BME's

INSIDE: EXCLUSIVE NAB ROUNDTABLES WITH LEADING ENGINEERS
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Television Engineering

AN ACT III PUBLICATION $3.00 JUNE 1990

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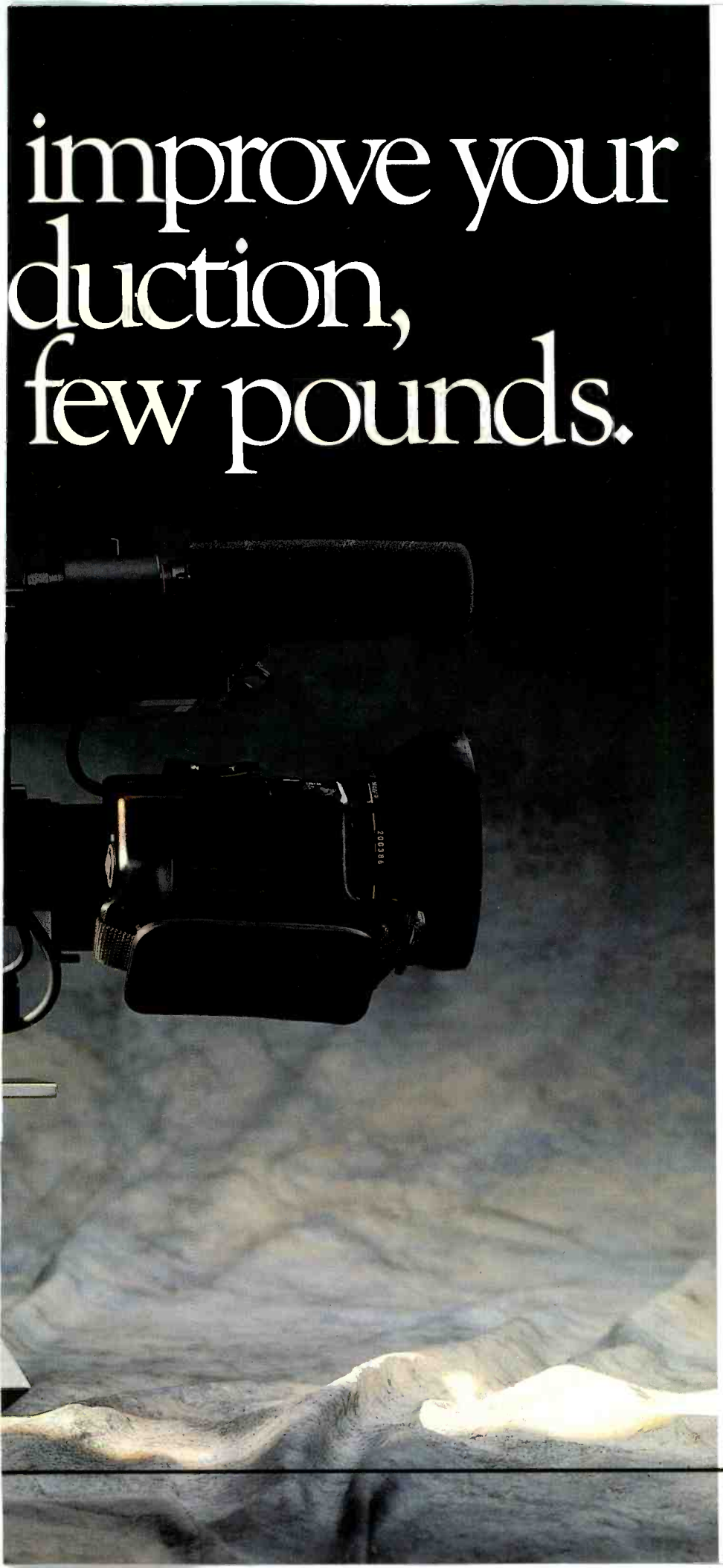

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Model 4071
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Model 4073
Line+Gradient Condenser Microphone

The Model AT4071 is just 15½" long, while the AT4073 is a mere 9". Yet, both 40-Series shotguns perform far "longer" than their actual size. Because inside these two new Audio-Technica studio condenser microphones is a revolutionary approach to shotgun design.

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This shorter length for a given acceptance angle has practical benefits in the studio and the field. It's easier to avoid shadows and to stay well out of the frame. Cancellation from the back is also impressive, making exact mike placement less critical. And the very light weight (far less than the others) will be appreciated by every user. As a bonus, the nested internal construction makes the 40-Series shotguns unusually resistant to accidental damage.

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Listen carefully to the 40-Series sound. The transformerless output insures fast, distortion-free response to transients. You'll hear crisp, natural dynamics over an extended frequency range, even under high SPL conditions. Output of 40-Series models is extremely high, for a very favorable signal-to-noise ratio. A built-in high-pass filter is included, of course.

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Finally, both can be powered from any 12-48V phantom power supply. They come complete with foam windscreen, stand clamp, and case. Yet, with all their advances and performance superiorities, the new A-T 40-Series microphones are priced competitively with the best known shotguns.

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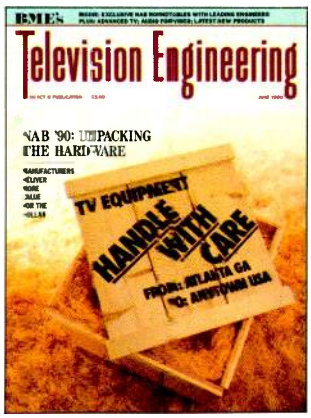

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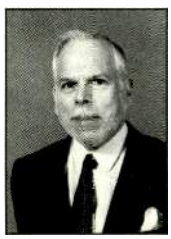
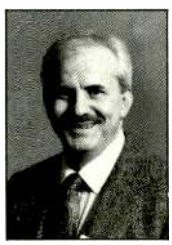
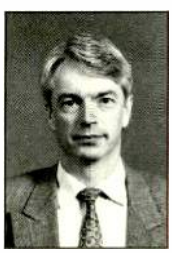
BME's
Television Engineering
JUNE 1990 VOL. 26, NO. 6

Features






40 *Some of this year's 19 NAB Roundtable participants.*

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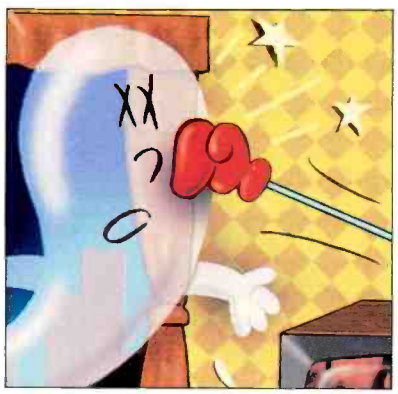
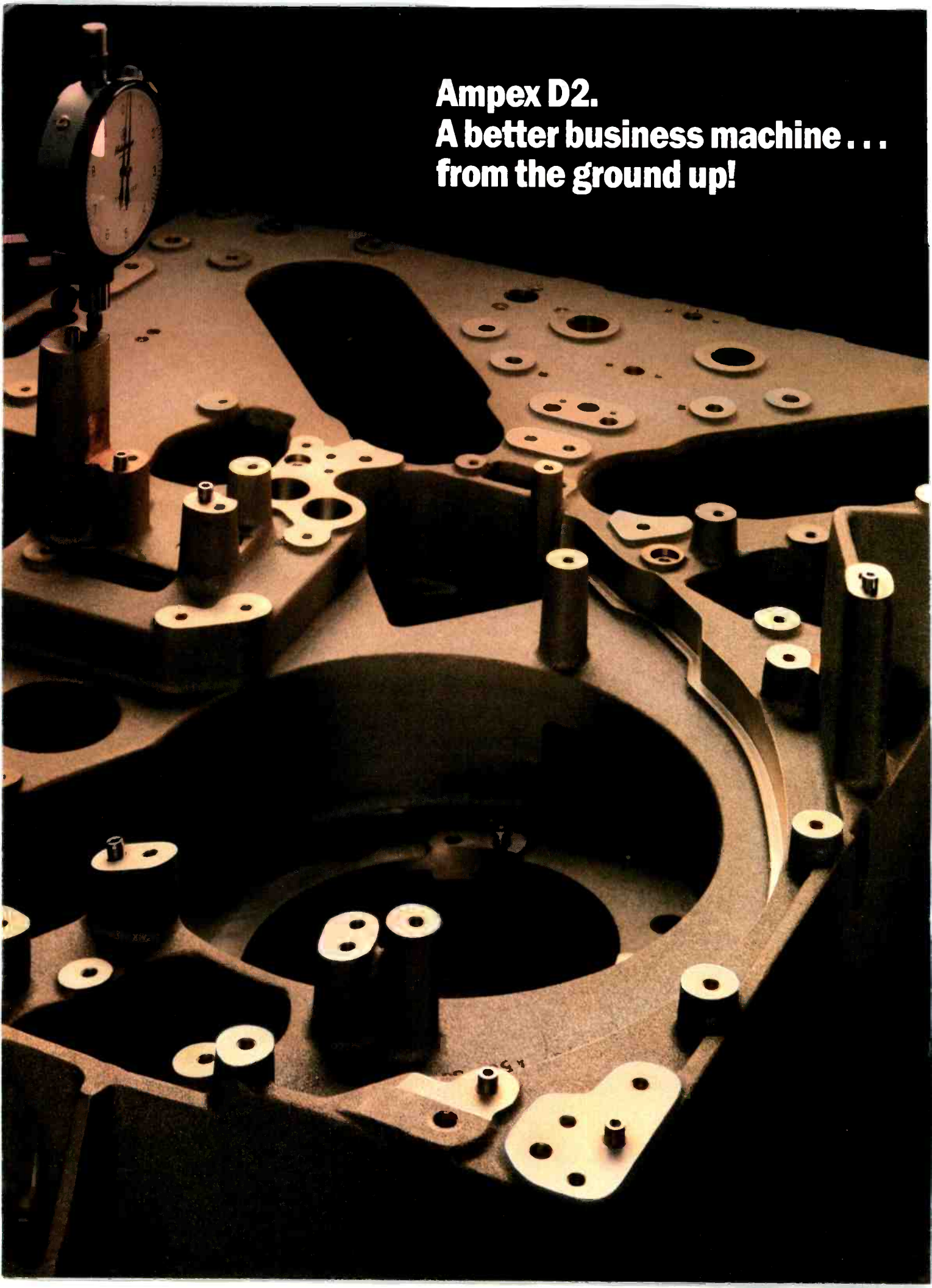
ABP CVBPA BME's Television Engineering (ISSN 0005-3201) is published monthly by ACT III Publishing. BME's Television Engineering is circulated without charge to those responsible for television station and teleproduction facility operations and engineering, and to those responsible for specifying and authorizing the purchase of equipment used in television facilities in the U.S. and Canada. These facilities include VHF and UHF TV broadcast stations, cable TV systems, TV networks, corporate TV operations, audio and video recording studios, teleproduction and postproduction houses, consultants, etc. Subscription prices are $36 one year, $50 two years. Overseas: $50 one year, $75 two years. Air mail rates on request. Copyright 1990 by ACT III Publishing, New York City. Second class postage paid New York, NY, and additional mailing offices.

POSTMASTER: send address changes to BME's Television Engineering, P.O. Box 6056, Duluth, MN 55806.

Columns & Departments



15 *Phantom of the airwaves gets busted at NAB in Atlanta.*


Ampex D2.
A better business machine . . .
from the ground up!

Yes, it's true that our new VPR-200 and VPR-250 D2 video recorders are designed and built specifically for broadcast operations. It's also true that they offer the broadcaster superior signal quality. But a much more important consideration is that these machines make *business sense*. Here's how.

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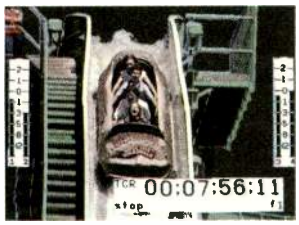

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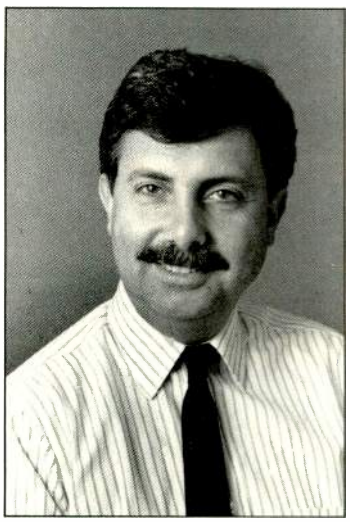
VIEWPOINT

Let's evaluate NAB's new products and technology through the eyes of users who must justify their purchases.



Is there any way to summarize the NAB? This year's show in Atlanta attracted 50,000 convention-goers and 800 exhibitors. As always, it featured hundreds of speeches and panels, and served as the site of thousands of power meals and meetings. So vast is NAB that it will always resist attempts to encapsulate it neatly.

For the TV engineering community, NAB's technology exhibits and product introductions are by far the most significant event of the year. Yet few engineers get a chance to view more than the narrow range of products for which they're shopping. They have little time to wander the floor and witness the technical trends sweeping their industry and impacting their profession.

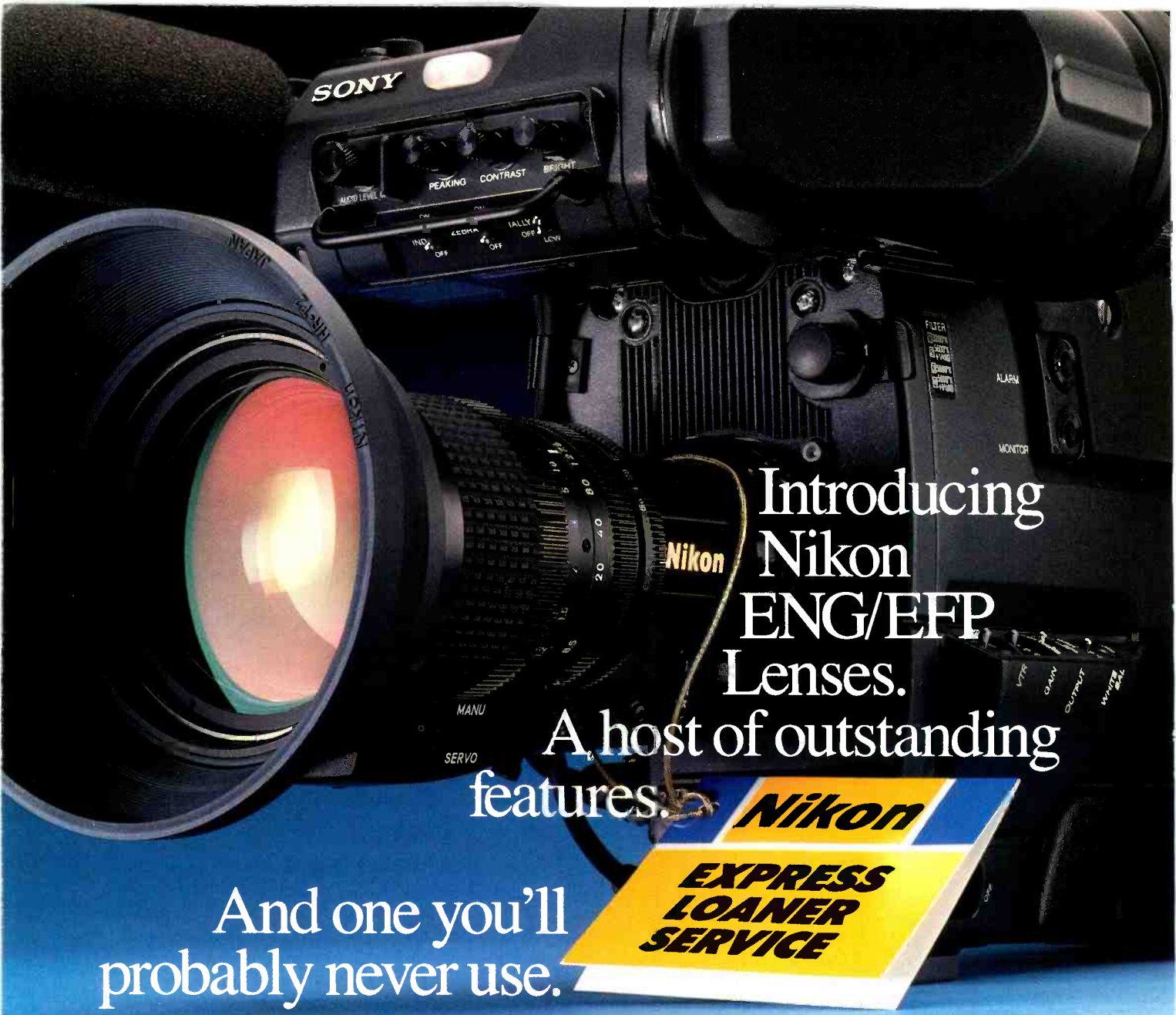
Here at *BME's Television Engineering*, we feel one of our primary responsibilities is to deliver to our readers those parts of NAB they missed; to present not only a global overview of the show, but also to delve into the details. We also feel that the best way to assess NAB's technology exhibits is through the eyes of the engineers who use the equipment, and who, if they want it, must persuade their bosses to purchase it.

That's why, for the past several years, this magazine has conducted roundtables during the NAB convention. These gatherings bring together top station and facility engineers who speak their minds on what they've seen on the floor and discuss the technology in the context of its costs and its applications.

We conducted five such roundtables in Atlanta, focusing on the broad themes of acquisition and recording, automation, post-production, audio for video, and transmission. Each was painstakingly recorded, transcribed and distilled into a feature article in this issue. My sincere thanks to the many roundtable participants who gave up precious show-attendance time in order to share their perspectives, and to panel moderators Eva J. Blinder and Bob Paulson.

We believe these roundtables have again achieved their goal, which is to present an objective view of the NAB's new products and technologies. And we hope they will serve our readers well by making some sense out of a show that has become too multifaceted for any individual to comprehend in the few days available. ■

Peter Caranicas
Editor in Chief



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UPDATE

Cycle Sat Parent Winnebago Releases CEO Conner....
Who Ya Gonna Call?: BTA Ghost Canceler ....
Broadcast News Facility To Be Built in Moscow ....
New Interactive TV System Is Test-Marketed ....
Chyron Launches Computer-based Products

Losses Trigger Ouster of Winnebago CEO

Richard D. Conner, president and CEO of Winnebago Industries, Inc., has been terminated after only four months on the job. John K. Hanson, Winnebago's major stockholder and board chairman for 100 percent subsidiary Cycle Sat, Inc., will handle the president/CEO reins until a replacement is named.

As parent of Iowa-based communications operator Cycle Sat, Winnebago sustained a $10 million loss in the six months ending February 24, according to the *Wall Street Journal*, which reported a drop of 32 percent in the company's earnings compared to the previous year. Prior to becoming Winnebago's CEO and president, Conner headed the Cycle Sat operation.

Cycle Sat, Inc. has operated as a subsidiary of Winnebago since 1986, two years after its founding. The company provides satellite transmission services to advertising agencies, delivering their commercials to "affiliate" stations and eliminating the need for dubbing and shipping tapes. To overcome resistance in the broadcast community, the company is reportedly providing Ku-band dishes to stations in return for their support.

Sheila Davis, public relations manager for Winnebago, would not say how much of the $10 million loss was attributed to Cycle Sat, but told *Television Engineering* that the company's "original projections were too optimistic, [and that] Cycle Sat was still an infant, growing, but not as yet providing anything to the bottom line."

According to Davis, changes at the top of Winnebago would have "no effect on Cycle Sat or its operations." Davis also pointed out that Cycle Sat was "now showing advances in the marketplace." Cycle Sat says that as of December 1989, satellite delivery of commercials had not yet reached 15 percent of market potential.

It should be noted that Winnebago has a history of rapid-fire management changes, reflecting the roller-coaster fortunes of its basic motor-home business.

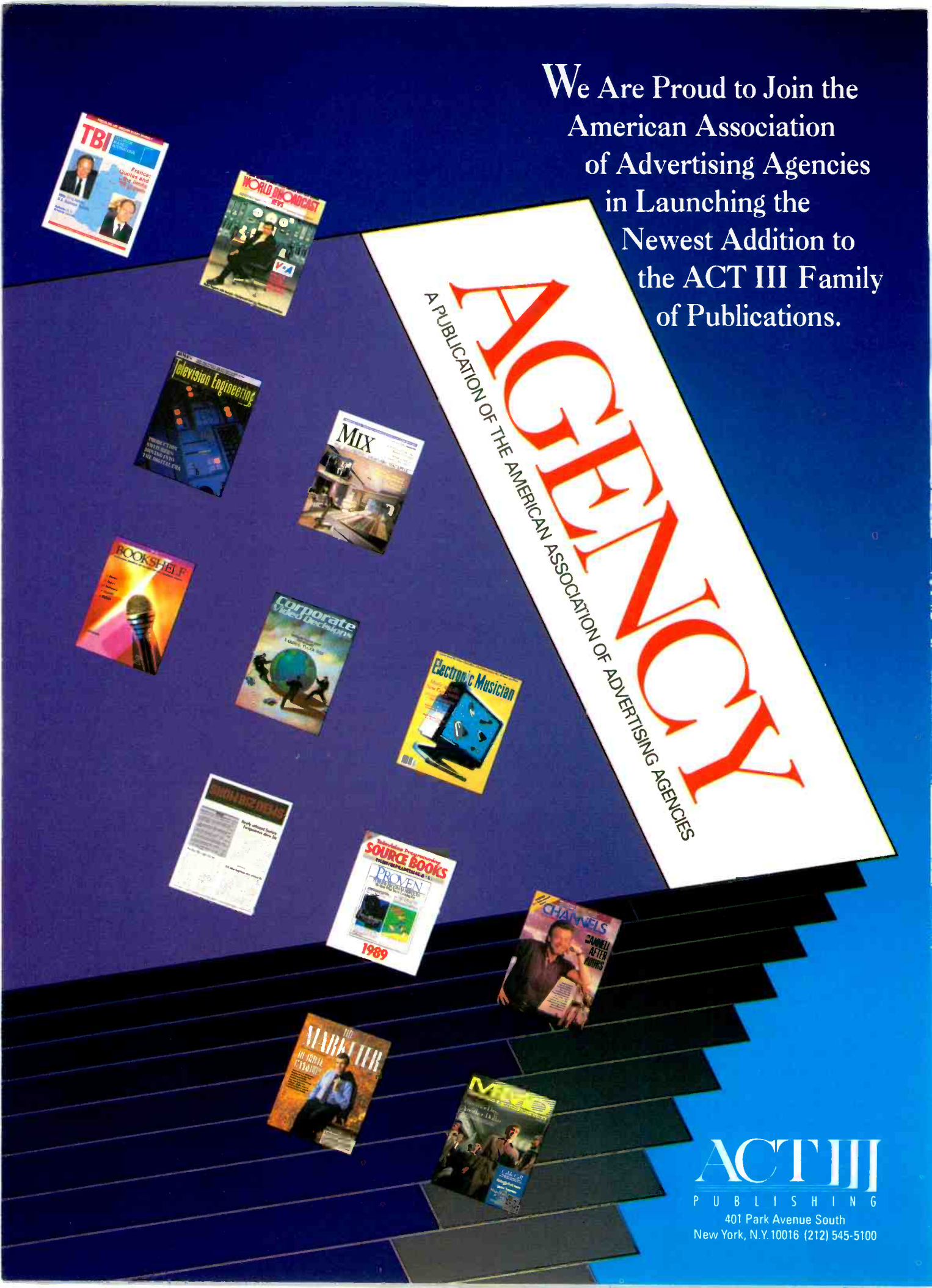
—*William A. Owens*

Ghostbuster!

The NAB called on a ghostbuster for its recent convention in Atlanta, GA: Broadcast Technology Association of Japan's (BTA) NTSC ghost-canceling system. Demonstrated at NAB '90, the BTA system promises to eliminate "ghosting"—a phenomenon of reflected signals that creates double-images on TV sets.

BTA's system, standard-

TOM CUSHWA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UPDATE

zed in Japan in October 989 and currently in use ıt nearly 200 Japanese sta- ions, transmits a special Ghost-Canceling Reference GCR) signal that can can- el ghosts without the use f cable. A ghost-canceling eceiver uses the signal to onfigure an appropriate lter for removal of the nulti-path ghost image.

At the Atlanta demon- tration, six area stations hat had cancelers installed y the NAB transmitted ignals to the convention. GCR signals were trans- aitted by the stations from 'ektronix 1910 Opt. 01)igital Generators/Insert- rs.) Test equipment howed what the GCR sig- ıal looked like before and ıfter impairments.

The demonstration also eatured equipment that rtificially induced ghosts n local signals to show the ffectiveness of the ghost ancelers under controlled onditions. Research mate- ial, compiled by the Carl . Jones Corporation, is urrently being analyzed y the NAB's Science and Technology Department.

"We feel ghosting is one f the most prominent im- airments of terrestrial roadcasting," explains ynn Claudy, staff engi- ıeer at NAB, who feels the BTA system will "bring bout technical perfor- nance parity between roadcast performance and able. [Even] cable sys- ems—with design errors uch as impedance mis- natches or corrosion of con- ıecting components—can ıave ghosting. Many peo- ple who can't receive cable, or don't want to, can use this to improve their pic- ture."

Claudy adds that the NAB is enthusiastic about the BTA system and says that the association is "in favor of exhaustively evaluating it."

Yet some feel the system has far to go before the average viewer uses it to supplant cable. "To be accepted by the consumer, I think it has to cost a lot less [than the $700 asking price], particularly in markets with over 50 percent cable penetration," notes John Dolive, director of broadcast operations at CBS affiliate WAGA-TV, one of the six Atlanta test stations. "I mean, would you spend $700 extra?" Dolive acknowledges that the canceler killed the ghosts, but adds: "It looked to me like it added some video noise to the picture."

According to Claudy, however, "video noise is not a characteristic of the ghost-canceling system. It can be a characteristic of digitizing the video. [How the station achieves] digital filtering could increase the noise." As for cost, Claudy admits that $700 is expensive (although he jokes that it is equivalent to two years of cable payments), but predicts that it will be coming down within two to three years when the Japanese introduce a TV-integrated ghost-canceling system. "When you do that, you'll get cost economies that will bring the added cost to only about $80."

Station overhead can also be minimal. According to Claudy, fabricating and inserting the ghost-canceling signal into the vertical interval system is not cost-

Company News

Pierre Angenieux, pioneer developer of camera lenses, won a 1989 Oscar for his numerous lifetime achievements, while the company he founded, **Angenieux Corp.**, continues to announce groundbreaking technical advances. Angenieux, now retired at 82, received the Gordon E. Sawyer scientific award from the Academy of Motion Picture Arts and Sciences. Angenieux Corp. recently unveiled HDTV lenses, extreme wide-angle lenses for CCD studio cameras, and a microprocessor-controlled zoom lens. The zoom will be used by ABC in their field mobile units . . . **Keystone Communications**, the product of last year's merger between Wold Communications and Bonneville Satellite Communications, has opened a new facility in the heart of Hollywood while expanding its facilities in Washington, DC . . . . **Mark IV Audio**, Buchanan, MI, has acquired a majority interest in **Dynacord GmbH** of West Germany . . . . In case you missed this news at NAB: **Grunder & Associates** no longer distributes for **CEL** . . . . **Weather Network**, Chico, CA, will stick to meteorology, scuttling their brief foray into the TV equipment market . . . . Philadelphia-based **Videosmith** recently completed seven personnel training tapes for Performance Edge, Chatham, NJ, and post-production work for Pharma Com International of Toronto; meanwhile, Videosmith's rental department now stocks five Sony BVP-70 CCD cameras and a Sony BVW-300 one-piece camcorder . . . . The syndicated TV show "Missing/Reward" used the **Savannah College of Art and Design** Videoworks team for an April segment . . . . Public relations firm **The Benjamin Group** will represent all TV equipment products in the U.S. for **Ampex** . . . . Despite an apparent shrinkage in the microwave radio industry, **Microwave Radio**, Lowell, MA, doubled its U.S. field sales organization, adding four regional manager positions . . . . **Cacioppo Production Design**, New York City, produced the opening title sequence for the series "Portrait of the World," which debuted in March on TBS SuperStation. ■

Pierre Angenieux, the famous lens inventor, has added an Oscar to his many awards.

UPDATE

People on the Move

Clio Award-winning editor **Bob Fahringer** has joined the production staff at **Henninger Video** . . . . **Dave Castellini** is the new president at **Channelmatic**, the 16-year-old TV automation firm in Alpine, CA; **Bill Killion**, owner and former president, will now serve as chairman. Channelmatic also has a new southeastern regional sales manager: **K.J. (Rick) DuRapau** . . . . The new chief engineer for **WCMH-TV**, Columbus, OH, is **J. Lawrence Pozzi** . . . .

Bill Killion (right) congratulates Dave Castellini as his successor as Channelmatic president.

Hughes Television Network recently promoted several people at its New York headquarters, including **John J. Rourke** to director of communication services and **Nancy Salas** to manager of telecommunications facilities . . . . **VSC Post**, New York, will now rely on **Susan Radice** to manage graphics production. . . . **Peter Ronick** took on **Broadway Video Graphics'** new position of executive producer . . . . **Burt Young** is the new Midwest regional sales manager for **BTS**, and **Greg Pine** is the product marketing manager for the BTS line of portable and studio cameras . . . . **Dynair** has added **Don Reynolds** as its product manager and promoted **Robert Jacobs** to marketing & sales VP . . . . **Gene Tollini** now directs U.S. sales for **Paltex International** . . . . **Barco** has appointed **Philip Lachapelle** as its U.S. western regional sales manager . . . . **Sheldon Pines** is the new marketing & sales VP at **Lyon Lamb Video Animation Systems** of Burbank, CA . . . . **Modern Teleproduction Services**, New York City, has named **George Lefteris** as senior account executive for special projects and **Michael Pelech** as account exec for studio sales . . . . **Gordon Tubbs** is now regional sales manager for **Canon USA's** Broadcast Equipment Division . . . . National sales manager for **Alpha Audio**, Richmond, VA, is **Richard Foate** . . . . **Alamar Electronics**, Campbell, CA, has called on **Donald J. Power** for general manager and **Frank Kovary** for sales manager. ■

ly. "If you have the right equipment, it can be modified," says the engineer. "And if you have to buy a new sync generator, it costs $2,000 to $5,000."

Whether stations and viewers will take up the interest is an open question. Although Bell Labs has drawn up plans for a similar ghost-canceler, it has as yet no funding to turn it into a reality. Nonetheless Claudy is optimistic: "HDTV aside, this is the technological development that holds the most potential for viewers. Elimination of ghosts would be a very major contribution to improving the broadcast situation."

—Tom Soter

Soviet-U.S. Joint Venture

Videofilm, a Soviet TV production organization, will join hands with Video Services Corp. (VSC) and subsidiary A.F. Associates (AFA), Northvale, NJ, to develop an international broadcast facility outside Moscow. This logistic aid to *glasnost*—funded entirely by private capital—is slated for full readiness by mid-1992. Announced at NAB, the joint-venture agreement was signed by Oleg V. Uralov, Deputy Chairman of the State Committee of the USSR for Cinematography and Director General of Videofilm, and Louis Siracusano, Chairman and CEO of VSC. Details of the agreement evolved out of meetings between Richard Lunniss, AFA's VP for sales, marketing and product divisions, and Videofilm officials.

AFA will draw on its experience as the largest builder of broadcast facilities in the U.S. to serve as technical consultant, and to design and build the broadcast systems.

A comprehensive facility would be a boon to reporters and newscasters in Moscow, where editing facilities are currently very limited and where equipment is not leased locally. Invitations are going out to broadcasters from eastern and western nations, who are being asked to specify individual requirements. Discussions are already progressing with the news departments of the three American networks and with CNN.

The International Consolidated Trading Company, Los Angeles, CA, is formulating the overall plan for the facility. ■

ACTV Domestic's Interactive TV—A Matter of Choice

Ten years ago, Warner Cable tested its Qube interactive television system in Columbus, OH, Pittsburgh PA and Dallas, TX. Now ACTV Domestic Corp., New York City, is testing a

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Down To

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ENG/EFP

STUDIO

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STUDIO

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ENG/EFP

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Panasonic has the editing system configuration you need. From sophisticated programmable 128 event A/B roll systems with time base correction to highly accurate insert and assembly systems. It's everything you need to turn ordinary footage into extraordinary productions.

In addition, Panasonic speaks the industry's language for inter-format editing with RS-422 VCR control interface components. And video signal transcoders that allow you to integrate virtually any video signal with the Panasonic Video Production System.

Whether your editing operation requires single format or inter-format editing, Panasonic delivers the high performance and signal integrity you demand for final playback.

ideo Production A System.

you need for demanding broadcast and post-production applications. Like a luminance bandwidth of 4.5MHz, a K factor of 2% and a signal-to-noise ratio in excess of 50dB. To produce images that equal one inch VTRs with signal integrity that exceeds five generations of recording.

The integration of SVHS and MII video production components adds a new dimension to video system specialization. Because you can select the Panasonic components you need for the highest degree of performance and flexibility for specific system applications. And for highly efficient playback operation, there's Panasonic's line of professional VHS recorders and players.

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EDITING

PLAYBACK

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EDITING

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Panasonic

Simulated monitor pictures

BRM 590

PLAYBACK

new interactive system called ACTV (not to be confused with the ACTV acronym, which stands for Advanced-Compatible Television, used by RCA/Sarnoff for its EDTV system) in Springfield, MA.

According to an ACTV spokesperson, the system differs from Qube in that ACTV is one-way while Qube was two-way. Qube, says the spokesperson, had viewers sending information back to the sending station, which then polled the info. Viewers could also choose movies to watch, as with today's pay-per-view.

With ACTV technology, four signals are sent out at once and viewers choose among the signals by pressing buttons on a remote-control unit. What this translates into is choices in program content for programs created for the system, and choices in coverage for sports events.

For example, in a children's show, a character would ask the child to press one button for 'boy' or another for 'girl.' If the child pressed the 'boy' button, the character might say, "Hello, little boy," and continue accordingly with the program on the 'boy' signal.

In sports coverage, viewers might choose what event they want to see in an Olympics, or choose camera angles for a sports contest. Coverage or camera angles available would, of course, depend on the network programming. In the case of camera angles, viewers would see four windows (each with one camera angle) on screen, and could pick the largest window by pressing its button.

Reception may be possible through an existing cable converter, or perhaps a separate box, says the ACTV spokesperson, who claims that ACTV has put together about 1,000 hours of programming over the past several years.

The ACTV test in Springfield, MA involved 300 homes, each of which received 100 hours/week of ACTV programming for four weeks this spring. Continental Cablevision, the fourth largest cable operator in the U.S. with 2.5 million subscribers, provided facilities and subscribers. At the time of publication, the tests were still going on, but the ACTV spokesperson said they were successful so far. The firm of Malarky Taylor is researching the audience reaction.

Market-readiness for interactive TV has yet to be demonstrated. But Michael Freeman, ACTV chairman and inventor of the technology, is, naturally, optimistic. "Years from now, people are going to look back and wonder how they were ever satisfied with ordinary TV," claims Freeman, who adds, "If the subscriber reaction to ACTV in Springfield is as positive as we expect, we'll expand the market for it as quickly as we can." ■

New Technology Means More Bang for the Buck at Chyron

April's NAB Convention brought two new Chyron Group products to the attention of the television community. Each product is designed to take advantage of advances in computer-based video processing technology.

According to Isaac Hersly, president, Chyron Group, the Infinit! is "designed to replace the industry standard Chyron IV, providing fast-access, multi-channel capability for broadcast and production facilities." Configured with an internal still store, the Infinit! is well-suited for news and sports productions, which require intensive use of graphics.

Also making its debut at the show was a new computer-based editor, the Omni from Chyron subsidary CMX, designed to directly interface with the many devices found in an edit suite. Plans are to provide the Omni with the ability to "call up" menus from other devices, for integrated single-keyboard operation. ■

More People on the Move

Jim Friesen is now editing at **Skaggs Telecommunications Services**, Salt Lake City, UT .... **Joe P. Wellman** is the new marketing manager for **Microtime**..... **Eric (Ric) Sherman** has joined **Videotape Distributors**, Northvale, NJ, as manager of national sales and marketing .... **CableLabs**, the research and development consortium of cable TV operators, has named **Larry N. Lehman** of Cencom Cable Associates as chairman for the New Business Subcommittee of the Technical Advisory Committee .... **Summit Broadcasting**, Atlanta, GA, has appointed **Dean Smith** corporate director of national sales and **Dianna Obermeyer** corporate director of retail development .... **Chris Smith**, formerly with Microtime and RCA, is now president of **Essex Marketing Services**, Simsbury, CT .... **David G. Meyer** is the new audio sales manager for the **Peirce-Phelps** Audio/Video Systems Division; **Henry Grove III** of Peirce-Phelps has been elected to the Executive Committee of the **International Teleconferencing Association**. ■

Jim Friesen, Skaggs editor.

FCC Decisions Will Not Crimp ACTV, Says NBC

By Eva J. Blinder

In March, widely publicized statements by Federal Communications Commission Chairman Al Sikes were interpreted by many in the press as casting a pall over enhanced-definition television, or EDTV. In essence, Sikes stated that the FCC would table any decision on EDTV until the commission had settled on a system for HDTV—a choice that won't be made until 1993, assuming the testing process continues as scheduled. Coupled with the FCC's apparent decision to go with a simulcast HDTV system, this would seem to leave proposals such as the NBC/Sarnoff Advanced Compatible Television (ACTV) out in the cold.

NBC and its partners in the Advanced Television Research Consortium (ATRC) aren't willing to concede the game so quickly, however. According to top network executives, ACTV is still in the running as a potential companion to a full-fledged HDTV simulcast system. At the 1990 NAB convention, the ATRC set up a functioning "Studio of Tomorrow" at the Atlanta Inforum HDTV exhibit to make its point.

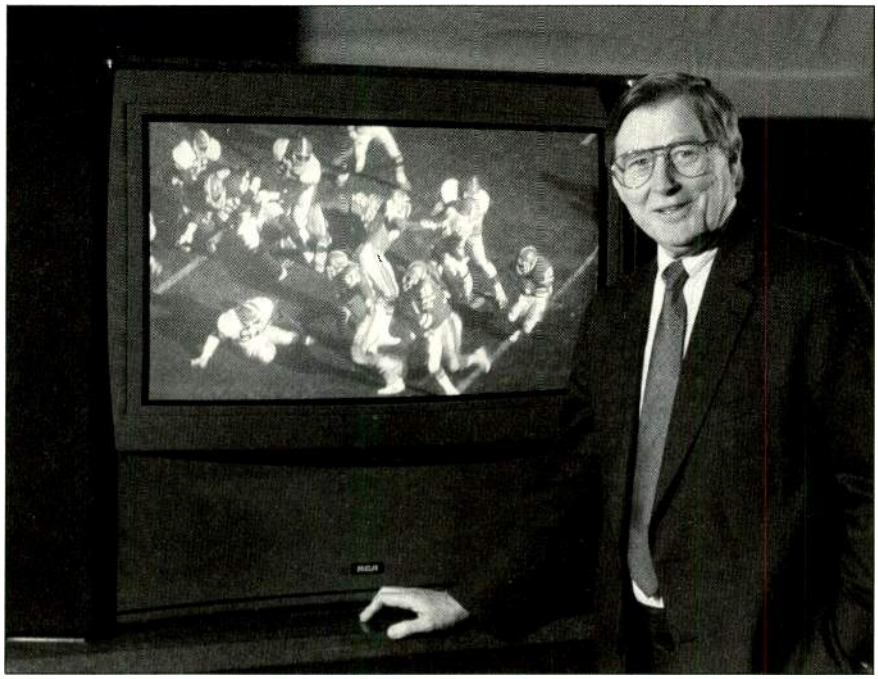
The "Studio of Tomorrow" demonstrated the widescreen (16:9), 525-scan-line production system that is the studio companion to broadcast ACTV. At the show, NBC released the results of a study indicating that conversion costs to ACTV could be as low as $250,000 for a local station that chose to simply pass network-originated ACTV, without doing its own production.

According to NBC, the capability to begin local widescreen production would set stations back an additional quarter-million dollars, and full conversion to widescreen production and ACTV transmission would cost about $1 million. S. Merrill Weiss, managing director for advanced television systems, NBC Operations and Technical Services, noted that these figures reflect the cost of upgrading equipment in current use. The higher costs that have been quoted in other publications are for complete equipment replacement, he stated. The figures are in stark contrast to the estimated $30 to $40 million cost of upgrading a television station to full HDTV operation.

According to Weiss, the FCC's decision to hold off on approving an EDTV system is far from a deathknell for ACTV. "We think that EDTV is something that the Commission will want to consider, and that ACTV has a very good chance of being the EDTV system that is chosen," Weiss told *Television Engineering*. "Choosing to separate EDTV and HDTV can be a good thing."

Jack S. Fuhrer, director of Sarnoff's Television Research Laboratory, echoes Weiss's sentiments: "We think that Chairman Sikes actually did us a service by clarifying that there is a

NBC's Studio of Tomorrow is designed for production of widescreen EDTV programs.



D. Joseph Donahue, Thomson Sr. VP, shows off his company's prototype 34-inch monitor.

distinction between EDTV and HDTV, and we think he set the right criteria for choosing a system: customer acceptance, cost-effectiveness and appropriate technology. These are what we've been assuming were the correct criteria to judge EDTV and HDTV. Our expectation is that in 1993, EDTV and HDTV will both be chosen. The good news is that prior to this statement, EDTV and HDTV had been commingled as if they were competing with each other, and that's really not appropriate."

NBC has conducted a number of transmission tests of ACTV over various transmission media, and the system is expected to meet its testing deadline at the Advanced Television Test Center. While the network has not announced a specific timetable for ACTV program broadcasts (an understandable position, given the FCC approval needed for such a step), the network stands strongly by its belief that a gradual approach is best for the industry.

According to Weiss, adoption of an EDTV system would get widescreen receivers more quickly into viewers' homes, creating a ready-made audience for true HDTV when it comes on the air. Without such an audience, the economic incentive for stations and networks to make the costly switch to HDTV would be greatly reduced. (At the ATRC exhibit at the Inforum, Thomson demonstrated a prototype 34-inch ACTV receiver that a spokesman says could sell for less than $1,000.)

Pointing out that a simulcast HDTV system would require a separate transmitter, Weiss asked, "Why would you even incur the power bill if there's nobody out there with receivers that can receive [the transmission]? If you start with EDTV, you can afford to do it when there's a very small population of receivers because implementation will be very quick. You can start serving that population, and that population will start building. An EDTV system can be the catalyst for HDTV."

On the simulcast front, Philips Laboratories, which recently joined NBC, the David Sarnoff Research Center and Thomson Consumer Electronics in the Advanced Television Research Consortium (ATRC), is moving ahead on development of a simulcast HDTV system. Mikhail Tsinberg, research department head for advanced television systems at Philips Labs, says the R&D operation expects to have its simulcast system ready for testing in 1991. Philips Labs originally announced its intention to develop a simulcast system last fall.

Sarnoff Research Center will participate in the simulcast development effort as an equal partner, according to Fuhrer. "Sarnoff and Briarcliff [Briarcliff Manor, NY, the home of Philips Labs] have both had efforts going for several years in simulcast research," Fuhrer says. "The task now is for the Sarnoff effort and the Briarcliff effort to be combined and a new, or possibly not new, system to be proposed." He adds that it is "premature" to assume that the publicly discussed Philips system will be identical to the final ATRC proposal.

Tsinberg says the Philips system differs in baseband compression technology and RF packaging from the well-known Zenith Spectrum Compatible Television proposal.

According to Tsinberg, the RF packaging of the Philips system differs from that chosen by Zenith in two basic ways it treats the high-energy parts of the signal: placement and encoding technique. The Philips proposal encodes this information into a frequency location that is attenuated by the Nyquist filters built into NTSC receivers, Tsinberg says. By contrast, the Zenith system puts the high-energy parts of the signal into the vertical blanking signal, already used for closed captioning and other features. This issue strikes at the heart of simulcast system development, since simulcast systems are predicated on the ability to use the taboo channels, currently unusable because of interference problems. The other basic difference between Philips and Zenith, says Tsinberg, is that Zenith uses digital encoding techniques, while Philips uses analog. ■

Audio and Video Post: One Place for Both?

By Dan Daley

Will the practice of using separate post-production facilities for audio and video fade away as new technologies, particularly digital, continue to shape the audio-for-video industry?

"I would have to say that half the audio work that I used to have to send out-of-house to do, I now do in-house," says Alan Miller, VP of post-production at Rebo Studio, a well-known video post house in Manhattan. That statement could shiver the spines of owners of smaller audio and audio-for-video facilities, already being squeezed by the burgeoning personal studio and project studio industries.

Miller attributes his new-found audio capabilities to digital technology, which could become the Grand Unification Theory behind an ultimate linkage between audio and video. "There's been a quantum leap in audio-for-video quality directly traceable to digital and Beta with FM audio tracks," he says. A recent Rebo project for RCA/BMG Records' presentation at the last NARM convention included mini versions of music videos. "We were extremely conscious of keeping the audio quality as high as possible since this was a show for the record industry," Miller says.

Rebo took full advantage of its new digital equipment. Beta SP with FM audio tracks recorded the non-music-video parts of the presentation, and these segments were edited directly to D-2. All of the audio tracks for the mini vids were taken from CD or DAT, and the mix stayed digital until it was played back on a pair of one-inch machines and Dolby SR.

"A year ago, I would have gone out-of-house to do that kind of a mix," Miller admits. "Digital media like D-2, combined with things like the ESAM audio mixer control protocol, can give the video post house an incredible amount of capability in the audio department."

With eight-track-audio HDTV looming on the horizon—in an industrial role if not a broadcast one—Miller predicts a growing trend of audio work staying in video post-production houses.

Miller is also using the Avid/1 Media Composer at Rebo for posting audio to video. The system is only two-track at present, but Miller anticipates a multi-track version soon for the disc-based system whose seven 600-MB hard drives can provide up to four hours of digital audio at a 44.1 MHz sampling rate. "Even off-line, you can build an on-line edit track that you can take and transfer to D-2, and you've got a finished audio aspect to a production," Miller says.

A current project, "American Patchwork" for PBS, shows off the digital audio possibilities that D-2 gives a video post house. American musicologist Alan Lomax has spent several years recording native American music onto a variety of formats. The quality of these recordings can sometimes be rather questionable, according to Miller, but the contents are irreplaceable. "It's recorded on a polyglot of audio media formats," says Miller, "but we're doing the entire show mixed in D-2. By staying in a digital medium, we don't experience any additional signal degradation."

All this has Miller thinking about further upgrading his audio equipment, adding, for example, a new extended-input audio console. Upgrading up to a point: "We're a video facility," he states. "I don't want to pretend we're an audio facility. There's a limit to how far I want to go.

"But there are a lot of [audio] jobs that a video facility can do now that you would have had to go out-of-house

Rebo's Alan Miller works with the Avid/1 Media Controller.

for before," he adds. "With the upgrade to SP and D-1 and D-2, and a few other items like better mixing consoles, better EQ and library music on CDs, it's suddenly easier to do a lot more audio than it used to be. That's the trend I've seen in the past year, and I can only see it getting more prevalent."

A bit further up on the same side of town, Power Station co-owner Tony Bongiovi has been presiding over the shakedown cruises of that landmark audio facility's video suite, Studio D, which opened in April. Studio D has projection, HDTV and D-2 capabilities, but no video editors.

While Bongiovi acknowledges a trend of upscale audio houses improving their video as high-end video houses enhance their audio abilities, he sees a solid demarcation between audio and video facilities. "What Power Station does best is sound," he says. "We have 10 years of experience on SSL consoles, and we're constantly experimenting with new sound technologies." A video facility, even with digital audio, going too far into the audio domain, he says, "is like me opening up a sound stage. Others have years of experience ahead of me, and I wouldn't be able to compete."

Bongiovi says that Power Station opened Studio D because he believes that that's where the business of music is going. "Take a look at MTV these days," he points out. "With HDTV and stereo television, people will be demanding even higher-quality audio for video, and that's what made us do it. No matter how much video facilities do [in audio] or how many CDs they buy, they still need places like us."

"Half the audio work I used to have to send out, I now do in-house." —Alan Miller, Rebo Studio

". . . in a sense, it was inevitable that there would be a convergence on a basic interfacing level."—Dick Maitland, Videomix

At Videomix, an audio-for-video post-production facility in New York, co-owner Dick Maitland looks at the larger emerging picture and remarks, "What you're seeing here is a masking effect. Most high-grade audio houses are importing high-quality video in order to dub off and layback effects. Audio houses have transcended into the video domain in terms of certain types of technologies like time code, and video houses have been forced to improve audio. In the process, they have found it's a good thing to be able to have some minimal sweetening capabilities and CDs. So in a sense, it was inevitable that there would be a convergence on a basic interfacing level."

Both Maitland and Rebo's Miller agree that this convergence will probably impact negatively on the lower end of the industry, squeezing smaller audio studios as basic sweetening and even some voice-over work remain with the video post facility. "There are still people who are more comfortable having their audio work done in an audio facility," says Miller. "But on the other hand, there are people who like to have everything done in one place if it can be."

Maitland concurs: "Small voice-over studios; eight-track audio studios; will get hurt because a lot of basic audio stuff can be handled by a video house. Low-end video operators, as few as there are, will also get squeezed. And even some big video houses might lose a few dubs to the better audio rooms. However, keep in mind that sophisticated audio will still need to be done in an audio environment."

There is an aspect here of the-rich-get-richer, the-poor-get-poorer; the better-equipped a video facility is in audio—and vice versa—the better their chances of surviving the shakeout. But before anyone gets comfortable with that notion, remember that change has become a way of life in this industry. Eventually, the whole idea of separate facilities for audio and video may be extinct. "In less than 10 years, I don't think you'll recognize this place," says Miller of Rebo. "I think editing rooms as we know them will become dinosaurs. Everything will be done through the computer, audio as well as video, like the Avid model on a grand scale."

"No matter how much video facilities do [in audio] or how many CDs they buy, they still need places like us." —Power Station co-owner Tony Bongiovi

"It's like a form of technological arbitrage," Maitland says. "Everything coalesces to a certain level. The guys not on top of the technology wind up being squeezed out, and I think that's a loss because it'll end up squeezing out some talent, too. All the equipment will end up being run by technoids.

"But in the end, I think that producers and clients won't ultimately sacrifice talent for more computers. The human factor in all this, I think, will keep pace." ■

Dan Daley is a New York City-based freelance writer specializing in audio technology.

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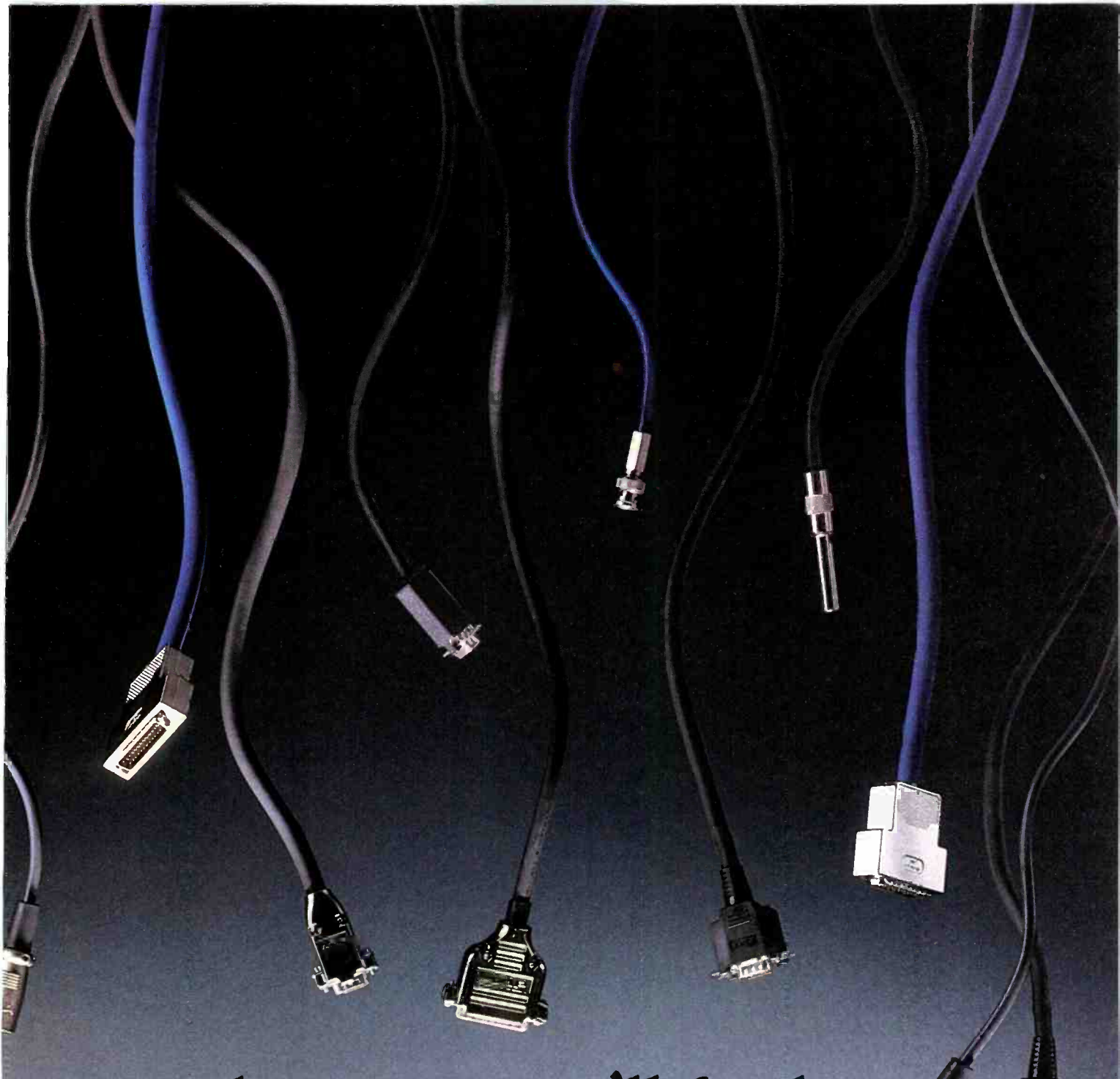

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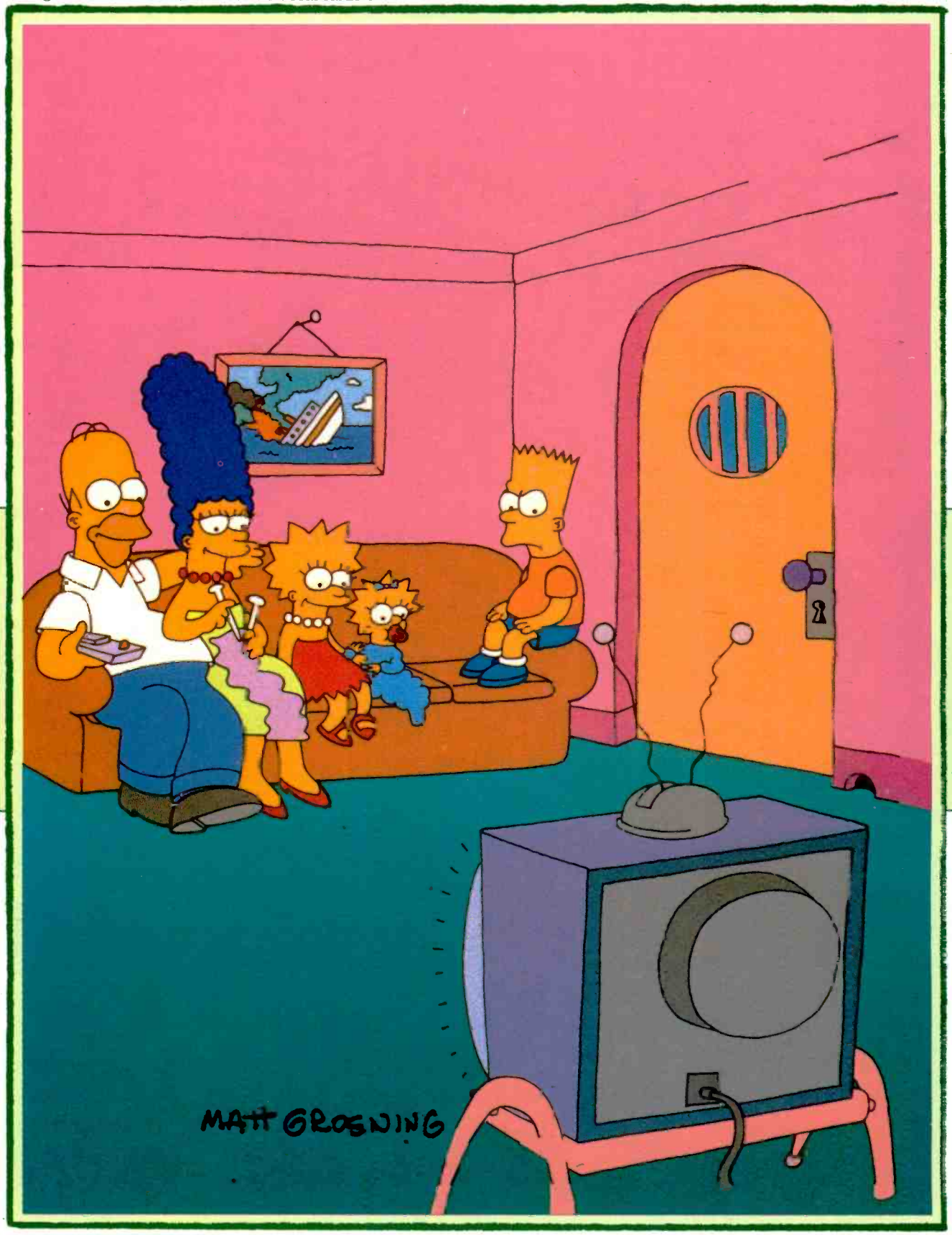


Homer Simpson loves watching TV. While his viewing habits are determined by the content of a show, not the technology used to make it, his favorite program is now likely shot using chips instead of tubes, and may soon be recorded on D-2 instead of one-inch.

NAB '90: CHANGING WITH THE TIMES

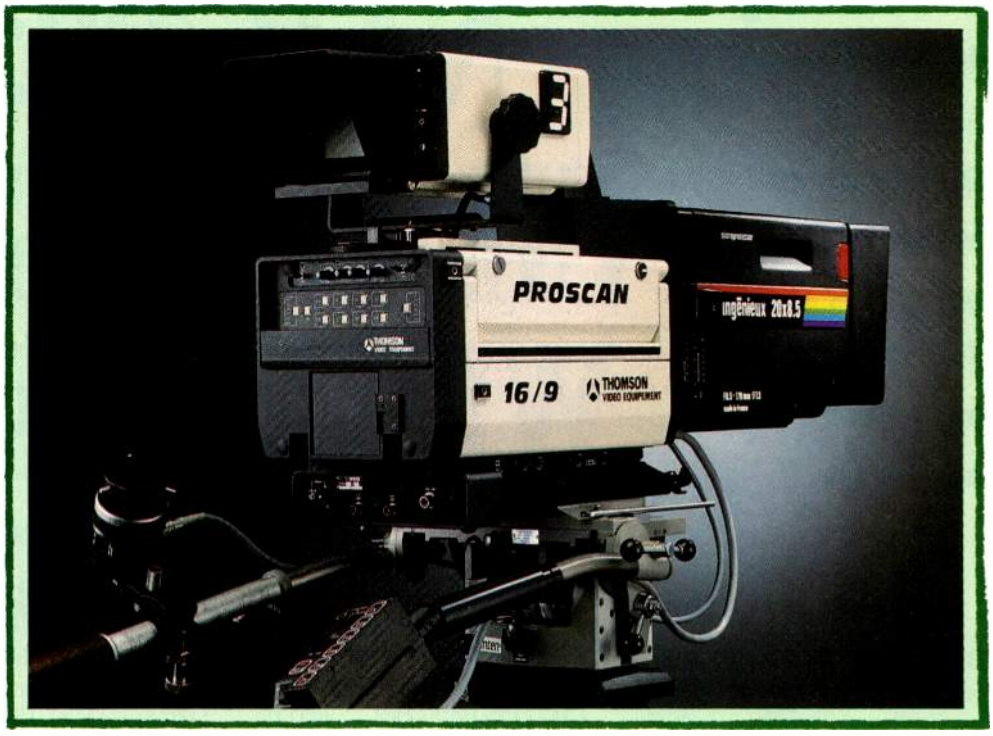
BY WILLIAM A. OWENS

Impressive new technology was on display at NAB. The question is, how can engineers best apply it in today's economic environment? And what effect does it really have on the average viewer at home?

When the National Association of Broadcasters convention opened in Atlanta in early April, a thick fog hung over the city. For some, this was a reminder that in this last decade of the 20th century, the business of broadcasting is a troubled one, hounded by aggressive cable competition, a less-than-robust national economy, and the financial manipulations of those more interested in junk bonds or asset stripping than—as the Communications Act says—in "serving the public interest, convenience and necessity."

Enter Homer Simpson. If life is a stage drama, then Homer Simpson—of Fox TV's animated "The Simpsons" series—is Everyman, standing in for all of us. For Homer and his family, life's greatest pleasure is watching televi-

Television Engineering's NAB Roundtables



Left: Thomson Proscan 16 x 9/ 4 x 3 switchable-format camera. Below: Panasonic digital studio camera.

sion. He knows nothing about D-1 or D-2, tubes or chips. He watches television on a low-tech, Never-Twice-the-Same-Color receiver. The technology is of no importance. His viewing is determined by the content of a show, not what cameras were used, or what tape machines were used.

The 1990 NAB will be remembered more for its attitude than for its content. And perhaps for the beginning of a shift from "pie in the sky" engineering towards a more realistic approach to the technical needs of today's broadcasters. Within today's economic environment, engineers face difficult choices, choices that are determined more by the availability of funds than by pure engineering. And at this year's NAB, it was clear that more and more manufacturers are understanding the new economics, and are responding with cost-effective equipment lines to meet the market demand for efficient products.

Discussions among the participants at *Television Engineering*'s NAB roundtables—which constitute the five articles following this one—brought into clear focus the difference between television's "haves" and "have-nots." In the discussion on station automation, one chief engineer was asked how his station would handle a crash of its half-million-dollar library system. His answer: The air operators would just fire up the other system. His station, in a major market, able to own two half-million-dollar systems, is one of the "have" stations.

Few stations can afford to buy a half-million-dollar anything, let alone a second one as a spare. And the have-nots are not confined to small markets. Many major-market stations have fallen upon hard times financially. Yet they need to maintain a clean on-air presentation to hold their position in the marketplace. These have-not stations are the ones that can benefit most from the new technology, yet high-ticket equipment is out of the question for them.

Thus, two distinctly different markets are emerging. The haves can buy what they want, and are clearly intent on pushing technology to the limit. The have-nots must make their limited dollars work harder to stay abreast of their competitors and keep their overhead low.

It's in this have-not market that truly creative solutions are found, in systems and technology that only a few years ago would not have been considered broadcast-quality by many. This is the real story of the 1990 NAB Convention.

STATION ECONOMICS 101

The economic structure of a TV station is easy to understand. In the beginning, there's a large cash investment for construction or acquisition. This can be equity or debt; either way, it entails an ongoing payback obligation.

Additional areas of expense include programming and sales. The cost of programming requires payment in some form. If programming is through a network or through barter syndication, payment is in commercial time given to the program supplier. This represents revenue lost to the station, although some network compensation may be provided. Syndicated programming is also purchased for cash, and for many stations, this represents their highest single expense line.

Because advertisers pay

for the number of eyeballs watching, station promotion is considered a sales expense. If the public didn't know what's on the air, there would be no audience. In addition to the acquisition of viewers, other sales expenses include the costs of the sales department, including commissions as well.

These costs are relatively inflexible. Debt-service cost is determined by interest rates and the availability of funding. Programming costs are based on the marketplace. The same is true of promotion and sales costs.

The only area where a station can exercise significant control over costs is within day-to-day operations. The creation of a news department, for example, can have a major impact on station costs and potential profits. To set up such an operation, does the station buy Betacams, S-VHS camcorders or 8 mm? Does it hire licensed engineers to operate cameras, or use interns? Does it invest in robotic camera systems? Does the potential increase in profit justify the cost?

Since it is in the operations and engineering area that a station can apply the most financial control, it follows that this is where station managers look for improved productivity and cost reductions. And this is where the manufacturers have been most responsive.

ON-AIR AUTOMATION: Productivity Equals Profits

Manufacturers exhibiting at this year's NAB clearly understood the need for cost-efficient, streamlined station operations. Computer-controlled systems were shown for a wide variety of applications, each designed to lower operational costs by reducing manpower requirements.

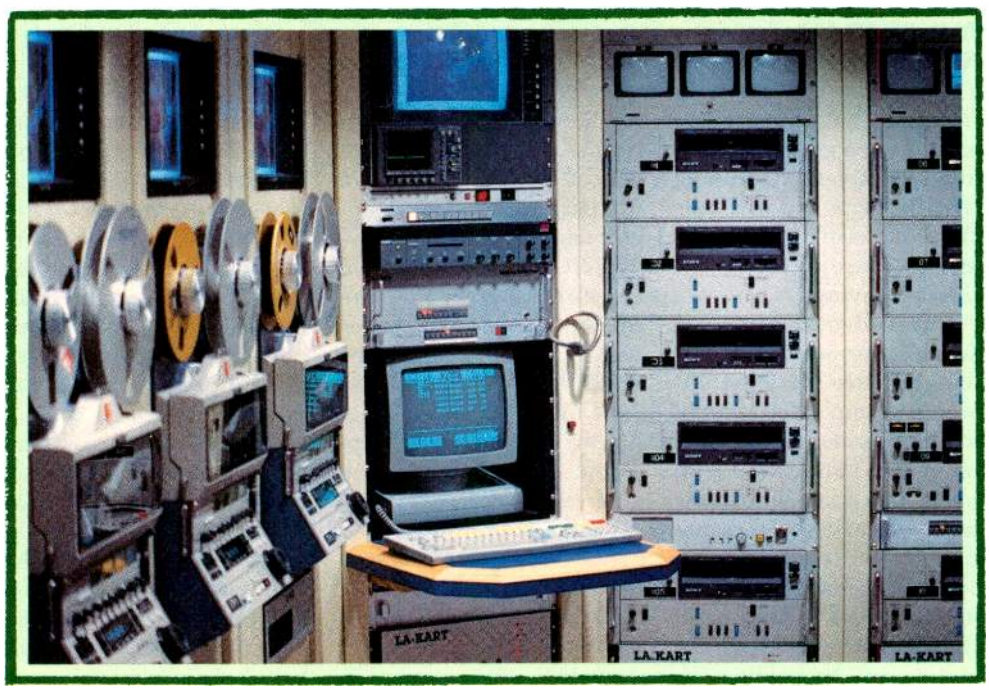
Large-scale station automation products were shown by several companies, including the Alamar MC-2055, Ampex ACR-225, Channelmatic AD-CART, Odetics TCS-2000D, LaKart ALS, Panasonic M.A.R.C. II and Sony DVC-1000. Many large-market stations with high-cost labor contracts expressed firm interest in the various library systems, with an eye towards cost savings through reductions in manpower.

While many of the library systems sport large price tags, some of the manufacturers have designed products for stations with fewer resources. Alamar, Channelmatic and LaKart have long offered low-cost automation and spot-insertion systems, with various tape format options, including S-VHS. At NAB, Odetics introduced a spot sequencer, Panasonic a prototype spot reel compiler, and Sony a small-capacity LMS. JVC announced a prototype S-VHS-format automated cart player. From discussions with manufacturers at the show, it was clear that they consider have-not stations a strong area for future growth.

Some companies have taken a different approach. Master control switchers from BTS, the Grass Valley Group and Utah Scientific are available with add-on automation packages, while Alamar, the Basys Group (through its Connolly Systems), Image Video, LaKart and Matco provide add-on systems that will integrate with many vendors' MC switchers. This approach can be used by stations to implement automated operations without the expense of converting to extensive library systems.

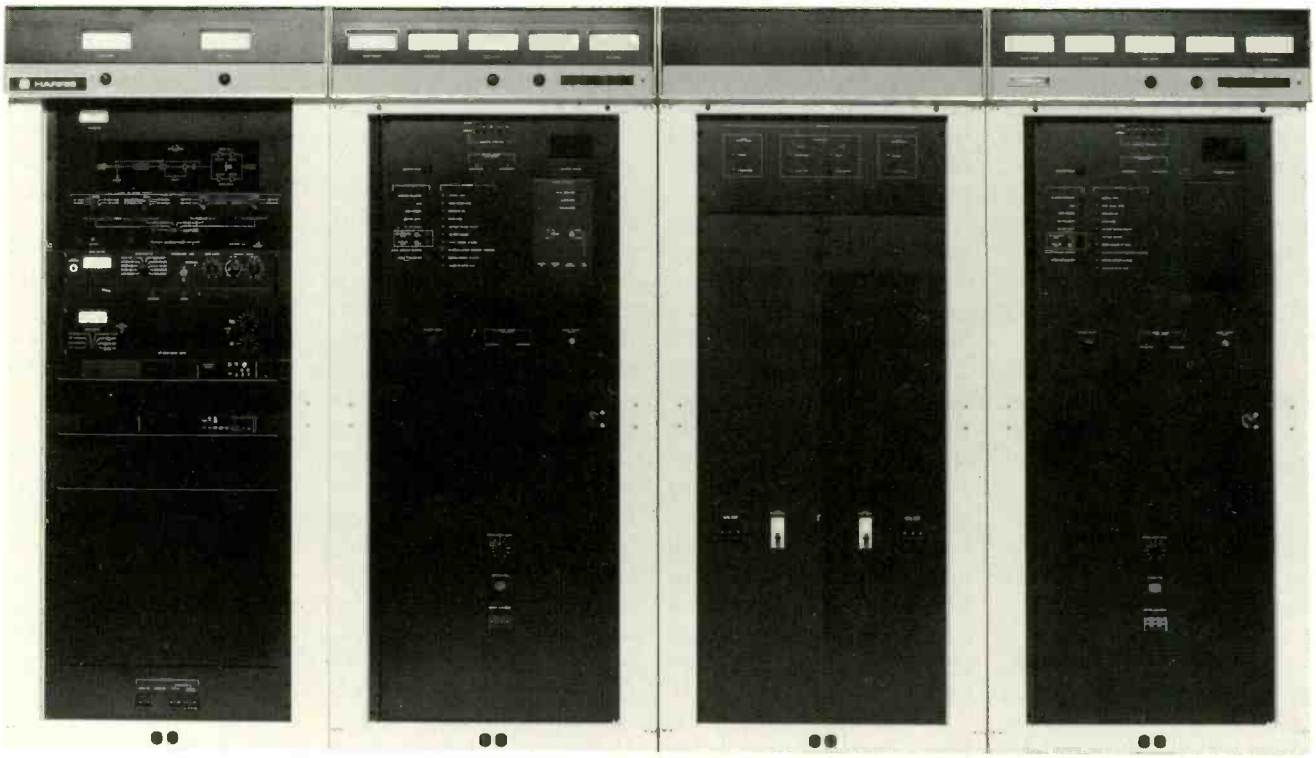
With the many on-air automation systems available, and the wide range of prices, prospective customers are likely to find exactly what they need at a price within their budget. For both the have and have-not stations, on-air automation represents the opportunity to cut manpower or to reassign existing manpower to other operations.

But there's another benefit to on-air automation: the elimination of errors that previously resulted in the need for commercial make-goods. The lower the goof rate, the fewer avails that need to be reserved for make-goods. With fewer on-air goofs, and a lessened need for make-goods, time previously held for make-goods may now be sold. These additional spot sales impact on the bottom line.



LaKart Corporation's multiple-format automation system for full station automation.

INTRODUCTION



New-generation Harris UHF transmitter features power-efficient MSDC klystrons.

For the have stations it could be extra profit. For the have-not stations, it could mean the difference between red and black ink. And the Simpsons can't tell the difference.

TAPE FORMATS: Half-Inches, Big Dollars

The various "D's" are making news, but broadcasters are taking a good hard look at alternatives, and finding that they can live with less than state-of-the-art images because of the potential cost savings.

Raw videotape (or cassettes) represents a major expenditure for most TV stations, but particularly for independents. Stations must dub syndicated film packages onto whatever tape format their automation system requires, or record programs off satellite for future use. In the case of the film package, where the station will be holding the tape for several runs, the investment in tape can be quite expensive.

Based on tape prices in the New York City area during mid-April, the cost of tape to hold a library of 500 movies, each 90 minutes long, would be approximately $81,000 for D-2 tape. For BetaSP tape, the cost would be approximately $28,000, a savings of over 65 percent. The cost of S-VHS tape would be approximately $4,500, a savings of over 94 percent from the cost of D-2. For the smaller stations, the lower cost of small-format tape can have a significant impact on the bottom line. Again, our average Simpson family can't spot the difference.

STUDIO AUTOMATION: Here Come the Robots

News production is perhaps the most labor- and hardware-intensive operation that a television station can attempt. And potentially the most profitable. A highly rated newscast can drive access and prime-time ratings, as well as provide premium-priced local avails. But here too, a low-cost, efficient operation is a must.

Computerization—with wire copy capture, news databases, and production management systems—has streamlined the news-gathering process. Newsroom computer systems provide the capability for scheduling crews and equipment, and for interfacing with studio production gear. They are available from a variety of vendors, using both custom and off-the-shelf hardware, at a wide price range.

It is in the studio that the major effect of newsroom computerization can be found. Camera robotics have been around for several years, from simple pan-and-tilt control, up to full x-y-z axis ped systems. A.F. Associates, TSM and Vinten showed full-scale systems at this year's NAB, and Basys displayed a robot camera system tied to its newsroom computer.

One route to future cost savings is a system whereby camera moves and switches are triggered by cues embedded in the computer-generated newscast script. With that capability, along with character-generator and tape-player control, execution of the newscast becomes automatic, providing a cleaner presentation using a smaller staff. With this technology, even a have-not station can deliver a competitive, high-quality on-air product.

TRANSMITTERS:
The Final Link

The cost of transmission is an integral part of operating a television station. While a transmitter is a big-ticket item, the purchase of a new one can actually free up cash for a station, thanks to recent advances in transmitter technology. This will greatly impact both have and have not stations, as the industry's bean counters view the reduction of operational expenses as justification for a capital expense.

While there's considerable debate as to the method, transmitter manufacturers have clearly made the reduction of transmitter operational expenses their mission. Several have introduced new technology designed to provide more efficient, less power-hungry and less labor-intensive systems.

At the NAB, Comark was promoting its klystrode-equipped transmitters as the wave of the future. Claimed to be approximately 80 percent power-efficient, klystrode technology promises considerable reduction in power consumption. The same cost-saving mind set prevails at Harris, which is promoting its multi-staged, depressed collector klystron tubes as cost-efficient alternatives to previous UHF technology. Harris also claimed greater efficiency with its solid-state VHF transmitter line. There is no question that the other manufacturers will follow.

To put the economics in perspective, consider a five-million watt UHF station in New York City. With a power rate of 23 cents per kilowatt hour, the cost of a new, klystrode-equipped transmitter can be made back through savings in power consumption over approximately two years. Over the 15-year life of the typical transmitter, the dollars not spent on electric power can provide cash for other uses, or go directly to the bottom line.

One owner of a Harris solid-state VHF transmitter told us he anticipated a $30–40,000 savings in his yearly budget just from lower maintenance costs.

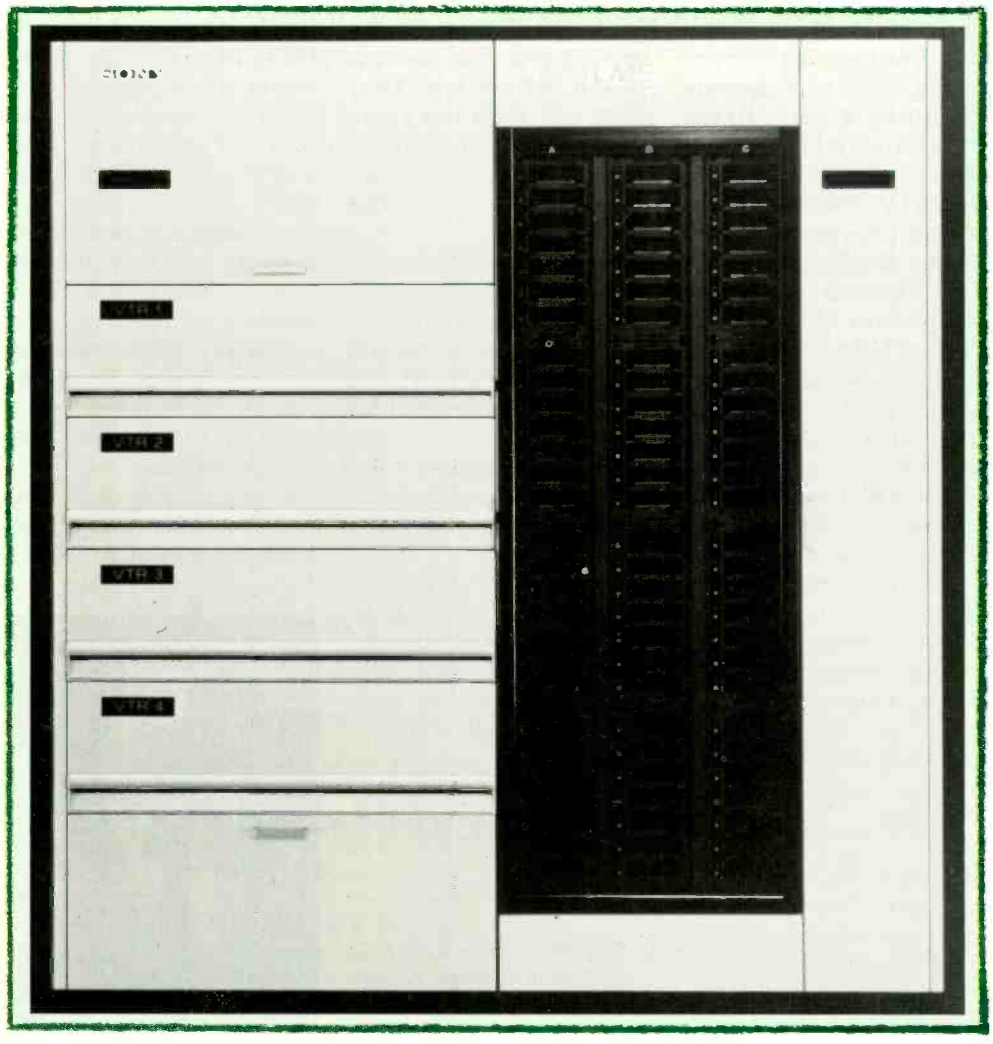
CHANGE AND CHALLENGE

On the following pages are *Television Engineering*'s NAB roundtables. These panel discussions occurred in Atlanta, in the midst of NAB, with everyone bringing to the table findings freshly gathered from the convention floor. The participants consisted mainly of TV engineers involved in the broadcast and teleproduction industries. Their opinions may differ, but from their dialogue emerges a consensus about the way technology is developing and the directions it may take in the future.

The coming year will bring both change and challenge. The change will be one of economics. How will other financial difficulties be overcome? The challenge will be to operate more efficiently than ever before.

The manufacturers—the people who make the technical marvels that help create the magic of television—have recognized the need for a new generation of tools and are responding in force. Homer Simpson and family may not see the difference now, but, as our friends in Atlanta would say, "Tomorrow is another day."

Welcome to the '90s. ■



Sony DVC-80 LMS features four D-2 digital VTRs for high-quality playback.

CHIPS, TUBES AND VIDEOTAPE: WHERE IT ALL BEGINS

The participants in *Television Engineering*'s Video Acquisition and Recording Roundtable were: Bruce Bredon, chief engineer, Mincey Productions, San Diego, CA; Ken Miller, VP of engineering, Capitol Video, Washington, DC; Karl Renwanz, director of engineering, WHDH-TV, Boston, MA; Joseph Lore, president, DeLorean Video, Atlanta, GA; Christin Hardman, independent producer and postproduction consultant based in northern California; Bill Owens, technical editor, *Television Engineering*; and Eva J. Blinder, New York City-based writer and former editor of *BME*. Miller is also a member of *Television Engineering*'s Editorial Advisory Board. Blinder moderated this roundtable.

Blinder: Do any of you have any comments on the cameras shown here at NAB—chips versus tubes, studio versus field, etc.?

Miller: I perceive the difference between studio cameras and field cameras as one of function. They start out with the same electronics. The studio cameras have large mass, the field camera is the small portable.

Owens: You still have remote truck operators putting on large studio-type cameras for use at concerts or sporting events. Why do you think they are still doing that, if there's a direct interchange between the small camera and the large camera?

Miller: I think it's one of utility. You are not going to put a 15-to-1 small lens in the top of a stadium and make the same shots that the 50-to-1 lenses are making. And you put a 50-to-1 lens on a little teeny prism assembly, and with some electronics on the back of it, suddenly you don't have the control to make your normal movements. You have to flow with the action.

Lore: I was going to say I agree with you one hundred percent; one of the factors with a studio camera is mass. And it's great if the camera can make good pictures or excellent pictures, but if the person who is operating it can't take his talent and bring it to the fullest, no matter how good you are, even with a person like me who's been doing camera for over 20 years, the shots still look like shaky-cam.

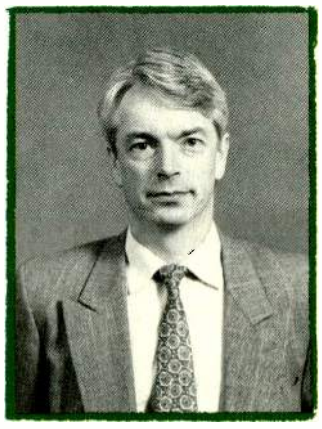
Blinder: Can I bring you back for just a minute to the CCD versus tube question? Given the advances in CCD technology now, would any of you still consider buying a tube camera or would you prefer a tube camera over a CCD camera?

Renwanz: For television broadcast, the answer is "No."

Lore: For production, I would say there would be [no comparision]. The problem in the business is always that by the time you get to the home receiver, whatever you've done, you can spend $50 million in equipment, and people at home will still turn the contrast all the way up on the color set. So in every step of the line, there's always that limiting factor, but when you take the output of the best chip camera and put it next to the best studio camera and put it up on a high-quality monitor, there is a difference. And I think this is one of the reasons why all the production studios and most of the larger network broadcast operations are still running tubes.

Bredon: Under certain conditions, you can notice some aliasing problems with the way the pixels are arranged, and also I believe the tube cameras still have a little better center resolution—zone-one resolution—than any of the chip cameras. I think 800 horizontal pixels is the maximum at this point, if I am not mistaken, and that yields what, 540 lines of resolution? Not 700 like we're seeing with tube cameras.

Miller: I come from a practical point of view. The problem right now is that most of us are dug in pretty deep with what we already have. There are people out there that have giant dollar investments in tube cameras that were state-of-the-art only two years ago, and part of the reason they are



Bill Owens, technical editor, Television Engineering, *left; Karl Renwanz, WHDH-TV, Boston, right.*

not going to change over to chips or anything else immediately is that they can't, for the practical, economic reasons.

Blinder: Last year at this same panel, when I brought up small formats like S-VHS and 8 mm, there was a deafening silence in the room.

Owens: Small-format is there now, even at the networks.

Miller: Very much so. At the Olympics four years ago, they started calling the little 8 mm cameras "throwaways" simply because they could mount them on a bobsled, and if it goes badly, other than the fact that there are humans getting hurt, it's okay as far as the camera.

Bredon: I don't think you are going to see serious acquisition done in those formats. It doesn't take much of a videophile to see a vast difference.

Hardman: I want to bring up a point. One TV station that I'm aware of uses S-VHS for news acquisition; they go over to another format when they edit.

Miller: I know of two documentaries in Washington, DC; one was shot on S-VHS, the other on Hi-8. They both passed as very watchable. Information-wise and aesthetically, I thought they were excellent.

Renwanz: It's certainly a lesser-quality choice, but if it's got the only footage of an event, there's no reason to duck it.

Owens: To the vast majority of the American public, though, that is acceptable. Look how many people go out and spend a couple of hundred bucks to have somebody shoot their wedding. For them, that's acceptable quality.

Blinder: But the people who are having their weddings videotaped are not planning on then putting it over a distribution system, such as broadcasting.

Renwanz: It's been done on "America's Funniest Home Videos," though.

Miller: I didn't want to bring that up. That's true. One of the most popular shows on TV is "Home Videos." It's scary.

Owens: So is the American public then going to accept poorer quality on the air?

Renwanz: I think they accept it by virtue of what they rent. If you look at the number of tapes that are rented in this country every day; it's staggering. And because VHS is the format of viewing choice, people have accepted some pretty lousy things.

Blinder: Any other comments on cameras?

Owens: Based on the inability of the chip cameras to hide optical problems, as we get into 16-by-9 formats, into high def, does anyone think the problems are going to multiply?

Renwanz: That's a real big problem in HD.

Bredon: Ask 35 mm film people about the lens problems.

Miller: I don't think it's going to be any worse than what the film people have fought over the years.

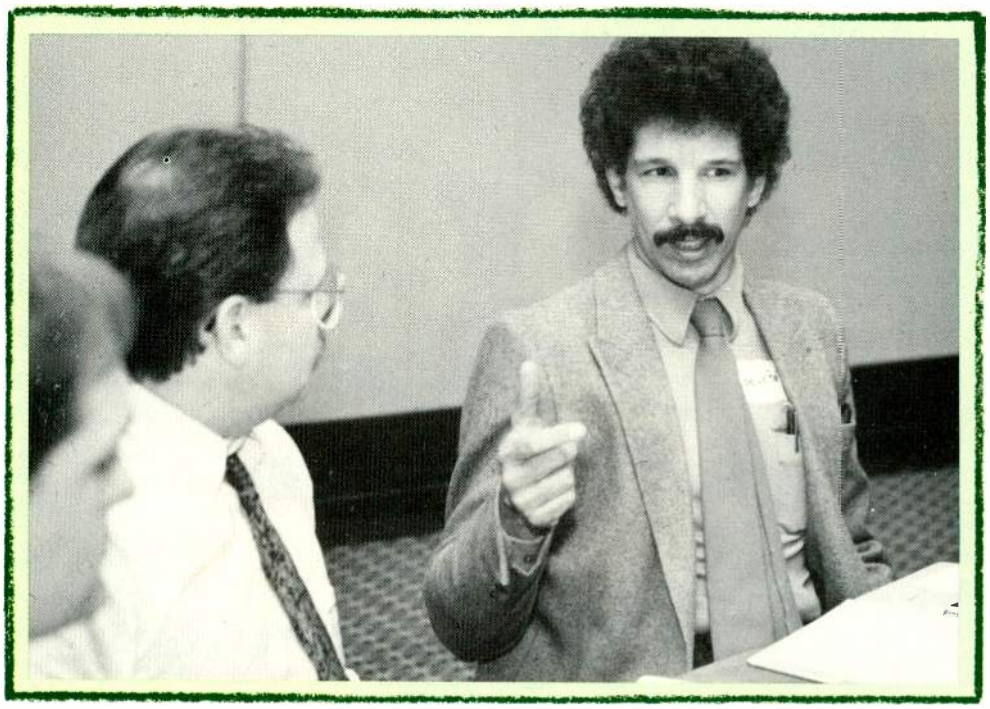
Hardman: Film people don't have the patience for going through all of that because they have been through it all a long time ago. They could say, "Why can't you solve these problems? We solved them 50 years ago."

Miller: I think that people who want to use video to do film-style capture have been shooting film-style for many years. They have done whatever it takes to replicate film format.

ROUNDTABLE PHOTOGRAPHY BY DAVID MURRAY

Ken Miller, Capitol Video, Washington, DC, left; Eva J. Blinder, former BME *editor and moderator, right.*

VIDEO ACQUISITION & RECORDING



Owens: Yet the one camera that came out specifically designed for that type of production, the EC-35, went nowhere. They didn't sell a lot of them.

Miller: I don't know why that happened. Price was very high, and it was using 35 mm prime lenses; to this day it still scares the hell out of video people that glass costs that much.

Blinder: Are any of the facilities people here contemplating any D-2 purchases? Is it attractive to you? If not, why not?

Bredon: I have a feeling that D-2 could have problems getting fully accepted. Main reason is the cost, not only of the machines, but of the tape as well.

Miller: And it took months to convince people to use Betacam SP effectively. They'd say, "Metal tape. Do you know how expensive metal tape is?"

Bredon: But if another digital format comes out that is less expensive in terms of machine and tape, I think it could hurt D-2.

Miller: If a client had a choice of spending $1,000 a day on a Betacam SP shoot, or $3,000 a day on a D-2, using the identical cameras because we're back to imaging format versus recording format, they'll more than likely with very little effort talk themselves into Betacam SP.

Blinder: Here at NAB, Panasonic is introducing a half-inch digital composite format that some are calling DX. It has been selected as the official tape format for the 1992 Olympics, which will be broadcast here by NBC. Panasonic has promised to deliver a large number of machines and camcorders to Barcelona.

Renwanz: This is reminiscent of a network that was going to shoot on half-inch [at the Olympics] in L.A. Do they read this magazine?

Miller: Other than the technological achievement and the ability to say they were the network that did this, there is not going to be any difference in the quality at all. In fact, the chroma noise off MII might even be lower than what's off a digital format because it's done in component.

Blinder: Does anybody here for your own operations have an interest in a half-inch digital format? Is it something you would look at seriously as it becomes available?

Bredon: Right now in San Diego, there's no market for digital. They don't see a large benefit in it. We do a lot of our acquisition on one-inch because it simply looks better than Betacam SP, but for our lower-budget jobs, we use Betacam SP, and people are very happy with it.

Renwanz: I think that at this stage in D-2, we're still looking at some tape issues very much like those we saw in two-inch and one-inch at their infant stages. We have interchange issues that have to be addressed between manufacturers.

Blinder: With all of the new formats at the high end, low end, middle end, has one-inch analog tape reached the end of its life cycle?

Miller: It may have reached the end of its production cycle. I think it's going to be around a long time, though.

Renwanz: I saw only one [one-inch] machine in the entire Sony booth. What does that indicate about their philosophy and about the position they're taking?

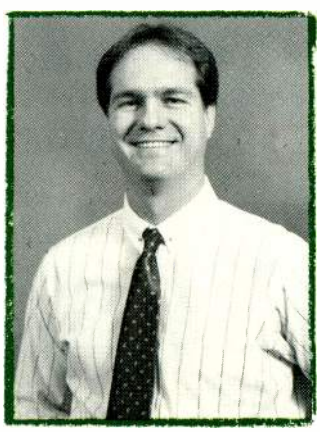
Bredon: They are strongly digital. In fact, at the SMPTE show in L.A., they had no one-inch machines whatsoever.

Renwanz: There's a lot of people with investment in one-inch, and it's not going to go away. It's a durable and forgiving format.

Bredon: And the tape cost is actually quite reasonable.

Renwanz: I'm sure it will get more reasonable.

Owens: You've still got people running two-inch,



Bruce Bredon, Mincey Productions, San Diego.

even though that format has been long gone. Are we going to see the same thing with one-inch?

Miller: A lot of people are going to keep whatever formats they have until they have no choice. I have 16 one-inch machines in-house that are busy 16 hours a day. They barely get a rest for maintenance.

Bredon: Do one-inch machines ever really die? I think you can keep them going forever.

Lore: Just to reflect on the comparison between two-inch fading out and one-inch, I think with two-inch, everyone was looking for something better because of all of the obvious problems, quad errors and banding. As soon as a format came in which eliminated that....

Bredon: And it was the only format coming in. Right now, we have a lot of people trying to get their slice of the pie, and it's a whole different ball game. I think it's going to take longer for things to take over because people don't know which way to go.

Miller: Anybody purchased a reel of two-inch tape lately? There's only one manufacturer in the country: Ampex.

Blinder: How much does it cost?

Bredon: Whatever they want to charge.

Owens: But the folks that are still running TCR-100s and ACR-25s need that tape to reload the cassettes.

Renwanz: Poor souls.

Blinder: Do most of you share my view that the move toward high definition, when it comes, may do more to ensure the future of film than of video, at least for high-end production?

Miller: Absolutely. Kodak is right on target [in saying film is] a high-definition format. They're saying film can record over 2,000 lines, although 1,700 lines is its practical limitation because you can't control exposure perfectly to always get in excess of 2,000. I personally think film transferred to high definition looks head-and-shoulders better than high-definition video.

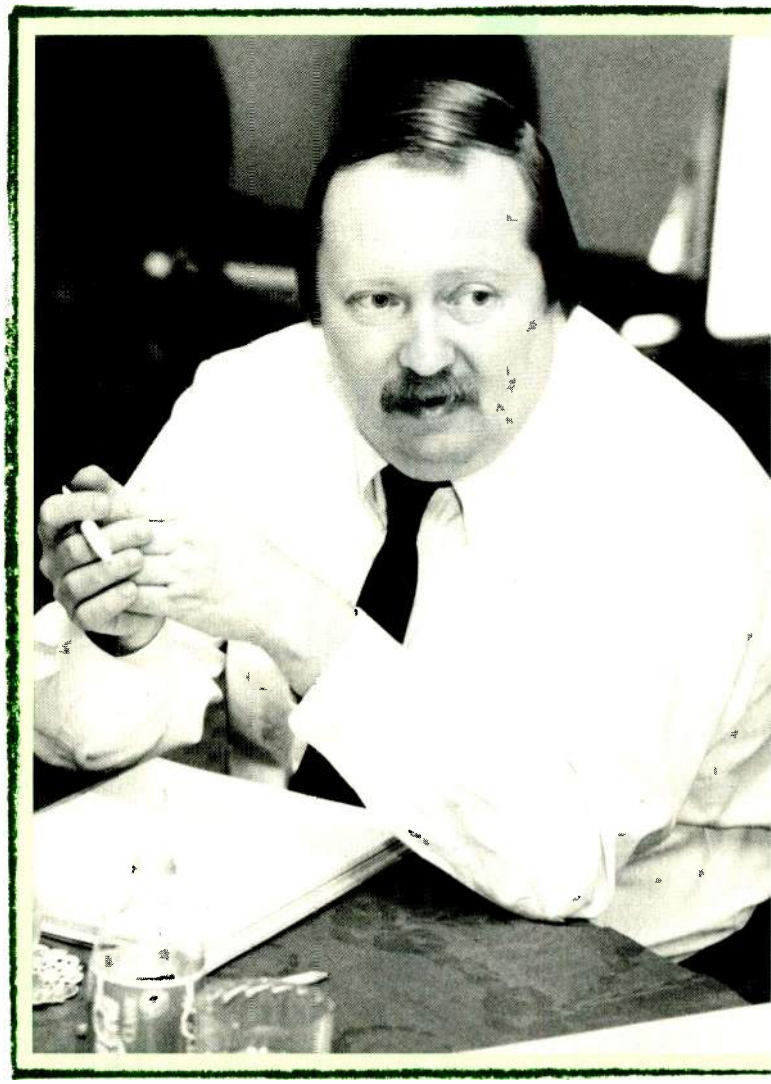
Bredon: Don't underestimate the future of solid-state imaging devices. Right now, you're seeing tube cameras in the high-def arena, and they're being pushed beyond the limits of what tubes can do. We're going to see chips developed in the next 10 to 20 years that are going to blow us away. Electronic acquisition has a number of advantages; you get to see what you've gotten immediately, and you know for sure you're getting it.

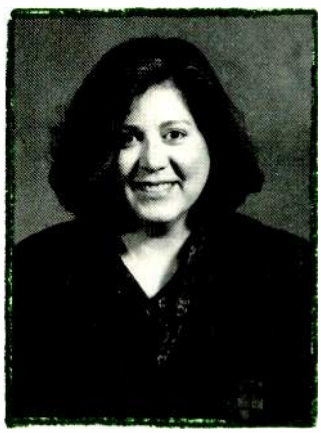
Miller: There's absolutely no reason why "Gone With the Wind" can't be available in high definition. The real stickler is how to broadcast high definition and how to afford it. But there's no reason why every film ever made can't be transferred to a high-definition format.

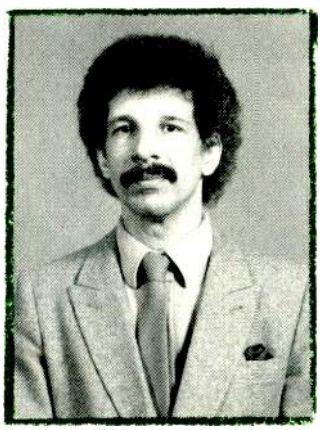
Owens: I think that's where you are going to see the push to the consumer for high def. Because the movie software will drive the sales. Just like movie software drove the sales of home video recorders years ago.

Miller: Movie software drove the change from black-and-white to color TV.

Owens: With its major movie studio, Sony has positioned itself in the perfect place, having the whole chain from software to hardware. ■







Christin Hardman, independent producer, left; Joseph Lore, Delorean Video, Atlanta, right.

AUTOMATED OPERATIONS AND ROBOTICS: ARE THE SAVINGS REAL?

Participants in *Television Engineering*'s Automation Roundtable were: Bill Napier, director of engineering, WBTV-TV, Charlotte, NC; Karl Renwanz, director of engineering, WHDH-TV, Boston, MA; Alvin Saltzman, chief engineer, WHSE-TV, Newark, NJ; Fred Steurer, VP of engineering, Pulitzer Broadcasting, St. Louis, MO; Bill Owens, technical editor, *Television Engineering*; and Eva J. Blinder, New York City-based writer and former editor of *BME*. Napier and Steurer are also members of *Television Engineering*'s Editorial Advisory Board. Blinder moderated the session.

Blinder: It looks like either the fantasy or nightmare—take your pick—of the totally automated television station is coming within reach. What are some of the pros and cons of this concept?

Napier: If a human being is involved in some intelligent capacity—something more than answering a bell when it goes off—can [a system] be called automated? If so, I would submit we've been automated. We haven't actually operated a transmitter in a number of years. The ACR-25s could be argued to be an automated system. We only switched between them and network. We are just now seeing that automation evolve into more of a synergy between the different systems to the point where they can, if you will, talk to one another.

Blinder: How well is that synergy working?

Napier: Well, each time we've bought [another device], we found that we become a little more automated. We do a little more with maybe fewer people, but not necessarily a lot fewer people. What I think of when I think of automation is saving human work, so people then can do something that's more productive. An engineer sitting there for 45 minutes typing in a log is not real productive.

Saltzman: For years, we've had automated switching where the traffic log would translate to a disk and then get loaded into your switcher, and that would actually do the rolling of the machines and all your switching events. But on the surface, you don't see the homework that has to go in. It may save you manpower while on-line, but you now actually have to true-time your programming to make sure you are timed down to the second.

Owens: You also have your pre-prep work. In one system I've worked with, we had to dub everything to that particular tape format, so we were actually doing double work. We were recording a program onto the specific format the automation system needed and then playing to air.

Saltzman: When a person has automation, there's homework that has to go into that automation that's not initially seen on the surface.

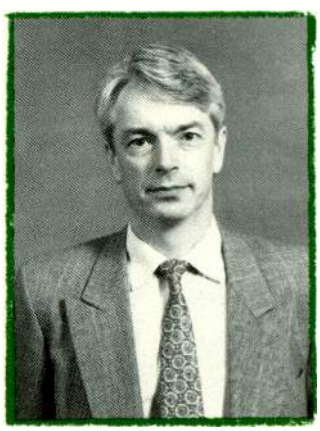
Napier: We specifically do not run multi-segment programs off our library system; not because it won't do it, but because you can't "rubber-band" the shows, as I call it. We do live news breaks, and sometimes they run on time and sometimes they are a little over or a little light. A master control operator with remote control on the one-inch machine can rubberband that show a little bit with no trouble.

Steurer: I agree with Bill and Al that the true automation system isn't here. You just have a lot of systems out there. And you almost have to separate what is automation for your particular station.

Owens: You transfer work from one area to another.

Steurer: Right. Say you're at the point where the machine has got the whole day in and it can fly on command. Well, you still have somebody pushing the button. If [the networks] say they are going to be down at 29:48, it's great. But what if their clock is skewed a little bit and ours isn't?

Saltzman: Or if it's live



Bill Napier, WBTV, Charlotte, NC, left; Karl Renwanz, WHDH-TV, Boston, right.

sports, nobody knows the time.

Steurer: Well, sports is another story; you're manning the control room. If the network sends down something on which to toggle your machine, that's fine—if it's accurate. Otherwise, you are still going to pay that person to sit there and push the button when he sees something happen. So you can buy these big automation systems, but you are still back to that position.

Napier: Push the button.

Steurer: Just like Bill is saying. Now, the next step from there is that we can get a load from traffic and we can air the thing. We can't guarantee the sponsor, unless somebody is watching it, that it is the exact commercial that aired without some method of encoding the spot. Now, I think NBC has some way; they put in field one of line 20. Well, if that's what we would choose to do, somehow the machine—the cart machine, LMS, ACR, whatever it is—when you are making the spot up, has to encode it.

Saltzman: But you still need a human being to confirm that the video was there, right?

Steurer: Well, except if you have this encoding in there.

Saltzman: Say you have a head clog and you've got part of it you're losing?

Steurer: Then you have to look at sync-lock and say there was a sync error.

Renwanz: You go D-2, and when you lose the head, it doesn't matter.

Napier: I would assume that for the foreseeable future at [broadcast] facilities, there will be one reasonably intelligent human being, at least. I know there are redundant systems, but there will probably be one person there who is minding the store.

Lore: What about National Supervisory Network? They are running one TV station now remote from Colorado—

Saltzman: It's a low-power.

Lore: It's still a TV station.

Steurer: Can it be done?

Lore: Sure, absolutely.

Renwanz: There are some sacrifices you make. The business is becoming much more competitive, and automation is a way to last longer in this industry that doesn't have the brightest of all futures, compared to where we've been for the last 40 years. And for us in a major market, we're talking better than a $60,000 impact per person. And while that doesn't seem like the most kind thing to do in life, it is a matter of survival in business, and you've got to be as compassionate as you can. But redistributing labor is not our intent. Our intent is to eliminate as much as we can [that is] done by humans, so that we can maximize and perhaps even improve our performance on the air because automated systems can do a better job.

All of these [automated systems] are possible. Therefore, you improve your operational efficiency and if you can't say you improved your bottom line, then you really haven't gotten more efficient. The efficiency is dollars, pure net profit dollars.

Owens: Let's take the case of the station I ran in Portsmouth, Ohio. We were dealing with $5-an-hour operators. Where are my savings with an expensive library system?

Saltzman: How long will it take to pay back that li-

Fred Steurer, Pulitzer Broadcasting, St. Louis, MO, left; Alvin Saltzman, WHSE-TV, Newark, NJ, right.

NAB ROUNDTABLE #2:

AUTOMATION

brary system if you cut one $5-an-hour operator?

Napier: It's hard to afford a library system at those rates.

Saltzman: It's cheaper to have the labor.

Napier: Exactly. Look at camera robotics. For a three-camera system, you're talking about $350,000. In a smaller-market operation, those people with benefits cost you $18,000 to $20,000 apiece. The numbers don't work.

Saltzman: Or even part-timers, just the hours you need them.

Owens: At one affiliate I know of in Florida, the five and 11 o'clock news studio crew is all part-time. They come in and just work those hours. They operate the cameras and they go home. They're paid part-time. No benefits.

Renwanz: When you are talking about paying somebody five or six bucks an hour, it's a hard argument. I don't think automation is for every market. If it doesn't save you money, don't do it.

Saltzman: When all of these automation systems are planned, laid out and installed, does anyone along the way say, "Gee, we have to have contingency. We put all our eggs in this basket, and if the system goes down, we still have to maintain an ample product."

Renwanz: Nothing is perfect; you still have to have somebody there.

Napier: Somebody watching.

Steurer: Well, it goes back to the particular station.

Napier: Right. We're not against robotics; quite the opposite. It's just whether they meet our needs. Do you need an ACR-225, or maybe all you need a is a handful of tape machines? It depends on the facility.

Steurer: I have a 225.

Saltzman: I use Beta.

Renwanz: A 225. The machine is like a computer. It's like a hard-disk drive. You don't know where, but it's in there.

Saltzman: But homework has to be done when you give it a schedule.

Steurer: The schedule automatically downloads, anyway. You don't do anything.

Renwanz: Somebody has to cue the spot up on one-inch if that's what it comes in on, but when it goes in, it goes in wherever it goes.

I would like to make another point about automation. These are all successes, but not one has been easy and quick like we had envisioned at one time.

Steurer: No, it's been exasperating.

Renwanz: It has been a frustrating time; it's fun to get in early because you get the early payback, but you sure get beat about the head learning.

Napier: Now, that's very interesting to me, because when we went in early—we think very early—it was

anything but exasperating. It was a piece of cake.

Renwanz: But when we went in, we projected staff reductions. The reason we automated was to improve the bottom line. So, when you deliver those things, you have to live up to the projections you made.

Saltzman: When you put it in on Monday and [management] asks why the bodies are still standing around on Tuesday, it's hard to explain.

Renwanz: It *is* hard to explain.

Steurer: You uncover things you didn't quite realize were going to be there; it's not just one cut-and-dried thing. It becomes quite complex when you are fitting the whole thing together.

Renwanz: But these devices are even more powerful than you believe. When you're talking about videotape playback, and where you've got people making spot reels or feeding TCR-100s or ACR-25s, and then you move into the next generation—that's the major thing that a lot of stations are starting to look at. In other words, this is trickling down to the hard-working people that are making dub reels all night. And the cost of making dub reels is tremendous.

Steurer: It takes about seven man hours to make a dub reel.

Saltzman: You mean from separate spools or from a cart machine to dub reel?

Renwanz: I think from separate spools would be even longer.

Saltzman: Why take a Betacart to make a spot reel?

Blinder: I think it has to do with the TCR legacy . . . .

Saltzman: People don't trust it?

Napier: If you are going to do that, you haven't achieved anything. You are cheating yourself.

Saltzman: I think the way to make it is to just program it and walk away from it. It will make the dub reel itself.

Napier: When we went from TCR to Betacart, we decided to run parallel. We ran parallel for two and a half hours.

Saltzman: The Betacarts are spooky; they work right out of the box.

Napier: When ours came in the door, we took it out of the box, plugged it in, and said, "Well, let's run parallel." That lasted for one break.

Saltzman: The hardware we're getting now is really super-quality. It's working. It's not like it used to be, when for two weeks after you got it out of its piano crate, you were working on just getting the servos running. Now, we're dealing with hardware that comes out of the box and away it goes.

Napier: And it works and works.

Saltzman: The hardest part about installing my Betacart to replace the film chain was getting the steel plate off the floor.

Napier: Same here. I pulled the film chain out, put the little Betacart right in its place, and the thing works.

Renwanz: In the case of the ACR-225—and I'm sure Fred can attest to this—when you can put all of these multiple cuts on a tape, and can get automatic conflict resolve, and it automatically has a scratch tape and it goes and does its thing, then you've really turned a corner in automation. It really takes a burden off you.

Saltzman: But the smaller single-machine station has to be prepared for the consequences if that one automation unit goes down.

Renwanz: Well, that's obviously a concern if you have one of anything. It's like having one STL.

Napier: We have backups even with the little Betacart. In the worse-case condition, you could pull out the decks and put the tapes in manually. If all of that blew up, we could just carry them over to the BVW-75s and finger-roll them. It wouldn't be pretty, but we wouldn't lose any money.

Saltzman: Did you ever do a drill?

Napier: Yes. Oh, absolutely.

Saltzman: That's good planning.

Owens: If you plan ahead, you can beat just about any emergency situation.

Napier: We did a drill and we lost one 10-second commercial. I mean, when it actually happened, we just couldn't get it turned around. So I think this redundancy is a very, very important thing, and you've got to make your own decision as to whether or not the concept [of automation] is good in your market, and good for you.

Blinder: Gentlemen, this is probably the easiest roundtable I ever moderated. You all obviously had a lot to say. ■

COMPUTERS, WORKSTATIONS AND NONLINEAR SYSTEMS GIVE NEW MEANING TO THE PHRASE "FIXING IT IN POST"

Participants in *Television Engineering*'s Post-Production Roundtable were: Bob Frey, director of engineering, Pacific Video Resources, San Francisco, CA; Ken Miller, VP, engineering, Capitol Video, Washington, DC; Tony Cutraro, chief engineer, Marx Production Center, Milwaukee, WI; Christin Hardman, independent producer and postproduction consultant based in northern California; Peter Caranicas, editor in chief, *Television Engineering*; and Bob Paulson, Massachusetts-based writer and consultant, who served as moderator. Frey and Miller are also members of *Television Engineering*'s Editorial Advisory Board.

Paulson: This time, the subject is post-production.

Caranicas: What significant technology or trends have any of you noticed at this NAB?

Cutraro: I've seen a trend toward nonlinear editing, or off-line editing.

Hardman: That's a very interesting area right now. There are currently 14 manufacturers making nonlinear random-access systems for off-line editing workstations. These are primarily used for picture editing, not for sophisticated audio editing.

Paulson: With audio carried along; you still have to hear it.

Hardman: Yes, of course. The picture editor needs to edit at least two tracks of audio, because you have dialogue, and also you want to have music and some rough effects.

Frey: It's interesting to see nonlinear systems being used for things that originate on video, even for industrial programs. I think that's going to continue.

Paulson: Looking at this generation of workstations as kind of the 78-rpm record, what would you like to see as the LP five years from now, or the stereo, or the CD?

Hardman: Well, let's see. It has to cost under $20,000. And it will have to hold hours and hours of material.

Frey: And it will have instant access.

Cutraro: I'm curious as to how anybody feels the role of the editor will change or has changed with regard to off-line systems, because now a lot of the decisions are being made off-line.

Paulson: When WGBH-TV in Boston bought a CMX-50 so that they could get everything off-line and keep the on-line suite for the quad final edit, Tom Keller, who was then the chief engineer, said that editing costs doubled—because after everybody made the off-line decisions, they brought in the edit list and somebody would say, "Now wait a minute." Is that still happening with your clients?

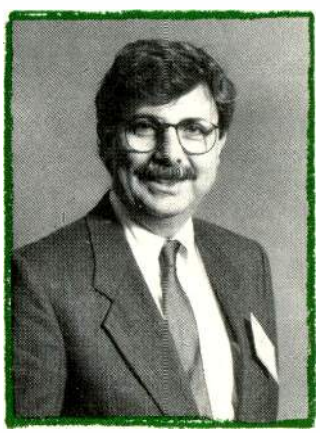
Hardman: Yes.

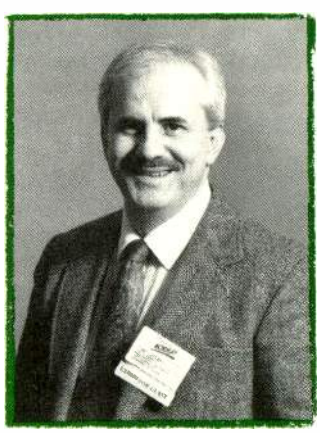
Miller: Yeah, what looked good on the flat table doesn't always look good in video, necessarily. What they wanted to call a 48-frame dissolve in film may not look quite right as a 60 frame in video.

Frey: You know what else has happened? I can remember back in 1980, we put together a very sophisticated off-line suite. At that time, using BVU-800 and having A-B roll and limited effects to resolve some things really allowed somebody to get a pacing of the show and get an accurate list.

We were then operating more just as a service agency for producers, and turning over complete lists that could be fairly flawlessly auto-assembled. That business did very well for a while, and I think that business started to decline as on-line effects became more and more part of every program that was edited.

I think the explosion of graphics and effects really limits the number of off-line





Peter Caranicas, Television Engineering, *left; Tony Cutraro, Marx Production Center, Milwaukee, right.*

decisions you can make.

Hardman: You're absolutely right, because it really also depends on the type of project you are working on. Where I am dealing pretty much with one picture plane at a time, then I can cut off-line; I can do everything. I've been working with some people who are trying to do four layers at once, and there's nothing you can off-line on. You just have to go into on-line. All you can do is lay down some base shots; that's about it; and it really depends on the project, but, yes, I think there's still a real need for off-line, obviously, because there are plenty of things that can be very tastefully done with just cuts.

Frey: Part of the problem with the off-line process is that you really are not in the position to evaluate the quality of the images that you have.

Miller: My favorite technical nightmare concerns the person who shoots multicamera in the field, locks everything to a time-code generator, shoots for two straight days, has everything transferred to off-line with windows, cuts the whole show, brings the one-inch masters in . . . and the time-code generator was unlocked, so it's off-speed. The first fix is, "Well, we'll just restripe it." So you restripe it, but 33 seconds later, you are already a frame out and it just accumulates from there, so the whole show goes down the drain.

Frey: Because the technology is much more accessible to people now, small independent producers can afford to buy their own equipment and do their own off-line. We find we're spending more and more time explaining simple things to clients who are not experienced editors. I don't know how many times a month I explained that your out-point is when you are out of record, that something didn't get recorded, etc.

Cutraro: In our experience, sometimes there's a lot of acquired field footage—reels and reels—that needs to be gone through. That shouldn't be done at on-line rates. People object to having to look at something for the first time on-line.

Paulson: How much time do you need in the off-line storage capacity? What's going to be adequate; 20 minutes, an hour?

Cutraro: Well, most industrial films or programs generally go anywhere from five minutes up to an hour. It depends on the program.

Paulson: But how much would you need on-line at any one time?

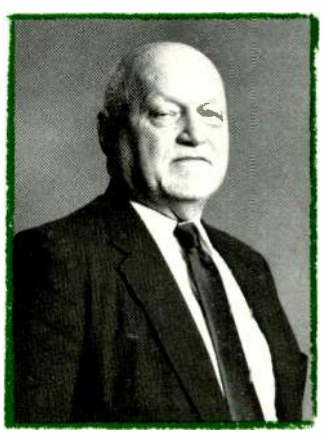
Miller: It depends on whether you're going to insert an early shot later in the show. There's no way to tell.

Frey: Years ago, people came from film backgrounds. The economy of shooting was very high. Video is cheap to shoot, but it's not cheap to have to go through all that stuff.

Cutraro: There used to be a very special relationship between the cinematographer and the director until video assist came along. Now with video assist, we've opened up that vision of what the framing should be like and how the talent should be acting to a whole crew of people, each of whom has a valid input.

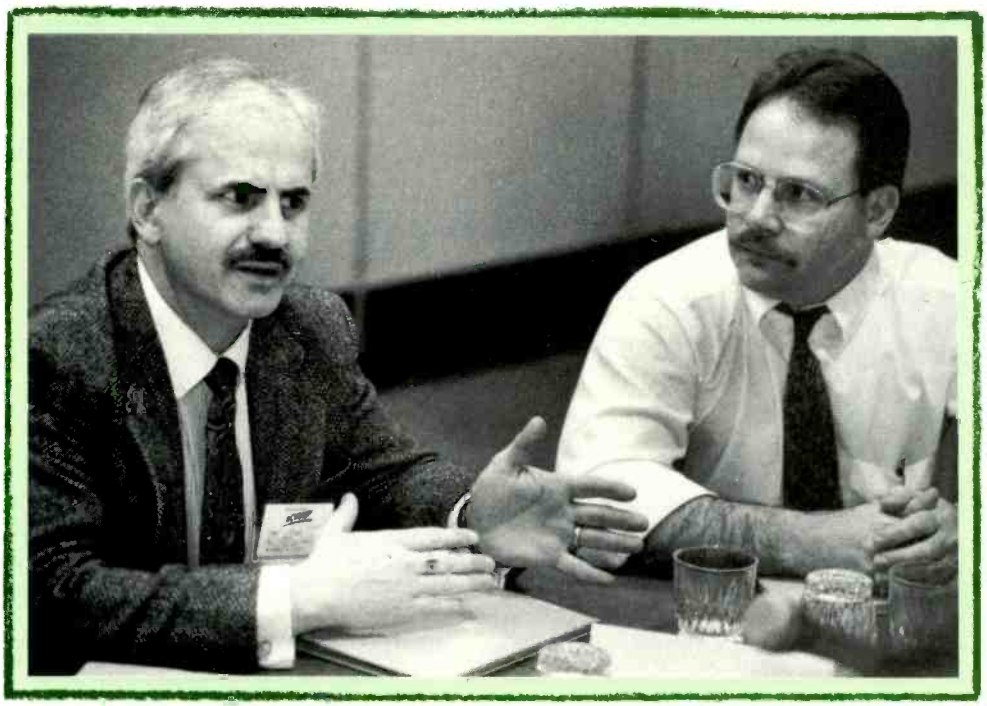
Miller: It's kind of like the people in the back of the edit suite.

Frey: One of the problems in dealing with small format off-line is that a lot of people would like to use



Bob Frey, Pacific Video Resources, San Francisco, left; Bob Paulson, consultant and moderator, right.

POST-PRODUCTION



cheap technology—VHS, for instance. If you use time code for a channel, then you only have one audio channel, which makes it useless.

Miller: In terms of the relationship between the post-production house and the client base, it's very important to teach or educate your client base as to what your house is capable of. [That task] might fall under the realm of marketing. I know from the engineering side that it becomes very valuable just to be known as the problem solvers in your marketplace, as opposed to just the technical wizards.

Hardman: It really is a customer service. Everybody has pretty much the same stuff; what makes you different is that you can really help people and make it easy for them. They come to you clutching their hopes and dreams and their visions.

Miller: And their last dollar.

Hardman: And their last dollar. They've got to make it go far, and they may have problems they don't understand.

Miller: That's one of the unfortunate things about post-production.

Hardman: The meter is running.

Miller: The last place to save any money on the project is in post-production.

Hardman: Right. We'll fix it in syndication, yeah.

Paulson: I heard a horror story last night from a New York post house fellow who said that some client came to him and insisted that there had to be a D-2 edit suite or they weren't going to use them anymore. So they went out and somehow got the D-2 machines, and the client walked in—literally—with VHS original camera footage! It wasn't archive footage; that's what they shot on. But for some reason they had this bug: got to edit D-2.

Hardman: The buzzword.

Paulson: Is this still prevalent among all of your clients?

Miller: You have to give the manufacturers a backhanded compliment on their marketing strategy. They certainly teach the clients the right things to say.

Frey: Yeah, like S-VHS is as good as good as one-inch.

Caranicas: Buzzwords can't be the only reason for investing in a new technology.

Cutraro: Well, for us, the decision to go to D-2 was not because it was a buzzword, but because we thought there would be some marketing advantage to introducing something new to the market, and that's what we did. I think we've been relatively successful at it. Part of the responsibility we have to our clients is to direct them to the best medium for their end product.

Frey: If clients had all the answers themselves, they would never walk in your door. You are a lot more than a hardware facility. You're developing strategies. What's happened in our business is that facilities that started as boutiques are becoming more and more full-service. I also think that the full-service business is becoming a lot of little businesses all put together. You don't have the same person doing the editing, the shooting, being TD, etc., like you used to have.

One of the things that falls out of the workstation concept is that you don't dedicate resources that aren't being used at the time, and once you can get

Christin Hardman, California-based consultant, left; Ken Miller, Capitol Video, Washington, DC, right.

a creative person or an editor into that environment, they can work on the parts of the project they have the talent to deal with. When they need help or when they need to have somebody else take over that part of the project, that's certainly possible.

Miller: The integral stations seem to work for projects that are bid at delivery of product at an agreed-upon price. This is going to change. The price is going to change to where you can sit back and take the time to play with this and try that. A typical client walks in, hands you all the tape, you give them to the assistant editor, he loads the machines up, gets everything timed, everything is wonderful, and then the client says, "Well, I'm ready to start the session now."

Hardman: Right, they don't consider setup. I know, we all have that problem.

Miller: But I think the integrated stations work fine for projects actually designed for them, because they give you a lot of creative flexibility to try things. It's tremendous pressure to try to guess what the client wants, as opposed to working with storyboards where you sit down and design something.

Caranicas: Any comments about the growing role of computers?

Cutraro: From my standpoint, it's real exciting to see the level of equipment that's being put into place.

Hardman: I think the same thing. I think that we have to get very hip to computers because everybody and their brother is out approaching the convergence of broadcasting and computing; telecommunications and publishing.

Cutraro: There's no question that the computer will take its place alongside the wheel and fire as one of the greatest revolutionizing events of mankind.

Hardman: As long as we have enough electricity, we'll be fine.

Miller: I think it's just another step in the evolution of our business. I mean, it's new tools, new technology. And we're just at the threshold here of new technology that's maturing and becoming acceptable.

Frey: I'd like to build on that. Yes, we are seeing the technology maturing and becoming acceptable. As older technology is becoming obsolete in all of our facilities and is being replaced, I think that's creating the opportunity. What we're also able to do is to give all of our clients much more sophisticated tools that let them be more creative. I think that's the business we're in. It's exciting to see new hardware and software tools that allow us to do that. ■

AUDIO'S KEY ROLE IN TV PRODUCTION SHOULDN'T BE OVERSHADOWED BY TODAY'S CONCERN WITH HDTV AND IMAGE QUALITY

Participants in *Television Engineering*'s Audio for Video Roundtable were: Murray Allen, sound designer for the Grammy Awards show and president of Universal Recording, Chicago, which is responsible for all the audio at Oprah Winfrey's Harpo Studios; Joseph Fedele, chief engineer, WCBS-TV Channel 2, New York; Neil Feldman, president of Video Post & Transfer, the Dallas-based post facility, and a member of *Television Engineering*'s Editorial Advisory Board; and Dan Daley, VP, Paramount Recording, New York City, and *Television Engineering* "Audio for Video" columnist. Joining them were *Television Engineering* technical editor Bill Owens; and Bob Paulson, Boston-based consultant and writer, who also served as moderator.

Paulson: Gentlemen, the floor is yours.

Owens: How are you folks doing audio differently today than you were doing it 10 years ago?

Feldman: Talking from the point of view of video post-production, 10 years ago, audio was a stepchild. We didn't pay much attention to it. One-inch had become the broadcast format, and everyone wanted one-inch machines. While they have lots of features, audio is not one of their stellar qualities. If you wanted good audio, you went to the sound studio. That is about to change. Two years ago, we started putting in D-1 and D-2 machines, with 48 KHz audio capability and four channels.

Allen: Another thing that's different today is the presence of the workstation. Every audio man is using a workstation of some sort. That's good. But it's also bad because one has to make a huge investment for things that can be done very simply. A lot of shows could be done much more simply than we do them. However, because the workstation is there, everyone wants to use it, so we have $100,000 worth of gear and lots of disk power.

Feldman: We master to D-2. We keep the protection master as the D-2. If somebody is going to duplicate, and the duplication house is one-inch, we'll give them one-inch. We're trying to push all the duplicators to have the ability to go from D-2. We've already seen the people doing laser disc to be able to take a D-2 master.

Owens: The question in my mind is the cost factor; are producers ready to pay for better-quality sound?

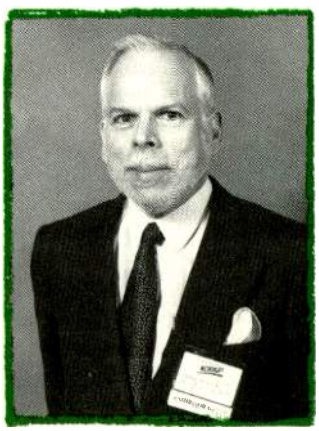
Allen: That's interesting. Like Coca-Cola, this year, did that one commercial using Q-Sound. The minute they did that, then McDonald's comes to us and says we've got to do something. So we did all the McDonald's commercials in surround. And the guy who owns McDonald's has a surround system at home, so he loved it. But then you've got to make sure that when it's broadcast, that it's indeed loaded in there properly.

Daley: They had some problems with that, with the Q-Sound situation, in certain markets. In New York, they couldn't hear it. For one reason or another, it simply did not translate on the flagship station in New York. Other places said it sounded wonderful.

Allen: We have to make sure how it's transferred and where it goes because you want to make sure that somebody just doesn't dump it on a cart and play it back.

Daley: Well, in the consumer world, you don't have control over where it's going to wind up—you have a lot more control in the industrial world.

Owens: We did an inter-



Murray Allen, Universal Recording, Chicago, left; Joe Fedele, WCBS-TV, New York City, right.

esting experiment with that. We took an advance copy of the Q-Sound commercial on VHS to a couple of video retailers in Jersey, and we played it back on their top-of-the-line stereo TVs and top-of-the-line stereo VCRs. Many people said it sounded absolutely great; a few could not tell the difference.

Feldman: Were they alerted before or after?

Owens: They were told exactly what to listen for, and some heard it fine and some didn't.

Allen: You could play it back on a simple boom box and it works.

Owens: Murray, you're recording "Oprah" in Chicago. The show is then transmitted via satellite. At the other end, some stations are now using S-VHS for record and playback of all satellite-fed material, at one and seven-eighths inches per second analog. Is their playback doing justice to your quality?

Allen: No. And it's worse than that. Most downlinks aren't up to snuff—that's the terrible part about it. Anything that the audio goes through is going to have an effect on it. The question is, just how much does it color it?

Owens: But does it matter if the folks at home are listening on a typical TV set with a three-inch speaker?

Allen: It's a good question, but let me say this about sound. I think everybody agrees on this. Can the human ear hear the difference between a square wave and a sine wave above, say, 3 K? Above 7 K? Very unlikely. It really doesn't make a tremendous amount of difference.

Daley: Right, you're in Dogland at that point.

Fedele: You're absolutely right. "Joe Beercan" sitting at home is not going to notice the difference. When you do a lot of remote broadcasts, for instance, or live telecasts where the audio miking is not so good, that's where it makes a difference.

Owens: How do you handle audio in the ENG environment?

Fedele: I hate to tell you this. Do you know how a TV person tests an audio circuit at most TV stations? With: "Hello, you hear me?"

Owens: And by banging on the microphone.

Fedele: There's no measurement of noise or anything, especially with breaking news. You just don't have the time for it. With TV, the emphasis is on the picture. The mind is distracted. You hear the voice, but you're watching the picture. So it's a different concept.

Owens: It's a concept of acceptability. If you've got the only videotape of the disabled jetliner landing on the freeway and the audio sounds terrible, you're still going to air it.

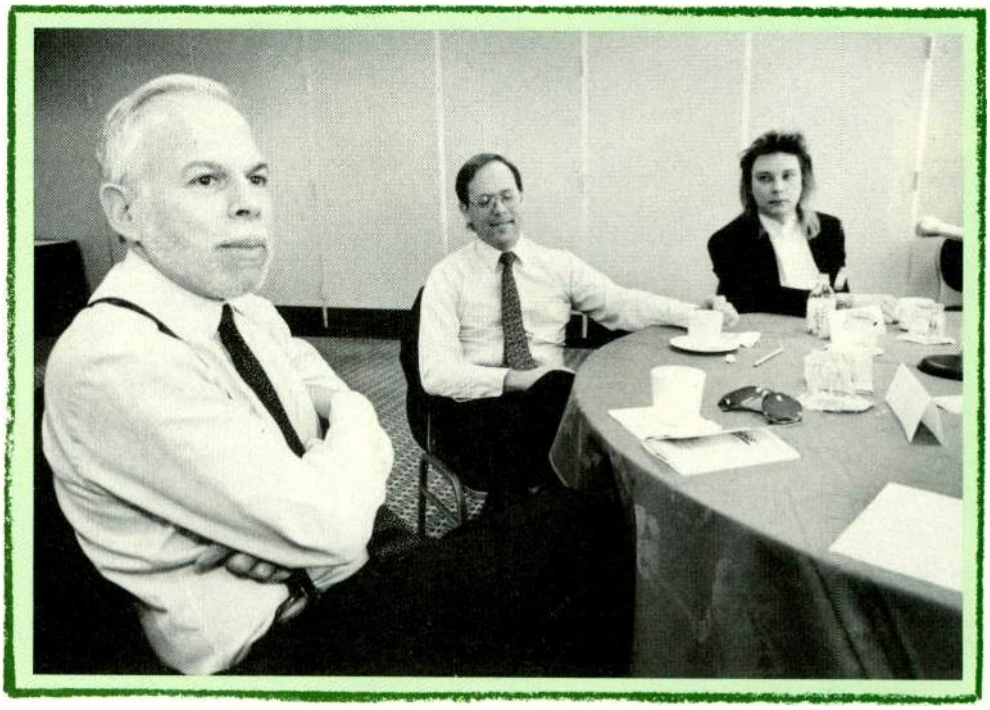
Fedele: When the earthquake struck in San Francisco back in October, how many times did you see the picture of that car going off that bridge, played back again and again and again? There is no way that would have made the average broadcast for quality if it was just a picture of something else. You have to be very specific.

Daley: You're picking up a lot of different sources for both audio and video. I notice that CNN, WCBS and others are actively soliciting news-type videotapes from viewers. What's the range of audio quality that you're picking up from that?

Dan Daley, Paramount Recording, New York City, left; Neil Feldman, Video Post & Transfer, Dallas, right.

NAB ROUNDTABLE #4:

AUDIO FOR VIDEO



Fedele: If they're shooting something with a good-quality mic in a fairly controlled environment, you can get quality such that the average person can't really tell the difference between something that we shoot in the street and what this guy at home just shot. So the audio is not so much the problem.

Paulson: What are we seeing on the show floor?

Feldman: What we're witnessing, especially at this NAB, is the transition from analog to digital. The change in audio quality is amazing. As [video people] begin to play with digital audio, [they] are going to confront what happens when you clip, and how you deal with emphasis.

Allen: What I tell a lot of my clients is: "Think where you want that. I don't care whether it's a $4 TV set or the biggest, widest screen you have—try to think where you want that sound to be, relative to what it may follow, and how you want it to hit." Take a Michael Jackson record; put him on, following anything, and it will sound right because of the way it's orchestrated and mixed and everything else.

Owens: In today's audience are many aging baby boomers who have spent years listening to rock 'n' roll at extremely high volumes and may have some sort of hearing damage. Does that have any bearing?

Allen: None. There are no two people in the world who hear identically, and we have the same problem with ears that we have with our eyes. Who's got 20/20 vision? Who sees color bars the same way?

Fedele: There's nothing—whether you're talking audio or video—that is the same to two different people. It's completely subjective.

Owens: Murray and Neil, you're doing things for national markets, and Joe is serving a major market. You can afford the time to make it right. But how about the station in the 200th market that is understaffed and doesn't have the best of equipment? Is it essential for those folks also to take care of audio?

Feldman: I think this is an area that certainly needs to be addressed, since we're video people now discovering audio. I think it's going to be an important issue. It should have been before, obviously.

Allen: Stereo has got to be compatible with mono. That's a given. It's got to be good mono. It's going to more or less work depending on how it's broadcast back, but you're always at the mercy of the last person who's got a broken three-inch speaker in their TV.

Daley: Consumers have also been educated in terms of audio now. That's why "digital" has become such a buzzword.

Paulson: There's a de facto practice in news broadcasting—and this goes down to the 200th station—that without exception, all of the on-camera news people are mono in the center, while the music lead-ins, lead-outs and effects are in stereo.

Allen: It works. There are some things that work and some things that don't. Take Johnny Carson and the way they open that show. At first, Ed McMahon is on one side and Doc on the other. Then the whole show becomes mono, which is fine. "Here's our stereo for the day, folks." I like to do surround shows, but we do very few—it's there only for those three million people that may be listening to surround.

Fedele: Only three million viewers are really listening?

Allen: Only that many have surround decoders at home.

Fedele: Well, I also remember a time when there were less than that many FM listeners, and everybody was listening to this little crystal AM radio that sounded like everybody was singing through tin plates. Where is it going to go? It's not going to get less; it's going to get more. You're going to get more people listening. Like Dan was saying, people have become educated. Americans are really nasty when it comes to demanding more. We don't want something that just sounds okay: "I want mine to sound better than his."

Owens: If America wanted better quality, why are the majority of Americans watching VHS tape?

Fedele: I didn't say they

wanted better quality. I said they wanted it to *sound* better. There is a difference. Again, we're talking subjectiveness.

Allen: And perceptions. Lucasfilm found out that motion picture theaters that have good sound do sometimes as much as five times more business than theaters with just average sound. I seriously believe part of the success of "Miami Vice" was the soundtrack.

Fedele: That's why highly creative people are at such a premium; they know where to bend the rules to make it perfect for the human ear or the human eye.

Owens: Are we shoving too much into the information chain? Will our friends from the FCC say to us, "You're not supposed to do this"?

Fedele: Well, they're working on HDTV. If that's not trying to shove too much into the band, I don't know what is. No, I think the FCC is going to do whatever the public wants; what's in the best interest of the people; which is what they're supposed to do, anyhow.

Owens: But did they do that with AM stereo?

Fedele: I think they fell on their face on AM stereo.

Paulson: That was the beast that nobody wanted.

Fedele: I think they chickened out. What the FCC should have done was say from the very beginning, "Okay, this is the standard." They backed off—it was 1980, I think—and AM has suffered tremendously because of that.

Owens: But are they repeating themselves now with HDTV?

Fedele: I don't think so. They're allowing a lot of time for the industry to really look at it. You have very large corporations investing tens of millions of dollars. I think the FCC is probably going to be a lot more responsive, and I think they're also going to allow the industry to do more of the fact-finding. I think the judgment will already be made before the FCC has to make the final announcement.

Owens: In other words, let the vendors spend all the money in research and development.

Fedele: Well, I don't want the FCC to do that. For one thing, economically, it's not possible. The FCC has a hard enough time regulating what they should.

Paulson: And Congress shouldn't do it.

Fedele: Over-the-air television is never going to go away. It's free. It doesn't cost you anything. You buy your TV set—whether you're going to invest $50 for a little portable or $5,000 for this huge system, [over-the-air is] free. So you're never going to get rid of it.

Feldman: I don't think the issue has ever been that television is going to disappear. The issue is: What role will it play? Same way as the AM radio has been transformed in many regards by FM. ■

TUBES, SOLID-STATE DEVICES, TOWERS AND THE FUTURE OF TRANSMISSION: WHERE IT ALL COMES HOME

Participants in *Television Engineering*'s Transmission Roundtable were: Rick Edwards, VP and director of engineering, Guy Gannett Broadcasting, Miami; Joseph Fedele, chief engineer, WCBS-TV, New York; Al Saltzman, chief engineer, WHSE-TV, Newark, NJ; Fred Steurer, director of engineering, Pulitzer Broadcasting Company, St. Louis; Roy Trumbull, assistant chief engineer, KRON-TV, San Francisco; Bill Owens, technical editor, *Television Engineering*; and Bob Paulson, Boston-based consultant and writer. Edwards, Steurer and Trumbull are members of *Television Engineering*'s Editorial Advisory Board. Paulson moderated.

Paulson: The topic of transmission is wide open.

Saltzman: Well, the major thing hitting the UHF broadcaster is the power bills. Going to upper management and saying, "Look, I can get two percent better ICPM"—that's not going to buy you a new transmitter. But if you can show a 30 percent reduction in your utility bills—and in my case, it's 23 cents a kilowatt hour—it's a serious matter. That's what will get you new equipment. I'm seeing solid-state transmitters now in the world of VHF. From what I gather, they don't buy much in efficiency, but they do in long-term reliability.

Trumbull: When you buy a tube transmitter, you also buy an operating expense on an annual basis to keep that transmitter running. In the case of my transmitter, I had a tube operating budget of between $24,000 and $30,000. So if you take the life of a transmitter as being, say, 15 years, over the life of the transmitter you have to tack $450,000 onto its price, which is the cost of keeping that thing in tubes. When you go to a solid-state transmitter, you'll have a few FET failures in the course of a year, but you're talking hundreds of dollars, not thousands. So your operating costs go down; your reliability goes up.

Steurer: Then there's the issue of the transmitter engineers who are retiring, and there aren't many people to replace them anymore.

Edwards: I'd like to add that not only has the cost of tubes has gone down, but when you do have an FET or a module to replace, you don't have to bring somebody in overnight to shut it down. It's fewer man hours.

Trumbull: We have gone to daytime maintenance. It's much more reliable because of the implicit parallelism of the design. You don't have the crisis that will take you off the air.

Saltzman: You can almost get rid of your beepers.

Trumbull: Just about.

Owens: What about klystrodes?

Saltzman: I think the jury is still out on them.

Edwards: I just don't think there's enough on them yet. I really haven't done much [of a study] on them. But I don't know if anybody else knows. I understand they're quite sensitive and hard to keep in adjustment.

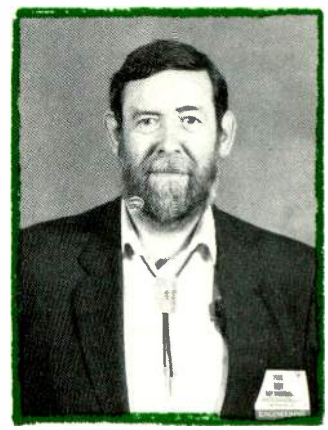
Saltzman: We've looked at MSDC. The nice part I see about the MSDC transmitter—while it's brand-new—is that if some trouble should come along the line, at least with some of the manufacturers, you can drop a conventional tube into the same socket.

Owens: What about the concept of leasing tubes?

Steurer: Oh, our treasurer wouldn't want us to do that.

Saltzman: We do, at one location. I like the idea. You lose a tube; you call, "Hey, ship me another tube." However, at that site, I've never lost a tube. This was a carry-over from the former ownership of the station.

Edwards: I guess we're rare. We like to own every-



Roy Trumbull, KRON-TV, San Francisco, left; Rick Edwards, Guy Gannett Broadcasting, Miami, FL, right.

thing. It's cheaper to own.

Saltzman: We do, too. It's just that this is a carryover. On internal cavities, we're leasing. Probably if we were to redo it today, we wouldn't. Just put it in and get the tube in there. Then again, it becomes an operating expense versus a capital expense. I'm talking four tubes. So we're talking almost a quarter of a million dollars with internal cavities, but this was done because former owners of that station were cash-flow poor, so they went the leasing route. We've never duplicated the leasing arrangement under the present ownership of the company. But tubes are a serious investment. You're now talking $56,000 for a single tubing. So putting in a three-tube transmitter, we're talking about $170,000, and in New York City, just thinking of the sales tax on it is something to shudder about.

Owens: Right now we're still in good old NTSC, 525-line transmission. Do any of you foresee HDTV over the air?

Trumbull: I think it's going to save a lot of bills at the UHF station and for the VHF boys that join the UHF ranks, because the HDTV transmission systems we're looking at imply that you won't need more than a five- or 10-kilowatt transmitter to serve your present area, and because you won't have the humongous sync spike.

Steurer: The sync is the carrier itself.

Trumbull: It's hogging all the power. I mean, if you take a look on a spectrum analyzer, where all the energy is, it's all at the carrier.

Saltzman: Yeah, if we were able to transmit our sync in a different form, we could really scale down our transmitter sizes.

Steurer: I see a conflict here. Suppose there is a Channel 8 and a Channel 12 and both of them want to go to HDTV, and Channel 20 is open and Channel 63 is open. Now, who gets which one? I think that's going to be a major issue.

Edwards: In addition to the major ones we're looking at now.

Steurer: And then after that, what happens in time to the V's? Are we shutting those down, or will we go to HD over the V's and put NTSC up in UHF?

Owens: Would it not be better at the point when we realize that everybody's going to go HDTV to just reorder the entire TV broadcast spectrum?

Saltzman: And put everybody in order of seniority on the UHF bands.

Owens: Exactly.

Steurer: That's an interesting concept, but what about the guy at WCBS-TV who's on Channel 2, firmly rooted there, and has invested many dollars in a trademark and in the concept of "Channel 2 News." How do you assign him to Channel 42 or 48 or 63?

Saltzman: Well, there's a way out on that. Take the UHF band, give it a different set of numbers. It could still be Channel 2.

Owens: But "new" Channel 2 starts at [UHF] "old" Channel 15.

Saltzman: Where 15 is now on the spectrum. But if you're moving everybody at once, that could be done at that point.

Steurer: Perhaps it could.

Saltzman: Who says Channel 2 has to be 54 to 60 MHz?

Steurer: And it could be addressed on TV sets. For example, if one is on 50 and

Bill Owens, Television Engineering, *left; Alvin Saltzman, WHSE-TV, Newark, NJ, right.*

TRANSMISSION

another on 63, and you call 50 Channel 2 and 63 Channel 4 . . . .

Owens: Well, then you can also go from the six- to a 12-MHz bandwidth.

Saltzman: And just reallocate the whole spectrum.

Owens: If you're going to renumber channels and make them wider, then you've provided room for HDTV transmission.

Steurer: I don't think it's as easy as that.

Paulson: Isn't that the intent of what Chairman Sikes has now announced about simulcast?

Saltzman: Using two channels.

Steurer: He essentially said, "Hey, guys, with your augmented channel, forget it."

Owens: Believe it when you see it.

Trumbull: I think there'd be an uproar between the UHF operators, who have pioneered and done all the hard work and paid all the big power bills, and the Johnnys-come-lately. That's where all the bad blood would occur.

Owens: But wouldn't that also tend to equalize them?

Saltzman: We have a UHF-ignorant market. The general public is not UHF-savvy. In the New York City market, they never have been. It's really been an uphill fight. One of the things that has held it back is that we never had a mainstream UHF commercial station in New York.

Owens: Low budget, low profile, no promotion.

Saltzman: And the first two that came on were foreign-language.

Edwards: We have UHF stations [in the Miami market] beating CBS now. Independents, which is interesting.

Saltzman: Well, they're pretty much on an equal footing. But the U's [in Miami] promoted themselves. A lot of this could be the fault of the stations themselves—lack of promotion. But that reallocation changeover would put everybody on an equal footing. And with today's microprocessor receivers, it's no big deal. If you want to put Channel 2 at 500 MHz, it's no big deal.

Steurer: That's a good point, but there's a mindset that something is on Channel 4, something else is on Channel 5 . . . .

Saltzman: It could still be on Channel 2, but internally, the set will go to 500 meg. The average viewer won't know the difference.

Edwards: You could have a market to pick its own channel [sequence], as a matter of fact.

Steurer: Yes, but what I'm saying is when the set comes in, it will be up to the viewer to program it.

Owens: Just the way everybody programs their VCR. I should point out that in England, Sky Television uses a programmable card that you buy every month. That's your authorization to receive their programming off the bird. Now, why not just put that slot in the TV set . . . .

Edwards: The stations could give them out. Or newspapers.

Owens: Or TV Guide. Tear it out, shove it in the slot and you've automatically programmed.

Saltzman: Panasonic has a VCR that can read bar codes . . . .

Edwards: We've solved all the problems.

Saltzman: If the whole spectrum was moved, and everybody got put on an equal [UHF] footing, it would free up the whole VHF spectrum.

Owens: The sheriff will love us. More room for police radios.

Saltzman: You'd need a transition period to slide into that. Say five or 10 years when you're simulcasting NTSC on your V's, where everybody is now.

Edwards: Since we opened all this up, let me ask: In five, 10, 15 years, are we going to be doing over-the-air television like we are now?

Steurer: I think it will change.

Bob Paulson, consultant and writer, Westborough, MA.

Edwards: It's going to change.

Steurer: I wish we had a crystal ball.

Paulson: We'll have higher-power DBS and one-foot dishes.

Steurer: And 108 channels. There simply isn't going to be enough programming.

Owens: Are you going to have 40 channels of "Gorgeous Ladies of Wrestling"? On cable now you see a couple of home shopping services, religious networks, multiple sports services—it's just duplicating the same programming.

Steurer: That's because there isn't enough programming to go around to fill up the slots.

Trumbull: The public very quietly has conducted its own little revolution over the last eight years by buying VCRs. They're now their own program directors, and they watch what they want to watch and when they want to watch it. We are no longer in control of their sets.

Owens: And they're also providing the programming on "America's Funniest Home Videos."

Trumbull: Look at the VHS VCR. What we're talking about is absolutely 250 lines tops, center picture, and yet it's the most successful thing that's come along in consumer electronics. People would love to see at home what we can see on a monitor in the studio. For them, that would be high-definition television.

Steurer: I think the days of VHS are numbered. If they can do a digital VTR .... Panasonic has announced a half-inch digital VTR; all they have to do is get the cost down. If they replaced VHS with that quality, very likely half of those people would buy a new VCR.

Trumbull: They might buy it, but basically, the vote out there in the public is not for better electronics; the vote is for better programming. They'll sit there with 250 lines until hell freezes over if they can get the programming they want. And that's what they've been doing. They've been marching out to the store bringing home what they want to see.

Saltzman: They're not going to go for an HDTV version of "The Gong Show."

Owens: The HDTV system that becomes reality can [technically] be anything; 16 x 9, 1125-line; 20 x 6, 1050-line; it will not matter. As long as it's the only one broadcasting the Super Bowl, everybody will buy it.

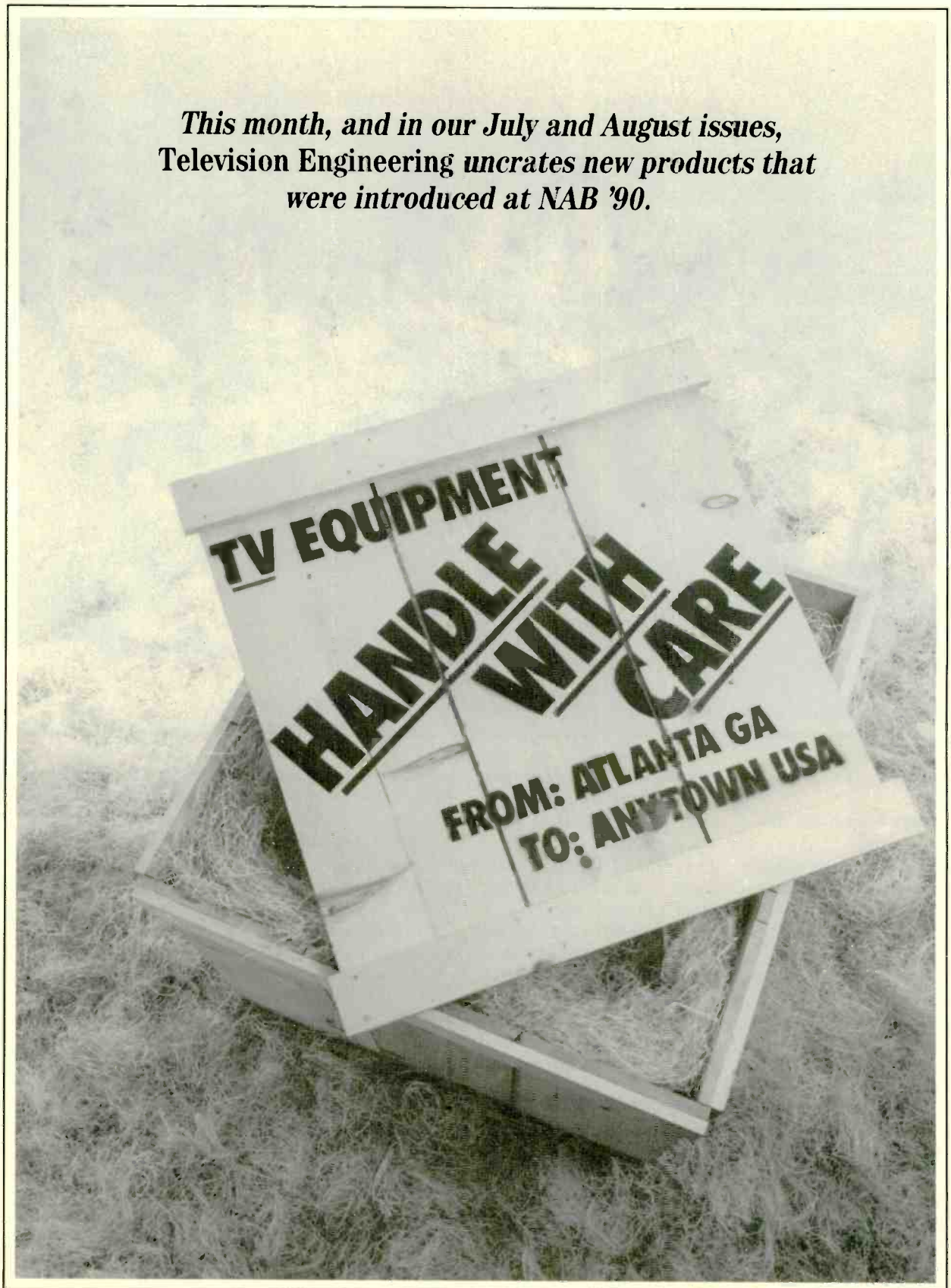
Steurer: That's a very good point.

Owens: It's the software that will drive whatever hardware is out there.

Steurer: That's right.

Owens: The play's the thing. ■

This month, and in our July and August issues, Television Engineering *uncrates new products that were introduced at NAB '90.*

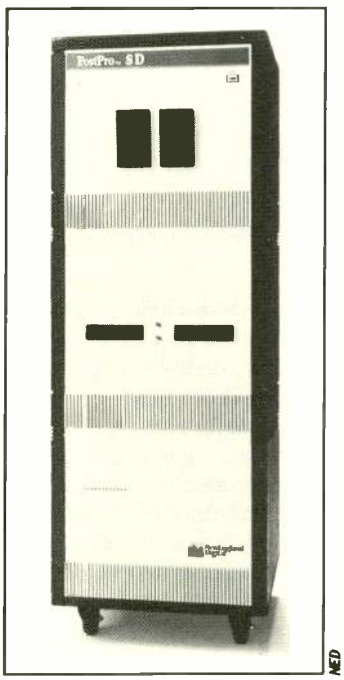


GARETH HOPSON

New Products

NEW ENGLAND DIGITAL PostPro SD Workstation

Synclavier sound design and Direct-to-Disk recording and editing are wedded in the PostPro SD. Billed as the industry's first random-access 24-track recorder and demonstrated at NAB, the PostPro SD workstation offers eight separate Synclavier outputs and 16 tracks of disk recording. Music, dialogue and sound effects can be recorded on the system's built-in Direct-to-Disk recorder/editor, to be swapped digitally to Synclavier RAM for processing and then dropped back onto disk. Available in eight- or 16-track configurations, the recorder/editor module offers nearly 30 minutes per track of continuous recording time at 44.1 kHz. The integrated Synclavier module includes an Apple Macintosh interface. Also available with the PostPro are Direct Digital I/Os for AES/EBU, ProDigi and SDIF-2 formats; VITC and SMPTE synchronization; and multi-rate sampling from one to 100 kHz (user-variable). Options include two-Gb optical disk storage; 50 to 200 percent time compression and expansion; MIDInet; CMX Autoconform and EditView software; an enhanced Synclavier velocity/pressure keyboard; and a DESC controller/editor/locator. Price: under $130,000.



NED

Reader Service #200

MICROTIME Impact DVE

Demonstrated at NAB, the joystick-controlled Impact digital video effects device wraps video sources onto such 3D-shaped objects as cubes and pyramids. The system can fill cylinders and page turns with two live video sources or fill a cube (or other three-plane shape) with video from three sources in a single pass. The control panel provides system timing, proc amp controls, and a 3.5-inch floppy disk drive for sequence storage. Multiple-run registers are available to ease the creation of sequences. A keyframe time line is displayed on the workscreen.

Reader Service #201

PANASONIC IFP-422 Serial-to-Parallel Interface Unit

The IFP-422 allows edit control when used with RS-422 serial controllers and Panasonic 34-pin control professional VTRs. Key features include an LTC reader and capstan override capability. Its design is based on microprocessors and CMOS logic. With a 34-pin Panasonic remote connector, the IFP-422 allows control of remote functions such as play, stop, fast forward, rewind and pause. The unit's time-code reader uses an RCA connector to accept longitudinal time-code input. The suggested retail price is $1,850.

Reader Service #202

CLEAR-COM 1021 Monitor Speaker

Operating on 115 or 230 VAC, the 1021 amplified stereo monitor speaker features 100 Hz–12 kHz audio frequency response; XL-3 balanced line level inputs; and LED bar-type peak reading input level meters. Displayed at NAB, the biamplified unit contains one six-inch low-frequency and two four-inch mid-/high-frequency loudspeakers. The low-frequency information from both channels is fed into a single amplifier and specially baffled speaker to provide extended bass response. Just 19 inches, the 1021 costs $595.

Reader Service #203

KARL HEITZ
Gitzo Accessory Bag

This triangle bag attaches to a tripod with three straps. It measures 15 inches on all sides and folds with the tripod. The bag can be used for film rolls, film holders, interchangeable lenses, lens caps, cases, batteries or other accessories while shooting.

Reader Service #204

VIDEO ACCESS
Easy Lister Software

Having made its debut at NAB, the Easy Lister software program runs on IBM or compatible personal computers with 256 K minimum and EGA, VGA or MONO Graphics adapter boards. The program will transfer your EDL file to a disk, ready for editing in the on-line edit computer. Cost: $495.

Reader Service #205

BARCO Barcographics 800
Graphics Projection System

Demonstrated at NAB, the Barcographics 800 system uses intelligent microprocessor control, proprietary microchips, and software to set up and control, via an IBM (or compatible) or Apple computer, as many as 256 projectors. The horizontal frequency ranges from 15–90 kHz and vertical frequency ranges from 45–120 Hz. Barco says this represents the widest range of computer display compatibility of any projection system now available. The system can accommodate such input sources as IBM CGA (320 x 200 pixels) and CAD/CAM computer graphics (1,600 x 1,200 pixels). Light output reaches 825 lumens at 10 percent peak white. The lenses deliver an optical resolution above 2,000 lines.

Reader Service #206

FUJI UH400 Videotape

Introduced at NAB for release in summer of 1990, this new tape has two layers of magnetic particles instead of a standard single layer. The base film layer is 14.7 microns thick with a 0.3 micron-thick undercoating. On top of this are separate magnetic layers—one for audio and one for video. The audio layer is 3.5 microns thick, and the video layer on top of it is 0.5 microns thick. The thicker audio layer of particles is designed to improve the longer-wavelength, low-frequency audio signal, which reaches further into the tape structure than the shorter-wavelength video signal. Beridox DC-A particles make up the audio layer, while the video layer uses superfine cobalt modified ferric oxide Beridox DC-V particles. Particles in the layers are aligned magnetically and then passed through a second magnetic field to ensure that all particles are in order—a process Fuji calls "double orientation" technology. Fuji says test results show that S/N degradation levels go from +1.5 dB in SP mode to +1.2 dB in EP mode.

Reader Service #208

TELOS

TELOS 100 Direct Interface Module

Optimized for broadcast on-air use, the Telos 100—introduced at NAB—allows direct connection to central office lines without an intervening PABX or key system. Other Telos 100 series consoles and panels for the 1A2 Key System Interface Module are used with this system at the announcer control positions. Each 100 module can handle 10 incoming lines and two announcer positions. List price: $1,800.

Reader Service #207

TECHNI-TOOL Tech Duster
Cleaning System

A non-corrosive, non-flammable spray, the Tech Duster dispenses a premeasured amount of dry, clean freon gas to remove dust from inaccessible areas. It is available in 12-ounce and 20-ounce refillable canisters, with a self-contained, variable-flow control valve.

Reader Service #209

NEW ENGLAND DIGITAL
MIDInet Expander Module

Introduced at NAB, this enhanced version of NED's MIDInet hardware and software module operates with the Synclavier, PostPro or PostPro SD

workstations to manage communications among eight to 128 devices. Incorporating two 68000 and eight 80C31 processors, the module allows user access to filtering, channelization, merging, echo, keyboard mapping and scaling. System setups can be reconfigured.
Reader Service #210

PANASONIC AG-5200 Transportable Hi-Fi VCR

The AG-5200 features a 90-dB dynamic range, two-channel audio capability, fixed-head monaural audio, audio REC level controls, and an audio output selector. The VHS unit can play back S-VHS tapes with VHS quality, according to the company, and has a GT4 head system that provides clear special-effects playback. Suggested retail price is $870.
Reader Service #211

SYMETRIX DPR-100 Digital Processing Recorder

Demonstrated at NAB, the DPR-100 serves a variety of applications, including multi-channel audio confirmation to picture, ADR/Foley recording and editing, and digital signal processing. Features include real-time multi-channel audio playback from hard disk, real-time synchronization to external/internal time code and video sources, serial control of external ATRs and VTRs using standard interface protocols, and a dedicated control surface with transport controls, moving channel faders, edit wheels and EQ Controls.
Reader Service #212

TEKTRONIX TFS2020 Optical Fault-finding System

Tektronix's TFS2020 is billed as a fiberoptic test system that does not require waveform interpretation. Designed primarily to find faults or catastrophic events in optical cable, the push-button machine displays simple symbols on an LCD. It operates off a six-hour, rechargeable battery pack.
Reader Service #213

AUDIO-TECHNICA Wireless Unipak Microphone Systems

The standard body pack (ATW1031) and hand-held (ATW1032) transmitting systems utilize silent turn-on/turn-off functions, built-in mute switches, and adjustable squelch control to minimize background RF interference. Ten pre-set frequencies include a choice of clear-channel travelling frequencies to eliminate geographic limits. The receiver has a 12–18 V DC jack for battery powering. The front panel has an adjustable audio output and LEDs to indicate signal strength and audio level. The rear panel has a mic-level balanced XLR and an instrument-level unbalanced phone plug.
Reader Service #214

SONY GVM-1300 Multiscan Monitor

A 13-inch monitor designed to detect the line frequency of any input signal and adjust its scanning rate to correspond to that of the input signal, the multiscan encompasses line frequencies from 15 kHz to 36 kHz horizontally and 50 Hz to 100 Hz vertically. The CRT can display composite video, Y/C and analog/TTL RGB signals, achieving a resolution of 900 x 560 pixels RGB and 600 TV lines video. The 1300 features horizontal and vertical size/shift controls for picture positioning and has a built-in decoder to process and select the appropriate MDA, CGA, EGA or VGA modes for color and monochrome inputs. Price: $1,495.
Reader Service #215

SONY

Q-TV FPD-9 Flat Display Prompter

The FPD-9, in development since 1987, was unveiled at NAB by Q-TV. This flat-panel through-the-lens prompter weighs only 10 pounds with the mounting plate, and is readable at up to 20 feet, according to Q-TV. Features include high contrast and adjustable brightness; NTSC, PAL and digital RGB inputs; 110/240 VAC and 12 VDC power inputs; and a reverse polarity switch.

Reader Service #216

KARL HEITZ Gitzo 520 and 521 Video Camera Wall Supports

Designed for permanent installation of cameras, the Gitzo supports come in two styles: the 520, a turnable, fixed-length (15-inch) model, weighing two pounds and supporting 20 pounds; and the 521 turnable, ex-

tendable (from 24- to 30-inch), weighing 3½ pounds and supporting 20. Price: $149.95 (520), $249.95 (521).
Reader Service #217

LEADER INSTRUMENTS 425 Component Video Test Signal Generator

Introduced at NAB, the 425 model features a "shark-fin" timing signal and generates 23 types of component test signals, including: color bars; 100 percent line sweep; 5T, 2T pulse and bar; and nine kinds of composite test signals. Component output is switchable between three-wire (Y, R-Y, B-Y), and two-wire (Y, time-compressed chroma) systems, and is Betacam- and MII-compatible. Price: $4,495.
Reader Service #218

SHURE VP88 Stereo Condenser Microphone

Introduced at NAB, this single-point stereo condenser microphone incorporates two independent elements—two condenser microphone cartridges mounted coincidentally to produce a stereo signal that is fully mono-compatible. To produce a Mid-Side stereo signal, the Mid capsule faces directly forward, employing a cardioid polar pattern, while the Side element is perpendicular to that, employing a bidirectional pickup. Other features: low-frequency rolloff switch, shock-mounted cartridges, built-in pop filter, 30-inch "Y-splitter" cable, foam windscreen, stand adapter, storage bag and six-volt battery. Price: $995.
Reader Service #219

CANON USA U-4 Remote Control System

This weatherproof remote-control pan-tilt system has a standard wired remote and can be equipped with a modem for off-site control of pan, tilt, zoom, focus, iris and extender functions.
Reader Service #220

SYMETRIX SX206 Multi Dynamics Processor

The SX206 Multi-Dynamics Processor acts as a compressor/limiter, gate, downward expander or ducker; it accepts balanced or unbalanced inputs through quarter-inch TRS connectors. Attack and release times are program-sensitive through cross-coupled active integrators, which Symetrix says will allow a user to establish time constraints while reducing distortion. Other features: low-noise VCA, soft-knee transition, and feed-forward circuitry. Price: $329.
Reader Service #221

FLUKE Second-Generation Custom Disassembler

New software for Fluke's PM 3655 logic analyzer allows the user to enter a description table of such signals as the microprocessor and computer bus, while global and local variables allow the software to select the correct mnemonic disassembly. Calculations for "next-address" decisions are handled through 32-bit mathematic capabilities. Compensation for pipelined instructions is provided and the tables can be nested and called up recursively. Additional available data can include address locations, and I/O port identification. Price: $1,400.
Reader Service #222

CT SYSTEMS Model 1470 Satellite Test Set

The Model 1470 Satellite Receiver Test Set from CT Systems is designed to simulate satellite television transmissions for testing satellite receivers. This unit has the ability to function as an IF sweep generator, and completely simulates satellite signals. The unit provides a precision 45 to 95 MHz, 0 to -79 dBm IF sweep with up to five crystal-controlled frequency markers. Features include two independent audio FM subcarrier sources, selectable for the following: mono or stereo; frequency of five to eight MHz; and pre-emphasis. Subcarriers can be modulated externally or internally.
Reader Service #223

MCG ELECTRONICS SPB Series AC Power-Line Protectors

These compact units (eight x eight x four feet) provide up to 6,000 joules/phase (watt-sec) overall absorption capability for 120 VAC to 480 VAC, single phase, wye and delta service panels. The units feature one-nanosecond component response time, automatic resets, modular construction and LEDs. Price: $755.
Reader Service #224

PRECISION MONOLITHICS SSM-2220 Transistor

Maximum input voltage noise at 100 Hz is 1nV/√Hz for this dual PNP matched transistor. With a typical gain bandwidth product of 190 MHz, and maximum offset voltage of 200μV, the SSM-2220 is geared for preamplifiers, multiplier/divider circuits, current sources and mirrors, and logarithmic amplifiers. For stability, internal protection diodes run across the base-emitter junction to clamp any potential reverse breakdowns. Available in an eight-pin epoxy DIP covering the extended industrial temperature range of -40 degrees C to +85 degrees C. Price in 100-piece quantities is $1.95.

Reader Service #225

ELECTRON PROCESSING Studio Switcher

Using sealed reed relays, this unit switches up to four stereo audio sources to one stereo output. The unit is connected to each control panel through a nine-wire control cable. Complete status indicators are set up in each studio, while a supervisory panel that overrides normal operations is provided at the switcher itself. According to Electron, the unit's passive design means that there is no noise distortion. Price: $375 for the switching unit and $75 per studio control panel. Control cable costs $45 per 100 feet.

Reader Service #226

RGB Spectrum X Series of RGB/Videolink Scan Converters

The X series of scan converters transforms computer graphics to video in real time. The 600A and 600AX convert EGA, VGA and Mac II graphics, and the 1400AX converts signals with horizontal scan rates of 45–80 kHz. Output on all three models includes NTSC RS-170A; PAL EBU standard; S-VHS; and RGB. The AX models also output Betacam/MII.

Reader Service #227

STANTON MAGNETICS 45M/MC Headphone

The single-sided, closed-ear 45M/MC is mounted on an adjustable metal headband covered with soft padded vinyl. A 200 ohm unidirectional microphone, mounted from the headphone, has a frequency response of 25–12,000 Hz and a sensitivity of 1.2 mV/Pa @ 1 kHz/im. A 12-foot dual straight cord with two quarter-inch plugs is provided. Frequency response of the headphone: 20–18,000 Hz; sensitivity: 96 db @ 0.7 V; maximum power input, each channel: 500 mW. Price: $75.

Reader Service #228

TIMELINE Lynx KCU Software Update

The Lynx Keyboard Control Unit (KCU), designed to control up to six tape machines, now has updated software to enhance its features. Through its new software, the KCU allows any machine to be operated as the master; chases a locally or externally controlled master for automated mixing; supports record mode selection (assemble versus insert editing and insert track selection); and also supports two GPIs, including duration, pre-roll, dialogue beep mode and rehearse mode. A "wild mode" allows the equipment to operate nonresolved transports or tapes with no time-code strips. Price: $3,450.

Reader Service #229

FLUKE PM 3655/R RISC Logic Analysis System

Designed to provide logic analyzer support and chip debug at full bus speed for Intel's i960 CA microprocessor (a 32-bit RISC chip based on Intel's 80960 superscaler architecture), the 3655/R includes a 96-channel logic analyzer with two K-bytes of memory per channel, a second-generation custom disassembler configured for i960 CCA, 640 K for running the disassembler under MS/DOS, and a 40-megabyte hard drive. Price: $13,200.

Reader Service #230

CINCH CONNECTORS HTD D-Subminiature Cable Ends

These 1.5-density cable ends, which the company says feature 67 percent greater contact density on both the plug and socket styles, have phosphor bronze contacts with gold-over-nickel plating and are available in 15-, 26-, 44-, 62- and 78-contact sizes. The ends have an operating temperature of minus 55 degrees C to plus 125 degrees C, a working peak voltage of 350 V DC or AC, and a proof voltage of 1.05 KV DC or AC. They are compatible with high-density D-Sub connectors, which comply dimensionally with MIL-C-24308.

Reader Service #231

Circle 113 on Reader Service Card.

OPAMP LABS A-4/2ML and A-6/ML Audio Distribution Amplifiers

Both amps feature 94 db ch. gain, 50 Hz–15 KHz (+/-2 db), eight-hours/channel on internal 12 v battery, and each measures six inches wide by eight inches deep by 1⅝ inches high. The A-4/2ML is a one-input, two-output system, while the A-6/ML has one input and six outputs. Each model is priced at $350.

Reader Service #232

OPAMP LABS A-24/2ML Audio Press Feed Transformer

A 16-pound unit mounted in a Haliburton aluminum case, this portable transformer has two balanced microphone inputs (switchable to line inputs at 10 k ohms), gain controls, VU meter, and 24 separate, transformer-isolated outputs with +18 dbm output capability. Price: $995; $1,200 (for model 2ML/B, the internal battery version).

Reader Service #233

WINSTED CORPORATION A5285 Rack Rail Brackets

These adjustable rear rack rail brackets, available in various models to fit Winsted's 22-inch and 26-inch "D" vertical and slope racks, allow the front-to-back adjustment of rear rack rails to accommodate various types of electronic equipment. Price: $18 each tapped rail for the A5285 24½-inch model.

Reader Service #234

COMPUTER ASSISTED TECHNOLOGIES BCAM Software

As described in *Television Engineering*'s April "Update," BCAM is a database program that helps station managers and engineers keep records on equipment. The menu-driven program runs on IBM PCs or compatible computers. Records for equipment inventory, equipment history and repair schedule can be created and easily accessed through directional prompts, according to the company. In addition, a knowledge base of problems and solutions can be created to help engineers with problems at hand. Future software enhancements will include ready-made databases of problems and solutions for different makes and models of broadcast equipment; and the printing and reading of bar-code labels for data input and identification of equipment and parts inventory. The price, $1,995, covers the software, a manual, one year of telephone support, and product upgrades during the first year.

Reader Service #235

SENNHEISER MKH60 Short Shotgun Microphone

This microphone has a symmetrical push-pull transducer incorporating optimum resistive loading, Sennheiser says, resulting in an ultra-linear frequency response. Capsule dimensions and electronic circuits are designed to minimize equivalent noise (S/N 86 dbA) of the mic. The impedance is low enough to drive a low-noise, Class A output amplifier delivering a high output (1.3 v) and balanced audio signal. Sound pressure levels up to 135 db are tolerated. Price: $1,190.

Reader Service #236

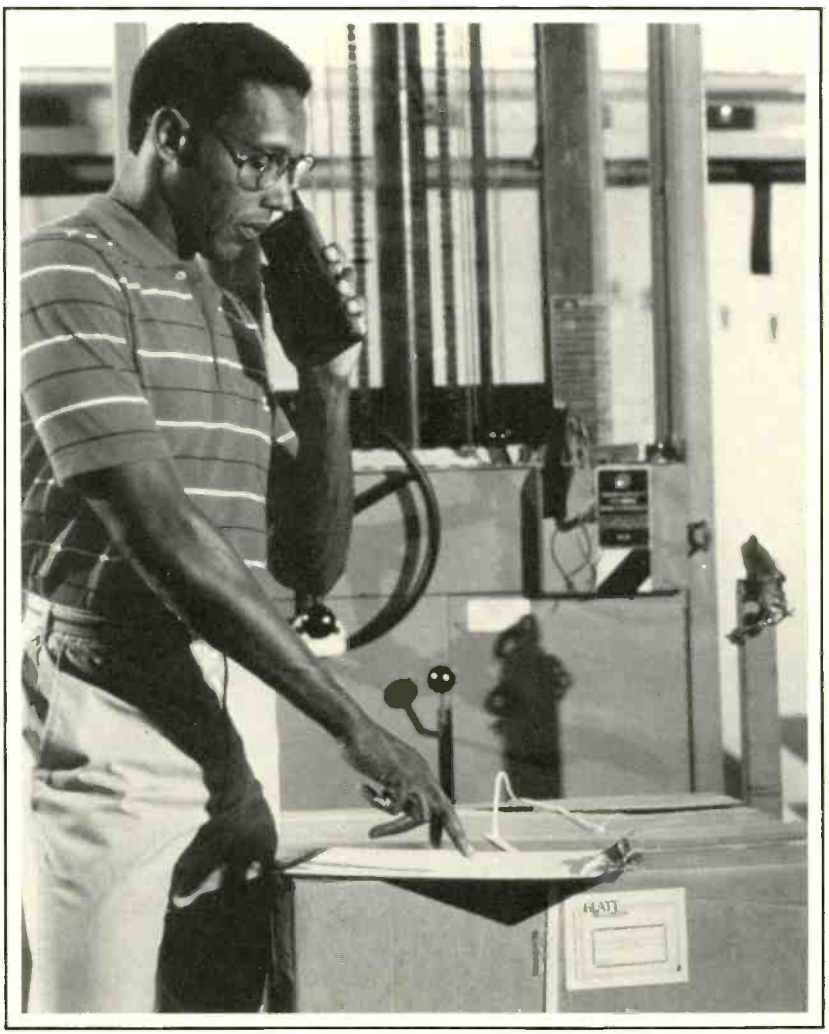
SONY LVR-5000/LVS-5000 Visual Database Software

Developed for use with the LVR-5000/LVS-5000 analog Component Recording Video Laser Videodisc Recording System, this new package allows a user to store and retrieve motion images. The windowing capability of the hardware then lets users compare visual images from

MOTOROLA MTX-810 Dual-Mode Portable Radio Series

Besides conventional repeater/talkaround capability, these radios offer a number of features: rapid channel access (automatic assignment of channels occurs in a fraction of a second during normal traffic periods); automatic call back (when all channels are occupied, the radio calls the user back when space is available); recent-user priority (if the user's response is delayed, he or she will receive priority in the system, being placed at the top of the list if all channels are busy); automatic reentry (when a user is in a fringe area, the radio will automatically be assigned to the correct channel when the radio reenters the system); and privacy (coded IDs so only authorized participants can take part in a conversation). There are four dual-mode MTX-810 models, each fully synthesized with 20-channel trunked system capability.

Reader Service #237



MOTOROLA

the database on a single monitor. According to Sony, the software permits easy creation of customized search menus, eliminates interfield jitter in video images, and offers full-motion, single-screen playback without image cropping. Price: $1,600 (excluding board).
Reader Service #238

ZAXCOM VIDEO ZX400 TBC Remote

A four-TBC/D-2 control system, the ZX400 can be expanded to an eight-TBC/D-2 system. Zaxcom's patent-pending Digimatch matching system allows matching back to setup of any memory of any tape on any machine in the system. Features include TBC transition, a real-time dissolve between memories, and memory search and recall by reel number. The basic unit has three analog TBC protocols and EDL or GVG 200 interface software. List price: $3,500.
Reader Service #239

INTELLIGENCE RECHERCHE SYSTÈME (IRS) HTZ "Le Kit" Software

This modeling software simulates the coverage zones for a variety of hertzian transmitters, aiding engineers in the cost-effective design of networks—including cellular mobile, paging, and radio and TV networks. Users can model and design point-to-point circuits and multiple locations networks. The system enables a user to vary power, type and frequency of transmitters, as well as the height of pylon and antennas before running calculations on user-supplied or commercially-supplied geographic data. Developed around a software nucleus that includes digitized land surface data (French National Geographic Institute or Spot Image-type satellite-generated), a visual display module, a file selection, and a resampling unit, the system has seven modules that can be selected according to the type of job. Module 5, for instance, calculates the diffraction fields (with values in db V/m) for a given piece of geography. User parameters in module 5 include the coordinates of the transmitter, the height of its pylon and reception antennas, the transmitter's power, its diagram of horizontal and vertical weakening, and its emission frequency (from 55 MHz to 1,200 MHz). HTZ "le Kit" runs on IBM PC/ATs or IBM PS/2s under Microsoft's MS-DOS operating system, as well as on Apollo Computer hardware under Unix System V, and Digital Equipment platforms under Ultrix. IRS will sell direct or license in the U.S., and the French company is looking to create a distribution network. Price: $20,000.
Reader Service #240

NEW PRODUCTS

SONY PVM-3230 Monitor

High-resolution pictures from a variety of sources are among Sony's claims for this new 32-inch monitor, which offers horizontal resolution of 650 TV lines (composite video inputs) and 640 x 200 pixels (RGB inputs). There are two composite video (BNC) inputs, two S video (Y/C, Mini DIN four-pin) inputs, VTR (eight-pin) input, and Analog (BNC)/Digital (D-sub nine-pin) RGB inputs. The unit is IBM PC- (CGA graphics) compatible and also accepts external sync and sync on green. It has a comb filter to preserve full luminance bandwidth; a wideband chroma circuit to minimize blurring; a dynamic color circuit; a dynamic picture circuit for contrast control; selectable digital noise reduction; and a degauss switch to demagnetize the screen manually or automatically. The monitor includes a wireless remote. Price: $2,799.

Reader Service #241

VISUAL INFORMATION INSTITUTE

VISUAL INFORMATION INSTITUTE 2701C Video Pattern Generator

Manufactured for industrial, medical, computer, and military display device performance testing, the 2701C provides video pixel clock rates of up to 125 mHz, full eight-bit digital capability at all clock rates, and outputs in RGB color-video format with nominal three nsec. rise and fall times. All operations are controlled through a front-panel keypad coupled with a built-in cathode ray tube display. There is an optional built-in floppy disk drive. Price: $9,500.

Reader Service #242

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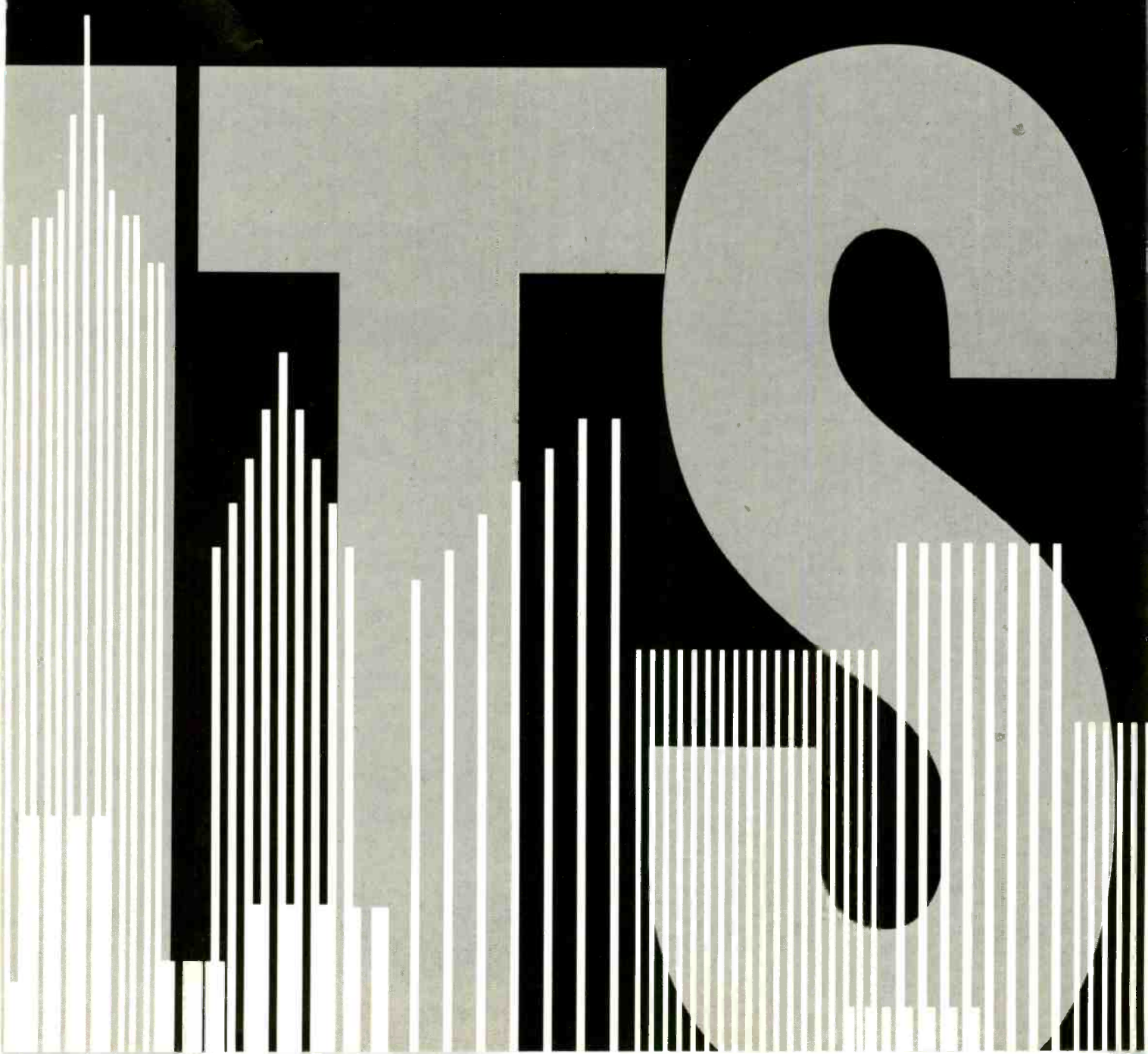

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___Equipment Wanted
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___Services
___Teleprompting
___Training & Instruction
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Canon is the number one lens in every sense. Quality, application and significance.

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Our product line is the most comprehensive in the business and includes our new J14a x internal focusing lens, the only standard square lens available. Our response to the industry's needs.

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Canon
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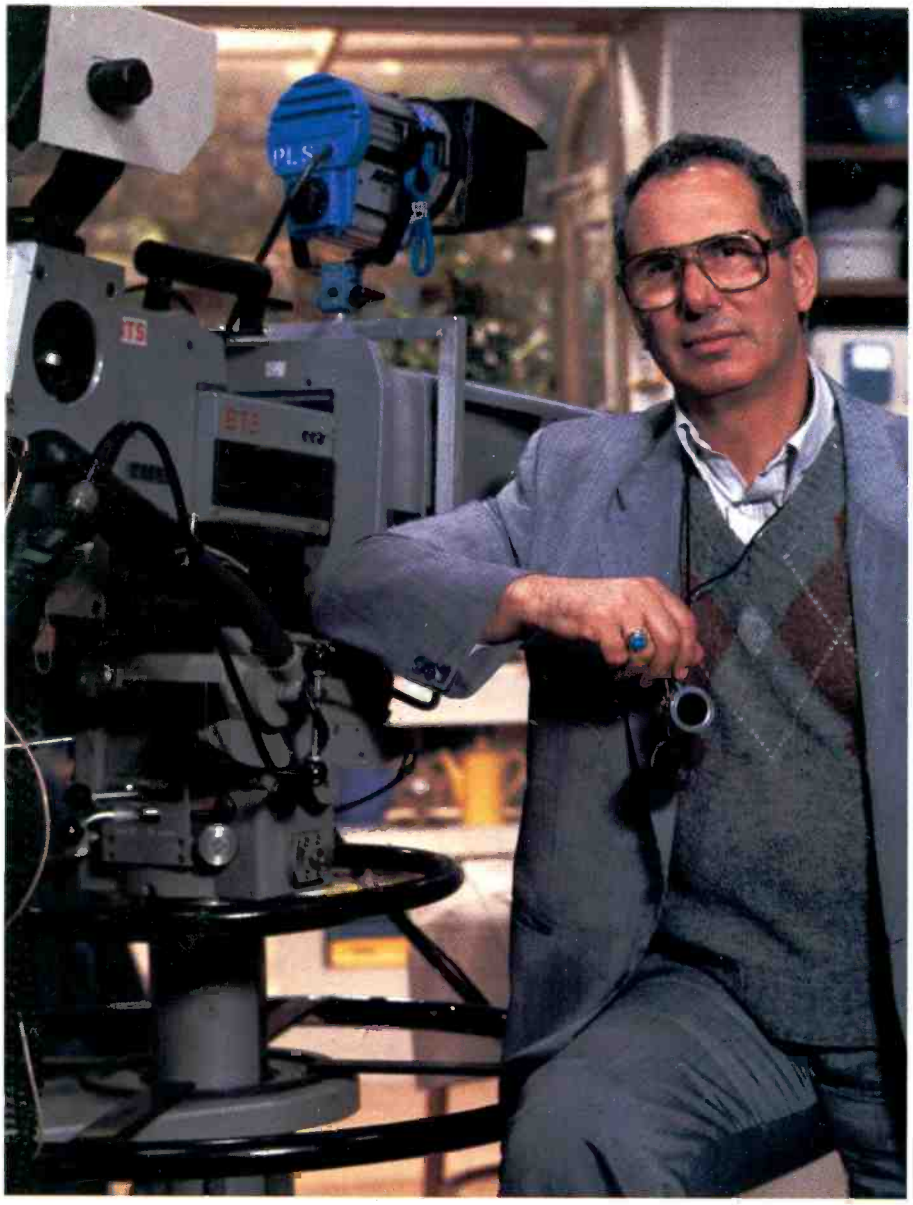

Name: George Spiro Dibie

Profession: Supervising Director of Multicamera Photography for Warner Brothers Television.

Current Credits:
Growing Pains
Just The Ten Of Us

Organizations:
President, International Photographers Guild, Local 659, Hollywood; member, Directors Guild of America (DGA); member, Society of Motion Picture and Television Engineers (SMPTE). TV Academy, A.S.L.D. and S.O.C.

Awards:
Winner of three Emmys.

George Spiro Dibie on Production Lighting:
"The most important concept is to follow the source. Windows, doors, lamps...these are the sources of light in a scene. I start from there. To accommodate one camera or multi-cameras, you deal with the feel of the source."

George Spiro Dibie on BTS LDK-90 cameras...

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BME's

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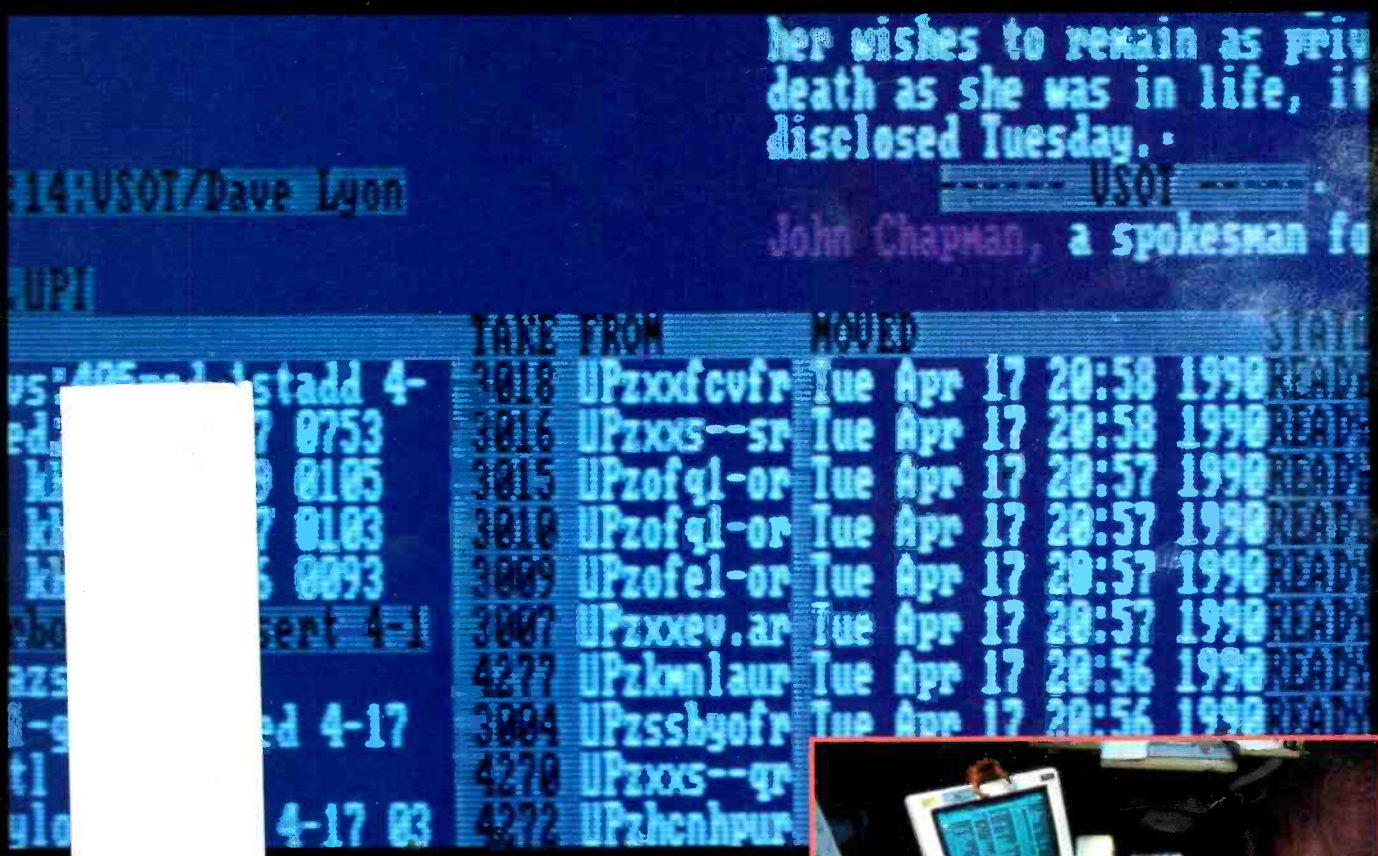
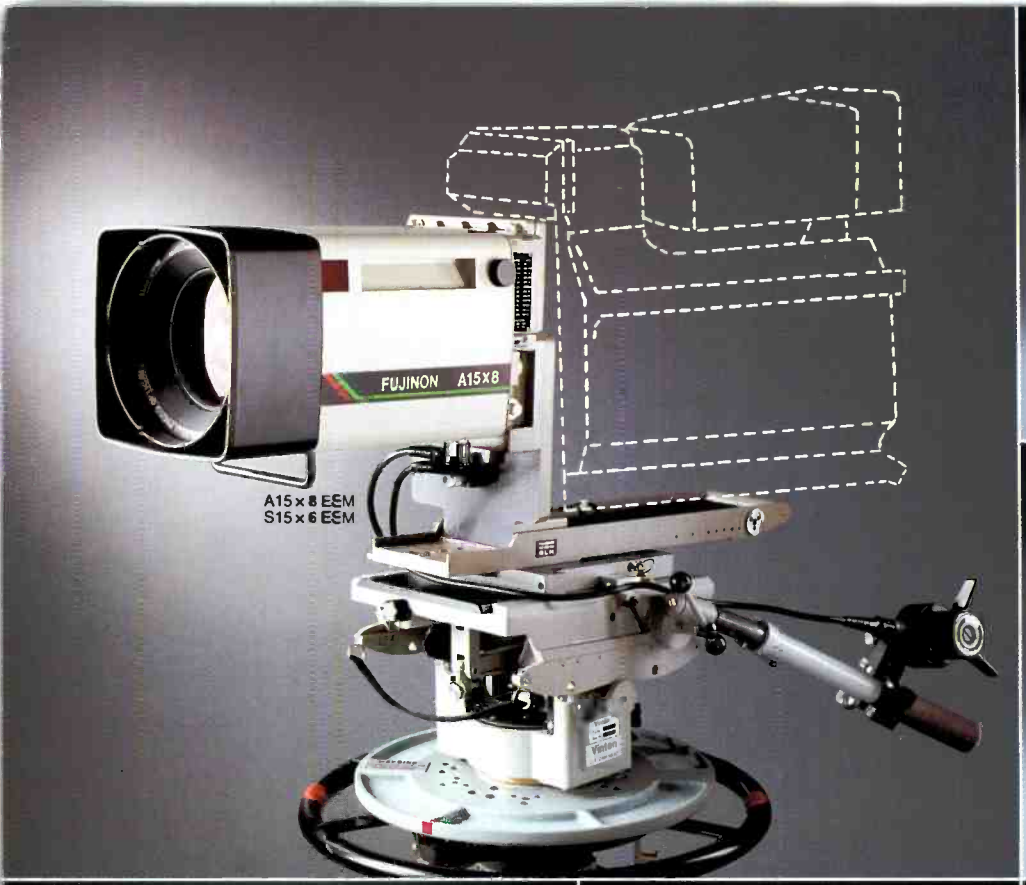
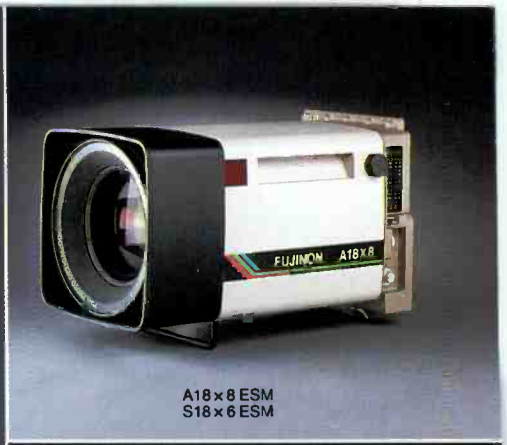


NEWSROOM AUTOMATION

DOES IT REALLY BENEFIT THE BOTTOM LINE?



A15x8 ESM
S15x6 ESM



A18x8 ESM
S18x6 ESM

A20x7 ESM
S20x5.4 ESM

A55x9.5 ESM
S55x7.3 ESM

A44x9.5 ESM
S44x7.3 ESM

A34x10 ESM
S34x8 ESM

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Long before anyone seriously considered CCD cameras for studio use (more than 3 years ago), FUJINON was developing and perfecting lenses in anticipation of today's cameras. To meet their far higher transmission requirements, the drastically lower distortion, and advanced electro-mechanical demands, FUJINON made the commitment and the investment. The same resources and experience responsible for making FUJINON the leader in HDTV optics make FUJINON first in CCD lenses today.

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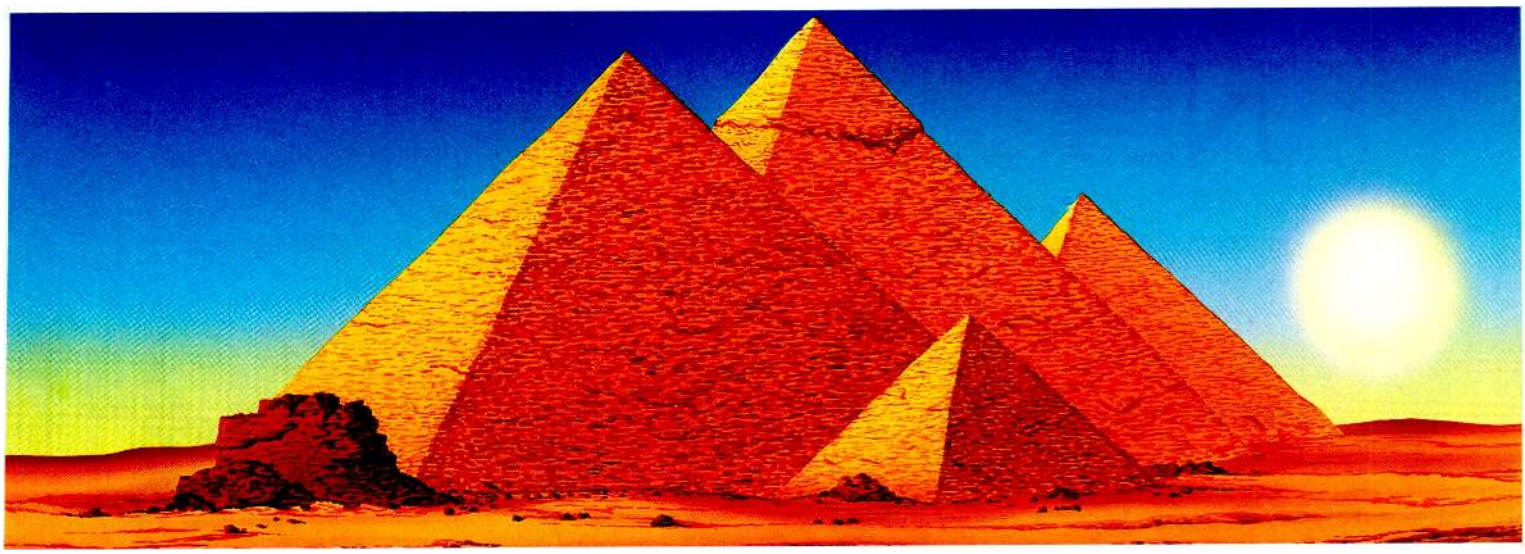

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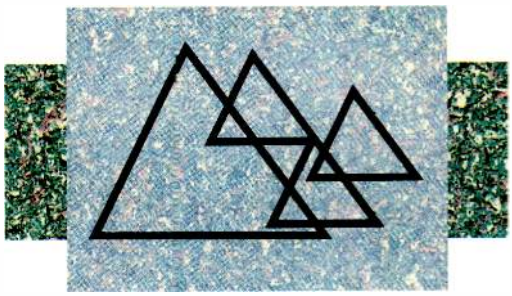

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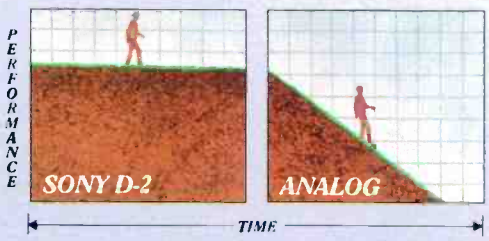
Circle 101 on Reader Service Card.

To everyone with their video it's time to

Not long ago, these facts would have been fiction. Then Sony introduced D-2 composite video.

D-2 takes the amazing possibilities of digital technology and makes them a practical reality.

In fact, revolutionary is the only way to describe it. D-2's digital world is a place where performance is consistently extraordinary. Where every tape copy is as good as the original. Where audio is as important as video. And where machines operate without the need for constant adjustments.

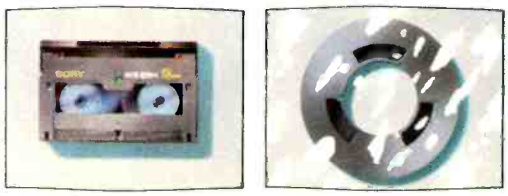


D-2 maintains consistently high performance.

In the digital world, a D-2 VTR does its job just about perfectly. So you can too.

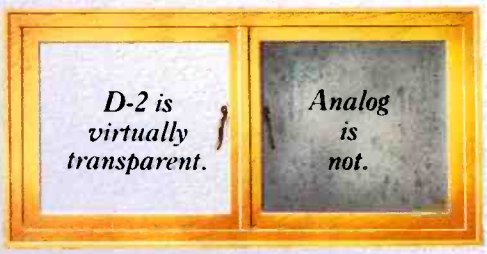
And it's all a matter of fact.

D-2's picture quality is exceptional from the start, and it stays that way consistently. Here's why:


D-2 effectively eliminates dropouts.

D-2's unique error correction and concealment system means you'll never have to worry about dropouts.

D-2's digital transparency is another clear advantage.



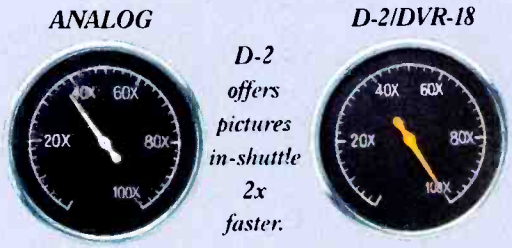
And copies of D-2 tapes aren't dubs.

They're "clones." Digital replications indistinguishable from the original.

As for audio, D-2 VTR's have broadcast sound quality previously unheard of.

formance machine would be hard to work with. But in fact, D-2 is quite easy to use.

For example, D-2 shows you pictures-



D-2 offers pictures in-shuttle 2x faster.

in-shuttle faster and in color. So you can work more quickly and efficiently. And one person can comfortably operate up to eight D-2 VTRs. Which makes it a lot easier to do a lot more.

who's satisfied tape recorders, face the facts.

Given all this intelligence, you'll have to agree. Sony D-2 sets a new standard in recording technology. After all, you can't argue with the facts.

D-2 combines digital audio with digital video.

Four independently editable channels of CD quality digital sound. In stereo that never needs a phase adjustment.

Fact is, no other composite VTR performs as well as D-2. In both video and audio. You might think such a high per-

D-2 lets one person easily operate up to eight VTRs.

For more information call (800) 635-SONY.

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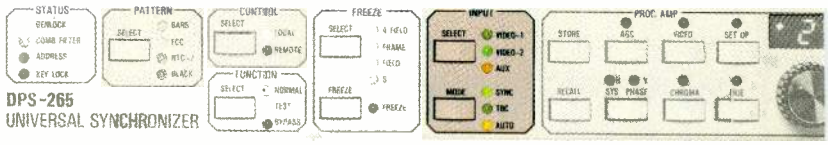
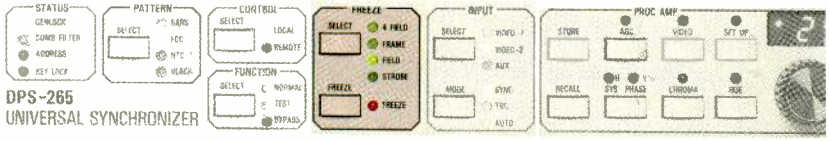
The Whole is Greater Than the Sum of Its Parts.

. . . . . The Price is $13,000 Less.

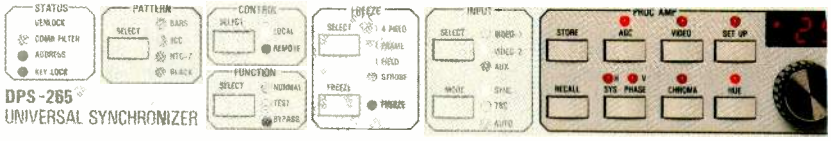
Starting with a Four-Field Wide Band Synchronizer for $5,995.*



An infinite window TBC for $4,995.*



A Digital Proc Amp with AGC, Black/White Clip and 10 memory presets for $2,580.*



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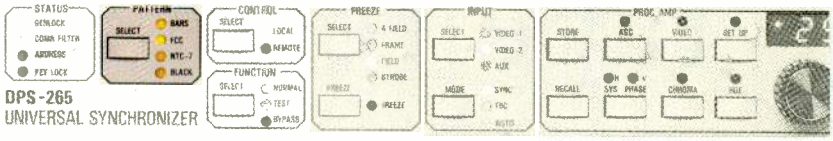

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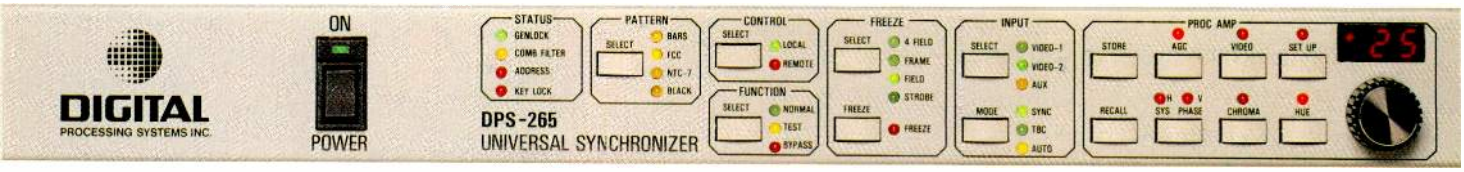

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BME's
Television Engineering
MAY 1990 VOL. 26, NO.5

Features

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Closeup of a newsroom computer screen courtesy of BASYS, Inc. Photography by Fried-Louis Studio, Yonkers, NY. Cover story begins on page 26.

39 *TBCs make possible* "America's Funniest Home Videos" *with host Bob Saget.*

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26 *More TV stations are installing computerized newsrooms. When are they a wise investment?*

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BME's Television Engineering (ISSN 0005-3201) is published monthly by ACT III Publishing. BME's Television Engineering is circulated without charge to those responsible for television station and teleproduction facility operations and engineering, and to those responsible for specifying and authorizing the purchase of equipment used in television facilities in the U.S. and Canada. These facilities include VHF and UHF TV broadcast stations, cable TV systems, TV networks, corporate TV operations, audio and video recording studios, teleproduction and postproduction houses, consultants, etc. Subscription prices are $36 one year, $50 two years. Overseas: $50 one year, $75 two years. Air mail rates on request. Second class postage paid New York, NY, and additional mailing offices.

POSTMASTER: send address changes to BME's Television Engineering, P.O. Box 6056, Duluth, MN 55806.

Columns & Departments

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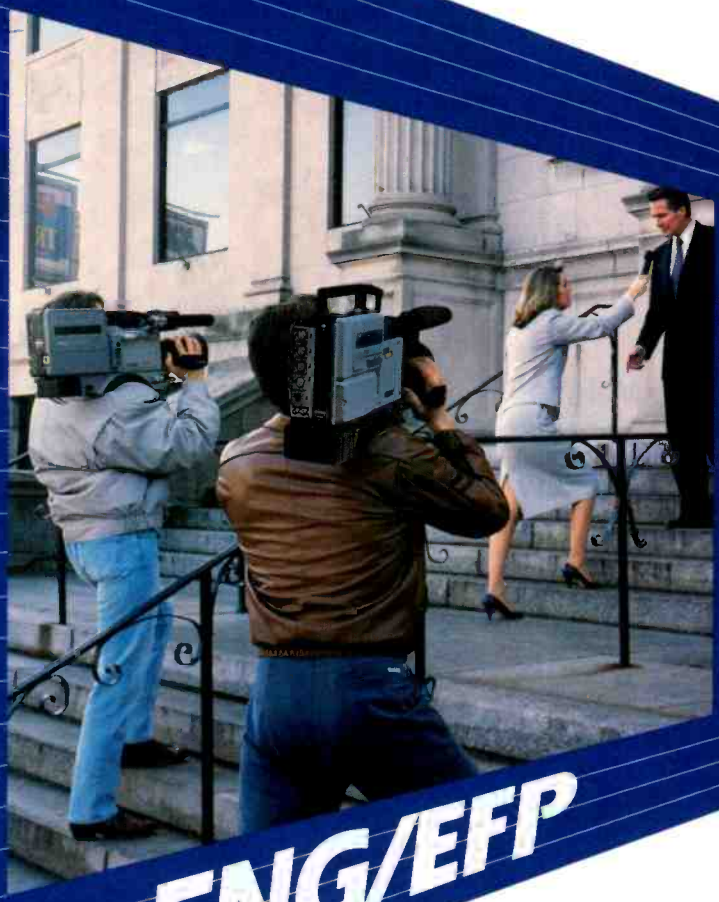
Panasonic Has Down To



ENG/EFP

STUDIO

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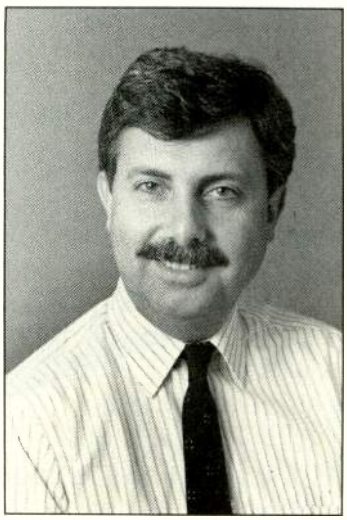
VIEWPOINT

The FCC did the right thing by rejecting HDTV augmentation systems and postponing selection of an EDTV standard.



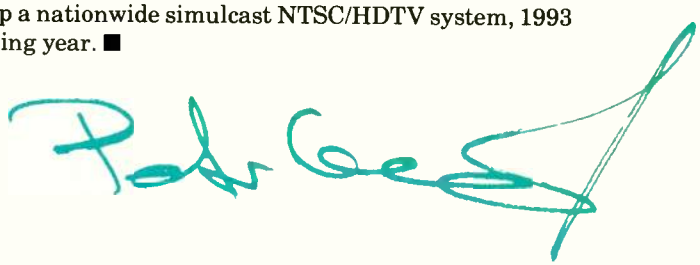
Our slow, deliberate march toward establishing an advanced TV transmission standard in this country took two steps forward recently when the Federal Communications Commission stated its intention to back a simulcast system, and to rule on a high-definition TV standard by mid-1993, prior to ruling on any standard for enhanced-definition TV.

By opting for the simulcast route, whereby stations would be given second six-MHz channels on which to simultaneously transmit a compressed HDTV signal of their NTSC programming, the FCC effectively precluded the establishment of cumbersome augmentation systems. (Under an augmentation system, stations now transmitting NTSC would be assigned second channels of between three and six MHz to transmit supplemental information needed to "augment" their NTSC signal for better resolution and aspect-ratio changes. Special home sets would combine NTSC with augmentation information to create HDTV images.)

In making this decision, the FCC, at a stroke, eliminated potential spectrum-availability and utilization problems that the selection of an augmentation system would entail. That's because once an augmentation system got established, it would perpetuate double-channel transmission of each HDTV signal, which would occupy nine to 12 MHz of bandwidth. With simulcast, each HDTV-transmitting station would initially occupy 12 MHz of bandwidth—six MHz for NTSC and six for HDTV. However, once HDTV sets penetrate a sufficient number of TV homes, the NTSC channels could be dropped, liberating precious bandwidth for other purposes.

The FCC's other decision—not to rule on any EDTV system prior to reaching a final ruling on an HDTV standard—eliminates the possibility of an enhanced system taking root in the marketplace before HDTV. Such a development could stall the emergence of a full-blown HDTV standard, which is now obviously the Commission's goal.

In making both of these decisions, Chairman Sikes's FCC clearly declared itself in favor of high technical standards and maximum picture quality. Assuming that full HDTV signals can be successfully compressed into six MHz, and that space can be found on the terrestrial spectrum for all the additional channels necessary to set up a nationwide simulcast NTSC/HDTV system, 1993 will indeed be an exciting year. ■



Peter Caranicas
Editor in Chief

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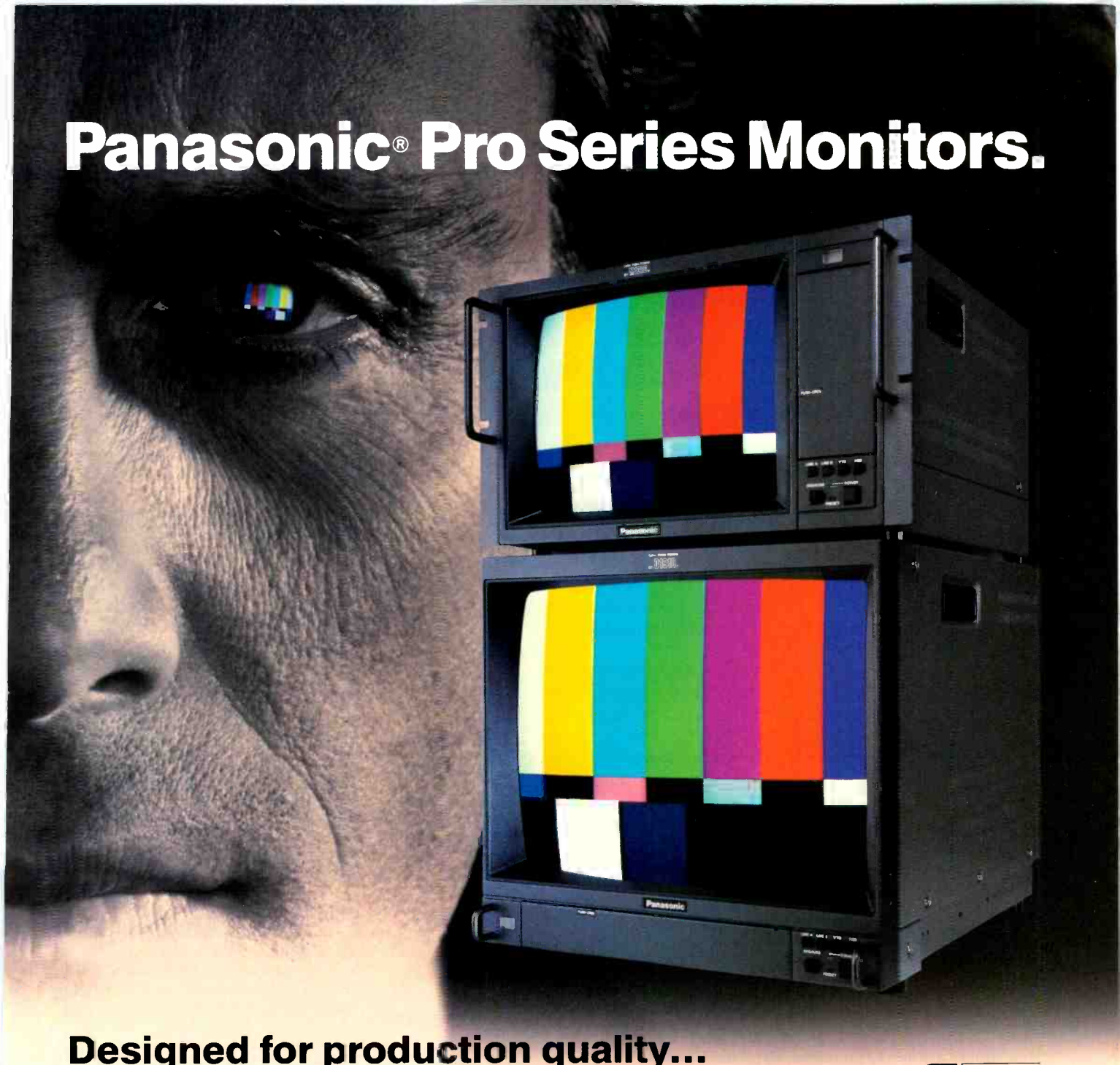

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UPDATE

HDTV Teleconferences Take to the Air .... Airwave Overcrowding Warned Against .... Ampex Helps Free Romanian Television .... Survey on Uplink-Provider Practices .... What's Hot, What's Not, at Sony .... Strategic Alliances: Aston/Paltex, Chyron/Midwest

HDTV Teleconferences Take to the Air

In an industry where "firsts" are announced on a regular basis, two recent claims are notable, at least for their use of HDTV technology.

On February 12, the Sony Advanced Systems Company combined with Scientific-Atlanta Inc. to produce what was billed as the "first live HDTV interactive teleconference" for MAST Industries, Inc. The conference allowed merchandise buyers and design officials located at MAST's Andover, MA offices to view fashion merchandise from vendors located in Hong Kong.

MAST Industries, Inc., is the design and purchasing division of The Limited, Inc., a major fashion retailer with over 3100 stores operating under the following names: The Limited, Victoria's Secret, Lerner, Lane Bryant, Henri Bendel and Abercrombie & Fitch.

The teleconference provided close-up HDTV images of fashion merchandise, so that buyers could make "on-the-spot" decisions without traveling to Hong Kong to meet with the vendors. The quality of the HDTV image made it all possible, according to Martin Trust, the president of MAST. "In our business, color, texture, style, quality and timeliness are essential factors in making buying decisions," he says. MAST officials believe that the use of teleconferences will shorten the amount of time between the purchase of offshore merchandise and its appearance in local stores.

MAST Industries, Inc. teleconference delivered the goods for store buyers halfway around the world.

Prime contractor for the teleconference was Sony Corporation of America. Sony's Video Conferencing and Satellite Systems Division and the Sony Advanced Systems Company participated in the project, with Sony-supplied hardware used in Hong Kong and Andover.


"Innovations in Rhinoplasty," a teleconference produced by Hospital Satellite Network, brought plastic surgery to life in HDTV.

Steve Lysohir Productions produced the American segment, with Sony HD Software Company of Tokyo handling production in Hong Kong.

Scientific-Atlanta, Inc. HDB-MAC technology was used for transmission, which included two bidirectional satellite hops: over the Pacific via Intelsat, and over the U.S. via GE Americom. Land-based fiberoptic links were used as well, with Cable & Wireless (HK) Ltd., and Hong Kong Telephone providing fiberoptic circuits for the Hong Kong segment. The entire network was assembled by Vision Accomplished of Santa Monica, CA.

On March 3, Los Angeles, CA-based Hospital Satellite Network, a provider of medical educational programming to hospitals throughout the country, produced what was billed as the "first HDTV interactive medical teleconference." The program, "Innovations in Rhinoplasty: Augmentation/Reduction," featured highlights of two pretaped operations performed by Jack H. Sheen, a noted plastic surgeon, along with questions from the live viewing audience.

According to Richard Schreier, VP of Hospital Satellite Network, his company elected to produce the program in HDTV "because HDTV can generate more realistic, [more] dimensional images than regular TV." The teleconference was beamed to two HDTV sites: Sunderland Auditorium at St. Lukes-Roosevelt Hospital Center in New York City, and Factor Auditorium at UCLA. An additional 1700 hospital sites viewed the program via a standard NTSC satellite feed.

Technical support was given by NHK Enterprises USA, Inc., with Hughes Communications Inc. providing satellite transport.

With this use of HDTV for business and educational programs, these "firsts" are most likely the first of many firsts to come. —*William A. Owens*

Airwave Overcrowding Warned Against

The National Association of Broadcasters has filed with the FCC, cautioning the Commission against overcrowding the airwaves by approving too many new services, such as mobile services, a satellite sound-broadcasting service in the 500–3000 MHz range, and HDTV satellite broadcast. Questioning whether any more spectrum space can be supported without interfering with or displacing TV and radio signals now in use, the NAB urged the FCC to "responsibly [assess] whether there is any demonstrated need for the suggested services, especially in light of the intense use of these frequency ranges for conventional broadcast and broadcast auxiliary services." Pressing the issue further, the NAB advised regulators to follow allocation policies that will "stress the use of terrestrial, local stations to provide responsive programming in the local public interest. At stake, according to the NAB, is "the universal availability of free, over-the-air radio and TV service." ■

Ampex Helps Free Romanian Television

Fighting during Romania's December overthrow of dictator Nicolae Ceausescu damaged the state television facility, resulting in the loss of much technical equipment.

Working with the United States Information Agency (USIA), Ampex Corporation dispatched a crew to evaluate damage and to assist in the start-up of newly formed Free Romanian Television. The company donated Betacam-format studio VCRs and ENG equipment to the fledgling service.

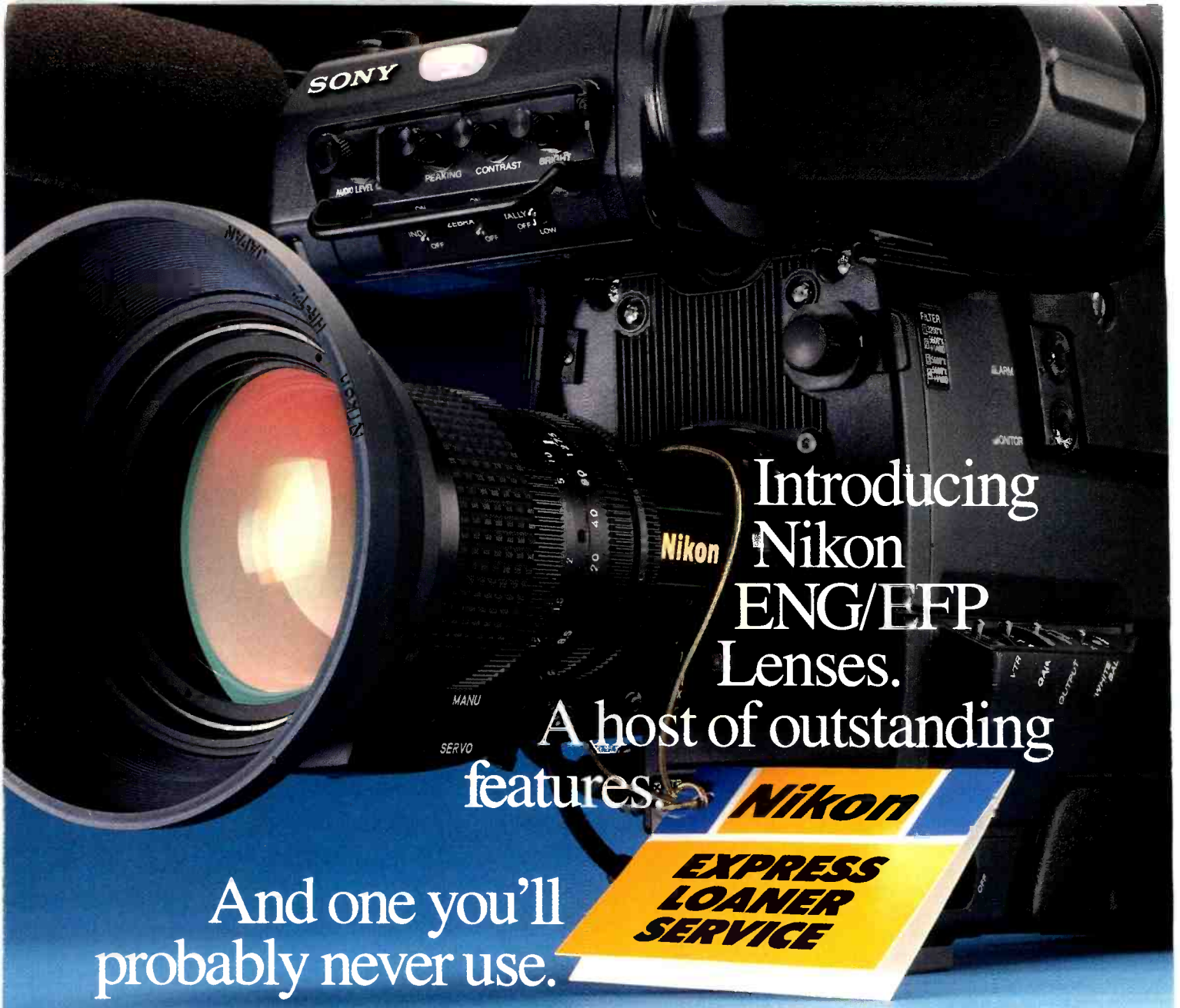
Ampex claims to be a major supplier of television equipment and tape to Eastern Europe and the Soviet Union. According to Ampex President and CEO Ron Ritchie, Ampex has had a relationship with Dr. Stanciu [deputy general manager of FRT] since 1971.

"We realized that we had equipment that could help FRT resume normal operations," Ritchie says.

The Ampex donation may not be the last from U.S. companies. USIA di-

Company News

Two major competitors of post-production services in Dallas, TX have merged: **Dallas Post-Production Center** and **Tele-Image** have combined to form **Pyramid Teleproductions**, which now lays claim to being the largest video post-production firm in the Southwest . . . . **Calaway Editing** has named two distributors: **Beers Associates** in the Northeastern U.S. and **Shoreline Professional Video** in southern California . . . . **New England Digital** says its fourth-quarter 1989 sales show that the digital audio workstation maker is broadening its customer base. In addition to members of the music recording industry, video post-production houses and broadcasters have joined New England Digital's customer list . . . . **Paltex** will market its editing systems in Japan through **The Victor Company of Japan, Ltd** . . . . **Canon U.S.A.** has moved its Broadcast Equipment Division headquarters to Englewood Cliffs, NJ . . . . **Ampex** has added **Videoplay Industries, Inc.**, Tolland, CT to its list of dealers . . . . FlyPak, a portable multi-cam production unit, is the marketing objective of a joint venture between **One Pass** and **Starfax** . . . . **Dubner Computer Systems** has agreed to sell **ImageWare** software as an option to Dubner's Paint Systems . . . . **A/Z Associates**, a new marketer of high-end telecines, editing systems and automated program-delay systems, has been created by Harry Adams, founder of manufacturer **Adams-Smith** . . . . **Neve** has changed their address to 7 Parklawn Dr., Bethel, CT, after a move to larger facilities in the same industrial park; phone and fax numbers have not been changed . . . . **VSC Post** has opened a second facility at 25 West 45th St. in New York City; equipment includes Grass Valley Kaleidoscopes, Sony Beta SPs, and a Harry LP with Harry Sound . . . . **Telmak U.S.A.**, which markets the Neriki Image Master and Desktop genlocks, has moved from New York to Glendale, CA . . . . **CMTV** says its new home in Burbank, CA, is four times the size of its most recent facility . . . . **Tektronix** recently entered the image-processing market by teaming with **Image Data Corp.** to create a fully integrated image and graphics superworkstation, available later this year. . . . **First Choice Market**, a new broadcast manufacturer marketing firm, will be based in Seattle, WA. ■



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UPDATE

rector Bruce S. Gelb and FRT officials are discussing ways in which the U.S. private sector can help.

A classic example of good business relations, Ampex's donation may help the company exploit some burgeoning markets. Dennis Atkins, Ampex's marketing manager for Europe, Africa and the Middle East, sees great potential for the company in the privatization and deregulation sweeping European broadcast industries: "Countries where there was a single government-controlled broadcaster only a few years ago are blooming into two or three channels of regional broadcasting. Plus, there's been a tremendous opening up of Europe to commercial stations." Atkins also sees a notable expansion of video and post-production currently underway in Europe. ■

Survey on Uplink-Provider Practices

Automatic Transmission Identification System (ATIS) is not catching on with the satellite uplink industry, according to results of a recent survey of 40 uplink providers by Hughes Television Network (HTN). Despite an FCC recommendation to do so two years ago, none of the 40 satellite uplink providers are using any method of ATIS.

Although ATIS is touted as a method of identifying and alleviating signal interference, David Higgins, director of engineering at HTN, sees three roadblocks to implementation: "vast differences between ATIS methods," "high costs" and "lack of a clear mandate for their use."

HTN's survey, which focused primarily on transmissions involving single, full-transponder video and dual-subcarrier audio, also revealed a wide consensus on signal-transmission levels for video, but no such consensus on audio. Ninety percent of the providers reported using 10.75 MHz video peak deviation for 36 MHz occasional C-band transmissions. For audio, HTN says the uplink providers appear to honor customer requirements.

HTN hopes to help establish standards for uplink practices. The company has recommended the survey's consensus video spec to NAB and will recommend audio subcarrier deviation levels of 25 KHz at 0 dbm for average program levels and 75 kHz at +10 dbm peak levels. ■

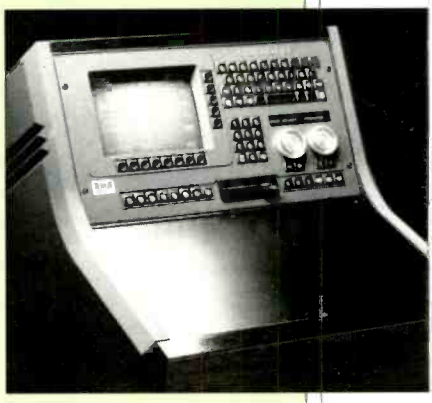
What's Hot, What's Not, at Sony

On March 6, at its annual "Pre-NAB" press briefing at its Teaneck, NJ offices, Sony clearly directed major promotional efforts towards its D-2 and Beta-SP technology. While company officials gladly quoted sales statistics on both D-2 and Beta machines, no mention was made of sales figures for D-1, or of its future prospects.

Interestingly enough, much was made of Sony's new video-switcher line, and of the black boxes planned by the company to

Equipment Sales

Turner Broadcasting in Atlanta has installed an **Abekas** A53-D Digital Effects System to produce 3-D effects for commercial television . . . . Telecom Australia has purchased 95 video measurement sets from **Tektronix Australia PTY Ltd** . . . . The Weather Channel is upgrading its master-control facility with two **Odetics** products: a TCS2000 Cart Machine and an XR800 External VTR Controller . . . . **Paltex** has installed an Elan 4/8 editing system at KBRK-TV in Sacramento, CA . . . . **Unitel-Mobile's Red Unit** moved with "Steel Wheels"—the recent Rolling Stones tour. The mobile unit, featuring double expansion capability and 69 monitors, covered the Stones in Montreal's Olympic Stadium and at the Atlantic City Convention Center . . . . More for Stones fans: **Broadway Video Graphics** of New York was called upon by Andrew Solt Productions of Los Angeles to create the 52-second opening title sequence for a Stones video . . . . CBS is using two **AMS** AudioFile systems, one for post-production and one for TV production—including "on-air" applications . . . . The Home Sports Entertainment Network, Houston, TX became the site of the 200th installation of **Chyron's** CMX 3600 editing system . . . . **Rebo Studios** in Manhattan is expanding; four video post suites, two off-line edit rooms, and two computer graphics suites are among the additions to Rebo's facilities . . . . British Columbia Television Broadcasting System has upgraded its **Satellite Information Systems Company (SISCOM)** NewsPro newsroom computer system . . . . Recent customers of **Neve's** Prism signal-processing systems include The Castle Recording and Javelina Studios in Nashville and Sting's Roxanne Music . . . . Midilab of Chicago recently purchased a **Digital Dynamics** ProDisk-464 digital audio recording and editing system. ■



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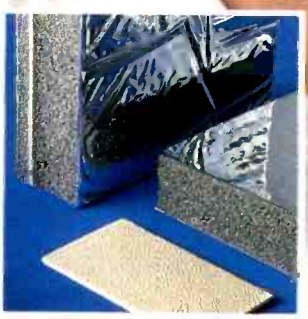

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UPDATE

help interface digital and component analog signals into the composite analog world.

It would appear that station and facility owners are holding back on the purchase of "pure" digital equipment, waiting for less costly models, or perhaps for a better market climate. Sony's focus on D-2 may well be a reaction to customer needs for a less expensive "high-quality" technology. ■

Strategic Alliances: Aston/Paltex, Chyron/Midwest

Character-generator makers etched a lot of business news in the days leading to NAB, as Paltex International and Aston joined forces for marketing clout, while Chyron Corporation and Midwest Communications agreed not to merge.

In late February, Paltex International, Tustin, CA, announced that it had completed negotiations on an exclusive licensing agreement with Aston Electronic Designs Ltd., of Surrey, England. The agreement calls for the immediate takeover by Paltex of manufacturing, sales and technical support of all Aston products designed for NTSC applications and markets.

Since its acquisition of Convergence Corporation just over a year ago, Paltex has built a solid dealer base in the U.S. The licensing agreement provides that network with the line of Aston products, including the Caption and Aston 4 character generators, and the Wallet still store.

Paul Stewart, with Aston since its debut in the U.S., joins Paltex as Aston product specialist, to provide customer support as well as assistance to the new dealer group in the training and technical areas. He will be based in Tustin.

The manufacturing, quality control, and distribution activities of Aston will remain in Kansas until the facility in Tustin is able to accommodate them.

Meanwhile, the much talked-about merger of Chyron Corporation and Midwest Communications has been called off. A March 2 press release stated that the two companies "had been unable to reach agreement on definitive terms for the merger."

Midwest is a major video equipment distributor and systems integrator. The Chyron Group includes Chyron, DSC, CMX and Aurora.

Chyron's press release stated: "Neither [Midwest or Chyron] expects that the failure to reach agreement will disrupt their long-standing commercial relationship." ■

Television Engineering *welcomes your comments and opinions. Write to us c/o Editor,* Television Engineering *magazine, 401 Park Avenue South, New York, NY 10016. You may also fax us at 212-696-4215.*

People on the Move

Sony Corporation of America continues to make key personnel moves in its Business and Professional Products Group. Most recently, the company appointed presidents at three of the four arms in BPPG: the Sony Communications Products Company (SCPC); Sony Operations and Technical Services; and Sony Systems and Technology. Mark Gray, who joined Sony in 1989 and has over 20 years in broadcast-related industries, is the new SCPC president. Richard K. Wheeler is now president of Sony Operations, and Dr. Harry Taxin is the new president of Sony Systems. Taxin is responsible for R&D systems development and for Sony's Advanced Video Technology Center. Late last year, Sony made several appointments at Sony Professional Video, one of three operating groups in SCPC. Gary Johns was appointed to a new position as national sales manager for business applications; Luke Rawls became sales manager of Video Library Systems; Conrad Coffield is now director, marketing; Jack Mann is marketing manager of display products; Adam Shadle is marketing manager for production video tape recorders—responsible for developing marketing programs for U-Matic, U-Matic SP and Betacam products; and Steve Difranco (formerly with Dynatech Corp.) is marketing manager for systems products. On the audio side, Courtney Spencer has joined Sony as VP of SCPC's Professional Audio Division. "We recognize that our customer base, customer requirements and products are expanding," comments Charles Steinberg, president of Sony's Business and Professional Products Group . . . . **Allied Film & Video** has named Mark Anzicek as its director of engineering . . . . Max Berry has joined **Faroudja Research Enterprises** as strategic planning manager. Berry will help define strategies for the Super NTSC and HDTV . . . . Houston Pearce, president of WTUG-FM, Tuscaloosa, AL, has been appointed to the **National Association of Broadcasters Radio Board of Directors** . . . . Stuart R. Smith has been recently named new chief engineer at **WMAG-FM** and **WMFR-AM** of Greensboro, Winston-Salem and High Point in NC. ■

Mark Gray, Sony.

Viacom Breaks the Digital Barrier

By Dan Daley

Viacom International's recent conversion to a total D-2 digital tape operation—making it the first such installation—is not only a large undertaking for the company, but one with portentous overtones for an industry that sometimes regards digital technology as a paradox: both inevitable and an expensive luxury.

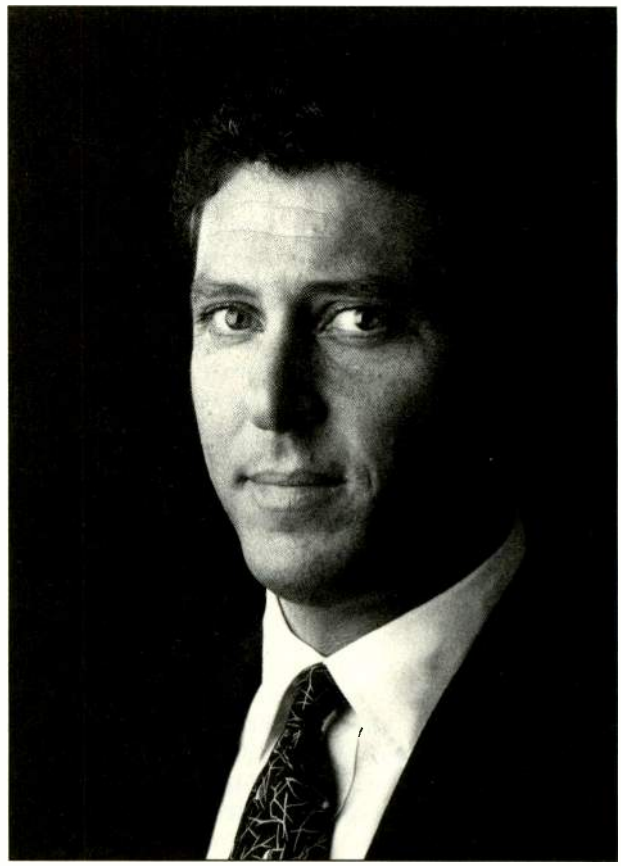
Scott Davis, Viacom's senior VP for network operations, concurs wholeheartedly with the inevitability of digital, but does not see it as an expensive luxury. "We checked the economics very carefully when we first considered this change," he explains. "Given the advantages that D-2 offers us in terms of power consumption and space savings, among other things, we expect it won't take long to recover the conversion investment. It's really a natural part of the progression of updating the industry."

Davis says Viacom selected D-2 for a variety of reasons, including the fact that D-2 offers both video and audio in a digital format while making available four independent digital audio tracks.

Viacom International Inc., which owns and operates MTV, VH-1, Showtime, The Movie Channel, Nickelodeon and the nascent Ha! The TV Comedy Network, spent "several millions" of dollars on the transition, Davis says. In addition to upgrading to Sony D-2 decks, Viacom began to convert to the Sony LMS (Library Management System) last December, with completion expected by last month.

The LMS equipment, which was installed at Viacom's Network Operations Center in Smithtown, Long Island, NY includes three 1000-bin LMS machines, two 300-bin machines and a single 80-bin machine. MTV and Nickelodeon/Nick-At-Nite were the first to go on-line with the D-2/LMS combination, with Showtime coming on shortly thereafter. Showtime will use two of the 1000-bin machines and one 300-bin unit. VH-1 and The Movie Channel will use a 1000-bin machine and a 300-bin machine, respectively. The 80-bin deck will be employed for network continuity and compilation.

The LMS system has up to six videotape transports per unit; software programs—in this case modified by Sony to Viacom's requirements—direct the storage and loading of cassettes placed in the bins. Information about each cassette is contained on bar codes, cross-referenced between a data base and a log which is constantly being monitored and reviewed by the LMS computer. "Among the modifications we requested from Sony is the capability within the software to vary the duration of time prior to the indication of when a new tape needs to be actually loaded into the LMS," Davis says.



Scott Davis, Viacom's senior VP for network operations, says the move to D-2 was a "sound business decision."

"The system produces a series of flags alerting us to when we have to intervene in what is otherwise a sophisticated computer-assisted and error-free system of event management," he adds. Also, system management efficiency becomes enhanced; for example, the tech staff can call up reports on a variety of categories, such as inventory, running logs and as-run logs, rather than have to go to each machine independently.

LMS is expected to be a particular boon to the audio-conscious MTV, according to Davis. "Unlike broadcast networks, MTV's elements are not standard 15-, 30- and 60-second lengths," he says. "The LMS system will total the elements' running time automatically, either for a given hour or from any two points we choose within the hour. Now all we have to do is look at the surplus time, remove the option elements that total that

surplus, and bring the network back to time—all at the touch of a button."

While the LMS system puts Viacom at the leading edge of program management technology, it wasn't purely the lure of state-of-the-art that triggered Viacom's move to digital tape operation. The benefits that Davis alluded to earlier are documentable and substantial: 1) an anticipated 50 percent reduction in power consumption at the Smithtown facility; 2) the capability to preserve quality from generation to generation; 3) the freeing-up of one third of the technical floorspace at the Operations Center; and 4) longer tape stock life.

"This is the new one-inch, and what it can do for audio for video is really astounding." —Scott Davis, Viacom

But don't discount state-of-the-art, either. Aside from bringing digital audio quality to the most consistently high-profile user of audio for video—MTV—the use of D-2 positions Viacom like the prow of a ship in the midst of a huge and significant turn towards the future of the industry's technical side. "Until now," notes Davis, "television couldn't compete with the level of audio quality that MTV and VH-1 listeners have come to take for granted from audio-only sources, mostly CDs, but DAT cassettes as well. A lot of music is being recorded and released in an all-digital domain. Now we are positioned to make digital available to the home [TV] set."

Viacom has three of the above DVR-10 Composite Digital Recorders in its all-D-2 environment.

Over the horizon, the extension of digital audio capability has implications for the industry. If suppliers of programming and other material are making and providing product in a digital domain, and that product can remain in a digital format right through to the point of transmission, it could spur consumer demand for and acceptance of digital television. And as the popularities of CDs and 8-mm have shown, consumer demand has an increasingly large influence on pro side choices. (Viacom is currently bumping non-D-2 programming and commercials to the digital format, but expects shortly to begin asking suppliers to provide programming on D-2 tapes.)

Because D-2 enhances the audio quality of movies in broadcast, it could provide a catalyst for HDTV movie production. With both audio and video in one digital format, rendering quality control no longer a concern, and HDTV's putative potential for visual resolution married with the sorts of audio special effects that digital allows, film studios could begin looking over their shoulders very soon.

Davis says that any real resistance to D-2 within the industry is attributable to a lack of awareness of the true costs of digital, relative to the cost of not converting. "This is the new one-inch," he states, "and what it can do for audio for video is astounding.

"Viacom's move to D-2 was a well-thought-out and sound business decision," Davis continues. "It's part of a rollover in videotape technology, and part of its significance lies in the fact that D-2 inherently means better-quality picture and sound." ■

Dan Daley is a New York City-based freelance writer specializing in audio technology.

The D-2 Story

The D-2 format is a digital component recording system using both analog inputs and outputs (i.e., the video and audio signals are digitized inside the recorder). This makes the D-2 system considerably easier to interface with current station technology than, for instance, the component digital D-1 format.

The D-2 format hardware uses an eight-head helical scan system running at approximately 312 inches, or 26 feet, per minute. The tape, which is cassette-loaded, measures 0.55 mil in total thickness, and it holds four digital tracks.

D-2's sales have been slow up to this point, according to a spokesperson at Ampex, which first developed the format, and which is betting a sizable portion of its future on it. Cost is the primary reason, said the source, although equipment manufacturing for D-2 has lagged below expectations as well. Added to this is the usual problem that accompanies new technologies. How long will the format last in the marketplace? Could it be replaced by a half-inch digital tape?

While the crossover is slow right now, insiders expect the move to D-2 to increase substantially over the next two years, as normal equipment-replacement cycles come due. And as more stations buy into D-2, the price will slowly decline, allowing an even greater number of stations to invest in the format. "I doubt if five percent of stations now have digital equipment," said the Ampex source, "but that's going to change dramatically in two years. Right now, the D-2 is the Cadillac of the industry; when it becomes the Chevy—from a cost point of view—it'll really take off."

—D.D.

From Kowloon to Andover, HDTV Gets Down to Business

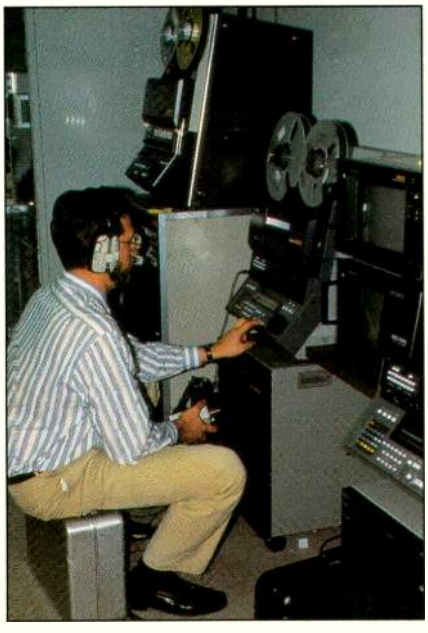
By Eva J. Blinder

As the technologies available for HDTV production and distribution mature, each month we seem to learn of a new business application for high-quality pictures. One of the more interesting items to cross our desk so far this year was the news of a live HDTV satellite videoconference held in mid-February that linked the Andover, MA headquarters of MAST Industries, Inc., a division of clothing retailer The Limited, with its offices in Hong Kong for a high-definition fashion show. [See "Update."]

According to T.C. Browne, VP of Sony Corp.'s Videoconferencing and Satellite Systems Div., the idea for the videoconference started on a boating trip. Leslie Wexner, chairman of The Limited, and Michael T. Schulhof, vice chairman of Sony Corp. of America, were out sailing last fall when Wexner began to complain of the high costs of sending personnel back and forth to the Far East for buying trips. The company had rejected teleconferencing because the resolution and color reproduction of NTSC video weren't sufficient to convey fabric textures and clothing styles with the accuracy the buyers needed to make crucial business decisions. Schulhof's suggestion that the company try HDTV intrigued Wexner enough that he agreed to an experiment.

Logistics for the two-way international transmission, which involved two satellite hops and a fiberoptic link on the Hong Kong side, were complex. Planning began in October, almost as soon as Sony and MAST shook hands on the idea. The project involved several U.S. and Japanese divisions of Sony, two divisions of Scientific-Atlanta (which provided HDB-MAC satellite transmission technology), and Vision Accomplished, a Santa Monica, CA company that arranged for appropriate uplinks, downlinks and transponder space.

"[Before any real work started,] we had to determine if it was technically feasible," Browne commented. "Nobody had ever transmitted HDB-MAC across fiber, no one had tried to mate fiber and satellite transmission in a network carrying high-definition television, and there were a lot of regulatory problems in Hong Kong. High definition takes a lot of transponder capacity."



Kim Vaughan, COO and general manager of Vision Accomplished, characterized the high-def videoconference as "extremely difficult to set up," due to the plethora of technical and regulatory hurdles it faced.

Vaughan himself went to Hong Kong to help figure out that end of the project. Hong Kong Cable and Wireless, one of the regulatory agencies involved on the Far East side,

Above: "Home-base" area for MAST teleconference featured seating for on-camera talent, two HDTV cameras, and an HDTV monitor for talent viewing.

Left: Videotape area with one-inch Type C VTRs for HDTV playbacks.

placed some initial barriers when it refused, for reasons of local policy, to allow an earth station to be located directly at the MAST offices in Kowloon. The solution to that bit of the puzzle was to set up a fiberoptic link to go the 15 km from the Kowloon offices to an earth station complex in Stanley, Hong Kong.

The greater overall problem was setting up a system with the bandwidth and noise specs required by the high-definition television system. Scientific-Atlanta's HDB-MAC, a high-definition variant of the company's well-established B-MAC satellite transmission system, requires a carrier-to-noise ratio of 17 dB and 36 MHz satellite transponders.

"We had to figure out how to squeeze that out of two satellite hops and a 15-km fiberoptic link," Vaughan said. "We ended up using the most powerful domestic links we could find"—a portable link on the East Coast and a semi-portable on the West Coast, both five-meter Ku-band.

"Then we went to Intelsat and found there was virtually no space segment available [with the required bandwidth at the times needed]," Vaughan continued. By going through some "back doors," Vision Accomplished managed to find the time. Because of the bandwidth requirements, the international segments of the videoconference had to use 30-meter up/downlinks.

"We really went after a deluxe system, so everything would work well," Vaughan said. "We needed extra ooomph out of all the components to achieve that 17 dB carrier-to-noise."

According to Vaughan, the U.S.-to-Hong Kong side of the videoconference was converted to the HDB-MAC format in Andover, then uplinked to General Electric's K-1 satellite for the domestic hop. Intelsat's Pacific Ocean Region POR-174 satellite took the signal from the Pacific Northwest to the Stanley downlink site, and the fiberoptic link relayed the signal to MAST's Kowloon offices. The return trip was similar, except that it used Intelsat's POR-180 satellite. For typical international links, a single 18.5-MHz transponder channel is sufficient, but the high-definition signal required the use of a full 36-MHz transponder each way.

Production of the teleconference was handled by Sony personnel and directed on the Kowloon side by the Sony High-Definition Software Co., Sony's Japanese production arm. Steve Lysohir Productions of New Jersey produced the U.S. end.

Lighting the videoconference "was

a big trick because high-definition monitors only work well in a low-light environment," Vaughan said. The MAST Industries Kowloon offices were set up for the conference with six 28-inch Sony HDTV monitors, requiring careful lighting techniques to ensure that both the monitors and participants would be visible. The output of three Sony HDTV cameras was switched into the HDB-MAC encoder for the trip back to Andover.

According to John Messerschmitt, senior director, advanced television systems for Scientific-Atlanta, HDB-MAC was selected for its conditional-access security features, its compatibility with the 1125/60 HDTV standard, and the fact that its equipment is currently available.

HDB-MAC grew out of S-A's five-year-old B-MAC system, which is in wide use for fixed business networks. (According to Messerschmitt, B-MAC users include General Motors, Chrysler, Eastman Kodak, Cable News Network and the Armed Forces Radio and TV Services.) The high-definition version uses a 525-line progressive-scan structure and offers approximately 500 lines vertical and 1000 lines horizontal resolution in 16:9.

A "neat twist" is that an HDB-MAC transmission can be received by a standard B-MAC decoder and displayed as a 4:3, 525-line interlace picture. Its requirement of 10.7 MHz of baseband, however, puts it out of consideration for use as a terrestrial HDTV format.

"We have put [HDB-MAC] over satellite, through fiber and down coaxial cable," Messerschmitt stated. "It works perfectly, but it's not designed for six-MHz compatibility. [It should fit into the overall U.S. HDTV scheme] as a feeder signal to terrestrial HD transmission systems because we can deliver a high-definition 16:9 component, 525-progressive signal via satellite." In addition to its video capabilities and conditional access, HDB-MAC carries six channels of audio, teletext and data signals.

Despite some reservations based on logistical difficulties encountered, Vaughan was cautiously optimistic about the practical uses of HDTV videoconferencing, especially for this kind of application, where detail and accurate color representation are of paramount importance.

"It's gorgeous," he said. "It's very exciting to see something that beautiful. [Hong Kong vendors] held up swatches of material next to the monitors, and the audience was just floored. They couldn't believe how accurate the colors were." ■

NEWSROOM COMPUTERS

Powerful, less-expensive systems are helping a wide range of stations get a scoop on the competition.

By James McBride

The days of "rip-and-read" news coverage are quickly fading into memory. Increasingly, broadcast news organizations are trading in their old typewriters and wire machines for integrated networks of minicomputers, capable of automating everything from scriptwriting to camera moves. In the last decade, 80 percent of all stations in the top 20 markets have computerized their newsrooms. Most station managements make the purchase of newsroom computers for the efficiencies this type of technology can bestow upon their operation. However, the upgrade to newsroom automation is not inexpensive. The decision to install computer systems can lessen the work burden on personnel, but can also impact the organization's ability to acquire and maintain other programming resources.

Workstation's small "footprint" leaves plenty of room for other important items on reporter's desk: written notes, calendar book, soft drink.

This is especially true in smaller stations, where every dollar spent is carefully watched. News, like other station departments, must show a return on investment. The need to be competitive, the pressure put on news directors to get the story on the air first, has generated considerable interest for both customized and generic computer networks.

High-end market stations continue to gobble up features such as control of still stores, character generators, closed captioning, robotic cameras and cart machines. But for a majority of stations in the country, automation of all these functions is still a long way off. There does seem to be a trend, however, towards the integration of customized software and cheaper, off-the-shelf hardware, creating hybrid systems at significant cost savings.

"We looked at several newsroom systems. A couple had what we needed, but none of them had exactly what we wanted. We also thought they were substantially overpriced for what they were delivering," says Richard Edwards, VP of engineering at Guy Gannett Broadcasting in Miami. "We went out and bought our own PCs, tied them into a mainframe and wrote our own software. We also bought modems for reporters, so they could file their stories directly from the field."

Edwards indicates there weren't really any dilemmas involved. It was simply, as he says, a need whose time had come. "Ten years ago when we started looking at computerizing our newsroom, we took note of what these systems would not do," he continues. "We decided we had people in-house who could put a system together for a lot less money than the vendors and probably do more. We've got less than $40,000 tied up in a system that might have cost $500,000 to $750,000 from an outside source."

NETWORKS, LARGER STATIONS PAVED THE WAY

Interest in newsroom computer packages really got started in 1978, when Cable News Network (CNN) totally automated its news operation due to the enormous need to

Overview of newsroom shows workstations at all reporters' positions.

manage news and associated data quickly. The other networks eventually followed suit, with the affiliates close behind. Hardware and software packages today offer more than just the ability to compose, edit and manage wire stories on a newsroom system; there are also advantages for management, including personnel data bases, play lists, shot lists and archiving.

High-end systems have tied the increasingly complex functions of the newsroom into traffic, engineering and operations. The use of newsroom computers for information capture and scripting is only half the story. Diverse hybrid products in this area are now becoming available from an increasing range of manufacturers. Today's newsroom computers can interface with devices such as Dynatech NewStar's Touch Screen Option, Odetics' News Control Terminal, the MARCUS system from Panasonic-Utah Scientific, and Sony Betacart machines, making possible the last-minute re-stacking of show segments.

Looking ahead towards computer control of camera movements, companies like Vinten Broadcast, A.F. Associates, TSM and Telemetrics Inc. have rolled out computer interfaces for their remote-control camera systems.

"Having a computer system means that everybody does not have to be in the same place at the same time for things to happen," says Roy Trumbull, assistant chief engineer at KRON-TV in San Francisco. "When reporters log on the system, they know exactly what they are supposed to be doing. It allows us to integrate many diverse functions at the same time. Inventory of all the still stores and scripting are almost automatic. It is like a big, easily accessed pile of notes. And with our second-generation system, that whole process has been speeded up."

Bart Feder, news director at CBS affiliate WJXT-TV in Jacksonville, FL, indicates that his company has always made a commitment to be on the cutting edge of broadcast technology. "We have been the beta test site for a lot of things that NewStar has put out. I'm not sure that would be possible for stations of our size that are not part of a larger group," he says. "We look to the long term rather than short term. The newsroom computer allows us to be more efficient. There is more review of reporter packages;

Newsroom computer screen displays script formatted to handle audio narration and related visual information. Note news-wire listing of story file in lower half of the screen.

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KABC-TV Los Angeles, CA	**KTBS-TV** Shreveport, LA	**WBRZ-TV** Baton Rouge, LA	**WINK-TV** Fort Myers, FL	**WNEP-TV** Moosic, PA	**WTNH-TV** New Haven, CT
KATU-TV Portland, OR	**KTRK-TV** Houston, TX	**WDIV-TV** Detroit, MI	**WISC-TV** Madison, WI	**WPLG-TV** Miami, FL	**WTOL-TV** Toledo, OH
KCRA-TV Sacramento, CA	**KTVI-TV** St. Louis, MO	**WESH-TV** Winter Park, FL	**WISH-TV** Indianapolis, IN	**WPVI-TV** Philadelphia, PA	**WTSP-TV** St. Petersburg, FL
KFDM-TV Beaumont, TX	**KVOA-TV** Tucson, AZ	**WFLA-TV** Tampa, FL	**WISN-TV** Milwaukee, WI	**WREG-TV** Memphis, TN	**WTVC-TV** Chattanooga, TN
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it is easier to make changes and to hone things to make better sense on the air. We make fewer mistakes, and there are more hands on the product. More can get done with fewer people, and our broadcast looks better."

Feder says WJXT is currently beta-testing NewStar's new Touch-Screen, which controls the still store, character generator and bar-coding of tapes. "We have always liked to get into things when they are new. I think this has been a very cost-effective attitude. Our timing was very good with the computers because we made these decisions at a time when news was expanding. If we had to make them today, they would be very tough to make."

A CHANGING MARKET

Despite the advancements, only 35 percent of the affiliates in the top 75 ADIs are equipped with newsroom computers. Most of these stations have the older word processor-type configurations with none of the advantages of automation. Because of the gap between station needs and funds available, many manufacturers will be positioning their marketing at these small to medium-sized stations in the next several years.

Vendors have been sensitive to emerging user needs. BASYS now offers software products for the newsroom, including MCS-1, the recently introduced MCS-2, and the PC-based Newsdesk software, which allows several automated functions without needing the expense of a large-scale hardware system. The company has also added the ability to access and exchange information from different systems via networks and serial ports. Generation Technologies has developed an OS2-type environment for multi-tasking of functions, and SISCOM has increased the amount of files a user can store, combined with a parallel instant-update system to minimize data loss.

Other players in this arena include Media Computing in Scottsdale, AZ. This company has developed software that can run on IBM-compatible systems and offer editing, archiving, remote interfaces for VTRs and data-base options called TEN (The Electronic Newsroom). Media Computing also markets election graphics software called ANGIS (Automated News Graphics Interface Systems), which interfaces with a character generator.

ANGIS has made quite a name for itself in the last several years because of the specialized needs growing out of election tabulation. The software has been used in over 40 elections since it was introduced at the 1986 NAB convention. However, stations need to make sure that this software will drive their particular model of character generator. ANGIS runs on a variety of Chyron products, including the 4100 EXB, the 4200, RGU and the Scribe. It is also compatible with the Aston 4 character generator, and interfaces to AP Election Wire, the News Election Service, UPI and the SportsTicker.

ANGIS can also be used in conjunction with Media Computing's newsroom computing system and NCI software, allowing the news staff to enter supers directly into terminals. NCI then acts as an electronic translator to update displays for the character generator.

"We are installing our second-generation computer system, which attests to our dependence on this technology," says William Napier, director of engineering for WBTV in Charlotte, NC. "Our hardware simply began to wear out. The thought of using typewriters again brings terror to the newsroom because they are so inefficient. We originally had the ENT system by Jefferson Pilot. It did script processing, electronic output to the teleprompter, ingestion of wire services and stacked the show."

MAKING THE CHOICE

The options for stations considering automating their news operations are straightforward. There are three categories of computers: mainframes, minis and microcomputers. Mainframes are usually overkill for the average station. These machines are utilized by networks and the largest affiliates. A mini network can serve approximately 30 to 40 people and costs range from $50,000 to

Newsroom Computers . . . Another View

There is no question that computers have made the work of the newsroom much easier, providing the ability to process information faster and more accurately than ever before. But there are also some risks involved, risks that need to be addressed before one spends those important dollars on a newsroom system.

One of the leaders in newsroom automation, KRON-TV, will be remembered from the NBC network coverage of the recent San Francisco earthquake: Anchors sitting in a candlelit studio, reading notes from scraps of paper. The point here is that the best computer system in the world is of no use if you don't have the electricity to power it. No station should become so dependent on any type of automation, be it newsroom, camera robotics, or master-control switching, that the station's basic on-air functions can't be performed without it. Stations need to recognize that automation is an assistant, not a replacement for a well-trained staff.

But there is a darker side to newsroom automation as well. Television is an industry where employees frequently change jobs, where the folks working beside you today may be your cross-town competitors tomorrow. The recent case in the Tampa, FL market, where former employees of one station raided its newsroom computer, via modem, for the benefit of their new employer, brought to light the potential for all kinds of mischief. A prime concern of anyone considering a system should be its provisions for security.

—William A. Owens

NEWSROOM COMPUTERS

$500,000. Most micros serve one person at a time; however, modern configurations have enabled users to tie them together for a variety of functions.

When considering vendor-supplied systems, thought should be put into the amount of customer support a package will ultimately receive and what upgrade programs are available, if at all. Another area of scrutiny is the amount of expandability the software is capable of. Buyers need to be aware of these limitations if they plan on adding more hardware down the line. The vendor should be asked what type of licensing agreements are mandated because some systems require purchase of a second copy of software to run expanded configurations.

Some stations are looking at sharing the cost of newsroom computer systems with other media, such as co-owned radio stations. And the facilities- and manpower-management functions make the systems useful to the engineering and operations departments as well.

"The cost for a computer system would not be justifiable at this time, except that we are a UPI subscriber, and UPI has a program to get a BASYS system in," says Doug Ballin, news director at WTTV in Indianapolis. "We will consolidate it with the rest of the station staff."

Companies are continually offering updates to compliment their existing systems. Dynatech has an IBM-AT configuration to provide script archives, VTR libraries and laser-disc storage for large-capacity needs. The company also offers dial-up, intersystem mail and Betacart access systems currently in use at CBS. BASYS has a system compatible with the Mini-VAX II that can be used in addition to Parallel and Onyx computers, as well as an IBM-AT system for smaller newsroom-computer networks. Large disks can also be added to the ATs with a split-screen.

On-line graphics, once thought to be an unattainable domain for many smaller news operations, is now readily compatible with most of the workstations on the market. ColorGraphics has the ArtStar III-D, which can simulate lighting, camera zooms, pans and spline-curve motions, and can be coupled with a VTR to produce animated graphics. Chyron offers the 4200 with motion.

It is important to keep in mind that newsroom computers are not a panacea for all operational problems. They don't directly affect viewers, and it is doubtful that many news directors contemplate purchases of such systems with the idea of a direct correlation to ratings points. Yet

computers do make the day-to-day operating environment easier and more efficient.

"We use the computers for general assignment work, series and documentaries," says Alan Griggs, news director at WSMV-TV in Nashville. "We keep a big file system for reporters' notes, and we are just getting into closed-captioning in conjunction with our character generator. We needed a shot in the arm because we were working with typewriters. Pushing deadlines is always going to be difficult, but it is minimized with computers."

Griggs cautions colleagues contemplating newsroom-computer purchases that the systems are only as good as their users, and that the ease of use can lull some staffers into a false sense of security. "The only big problem is the potential for abuse and pushing back things that are urgent," he maintains. "It is definitely something you have to work on in the minds of reporters."

KRON-TV's Trumbull agrees: "The computer is no magic bullet for getting ratings. Sometimes you can get so bogged down in the daily grind of doing things that you lose sight of what you are trying to accomplish. Just hacking information into a computer does not mean it will make any more sense on the air." ■

Newsroom Computer Systems

Basys Inc.	415-969-9810
Columbine Systems Inc.	303-237-4000
Comprompter Inc.	608-785-7766
Computer Engineering Associates	301-247-5244
Computer Prompting Inc.	202-966-0980
Data Center Management Inc.	704-377-1496
Dynatech NewStar	608-274-8686
ICA Systems	202-872-1633
Media Computing Inc.	602-482-9131

Newsroom Weather Systems

Accu-Weather	814-237-0309
Alden Electronics	508-366-8851
Arvin/Diamond	614-756-9222
ESD Weather Systems	301-423-2113
Kavouras Inc.	612-726-9515
WSI Inc.	617-275-5300

PART I: THE DECISION-MAKERS

STATION E BUYING 1990

Television Engineering debuts its exclusive study of purchasing trends among TV stations. This month: the role of engineers and others in equipment decision-making.

By Peter Caranicas

An unfortunate coincidence now greets TV station executives. On the one hand, recent swift technical advances have laid before them an unprecedented array of new technologies from which to choose. On the other, never before has the broadcast industry been so financially ill-equipped to invest in new equipment, let alone risk dollars on technologies that offer no assurance of making it in the marketplace.

What's going on in the minds of TV station engineers as they face this enormous dilemma, and how are they proposing to allocate short-term resources? To reach some answers, *Television Engineering* conducted a scientific survey among 245 stations nationwide [see box].

We found that fully 11% of TV stations in the 150 largest markets have no plans to purchase equipment in 1990. Among those that do plan to buy hardware, spending is flat compared to 1989 (it was up in 1989 over the year before).

This is the first of a series of three

QUIPMENT

features presenting the findings of our research. Here we define our sample of respondents by job title and assess their roles in the entire station equipment purchasing process.

Future installments of this series will present our findings on specific station equipment budgets by calendar year and by market size, on how the various equipment categories are impacting on stations, budgets and the plans of engineers in the areas of digital recording and high-definition television.

TABLE 1

	Major Role	Minor Role	No Role At All	Position Does Not Exist	DK/NA
Director or Chief of Engineering	95%	4%	1%	—	1%
Owner or station management	68%	28%	3%	—	1%
Production Manager	45%	48%	4%	1%	1%
Staff Engineer	24%	64%	9%	2%	1%

QUESTION: *How much of a role does the _____ have in initiating equipment purchase discussions at your station?*

TABLE 2

	Major Role	Minor Role	No Role At All	Position Does Not Exist	DK/NA
Director or Chief of Engineering	95%	4%	—	—	1%
Production Manager	38%	52%	8%	1%	1%
Staff Engineer	33%	53%	10%	2%	2%
Owner or station management	31%	54%	14%	—	1%

QUESTION: *How much of a role does the _____ have in studying and evaluating the equipment being considered by your station?*

THE RESPONDENTS

The researchers telephoning the stations began by asking to speak to the person "most familiar with the station's technical equipment . . . and the purchasing of it." If that person was not available, they set a time to call back. In each of the 245 completed calls, that person was reached and asked a total of up to 77 questions.

Of the respondents answering the telephone interviewers' questions, most had engineering titles, with 69% being chief engineers or assistant chief engineers; 14% directors or managers of engineering. The balance consisted of production managers (9%), operations managers (6%), and "other" (2%).

An astounding 88% of our respondents had worked 10 or more years in the industry when they answered our questions. Only 4% have been in broadcasting 7–9 years, 5% 4–6 years, 1% 1–3 years, and 1% 0–1 years.

Markets of all sizes were well represented. Twenty percent of respondents worked at stations in markets 1–25, 17% in markets 26–50, 31% in markets 51–100, and 23% in markets 101–150. Equally well represented were varieties in station affiliation. Twenty-one percent of respondents were ABC affiliates, 22% were affiliated with CBS, 20% with NBC, 13% with Fox, and 23% were independent.

ROLES IN PURCHASING

As might be expected, chief engineers are said to have a "major" role at all stages of the equipment-purchase decision-making process. Ninety-five percent of all respondents said CEs play a major role in initiating equipment-purchasing discussions, and only 4% attributed a "minor" role to them. Conversely, station owners or managers were said to play a major

STATION EQUIPMENT BUYING/1990

PART I: THE DECISION-MAKERS

TABLE 3

	Major Role	Minor Role	No Role At All	Position Does Not Exist	DK/NA
Director or Chief of Engineering	97%	3%	—	—	1%
Owner or station management	46%	46%	6%	—	2%
Production Manager	36%	54%	7%	1%	2%
Staff Engineer	22%	61%	13%	2%	2%

QUESTION: *How much of a role does the _____ have in deciding which general pieces of equipment should be recommended for approval by your station?*

TABLE 4

	Major Role	Minor Role	No Role At All	Position Does Not Exist	DK/NA
Director or Chief of Engineering	94%	5%	1%	—	—
Owner or station management	37%	51%	11%	—	1%
Production Manager	31%	59%	9%	1%	2%
Staff Engineer	18%	65%	14%	2%	1%

QUESTION: *How much of a role does the _____ have in deciding which specific equipment brands and models should be recommended for approval by your station?*

role by 68% of the respondents; a minor role by 28% of them. Production managers were given a major role by 45%, a minor role by 48%. And staff engineers were said by 24% of the respondents to play a major role; by 64% to play a minor role. [Table 1].

While a considerable number of station owners and managers seem to play a significant role in the initiation process, their importance diminishes when it comes to studying and evaluating equipment being considered. At that stage, the role of station management and ownership drops considerably [Table 2], with only 31% of all respondents telling us that management plays a major role. When it comes to deciding on equipment purchases in general, as well as on specific brands and model numbers, engineers remain firmly in control [Tables 3 and 4].

BUDGETS

Engineers may reign supreme in the evaluation and selection of equipment, but they play distant second fiddle to ownership and management in the setting of overall station equipment purchasing budgets, as well as in the approval of equipment purchases.

A hefty 59% of all respondents said corporate ownership or management "ultimately" sets the yearly equipment budget. Add to that the 29% who say the general manager or station manager sets that budget, and you get a total of 88% who say non-engineering management titles set annual equipment expenditure budgets. Only 21% say engineering titles set yearly equipment budgets. [Chart 1].

Who approves equipment purchases? The story here is similar. According to 74% of the respondents, station ownership and management titles (corporate ownership/management, GMs, station managers) "ultimately" approve equipment purchases. Only 21% say that those purchases are ultimately approved by directors/managers of engineering or by CEs [Chart 2].

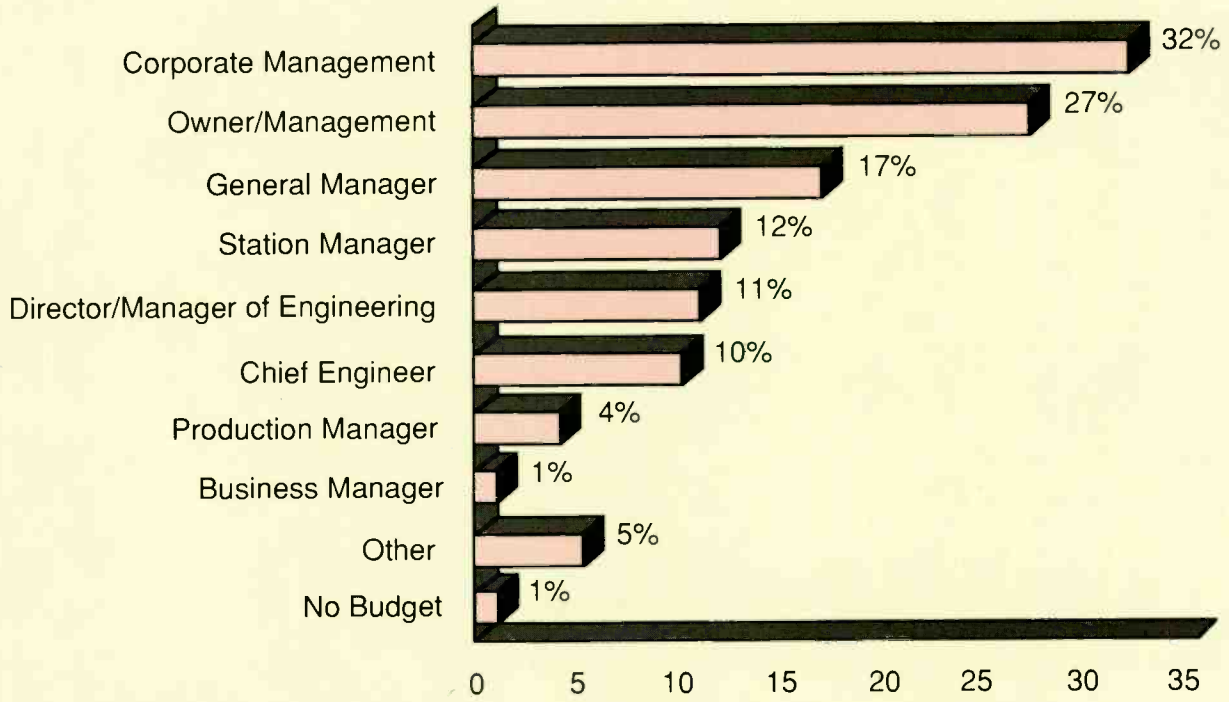
Interestingly, in more than three stations out of five (62%), the individual who *sets* the yearly equipment budget is the same person as the individual who *approves* equipment purchases.

In its July issue, *Television Engineering* will quantify station equipment purchasing budgets for 1988, 1989 and 1990. ■

Methodology

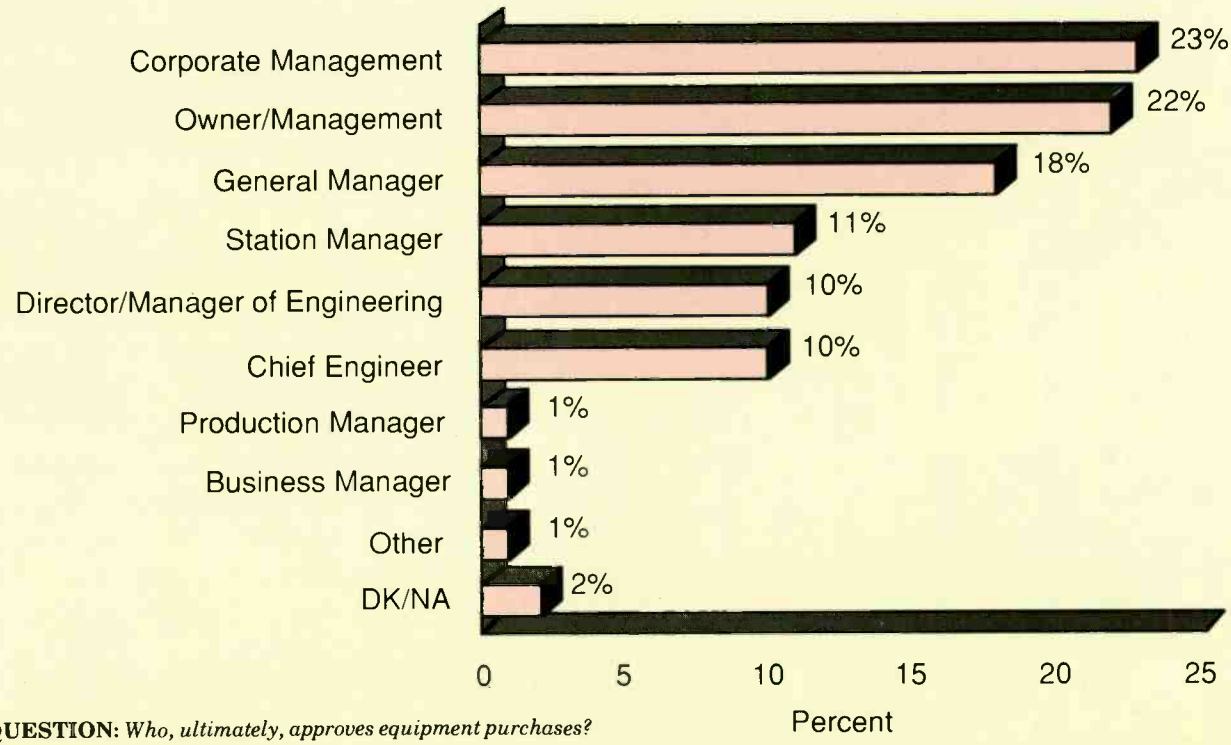
Last year, *Television Engineering* commissioned the research firm Frank N. Magid Associates to conduct an equipment-purchasing survey among television broadcasters in the nation's 150 largest markets. (Markets 151 through 213 were not contacted in order to limit the research to those buying sites that purchase the lion's share of TV equipment.) In late November and early December of 1989, Magid researchers conducted a random-sample survey by telephone of 245 stations in these markets, out of a total universe of 875 such stations. The resulting margin of error is plus or minus five percent, and the survey's findings are projectable to that entire universe of stations. ■

CHART 1



QUESTION: *Who, ultimately, sets the yearly equipment budget?*

CHART 2



QUESTION: *Who, ultimately, approves equipment purchases?*

BROADCAST NEWS!

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SONY.

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KEEPING IT ALL IN TIME

By William A. Owens

Time-base correctors and frame synchronizers set off a revolution in broadcasting. Now, many years later, they're just part of everyday reality.

Back in 1956, when that first "CBS News with Douglas Edwards" rolled off an early quad machine, who could have imagined that, 34 years later, members of the viewing audience would be making their own home "videos," and that a show built around them would be rated in the top 10 programs? That's how far video recording technology has progressed. And yet, without modern time-base corrector (TBC) and frame synchronizer technology, "America's Funniest Home Videos," one of the most popular programs on the air today, would be impossible to produce.

With tapes arriving in the various "home" formats, the use of time-base correctors and frame synchronizers is essential to the program's success. These little black boxes allow the home videotapes to be converted for broadcast use. Today, the technology of those black boxes is a given; the jobs of engineers a lot easier. But it was not always so.

The year: 1973. The place: Washington, DC. Tucked away in the "K" wing of the Sheraton Park Hotel was Suite K708, a most unlikely place for the start of a revolution. Yet those leaving the suite were describing its contents as "revolutionary," "mind-boggling," and "the biggest thing since the introduction of the VTR itself." Not since that first Ampex videotape recorder was placed into service at CBS had technology created such excitement in the broadcast business, or created the potential for such dramatic changes.

It is not unusual to find exciting new things at an NAB convention. It is unusual to find exciting new things that change the basic way in which broadcasters do business. This was the year that a small company, one that applied too late to gain booth

Microtime dual TBC/effects system features multi-system inputs.

KEEPING IT ALL IN TIME

Host Bob Saget at taping of "America's Funniest Home Videos." ABC's suddenly popular Sunday night program would not be possible without the use of TBCs and frame synchronizers.

space on the convention floor, sparked a revolution that continues today.

The introduction of the digital time-base corrector by Consolidated Video Systems started the move to broadcast helical videotape formats. The CVS 500 TBC provided an exceedingly wide correction window, about 30 times greater than previously possible. The new device converted incoming video signals into digital, and inserted both regenerated sync and burst information. The result was a broadcast-ready video signal, capable of being timed to the rest of the video plant. This would permit the on-air use of helical-type videotape recorders. With the cost of a helical VTR and TBC package considerably less than that of the typical two-inch leviathan, there was no question that quad technology was doomed. It would be just a matter of time—and of time-base correction.

The basic technology used for time-base correction was created long before 1973. RCA's PIXLOCK and CAVEC electronics, and Ampex's COLORTEC and AMTEC, were subsystems of those first-generation quad VTRs, designed to handle time base and other signal-reproduction errors. These were integral systems, circuits built into specific machines as part of the signal-processing path.

But it was not until the late '60s, with the new low-cost helical-scan VTRs coming on the market, that thought was given to the need for standalone TBCs. Companies like Consolidated Video Systems and Television Microtime, Inc. realized the potential that existed for low-cost VTRs at television stations unable to afford, or unwilling to spend, the heavy investment needed for quad. Within a year following the CVS introduction, 10 more manufacturers had jumped into the market with their own TBCs. Users discovered that with the use of a standalone TBC, a low-cost VTR's output signal could be cleaned up for broadcast. Stations could convert to helical tape for local production, network delay or archiving, without the high price tag or costly care and feeding required by a quad VTR.

Today, one would be hard-pressed to find a television facility that does not use some form of time-base corrector. Be it standalone, or built into a tape machine, today's TBC goes far beyond the simple function of bringing a playback tape into the television signal path for broadcast. TBCs allow us to fix in post the errors in color, lighting or filtering that somehow creep into our field tapes. And they allow us the freedom to make even the most marginal-quality tapes airworthy.

IN SYNC

But there's another use of TBC-like technology. Engineers have a habit of finding new problems to solve, and just as TBCs helped solve the problem of integrating playback tape into the broadcast chain, engineers looked at another problem and found TBC technology to be the basis for a solution.

Back in television's Stone Age, signal synchronization was a difficult process. The sync generators of the day took up a full rack and needed constant attention. The broadcast of network programming required, in many cases, taking a roll as receivers lost lock during the shift between local and network-originated sync.

One who remembers that era is Robert Hurst, manager of digital video interactive programs for GE Gov-

ernment Services. Hurst was an engineer at WAVE-TV, Louisville, KY in those early days.

"It was quite dangerous to run on network sync," Hurst told us. "Signal quality of the early network lines was poor, and every minute you took a chance of losing sync." Hurst remembers one incident where WAVE-TV picked up World Series games aired over WLWT-TV in Cincinnati for rebroadcast. "With a receiving antenna mounted at the 200-foot level on our transmitter tower, we were able to pick up WLWT with a small amount of noise, but we couldn't get [the signal] to lock up through our system," he explains. "We finally fed the WLWT off-air signal into a 10BP4 monitor on the studio floor, and shot the face of the monitor with one of our TK-10 studio cameras. We used a blanket to cover the space between camera and monitor, to eliminate reflections. The trick worked, and allowed the station to switch cleanly in and out of the games."

Such solutions were impractical for long-term usage. After a short flirtation with the use of atomic clocks for local-to-network synchronization, a new, improved method appeared.

With TBC technology as a base, it was a short stretch to envision the ability to lock up an incoming feed in a similar fashion. The frame synchronizer is a TBC-based device that will lock the inbound, free-floating video signal to the sync platform of a timed video system. GE's Hurst, who was involved in the creation of the RCA TFS-121 frame synchronizer, pointed out the difference the years have made in the technology. "It took 30 years to go from a sync generator filling a full seven-foot rack to a chip-sized one, yet it only took eight years to go from a full-rack-sized frame sync to a chip-sized one," he says.

For proof that TBCs and frame syncs have changed the industry, one need look no further than "America's Funniest Home Videos."

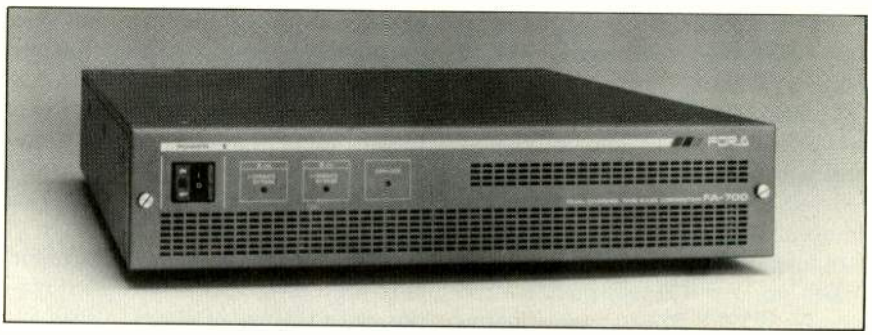
Each day, over 2000 home videos arrive at ABC. Rene Sanchez was the ABC Network's videotape supervisor for the original pilot program, and

TBC/FRAME SYNCHRONIZER MARKET GUIDE

Manufacturer	Simple TBC	TBC with Effects	Frame Synchronizer	Frame with Effects	Dual Channel w/Effects
Alta Group		✓		✓	✓
Ampex	✓				
Crosspoint Latch					✓
Digital Processing Systems	✓	✓	✓	✓	
For-A	✓	✓	✓	✓	✓
Grunder Associates (Cel)			✓	✓	✓
Harris		✓		✓	
Hotronic	✓		✓		✓
I.Den	✓	✓	✓	✓	
JVC		✓		✓	
Microtime		✓	✓		✓
Nova Systems	✓	✓	✓		
Panasonic	✓				
Prime Image	✓	✓	✓	✓	✓
Progressive Image		✓		✓	
Sony	✓			✓	✓
Tektronix			✓		
Videotek			✓		

KEEPING IT ALL IN TIME

continues to be involved in its production. "The tapes we receive are a mixed bag of formats and speeds; lots of VHS, along with S-VHS, Betamax, Super Beta, 8 mm and Hi8," he says. "Many are shot under poor lighting conditions, and mistracking is a constant problem."



For-A TBC, "THE DUALIST," features two independent full-frame TBCs.

ON THE RACK

Tapes are screened for funny content, and rated on a laugh scale of 1–10. Those rated five and above are sent to "the Rack" for a bump to Beta SP. Built by the ABC crew, "the Rack" is home to playback machines in all the consumer formats, as well as the required signal-processing gear. The home tapes roll through a frame synchronizer during the bump-up process, and are logged as to the subject matter.

Once the show's producers determine what segments will be used, the Beta SP file reels are edited and dubbed onto a one-inch type-C element reel. During the edit and dub process, the tapes are fed through an ADO for repositioning (to "legalize" the image technically, and to eliminate head-switching at the bottom of the picture) and color correction. Audio is cleaned up and delayed to compensate for the length of the signal-processing path.

Finally, the element reels are played back to the studio audience for their reaction, and later video is inserted into the master show tapes. This saves another generation. "By the time we air a program, we've added four to six generations to the home video," Sanchez notes. "And many times, the tapes we receive are several generations away from the original. We do everything possible to provide a top-quality, technically legal image for our viewers."

Sanchez proudly pointed out that with the possibility of expanded use of home tapes by the news department, "the Rack" has been made available to the network's news operation even as it continues to be used on "America's Funniest Home Videos."

The TBC/frame sync devices available today fall into one of four categories [see table]: a simple "one-function" TBC box; a TBC with limited effects capability, like freeze or posterization; a box that combines TBC and frame synchronizer; and a TBC/frame synchronizer with built-in effects. An offshoot of the last category is the multiple TBC (or TBC/frame sync) channel unit with built-in effects generator for A/B rolling with digital effects between sources. Many units are designed to input and output a variety of signals, including composite, component and Y/C 358 for S-VHS.

The blurring of the line between pure broadcast and non-broadcast ap-

KEEPING IT ALL IN TIME

plications has created market opportunities for vendors at all levels. Within each category, there is a wide range of price and performance level available. While some manufacturers have taken a General Motors approach [offering a product at every price point], others have taken the niche approach, concentrating in select segments of the market.

LITTLE BOXES

There is no question that these boxes have greatly reduced the cost of creating professional effects, thus sparking into existence a multitude of small video production facilities.

Perhaps the most striking example is in the area of low-cost dual-channel TBC/effects units. These units cost less than the last generation of single-ST channel TBCs, yet allow two playback tapes to be matched for color and synced, utilizing built-in special effects circuits to create a variety of wipes, dissolves and digital effects.

For the broadcasters, the availability of low-cost boxes means expanding production capability, with prices low enough to permit equipping several edit bays with A/B roll effects for what one bay would have cost a few years ago.

But digital effects are not confined to dual-channel devices. Even many low-cost single-channel boxes include field and frame freeze, and many also include posterization, mosaic and other effects.

There are several interesting mid-range single-channel boxes available, with limited digital effects capability. Some include limited or full-scale compression, joystick positioning, wipes and pulls, and an internal keyer. At the upper price range, a few include a host of effects, keying, still store, color generators and more.

Of course, the folks with unlimited budgets can always find some new toy with which to play. But after years of playing follow the leader to ever more expensive boxes, many in our industry have decided to buy the box that does the job required at the best price. In fact, one major network has equipped all of its O&Os with a $10,000 digital effects device, bypassing more expensive products. And that's just the beginning.

There is no doubt that the TBC/frame sync revolution has been driven by technology. But it has also been driven by economics. For the manufacturers, it means more business. And for the users, it means a better selection of cost-effective alternatives. It seems like a good deal for all concerned. ■

TRANSFERS IN TRANSITION

Digital equipment is invading the telecine suite, but the choice between digital and analog is not black and white.

By Claudia Kienzle

When the producers of commercials, music videos or television programs bring their 35 mm film to a video post-production facility, the first stop is the telecine suite. "The telecine feeds our edit bays, our graphics area and duplication," says Patti Mauck, VP sales and marketing, Editel, L.A.

"Clients tend to keep the entire job under one roof to avoid shots that don't [color] match and [to avoid] inconsistencies of quality. So, if I don't get the transfer, I won't get the edit or anything else," Mauck told us.

Post-production houses, in order to offer more capabilities to their clients, are bringing more digital equipment into telecine suites. Some are using Rank Cintel's digital URSA telecine and/or digital support equipment to aid the colorist.

This influx of digital equipment does not change the basic importance of the telecine—or of the colorist. No matter what type of transfer equipment is used, the colorist must exercise his or her technical and aesthetic judgments to make the film look good on tape. "What I use to make pretty pictures shouldn't make a difference to my clients. Even if I use sticks and stones, if I can make the prettiest pictures in town, they'll come to me," says Nick D'Antona, Sr. VP and creative director of New York City's Manhattan Transfer.

The colorist's primary tool is the secondary color corrector—a vital peripheral in the telecine suite on jobs other than straight archival transfers. "Whereas primary color correctors in the telecine allow one to manipulate approximately six hues, making an awful picture look nice and acceptable, the secondary color corrector offers manipulation of up to 30 or more, allowing the colorist to do much more," says Geoffrey Orme, president of Rank Cintel's Unimedia Division. "The colorist can isolate those areas of the picture [that need] to be adjusted.

"Art directors and creatives, producing national ads, now spend a lot of time in 'color-correction suites,' matching the nail polish on the model's hands to the exact shade of red on the bottle, or showing only the product in color while everything else in the shot is monochrome," he explains.

"Whereas a commercial client will go for product color that is very exact, with refined image enhancement, the music-video client may want the shots all green and blown out," says Bill Willig, sr. colorist at Princzko Productions in Manhattan. The telecine suite at Princzko is organized around a Turbo Rank telecine, with a Pallette II secondary color corrector. The suite also includes an Ultimatte 5, Faroudja encoders, an Ampex ESS-5 still store, and an Accom DIE 125

noise reducer.

Princzko's Rank MkIIIC telecine was rebuilt by Rank Cintel's Unimedia Division, resulting in a conversion to an equivalent of Rank's current model "Turbo." According to Orme, "When the owner of an old MkIII or MkIIIC is not interested in the sophisticated digital-effects capability provided by [Rank Cintel's] top of the line URSA, he can choose the more cost-effective route of upgrading his machine into a Rank Turbo. We incorporate all the newly developed features and functions not available when the MkIII was first introduced. Turbo modifications are designed to improve signal handling and interface with third-party manufactured equipment." (The MkIII is no longer being manufactured. Unimedia, recently acquired by Rank Cintel, created the Turbo design.)

Digital-effects capability, however, did sway The Post Group in Los Angeles to buy the URSA telecine. The Post Group also sports three Rank Mark IIIs with Dubner color correctors. The URSA needs no secondary color corrector, as that capability is built into it. "The URSA is an amazing device," says Steve Buchsbaum, telecine director at The Post Group. "It allows you to do a whole range of ADO-like effects, such as spins, flips and picture distortion, and the computer is able to remember your changes and recall them when you reselect your scene. We use it mainly for doing music videos, because you need to take things to extremes, and that's easier to do on the URSA." However, some telecine managers feel that there are still bugs to be worked out in both the hardware and software.

"The URSA is going to be a good machine, but [right now] it's having teething problems, like any new product," says Ted McConville, director of engineering at Complete Post in L.A. "Fortunately, adjustments can be made in the field." In response to customer requests, Rank has begun modifying the programming software.

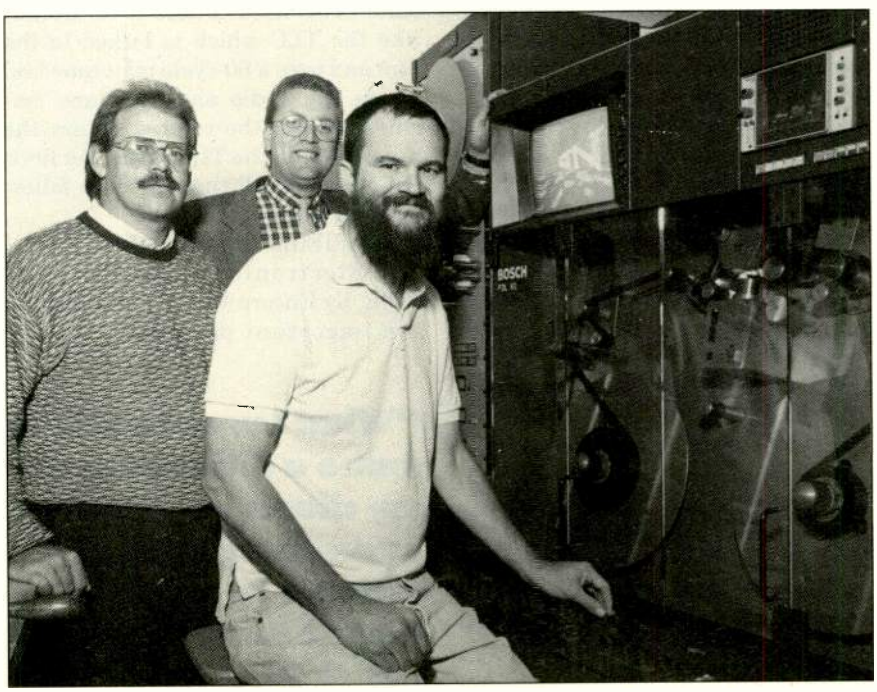
Complete Post is equipped with four telecine bays: one with an URSA, two with Rank MkIIICs and one with a Turbo Rank. In the Rank MkIII suites, there are three Ultimatte 4s, Rank secondary color correctors, and Matchbox or Abekas A42 still stores. Three rooms have Time Logic Controllers (TLCs), and one has its predecessor: the AVRS. "Our four rooms are running about 18 hours a day. Since no one room specializes in anything, our scheduling department has the flexibility to put any job in any bay," McConville says.

Though 35 mm film is the standard, at Complete Post, McConville finds that, "Many commercial clients will occasionally shoot on Super 8 mm if they're looking for a cinema verité look. Transferring from Super 8 mm is a trend we've been seeing in the last two years."

Small-format film has also made an appearance at Skyview Film and Video in Chicago, where colorist Pete Jannotta has seen some national advertising work shot on 16 mm. "Advertisers feel they can get good quality for their purposes at lower costs, but since it has less resolution than 35 mm film, it tends to look a little soft. We'll have a better chance of 'eeking' everything out of it if we put it on the Marconi, because the CCD sensors will sharpen it up," he says.

The Marconi Telecine, like the BTS (formerly Bosch) FDL 60, uses CCD technology rather than the Flying Spot Scanner used by Rank. Jannotta continues, "The CCD-type telecine delivers a very crisp, consistently high-quality resolution, and unlike the CRT-type Rank, you don't have to worry about excessive picture-tube aging. However, the Rank is better if you want to do zooms, X-Y repositioning, compression, or expansion to eliminate selected elements from the shot. Though a CCD-type telecine can frame up or down or pan and scan, it has no internal repositioning capabilities, so you need to go to an external device like the ADO, Kaleidoscope or Abekas A53."

These "picture-moving" devices are important peripherals in telecine suites that are built around a CCD-type telecine. In addition to the Mar-



Telecine at GTN, Detroit. Left to right: Engineering VP Mark Piechan, Operations VP Doug Cheek, and film transfer specialist Frank Smith.

TRANSFERS IN TRANSITION

coni, Skyview also has a Rank Turbo, and both telecines are equipped with da Vinci secondary color correctors. "In fact," says Jannotta, "We may be the only da Vinci/Marconi interface in the country."

The da Vinci is unique in that it offers a centralized control panel for the telecine, and audio or video tape machines from its controller. It manages a list of up to 1000 color events, remembering the color choices you programmed, and recalls them to you as you go back and forth between scenes or frames. According to Bob Hemsky, the general manager of da Vinci Colorgraphics Systems, Inc., "The da Vinci is very user-friendly, executing the color-correction edit sequence all in real time." A special tape-to-tape methodology enables you to place the da Vinci between two tape machines for color correction.

At General TV Network (GTN), in Oak Park, MI, tape-to-tape color correction was used with tremendous success on a Ross Roy sales effectiveness training program. Doug Cheek, VP of operations, describes the method used: "All original film footage was taken across the BTS FDL 60 telecine in a best-light film situation. Then we cut an uncorrected submaster and color-corrected it through the da Vinci to another one-inch machine. The product was very well-received."

In another instance, related by Randy Seiler of Pyramid Teleproductions in Dallas, "When Radio Shack was putting together their Christmas spots, they used several film transfer locations around the country, and by the time they cut their spots together on videotape, much of what was on the tape didn't quite match. So we color-corrected the tapes for consistency, using the da Vinci, prior to dubbing them off for all the markets."

The SunBurst II, Pallette II, Dubner or other color correctors will also program and remember color-correction choices. "Dubners pass the film image very cleanly, without a processed look, letting the quality of the film really shine through," says Manhattan Transfer's D'Antona.

Color Correction suite at Editel, L.A. In foreground: da Vinci color corrector.

However, unlike the da Vinci, most other color correctors do not control the audio and tape machines in the suite. You need to add a controller, like the TLC which is locked to the film and uses a 60-cycle pilot tone laid across the audio and videotape machines. After the colorist enters the numbers into the TLC, the Rank finds the stop, and all the machines follow the film to that point.

SteadiFilm (by SteadiFilm Corp.) and Electronic Pin Registration (EPR, by Encore Video, in California) are important peripherals to the CRT-type telecine—they hold the film steady as it moves through the gate. Orme explains the difference this way: "SteadiFilm takes still pictures of the film in non-real time (three f/p/s). It's relatively inexpensive and reliable. EPR electronically adjusts the picture as you go in real time (24 f/p/s), but it's relatively expensive and more technically complex." Though EPR is more costly to the facility, it can be more cost-effective to the client. According to Bill Willig, "If the client is running 50,000 feet of film, it will take days at three f/p/s."

"What I use shouldn't make a difference to my clients . . . if I can make the prettiest pictures in town, they'll come to me."
—Nick D'Antona

There is no SteadiFilm- or EPR-type device yet available for CCD-type telecines, though many manufacturers are working on one. "Being able to produce a steady image is a major issue in the film-transfer business today, especially for those types of jobs where you do multi-layering," says GTN's Cheek. "We're working diligently with BTS as they develop a real-time system for their machine, to

be called Electronic Steadiness Optimizer (ESO)."

Pyramid's Seiler, however, doesn't really see a need for a steadying device for his BTS telecine: "The FDL 60 is already so steady that you can just go ahead and run it real-time. We've been able to satisfy our most critical animation clients." Pyramid, which also uses the da Vinci color corrector and an Ultimatte 4, serves major animation houses from a five-state area around Texas.

Rank also offers a slide gate for the telecine but, because there are so many other ways to transfer slides, it's not used very often. "We do a lot of videodisc projects for the military, and we occasionally need to use a slide-gate attachment," says Oliver Peters, facilities operations manager at Century III at Universal Studios in Orlando. "We rent it from Rank."

While transferring slides with a slide-gate attachment is very uncommon, grabbing still images from a still store is very common. Still stores like the Ampex ESS-5T or the Rank Cintel Matchbox, allow the colorist to store representative stills from different scenes to compare color consistency between scenes. Still stores can also freeze shots and wipe digitally between them. Rank's Slide File/Art File also stores images, but allows for some Paintbox-type treatments to the image during the transfer process. Image enhancers, such as grain or "noise" reducers like the BTS and Accom DIE 125, which works with analog RGB as well as in the 4:2:2 digital domain, are used to process grain and reduce it. Encoders like the Faroudja, CDL, Accom, and Grass Valley, produce enhanced NTSC outputs.

Most telecines today can output to either analog one-inch, Betacam SP, or ¾-inch, or to digital machines—D-1, D-2 and A62 digital disk recorders. Facilities that transfer films into "digital production centers," where they are layered and combined with other images, use the Ultimatte, in combination with the Faroudja encoder, during the transfer process. The Ultimatte is a digital matting device which allows for sophisticated compositing in post-production with devices such as the Harry, ADO, Paintbox and Kaleidoscope.

When planning changes to your telecine suite, you need to consider what equipment you presently own, what type of client you want to attract, and what upgrades you must make to serve your clients. But you shouldn't get so bogged down with evaluating which unit to buy that you fail to consider the dynamics of the suite as a whole.

According to D'Antona, "It's not what color corrector will give the best shade of blue, but rather: How does this particular color corrector come into the path of the Ultimatte? Do you want to go to digital or PAL? How will this piece of equipment fit in your existing loop or signal path?" In this way, you will be assured of designing a telecine suite which is versatile enough that you can tell your client, "Yes, we can do that." ■

Secure Future: Telecines in a High-Def World

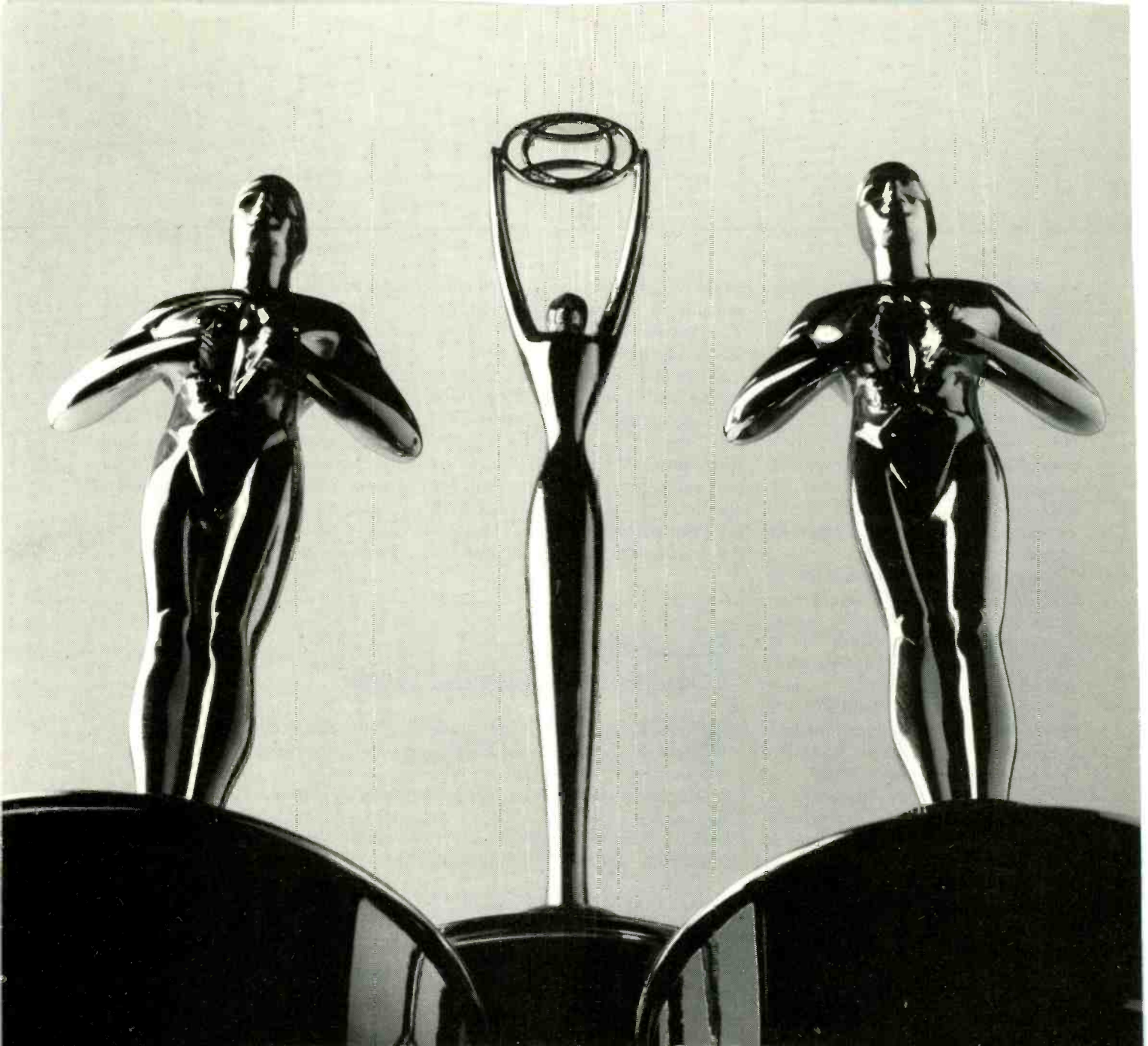
Though there is still some debate about the standards and aspect ratios that will be adopted for HDTV, the future of the telecine is certain. Regardless of what standards are adopted, "there'll be a need for a telecine capable of transferring all existing motion pictures to the high-definition format," says Geoffrey Orme, president of Rank Cintel's Unimedia Division. "The future of film is just tremendous. Kodak now has a fine-grain super film stock available, and film continues to be the medium of choice," he notes.

Rank Cintel and Kodak recently entered into a partnership to develop, market and manufacture a CCD-type HDTV telecine, designed to scan negative film shot for HDTV in the 16:9 aspect ratio. Also, a prototype of the Mark III HD Flying Spot-type telecine is already available and is in use at Media Productions' 20,000-sq.-ft. facility in Pompano Beach, FL. According to President Jim Honey, "The Rank MkIII HD offers a built-in Amiga (Rank) secondary color corrector with joystick control, capable of infinite hues. A colorist needs to have a better eye when transferring to HDTV, because the colors are sharper and there's more range."

With its partner Club Theatre Networks (CTN), Media Productions used the November 1989 Leonard/Duran fight to launch a closed-circuit HDTV network around the Southeastern U.S. It is slated to have 14 theaters by the end of 1990. Southern Bell is providing a fiberoptic network to connect the cinemas. After film features are transferred to HDTV tape, they will be transmitted via the fiberoptics, from a central "head-end." The 75-seat HDTV theaters will be equipped with Barco HDTV video projectors, 10- x 20-inch screens, and Dolby Surround Sound decoders. According to Haney, "We will be transferring scientific and industrial programs, as well as first-run feature product, so the theaters can host teleconferences. Theatre owners across the country who eventually participate will be able to gain additional revenues by showing HDTV features and hosting teleconferences."

"The telecine will continue to play a very important role in the future," says BTS product manager Anthony Magliocco. "Producers are choosing and will continue to choose to work with 35 mm film over videotape because it's future-proof. And no matter which standard is selected, the producer will always be able to transfer his or her work via the telecine."

—*C.K.*

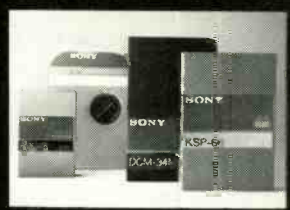


LEADERSHIP HAS ITS REWARDS.

Video leaders see the Sony difference not only in the quality of their pictures, but in their trophy cases.

Award-winning producers, editors, news teams and duplicators rely on Sony professional videotape to capture their best creations. They see a virtually perfect balance of durability, reliability, audio-video performance and responsiveness in sales and service.

That's why Sony, the leader in professional videotape, is the choice of video leaders. Worldwide.



SONY
PROFESSIONAL VIDEOTAPE

Circle 108 on Reader Service Card.

New Products

This month, Television Engineering's coverage of broadcast equipment focuses on RF technology.

ACRODYNE TRU/1000 UHF Transmitter

Exhibited at NAB, the TRU/1000 is a 1-kW solid-state UHF transmitter featuring built-in diagnostics for troubleshooting amplifier boards and other components. Its amplifier slides out to facilitate maintenance.

Reader Service #200

TFT Model 9000 STL Composite Transmitter

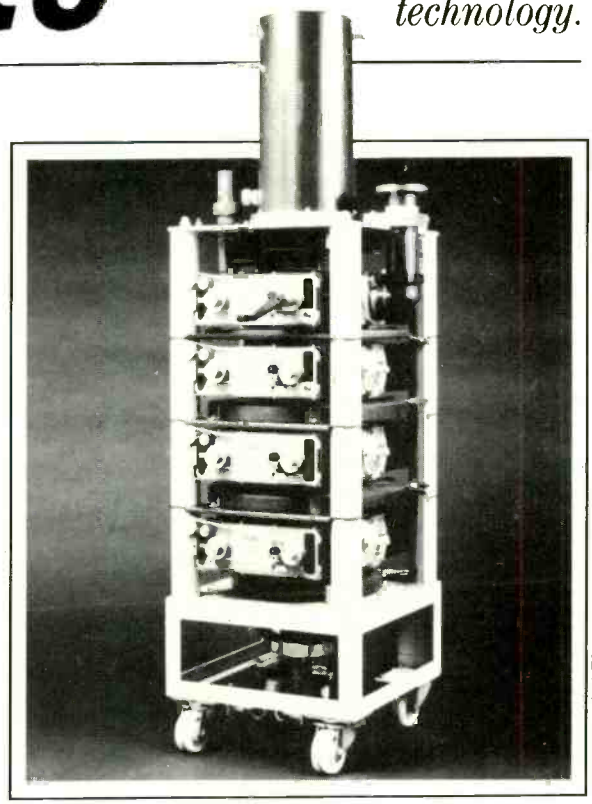
The 9000, which meets pending FCC requirements, improves audio quality if used with older receivers, according to the company. When not integrated with a receiver, it features a 944–952 MHz band, 82-dB signal-to-noise, 0.05 percent T.H.D., 60-dB stereo separation, and a 7.5-watt power output. The price, including a two-year warranty, is $2750. The Model 9007 companion receiver should be available by May 1990.

Reader Service #201

TEKTRONIX 751 BTSC Aural Modulation Monitor/Decoder Option 01

Outputs from a number of different demodulators, cable modulators and cable BTSC encoders can now be accepted by the 751 BTSC with the Option 01 4.5 MHz Demodulator Board. With the 01 installed, the 751 accepts a 4.5-MHz aural carrier, with or without video present, and also the Tektronix 1450-1 Demodulator's 4.5 MHz aural carrier output. The company says that such a configuration lets broadcasters locate the demodulator and 751 when far apart without appreciable line loss or ground-loop problems. Calibration is automatic, eliminating the need for a 1450-1, while field installation requires simple cable rerouting and replacement of two EPROMS on the 751's CPU board. The Option 01 costs $2000.

Reader Service #202



PHILIPS COMPONENTS

PHILIPS COMPONENTS YK1267 Klystron Tubes

Constructed with a non-intercepting electrode that constantly regulates the beam current over the entire modulation range, these annular beam control (ABC) klystrons reportedly save roughly 25 percent of the energy expended by standard tubes. The YK12G7s have the highest output power available in this format, 70 kW, and operate over the complete 470 to 860 MHz UHF frequency range. Besides an efficiency rate of more than 65 percent (depending on the modulation circuitry), the tubes are compact, which can help conserve floor space. Price: $32,500. Philips has also developed the YKI22I, a special sound klystron that operates in a sound/vision configuration.

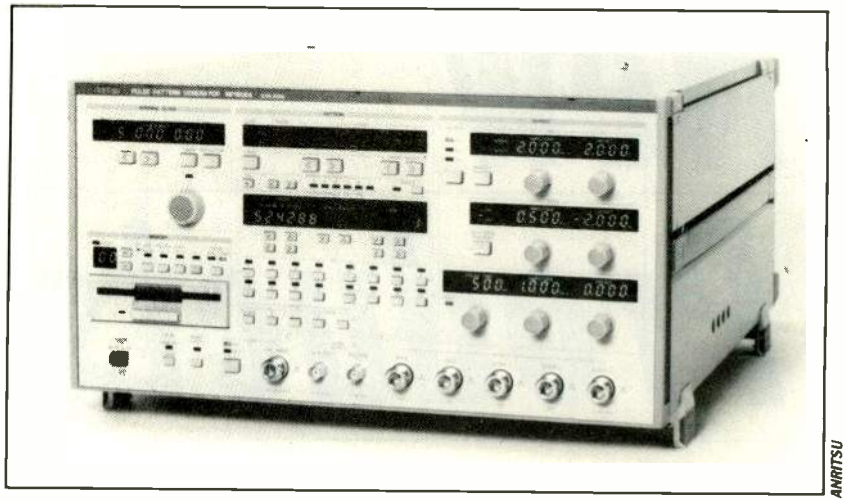
Reader Service #203

ANDREW CORPORATION
Flashpac Flyaway Antenna

This 1.8-meter earth station antenna, which is available in four pieces or eight, operates in C, X, Ku and C/Ku bands (in circular or linear polarization). It has a preassembled, aligned and matched feed system for each frequency band. All components are aluminum alloy; the segmented reflectors split into either four or eight quadrants, depending on the model.
Reader Service #204

ANDREW CORPORATION
Trifold Mobile Receive/Transmit Antenna

Meeting FCC, EUTELSAT, and INTELSAT requirements, the Trifold has a manual/motorizable antenna positioner which utilizes an elevation-over-azimuth mount. The company says this 4.5-meter trailer-mounted receive/transmit antenna can be easily towed with a pickup truck or van and can be put into operation by one person within 30 minutes. Optional features include a motorization kit for elevation and azimuth control, and a remote control system.
Reader Service #205


ANRITSU

ANRITSU MP1608A Pulse Pattern Generator

This pulse pattern generator uses an internal or external clock to produce a digital bit stream at frequencies as high as 5 GHz. It can generate programmable patterns up to 512 Kbits long, allowing STM-16 patterns to be generated in one page. In addition, the Pseudorandom Binary Sequence Patterns and their mark ratio can be varied; the system will convert eight external data inputs at one-eighth of the basic clock rate to one serial data output available at the front panel. The multiplex function works as a byte-to-bit serial converter, transforming eight separate inputs into one pattern output. The generator utilizes a 3.5-inch floppy disk to store up to 1.6 Mbytes of programmable patterns for other instrument settings. Cost: $155,000.
Reader Service #207

ANRITSU MS3401A Network Analyzer

The analyzer measures amplitude, phase and impedance of such active

WAVETEK FiberSAM Cable Signal Analysis Meter Provides Fiberoptic Test Signals

FiberSAM, a cable signal analysis meter with a built-in fiberoptic power meter, measures optical power at 1330 and 1550 nm. It also measures RF signal level, carrier-to-noise ratio, hum, tilt and video-to-audio carrier level ratio. FiberSAM has an analog meter for signal peaking, while a video-minus-audio function key permits direct measurements of the video/audio carrier level relationship. A tilt function simultaneously provides a tilt reading (for slope adjustment) on the left side and the Hi pilot level (for gain adjustment) on the right side of the LCD display, with carrier-to-noise measurements indicated directly on the display. The channel plan (standard, HRC, IRC, and Jerrold formats) may be selected through a keyboard. The Hi/Lo carriers, as well as seven channels, may be user-configured for fast tuning. In the optical power area, besides a wavelength of 1330 and 1550 nm, the system has a range of -40 to +5 dBm. RF signal level measurement frequency ranges are: standard, 50–550 MHz; sub-band option, 4.5–550 MHz; sub/UHF option, -4.5–890 MHz. The range for amplitude measurement is -35 to 60 dBmV, with accuracy readings of ± 0.75 dB level accuracy vs. frequency (flatness); ± 0.75 dB level accuracy vs. level (meter linearity); and ± 1.5 dB total (+ 1.0 typical). The unit operates in a temperature range of -20 degrees to +50 degrees Centigrade (-4 to 122 F). Price: $2,995.
Reader Service #206

WAVETEK

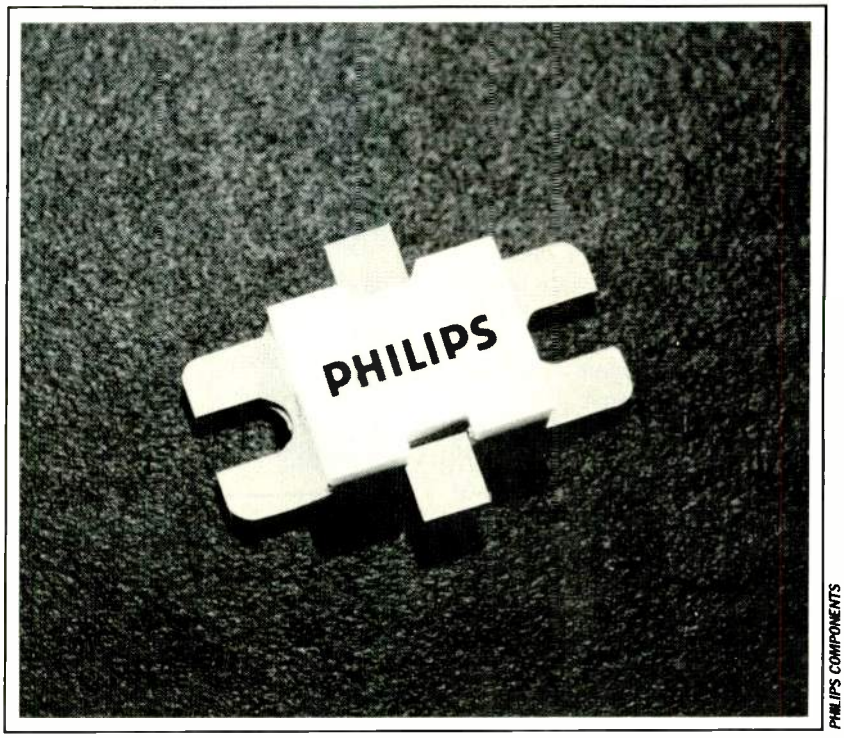
and passive components as amplifiers, crystals, filters and switches. It operates from 10 Hz to 30 MHz, features 300 μs/point measurement speed, and displays results on an eight-inch CRT screen, using a maximum of 501 data points. Measurement dynamic range is 0.01 dB amplitude resolution and 0.1 deg. phase resolution. The MS3401A operates at sweep rates of 10 milliseconds to 27.5 hours per span, and measures impedances at 50 ohms or 70 ohms. The equipment can store as many as 10 different measurement functions on a plug-in memory card and, with a personal test automation (PTA) option, can be equipped to perform automated measurements without an external controller. The price is $16,130; the PTA option is $2530.
Reader Service #208

MICRO COMMUNICATIONS Series 44110 UHF Filters

The 44110 series is designed for use in super-high-powered TV installations. The "reactive-type" filters feature 1.05 VSWR at the fundamentals, second harmonic rejection of 35 db, and third harmonic rejection of 30 db. Units allow for field-adjustable tuning.
Reader Service #209

CINCH CONNECTORS 2-mm Flat Cable Header Connector

Intended primarily as a component for disc drives, Cinch's cable header saves 38 percent of the PCB area in a PC board to flat cable interconnections, according to the company. The cable header is made of brass and a 50-microinch nickel contact underplating. The .020-inch (.5l-mm) square pins are insulated by UL 94V-0-rated glass-filled polyester. The minimum contact retention is two pounds, with operating temperatures ranging from -55 degrees C to 125 degrees C. The connector is intermateable with other 2-mm products.
Reader Service #210



PHILIPS COMPONENTS

PHILIPS COMPONENTS PXB16050U Microwave CW Transistor

Providing 50W continuous-wave power at 1.6 GHz, this NPN silicon planar epitaxial transistor is designed for common-bass Class C narrow-band amplifiers. According to Philips, the PXB16050U has the highest available output power for satellite links in INMARSAT systems. It operates from a 28 V supply, has a typical power gain of 9.5 dB, a collector efficiency up to 52 percent, and a thermal resistance of 1.5 K/W. The transistor has input and output prematching circuits to help distribute power equally over the total active area. The company promises improved durability and longer life for the PXB16050U because of diffused emitter ballasting resistors and gold metallization. The price is $240 in 1,000-piece quantities.
Reader Service #211

STANDARD COMMUNICATIONS CRC850 Remote Control Hardware and Software for MT830 Satellite Receivers

Using a direct connection to the serial port of a computer or telephone lines, the CRC850 can configure satellite receivers from an IBM computer, automating the space segment at up to 60 times per day. Other features allow remote operation of video and audio level settings, five custom alarms that notify the computer if scrambled or unscrambled video is lost, signal meter readings, and three frequency-agile audio subcarrier demodulators with three IF bandpass filters for each demodulator. There is also a permanent serial number address in each control board. The basic setup requires a Standard Communications CRC800CI interface cable to the first MT830, then a "daisy chain" of pair cables to the other receivers. Cost: $499 for interface board (not including software or power supply).
Reader Service #212

RF TECHNOLOGY Pathfinder Antenna System

The Pathfinder antenna, available with either dual or quad polarization and an integral bypassable, low-noise amplifier, has been designed for medium-haul ENG applications. The system employs an offset-fed semi-parabolic antenna to provide high efficiency and very low side-lobes. Besides the single-band models, RF Technology offers 2- and 2.5-GHz wideband versions. The complete Pathfinder system includes antenna, panning table, radome, integral LNA, junction box and local control. Two- or four-wire remote control is optional.

Reader Service #213

FREQUENCY PRODUCTS SAA5964-10 and SAA6471-10 Power Amps

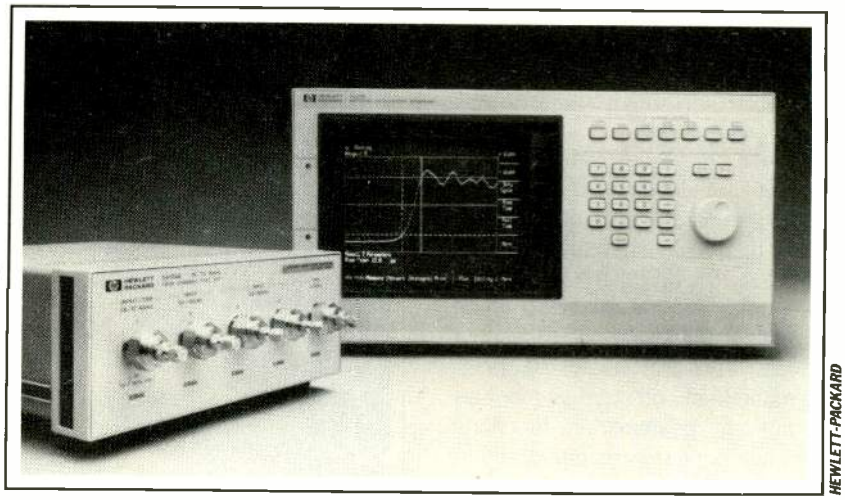
These GaAs FET 6-GHz power amplifiers are designed for saturated-mode FM operation. Options allow for exact bolt-in TWT retrofitting. Typical specs include: frequency range of 5.9 to 6.4 and 6.4 to 7.1 GHz; power output of 10 watts (+ 40 dbm), input level range of -7 to + 3 dbm, gain of 47 db, VSWR 1.5:1, NF 6 db, and harmonics of -45 dbc. DC voltage is + 12V or -24V, -48V for an office battery.

Reader Service #214

RF TECHNOLOGY 03C Series Miniature Portable Transmitters

Designed for backpack, on-camera and lightweight portable applications, these transmitters run from 1.7 to 13.25 GHz with optional add-on power amplifiers for increased RF output power and extended range. Other features: dual high-quality audio channels with Line/Off/Mic switching, and 250 MHz frequency (including a wideband 2 and 2.5 GHz option and wide/narrow baseband switching).

Reader Service #215



HEWLETT-PACKARD

HEWLETT-PACKARD HP54124T Oscilloscope

This four-channel, 50-GHz digitizing oscilloscope has a built-in time-domain reflectometer (TDR) that measures impedance, reflection coefficient, and distance from a reference plane. Aimed at designers of lightwave communications components and systems, high-speed digital and optical devices, and high-speed semiconductor processes and technology, the device has a 12-bit A/D converter that provides up to 14 bits (14 microvolts) of voltage resolution, yielding a sensitivity as low as 1 mV per division. Hewlett-Packard claims that its sampling oscilloscopes are the only ones on the market to employ a digital-feedback sampling scheme, thus eliminating the need for a dot-response adjustment. Price: $42,800.

Reader Service #216

FREQUENCY PRODUCTS SAA7177-10 Microwave Amplifier

As part of Frequency Products' C-band amplifier subassembly system, this 10-watt gallium arsenide field effect transistor [GaAs FET] power amplifier was developed for saturated mode FM microwave communication transmitters. It has seven stages of amplification, providing roughly 41 dB maximum gain. GaAs FETS are used throughout, with the first six stages single-ended, operating in a Class A mode. The output stage is derived from two identical devices combined in a 90-degree hybrid configuration that incorporates an internal load to capture reflected power. The amplifier operates from a single positive power source of + 12 VDC. Also provided: an external DC to DC converter, operating from a -48 VDC supply. Other specifications: frequency range 7.1–7.7GHz, output 10 watts (+ 40 dbm), gain of 41 dB, VSWR 1.5:1, NF 6 db, Harmonics -45 dBc, and DC voltage of + 12 or -24V (-48 V office battery). Price: $5,200 in quantities of one to four.

Reader Service #217

PANASONIC TBC-200 Plus Y/C Time Base Corrector

According to Panasonic, chroma-enhancement circuitry enables the TBC-200 to minimize signal loss over multi-generations. Besides being able to transcode NTSC and Y/C 3.58 (S-VHS) into NTSC, Y/C 3.58 or Y/R-Y, B-Y, the system has a 16-line correction window, horizontal and vertical Y/C delay adjustments, frame-editing capability with consistent horizontal position, and QIW circuitry for stable pictures in jog/shuttle modes.

Reader Service #218


FLUKE

FLUKE PM 3355 and PM 3375 DSO Oscilloscopes

These analog/digital storage scopes offer real-time sampling speeds of up to 250 MS/s, analog and digital bandwidths of up to 100 MHz, and added microprocessor-calculated measurements. Both feature cursors and full autoset. List price is $5390 for the PM 3375 and $4500 for the PM 3355.

Reader Service #219

RF TECHNOLOGY RF-FOM-13L Fiberoptic Link System

This new system, based on a 1300 nm laser, can transmit video and four audio channels over 35 miles. It also includes diagnostics, alarms, and test waveforms. 70 MHz injection, repetition or output allows the 13L to be used as a spur from an existing hetrodyne microwave backbone system.

Reader Service #220

AMERITRON AL-82 Amplifier

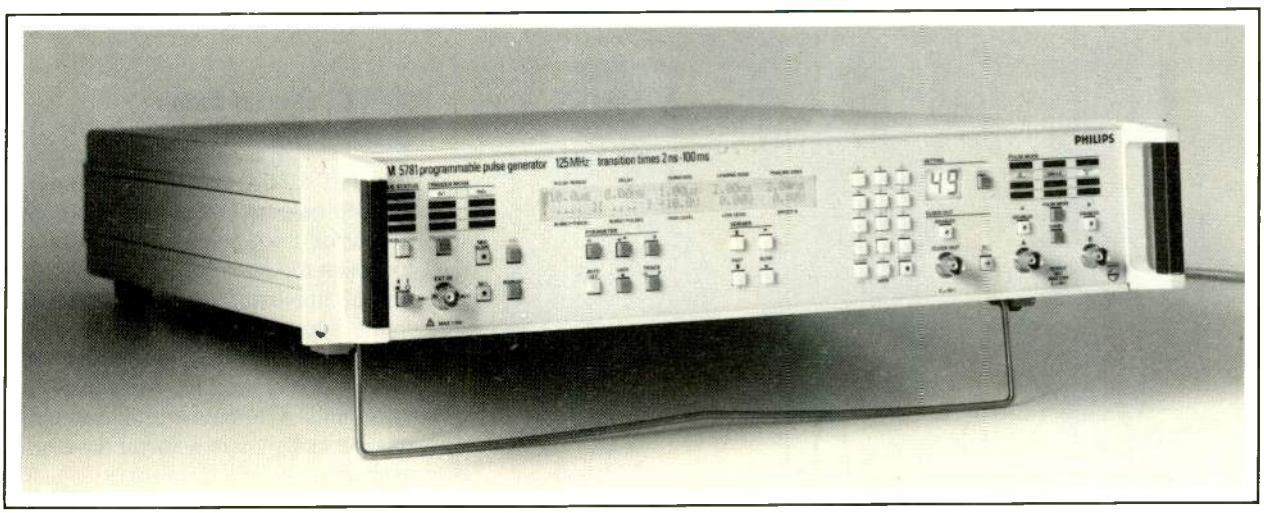
The AL-82 uses two 3-500Z transmitting tubes, and has an 1800-watt hypersil transformer to drive the tubes to their maximum output. Two illuminated meters are featured: One gives a constant reading of grid current; the other displays plate voltage and current, peak RF output power, and drive power/ALC. The unit has heavy-duty rectifiers in a full wave bridge supply with computer-grade capacitors. Two bias settings allow either RTTY and CW operation at 1500 watts of continuous output at nearly 70 percent plate efficiency, or low distortion 1500-watt PEO SSB, SSTV, or AM output. The Pi-L tank circuit permits full impedance matching over the entire 160-meter band. The AL-82 covers 160, 80, 40, 20 and 15 meters, and gives 80 percent rated output on 12 and 17 meters. Price: $1,995.

Reader Service #221

FLUKE PM 5781 Programmable Pulse Generator

The PM 5781 has a frequency range of 0.1 MHz to 125 MHz with an extendible range to .025 mHz and individually programmable rise and fall times from 2 ns to 100 ms. There are two outputs for positive and negative going pulses, with independent dc offset control on the second channel output, and a third, switchable TTL/ECL level output. Because of internal 50 ohm back-matching terminations, the generator provides clean pulses even with mismatched loads, according to the company. The system's microprocessor control includes a track mode to maintain a programmable fixed relationship between specified pulse parameters; output can be inhibited until all parameters automatically checked for inconsistencies have been defined and validated. Price: $9585.

Reader Service #222



FLUKE

SCHMID TELECOMMUNICATION SIAT (Short Internal Audio Testing) System

This fully automated system, conforming to CCITT standards and consisting of the SZ316 Signal Generator, SZ346 Measuring Receiver, and SZ SIAT-NET Software for Network Supervision (optional), can monitor any audio network, completing an entire test sequence in as little as five seconds. SIAT checks frequency response, phase/level difference, total harmonic distortion, crosstalk, noise, channel transposition and intermodulation distortion. If tolerances are not met, the system reports a "No Go," and automatically prints out all measured values, highlighting problem areas.

Reader Service #223

PANASONIC

AUDIO-TECHNICA 600 Series Headphones

Three new headsets are available in this series. All feature large leatherette earpads and wide headbands, newly configured oval earcup cavities, samarium cobalt rare earth magnets, 10-foot cables, and standard one-quarter-inch plugs. The ATH609 features 40-mm drivers, 20-20,000-Hz frequency response and 32 actual impedance. The ATH610 responds well in situations requiring additional isolation and maximum low-end clarity, according to Audio-Technica; it utilizes 44-mm drivers, and it has a 20-22,000-Hz frequency response and 40-ohm actual impedance. The ATH611 features 44-mm drivers, 20-23,000 frequency response, and 40-ohm actual impedance. Prices range from $49.95 to $69.95.

Reader Service #224

AUDIO-TECHNICA

PANASONIC AG-520 Monitor/VCR

The AG-520 combines a 20-inch monitor with a VCR unit that uses two rotary heads and a helical scanning system. Other features of the AG-520 include internal timer playback with auto repeat, and a variety of special effects playback. Wireless remote is standard. Suggested retail price is $875.

Reader Service #225

AVITEL Digital Video Distribution Amplifier

This full 10-bit digital DA with reclocked outputs has a dip switch on the inside front panel to allow users to assign the dual-output modules to any of the input modules. The DA frame allows up to three input and three dual-output modules. Optional input cable equalization (up to 500 feet) and a remote-control output module assignment selector are also available.

Reader Service #226

PERROTT ENGINEERING LABS AC Power Supply

The features of this two-pound, compact, low-noise power supply include 115-bolt AC input, 12-volt DC output, 4-AH amperage, and an on/off switch and indicator lamp. Price: $415.

Reader Service #227

AUDIO-TECHNICA ATM25 Microphone

This wide-range, moving-coil dynamic microphone with a hypercardioid pickup pattern features 30–15,000 Hz frequency response, 600 ohm balanced output, and -57.8 dBm sensitivity. According to the company, the mic is well-suited for recording highly dynamic instruments. The narrow acceptance angle of its hyper-cardioid polar pattern allows the mic to focus on a desired sound source, control feedback, provide more flexible microphone-to-instrument working distances, and reject unwanted sound.

Reader Service #228

AUDIO-TECHNICA

PANASONIC PT-200 Color Video/Data Projector

When used with Panasonic's ET-100DS advanced digital scan converter, the PT-200 can reportedly reproduce flicker-free images on a 70- to 120-inch screen, operating at any scan frequency within 15 kHz to 37 kHz horizontally, and 50 Hz to 100 Hz vertically. It will automatically adjust to input signals when driven by any standard IBM PC/XT/AT or IBM PS/2 color graphics or compatible board. The system hooks up with many sources (analog RGB, S-VHS, TTL computer inputs), while its I-Cathode CRT maintains high-emission current density for smaller spot diameter and sharp outline delineation. The unit has a dual-focus, six-element lens design that employs both glass and polymer components. Optical power: 550 lumens. Horizontal resolution: 1100 lines, RGB; 650 lines, video. Price: $8000.

Reader Service #229

NEW PRODUCTS

PANASONIC UTP-2 Video Signal Transcoder

The UTP-2 user can transcode signals during editing with no generation loss, according to the company. The system, with a 5.5 MHz (-1 dB) bandwidth and a 60 dB ratio, accepts Y/C 3.58 MHz; Y/688 kHz; Y/R-Y; and linear RGB sync input signals. The transcoded output signals are Y/C 3.58 MHz; Y/688 kHz; Y/R-Y, B-Y; linear RGB sync; and NTSC composite. The unit, 19 inches, rack-mountable and one rack-unit high, lists for $1950.

Reader Service #230

JVC SA-F911U SMPTE Time Code Reader/Generator

The latest addition to JVC's S-VHS production and post-production equipment line, the SA-F911U uses a nine-pin subminiature D connector to connect JVC parallel VCRs to RS-422 serial controllers, reading both longitudinal time code from an audio or address track, and vertical interval time code (VITC) on the video track. The unit's window generator allows the codes to be superimposed over the video signal, permitting off-line window dubs. Time code is inserted in the serial data stream for use by the editing controller. VITC can also be inserted into the Y/C 358 video signal for Y/C dubbing.

Reader Service #231

PERROTT ENGINEERING LABS PB 90 Pouch Power Pack

Designed for the user who needs a lightweight belt as a power source, the PB 90 Pouch Pak can run a camera for roughly 90 minutes or a minilight for about 25 minutes. It fits around a normal belt, is constructed of a synthetic leather-like material, weighs one pound, and measures 8" by 5" by 1". Price: $75 (without battery).

Reader Service #232

VINTEN BROADCAST Penguin II Track-mounted Dolly

Vinten says this dolly is lightweight and its swivelling legs permit simple movement through a door when loading equipment. During a shoot, it can be lifted on and off a track, operating on standard-gauge and narrow-gauge track. It can also be run off-track in the studio, and can crab or steer on its studio wheels. The unit will accommodate existing Vinten Classic mountings from the elevation units with cam heads or heavy loads to such fixed columns and cranes as the Dolphin or Merlin. It can be fitted with pneumatic columns like the Midiped or the Osprey.

Reader Service #233

HM ELECTRONICS RW760 Interface Unit

The RW760 from HM Electronics is a rack-mountable interface unit that allows HME 700 Series Intercom products to connect to two-wire, non-compatible three-wire, four-wire or telephone intercom systems. The unit has the ability to connect telephone systems to standard three-wire intercom systems, and captures and holds telephone lines. The unit comes with an AC adapter.

Reader Service #234

PANASONIC WJ-MX12 Digital Audio Video Mixer

The WJ-MX12 features 500 lines of resolution and Y/C separation for S-VHS compatibility. A built-in digital frame synchronizer allows easy mixing of NTSC format sources or Y/C video sources such as cameras, VCRs and TV tuners without a time-base corrector, according to the company. Among the available digital effects that can be programmed into the unit's four separate memories: freeze-frame, negative/positive picture reversal, stroboscope, mosaic picture, and paint function. Up to 17 different wipes can be achieved by combining the WJ-MX12's wipe selector buttons, and the three video inputs allow for a number of superimposition effects. The suggested retail price is $3000.

Reader Service #235

When Viacom Networks had tough questions about Multi-Cassette Systems, Sony had the answers.

Scott Davis, Senior Vice President
Viacom Network Operations

When it comes to Multi-Cassette Systems, questions on efficiency, reliability and service are all pretty standard. But the answers are not. Because with each application there are variables. Like formats, capacities and software.

"It's a decision affecting every aspect of our operation. And it's a matter of doing what it takes to stay competitive in the years ahead.

For us, we knew the answer would be a Multi-Cassette System. Still there were many tough questions. Like how to implement a system that would satisfy our current needs, while working to fully integrate many of our operations.

We looked very carefully at what was out there. The equipment, hardware, software, everything. We talked both to manufacturers and current system users.

Increasingly we found that choosing and installing a Multi-Cassette System involved more than just equipment selection. It meant establishing a long term relationship. One based on the confidence in knowing that should the need arise, the necessary engineering and service support would be close at hand.

It became clear that Sony had the hardware and software solutions we needed to meet our challenges head on."

. . .Scott Davis

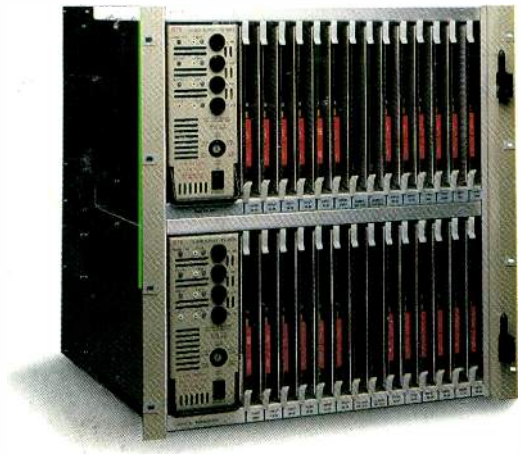
Every operation, large or small, needs a system that's right for today's demanding applications. Yet designed and engineered to provide solutions for tomorrow. Meet the challenge with a Sony Multi-Cassette System.

For more information, contact your Sony Broadcast Sales Engineer. Or call 800-635-SONY. And have your questions ready.

SONY®

BROADCAST PRODUCTS

This switcher handles standard bandwidth like it's going out of style.



TVS/TAS-3000 Distribution Switcher

The new TVS/TAS-3000 video/audio distribution switcher from BTS handles standard bandwidth switching in stride. But the fact is, standard bandwidth may not be the standard much longer. And that's why the TVS/TAS-3000 is not your standard switcher.

With the advent of wide bandwidth video, you'll need a switcher that can handle the new higher bandwidth signals. The 3000 will. It provides a video bandwidth of more than 50 MHz, measured with a full-amplitude sine wave or video signal. Which makes it upwardly compatible with HDTV or computer graphics—no matter what the standard.

The TVS/TAS-3000 also delivers the cleanest signal and expands to accommodate any matrix size to meet your specific needs.

And if high bandwidth capacity isn't a requirement, BTS still has you covered with our best-selling switcher, the TVS/TAS-2000. The 2000 represents the same advanced technology and quality as the 3000 in a standard bandwidth switcher. BTS also offers a full-range of control panels and distribution amplifiers for a complete system designed, tested and guaranteed by one supplier.

All BTS switchers undergo 100% computerized factory testing and are protected with a 5-year warranty. In the unlikely event you do have a problem, simply return the board for a free replacement.

Dependable, performing switchers from BTS. Anything else is substandard. Call for information and technical specifications today: **1-800-562-1136.**

BTS
The name behind what's ahead.™

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