work, are also used for slides. A few of the stationary effects, such as glows, auras and stars can be photographed on a copy stand.

Motion effects naturally require motion of the camera or the art from which the slide is made. Here Forox offers the necessary features: (a) motorized vertical camera lift with cam-operated automatic focus; (b) optional stage that slides left to right, front to back, and also rotates.

It's most important that all these motions operate smoothly, with little friction, so the images exposed in motion will also be smooth.

Required is a negative film image usually referred to as a Kodalith of the artwork and type which forms the basis of the special effect.

Special Effects Glossary

We at The Incredible Slidemakers have compiled a glossary of special effects, illustrated with examples of those effects described. The items are not in alphabetical order, as the effects themselves seem to relate to each other, in the following order.

Glow. Like most of the special effects, the *glow* starts with exposing the backlit art negative until the light saturates the copy film. Using color-reversal film results in a clear image known as a "white burn." The sharply defined edges and high contrast of the white burn preserve legibility after the basic shape is re-exposed in additional colors and derived shapes.

The white burn is done with the negative held flat under the glass holder on the stage. The glow is added by a second exposure of the same image through a diffusion screen laid on top of the glass. This screen can be a matte-finish drafting film or something similar. Fog filters also create good glow effects.

The backlight must be extended in area, not a point source, so that some light will spread out over the matte screen immediately surrounding the basic image. When double-exposed, with the lens opened three stops, tungsten color film ignores the basic image, since that part is white, and picks up a fringe of light that gives the appearance of the glow.

A color gel anywhere in the light path will color the glow as desired. For convenience, the gel usually goes on top of the matte screen.

Aura. Like the glow, the *aura* effect uses a negative of the art or type that is first exposed by itself. Then, over the negative is placed a positive contact print, on lithfilm, of the same art or type. With these two films placed together, in register, with their emulsion sides touching, no light passes through them. The matte screen, laid between the negative and positive films, permits a controlled amount of light leakage around the edges. The leakage is small and requires about 10 stops more exposure than the white burn.

As in the glow, the *aura* can be colored by a gel on top of the copy-stand glass. If you do this, you have a backlit effect for your initial image.

Stars. Headlights and twinkling *stars* are made with cross-screen star filters. A star filter with 1mm facets seems to work best. Getting the stars in the correct position requires planning and control of registration with the pinning system, described later.

A point light source is created by piercing an opaque sheet with a pin. Since the size of the stars will depend on the size of the hole, it is important to designate one or more "standard pins" to make controlled pin holes.

Working with a master negative on the

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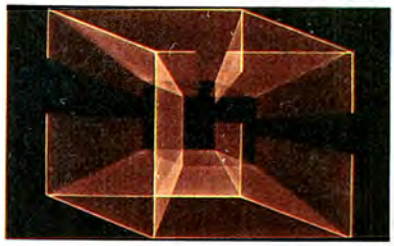
Glow



Aura



Stars



Zoom



Zoom



Linear Pan



Circular Pan (Spin)



Circular Pan (Spiral)



Rollercoaster

These slides are some of our more ambitious attempts with composite effects. – Fred Cannizzaro



This is an example of a Rotoscope technique. This enables you to add graphics and effects to an already existing 35mm slide. The object that the dancers are on is a 28mm transparency looking up at the TransAmerica building in San Francisco. There was no client for this. We did it for our own fun.



Here is an example of a variety of burn, glow and aura techniques applied to black-and-white line art. The client was Owens-Corning Fiberglass. The need was to illustrate a futuristic building. Through three projectors, the yellow lights on the building moved around the surface.



This scene of Greenwich Village in New York City was produced for the Village People's Tour in 1979. It is a much more involved version of the techniques and methods in the Owens-Corning Fiberglass slide. The key to this special-effects slide is patience and organization.

pin-register cells, you mark and punch the star locations. This sheet is then pegged in register under the glass on the stage and exposed. The amount of exposure controls the size of the star. The angle of the filter sets the star angle. Stars may be colored by adding gels over the point sources of light.

Get a Move On

Some of the more spectacular effects involve motion. The projected image that the audience sees can give the appearance of an object or words swooping, dashing or spinning. The motion is implied by trails of light extending from the basic art or type.

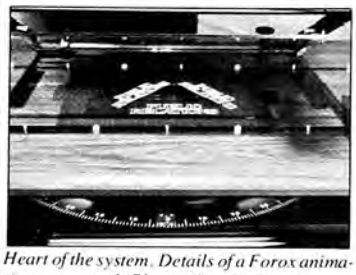
Zoom. The most basic motion effect is the *zoom*. Any copy stand with a smoothly operating height adjustment and automatic follow focus will do the job. Zooms can go in or out, and in any direction.

Zoom trails form a single point perspective of what can be visualized as translucent trails having the cross-section of the basic art. The vanishing point location is easily controlled: it is always on the lens' line of center in the copy camera. Thus to make the trails extend upward and to the rear, the negative of the art is placed in the lower area of the frame on the stage, and the camera is run up from its starting position. For zooms that seem to explode out toward the viewer, the camera will come down onto the art during the time exposure.

The best form of art for a zoom is an outline type in a bold face (like Helvetica bold outline) or fine line ▶48

unlocked direction on the stage.

Circular Pan (Spin, Spiral). The Forox compound stage also rotates freely to permit circular panning motion trails. It is seldom necessary to rotate the stage more than 360°. The camera could also zoom during a circular spin thus creating corkscrew spiral effects.



Heart of the system. Details of a Forox animation compound. Platen glass is placed on top of bottom-lit lithfilm negative. At front are handcranks for North, South, East and West movements, and peg bar movement.

Rollercoaster. Combining a pan and a zoom simultaneously leads to some great free-form effects. Since the trails are interesting on their own, the original art is usually restricted to a relatively small area near the bottom of the frame.

In practice, a *rollercoaster* is an extended zoom modified by some pan motion during the zoom. For example, during a 9-second zoom, the operator might slide the stage along one axis for 3 or 4 seconds to put the rollercoaster effect into the zoom trails.

Because of the manual control of the pan, a rollercoaster is planned in advance by running through it with the aid of the frame grid projected by your system's camera head. This is a reti.le that enables the operator to judge the position of the art in the frame at any focus distance of the camera. Desired positions and patterns are converted into timed intervals and specific motions, to be executed by the timer during the real exposure. All motion effects should be previewed to determine the best possible positioning for the art.

Using Special Effects

Single-effects slides are exciting but multiple-effects slides can be spectacular if combined into an imaginative program in a



Close-up of Oxberry peg bars for producing multiple cell frames.

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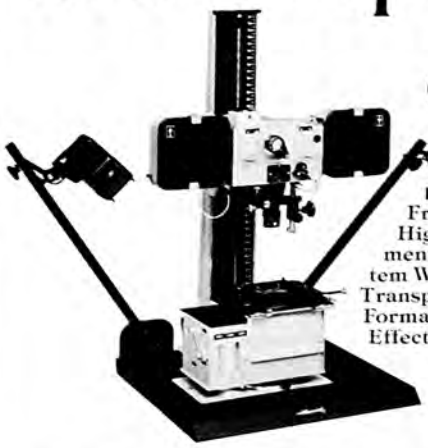
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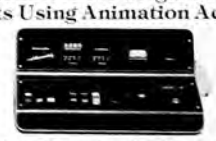
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multi-image show. Glows and auras need not be photographed on the same slide as the basic art. So in performance, the glow can pulse, change color, or come and go.

Make three separate slides of the star effect, all from the same pin-hole master. Only angle them at 1, 2 and 3 o'clock by changing the star filter's angle. Then put them in three projectors that can be cycled rapidly. The visual result is rotating star highlights.

Once you start producing your own special effects, you'll see many more possibilities for different designs and unlimited combinations.

Where Do I Go from Here?

Once you become familiar with these basic methods, the future use for effects will become very appealing. My own experience in working out these methods with the other photographers at work has been very exciting. We quickly found out that there were no books written on how to make special effects for multi-image shows. The solution was simply to dive into the unknown and try anything and everything. The only rule is to keep accurate records of all tests and experiments. It's no good to be amazed at your results if you can't remember how you achieved them. P



*Fred Cannizzaro is production manager for special effects photography for The Incredible Slidemakers, New York City. He graduated from Brooklyn College, **cum laude**, with a BA in television*

better for both its new SLO-323 and VO-2611/VO-4800 models. However, at 320 lines black-and-white, the 2611 still has a slight rated horizontal-resolution edge over the 323's rated 300 lines. Both the 323 and the 2611 have similar audio monitoring, pause and remote-control adaption capabilities.

Picture Search Function

One very useful new feature to be found on the Beta 323 is a high-speed picture search function called Beta-Scan. This lets you fast-forward through a recorded program at up to a 15X normal forward play speed while retaining a definable picture. This means that you can visually roar through 60 min worth of recorded material in something like 4 min or so. You can perform this picture-search function in reverse at up to 10X normal speed. Further exploiting this picture manipulation capability, the 323 will reduce playing speed for slow-motion viewing down to 10X and will hold a noiseless still frame for up to 7 min. After you have made your original recording on the 323 you will find these picture-manipulation capabilities are very useful for both your playback and dub-editing functions.

Beta-Scan should sound familar. It is also found on Sony's new '78-'80 consumer SL-5400 and SL-5600 Betamax models. We note that Sony's newly introduced VO-4800 portable ¾ U-matic recorder has a similar high-speed picture search which works up to 12X normal picture speed in both forward and rewind.

While external remote controllers have long been used to operate videotape machines for various editing and search purposes, this capability is being refined to a high degree in the ½" recorders and players. Sony first introduced a cable-connected, remote, playback search controller for its Beta 300 machines almost two years ago. As an aid for many playback applications it provided an amazing range of options: all modes of playback functions; location and play of random segments by predetermined and fixed locater codes; and still frame. First introduced for the Beta, the random-access controller became available for certain ¾ U-matic machines as well. VHS users will be interested to know that Panasonic offers a similar remote controller for its new 8200/8170 machines.

Sony's newest versions of its controllers which come plug-ready for use are programmable and complete with their own internal memory. As such, they are capable of handling up to 63 separate segment or chapter start points in numerical sequence from program start. As an additional feature, 8 of the 63 segment start points can be programmed for playback in variable order including "skip" and "review."

Besides letting you pick out any specific time point in minutes and seconds and then letting you call it up, both of the new programmable random-access controllers — the RX-303 and the RX-353 — also handle all remote control functions. Only the RX-353 is able to "write" or record the program on the tape, i.e., to record the designated segment location points which are then used for programmed search. The RX-303 just finds the programmed points on playback; it does not create them. As we understand it, if the segment location points are recorded into the tape, and the tape is then duplicated, the recorded segment location points will be similarly reproduced on all copy tapes. P

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SHOW NAME: TwinImages

PRODUCED BY: AMI / TwinCities Chapter

DATE PRODUCED: February 1980

TRAY NUMBER: Two

THIS MONTH

Graphic Imagination - it's out there and we've got a show to prove it. "Bumbles," a 15-projector visual extravaganza produced by Doug Mesney and the Incredible Slidemakers (NYC), will be the featured presentation at our next meeting. The meeting's topic is Graphic Imagination - Type.

Type manipulation (creating neons, zooms, streaks, burns, and the like) has come a long way in a very short time and has proven itself to be a highly effective means of adding jazz to any slide presentation, be it mini, multi, or maxi. Calliope's Pat Carney and Bob Dale, president of Slide Images, will lead a discussion on the myriad type styles and methods of manipulation currently in use, and will demonstrate some of the countless animation techniques possible using only the printed word.

In just a few, short, comprehensive minutes, the Ami award winning "Bumbles" shows most of the type styles and type activity being used in the field as well as a few known only to the Incredible Slidemakers themselves. If you've seen it you already know that it's the fastest slide show alive. If you haven't seen it, it's more than likely that you'll leave the meeting saying, "I've seen enough, I'm full."

Date: Wednesday, February 20, 1980

Time: 7:00 Refreshments, registration, and visual surprise
7:30 Graphic Imagination - Type

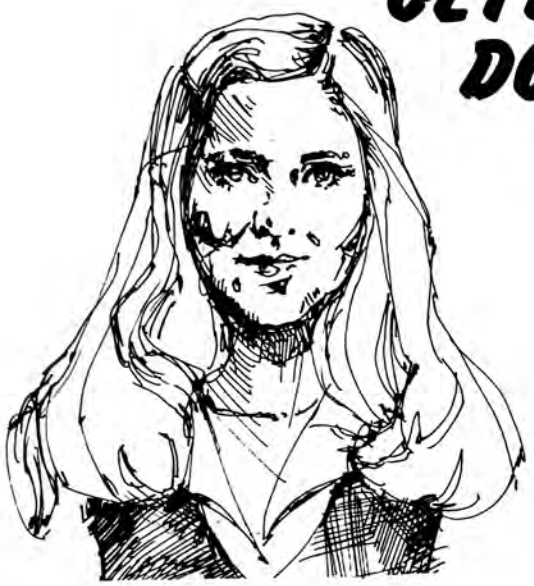
Place: Blumberg Photo Sound
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FORUM

Within our Chapter's membership we have hundreds of years' experience in multi-image production and purchasing. Each month we'll draw on that resource to answer questions or suggest innovative ways of doing multi-image. If you've got a question, idea, or just something you want to say to the membership, here's the place to do it! Address your correspondence to Editor AMI/TC P O Box 23044 Mpls MN 55423.

GETTING DOWN TO BUSINESS



Joan K. Heimbach

AMI FORMS BUSINESS STANDARDS AND PRACTICES COMMITTEE

It is with great pleasure and enthusiasm that I am devoting this quarter's column to a significant step in the development of a more professional industry. However, let me set the stage for you with some preliminary observations on the history of this event.

Since multi-image has so recently flourished as a business, few rules have developed regarding the compensation for services rendered. Those rules which have been applied have been done so sparingly and the rules have been borrowed from related industries. As a result, both producers and clients have been subject to misunderstandings, unpleasant financial disputes and in some cases overt unethical and disasterous ripoffs. **Both** parties have had their turns as victim and perpetrator (albeit, in many cases, unwittingly). And these misunderstandings have occurred in the course of high and low budget shows, commercial and educational shows.

As for the "BUSINESS" of MI production, it's been virgin territory for the most part. But as in any developing industry, the free-for-all soon becomes an organized game and rules or standards begin to take shape. The process seems perhaps a bit slower in the arts related business, but it takes place all the same. Various "creative" suppliers such as dancers, musicians and actors work under contractural agreements with their employers. (Actually, any form of employment constitutes a contractural arrangement, i.e., specified services performed for a stated amount of money.) When these terms are in writing, both parties can clearly see their mutual obligations. The same should be true in the "creative" business of multi-image production. Yet too often, it is not.

The cries are heard over and over again: "We lost our shirts on that one!", "They wanted a $10,000 show for three grand," or "I'll never hire a multi-image producer again . . . too many hidden costs and budget overages!" While we are not anywhere near the point of eliminating those tales, we are on the threshold of developing standard business practices that will hopefully one day permeate this industry.

One of AMI's new committees is "Business Standards and Practices." (Note: this does not imply industry technical standards, per se. A separate standing committee addresses those aspects.) This committee has begun addressing itself to such issues as uniform ways to deal with clients, salary structures, job descriptions and employee considerations. The group's first undertaking is about to bear fruit in a pro forma multi-image production contract. It is likely to be a welcome tool for both clients and producers.

Recently, I did a survey of both clients and producers. Most people I spoke with reported that a verbal agreement, coupled with a basic unilateral letter of

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Association for Multi-Image | *Multi-Images* magazine | Spring 1980

agreement (or actually one of "statement") was the extent of their contractural arrangements. Few producers spell out all the details of the project and even fewer stipulated specific areas such as rights and penalty clauses. Most hope that the addition of a contingency percentage will cover any difficulties that arise during production. Not unexpectedly, most producers and buyers related that they have had at least one experience where the absence of a specified letter of agreement or contract created difficulties.

Committee Chairman, ~~Doug Mesney, President, The Incredible Slide Makers, New York~~, explained to me that this was the reason a pro forma contract was the first undertaking of the committee. "Actually, the committee formation and the identification of objectives took place concurrently," Doug explained, "Many of us at the national conference in Los Angeles expressed the same concerns regarding the lack of uniformity in dealing with clients. We decided we wanted to see that change, for mutual protection and professional growth. Fourteen of us approached AMI President, Pete Mather, with a proposal for the establishment of a Business Standards and Practices Committee. Pete took our request for committee recognition to the Executive Committee and Board of Directors and with their approval we were operational almost over-night."

The quick move on a bona-fide pro forma contact comes partially as a result of sudden and increasing ►►►

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By What Rights Do You Buy A-V?

MULTI-MEDIA SHOWS CAN PAY DIVIDENDS IN LOW-COST REPEAT PRESENTIATIONS, BUT YOU'D BETTER KNOW WHAT YOU'RE BUYING IN PHYSICAL MATERIALS AND LEGAL RIGHTS.

Everyone agreed that the last meeting you planned was terrific. Best of all, the audiovisuals really tied the whole thing together and were well worth their sizeable investment.

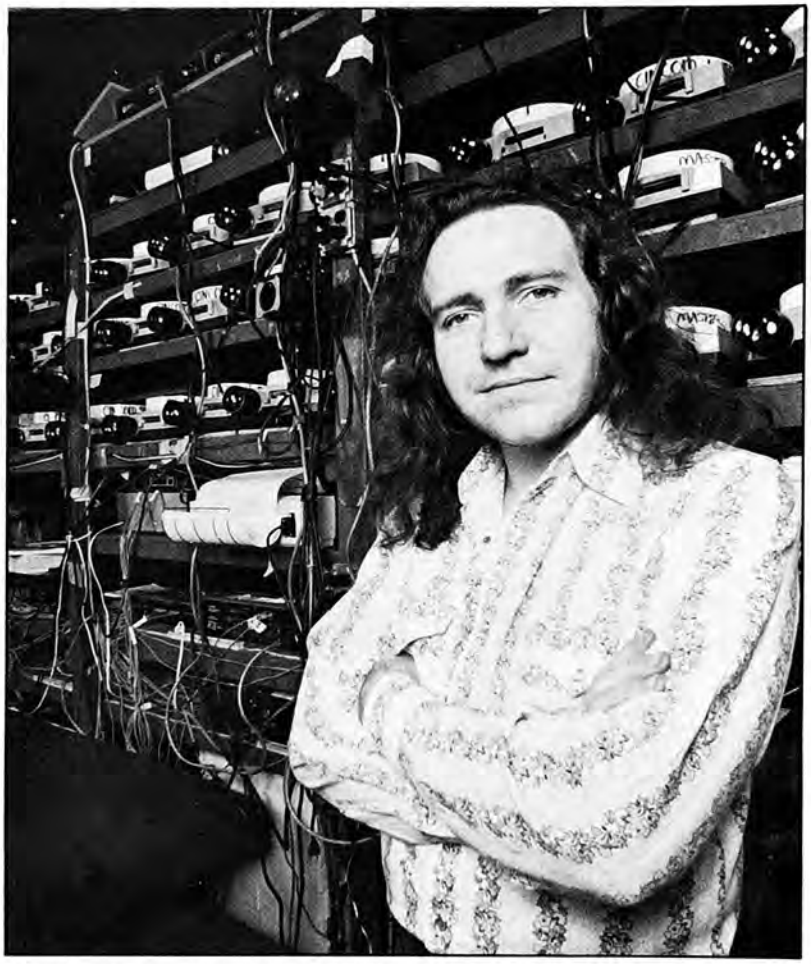
To get extra mileage from that investment, you've decided to repackage the a-v materials for use in smaller shows at regional meetings and at trade shows. But before you take what your a-v producer hath created and alter it, you had better find out if you have that right. Better yet, find out even before you buy an audiovisual package whether your producer will give you that right.

"People keep falling into the same trap year after year," says Doug Mesney, president of The Incredible Slidemakers, a New York City a-v house. "The one I liked best last year was the large midwestern corporation that spent $150,000 for multimedia at a national sales meeting—and that's all they got.

"They didn't know it, but they were buying just the one-time use of the material. When they were done, they didn't have so much as a set of the slides that were used. Everything belonged to the producer."

To restage that show, even for internal use or to a small group, the fee would be $6,000, plus expenses, plus equipment rental. That would make it financially unfeasible to replay the show at regional meetings or other company functions.

But, say your producer isn't quite that tight and leaves you with a complete set of slides and even a copy of the audio tape that accompanies the show. There is still the question: Can you use the show again? Do you have the equipment? Do you have the skilled technicians to set up a complex, multi-screen program and get it to run correctly?



Doug Mesney, president of The Incredible Slidemakers, a New York a-v house, urges planners not to fall into legal traps over future use of a-v material they've bought.

State of the art for major meetings, these days, calls for multiple projection screens and many, many projectors. Three screens and 15 projectors are fairly common. The really complex shows can have more than that, along with specially constructed cloth or plastic screens and other effects, such as lasers.

"Ignore the creative part of those really big programs, putting them together. You hire a producer to do that," Mesney says. "Simply to stage the show requires skilled people, an appropriate environment and expensive equipment. Most companies can't handle those requirements, so they never get full value from the dollars they spend on multi-media. Even if the slides, films and tapes are in the office,

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Audio-Visual Communications magazine | May 1979

Legal a-v

continued

they sit on a shelf because they can't be shown properly."

The physical handling problems pale before the tangled legal problems, though. There is a new copyright law, in effect since January, 1978, but the generally "underground" aspects of audiovisual productions posed such difficulties that the bill's drafters were not able to reach a compromise in time for it to become law. There is a conspicuous absence of guidelines concerning a-v materials in the new law, but plenty of very clear warnings that some practices, common in the past, are now very much illegal.

For example, that catchy tune that kept you bouncing along during the meeting—is it under a copyright? If so, who holds it?

If you don't, you could be liable for infringement if you play it without first arranging for royalty payments.

Remember that fantastic shot of the sunset over Manhattan? And the Grand Canyon from the air? And the rocket taking off? Did your producer take them? Or did he "borrow" those photos from his file of old magazines? Unless they were really old magazines (that is, more than 56 years old, the maximum term of a copyright under the old law), they almost certainly are under copyright protection. If the publisher doesn't have it, the photographer does. Or perhaps both claim rights.

The very restricted distribution of most multimedia shows has permitted the widespread practice of "swiping" music and photos with little danger of discovery. But when a show is played again and again, in different locations, sometimes open to customers and their friends, the possibility grows that the copyright holder eventually will learn of the infringement.

Penalties for infringement, under the new copyright law, can take one of three forms:

1. Actual damages plus the infringer's profits. The copyright owner is entitled to collect any money he lost as a result of the infringement, plus profit the infringer realized, plus attorney fees.
2. Statutory damages. If the copyright owner elects this option, the court can assess damages between $250 and $10,000 at the judge's discretion. Willful infringement raises the top fine to $50,000.
3. Criminal penalties. "Any person who infringes a copyright willfully for the purpose of commercial advantage or private financial gain," as the new law reads, is subject to criminal charges. Audiovisual materials are classed as motion pictures, for which the first infringement carries a fine up to $25,000 and up to one year in prison. A subsequent offense could get you a fine of $50,000 and two years behind bars.

How can you avoid these problems and legal liabilities while still enjoying the benefits of multimedia? The answer: being certain of what you're buying when you hire a producer.

The new law assumes that the author of a work, the one who actually created it, is the person entitled to copyright protection. Normally, the independent producer most closely fits this definition. The law further allows, however, that the client or buyer who specifically commissions a work "for hire" can be the copyright owner if there is a written agree-



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ment to that effect.

While this area of the law is yet unclear, it seems that the company desiring to own the copyright on a multimedia presentation should also insist on "for hire" agreements between the producer and any independent contractors who contribute creatively.

For example, the script writer, if not regularly employed by the producer, is an "author" entitled to copyright protection for his "work of authorship." The writer must relinquish his copyright rights with a "for hire" agreement before the client company can validly register a copyright. The same applies to photographers, musicians and composers.

The client can also obtain reproduction and performance rights from the copyright owners, via a license. Care must be exercised here if exclusive rights are needed, or if exclusive rights in a particular field (like steelmaking, medicine or retailing) are required. Some forms of exclusive license can be considered a purchase of that segment of the copyright.

Lawyers are just beginning to argue over these points and most of them agree on only one thing. It will take litigation and court decisions to set definite rules, and the process should take years.

In the meantime, the buyer of audiovisual services will get the most for his money if he watches out for the legalities and is very specific about what he's ordering from the producer. Most importantly, the buyer should insist that the producer exercise control over all phases of the creative work, and that he keep in mind possible future uses for the material.

"If the producer has control, he can create completely original shows on the same budget that a producer without control would spend in assembling swiped photos to swiped music," Mesney says. "By control, I mean the producer has all the people and equipment he needs, available all the time, in his own studio. He owns the projectors, tape decks, programmers, Forox camera, other tools of the trade, and has people on staff who are experts in each . . . always ready."

Legal a-v

continued

Photography is often shorted because it can be expensive. If a photographer takes only what is needed for a multimedia show, that's expensive. But if that same photographer at the same time also takes pictures needed for advertising, publicity, brochures, sales aids and every other thing for the next year, the cost is better than reasonable.

With a single authority, there is also a single profit to be made. "An independent producer, no matter how creative, usually pays top rates to rent studio equipment because he doesn't want to reserve too little time, which would interrupt his work. So he tends to book —and pay for—too much time," Mesney says. "The same thing happens when he hires a photographer, who must make his profit on the photography alone."

When everything is under the producer's control, there is no need to ensure that each operation has a padded profit margin to allow for contingencies. The overall project can absorb the inevitable emergency without wrecking anybody's budget, especially the client's. SM

Your music may need clearing

The right to include a musical composition as part of an audiovisual show is called the "synchronization" or "mechanical" right. The publisher or other owner of the copyright grants the license and sets the fee after considering what use is to to be made of the music. To facilitate licensing, most publishers are represented by an agency (like the Harry Fox Agency in New York, which acts for about 3,500 music publishers).

To obtain a synchronization license, you approach the publisher or agency with a description of the use you plan: size and type of audience, number of shows, geographical territory covered and so on. Each fee is individually negotiable, but they commonly range from "a few hundred dollars to several thousand."

Some compositions are not offered for licensing as part of an audiovisual presentation. Many others cannot be licensed because they are in the public domain.

But even public domain material, if copied from a commerical recording, requires permission of the publisher if used in a business-related way. Approach the publisher or record company directly.

After securing synchronization rights, it is necessary to obtain a separate license for performances.

The American Society of Composers, Authors and Performers (ASCAP) licenses most musical pieces for performances outside a dramatic setting (that is, without costumes or plot), done in public and for profit. The "for profit" clause includes business applications like sales meetings, where the show itself makes no profit but is part of a profit-oriented effort. "In public" is defined by the new copyright law as "outside the normal circle of family and friends."

ASCAP grants performance rights at very low rates if the use does not reduce the value of the music for commerical broadcasting. The fee per show might be only $5 or $10.

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Why is text handling significant? In the first place, consider the current debate over the office of the future. On everybody's list as a key ingredient is the integration of word processing with traditional data processing systems, yet no one to date – with the exception of Infodata – has so far made significant advances in that direction. (Data dictionary vendors, of course, are clearly aware of this area [refer to the November *Newsletter* interview with David DaCosta, President of MSP]; their efforts, however, are still in the planning stages.)

Of more immediate interest is automatic access to documents of all types, particularly to documents falling within relatively restricted subject boundaries (e.g., all recent research reports on toxic drugs, or all patent documentation within a certain technology).

"Document" must be loosely defined. Any type of textual material – correspondence, legal briefs, research commentaries, dialogs, clinical reports and so forth – represent documents. The "data" these types of documents contain tends to be descriptive, free form and interpretive, rather than fixed in nature.

We have talked about this type of "data base" problem before, specifically in the January, 1978 *Newsletter*. Briefly, the content of the data base tends to be archival, and once entered, seldom if ever modified. The primary focus is on data retrieval, rather than on managing update concurrency. Also, there tends to be records of only a single type; access is characterized by highly qualified retrievals of records of this one type, rather than on the inter-relation of records of distinct types.

The basic difficulty in text management is the assignment of descriptors, or more concisely, in document *indexing*. That this is largely an intellectual problem is a fact from which there is no escaping. Effective indexing depends on the *meaning* of the "data" in the documents.

INQUIRE supports two general approaches to the management of textual information: proximity searching (or free text, uncontrolled vocabulary) and thesaurus control (or controlled vocabulary). The former minimizes human intervention, though with sacrifice in precision (this is the "meaning" problem); the latter increases precision, but requires human participation in indexing activity. Thus,

continued on page 8

later

TIS Presentation

New York, December 7, 1978

Past, Present, Future

On December 7, 1978 in New York City, Cincom Systems unveiled its new TIS, TOTAL Information System, which it hails as the next generation in data management software. In fact, this was the second unveiling – the first took place last October at Cincom's semi-annual fall Knock-About in Cincinnati. The show itself was an impressive multi-media blitz – a battery of 18 microcomputer-driven slide projectors provided visual effects that literally assaulted the senses.

In a nutshell, if TIS proves to be everything the vendor promises upon its April 1 scheduled release, it will transcend everything you now understand about Cincom software. It is an aggressive offering, designed with manifold objectives. Its marketing parallels the spirit of the software – it aims at putting information decisions where it really counts, near the very top of the corporation. It is thus a reflection of a changing climate in the data management field; here is tangible evidence that the artificial boundaries that have long isolated DP from the rest of the corporation are unlikely to persist given the increasing sophistication of end-users.

To put the announcement into perspective, it is really necessary to go back at least a decade. Toward the end of the 1960s, data base was a new idea being kicked around – I-D-S and the original CODASYL efforts had attracted a small but talented following – but its concepts were generally understood only by the technically astute.

Then TOTAL appeared in the IBM market and almost overnight, or so it seems in retrospect, was a success. Why? It satisfied all the technical criteria of data integration and independence, and it clearly outclassed its only competitor, at least in performance, IBM's IMS/360. TOTAL was a technician's dream-come-true.

This is not to say that there weren't some early pioneers in bringing the data base concept to the people, so to speak – MRI's SYSTEM 2000, for example, also made its debut in the late 1960s. In hindsight, however, MRI may have been too far ahead of its time – its success was impressive, but the end-user climate had not really yet come into its own.

So, TOTAL found its home in the technician's kitchen and there it seemed to stay. Not one to foolishly turn from its constituency, Cincom has courted this firm technical following all these years. TOTAL itself, though it appeared on ever widening hardware horizons, remained virtually untouched, even though structurally outdistanced by both the newer IMS/VS and IDMS. Even more disturbing, new inverted DBMS, ADABAS and DATACOM/DB, took up positions alongside SYSTEM 2000, and greatly substantiated the whole concept of end-user data base – in theory at least, if not in practice.

Thus, a decade later, the time had clearly come for Cincom to make a new move in the data management arena. If TIS proves to be that move, which it certainly promises to be, Cincom's future will be placed squarely upon its shoulders. The larger question then is the following: just how well has Cincom put its fingers on the pulse of the industry? The answer remains for the 1980s, the second decade of independent data base software, to decide.

continued next page

The Swedish Chef

"For me, being creative is now discovering new formats, new ways to use equipment. I am tired of the traditional multi-image formats, which are so predictable. With few exceptions, all the shows being produced today look the same—and sound the same."

What's cooking with the incredible slide-maker? Douglas Mesney has been preparing award-winning multi-image shows for nearly two decades. His induction into the Association for Multi-Image International's Producers Hall of Fame last year attests to his recipes for success. In this exclusive and candid interview Mesney reveals why multi-image is still the spice of life, and why he enjoys being a "Swedish chef."

Audio-Visual Communications: Why do you compare multi-image with cooking?

Mesney: Because for me, it has always been out of the frying pan and into the fire. This is a crazy business. . .like operating a restaurant. But what we sell is food for thought. It has to taste good, and also be digestible and wholesome.

Then, too, you can make valid comparisons between the cuisines of specific nationalities and their preferences in multi-image. For example, in Sweden, where I am currently on assignment, the foods are heavy—lots of potatoes and meat and sauces—and so are the typical shows. English food is, well, "English." Japanese food is the highest artform of purity and simplicity while the French perfected the art of eating centuries ago. And you can see the same absolute differences in their multi-imagery. Americans, on the other hand, eat more fast food than any other culture, and their livestock and vegetables are often pumped full of growth hormones and additives that "revitalize" nutrients that escape during the food "processing." Need I say more?

AVC: Are the rumors that you are leaving multi-image to open a restaurant true?

Mesney: I like to cook. In many ways it is more fun than slides. You get immediate results you can actually taste. And by the next morning at the latest, you know if you made any serious errors.

Besides that, people need food, but they do not need slides. That is why slide shows must be perfectly cooked. And that is why selling slide shows is similar to managing a restaurant. People can always eat at home . . .(There is a loud, muffled explosion in the kitchen. Mesney quickly leaves the room and returns a moment later.)

Mesney: As I was saying, the reason people dine out is if the food is either better tasting than they can make at home, or they just cannot get it together with a

(continued on next page)



GLOBAL GOURMET: The producer/chef. . .still cooking creatively after all these years.

In His Own Words: Doug Mesney

complicated, fancy recipe. Or maybe they just want to relax and not be bothered with cooking.

I am mostly interested in oriental food now, especially Japanese. Sweden is great, but I am looking for a new slant.

AVC: That sounds racist.

Mesney: It's not, actually, but you have to call a spade a spade. I mean, when I say "a new slant," that is exactly what I mean.

But we were talking about cooking. In supermarkets throughout the world you can buy a wide range of pre-cooked or premixed foods. . .even international selections. You can throw away Larousse and all your other cook books because whatever you want, someone already has it prepared for you. All you do is add water and heat for fifteen seconds in the microwave. But these ready-to-cook-and-eat foods do not make eating or food preparation an artform. It is quick, easy stuff that anyone can make at home. To get people to eat out, the food has to be different and better than they can make for themselves.

AVC: Do you have a favorite recipe?

Mesney: I do not use recipes. Well, hardly ever. . .usually just to become acquainted with the basic ingredients. Foods are like colors. You can mix and blend families of foods together in every which way. I have lived and worked in so many places that I do not think in terms of specific recipes. I do not even think in nationalistic terms about combinations of seasonings. Chinese food tastes great with a dash of Indian or Thai seasoning. A turkey tastes better with a touch of Turkey. And so it goes.

AVC: Can we return to your earlier racist statement?

Mesney: My what?

AVC: The statement about "the new slant."

Mesney: I was talking about new experiences, new things to learn, keeping on the move. There is a whole world out there that is slowly becoming a single community. As you wander through the streets of any city, anywhere, you can smell the marvelous aromas of all sorts of foods from around the globe. Everyone is eating everything.

AVC: So the rumor about the restaurant is true?

Mesney: Did I say that?

AVC: Should we call you the "Swedish chef" now?

Mesney: There is no doubt about the fact that I am actually a Muppet. But the real Muppet character speaks Swedish better than I do. I never learned the language that well because I never expected to be here that long.

AVC: Why so long in Sweden?

Mesney: The climate.



SAVORS FLAVORS: Fast food and stale multi-image leave Mesney hungering for new tastes.

AVC: But didn't you originally move to paradise?

Mesney: Yes, but it turned out to be hell. We get too soon old and too late smart.

AVC: What was the problem?

Mesney: There is no business in paradise [Hawaii]. Also, sunlight and slide shows do not mix. Winter is a much better environment for creativity. There is nothing quite like a perpetually gray sky to bring out the best in you. And the freezing temperatures preserve the film better on extended outdoor shoots. More importantly, your chocolate bars will not melt, and meat lasts for days.

AVC: What is the "meat" of your life?

Mesney: I beg your pardon.

AVC: In your professional life, what is turning you on now?

Mesney: Very little. . .they have strict laws here.

AVC: About slides?

Mesney: That, too.

AVC: Would you care to elaborate?

Mesney: These are not real laws, but unwritten ones. In Sweden, you are not supposed to "sell," at least not in the American way. Selling is much less aggressive—and most people are relatively conservative, so promoters and corporate communicators are less inclined to take risks. It is much harder to be "creative."

AVC: How do you deal with that?

Mesney: I always try to surprise people. . .but just enough. . .like with the meals I cook. I never serve "normal" food here. It is always different and highly spiced, usually with all sorts of contrasting ingredients.

AVC: For example?

Mesney: First, boil two fresh chickens for twenty minutes. Then remove the meat, discard the bones and pour the broth into a large, flat bowl. After it has cooled, add ice cubes and freeze the fat so that it can be easily removed by dragging paper towels across the surface. You now have clean meat and real chicken broth. Incidentally, you cannot buy canned chicken broth in Sweden; only these horrid little cubes that taste like salt and chemicals.

Next, we have to assemble the spices. . .

AVC: But we were talking about slides. . .

Mesney: So am I. It is like the chicken broth. Many of the supplies you take for granted in America either are not available here or, with all the taxes, too expensive. In Sweden and many other countries you have to improvise and make your own. It makes producing good slide shows and good food a bit more challenging.

AVC: Couldn't you compare any communications technique or medium with cooking or food?

Mesney: I suppose you could. All communications media deliver food—food for thought. But I prefer slides because you can add more zest more easily and less expensively than with other media. I like to cook zingy international food using all sorts of spices, and I make my slide shows the same way. Both my food and my shows are eclectic. But that is why people like to dine out. . .to get something a little different.

AVC: People are interested in what's cooking with you now, so to speak. Would you care to answer that?

Mesney: I was trying to. . .so the basic spices are: garlic, finely chopped fresh ginger, red and green chili, fresh corriander leaves, light soy sauce, a dash of sherry and sugar, Thai fish sauce, tamarind water, lime juice, kummin and fennel seeds, sesame paste to taste and coconut

(continued on page 60)

(continued from page 26)
cream. There is more you can futz with, but that is the basic package.

AVC: That is a multi-sensory mouthful. But, at the risk of being boring, what about your slides?

Mesney: Is that a question? You tell me: what about my slides?

AVC: That is what we are here to discuss.

Mesney: I thought you wanted to know about my favorite recipe.

AVC: It does sound appetizing, but our readers are more interested in what your multi-imagery is all about these days.

Mesney: Oh.

AVC: Perhaps you could tell us about what you are doing currently.

Mesney: Cooking.

AVC: In addition to your kitchen classics, do you ever cook with slides anymore?

Mesney: Occasionally. . .usually for ten or twelve hours a day.

AVC: Soup's on! So you *are* still producing shows?

Mesney: I guess you could call them that.

AVC: What type of shows?

Mesney: They are not worth discussing.

AVC: Why?

Mesney: Because these shows are too "normal." There is nothing really unusual . . .no new ground is being broken.

AVC: You must have a few new tricks up your sleeves.

Mesney: Of course.

AVC: Would you care to comment on one or two?

Mesney: No, not for the moment.

AVC: In which production area are you concentrating? For example, are these new concepts graphic effects or programming techniques?

Mesney: No, not all. I think the technologies for graphics production and programming have been fairly well polished at this point. I am more interested in creating new ways to project and use multi-image shows. The thought of competing with video more effectively is much more interesting to me than dreaming up some new Forox trick.

New camera tricks and other special effects cost a fortune these days, driving our budgets so high that the video guys chop us to pieces like mince meat. We need new and better ways to exploit the available technologies. We must start thinking in terms of what our customers are trying to accomplish. Then we must generate ways of using multi-image that accommodate those needs better and more differently than we have in the past while remaining more cost-effective than video.

At the same time, of course, we all want to be as creative as possible. But for me, being creative is now discovering new formats, new ways to use equipment. I am tired of the traditional multi-image formats, which are so predictable. With few exceptions, all the shows being produced today look the same—and sound the same. I think we are all ready for something clearly new, especially our customers.

AVC: Are you prepared to say what that is?

Mesney: Soon, but not yet.

AVC: Your reputation was built on special effects and high-speed shows. Are these the types of programs you produce now?

Mesney: Not at all. Imitation may be the sincerest form of flattery, but too much is ridiculous. I still see some producers copying my old style. But for me, the stylistic aspects of the medium have changed radically. Recently, I have even started using dissolves longer than two seconds.

Actually, I found that my reputation was working against me. Although people liked "Bumbles" and, as far as I know, "Hawaii . . .Xanadu" still holds the world's land-speed record for slides, many of them thought that the only types of shows I could make were lightning-fast mind-blowers. But that is far from the truth. In



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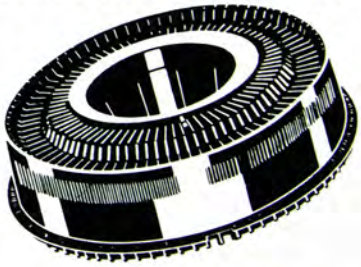
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track. It's just a matter of time," according to Kaplowitz.

Musical conductor. Another dimension of the audio-for-video phenomenon is MIDI (Musical Instrument Digital Interface). Basically, it is an industry standard for communication among synthesizers, samplers and computers. MIDI is only a few years young and growing like Topsy. At the June 1986 NAMM (National Association of Music Manufacturers) convention, the hot rumor was that a modified MIDI will also become the communication standard between electronic musical instruments and SMPTE.

While the cutting-edge systems such as Servisound's Kurzweil and Fairlight can be synchronized to SMPTE, there is a vast array of other samplers, synthesizers, drum machines as well as music- and effects-producing instruments that have only recently gained entry to the video world. This influx has occurred through home computer-based, MIDI-controlled "sequencer" software that can be synchronized to SMPTE code. This software offers the video producer even more economical capabilities.

Sound Suite, 534 West 50th Street, New York City, is a small production facility that uses new MIDI/SMPTE interfaces, a proliferation of sequencer software and MIDI-ized instruments to create video soundtracks. Taking advantage of the latest generations of automated audio hardware, it uses an eight-track recorder, numerous analog and digital synthesizers, samplers and drum machines, all centrally controlled by an Apple computer. The incredibly rapid progression of all this computer-based audio and video technology, where capabilities and sophistication increase while physical size and cost decrease, works in the favor of smaller studios such as Sound Suite. Although using only eight tracks, complex mixes of voice, sound effects, stock and original music—all synchronized to video—are available to the more budget-minded producer.

Pops tops. There are a few facilities of the "dream machine"-type that cross all borders and provide seemingly everything. One studio that receives a great deal of votes in this category is Bill Marino's Sync Sound at 450 West 56th Street, New York City. Serving clients such as CBS Records and MTV, the firm has developed its own hardware and software for automated 24-track audio/video synchronizing. The recording gear is located in one central room for maximum flexibility and minimum downtime.

Sync Sound also boasts a complete MIDI music and effects studio. This room can be synchronized to any in-house audio or video machine via an E-mu SP-12 digital drum box that reads SMPTE and emits control signals to a sequencer in an Apple Macintosh. In addition, there are digital samplers, analog and digital synthesizers as well as a bank of outboard processors. All of these systems are operated by Chuck Hammer, who has played guitar with the likes of David Bowie and Lou Reed.

In outlining the functional value of the technology, Hammer states, "A producer can come into the studio and get a soundtrack done reasonably, in-house, without having to run across town. It makes perfect sense to be able to score music in-house using the same SMPTE time base. If this is down the hall from the producer working in the voice-over room and he needs a soundtrack, or ten seconds of music, the sound of the wind going backwards through a phone line. . .you're synced to time code all the way through the project."

Now that Hammer mentions it, there does not really seem to be any other way to do it, does there? □

Tim Tully is an independent writer, producer and composer who owns and operates Sound Suite, a production studio in New York City.

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fact, those types of shows account for only about twenty percent of my current productions. The rest are fairly typical corporate shows that play at more conventional tempos.

AVC: That does not sound like the you we once knew.

Mesney: As I said, we get too soon old and too late smart. I eventually realized that while people may like to watch crazy, high-speed shows, not too many companies actually *buy* such programs. In fact, I am currently producing my first animated show in more than a year.

Another reason is that I have been operating on the international circuit for the last five years, learning about the preferences and prejudices of many different cultures. American selling techniques do not work overseas the same way that typically European, Australian or Indonesian sales approaches do not work in America. You must be sensitive to the way people live in different parts of the world, and the ways they think and feel. Unfortunately, not many producers have much varied experience in markets outside their own countries. The result is that while they can produce shows that may play well within their national boundaries, the programs do not succeed in moving audiences elsewhere.

So while other producers have concentrated on developing multi-image techniques, I have been studying the best ways to communicate and sell in different countries and cultures. I no longer position myself as a multi-image consultant. I now refer to myself as a business communications consultant. I try to solve my clients' communications problems in a wide variety of ways. Some projects do not even involve multi-image, if I do not think slides are appropriate.

All of this international experience has had a definite effect on my style, and my old buddies in the states probably would not recognize my new shows as being "Mesney productions."

AVC: You produced several early demo shows for AVL. Do you continue to work with the company?

Mesney: I am loyal, and I like what AVL did. It made multi-image possible as a global communications medium by providing reliable gear that was distributed worldwide. AVL made my multi-image career possible, so I have a soft spot in my heart for the company.

AVC: That does not answer the question.

Mesney: Excuse me for a moment. I have to see if the tomatoes are ripe.

AVC: Before you go, would you tell us if you are still associated with AVL?

Mesney: Yes, but in a more indirect way.

AVC: Is that an indirect answer or an indirect working relationship?

Mesney: Both.

AVC: Could you elaborate?

Mesney: Everyone knows AVL has been going through massive changes over the years. Its story in the multi-image industry has many parallels to Apple Computer in the PC business. Both firms started in garages and each is now a giant in its field.

No, I do not work as directly with the company as I once did because it is not like the old days. I produced the original "Eagle" show with David Fellowes, then went on to produce "Bumbles," "You Can't Stop a Dove," "Here We Go Loop-D-Loop," "The Inner World of AVL" and all the visual support for a few dealer meetings. I also created the print campaign for the Dove and Golden Eagle, and all the color ads, brochures and other material you saw during that period I wrote, designed and photographed. More recently, AVL has used "Hawaii. . .Xanadu" at trade shows as well as my face, name and reputation in its advertising. We continue to share a good relationship.

AVC: Did the relationship with AVL have an impact during the early years of your career?

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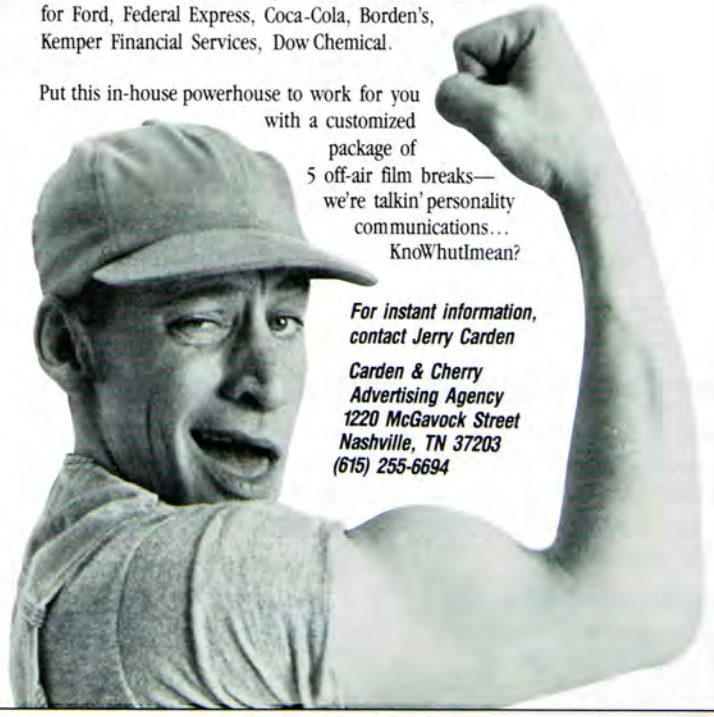
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Mesney: Yes, but it was a mixed blessing. I received considerable exposure, but also was labeled a nut. . .a weirdo. . .an extremist.

AVC: Along those lines, you are still wearing your hair long.

Mesney: I cut it off five years ago, took one look in the mirror and that was that.

AVC: In terms of acquiring new business, does its length place you in any jeopardy?

Mesney: Probably. Even Richard Shipps straightened out his act years ago, and he is the only one of the first four AMI Hall of Fame members whose original company remains intact. Chris Korody has always been impeccably manicured and dressed, as has Duffie White.

It is difficult to say exactly what is the long and short of it. But I use my hair to scare off the types of clients I probably would not work well with anyway. If they can get past my hair, they are probably okay folks. And this has proven itself over and over again. For example, in Sweden my biggest clients are IBM, Saab, SAS and Volvo. Hair is not a problem, except when it falls into the food.

AVC: Multi-image has experienced its ups and downs, but you have managed to survive and thrive. To what do you attribute your success?

Mesney: That is a good question, and I am not sure I have an answer. Probably, it was learning to say "no." I truly believe the old saying "you're only as good as your last show," and I have learned to stay a mile away if I do not think a project will be successful.

Yet it is not all that simple. Surviving means staying ahead of the situation. In the past, surviving in multi-image was as simple as inventing new graphics solutions and driving shows faster and faster. Back then, though, multi-image itself was a new medium, one that clients were interested in because it was fresh and young, and audiences had not experienced it. Today, that has all changed. TV is cutting in, so we must take a long, cold look at what we are doing and create new ways of using the techniques we have to compete with video.

Taking a cold look at something is easy in Sweden.

AVC: Is video "eating" into your multi-image market?

Mesney: For the time being, yes. It is new and different, so clients and the audience like the medium because it is in vogue. In a few years, however, many of the clients that are now switching from slides to video will return to multi-image. We can, after all, produce much better looking imagery and superior audio. Video boasts the benefits of quick production and mass distribution, but so does McDonald's. And eating a steady diet of McDonald's gets old fast, as anyone in this business knows.

AVC: In what creative direction are you heading?

Mesney: What does that mean?

AVC: What do you mean, "what does that mean?"

Mesney: If you mean in the traditional sense of the word, then I am moving backwards. We already have enough creative tools, and many of us have been guilty of exploiting these at the expense of the client and successful communications.

Recently, I have become somewhat of a minimalist. Maybe it is the influence of living in a world of Scandinavian design and appreciating Japanese food.

Creatively, I am now only interested in what best communicates the message. As I said, I have switched from being a multi-image consultant to a business consultant. Sometimes I recommend slides, sometimes not. It all depends on what the communications problems are. At the same time, I must admit that I prefer slides and feel most comfortable in the multi-image medium.

Ultimately, the highest form of creativity is conceiving an effective communications concept. Sometimes technique is critical to the concept, but too frequently multi-image designers and producers

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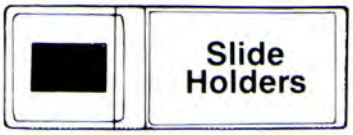
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allow it to dominate, which is like the tail wagging the dog.

While in the past I may have been guilty of promoting a new camera technique for its own sake, that is not the case today. I now try to use as little as possible to bring the concept to life. In cooking, I have learned that if a teaspoon of salt helps, two teaspoons probably hurts. And many say a salt-free diet is best, although I have not come that far yet.

AVC: You said you were moving backwards. How far have you traveled?

Mesney: I have always been known for high-speed shows with a lot of "pizzazz." While I still love to produce that type of program, I now realize that it is inappropriate for many situations. People expect my shows to be fast and flashy, so now I am inclined to do the opposite. . .unless the communications solution and resulting show concept demand otherwise. I learned how easy it is to be labeled, and how much labels can hurt as well as help.

I am currently exploring the more classical aspects of the multi-image medium. I look at how people used slide projectors twenty, thirty and forty years ago, and I see valid approaches and solutions to modern communications problems because the techniques are so different from what most producers are doing today. These techniques can be more interesting for business audiences that have seen a considerable number of multi-image shows during the last decade and have become rather sophisticated—and complacent—viewers.

Slide shows are like fashions. Styles and techniques come and go, but, in time, what comes around goes around.

Today, most business audiences have already seen too many 2+1 and 2+3 shows. Why bore them with those formats again? Why not try to be completely different? And why not think in terms of installing multi-image shows in places you never could before?

AVC: Is that a clue to your new tricks?

Mesney: Yes.

AVC: Does this mean you have given up on graphics?

Mesney: No, but I have de-emphasized graphics. From a budgetary standpoint, graphics are "gravy." And because most audiences cannot tell the difference between a lith title and a more complex one, I do not waste money on complicated, expensive graphics unless the show concept and/or audience demands it.

Another reason is that I do not like today's graphic trends. Maybe I am becoming old, but to me the wild, break-all-the-rules, nouveau styles seem to lack visual harmony. Much of the work is not even done in good taste. It seems that people are doing anything simply to be different. But why do that? In most cases, it points too much attention to the technique, so the message is lost and the project fails.

I saw one such "innovative" show at the BISFA festival in London last December. This show was truly original from the viewpoint of "creative graphics." But I still cannot remember who the client was or what the program was trying to communicate. I was too caught up in the "look."

Somewhere along the line you have to create a balance. The graphics package has to "work" with the concept and message. It cannot take control of your mind for its own sake.

It is similar to cooking. I could make you a truly creative chicken dinner by preparing the bird like a candy apple, but I am not sure you would swallow it.

Technique has a definite impact on how well a message is received—more than most producers, designers and clients realize. And, like cooking, it is easy for the neophyte to overdo it with the spices.

AVC: Programming is also part of the technique of multi-image, and your high-speed programming was probably the single most important innovation you lent the industry. Have you pulled in your horns on that, too?

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Mesney: No, I am hornier than ever, especially now that we are competing with video. But—and this is a big but—I am now concentrating on fluidity and clarity more than ever before. I have always believed that programming should be transparent, which is to say that you should not notice it. If you notice the programming as such, there is probably something that could have been smoothed out.

More importantly for multi-image producers, the programming—which I prefer to call "choreography" or the interrelationship between the visuals and the sound—is easier to control in our medium than TV or film. While it is true that you can cut video or film with computerized precision, it is rather expensive to edit with the same sophisticated precision that multi-image computers allow—especially when you add the simplicity of simple slide substitution.

But producers and clients alike have forever made the mistake of thinking that programming was some sort of magic solution to the whole problem of making a show work. That is simply not the case.

These same people would probably say that the key to successful cooking is a good chef. But if you gave the chef a chicken, a bag of sugar and some red dye, the result would be candy-coated chicken. The chef relies on the ingredients, and so does the programmer. Programming is only part of the answer. The rest depends on the visual and audio ingredients.

Photography for multi-image shows is probably what I do best because I understand programming so well. I also like taking pictures more than programming because I would rather be "out there" than stuck by some green screen. It also allows me to burn off calories. Recently, I have been writing letters abroad to solicit work as a multi-image photographer.

AVC: Has anyone answered your letters?

Mesney: No. People seldom answer letters anymore. You have to hit them with Jet Packs and telexes. But I did shoot all the Scandinavian and Belgian sections for Coca-Cola's centennial show.

AVC: Do you wear any other hats?

Mesney: I'm a writer, too.

AVC: What sets you apart from most AV photographers and writers?

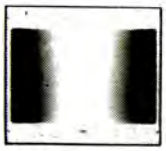
Mesney: My intimate knowledge of concepting and programming. Even if it is for other people's projects, I can usually fathom what they are trying to do and help better than most.

Nine times out of ten I have a hard time if I have to work with another writer's script or another photographer's work. Most writers are so involved in their words that they forget that multi-image, like film, is a visual medium; so if you can show it, do not say it. And most photographers still do not understand the types of sequences we need to produce a good multi-image show. I am not only speaking of animations, but even the most basic photography. It must work with the concept, format and, most importantly, the soundtrack and programming. It must provide valid choreographic possibilities. This is, of course, stating the obvious. But the obvious is what is usually forgotten while the practitioners of our trade press harder and harder to be different.

The programming of a multi-image show has to be fluid. It should resemble gliscerine, not water. Water leaves water marks when you clean glasses or silverware, and it also splashes. Gliscerine flows like oil and is transparent. It also can be dissolved in water and sprayed to create droplets. Gliscerine combines the best properties of both water and oil. Programming should be like that, too.

Most photographers do not have enough equipment to be "fluid" in their approach. I own virtually every lens Nikon has ever made and more than 900 different filters, which means I can produce visual effects on location that save money later by eliminating rostrum camera conversions and enhancements. Photography is where I started in the multi-image business. It is

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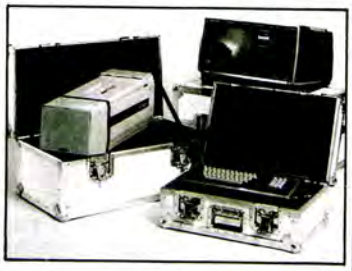
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where I began my career and what I understand best. All the rest of it—the concepting, the writing, the programming, the consulting—stemmed from a background in photography, graphic design and agency work as a copy contact man.

AVC: Where do you see yourself in ten years?

Mesney: Dead.

AVC: How about nine years?

Mesney: Let's not put a date on it. Let's just say that the only thing that really excites me now is the possibility of doing a two-, three- or four-hundred projector show.

I have had it producing small shows. I would rather just concept, write, take pictures or program for other producers, or maybe return to print work. In fact, I have been doing a great deal of print projects recently and have been quite happy, thank you. There is something about being able to hold a printed sheet in your hands that is so satisfying. One of the things that has always frustrated me about multi-imagery is that you spend such vast amounts of time and effort producing something that will be experienced just once and then, poof, it is gone forever. Maybe I *will* open a restaurant.

AVC: You can say the same thing about cooking.

Mesney: I never thought of it quite that way, but you are right. Possibly the only real difference is that the by-products of food are biodegradable and help perpetuate life's ecocycle. That is a terrible answer, but nonetheless real.

AVC: Do you have any advice for young people entering our business today?

Mesney: Definitely. First, always remember that multi-image *can* be fun. Even if you are producing a show for a difficult client, the experience should be a gas. But do not listen to old farts like me. Do your own thing.

Every medium has its gurus. In multi-image, I am, unfortunately, one of those. However, I continually admonish my students not to take what I say as absolute gospel. Although my recipes work, there are always improvements to be made. I encourage enthusiasts to do their own thing and only ask for occasional opinions, which is the same approach I take with my own work.

A large part of my consultancy activity involves teaching this business. I try to help developing companies plan and design facilities and business practices, as well as help these firms' personnel perfect their communications skills and multi-image techniques. While technique instruction is easy, it is virtually impossible to teach creativity or good taste. These are attributes that a lucky few are simply born with. . .and although its damn depressing to tell someone that he should look for some other line of work, sometimes I have to do just that.

On happier occasions I find students teaching me as much as I teach them. Perhaps this is because I am operating internationally and interacting with different cultures. Another reason is that I have learned to keep my mind open. There are no fixed rules. What works works, and what doesn't doesn't. This is true in cooking and it is true in communications.

Today's multi-image students have been exposed to unlimited quantities of TV and film. They watch rock videos all the time, for example, and their approaches and solutions to communications problems are as varied and different from mine as their perceptions and concerns about our modern world. Some of these I frankly do not understand, but others are positively genius, born of a generation far apart from mine. And, like them, I also have a great deal to learn.

So, in both teaching and consulting, there is a constant trade off.

AVC: Thank you, Doug Mesney. That's a wrap, except for one more question: what's for dinner?

Mesney: Dinner? It's only midnight. □

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Zen and the Art of AV

BY DAVID MACLOUD

Now that everyone seems to concede a time and place for video *and* film *and* multi-image, the next question becomes: Which time and which place? In the main, the appropriate applications are self- evident and logical, and point to multi- image as preferable whenever it can do the job successfully. Why? Because whenever multi-image equals the others in expressive or motivational capacities, it carries the hole card of being less complex, less time- consuming, less expensive.

And when does multi-image equal the others? Conventional wisdom tells us it's when the critical elements of a program exclude literal, real-time, cinematic motion. Multi-image works whenever still images will do, or when the implied motion created by dissolves will do, or when limited animation effects will do. That covers a lot of territory, but it also defines boundaries. For instance, you would not use multi-image when literal, real-time, cinematic movement is essential, would you? You wouldn't use multi-image to promote high-performance automobiles, for example, would you? Well, as a matter of fact . . .

In Sweden are many items of interest, two of which go by the names of Saab-Scania and Douglas Mesney. By fortuitous happenstance, the two became associated a few years back, and a lot of things have not been the same since.

Let's start with Mesney. From the Long Island area of New York, he began working in multi-image almost before there was such a thing. His identification as a pioneer and innovator is legitimate, but that alone is of marginal practical consequence. It takes talent and vision to engender achievement, and those qualities in Mesney were identified early on.

Mesney worked out of a shop called The Incredible Slidemakers, and today, nearly a decade after departing that establishment, he remains identified as *The* Incredible Slidemaker. The 1986 convention of the Association for Multi-Image was the first he'd attended in years, having long since expatriated himself to Stockholm. And when he entered screening rooms, heads turned and the air was filled with whispered "s" . . . "s" . . . "s" . . . from all corners. ("S" as in "There's Douglas Mesney.") Mesney is self-effacing about being a legend, as indeed he must be. This is an uncelebrated industry wherein achievement alone forms the yardstick for recognition. Still and all, Mesney is a legend whether he likes it or not, and even he should probably admit it's better than being poked in the eye with a sharp stick.

High-Performance Cars and AV: An Unlikely Match.

What contributes to Mesney's stature — the "incredible" part of The Incredible Slidemaker — is his graphic style. It can be described as, in a word, fast. A frenetic hecticity (in Mesney's case, there should be a noun for "hectic") attends his work, visions whizzing past so quickly that when he's being funny you have to laugh at three of his gags at a time. That's because he's popped two more before you've formulated the "ha" for the first. The AMI screened Mesney's "Bumbles" at the 1985 COMMTEX, calling it a "classic" (made all the way back in the paleolithic age — the late 70s). I saw it and was reminded of something I'd almost forgotten: that it is nigh impossible to inhale to breathe while exhaling to laugh. If the show had used 140-slide trays instead of 80's, the likelihood is that Mrs. MacLoud's youngest would have turned blue and dropped.

More recently, Mesney told me that nowadays he can hardly believe he'd ever done "Bumbles," because it was principally a demonstration of technique, a hodgepodge signifying not much beyond mirth and merriment. His techniques have matured, you see, and are serious narrative elements, still funny when appropriate, but also filled with storytelling ability. Another way to characterize Mesney's work comes in the words of one Thomas Lagerqvist, who told me, "Douglas eats slides. No matter how many we bring him, he wants more." Or for a further perspective, we can consider a recent Mesney program clocked at a mere 4½-minutes' duration. Now, admittedly, it was a 12-projector program, but it also was a 12-on-1; no slides or cues expended on trivialities like overlaps, wipes, and similar sundries that crowd programs. And when the show ran, I inspected the raster of Mesney's Eagle at the conclusion and found that the final cue was numbered 3005. Now, this obviously does not signify the presence of 3005 slides in the show, but regardless of the cues' applications, 3005 is a lot of *anything* in 4½ minutes.

Let's turn to Saab-Scania. Just after WWII, Saab entered the automobile business, having manufactured aircraft for a while. Their early cars were considered just a little funny, to American senses at least. Something practical in the fashion of those functional folk of Scandinavia.

Now, whether the Saab was ever really that funny may be open to debate. Even the earliest models emphasized aerodynamics and front-wheel drive. Nonetheless, with the introduction of the turbocharged, 16-valve 900 model, with its origins in the 1970s, a gutsy marketing position could be taken: that the doors of a 'Vette could get sucked off in a cloud of Saab dust.

In Dallas, TX, and Anaheim, CA, in the screening rooms of the AMI conventions for 1985 and '86, Douglas Mesney entered into competition various multi- image programs he had produced for Saab. These were blazing shows depicting Saabs dashing about the countryside at velocities seemingly beyond the reach of anything earthbound. During programs like these, half the audience gapes at the screen in disbelief that they are seeing "only" slides, while the other half turns around and gapes at the projectors, trying to figure out

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what in heaven's name they are *doing*.

At the Saab gathering in Toronto last October, Mesney arrived with yet another Saab screamer under his arm. This one had a different character, however, because it was to serve another purpose.

The earlier programs, with 30 projectors on panoramic screens, were produced for Saab dealer meetings. Nobody has said so, but I surmise that Saab-Scania must sell its product to its dealers as much as to the public. Most of these dealers also trade in Jaguars and BMW's and Mercedes and even, Lord deliver us, Volvos. So there can be no harm to instilling a little favoritism for Saab. But at the Toronto meeting there was a further objective. Saab had terminated its relationship with its Canadian importer, and the cars would now be exported directly through a new subsidiary, Saab-Scania Canada. Saab- Scania wanted to make a favorable impression of the new company, in the face of 30-40% annual sales increases through the old.

From this meeting, the dealers had to experience the impeccable perfectionism and unflagging dependability embodied not only in the car, but in the new company as well. It was imperative that this meeting flow with class and unblemished smoothness, for as somebody once said, the medium is the message.

Accomplishing this entailed a joint effort between Saab-Scania and Saab-Scania Canada. The Swedes would supervise certain concepts that were consistent with the worldwide image they'd masterminded for their product. The Canadians would perform some fine-tuning where necessary to adapt the Swedish message to the Canadian jargon. (In effect, to put the "eh?" at the end of Swedish suppositions.)

An expansive ballroom in the Hilton Harbour Castle hotel was divided in three. The central section would supply seating for the 150 dealers and their spouses. Behind them, concealed by what would appear to be a solid, paneled wall would be a complete automotive showroom designed in Sweden. It would actually be a room within a room, with its own floors, ceilings, and rounded walls constructed inside the ballroom, colored all silvery, fully carpeted, exhibiting Saab engines and other components around the perimeter, and housing five different Saab cars. Ahead of the audience would be the main set for the presentation: a fully draped rear-projection screen, a lectern, and a large circular structure left and right, each of which eventually would open to reveal an automobile. From the ceiling would descend a front-projection screen at the appropriate moment, for screenings of Saab commercials made in the United States and Britain, and a promotional film produced inhouse in Sweden by the aforementioned Thomas Lagerqvist.

"We're using 16mm for the commercials and the movie," said Lagerqvist, "because that is their available format. We would never use projected video in this application, however, because the quality is too poor to represent Saab. Even the European PAL format would be too poor, let alone the American NTSC. We have used video at meetings, but in a different way. For example, at one meeting in Sweden, we had 600 guests. It was advantageous to enlarge the speakers on the video projections screen to make them more visible. Also, with two or three cameramen at the site, we had a complete record, a documentary of the entire event, which we could analyze and learn from.

"But to open the meeting here, we would use only multi-image. Film quality is lousy by comparison, unless you use 35mm or an even wider format. Also, with multi-image you can make effects that you can't with film unless you're using very, very expensive optical techniques. And multi- image moves a lot faster, especially the way Douglas does it."

"Douglas eats slides. No matter how many we bring him, he wants more."

Mesney's show this time was more of a toe-tapper than the earlier programs because it was set to a song. Said Peter Salzer, "I had been thinking of a script that told of the parallels between Sweden and Canada, such as the wintery climate. I was thinking the two countries had so much in common that the Saab practically should be a Canadian-built car. But after thinking about it, I concluded this was a little too blatant."

Said Lynn Reid, advertising and sales promotion manager of Saab-Scania Canada, "We had a talk with our agency, Miller, Meyers, Bruce. They came back to us with the suggestion of using a song. They felt this would be more memorable - something people could hum afterwards. Also, it was important to us that the soundtrack not sound Swedish, not even American. We wanted it to be very Canadian, and accents are not so recognizable in a song."

The agency's Ian Mirlin wrote lyrics that supported the themes of Saab-Scania's high regard for the Canadians and the intention to provide unreserved backing. ("Hands across the ocean/Putting the future in motion.") An upbeat score was composed by Doug Riley of Dr. Music Productions. Once recorded, the track was shipped to Mesney for its graphic realization.

The new show was designed as a 12-on-1 because in addition to its primary purpose as a meeting opener, it was to be dubbed to video for point-of-purchase applications in dealer showrooms. A heavier emphasis on animated graphics was employed, with the word "Saab" swooping around the globe in representation of influences emanating from Nyköping. But there were plenty of Mesneyesque automobiles charging about the landscape in several graphic styles.

Mesney conducted his own photography of the cars in a way that enabled him to put them in motion through the use of programming techniques. Depending upon his timings and the degree of overlap from several projectors, Mesney was able to create different kinds of visions that bespoke different things about the cars.

Thus, in a moment of exuberance, a Saab approaching headlong may abruptly back up for a second, then resume its forward motion all without benefit of deceleration. At another moment, the car's travel may be choppy, staccato, almost as though pulsing with its own internal power. At yet another point, a Saab traveling across the screen may be sharply defined at the front but blurred at the rear as its speed seemingly outstrips the grasp of vision. Almost invariably, however, whenever the camera enters the car to observe its occupants, the people steer and shift and nod their heads in smiling approval, all with the graceful fluidity of a slow-motion movie.

While some of these effects are performed for the levity they introduce, others are literal depictions of the Saab pitch. The blurred car streaking along, for example, bespeaks the experience of driving a powerful, exciting car. Yet, when the camera enters the passenger compartment to behold the legato flow of its occupants, the tale is told: driving a Saab may be a thrill, but for those within there is also a cozy serenity.

Mesney had forwarded a completed show, but what he would see on Canadian screens likely would be different from what he'd see in Sweden. The show had been programmed using SAV projectors, whose lamp filaments have one set of characteristics and which run on 24V. In Toronto, the show would run on Elmo Omnigraphics, whose lamps would have different characteristics, and where 110V juice could exert its own influences. Either or both of these factors can affect how rapidly a lamp reaches full assigned brightness once power is applied, and fade-to-black once power is interrupted. Because the dif-

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ference is fractions of a second, it would be inconsequential to some shows. But it could have a radical effect on a program containing sequences of slides whisking past at nearly seven per second. A lamp that is slower to dim, for example, can keep an image on-screen longer, smoothening out a sequence meant to be choppy.

Compensating for this is no big problem, though. It means simply adjusting the time the lamps receive power, easy enough on any memory programmer. Delete the old cue, insert the new, commit it to disk, and the show is fixed.

Mesney's first tweakings were performed at Producers Optical Services, a transfer house with a custom-built aerial-image multiplexer able to accommodate up to 24 projectors at a time. The projectors in use were Ektagraphic III's, whose lamps are comparatively lethargic about doing most anything. Mesney retweaked for the Omnigraphics the next day while the sets were being constructed in the Harbour Castle. Sometimes he was found sitting cross-legged on the floor with his Eagle connected to no projectors at all. Working from memory or instinct, the Incredible Slidemaker exuded a demeanor that looked very Zen.

The construction crew had 36 hours to build the entire set, including the automotive showroom-within-a-room. It was a tight schedule, considering that the scale and ambition of the set exceeded that of many a set on the Broadway stage. Nonetheless, it was completed on time.

The dealers filed in, cheered Mesney's opener, heard a speech from Saab-Scania President Sten Lundin, watched the TV commercials and Lagerqvist's film, cheered again when the turntables revealed the Saabs up front, then went nuts when a crew swiftly removed the back wall to expose the secret showroom. They spent perhaps half an hour hobnobbing in the showroom, then moved on to the gala dinner. From the moment Mesney's module had struck, up till the moment the rear wall disappeared, exactly one hour had passed. The strain, the effort, the tensions and anxieties of staging the event — of which space here permits recounting only the slightest suggestion — were never in evidence to the audience. It all looked easy; everything ran as smoothly as, well, a Saab. Yet even as the dealers munched their appetizers, the set was being dismantled. The ballroom was booked for nine the next morning.

Once upon a time, it was enthralling simply for moving pictures to move, and tales are famous that tell of turn-of-the-century audiences diving for cover during scenes of approaching locomotives. But 80 years later, fast car chases are daily TV fare. Producers have sought ways to jazz up their works, and manipulation of motion has been the most frequent attempt. The use of jump cuts, stop-action photography, and the like all take special attention with motion picture film and video. They are native to multi-image, the product of having pressed the right button. And having pressed the right buttons, Mesney has been able to depict everything from cinematic realism to subjective impressionism. Showing a new way to see has been the route by which painters become immortalized, and Douglas Mesney has done as much here. But instead of using brushstrokes, he has employed that personification of high-tech, the computer, together with that remnant of the 19th century, the projected slide. Ⓟ

David MacLoud is an independent audiovisual producer, writer, and photographer based in New York City. His work has appeared in numerous photographic publications.

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Observations:

NEWS &VIEWS

CIRCULAR REASONING

A spin doctor's view of the wheel of fortune

by Douglas Mesney



THEY SAY: "WHAT GOES AROUND comes around." They also say: "all things come to those who wait." A third saying goes: "good things come in threes." These sayings aptly describe today's multi-image market.

"Excuse me," some of you Gen-Xers might interject, "what you mean is multimedia, right?"

No, I reply, multi-image.

"Aha… what's that?"

That is the point of this article; and if you don't know what multi-image means, read on…

Once upon a time slides (real slides… made of film) were the corporate presenter's favorite tool… a time when multimedia was more than just a picture show with sounds.

Back then a show involving more than one projector was called "multi-image." Why "multi-image?" Who knows… it's certainly not the term I would have chosen. "Multivision" was a better one, but even that didn't do very well when you tried to explain to your mother what you did for a living.

Personally, I always preferred the term "multimedia," because it put a more positive spin on what most so-called multi-image people actually produced—mixed-media extravaganzas.

Now, if I tell people that I'm a multimedia guy they think of me as some technoid who sits at a computer pumping out CD-ROMs and Internet stuff. I can't say "extravaganzas" because the term has a mendacity discount rate that would make any prospect pause. So all I've got left is that arcane old anachronism, "multi-image." Something that nobody wants anymore. Or, so I thought.

As far back as the late 80s, at the height of multi-image's popularity, I made the seemingly outrageous comment that "slides are dead." This became infamous by a Dataton advertisement that headlined my remark.

People may have thought I was crazy—it seemed, after all, like heresy—but time has borne out my prediction. Video and digital media have been running rings around slides, AMI is history and the wheel of fortune has spun a tale of woe for thousands of multi-image professionals who've had to move on to other professions.

Another generation is at the controls now and these Gen-X, new-media professionals haven't a clue about the power and effectiveness of nonlinear communications and multiscreen formats. The focus of their attention has been, quite literally, inside the box (ie, computer).

However, dare I say that my own report on the death of multi-image was premature?

Yes. In fact, instead of withering away completely, there are signs that traditional, film-based multi-image is staging a modest comeback while digital multi-image waits in the wings.

Indeed, the forces that shape the presentation market seem to be conspiring to create a bright future for multi-image in the new millennium. Even for a Luddite like me the signs of this are hard to miss.

What goes around…

Any soothsayer could tell you that this comes as no surprise. Prognosticators know well, after all, that the universe moves in cycles… this is why I hang on to my old skinny ties and bell-bottom jeans.

Nevertheless, even pragmatically speaking you could say that multi-image is a technique whose time has returned… and market cycles provide all the evidence I need to feel confident about making such an optimistic forecast.

There are three market forces that have had significant impact on the presentation business during the last half century. First and foremost, the state of the economy (local, regional, national, international, global). Secondly, the relentless advance of technology. Thirdly, the whimsy of style.

Each of these conditions is periodic and cyclical, moving like a sine wave. Economies rise and fall; technologies that seem revolutionary prove evolutionary; and the whims of fashion are as fickle as the finger of fate.

Although the forces shaping the cycles are dynamic and impossible to predict, there have been enough patterns to provide forecasters with statistics that can prove almost any possibility.

For example, economic micro-climates have lately been swinging in ten year cycles. However, digital processing power (and hence technological development),

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according to Moore's law, accelerates at something like ten times that rate. And, skirt lengths rise and fall faster than either the stock market or the life span of a laptop.

Since the "wave lengths" of the three cycles are dissimilar they go into phase and out of phase. If they are out of phase, meetings and events are less lavish and the style of presentations is more modest. However, when they are in phase (a strong economy combined with a new technology and a desire for change) then conditions are right for the production of extravaganzas.

Using this simple "phaseology" we can look back at the rise and fall of multi-image and even speculate about its revival in the new millennium.

20/20 hindsight

In the post-war 50s, as the wheels of industry turned from a military to a consumer-oriented economy, slide and overhead projectors became the primary tools for communicating to groups. Simple, economical, and effective, these humble projectors were technologically advanced enough to suffice in a world previously dominated by flip charts and pointers.

As the economy heated up in the 60s, fueled by the space race and the growing conflict in Vietnam, corporate coffers filled sufficiently to afford more extravagant presentations, and movies became the medium of choice. Flip through the pages of an old New York telephone directory from that era and you'll find page after page of 16mm corporate-film producers. However, film couldn't handle speaker support, so slides and overheads clung to this share of the presentation business (along with flip charts and pointers).

Only ten years later the corporate film was virtually extinct. New technologies that facilitated control of multiple slide projectors were aided and abetted by a major recession triggered by the 1973 Arab oil crisis. The new technique, called multi-image, offered more impact than film at lower production cost, and the preaching of these benefits by marketers of the new presentation technology did not fall on deaf ears.

Photographers and others buying the new equipment suddenly found themselves in new careers, as audiovisual producers... and they also found their order books filling fast. My own case history provides a relevant example of how new careers were created almost overnight. In 1970, my photo studio employed one assistant and our work was 95% for print, 5% for speaker-support slides. By 1975 there were 35 people on the payroll and our work was 95% multi-image and 5% print.

Making heads spin

Audiences approved of the higher-quality imagery of 35mm, 46mm, and 70mm slides, compared to 16mm. (Strangely, 35mm and 70mm motion picture formats never did well in the corporate market, which is especially ironic when you consider the ongoing vitality of Hollywood. Conventional wisdom once had it that in an age of video the cinema was doomed; but home video rentals instead spurred feature-film production. Why didn't this happen in the corporate market?)

Multi-image also provided a double benefit: movie-like "automated modules" with high-quality sound could be combined with speaker support that looked a lot better than "overheads." Thus, one medium could do the job of two.

Still another factor was that the "nonlinear" style of a multi-image show was new and unique, compared to film. And, the new generation of multiprojector special effects that blazed across screens really turned people's heads.

Thus did the three necessary market conditions converge at the dawn of multi-image in the mid-70s: a hot economy, a new technology, and desire for change. The rest, as they say, is history, and in less than a decade multi-image grew to become the foundation for true multimedia spectaculars, enhanced with stage sets, lighting and laser effects, singers, and dancers... you name it.

Choking on success

Few would argue against the proposition that a well-produced multi-image presentation is probably the most powerful communications tool available for meetings and events... and this fact contributed to the technique's meteoric success. But, like any meteor, multi-image quickly incinerated... especially in the rarefied atmosphere of the boardroom.

Part of human nature is to stretch the imagination and push technologies to their limits. So it was natural that the industry's leading producers kept increasing the size and complexity of their shows. It was likewise only natural for other producers to follow their lead... in this case like lemmings, right over the top. All this at a time when the inflationary trends of an overheated economy spiraled interest rates to over 20% by the early 80s.

Although once fired-up about the potentials of the new presentation technique, management began questioning its spiraling costs and complexity, and in the end, multi-image choked on its own success.

Finally, the economic bubble burst, triggering a rash of LBOs and culminating in the stock market crash that marred the close of the 80s.

The three forces moved out of phase and the party was over for multi-image.

I remember putting up a 30-projector, single-screen, multi-image module at a Merrill-Lynch annual meeting (it was "Incredible") only to be told by the CEO, five minutes before show time, to "get that stuff the hell out of here!" He may have been a bit too paranoid but the point was clear: shareholders would no longer tolerate big expenditures on unnecessarily extravagant presentations.

Thus, with the apex of multi-image's technology curve becoming synchronous with the nadir of the economic curve, the technique was disenfranchised from corporate meetings and events. Frugality became the order of the day, and the stage was set for the emerging Betamax and VHS technologies.

Stylistically, too, it was time for a change. After watching multi-image for years and years, audiences became a little bored with still imagery and nonlinear "modules." Live-action, a simple screen format and straight-ahead ►

business. But, being on the "cutting edge" is getting more and more difficult as the effective life cycle of computers and software shrinks from years to mere months.

Even back in the 80s I used to bemoan the fact that all my profits were consumed by the need to upgrade multi-image hardware every couple of years… but that was just a few dissolvers and a programming computer. Peanuts compared to the kind of annual systems overhauls that presentation designers and producers face today.

Maybe I shouldn't be complaining. After all, it's probably the huge turnover of digital hardware and software that's keeping the world's economy humming. Which brings me to the point of this whole diatribe…

Bored with the box

Lean meetings and events have been the order of the day for nearly a decade. During these Spartan times, single-screen format has been the dominant style because video, electronic "slides," and overheads have been the favored media. Even where digitally-produced modules have appeared they, too, have been confined to the 3:4 monitor ratio. As a result very few audiences have seen a multiscreen show… making multi-image an extremely attractive prospect for producers bold enough to step into the future.

(True, TVL's system offers a close imitation of real multi-image—not surprisingly since TVL's founder, Chuck Kappenman, is the man who founded AVL. In fact, I am surprised that the TVL system never came to be more popular, although the lack of a PAL version and the limitations imposed by its analog technology probably negated some of the systems intrinsic benefits. Nonetheless, TVL is still hanging in there and continues to make stylish presentations easy and affordable to produce.)

Now we are standing at the threshold of a new golden era for multi-image. Finally, after twenty years, the three forces of the market are converging to create a new demand for presentation extravaganzas.

Just as the introduction of VHS accelerated the "need" for feature films, the Internet and digital media will generate a demand for multi-image. It will never be what it once was, but there will surely be a reincarnation.

If this sounds absurd, remember the three forces—economy, technology, and fashion—and take a look around:

As this edition of *News&Views* goes to press, business around the world is booming; global stock markets just won't quit; and the Internet continues to revolutionize marketing, sales, entertainment and communications. However, in the meetings and events market, presentation technologies haven't kept pace… so the conditions are ripe for change.

What will be the final catalyst for change? Magic. Not the kind performed by magicians and sleight of hand artists. Rather, the kinds of presentation magic that people only experience at unique and impressive meetings or events.

We've all been to extravaganzas and spectaculars that made a huge impression on us. That's the kind of magic I am talking about. It's the kind of magic that's been missing for so long from so many corporate meetings and events… the kind you'll never get from videos or web sites, even if they're way cool.

The lack of magic has created a longing for it, conscious or unconscious, and clever presentation producers will capitalize on that longing, that need for something more, something special, something outside the box.

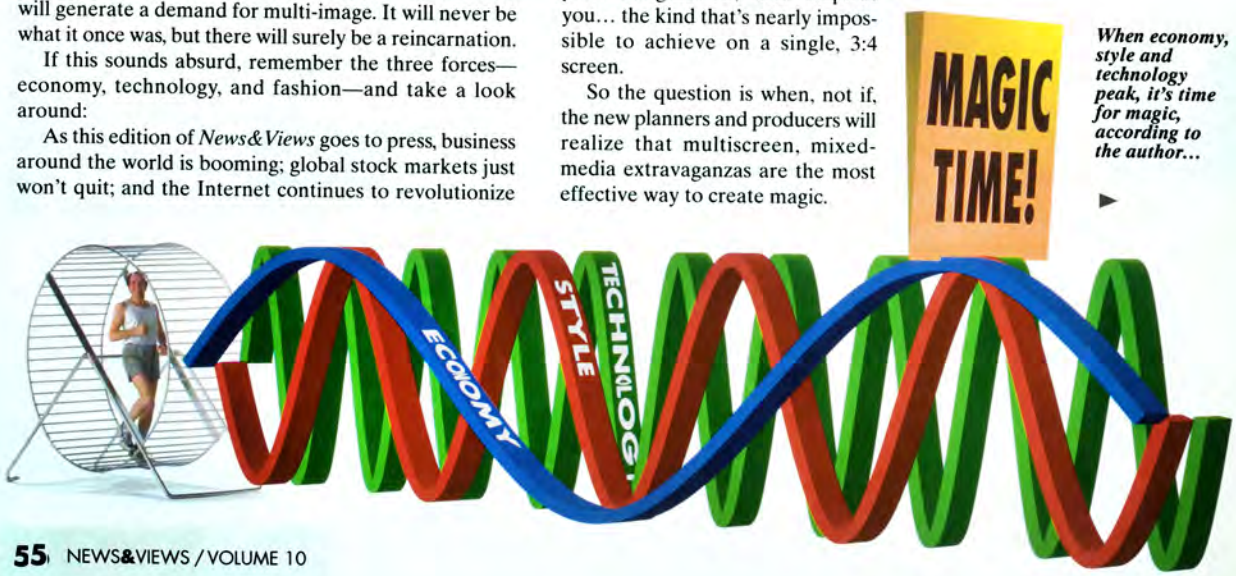
That's why, in my opinion, meetings and events planners are now more open to the possibility of producing extravaganzas (and, given today's thriving business climate, to the fact that they can afford them).

Those of us who lived through the 70s and 80s know how powerful an extravaganza can be. However, for many Gen-X planners and producers, extravaganzas are something new. For them, multiscreen, multi-image presentations are virgin territory… but a logical next step as they stretch their own imaginations and envelopes of technology. Undoubtedly, if the economic bubble doesn't burst, they will rediscover that most important of audio-visual Truths: big impressions produce lasting memories. And, the second most important Truth: the bigger the extravaganza, the bigger the impression.

First, however, they must learn that it takes more than just a big screen to make a big impression… especially if what you're showing on that screen is the same stuff that people see every day on their computer monitor or television. To make a big impression requires nothing less than magic… the kind that grabs your attention, captures your imagination, and inspires you… the kind that's nearly impossible to achieve on a single, 3:4 screen.

So the question is when, not if, the new planners and producers will realize that multiscreen, mixed-media extravaganzas are the most effective way to create magic.

When economy, style and technology peak, it's time for magic, according to the author…



Already there are signs that clients and producers are ready to take the quantum leap to multiscreen, multi-image presentations. The most obvious of these signs are, ironically, the images appearing on billions of computer monitors the world over which look just like... slide shows.

If you look closely you'll see that the march of progress in computer imagery has been following the historical footsteps of slide imagery in lock-step style. Using programs like PhotoShop® digital artists are recreating visual effects that once originated on multi-image rostrum cameras like the Forox and Maron-Carrel. Then, using software like AfterEffects® and Director® digital programmers are rediscovering slide animation and other traditional multiple-projector choreographic techniques. (They even call the results "slide shows!")

So far this digital re-creation of the multi-image slide show has been confined to a single screen—logical enough since the primary delivery device remains the computer or video monitor. However, the next "logical" step in the evolution of digital presentation technology is to go multiscreen and when that happens we will have truly entered the age of digital multi-image.



Douglas Mesney is an international audiovisual consultant who calls the world his home. He has been a regular contributor to News&Views since the first issue, and continues to design, produce, and program multi-image shows for clients around the world.

Nouveau retro

What's interesting is that while the digital revolution re-invents multi-image by mimicry, it seems to be creating a new demand for the real thing—traditional, slide-based multi-image.

This should come as no surprise. The economy is on a roll and haute couture is following suit. When times are flush people tire easily of tradition and get restless for new excitement. For today's new generation of digitally-oriented professionals, most of whom have never seen a real multi-image show, the idea of a multiscreen, slide based extravaganza might be retro enough to pique their interest. Or, maybe it's just nostalgia...? Whatever the cause, wherever I go these days former AMI colleagues report that the production and staging of multi-image shows is on an upswing. Speculating on this phenomenon, some of their comments included these:

In Portland, Oregon, Dave Frey of Sound Images (a production company known for huge multi-image spectaculars involving 100+ projectors) has this to say:

"From where I sit the multi-image niche is narrow but still very bright. It provides the surprise of format like no other medium. The human eye has become so familiar with the 3×4 aspect ratio. Multi-image takes you beyond. No other medium can cost-effectively deliver the visual interest provided by unique formats and the brilliance of projected film."

Half a world away, in London, Phil Ogden of First Image concurs: "Intriguingly, a CD-ROM, or electronic, lap-top or computer based presentation is not always the ideal solution to (our clients') problems and we do tell them this. In fact, there have been occasions recently when clients either require 're-educating' in the benefits of multi-image presentations or, indeed, might need an 'introduction' to the wonders and power of multi-image, as we know and love it!"

In Helsinki, Seppo Palimnen of Smile Audiovisual adds that: "Multi-image produces a level of quality that digital media will never match no matter how good it gets, because with multi-image you can create moods and feelings that simply cannot be accomplished any other way."

From the client side, Safeco Insurance Company's Ken Pickle agrees wholeheartedly: "We're still using multi-image after all these years because we have large audiences and no other media can give us the high-image quality and audience interest. The style of multi-image makes the audience work harder, so they retain more of the messages. Of course, many of our visuals are being produced by computer, instead of optically, but you can't beat multi-image for cost-effective projection of large images."

Phil Ogden adds: "The saying 'horses for courses' springs to mind. Like black and white photography, AV has unique qualities pertaining to no other presentation medium. It is one of many forms of communications (whilst there are people like you and I around to do it) which will last long in to the new millennium. Slides are certainly not dead in this part of the world."

Their optimism about multi-image is mirrored by that of many hardware and staging professionals. For example, slide projector sales are either holding steady or slightly increasing in Europe and Scandinavia—that's important, because for many years they were declining. In addition, sales of Wess mounts are still firm.

In fact, the only thing that may slow the wheels of progress for multi-image's resurgence is the loss of important infrastructure components. Key players have retired from the scene.

Laments Bruce Hornstein of Pyramid Studios: "We still love multi-image but it is getting harder and harder to produce and stage because equipment is scarce and people who have multi-image experience are hard to find. We recently did a boardroom installation and I had to handle all the multi-image gear myself because the hardware and staging companies don't know how to do it anymore."

For Kevin Oldcorn, and international designer and producer, the key issue is exposure: "Multi-image is an extraordinarily powerful medium, but clients and prospects rarely have the chance to see it anymore."

Putting these comments (and many others) into perspective, it seems clear that despite some production and staging obstacles we're going to be seeing a lot more multi-image in the future. In the short run the recent upswing in traditional multi-image will likely continue, pushed ahead by the dual influences of a hot market for extravaganzas and growing interest for something "outside the box." Then, in the not-too-distant future, large-screen digital projection will become affordable and digital multi-image will come of age. Then we will have truly come full circle.

So, as the wheel of fortune winds its way to the 21st century, I'm running like hell to get that 200-projector show I've been dreaming about.

Hopefully, I'm not just spinning my wheels...

email contact: mesney@aol.com


OXBERRY PRO SYSTEMS


OXBERRY PRO SYSTEMS

An Invitation To Take A Close Look

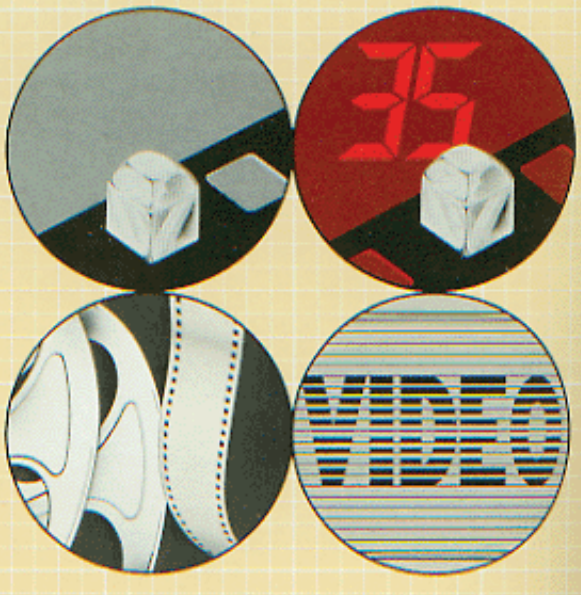
At Oxberry our business is making equipment to produce your photographic and video images. This product brochure represents a joint effort combining our skills, developed over thirty years in media production...and your needs as discovered from hundreds of trade show conversations and thousands of phone calls and letters.

Oxberry's design policy is simple. We take directions from customer communication, attempting to design the equipment that fulfills the needs of media-makers. It won't be surprising to hear what we've found to be the industry's desires...they are probably your own.

...Whether you're a practicing professional or an aspiring student, you will want three equipment criteria met... ***QUALITY*** *that guarantees a precision visual product...* ***VERSATILITY*** *that doesn't place limits or barriers to your creative horizons and...* ***ECONOMY*** *of price and operation.*

We take considerable pleasure in talking to our customers, answering their questions and searching out solutions to their problems. We believe the completeness and originality of the Oxberry product line will speak well for this process.

Oxberry invites you to take a close look at the product systems described in this brochure. If questions remain unanswered, call us and we'll find the answer. If you have special production needs, call us also...we're ready to reconsider our good thing and make it better.



Oxberry

Quality

Nowhere is quality a bigger design problem than in the field of multi-image. Huge dissolving images on panorama screens magnify errors unmercifully. Animation techniques exaggerate misalignment with rapid-fire dissolving images and expose imprecision by leaving slides on the screen for long seconds of scrutiny by critical audiences. Multi-image is unforgiving.

For this medium we had to design a camera that was uncompromisingly accurate. The industry's answer is pin-registration . . . Oxberry's answer goes further with its patented pin-registered camera back.

In order to faultlessly align the film in the camera aperture and return it there for repeated multiple exposures, a very special registration peg must be fashioned...a peg that fills sprocket holes precisely yet permits the film to shrink without damaging the sprocket hole. The patent office thought we solved this problem...our customers agree. Nothing less will get the dissolve animation effects, step and repeat images, title mattes and panoramas required in multi-image.

However, precision production is not the whole picture. Design quality also insures long production life. Oxberry's thirty years of experience in manufacturing pin-registered photographic equipment is put to daily use building durable cameras. We've rebuilt heavily used cameras but we haven't retired one yet.

Versatility

One of the first revelations that comes to a creative artist is the "happy mistake" . . . the unintended departure from plan that improves on original intent. Reason doesn't always result in the best end product.

Oxberry has attempted to design the PRO system with enough versatility to make adjustments for an indefinite future . . . Either the immediate future of slide production or the longer range directon of your media future.

Oxberry's viscous-damped animation compound is an example of a product design that gives you elbow room to experiment. Only Oxberry offers a viscous-damped compound which gives you straightline controlled streaks in any direction including diagonals, circles and free-float moves . . . pantograph tracing for truly unlimited sequential photography . . . indexing for composites from a pantograph and other effects unique with Oxberry.

Oxberry's "format freedom" concept considers your future growth by allowing for media additions. Adding other media formats to the stand permits cost efficient directional changes in your career without obsoleting your production equipment (see page 3). Avoid the purchase of a media production system that "zeros in" on a specific way of working, type of work or even medium of work.

Oxberry helps you keep your options open.

Economy

Design economy is a concept that goes considerably beyond the idea of low price. A good design incorporates many economies into a product. Oxberry does it the following ways:

***First** . . . the use of mass produced photographic and video cameras buy the user highly sophisticated features at a very low price.*
Example: the high speed automatic focal plane shutter in the Oxberry Pro 3 computer camera, capable of exposures from .002 to 99.99 seconds.

***Second** . . . we add those additional components necessary for superior media production.*
On the Nikon F3, we add a pin-registered back and field reticle for precision, an Oxberry motor drive for speed, a computer for efficiency and a bulk back for economy.

***Third** . . . we put the dollar where you will have the highest return.*
For instance, in the time-consuming field of animation we add microprocessor technology to control a video tape recorder for frame-by-frame recording, editing and playback.

***Fourth** . . . all our cameras retain their off stand, live-action capabilities for location work.*
This reduces user cost by amortizing the use over a wider media base.

Additional Oxberry economies are "Format Freedom" and "Room to Grow," described on pages 2 and 3.

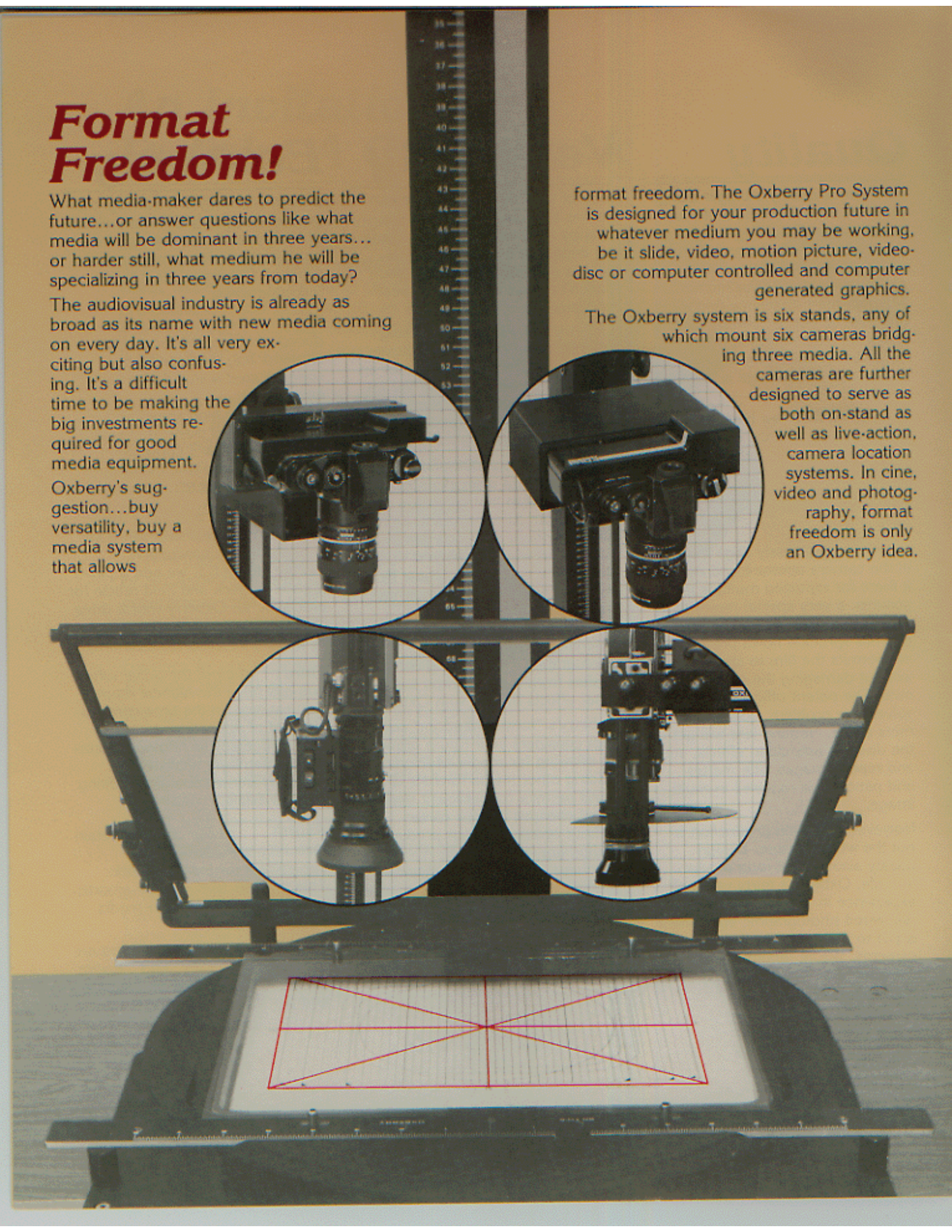
Format Freedom!

What media-maker dares to predict the future...or answer questions like what media will be dominant in three years... or harder still, what medium he will be specializing in three years from today?

The audiovisual industry is already as broad as its name with new media coming on every day. It's all very exciting but also confusing. It's a difficult time to be making the big investments required for good media equipment.

Oxberry's suggestion...buy versatility, buy a media system that allows format freedom. The Oxberry Pro System is designed for your production future in whatever medium you may be working, be it slide, video, motion picture, videodisc or computer controlled and computer generated graphics.

The Oxberry system is six stands, any of which mount six cameras bridging three media. All the cameras are further designed to serve as both on-stand as well as live-action, camera location systems. In cine, video and photography, format freedom is only an Oxberry idea.



Room to Grow...

Built into every Oxberry media system is the opportunity to grow into new techniques, methods and uses. Take as an example the Oxberry customer who started small and built his equipment as he built his business. He bought the Pro 1 Basic System, a reflective copy stand with a pin-registered manual camera...

After a period of hard struggle with moderate success, it became apparent that his clients would pay well for more sophisticated techniques, so he added a modular animation compound and accessory dichroic underlight...

The new equipment generated the expected business and heavy workloads. Efficiency became a very important word..."do-overs," a bad word.

He grew again. This time into a computer modification for the Pro 1 camera. With the new Pro 3, production went much faster and smoother. The resulting prosperity provided for a number of employees and the opportunity to take a closer look at the video mastering business and a Pro Video Camera System to add to his very well used Pro Stand.

Each step of the way, Oxberry kept pace with his professional growth and expanding aspirations.

From your first dollar to your first million, Oxberry is trying to fit your needs. Only Oxberry is interested in the way you grow.

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PRO 3 *The Computer Camera*

It takes a great camera to make a great slide. Innovative slidemaking demands more than an innovative slidemaker. You require a camera that is uncompromisingly accurate, efficient to operate and built durable for a long and trouble-free production life.

Since 1976, when Oxberry introduced the first pin-registered F2, we have remained one step ahead of our imitators. The Pro 3 computer camera represents a giant step beyond ordinary pin-registered cameras with many features that exist only with the Pro 3 camera.

PIN REGISTRATION

Only a pin-registered camera will insure image accuracy from the simple placement of routine title shots to the complex multiple exposure techniques, such as...

... Dissolving shots where each image must fall exactly on the preceding one.
... Meticulously spaced step and repeat slides.
... Title mattes without unplanned drop shadows.
... Faultlessly aligned panoramas.

A conventional camera will misposition these shots with unhappy results that are all too familiar to multi-image photographers.

Even cameras with "pins" often fall short of the required precision. Don't be fooled by false claims of "pin-registered" accuracy. In order to locate the film precisely, two very fine pins must be ground, hand filed and polished to exactly fit the sprocket holes...they must then be positioned critically in relation to each other and finally placed in accurate relationship to a precision reticle. If an error is made on any step, the result is not pin-registration but an expensive and worthless approximation.

Oxberry's patented pin-registered cameras are the most precisely aligned cameras available. We want you to know how good they actually are. That's why we give you film test results with each camera we sell...film chips that show roll back multiple exposures proving perfect re-registration on sprocket hole center.

Ask for a sample pin-registered film chip. We want you to see the registration you require in a multi-image camera.

COMPUTER CONTROL

Control is the key to the Pro 3 Camera System; control over the shutter speed, interval between exposures, predetermine sets, frame position...literally unlimited numbers of possible settings with absolute repeatability. No camera system can match the Pro 3 for micro-processor convenience. Dozens of user-friendly ideas have been incorporated into this camera. Ideas like:

... Automatic f-stop bracketing.
... Programmable fades.
... Dry run prevues.
... Preset exposures, moves and cycles.
... Exposure times from .01 to 99.99 sec.
... Time lapse intervals from .1 to 999.9 sec.

Three kinds of operation are available:

... Direct input...press a button and get an immediate result, such as move +, move −, expose, expose/move, etc.
... Predetermine automatic...input the information including the number of repeats...the camera takes care of the rest, rolling the information over and over.
... Programmable input...write simple directions such as a five shot bracket. The camera will then shoot your five progressive exposures automatically.

Triggering the camera will also automatically:

... step up the toplights
... turn off the reticle projection lamphouse
... recock the shutter
... remove the pins
... advance the film
... return the pins to registration.
... turn the reticle projector on
... and the top lights down.

Since no hands are needed to perform these functions, you won't be disappointed with an accidentally shifted image...and don't worry about forgotten production steps—they're automatic.

NOTHING IS LEFT TO CHANCE

We start with a customized F3 and then make 15 further modifications...virtually rebuilding the camera. The result is a camera in which film will always advance to the correct position and remain registered exposure after exposure, even when the film is wound back and advanced for a second, third or tenth series. To further insure that the registration stays, we cast a new camera back with a ¼" hardened steel hinge pin to insure permanent registration of the back to body...or pins to reticle.

This claim is not made lightly. We perform exhaustive photographic tests on each camera and send you a film chip...Oxberry's proof of precision.



Which makes more sense, roll film or bulk load?

Oxberry is the only camera to give you both.

... Roll film when your production requirements are light to medium and require frequent switching of emulsions. (36 exp. cassettes do not age on the camera.)

... Bulk load with larger production. Negative aspects such as the time to re-thread new emulsions and the cost of wasted leader are soon outweighed by per/frame film cost savings.

FIELD AND STUDIO OPERATION

Whether you are shooting a charging bear or a retreating glacier, a tripod mounted, battery operated Pro Camera will be a big assist in holding the background steady. Oxberry has provided for 12 volt D.C. operation in situations where 110 volt A.C. is not convenient.

The Pro 3 automatic shutter insures that location shots will be evenly exposed in spite of varying lighting factors.

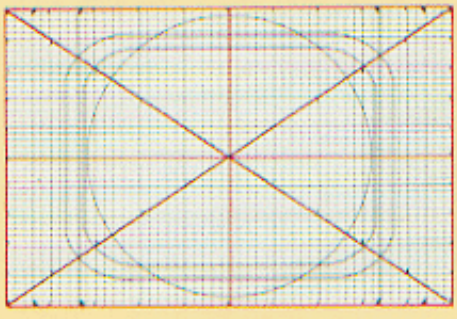
Need a time lapse in the field? Certain elements must remain static while others change. The Pro Camera holds the film in position frame after frame while the microprocessor times the exposure and the intervals. How about a first generation product shot with callouts added later? The Pro Camera will get it for you with accurate placement of all elements.

Need a multiple exposure in studio without the hassle of stroboscopic lighting? The Pro Camera gives you time between shots to do your set-ups.

RETICLE SCREEN ALIGNMENT OF ART

It's not enough that the film be pinned into the same place for each exposure...it's also necessary that the photographer be able to align artwork under the camera with equal exactness. A detailed reticle, critically positioned, makes this possible.

Reticle screens are commonplace in the photographic world, but the Pro 3 reticle stands alone for quality, completeness and brightness. Micro-deposited on stable mylar, the lined surface delineates the actual projected areas of the basic slide mounts (Wess #2, 9, 16, 24, 34), filmstrip, TV safe action and safe title. The entire slide mask area is broken into a grid, which assists in the placement of small art and copy. There are diagonal lines with numbers to designate field sizes 1 through 5. The reticle is factory aligned to the registration pin position and locked in place. Nikon viewfinders and Fresnel screens are interchangeable. Oxberry promises that what you see is what you photograph.

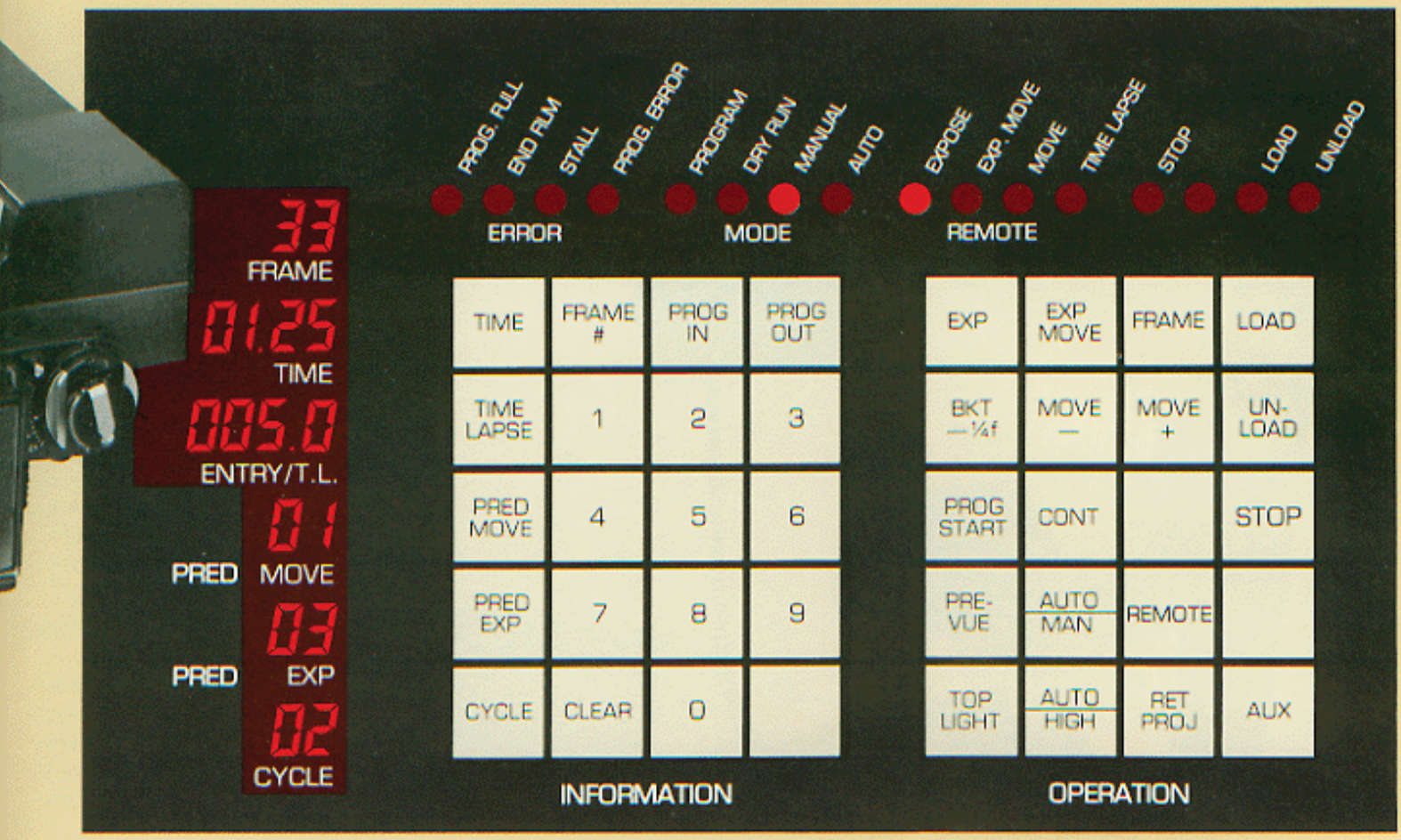


Why computerize the camera?

80% of the tedium and non-creative labor in slide photography involves repetitive camera work with labor intensive effects such as builds, composites, splits, step-builds and supers. Most all effects require some hold frame or roll-back multiple exposures. Many require duplicates and insurance shots. The micro-processor console automatically performs many of these functions.

Example: minus ¼ f-stop exposures can be shot by pushing a single button...or full bracketed exposure sets can be programmed and shot repeatedly by pushing another button.

A computerized camera speeds production and holds mistakes to a minimum.



INFORMATION

BUTTON	*DESCRIPTION OF FUNCTION*
Time	Enters time from .01 sec. to 99.99 sec.
Time Lapse	Enters time/lapse; i.e., time between exposures.
Pred. Move	Predetermines a number of moves.
Pred. Exp.	Predetermines a number of exposures.
Cycle	Predetermines the number of times the pred. move and pred. exp. will be repeated as a set.
Frame #	Changes the frame number.
Prog. In.	Permits the entry of information into memory.
Prog. Out	Terminates the entry of information.
Clear	Eliminates the unforwarded information entered with the number pad.

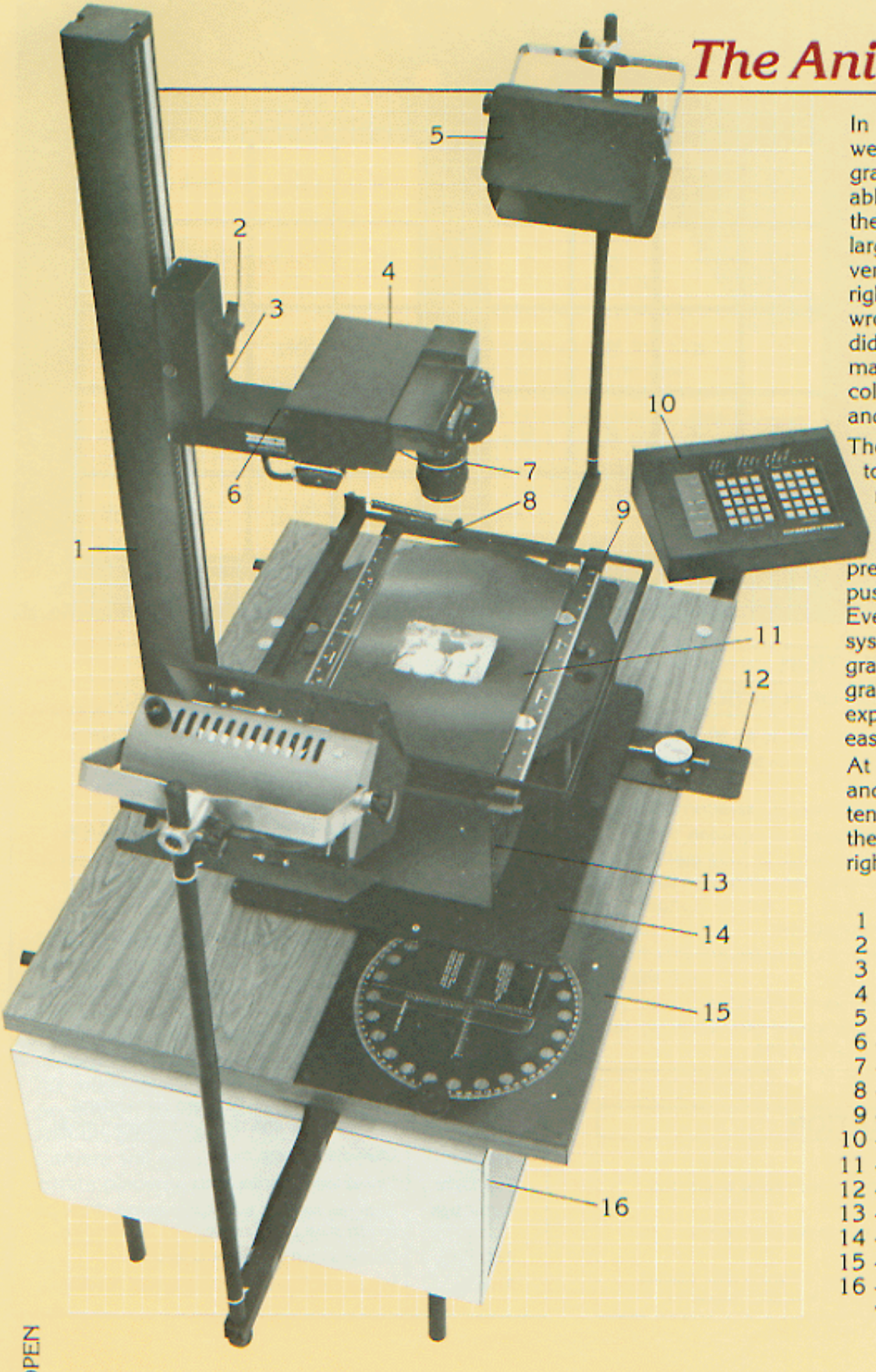
OPERATION

Exp.	Exposes one image.
Exp./Move	Exposes one image and moves to the next frame.
Frame	Calls up any frame (forward or reverse; 1 to 999).
Load	Will advance the film 3 frames after loading. The frame counter will register frame #1.

OPERATION

BUTTON	*DESCRIPTION OF FUNCTION*
Bkt.¼f	Automatically calculates ¼f stop down from base exposure and exposes and moves to the next frame.
Move –	Will reverse the film one frame.
Move +	Will advance or "jog" the film forward one frame.
Unload	Will return the film to the load position. Requires move - jog to return film into cassette.
Prog. Start	Begins the automatically programmed operation.
Cont.	Continues the operation wherever interrupted.
Stop	Stops any camera operation.
Prevue	Permits the prevue of a complete program when checking for content.
Auto/Man.	Switches operation between conventional manual mode and computer program mode.
Remote	Changes Remote mode.
Top Light	On/off switch for toplights.
Auto/High	Switches lights to automatic cut-out circuit to eliminate heat build-up and film flashing.
Ret. Proj.	On/off switch for reticle projection.
Aux.	Reserve A.C. outlet, no automatic functions.

The Animation Stand



In the not too distant past, there were only two types of photographic production stands available to media producers. One was the very reasonably priced "Enlarger Chassis," mounting a conventional camera. The price was right but dozens of things could go wrong in production...and they did. The alternative was the "Animation Stand," a stainless steel colossus with amazing precision and equally amazing price tag.

The Pro Series Stand was designed to fill this gap. The Pro is a medium-size stand with a medium-size price...a production stand with the famous Oxberry precision and enough versatility to push to the limits of the medium. Even so, the Pro is a production system so simple in operation that graphic artists and still photographers without animation stand experience are at their "creative ease."

At best, imaginative slides, film and video images are simple extensions of creative ideas. With the Oxberry Pro, you have the right tool to release that creativity.

1 - Column
2 - Carriage Lock
3 - Micro Drive
4 - Pro 3 Camera System
5 - Toplights w/Barn Doors
6 - Camera Bracket
7 - f2.8 Micro Nikkor Lens
8 - Glass Artwork Platen
9 - Pin-Registration Bars
10 - Pro 3 Computer Console
11 - Backlighting Stage
12 - Indicator Dials*
13 - Dichroic Backlight*
14 - Viscous Damped Compound
15 - Multi Effects Pantograph
16 - Filmography Table*

* Accessory items

OPEN

VISCOUS-DAMPED COMPOUND

The Pro Animation Stand is primarily a special effects machine. It efficiently and accurately provides the operator with control over many difficult media techniques. The animation compound is the heart of this product.

For artwork movement under the camera, a very special compound table is required. Only the unique viscous-damped compound will solve all the creative and production problems of media effects.

Viscous-damping is a necessary production plus for many reasons:

Only viscous-damping gives you the fluidity to streak artwork under an open shutter. Streaked images, impossible on conventional stands, can be mastered immediately, even by the non-technical camera person.

Viscous-damping gives you fingertip accuracy as fine as 5/10,000 inch (that's .0005). Microscope stages do no better! This precision isn't a luxury. It's required for complex step and repeats, inserts, segmentations and other critical effects.

Viscous-damping is speed. Geared compounds take a lot of time to crank across the artwork. Also there's "backlash," the design flaw of all geared compounds,. If you need precise measurement, the Pro compound is the answer.

Now add the advantage of working with a full-sized compound. Most slide compounds move a slide, but what do you do when you want to make a panorama out of an 8 x 10 transparency...segment a 4 x 5 or move around any art larger than a slide?

RIGID COLUMN

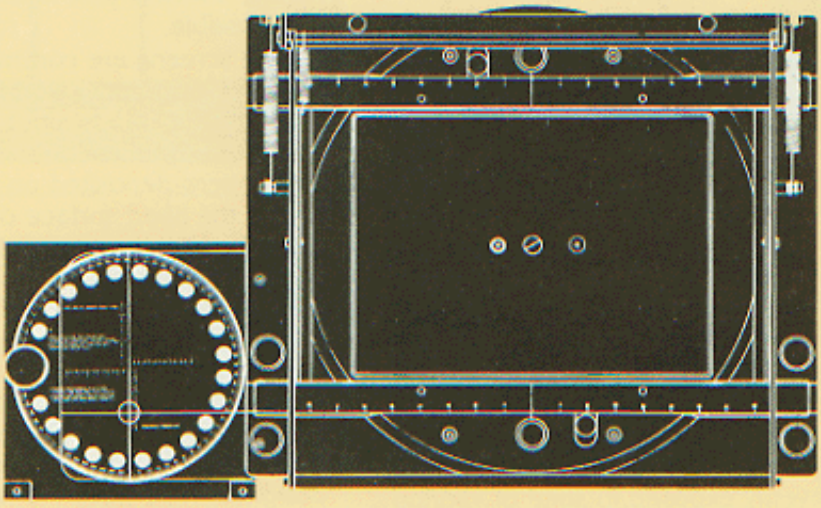
For critical sizing and focus, you need an animation quality column. The Pro column is precisely engineered for perfect roller bearing, counterbalance tracking.

Micro-drive movement provides the means to focus macro work... precisely, as only a manual focus will. Constructed of box welded, non-resonant aluminum, the annoyance of vibration has been solved...And when it comes to vertical tracking, nobody does it better.

EFFECTS PANTOGRAPH

Panning is the animator's term for moving artwork under camera. There are two kinds of pans: the first is step and repeat, the second a streak. The pantograph is the cameraperson's method of controlling these moves by assisting in planning, executing and repeating the move.

The multi-effects pantograph is a huge improvement on the unique viscous-damped compound. It provides the control lacking with this "free floating" compound.



PAINT WITH LIGHT

The many lighting problems of slide production require a specialized lighting system. The Pro benefits from 40 years of lighting design. The toplights are evenly distributed for reflective art up to 9" x 12" and 26" x 36" with additional lights.

Two underlights are available as accessories, each designed for a different photographic application. The 9" x 12" cold cathode white light is used for cel illumination. The dichroic backlight is used for color balancing in duplication of most color transparencies.

A pantograph assisted viscous-damped compound opens the door to many new effects such as:

- ... straight line moves. Locking the disc in the rotation plate aligns the slot and pin to guide smoothly the straight line angular pans in any easily repeatable direction.
- ... smooth free form pans moves without the stair-stepping in conventional compounds.
- ... circling, not to be confused with spins where the artwork rotates rather than remaining "right-reading."

... composite slide from many individual slides. Composites of 4, 9, 16, 25 and 36 images are quick and precise to produce.

... Pantograph tracing is accomplished by placing a prepunched tracing tissue over the artwork and pencilling in the move that will be traced by the stylus.

PANTOGRAPH TRACING

Problem: You have an 8" x 10" transparency of a crowd of people. On a single screen, with dissolving projectors, you want to show a 36 exposure sequence: the camera searching for a single face within the crowd. You'd like the camera to travel in a spiral pattern, moving an equal distance between exposures, and ending with a six frame zoom.

Solution? Simple! Overlay the backlit transparency with a sheet of pin-registered tracing paper. Through the camera viewfinder, size and position the first image, marking its center on the pantograph paper. From then on, you don't even have to look through the camera as you loosely draw a spiral path and indicate the center of each exposure.

To shoot the sequence, the tracing sheet goes underneath the pantograph shield with the cross hair centers on the first X.

Make the first exposure...move the compound so the cross hair centers on the next X...make the next exposure...and so on for all 36, zooming in on your last 6 exposures.

Five minutes from conception to a 36 frame film sequence. Only with Pro is it as simple as trace and shoot.

Why not computer control the compound and camera?

Because computer controlled stands mean big expenditures with questionable returns.

As any businessman realizes, it's the bottom line...return on investment...that should determine your capital expenditures. Since you can probably do the effect on the Pro 3...computer controlled slide stands are overkill.

... Try making a circle or a straight line diagonal streak on a computer stand.

... Try to trace a pantograph move with a computer stand.

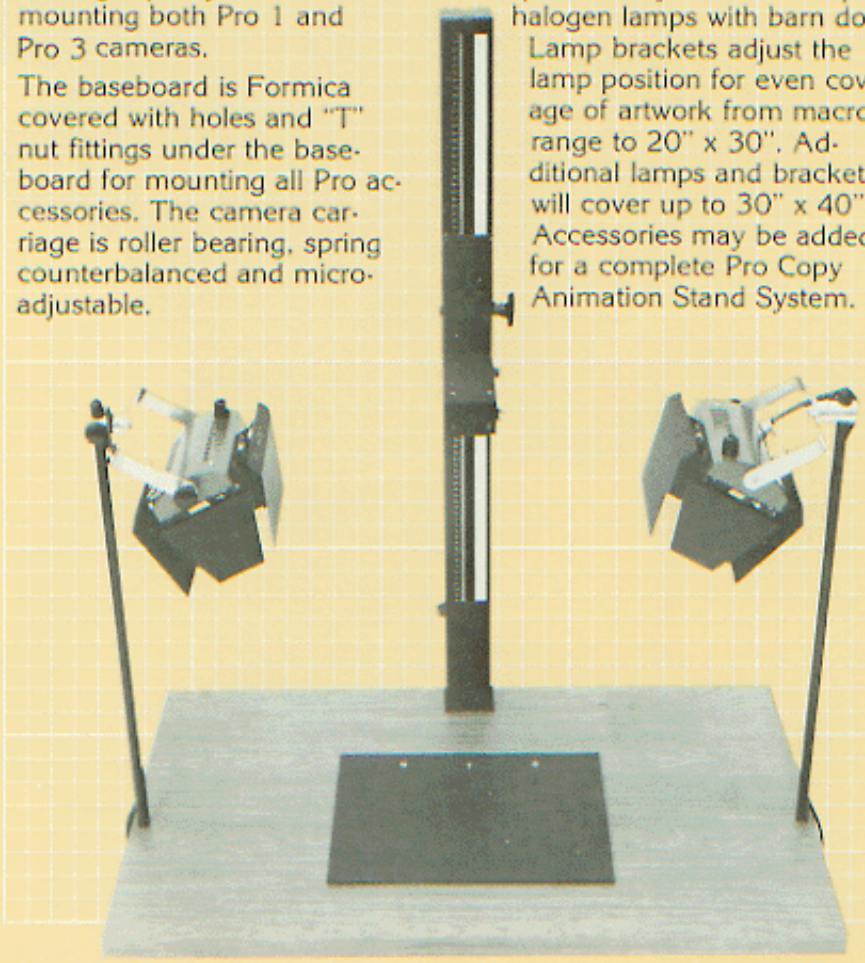
The Oxberry viscous-damped compound does it without a program or programmer...only Oxberry!

The Basic Stand

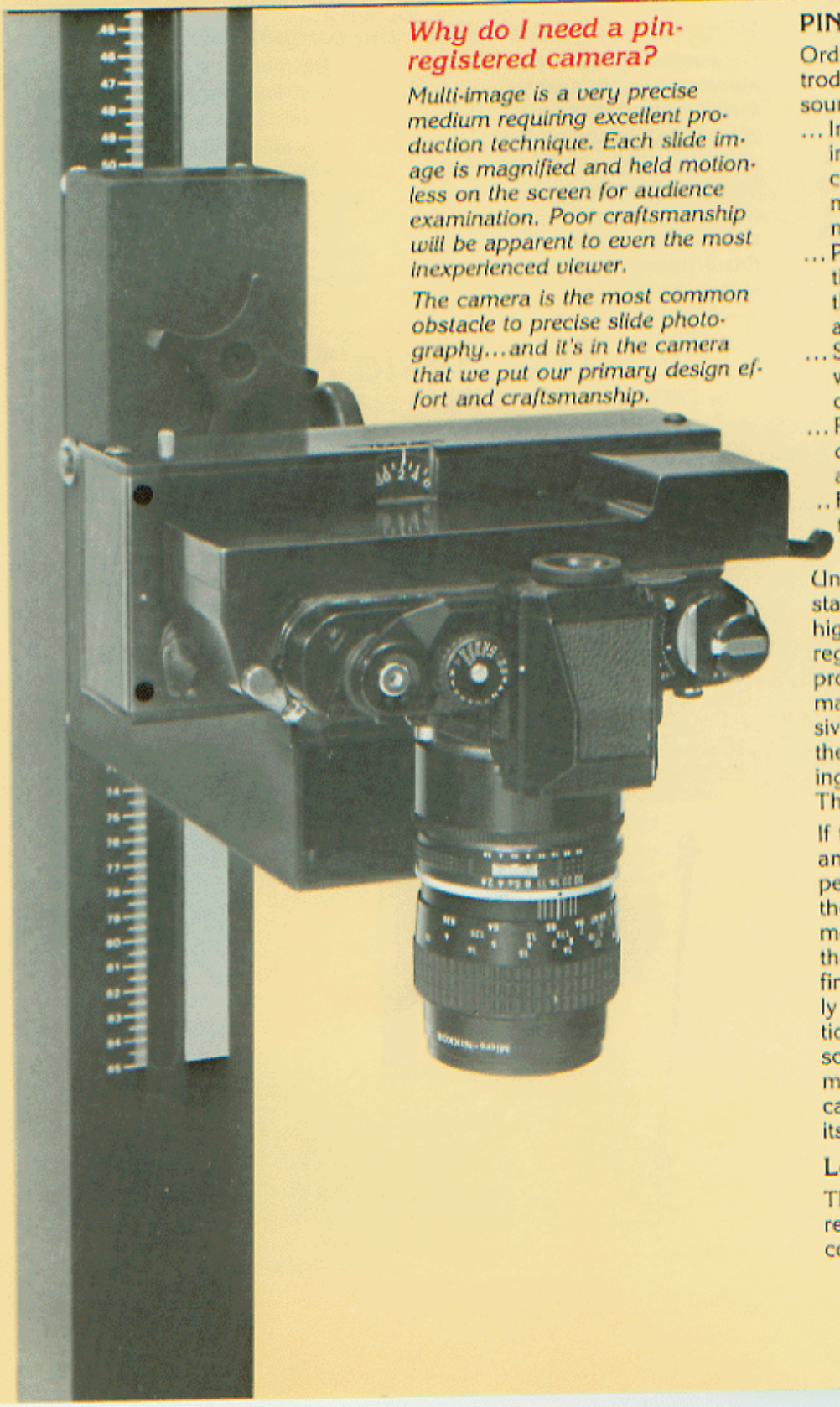
The PRO BASIC STAND is a reflective light copy stand offered as an economical alternative to the PRO ANIMATION STAND. It is a high quality camera stand mounting both Pro 1 and Pro 3 cameras.

The baseboard is Formica covered with holes and "T" nut fittings under the baseboard for mounting all Pro accessories. The camera carriage is roller bearing, spring counterbalanced and micro-adjustable.

The aluminum box-welded construction assures rigid non-vibrating camera support for pin registered photography. Lighting is provided by two 3200K quartz halogen lamps with barn doors Lamp brackets adjust the lamp position for even coverage of artwork from macro range to 20" x 30". Additional lamps and brackets will cover up to 30" x 40". Accessories may be added for a complete Pro Copy Animation Stand System.



PRO 1 The Manual Camera



Why do I need a pin-registered camera?

Multi-image is a very precise medium requiring excellent production technique. Each slide image is magnified and held motionless on the screen for audience examination. Poor craftsmanship will be apparent to even the most inexperienced viewer.

The camera is the most common obstacle to precise slide photography...and it's in the camera that we put our primary design effort and craftsmanship.

PIN-REGISTRATION

Ordinary 35mm cameras introduce misalignment from five sources:

- ... Initial aperture to sprocket hole inaccuracy which causes off-center framing when the film is mounted in a pin-registered mount.
- ... Progressive change in film position due to lessening "drag" in the film cassette as the film is advanced.
- ... Squirm as the film is advanced with uneven sprocket teeth and cassette pressure.
- ... Retardation of the gear train due to progressive wear and the accumulation of dirt.
- .. Film shrinkage due to manufacturing error or poor handling.

Unfortunately for the low budget, start-up slide producers, only a high quality set of precision steel registration pins will solve these problems. This is, by nature of the manufacturing process, an expensive procedure. Pin registration of the film sprocket holes is an exacting and time-consuming craft. There are no shortcuts.

If the pin is not perfectly ground and polished...if two pins are not perfectly located in relationship to the sprocket holes...if they are not mounted perfectly in relation to the aperture and reticle...and finally, if the system is not elegantly designed to maintain this position through heavy production schedules, the camera is of no more value than an unregistered camera. The chain is as strong as its weakest link.

Lowest Pin-Registered Price

The Oxberry Pro 1 provides the required accuracy at the minimum cost. The Pro 1 is identical to the

The Basic System

Pro 3 in camera body and pin registered back with exception of the computer electronic motor drive which has been replaced with a manual advance mechanism.

Automatic Pin Registration

The Pro 1 design maintains pin registration of the film except for the short time of film transport. The advance mechanism and lever lifts the pins momentarily and reintroduces them automatically at the end of the advance stroke. This eliminates the necessity of inserting pins before and removing them after each exposure. It also eliminates the forgotten pin placement causing out-of-register images.

A frame indicator keeps an exact count of film position. It also counts backwards when rewinding, making possible "roll back" multiple exposures. This feature is not available on the standard Nikon F3. The Pro 1 counter is resettable and silk screened with luminous ink for darkroom visibility.

Reticle Grid

Complete reticle information is vital for alignment of artwork under camera. This alignment goes further than precise positioning of artwork in the center of the aperture...it also permits the positioning of art in precise places on the film. The Pro 1 reticle is identical to that used in the Pro 3. It has been tested and found superior in five years of production use. An extensive line of field guides, layout pads and mechanical boards printed with the same reticle information are available to artists preparing art for the Oxberry cameras.

Room to Grow

If your production needs or capital budget fall short of the Pro 3 Animation System, we suggest you consider the new Pro Basic System. It's designed for immediate, pin-registered reflective copy work...and later growth to just about any other production work your future may dictate. Here's how it works:

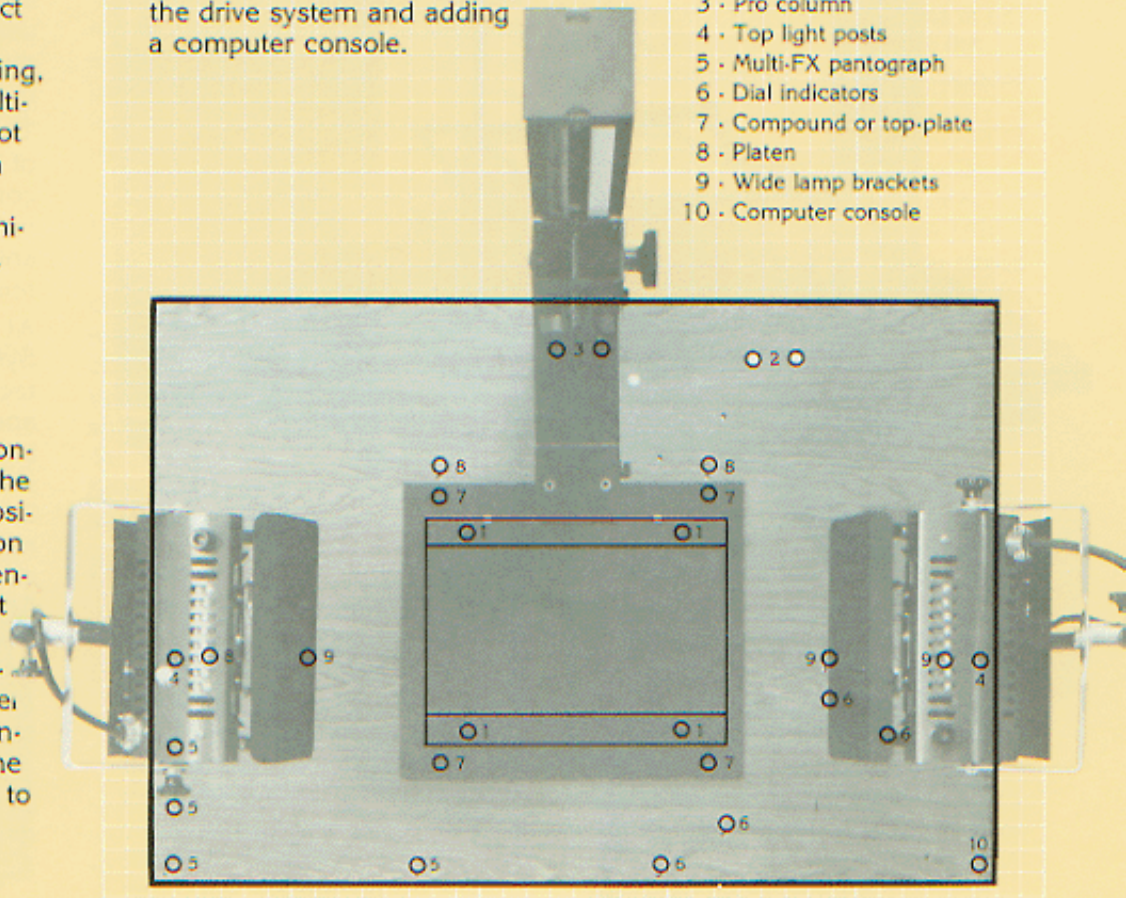
... You start with the Pro 1 manual camera and the finest pin-registered movement available. When your workload demands faster production, send the camera to Oxberry and we will convert it into the Oxberry Computer Pro 3 by replacing the drive system and adding a computer console.

... You start with the Pro Basic Stand with the finest counterbalanced micro-drive column and camera carriage, professional quality quartz halogen toplights with barn doors and an Oxberry pin-registered baseboard. Later add on virtually any component you see on the Pro Animation Stand. (See page 8).

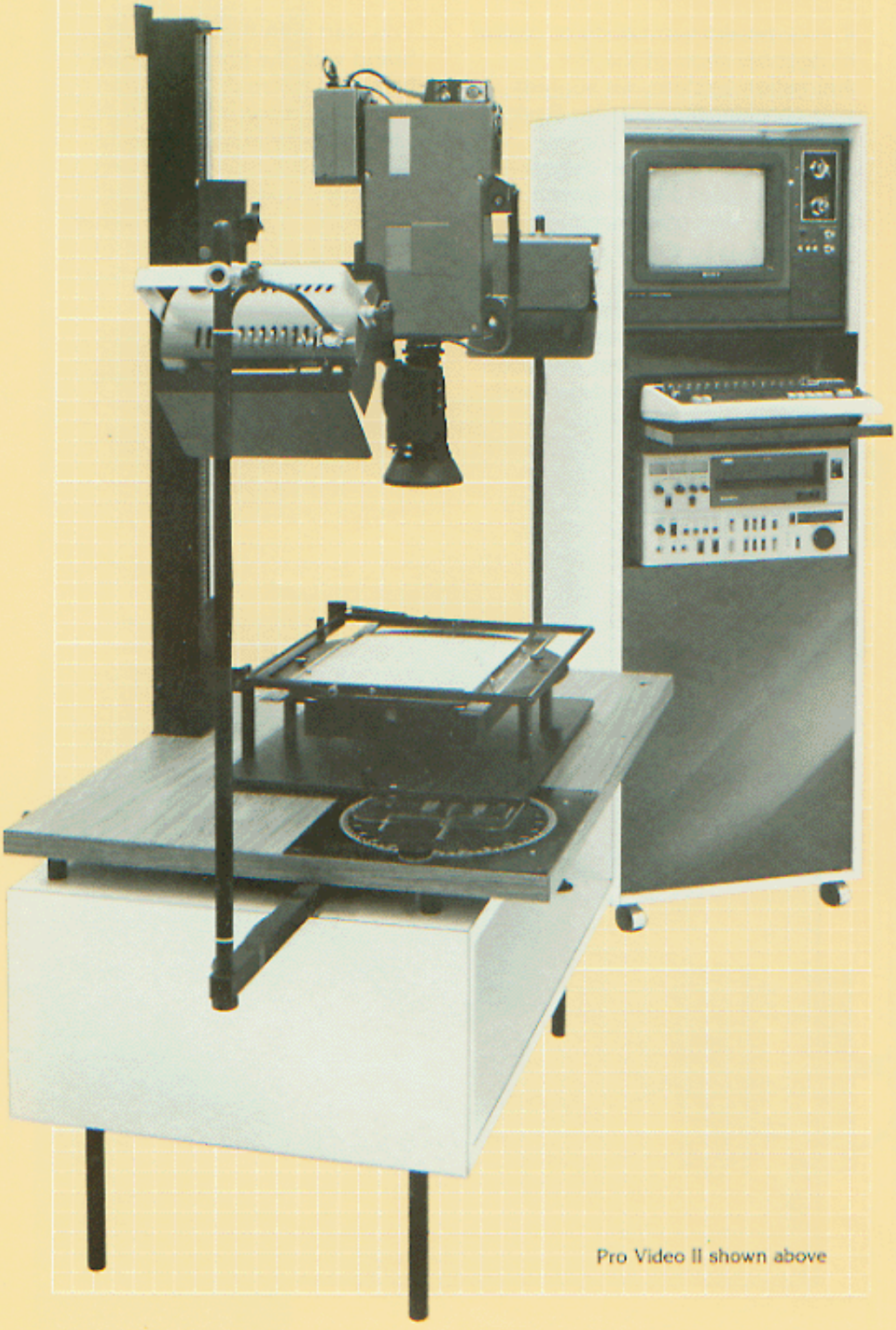
Start inexpensively but not cheaply...complete the system as needs require.

Grow Holes

1 - 10 x 12" backlight
2 - Media-pro column
3 - Pro column
4 - Top light posts
5 - Multi-FX pantograph
6 - Dial indicators
7 - Compound or top-plate
8 - Platen
9 - Wide lamp brackets
10 - Computer console



PRO VIDEO



Pro Video II shown above

Audio-visual producers have recently shown a strong interest in video as a direct and post-production medium. Pro Video I, II and III are systems that provide access to the frame-by-frame recording techniques previously restricted to photographic cameras. Multi-image photographers and cine-animators are finding many of their techniques directly transferrable to the video medium. The old restriction of poor resolution is not justified when the primary presentation medium is video. Why not produce directly?

The economies of direct production coupled with the many interfaces of other media is of growing interest to a wide range of end-users from educators through industrial and business marketers, to broadcast communicators.

The Pro Video series is made up of three production systems each comprised of a computerized controller interfaced with a Pro Video animation stand, video camera, monitor and videotape recorder.

At the heart of the Pro Video System is a microprocessor based technology which permits simple and precise videotape editing with immediate playback. Through a series of simple push-button steps, it is possible to record individual or multiple frames with full and accurate editing and replacement. This provides unique media possibilities in animation, videography, video special effects, computer graphics and video disc mastering.

There are three Pro Video Systems, each serving a distinctly different end user.

Pro Video I

...a black and white, ½" VHS cassette animation system. It is designed for recording pencil tests of cel drawings, puppet animation, pixilation and special effects without the long wait for processed film dailies.

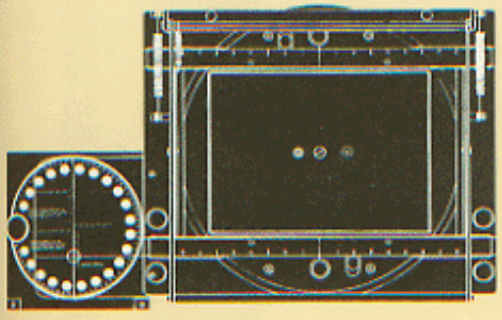
This system is ideal for the film educator teaching animation basics. Variable forward speeds plus hold frame allow rate experimentation. Variable time lapse recording speeds assist object animation and cel rotation.

The camera is typically mounted onto the Pro Video Basic Stand which comes equipped with top and bottom lighting pin registration and platen for basic animation techniques.

The Pro Video Animation Stand with full viscous-damped animation compound is used where pans, circles, diagonals, spins and other animation effects are desired.

Features:

... 24 or 30 frames per second
... any number of frames per recording from 1 to 99
... mode and frame total displayed on monitor
... each frame number recorded on video image
... auto search to title, forward and reverse
... 10 forward playback speeds
... 10 time-lapse recording speeds



Pro Video II

This system is designed for the industrial and business A/V market where there is a requirement for direct videotaping with precise editing control. Since Pro Video 2 has immediate playback capabilities, it is ideally suited for frame-by-frame animation, color correction and many other media production effects and post production techniques.

Animation Stand

The Pro Video is capable of film animation techniques such as pans, zooms and trucks. The unique capability of the viscous-damped animation compound permits real-time pans for taping at 30 F.P.S. (videography).

The Pro Video compound permits many moves not possible with any equipment short of computer controlled stands...moves like circles, free form floats, pantograph tracing and more. (See pages 8, 9 and 10 for a description.)

Video System

The Pro Video stand and formica console cabinet mounts a matched, industrial quality, video recording system. The heart of this system is a microprocessor console which controls the camera, ¾" V.C.R. and 12" monitor. Specifications of components are available upon request.

Features:

... frame-by-frame recording of artwork ranging in sizes from 1 field to 18 field. The 14:1 motorized zoom lens is also capable of auto focus zooms throughout the range.
... immediate viewing
... video stored time code
... time code display
... computer interfacing
... off-stand use of the camera. The camera comes fully equipped as a field system.

Video Stored Time Code

This exclusive feature improves greatly on the accuracy of audio track code storage. This vertical interval frame code generator/reader maintains exact field to field accuracy, preventing the loss of a single frame, whether the tape is stopped or in motion.

Immediate Viewing

Because the stored image can be viewed immediately, corrections and refinements can be readily made, making the Pro Video a creative tool. Experimentation with speeds are important in timing animation movements. This is an obvious improvement over the time-consuming delays of motion picture production.

Computer Interfacing

Both the Pro Video II and III accept any NTSC inputs from either a graphics terminal or video camera. Both have RS 232 interfaces.

Pro Video III

The Pro Video III is a broadcast quality version of Pro Video II designed for on-line final production of frame-by-frame animation and video graphics. It is similar to Pro Video II in the controller and stand but is upgraded with the video components.
Adaptation to users' components is also possible upon consultation with the factory. A further adaptation for European use is the Pro Video PAL III which records at 25 F.P.S. Specifications and component capability information is available upon request.

MEDIA PRO 16

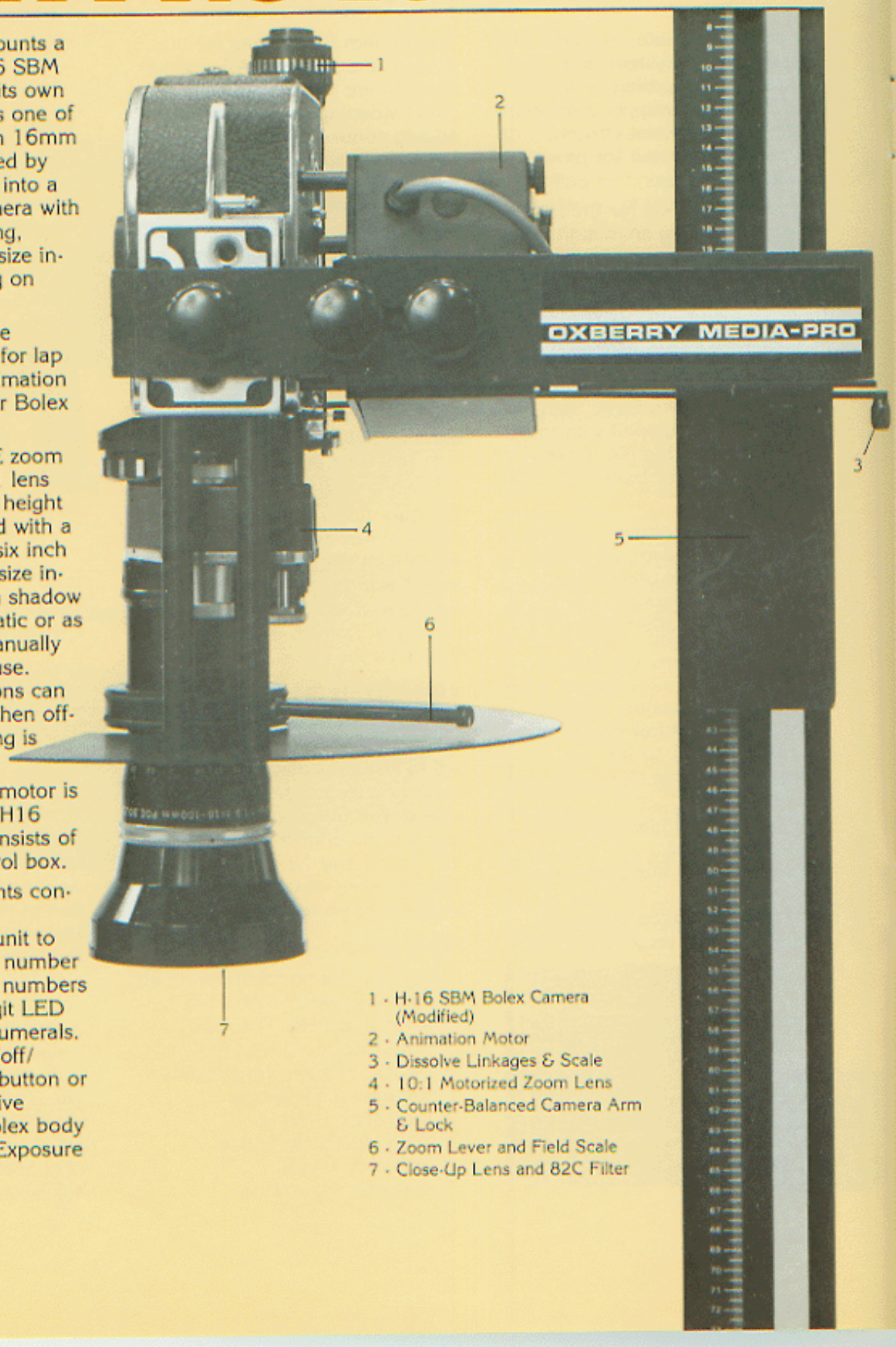
The Oxberry Media-Pro mounts a highly modified Bolex H-16 SBM 16mm camera system. In its own right, this camera stands as one of the most reliable live-action 16mm systems. The features added by Oxberry convert the Bolex into a high quality animation camera with capabilities for lap dissolving, zoom animation with field size indication and single framing on 110 V AC.

The Oxberry/Bolex dissolve linkage permits 100 steps for lap dissolves, an important animation feature impossible on other Bolex and competitive cameras.

The Vario-Switar 100 POE zoom optic is an auto-focus 10:1 lens modified to focus at stand height (close range). It is operated with a battery driven motor or a six inch lever referenced to a field-size indicator which doubles as a shadow board. Exposure is automatic or as is more often the case, manually overridden for animation use. These Oxberry modifications can be removed by the user when off-stand live-action filmmaking is desired.

The Media-Pro animation motor is designed specially for the H16 SBM Bolex cameras. It consists of a camera motor and control box.

The 4" x 6" console mounts controls for three-digit pre-set memory. This allows the unit to stop automatically on any number up to 999 frames. Frame numbers are displayed on a five-digit LED counter with clear, 3/8" numerals. Controls include: forward/off/reverse, from panel push button or foot switch. The motor drive mounts directly on the Bolex body with three thumbscrews. Exposure time is 1/6 of a second.



1 - H-16 SBM Bolex Camera (Modified)
2 - Animation Motor
3 - Dissolve Linkages & Scale
4 - 10:1 Motorized Zoom Lens
5 - Counter-Balanced Camera Arm & Lock
6 - Zoom Lever and Field Scale
7 - Close-Up Lens and 82C Filter

The animation stand is a vital asset to any animation production center. You need efficiency, accuracy and versatility to carry off today's animation effects. Camera effects are a vital element of most animation production. Oxberry Media-Pro 16 opens the door to the world of effects cinematography.

The heart of any animation stand is the compound table. Oxberry has put years of animation experience to work in this unique production tool. The Media Pro shares many of the features of the larger Oxberry plus a few characteristics unique to the animation industry.

... Full sized 12 field glass backlighted stage with two pin-registered panning rules.

... 12 field cold cathode backlight with power to backlight multi-level pencil tests and cel art.

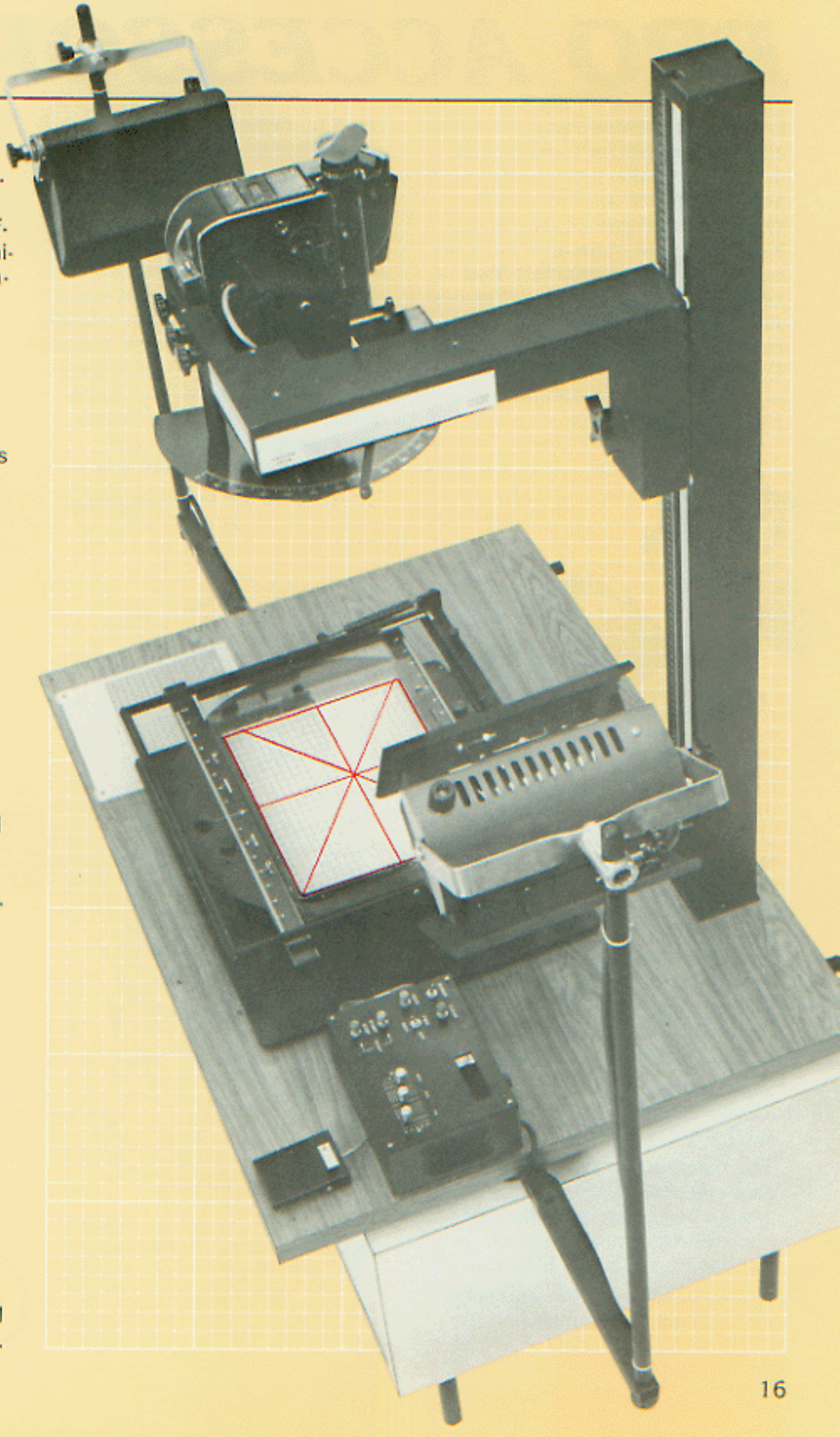
... 12 field, spring-loaded glass platen for flattening artwork, eliminating shadows and glare.

... 8 field tracing pantograph; just lay the pin-registered mylar field guide over the artwork, draw your move 1:1, return it to the baseboard and trace your move.

... Viscous-damping; that unique feature which permits silky movement under a camera, fingertip accuracy as fine as 5/10,000 inch; direct compound movement between any two points without the annoying cranking time or backlash common to conventional geared compounds.

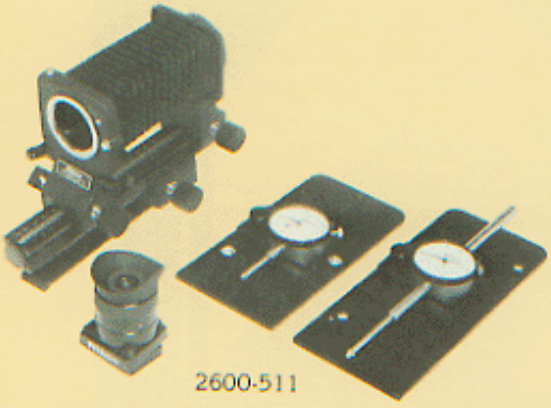
... Unique with Oxberry is filmography, our word for panning live-art under a camera running at live-action speeds...animation from available photos.

Only the Oxberry Media-Pro has all these necessary animation features.



PRO ACCESSORIES

Each Pro system is equipped with all the essentials for dynamic production...but there are optional accessories that will give the system special production capabilities. Some are more applicable to one medium than another. Most have multiple-media value. For slide producers working in the macro range, the job gets harder. Oxberry has the answer with the rigidly precise **Macrophoto System** (2600-511).



2600-511

It's designed to help you utilize that slide library and re-image exciting new material. You're not stopped at full-sized duplication... now you can go on to single slide panoramas, zooms into a slide, pans across a slide. With a macrophoto accessory, you can enlarge a portion of a slide and accurately segment it to as many as 25 equal components.

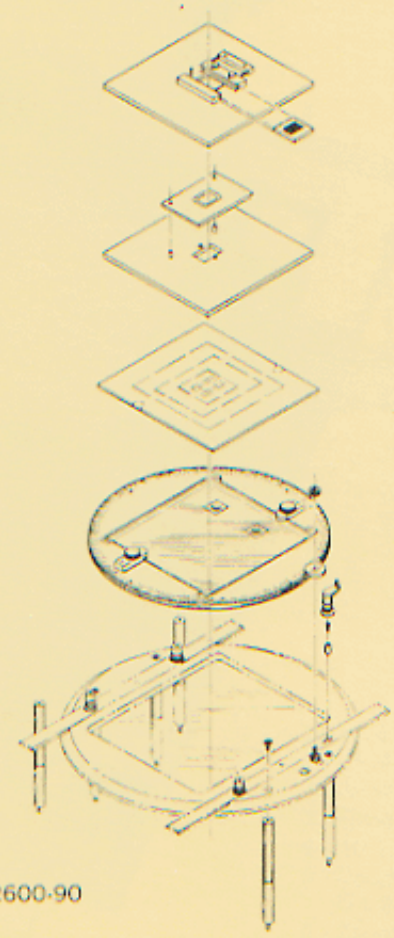
Composite slides are also easy since building a slide of separate images requires superb measuring. We have it! (.0005).

The macrophoto system has two elements: the customizing bellows system for steady magnification and dial micrometers and plates for precision N-S and E-W moves.

All Pro baseboards are equipped with mounting fasteners.

Small to miniature artwork requires precise miniature registration. Oxberry has it in the **Multi-format Rotation Stage** (2600-90). From unmounted 35mm film art through Wess Mounts, even to 8" x 10" transparencies, the multi-format stage will hold transparent art in pinned position for even the most delicate multi-exposures...the stage may be spun and cocked in any degree of rotation. This circular movement compliments the compound's move and zoom axis.

Three plates are provided for original art of different sizes.



2600-90

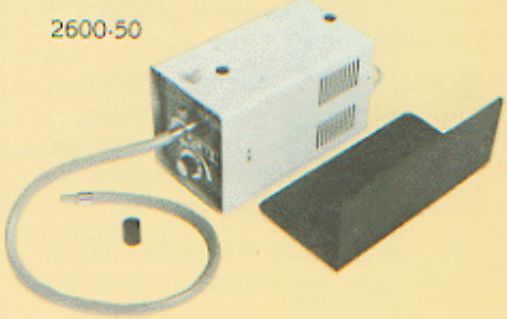
...Unmounted slide art in strips or as single frame are mounted onto a pin-registered plate and masked with a pin-registered top plate. This plate functions also as a high precision registration for contact printing of Kodalith negatives.

...Slide art in pin-registered mounts are registered on a spring-loaded mechanism for quick rotation.

...An 8" x 8" glass plate is used to mount 4" x 5" and 8" x 10" transparencies. Registration pins and adhesive tabs insure accurate alignment and replacement.

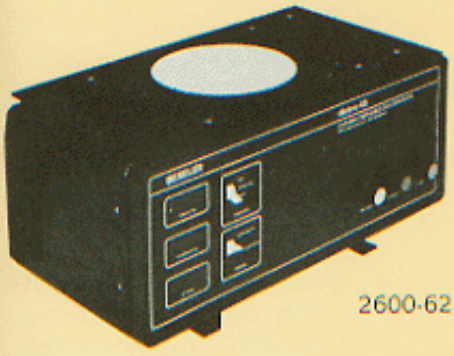
The **Reticle Projection Lamphouse** (2600-50) throws an enlarged image of the camera reticle onto your artwork. This speeds up critical aligning and focusing... something your eyes and back will appreciate on a long production day. The lamphouse has a variable intensity quartz halogen lamp, fan, and a fiber-optic bundle that channels the light into the camera eyepiece. This flexible light pipe permits the camera to move up and down the column without interfering with the reticle projection. An interconnection with the camera power supply automatically turns the light unit off and on for each exposure. A wall bracket mounts its power supply at mid-camera height. Designed primarily for the Pro 1 and 3 slide cameras.

2600-50



The **Dichroic Lamphouse** (2600-62) is a specially modified Beseler Dichro 45. It gives you three outstanding capabilities: professional quality color duplicating and full spectrum color range for litho titling to 5" x 5". It's no ordinary dichroic lamphouse, but one specifically designed for the demands of slidemaking. Only the best dichroic lamphouse will evenly illuminate the subject from corner to corner without fall-off of intensity or color.

The power supply is micro processor controlled and stabilized to eliminate surprises caused by fluctuations in voltage. We've made sure it will withstand the extra heat generated when it operates in an inverted position.

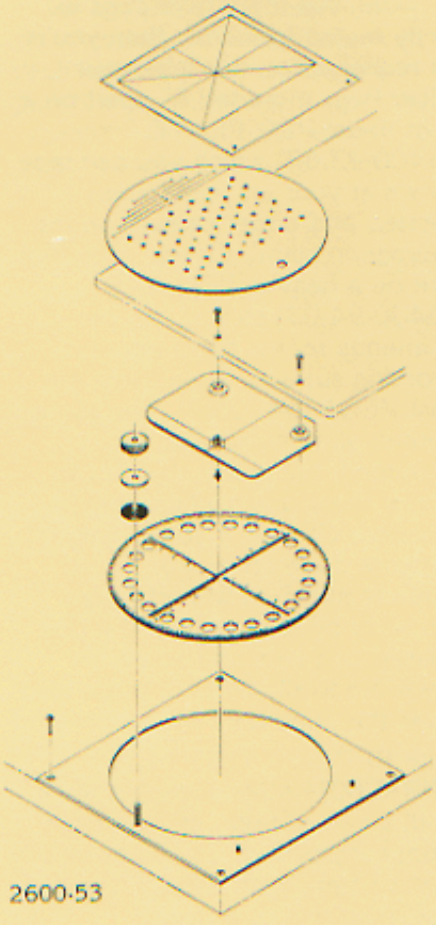


2600-62

Animators need an intense and photographically even backlight to punch through their 10¼ x 12½ cels and pencil tests.

The **Pro Backlight** (2500-417) is a cold cathode light source of high lumen output. It operates off a high voltage power supply which filters out line surge and provides long-lived and evenly distributed transillumination. This backlight inserts into the baseboard of the basic stand or slides into slots under the circular backlighting stage.

The **Effects Pantograph** (2600-53) is an effects device used to control the multi-directional viscous-damped compound. Serving as a solid state program, it guarantees professional compound moves...many effects unknown to the multi-image screen, such as the "free float," curved and angular streak and circle pan to name a few.



2600-53

Filmography Table (2500-51) rigidly supports the Pro Copy stand at an ideal working height and provides storage space for equipment.

When high production calls for a high number of dupes, the **Bulk Load Accessory** (2600-41) is a valuable addition to the Pro 3 camera. Interchangeable 100 foot cassettes are driven with D.C. take-up and rewind motors. Cassettes can be removed for processing short segments without unloading the camera and wasting large amounts of leader. A film piercer mounted internally marks the film at any point for darkroom coding. The bulk load accessory attaches to the Pro 3 camera back. It is not usable on manual cameras.

Auto focus zooming is convenient for certain multi-image effects, especially the in-focus zoom. Oxberry recommends the **Macro Zoom Lens** (2600-40) which takes the instabilities of conventional zoom movements and provides quality zoom photography over a 3:1 zoom field. This lens is also usable on tripod mounted field cameras.

The **Compound Table Clamp** (2600-70) locks the compound in any position.

The **Polarizing Filter System** (2600-73) intensifies colors when you're photographing with top lights and does a complete job of eliminating glare and reflections from shiny surfaces. The

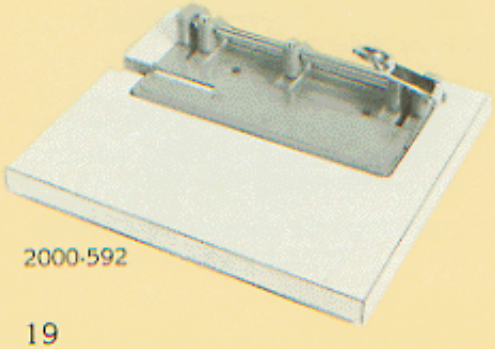
Other accessories are available to make your life easier...and improve slide quality.

PRO ART PREP

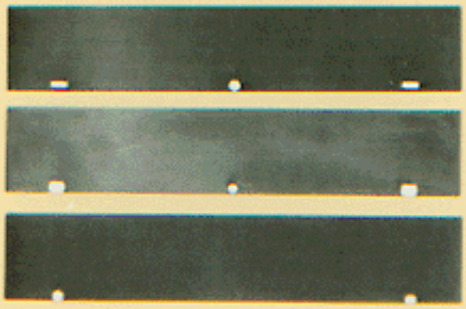
What do film animators know that slidemakers should know? Registration, that's what! They know about registration punches, registration pegs and all sorts of devices that make images glide smoothly over the screen.

Today's media artists need to know about those, too. Slidemaking of the 80's, multiple images, multiple exposures, animation, images that are precisely aligned with each other require very special equipment...like a pin-registered camera. But also, you need ways of registering and aligning the artwork, slides and everything that goes under the camera. Registration techniques for slides and animation are similar, and different. That's why Oxberry has designed registration and art equipment especially geared to the unique needs of both.

Oxberry's modestly priced precision ARTWORK AND ANIMATION CEL PUNCH (2000-592) fulfills the critical needs of the slidemaker and slide animator. For large artwork, it spaces two ¼" round holes 8 inches apart; for 4" x 5" and smaller artwork, an additional punch head puts the holes 3¾" apart. Unlike film and video animators, slide animators do not have to punch and rotate hundreds of cels for each sequence. If you do, then you'll need the heavy duty, rectangular hole Oxberry Standard Animation Punch.



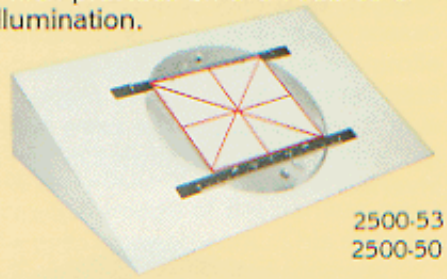
2000-592



Registration pegs are what keep it all together. Punch holes in your artwork, slip them over pegs exactly mated to them...then you're in register. You can take your pick: Pegs mounted 8" apart on a thin metal PEG PLATE (5400-93-03) which you can tape down at your art preparation center, and under camera on the animation stand. Or use pegs that are on a heavier PEG BAR (5400-94-03) so you can permanently recess them into the working surface. Then there are just PEGS (5400-98). The same round, aluminum pegs, unmounted, but made so you can screw them down where they're needed. Oh yes, if you're handed artwork done on cels or paper already punched with standard Oxberry or Acme holes; the peg plates, peg bars and screw-on pegs are available to fit those also. (See the price list.)

The REGISTRATION KIT (2000-60) has devices that work with small artwork, art you can't punch holes in or any place you need a temporary set-up. You'll get reuseable, low profile pegs that match the punch. You can strengthen the holes with adhesive-backed hole strengtheners or slip the pegs into registration tabs. You can even use these devices with our inexpensive one-hole punch. Very convenient.

Drawing the artwork, now that's where a film animator's DRAWING DISC (2500-53) can be mighty useful. It lets you fasten your drawing paper or acetate cel with registration pins, turn it at the most convenient angle, adjust the position of overlayed cels, toplight it, backlight it; even do your photography as well as art preparation on it. For art preparation, you'll find it convenient to mount the drawing disc on the special LIGHT TABLE (2500-50), which provides an even source of illumination.



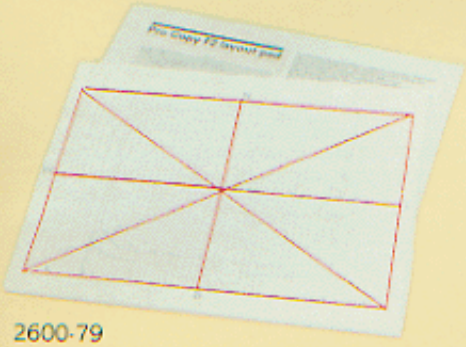
2500-53
2500-50

Artwork can be put onto many materials, but for some uses, nothing beats special white ANIMATION PAPER (2000-61). Very strong and very thin, it lets you trace from one layer to the next, accepts all kinds of drawing media and easily slides on and off the registration pegs. ANIMATION CELS (2000-62) are sheets of transparent, heavy acetate for inking and coloring and photographing through many layers.

Both the paper and the cels are available unpunched (punch your own) or pre-punched for Oxberry Standard and Acme holes. (See price list.)

Designing and laying out the artwork is another matter. You need very specific guides to keep those lines and letters placed the way they look in your mind. Oxberry makes several devices to help . . . devices printed with vital art prep and production markings.

The Handbook



2600-79

The LAYOUT PAD (2600-79), LAYOUT BOARD (2600-78) and SLIDE COPY FIELD GUIDE (2600-80) are communication links between the people involved in slide production. The camera reticle markings printed on each of these accessories make it possible for the designer to talk with the client, with the photographer, with the producer, and the artist, so that all can understand the specifications of each slide.

Storyboards are the universally accepted way of designing visuals for AV productions. As you progress to a tight layout, work on the LAYOUT PAD (2600-79). These sheets of bond paper give the designer a way to locate each slide element, precisely and easily. And, if you want to take copy under the camera and shoot it onto ortho film, an artist can do paste-ups directly onto these sheets or onto the heavier bristol LAYOUT BOARD (2600-78).

Then there's the plastic SLIDE COPY FIELD GUIDE (2600-80), necessary for artists when they prepare charts, graphs, animation on unlined animation paper or cels. It's the sure way to keep cel after cel of overlayed artwork in register. Field guides are also available for 16mm and 35mm cine format punched Oxberry Standard.

Burns...splits...glows...spins... conversions...posterizations... animation...slide effects from the simple to the complex...everything you've wanted to know and now you can find out. Oxberry tells all in the SLIDE PRODUCTION HANDBOOK, the only instruction book written specifically for the slide producer.

Slide communication, from the single projector show to multi-screen, multi-format extravaganzas, demands a constant flow of fresh images. This explosive growth of multi-image is opening dynamic new horizons, as well as causing perplexing production problems.

The SLIDE PRODUCTION HANDBOOK is a problem solver created to help you catch up with the state-of-the-art and to leap ahead of new developments. Oxberry draws on techniques from the photo and graphic fields of knowledge and brings them together in ways that are meaningful and practical for the multi-image producer.

The book starts with the basic how-to's and takes you through the nuances and intricacies of some of the screen's most exciting slides.

Beginners bursting with creative ideas will find ways to implement their visualizations onto film; graphic artists will be introduced to the mechanics of slide photography and pros will find information on techniques that have been eluding them.

Basic Photography

The HANDBOOK brings you basic photographic information not contained in the usual photography books. Here you'll find the facts and techniques as they apply specifically to the slide discipline.

film emulsions required for copy-stand reproduction.
lighting problems peculiar to slide work, such as polarization and backlighting.
filtration details for working with additive and subtractive coloration.
filters and lens attachments.
chart and graph production.
and that ever perplexing problem of transparency duplication.

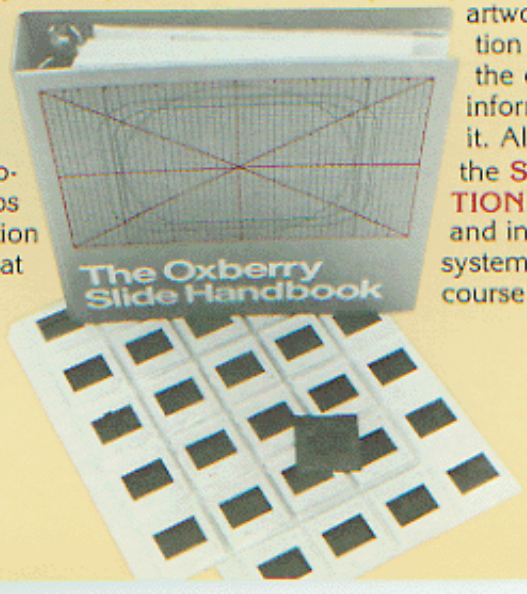
Animation Effects

Animation excites, motivates and explains. It's taking over the static screen, bringing vitality to the slide image. The illusion of life can be created with single slides or more traditionally through fast dissolving projectors' alternating images.

OXBERRY'S SLIDE HANDBOOK explains how these techniques are efficiently translated into multi-image animation.

Artwork Preparation

In the section on artwork preparation, only Oxberry completes the package with a complete artwork specification system and the essential intial information on using it. All explained in the SLIDE PRODUCTION HANDBOOK and included with the system purchase...of course!



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