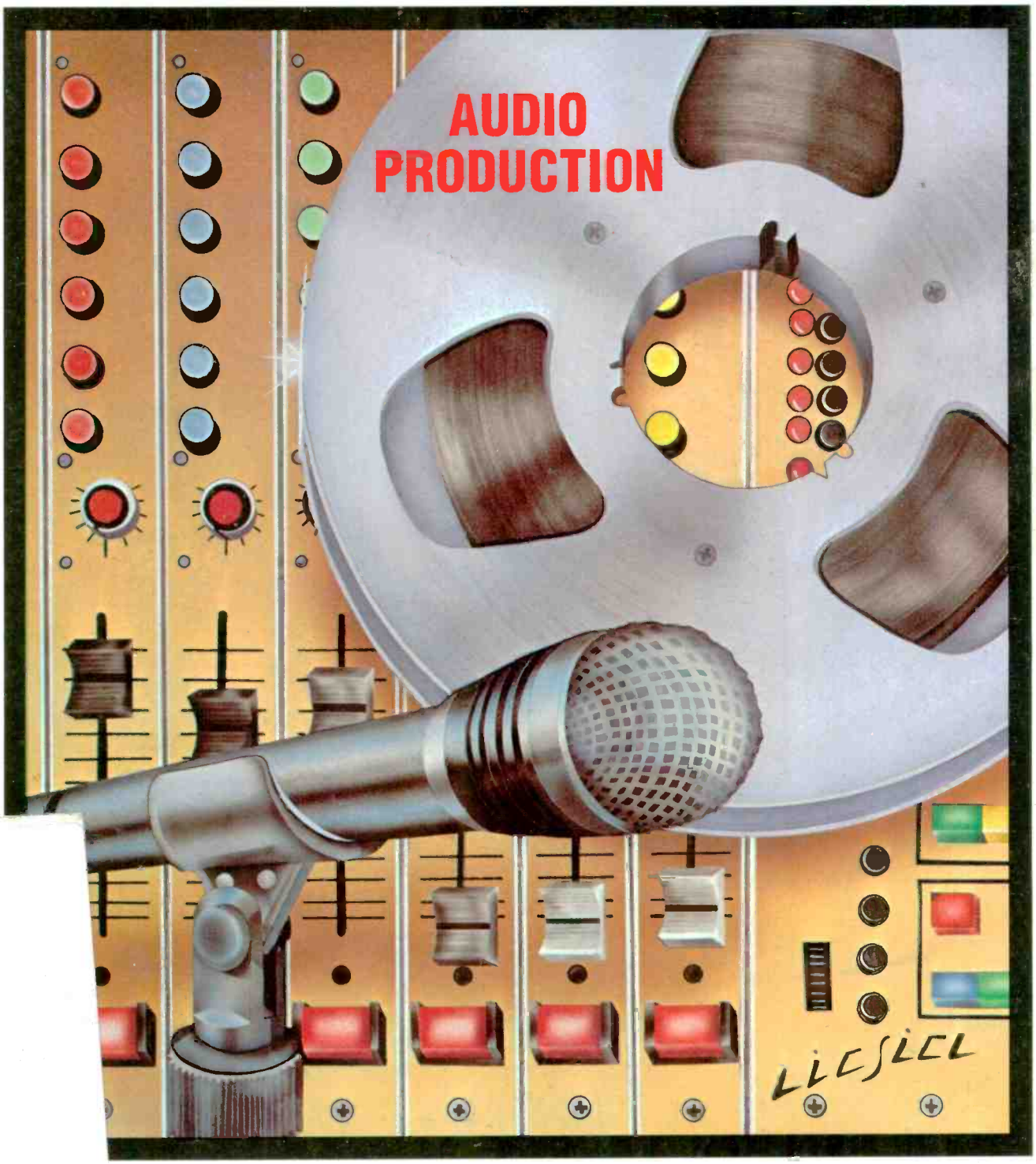
JANUARY 1985 $3.00

BM/E

BROADCAST MANAGEMENT/ENGINEERING

PROGRAMMING & PRODUCTION
ADVENTURE IN EFP



Also in this issue:
SMPTE Show-In-Print ■
Speak Out! ■ Multichannel TV Audio

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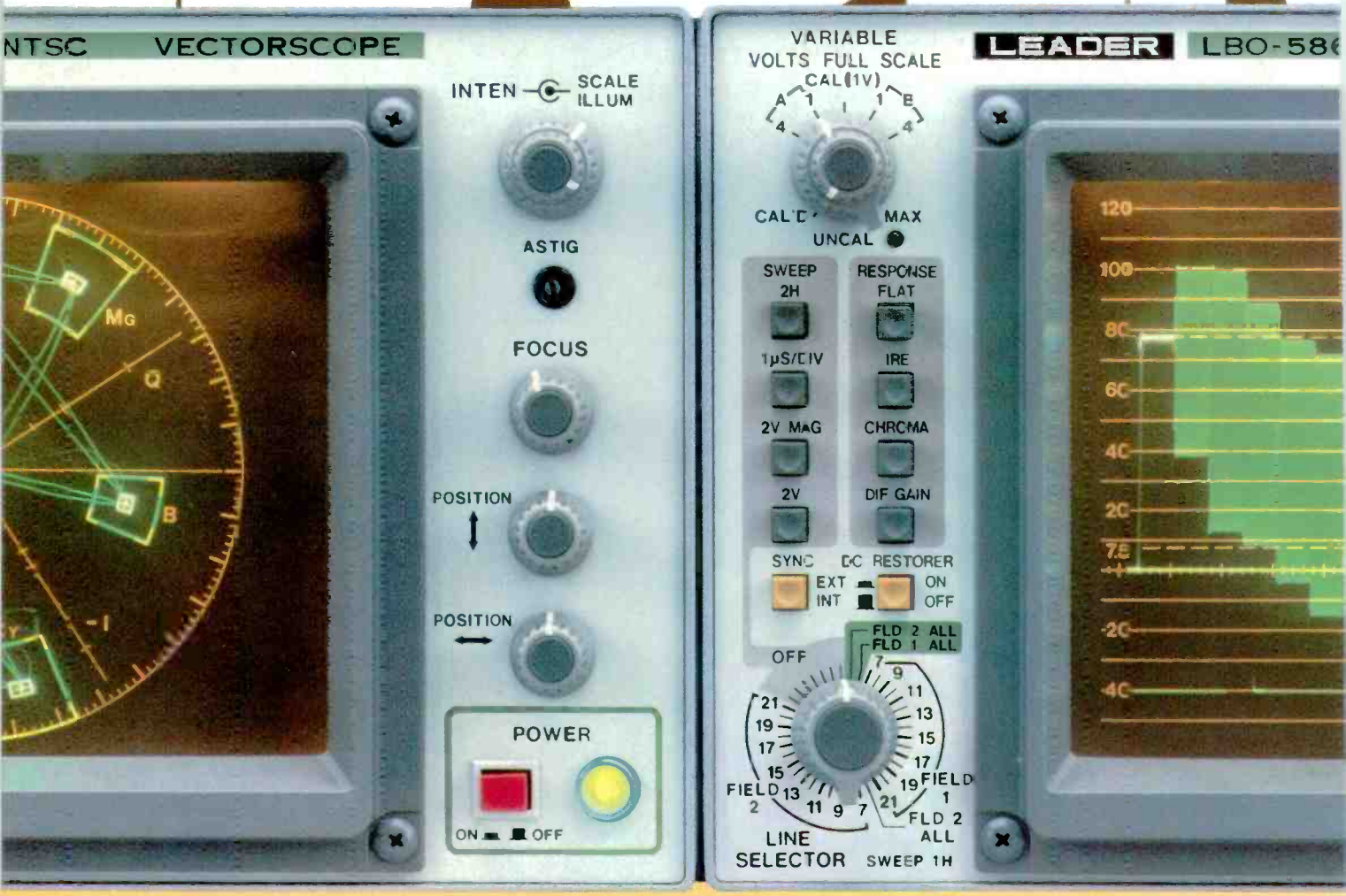

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What good is a recording tape that gives you a terrific video signal-to-noise ratio but falls short in signal wear? Or one that excels in video sensitivity but is dismal in dropouts? Or, for that matter, one that reduces head wear but sticks and slips in the jogging mode?

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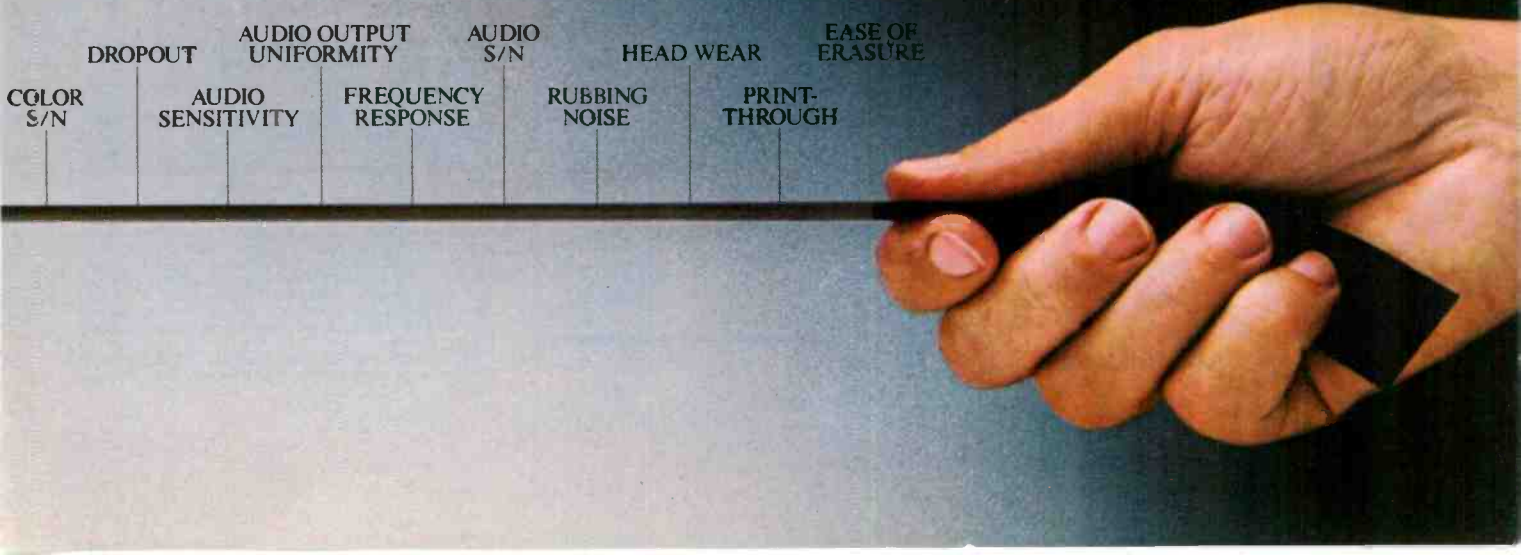
SONY
Industrial Tape Division



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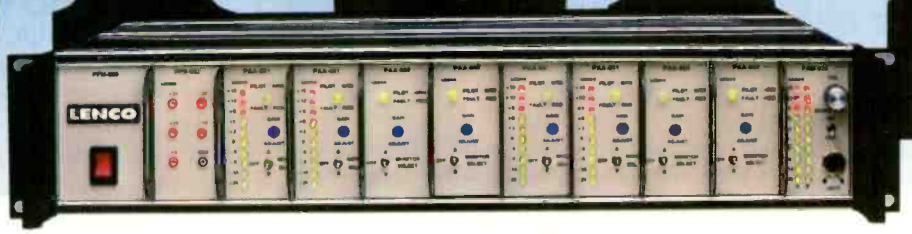

Lenco's New 600 System Audio Distribution Components Put All the Right Stuff Together...

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BM/E
BROADCAST MANAGEMENT/ENGINEERING

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NEXT MONTH

- **EXCLUSIVE PREDICTIONS FOR NAB**
- **STUDIO CAMERAS**

DEPARTMENTS

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Sports Time Cable Network wanted Midwest to deliver all the big hits – the game winning RBI's, the bruising tackles, and devastating left jabs – from any location, at any time. We designed and constructed Eagle 1, 45 feet of production capacity with more versatility than any mobile unit on the road today. What makes it the biggest hit are fine components like:

- Ikegami HK-357AT Automatic Color Cameras that set the standards for picture resolution, signal to noise ratio and registration accuracy.
- Ikegami HL-79EAL, the hand held camera that produces higher quality images than many other manufacturers' studio models.
- Ikegami 9-Series Color Monitors, reknowned for superb resolution and amazing life-like colors.

Midwest and Ikegami

This dedication to quality and versatility is evident throughout the unit. We used our 25 years of engineering experience to integrate these excellent components into a complete system that could handle any assignment.

The equipment package includes:

- Five Ikegami HK-357AT Cameras with Triax and Canon 40:1 Lenses.
- Two Ikegami HL-79EAL Cameras with Canon 13:1 Lenses.
- 24-Input Grass Valley 300/3A Production Switcher.
- Four Ampex VPR-2B One Inch Tape Machines with Slo-Mo.
- One Sony BVU-820 Umatic VTR with Slo-Mo.
- One Sony BVU-800 Umatic VTR.
- One VHS and one Beta VTR.
- Harris HDE-200 Digital Effects System.
- Adda ESP II Still Store System.
- Auditronics 36-Input Stereo Audio Console.
- Chyron 4100 Graphics Generator.
- Two Adda VW2 Frame Synchronizers.

Eagle1 is delivering the big hits for the Sports Time Cable Network, a Multimedia subsidiary. In fact, because of its diverse capabilities, other companies are leasing it. So the unit is also delivering hit specials, stage shows, and concerts.

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EDITORIAL

No News is Not Good News

The RTNDA *Communicator* recently carried a story about Herbert Byrd, formerly news director at KLRA-AM Stereo, Little Rock, AR. After 22 years on the job, Byrd was called into the new GM's office one day and told that the news department was being abolished, and that Byrd would be losing his job. Not only was the local news being done away with, but so also was all of the station's live programming—with the exception of an early-morning personality DJ.

Without passing judgement on Byrd himself or the job he was doing (this wasn't the issue), nor on the desire of KLRA's management to make an honest buck, the situation is little short of deplorable. And even worse, it is being repeated at station after station around the country where live production is being abandoned in favor of canned or satellite-supplied programming and national news services.

It doesn't take much research to show that if broadcasting in general, and radio in specific, are going to maintain themselves in a marketplace filled with narrowcasters, it's going to be because no medium does a better job of maintaining a local identity than the local radio station. And that identity is maintained not by adding the station's call letters into a prepackaged jingle, but by live, local presence—both with community-based on-air personalities and with the news.

Turning off locally originated programs may, of course, have a short-term impact on station expenditures. But the long-term health of the station, its local identity, will be irreparably damaged by such a move—to the detriment of both the community and the station's profitability.

But there's an even broader issue at stake. From the community, the local station takes and takes: it takes the local merchants' advertising dollars; it takes its listeners' attention away from other activities; and it takes their buying power and gives it to the advertiser. But what does it give back to the community which supports it? If canned programming is the best it can do, then it deserves whatever fate lies in store for it at the hands of listeners who want to feel they are part of the station and its identity.

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For Harrison Reliability

Sure, Harrison has waited to enter the U.S. broadcast market. When you're a stickler for precise engineering and a perfectionist when it comes to quality performance – you've got to take your time to get it right. *Get it just right for you.*

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It can be tough getting the right console to match your specifications. About as easy as fitting a square peg in a round hole, right? Harrison Systems has anticipated your need for versatility. A good deal of time and research goes into our consoles in order to bring you the smartest, most efficient technology and service. We've got the system that fits the size and scope of your needs, whether it be:

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- Video Edit Suite
- Film Sound Post-Production
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- Broadcast Production
- Live Sound Reinforcement
- Music Recording and Scoring

At Harrison Systems, we give you choices – not excuses or unnecessary fluff. Our systems are designed to bring you long-lasting, clean performance and reliability.

Harrison Puts You In Good Company

Organizations like Swiss Broadcasting and Belgian Radio and Television have believed in the superior quality of Harrison Stereo Broadcast Audio Consoles for years and have chosen Harrison for multiple broadcast installations. Swedish Television has selected 8 TV-3 consoles and has committed to several more. This year's Winter Olympics in Yugoslavia received the main audio feed from a TV-3.

At Last

At Harrison, we take the time to listen to your needs. We design our consoles with the flexibility to fit your operation. And although our standards may be high for our consoles – our prices are very, very reasonable. We think you'll find it's been worth the wait – in golden, Harrison-true performance. Call us for a demonstration and see for yourself.

For Harrison Innovation

Introducing Harrison's TV-3, PRO-7 and TV-4, the broadcast consoles you've been waiting for:

TV-3 For large scale TV audio, remote production, studio production, post-production and sweetening ■ Adapts to wide range of tasks ■ Available in a variety of configurations for customization ■ Plus many options.

Now Available *AIR-7* For on-air stereo radio broadcasting, combining sophisticated technology with simple operation.

PRO-7 Designed for comprehensive use in broadcast, live sound, motion picture teleproduction ■ Two major configurations ■ Simple to operate ■ Cost-effective ■ Independent mix decision capability ■ Long-term performance achieved through thick-film laser-trimmed resistor networks ■ Plus many options.

TV-4 For medium scale on-air production, remote production, studio production, sweetening and post-production ■ Three major, simplified configurations ■ Easy to install ■ High-speed, low noise, low distortion amplifiers allow for best possible electronic performance ■ Plus many options.

Harrison's new VSI Fader Section, which allows for simultaneous interface with automation and video editor/switcher, is available for TV-4 and PRO-7 consoles.

Why wait any longer? Call or write Harrison Systems, Inc., P.O. Box 22964, Nashville, TN 37202; (615) 834-1184, Telex 555133.

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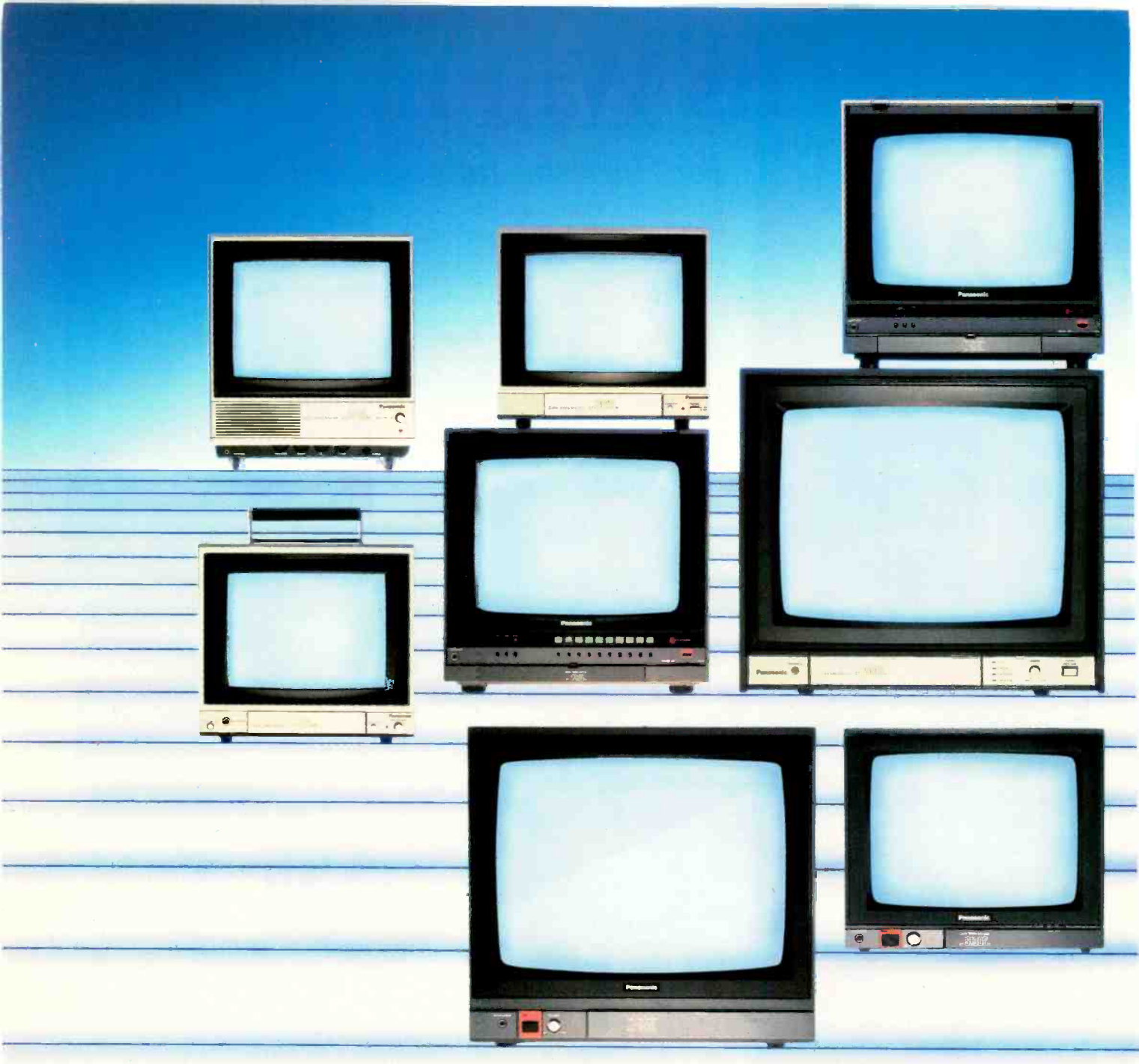


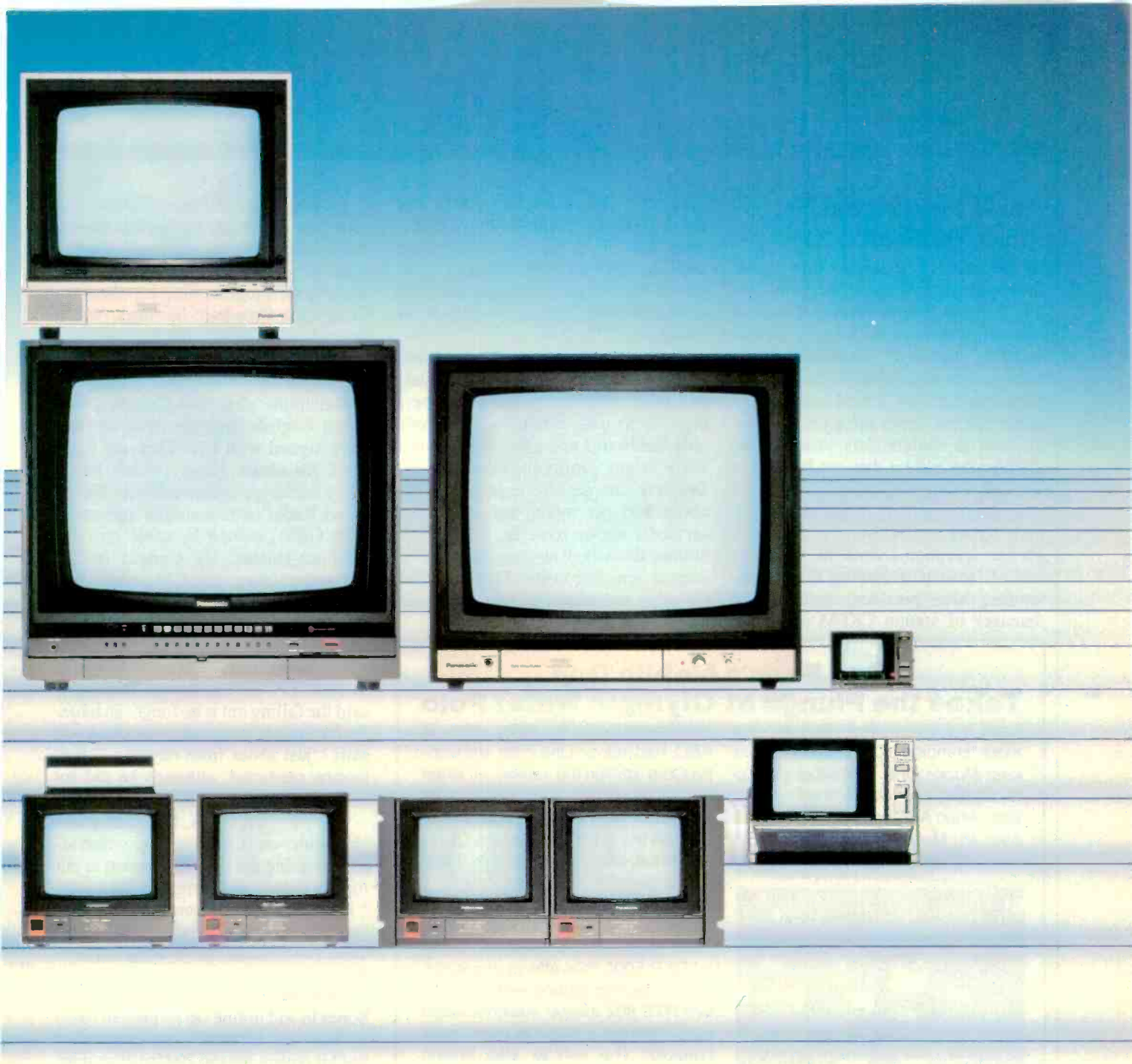
Panasonic® Industrial Monitors. Designed for teleproduction. Priced for any production.

When it comes to industrial monitors, it pays to come to Panasonic. Because Panasonic has just the right monitor for just about any application or specification you can think of. But don't think monitors good enough for teleproduction also have to be expensive. Take a good look at the Panasonic BT and CT series. What you'll see is outstanding picture quality as well as a full complement of features and controls. What you won't see are high prices.

When you look at the BT-S1900N 19" monitor (all screen sizes measured diagonally), you'll see one of our most brilliant and best defined color pictures ever. One reason is our CompuFocus™ picture tube with OverLapping Field Lens gun. Another is a switchable comb filter which increases definition for easy detection of signal flaws. Behind its push-open door lies a full array of operating controls. Like a normal/underscan switch, pulse cross, horizontal/vertical centering controls and blue-only for easy adjustment of chrominance and hue.

The 13" BT-S1300N has the same great picture, controls and inputs. And our 7" BT-S700N is ideal for mobile units and outdoor production because it operates on AC or DC. It also features controls for normal/underscan, pulse cross, blue-only and much more.

The 7" BT-S701N is equipped with switchable line inputs and external sync terminals while the BT-S702 consists of two 701 monitors mounted in



a dual rack adapter.

The Panasonic CT series will also show you a picture that's clear, well-defined and brilliant in color. Because both monitors have either CompuFocus or Quintrix II® picture tubes. And, of course, all models have 8-pin video input and output connectors as well as loop-through capability for easy system adaptation.

When portability and light weight are important, choose from two AC/DC monitor/receivers: the 5" CT-500V, or the CT-300VT with its 2.6" screen—the world's smallest industrial color monitor.

There are also three 10" monitors for educational, industrial, computer, medical, and scientific applications. There's the CT-1330V monitor/receiver, the CT-1330M monitor, and the CT-1350MG with NTSC composite and RGB inputs.

If you're big on 19" monitors, the CT series keeps you covered in a big way. Both our CT-1930V monitor/receiver and our CT-1920M have comb filters for increased picture definition, while the CT-2000M lets you switch from PAL to SECAM to either NTSC 3.58 or NTSC 4.43.

So, no matter what you are looking for, you can't afford to overlook Panasonic Industrial Monitors.

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AUDIO-VIDEO SYSTEMS DIVISION

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New Canadian Sat Net To Deliver Radio News

If all goes as planned, this month independent radio broadcasters in Canada will be able to receive Canadian newswires and programming via a new satellite network. Electronic News Group, a new company based in Toronto, says it has signed independent radio stations, news services, and syndicators as shareholders in a satellite distribution system that can be used to form ad hoc networks.

Though originally projected for January 1 startup, EN Group will actually go into operation around the middle or end of January, according to Bill Ballentine, vice president and general manager of station CKFM and EN's president. Ballentine told *BM/E* that about 200 stations are scheduled to start receiving EN's voice and teleprinter satellite news feeds. Of these, 125 are said to have recently installed receiving dishes in order to become part of the group.

To join, each station buys a share of the network for approximately $12,000. This entry fee pays for a three-meter dish installed with addressable hardware, and gives the station a share in any profits the system earns. Delivery charges are expected to run about $50 per month for each news service a station receives, a level Ballentine described as roughly equal to current longline costs. Delivery rates for other programming were not available.

Programmers and news services can also join the group by buying shares, Ballentine said, but they will not pay fees for transmitting their material. Among the programming members are Telemedia Broadcast Services, which specializes in sports, and St. Clair Productions, which produces a three-hour weekly country music special.

Ballentine also said Canada's four major English-language news services have signed with EN. They are Standard Broadcast News (which has a news exchange agreement with NBC); News Radio (with a similar agreement with CBS), owned by cable operator Maclean-Hunter; UP Canada (which exchanges news with UPI); and Canadian Press's Broadcast News. Radio broadcasters' difficulties last year with Canadian Press are credited as having given independent stations the impetus to form EN Group, though Ballentine said the falling out is no longer an issue. As for French-language coverage, it will start "just about from day one," Ballentine predicted, although he did not name the supplying news organization.

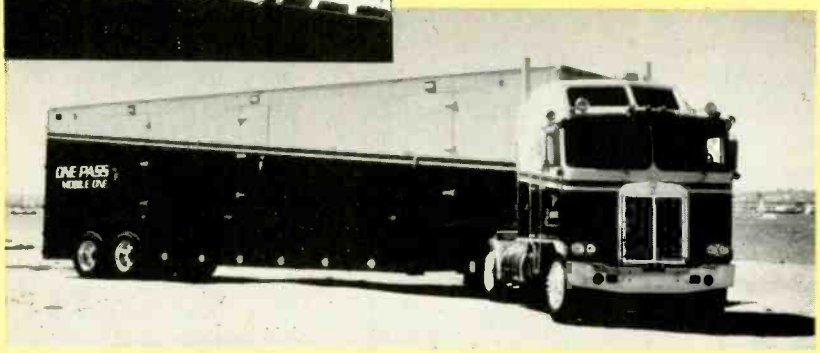
EN's biggest hopes, however, probably ride on Canadian radio broadcasters using the delivery system to put together their own program networks. "EN will make it so much easier to put together ad hoc networks," Ballentine observed. "It will be as simple as dialing up."

Over the next two years EN Group hopes to add uplinks to its present bases in Toronto, Montreal, and Vancouver until it covers the top 20 Canadian markets. The group also projects growth in station membership, and forecasts 350 stations in two to three years. To preserve a "democratic" structure, the group has set up bylaws prohibiting any organization from controlling more than 10 percent of the shares. Ballentine said the company is also looking at distribution of both audio and video programming for cable.

One Pass's Mobile One Takes the Plunge at Olympic Water Polo

Look fast—you won't often see this truck standing still. One Pass has kept Mobile One, its 45-foot production trailer, busy ever since the Olympics, when ABC used it to cover water polo in Malibu. Len Bottom, who handled technical production of remote broadcasts for many years at ABC, had helped One Pass and Centro Corp. design the vehicle, so when he came out of retirement for last summer's big event, he was able to plan on using the truck for the Olympic venue, despite the fact that it was only a blueprint at the time.

Fully loaded, Mobile One is equipped with up to 10 Ikegami cameras, a GVG 1680 24-input switcher, Quantel DEP-5000 Plus effects generator, Utah Scientific routing switcher, and five RTS 802 master stations. Audio goes through a 24 by 16 Auditronics console. The vehicle also boasts three Ampex VPR-3s (slow-mo capable with SMC 100s), three Sony BVH-500s, and three Sony VO-5800s.



*Built by Centro, One Pass's Mobile One truck has shot the Olympics, two 13-week series for Universal (*Charles In Charge *and* E/R*), and a seven-camera concert video for guitarist Lee Ritenour.*

Cable Audio Market Sold As Radio Rival

Multiformat cable audio is a viable premium service, according to a report put out by Satellite Syndicated Systems of Tulsa, OK. The report is based on marketing research done by the Cable Audio Research group, composed of Sat-

Can the Panasonic® AK-30 stand head to head with the bestselling broadcast camera in the world?

You bet it can. In fact, when you compare picture quality, automatic features and price, you'll discover the Panasonic AK-30 is far and away your best bet.

Compare pictures. You'll notice the AK-30 produces a superrefined video image. The kind of image broadcasters love to see. But that's not surprising with these kinds of specifications: Horizontal resolution is 650 lines center. S/N is a very quiet 62dB (−6dB gain), the highest ratio in the industry. Digital registration is 0.05%, 0.1% and 0.25%. And illumination is a mere 24 lux at f1.4 (+18dB gain).

This high level of performance is achieved with a unique combination of image-enhancing circuitry and high-focus-field Plumbicon* tubes.

You'll also appreciate the AK-30's automatic circuits. Like auto-white balance with memory for setting 2 color temperatures. Presettable black stretcher. Auto-black balance, and a knee circuit for variable dynamic range. Together, they let you customize the image you're shooting for.

Still, the AK-30 has plenty more going for it. Consider its dual outputs. One works with standard NTSC. The other lets you set new standards because it's compatible with component recording. That means you can use it as part of our famous M-format Recam system.

The Panasonic AK-30. Compare it to the world's bestselling broadcast camera. And see why it stands out far ahead.

*Plumbicon is a registered trademark of N.V. Philips for TV camera tubes.

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ellite Syndicated Systems, Daniels & Associates, ATC, United Cable, TCI, Warner Amex, Cox Cable, and United Video. The results are said to show that even in markets with many FM stations, a majority of cable subscribers are willing to pay $6 or more per month for alternative radio programming.

The survey cites studies done in Asheville, NC, and Abilene, TX, each reported to receive four FM stations, and in Austin, TX, and Boston, MA, both with 12 to 18 stations. In the small markets, format diversity was cited as most important to current cable viewers, while in the larger markets, no commercials and unique program format were most attractive. Reception quality was also said to be a high priority in the first three markets.

"Willingness to purchase a cable audio service" was placed at 75 percent in Asheville, 80 percent in Abilene, 86 percent in Austin, and 44 percent in Boston. As for pricing, the report says 50 percent of females indicated they would pay $6 a month, 29 percent said $8, and 21 percent said $10. Males seemed less budget-minded, with 17 percent willing to pay $10.

Satellite Syndicated Systems is offering a cable audio system providing up to 10 formats, which are sometimes marketed with stereo versions of video channels.

Home Computers Create Special Audience

A new radio show incorporating a teletext segment is now being delivered to 420 stations. Called *Download*, the half-hour show on computers includes packages of free software, information, or graphics that are broadcast or cablecast in seconds-long passages to the listener's computer using only a normal audio signal. Microperipheral Corp. of Redmond, WA (see *BM/E*, July 1984, p. 16), is producing the show, which it predicts will be the first of a whole new format aimed at computer operators.

Audiences can receive the material simply by tuning in the station with their normal radio receiver (or TV with an adaptor), but because most modems do not receive 4800 baud, which the system operates on, listeners will have to buy a special modem. Microperipheral plans to market this item in computer stores for $70. The company says it feels the extra equipment is worth this difficulty since without it, the messages take up too much air time.

The only special equipment necessary for radio listeners to download Microperipheral's programs and graphics is a 4800 baud modem.

The faster baud rate also allows transmission of pictures, which might prove especially attractive for radio stations. KAMT-AM of Tacoma, WA, which has been airing *Download*, recently inaugurated this capability by sending out a picture of a space shuttle launch. The images could be received by Apple computer owners who had a MacPaint graphics system. Microperipheral also plans to expand to IBM and Commodore graphics software.

Microperipheral declined at press time to identify the 420 stations it said had started receiving the show in December. The company says it is negotiating with two major advertisers, among others, who would be carried on the show.

CBS has also gotten into the act by making *Nightwatch*, its overnight news program, interactive for the 60,000 PC users who subscribe to the Source Information Network, a home computer service offered by a subsidiary of *Reader's Digest*.

Nightwatch has provided 20 toll lines for regular call-ins, which sometimes stack up for over an hour at the viewer's own cost. Source members can now pull up air times and listings, a guest and topic schedule, and a "feedback area" for sending messages to the studios. CBS reportedly hopes to benefit from the new arrangement since the nightly, four-hour news show relies heavily on viewer feedback and interaction.

It's Only a Video Moon...

SMPTE attendees who stayed out a little too late on Halloween night at the recent convention in New York City may experience a sense of deja vu *watching the new opening for this year's* Saturday Night Live. *Charlex, the New York production/post-production house known for memorable special effects and video matting, managed to catch some of Gotham's rarer sights, such as the Statue of Liberty rolling her eyes, and hot dogs drifting over the moon while a cockroach bays at the sight.*

In the sequence, which was conceived and executed by Charlex, Saturday Night's *regular troupe are introduced as giants who iron on the landmark Flatiron Building and bathe in Yankee Stadium. When asked about the elaborate production/post-production process, Charlie Levi of Charlex described it succinctly as "everything, with a lot of Paint Box and ADO."*

Dolphin Productions, a New York computer animation house, produced and designed the opening for ESPN's 1984 college football season, along with bumpers, bridges, an ending, and an animated title for the Chevrolet College Football Report. *Dolphin's "Creative Team" used football jersey numbers as keying devices to frame client-supplied live action scenes of players in locker rooms and on the field. The footage was solarized, and each jersey number was created in a different shading and texture. The Chevy report shown here creates a football from an aerial shot of a lighted stadium.*

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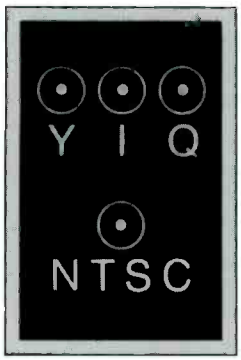

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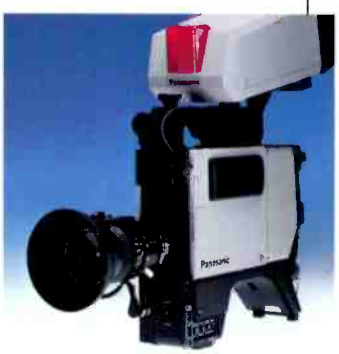

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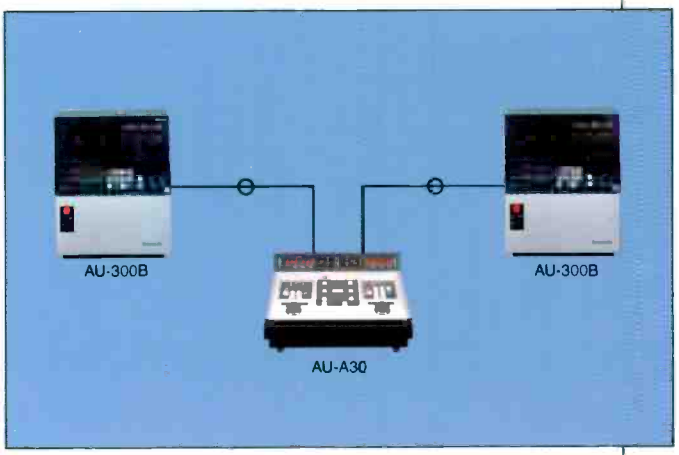

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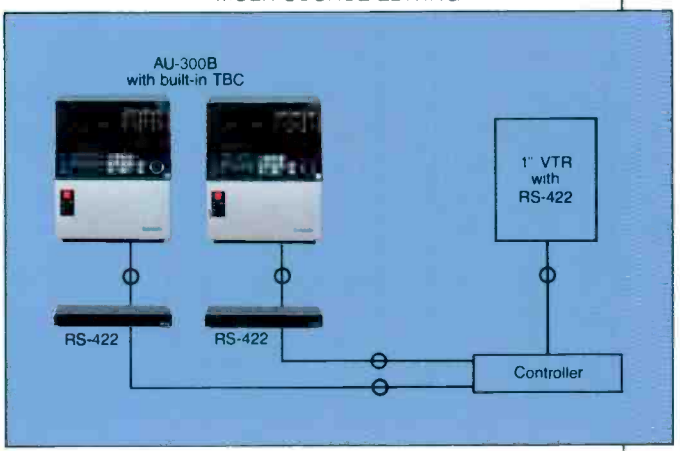

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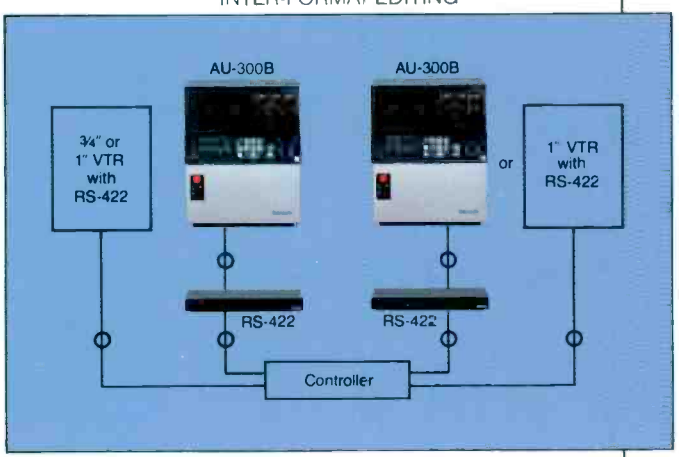

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SPECIAL REPORT

NBC Digitizes On-Air Graphics

"NBC hadn't been paying much attention to on-air graphics displays in recent years," explains NBC's VP of special production and design Tom Wolzien. Wolzien is the man in charge of projects such as election night coverage, and is responsible for the selection of everything from computer graphics systems to newsroom computers.

NBC was therefore able to begin planning from scratch back in January 1983 just how its election night graphics would look. Realizing that information absorption is limited when presenting results on nearly 500 races, Wolzien was determined to keep the displays as simple as possible. This was done by conveying the name of the state and its location using a map; showing the candidates in the race, using photographs and character-generated names (except in the case of the presidential race, where the photographs alone were sufficient); and implementing a way to graphically show vote totals and projected winners.

"Once we had decided what we wanted to get on the air," explains Wolzien, "we took a team approach to solving the problems. In the past, our Election Unit had done all the displays. But their expertise really lies in handling the numbers and analyzing them. It seemed to us that if we were going to actually get involved in real computer-driven graphics, we needed a team of people who really understood the creation and control of computer animations."

"Towers," generated by MCI/Quantel Paint Boxes, are proportional to candidates' vote totals.

Wolzien set up three six-person teams. The design team, responsible for actually defining what the images would look like, was headed by Bob Brandel, manager of news graphics. David Rabinowitz, director of the computer imaging team, which was responsible for the computer graphics systems, had been one of the main design engineers on the Chyron IV; one of his chief programmers had worked on the Evand & Sutherland computer flight simulation project. Finally there was the election reporting team.

The ideas evolved for election night graphics centered around several VAX minicomputers coupled to a vast array of graphics equipment featuring nine MCI/Quantel Paint Boxes (one for backup), each with a gigabyte of on-line storage. Two Quantel technicians were at NBC during the design project, and NBC's chief technician was on hand while the Paint Boxes were being tested at the Quantel factory.

The process of getting the graphics on-air on election night began at the Cherry Hill computer center, where data from the News Election Service was fed into RCA's IBM computer mainframe for verification.

Verified returns were then uploaded to the VAX computers at 30 Rock and were formatted into the desired race boards. A three-letter code (NYP for New York President, for example) was then used to set in motion the steps leading up to the animation. The VAX would find the latest results of the race in its database; find the background image of the state in the Paint Box memory; call up the pictures of the candidates in another Paint Box; cut and paste their names from a character generator input; generate the raw number results as an on-screen message; and feed the Paint Box with the vote totals. The process took about 15 seconds from the time the VAX command was issued to the time the animation was ready to air.

Since the framebuffer on the Paint Box is almost twice as large as the active video area, elements of the animated sequence are stored together and then played back rapidly to produce "real-time" animation. Thus, in the NBC setup, each Paint Box candidate image also contained the elements of the animated "towers" that were used to illustrate the vote totals. These stacks were interactive with the vote totals themselves and would grow to a height proportional to the vote total.

Also part of this graphic was a unique way of showing the projected winner, using a "glow" surrounding the candidate and his tower. This was accomplished by feeding the appropriate Paint Box image through one of two NBC state of the art graphics production rooms. Each has a Grass Valley 300 switcher with master E-MEM, and a multichannel Ampex ADO, in addition to Chyron character generators and Dubner CBGs. The glow effect was preset in a framestore which could be accessed through the switcher. The image of the projected winner was then fed from the Paint Box to the switcher and keyed under the framestore glow.

Election night at NBC.

Scanline Buys Editel, Eyes Video Publishing

In Chicago, the Editel Group has announced an agreement to merge with ScanLine Communications, a newly formed joint venture between One Pass, of San Francisco, and the George Banta Co., a media company based in Menasha, WI.

Robert Dehlendorf, president of Banta Ventures, and Steve Michelson, president of One Pass, will manage ScanLine from corporate headquarters in San Francisco. Editel operates three post-production facilities in New York, Chicago, and Los Angeles.

"We expect ScanLine to become one of the most important teleproduction companies in our industry," Michelson said. Harry Earle, Banta's president and CED, said the merger will allow his company to pursue the "emerging market of video publishing."

Terms of the transaction were not disclosed. Editel is currently part of a joint venture between Bell & Howell and Columbia Pictures; under the new arrangement, it is to retain an "active relationship" with that venture.

VBI Opened Up for Data, Paging Software

In a move to further expand its recently loosened rules on teletext, the FCC has authorized television stations to operate data transmission, computer software delivery, and paging services over the vertical blanking interval.

Citing its intent to give licensees "the broadest possible discretion" in making use of the VBI, the Commission said it would permit the transmission of data, processed information, or any other "communication" in digital or analog form. VBI services will be considered secondary to regular programs so that Fairness Doctrine, political, and public service rules will not apply.

No additional approval for technical facilities will be necessary where private or common carrier service is provided.

Comark, Marconi Ink Transmitter Sales Deal

Marconi Communication Systems of Chelmsford, U.K., has made Comark Communications, based in Southwick, MA, the sole distributor of its transmitter products for the U.S. and Central and South America. Comark will sell and provide support for Marconi's UHF exciters and VHF, AM, FM, and HF transmitters ranging from low-power to 250 kW. Simultaneously, Marconi will make available its new series of high-band VHF transmitters (see "Broadcast Equipment" in this issue). Comark says it will continue to sell its own high-power UHF transmitters.

Comark's senior operating officer, Nat Ostroff, described the agreement as "the beginning of a long-term relationship whereby Marconi technology and products will be integrated into the Comark line." Marconi called its action "a significant commitment" to the U.S. market.

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NEWS BRIEFS

The curtain fell for Turner Broadcasting's **Cable Music Channel** (CMC) November 30 just weeks after the would-be MTV rival made its debut. MTV Networks, Inc., bought out CMC for $1 million plus $500,000 worth of advertising time on other TBS networks. CMC, which had initially projected millions of subscribers, actually started up with fewer than 400,000 and "no assurance" of future profitability. MTV:Music Television is now seen in 24.2 million homes, according to the network; a new service, VH-1, was launched January 1.

VCRs will reside in 45 percent of U.S. television homes by 1990, according to an NAB report entitled "Home Video and Broadcast Television." Among topics covered are the likely effects of VCRs, strategies for capitalizing on them, and the impact on rating service policies, advertisers, and programming. Price to members is $10. Call (800) 368-5644 . . . A Young & Rubicam study found that **50 to 64 year-old viewers** are often overlooked as a relatively affluent market, especially for news programming. The group's median income is about 20 percent above average, with many people close to paying off their mortgages. They reportedly watch more than an average amount of news; *60 Minutes* is their favorite TV show.

Cable TV and local telephone companies should consider working together, according to a study done by the accounting firm of Coopers & Lybrand and International Communications Research, a cable consultant. The study says the industries' strengths in programming and equipment complement each other, and telephone companies are looking for unregulated investments . . . . **"Stereo television** may represent your most serious technical challenge this year," says the Society of Cable Television Engineers. It is holding a multichannel TV sound seminar on January 22 and 23 . . . . The NAB has sent out **cable copyright royalty checks** totaling over $1.7 million to more than 400 TV stations. The association says this represents partial distribution of 1982 royalties for cable carriage of distant signals.

To protect TV channel 6 from **educational FM interference,** the FCC has adopted the same standards that apply to commercial FM stations for power and antenna height limitations. Any NCE-FMer with greater existing facilites will be grandfathered. Higher-powered facilities will be permitted for those who choose to collocate their antennas within .25 miles of a TV-6 antenna. The Commission emphasized that interference can be reduced by engineering "individual situations," but in severe cases power may have to be reduced.

The NAB and NRBA have changed the dates of the **1985 Radio Convention and Programming Conference.** It had been set for October 6 to 9, but to avoid "any conflict with the fall Arbitron sweeps," it is now to be held on September 11 to 14, although the RTNDA is holding its convention from September 12 to 14. An NAB official said the RCPC dates are "firm" and observed that the show draws mostly programmers and general managers.

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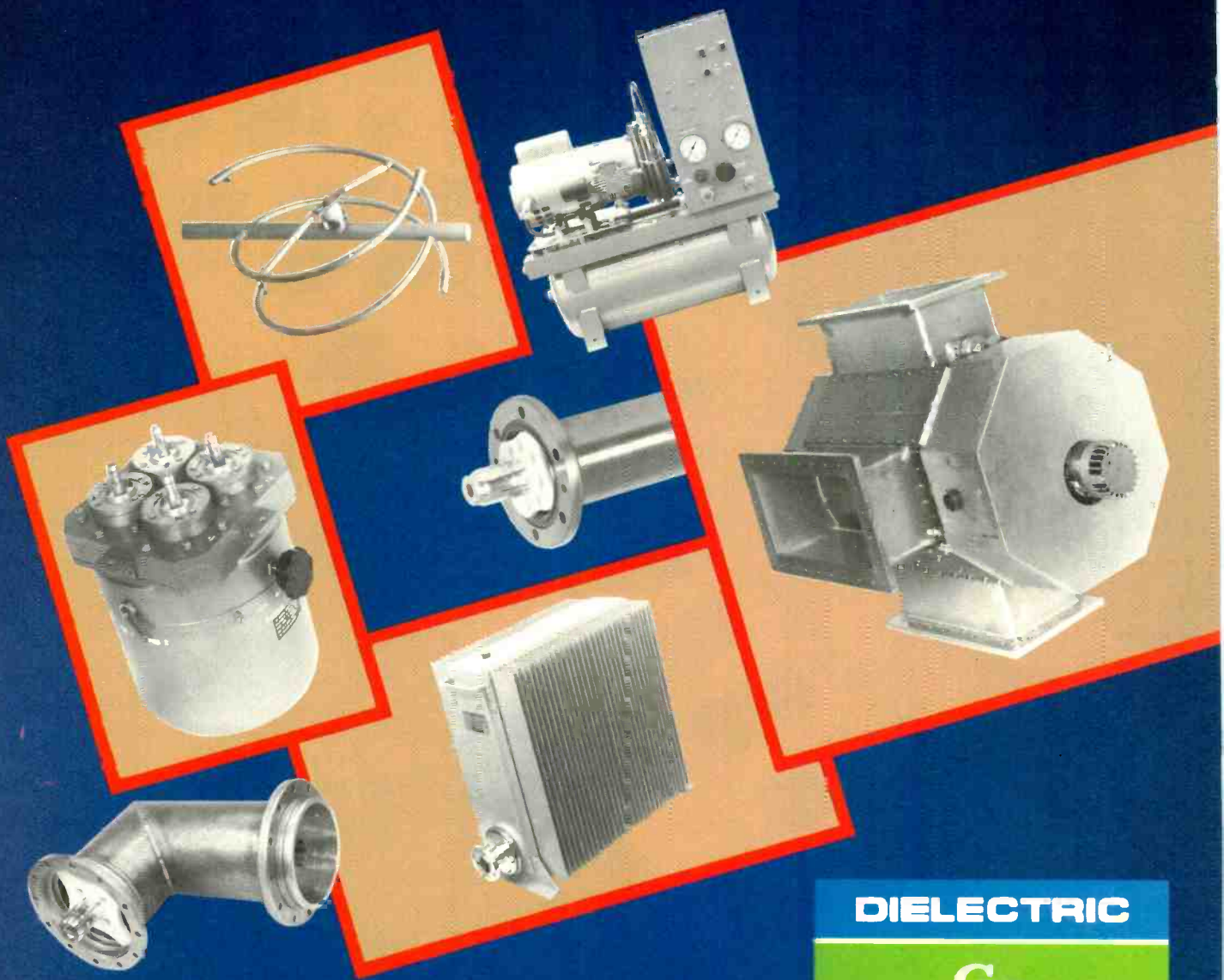

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New Production Room Brings WRVQ Some Unexpected Bonuses

By Michael Greenhouse
Associate Editor

Sometimes the best laid plans of a radio station go slightly astray—and end up benefitting the station more than anyone anticipated. Take WRVQ-FM, Richmond, VA, for example. Last spring the contemporary hit station—known as Q-94—decided to replace one of its 12-year-old production studios. Alpha Audio was brought in to design and install a room the station could use primarily for spot production, and for generating Q-94 promos.

A few months and $80,000 later, WRVQ had the production room it wanted—and much more. The station was able to produce "conventional" spots and promotions in the room, as well as some promotions it wouldn't or couldn't produce before. WRVQ also got an unplanned, unexpected bonus from the room: two shows—*Q-Zoo* and a talk show—are aired from the room. Both shows make use of capabilities the station's other studio doesn't have.

Q-94's new semicircular production room, with a Quad/Eight 248 console and Otari recorders.

Design

Chief engineer Harry Long says sitting in this one-person room is "like sitting in the cockpit of a starship, like the Enterprise." Well, not exactly. The room has no phasers for battling Klingons, but it does have "space age" gear arranged in a functional semicircle. At the heart of the semicircle is a Quad/Eight 248 console with 16 inputs and three-band equalization. Four of the inputs are switchable, mono mic and line. The other 12 are stereo. The room also has two Otari MTR-10 recorders, Technics turntables, ITC cart machines, Orban limiters and equalizers, an Eventide Harmonizer, a Marshall Time Modulator, an Orban reverb unit, and an Eventide long delay line, which is used primarily for a seven-second broadcast delay during talk shows. Patch connections are made with the ADC Ultra-Patch interconnection system.

A considerable amount of innovative thinking went into the room's design. Long and Roger St. John, Q-94's director of creative services, worked with Alpha Audio's Kirk Bowling and Joe Horner to come up with what Bowling calls the "wraparound look, where everything is at eye level." The equipment is 180 degrees around the talent and within arm's reach, so talent has a good view of the VU meters and can adjust the limiters, equalizers, and Harmonizers while listening to them. A clear Plexiglass copystand and interview table fold out of the way when not needed. The overbridge, which contains some of the much-used rack gear (like the cart machines), is sloped back so nothing can sit on top of the console without falling off the back. Coffee or soda may spill, but it won't spill on the console. The patch bays are sloped back as well, making them easier to read and use. They are lit from above, as is the entire table surface area, so everything is well-lit without having lights shining in the eyes.

To combat the bass buildup of the announcer's voice caused by the overbridge and countertop resonance, the cabinets are ported and covered with Soundtex, a new acoustic material. The rear covers, which can be removed for easy access, are lined with Sonex acoustical foam to control the bass once it gets through the ports. The cabinetry itself unbolts and can be moved, which will be very helpful if and when the station moves to a new building next year.

Remote control

Because the room required a remote system with one button to start and stop all events at one time, the design team came up with such a system; it controls the turntables, tape machines, and cart machines. While each machine has a remote START, STOP, and RECORD control, a group of machines can also be assigned to start and stop at the same time to simplify tape transfers. Remote control can also be added from other parts of the building so a taped show can be run from the station's on-air studio. Also, the turntable interface has a delay circuit so the turntable starts before the tape machines, eliminating an edit by letting it get up to speed before the tape machines kick in.

Promo and spot production

As St. John says, the "priority function of the room is production." The station produces its own promotions in the room, and it also rents out the room to outside clients for spot production. As for promotions, St. John says the room is best utilized to make these productions "different." One of these "different" productions is a promo in

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which $1000 is given away. For this piece an announcer does several characters, each with different voices. This effect is achieved with the Marshall Time Modulator, which changes the pitch of the announcer's voice, and a good deal of reverb.

One of the biggest and most successful promotions Q-94 ever did was a spot for The Jacksons' Victory Tour appearance in Richmond. St. John says the station would not have even attempted this kind of spot if it weren't for the new room. The time modulator was relied on to create a variety of effects including automatic double and triple tracking, flanging, phasing, and detune with reverb.

St. John says the revenue the station generates from spot production is an important factor in the station's financial success; the room, which gives the station added production capability, makes Q-94 attractive to clients. St. John is particularly proud of spots the station does for J.C. Penney and for a local client, Hip Pocket Jeans. The ample number of mic inputs on the Quad/Eight console is especially helpful for these multiple voice spots, he says.

On-air production

Additional production capability was what Q-94 thought it was paying for when it hired Alpha Audio to do the turnkey job. What it didn't plan on was using the room as an on-air studio. But that is exactly what happened when the station realized its *Q-Zoo* show—a wild morning show that features two jocks, a cast of characters, lots of effects, and heavy reliance on telephone callers—could be more easily handled in the new studio.

The ability to create effects immediately—without the need for pretaping—is perhaps the major reason for airing *Q-Zoo* from the room. Effects, such as multiple voices and sound effects, are created live with time modulation, reverb, and the Harmonizer. The room is also well set up for the telephone interplay that goes on. With just the punch of a button, all incoming calls are automatically dumped into the two-track Otaris. One track is used for recording, one for auditioning. It's particularly important, also, that so many functions are automatic; it helps keep the jocks' hands free. The show is aired from the production room for another, more mundane reason: no production is done in the morning.

The station—quite unexpectedly—also airs a talk show from the production room. St. John says the Quad/Eight board's mic inputs gives the station the ability to handle more guests than it could before.

When the room isn't being used for the two shows, promotion, and production work, it is being used to transfer all the station's music onto the ITC carts. Versatility seems to be the room's middle name.

With all the benefits the station has gotten out of its investment, it should come as no surprise that another Alpha-designed room figures in Q-94's future. St. John says the station will put in another room "just like this one" as soon as the budget clears and the FCC gives its approval. Certainly, the station management won't have to wait for its personnel to give its approval—that happened a long time ago. **BM/E**

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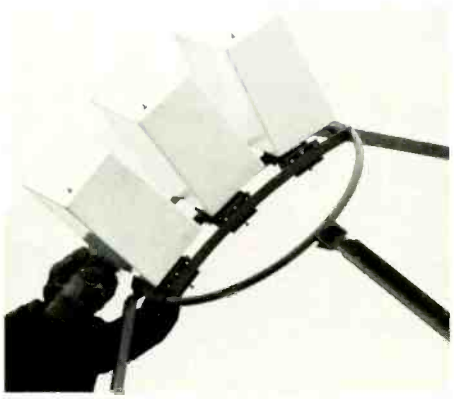

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Adventure in ENG

By Eva J. Blinder, Senior Editor

While it's a truism that television news tends to seek out the unusual, few local stations go as far as KIRO-TV, Seattle, did for a recent news series. The station sent reporter Hilda Bryant and photographer Richard Pauli, carrying a Sony Betacam, all the way to Pakistan—and from there into war-torn Afghanistan—to capture footage of the war, the refugees, and the Pakistani opium industry. The pair spent four weeks in Peshawar, Pakistan, gathering news and making contact with the freedom fighters who would smuggle them into Afghanistan for four days of shooting in mountainous Jajit Province.

Power problems

Besides the actual danger involved, the worst problem Pauli faced was finding reliable power sources for his Sony Betacam. "That was the biggest headache," he recalls. "Originally I wanted to bring in a solar battery charger. Our engineers laughed at me, but I would highly recommend it to anyone going to shoot in a Third World country."

In the absence of the solar charger, Pauli stretched his ingenuity to find a variety of ways to power up the camera. The situation was exacerbated by the loss of his regular charger, which, he says, "was fried by wild fluctuations in voltage right after we landed in Karachi." To clean up the voltage, Pauli bought a voltage stabilizer at a local store. In addition, he used a stepdown transformer to compensate for the local 220 V power. In Peshawar, the power was particularly unreliable and would go off completely each day for an hour and a half to two hours, usually at night, making battery charging difficult.

Because mains power was so unreliable, Pauli developed several other power sources. For example, he figured out how to power the camera from an automobile cigarette lighter. He also purchased a 12 V motorcycle battery (difficult to find in Third World countries, where most motorcycles use 6 V batteries), which he slung over his shoulder with the aid of gaffer's tape and a webbing belt. By connecting the battery directly to the back of the Betacam, he was able to get around 50 minutes of power for both the camera and the attached VCR. "I used it for about a third of my shooting on the trip," Pauli states, adding that the motorcycle battery was also easier to charge than a regular camera battery. In all, Pauli carried four Betacam batteries and the motorcycle battery.

In Afghanistan, Pauli resorted to the highly unorthodox (and not recommended) expedient of using jumper cables to charge the Betacam's 12 V battery off the 12 V battery from a farm tractor. In fact, he and Bryant had to cut short their trip when the tractor (which served four rural villages) was destroyed by shelling.

In all, Pauli believes, variety is the best insurance of usable power. "I'd suggest that any journalist going into a war zone has as many different kinds of batteries as possible," including solar if possible, he states.

Mum's the word

Travel into Afghanistan is risky at best, especially for Western journalists. Just before Pauli and Bryant started their trek, two foreign journalists in Afghanistan without official sanction were captured and imprisoned; they remained in prison even after the KIRO team returned to Seattle. For this reason, Pauli and Bryant had to keep the Afghanistan part of their assignment secret, even from the U.S. Embassy in Pakistan.

"The U.S. Embassy can't sanction anyone going in there; they have to tell you not to go," explains Pauli. "But they were very interested in hearing what we found after we got out."

Even in Pakistan, where the journalists were able to travel and photograph openly, there were some restrictions.

"Pakistan is a military dictatorship," Pauli comments. "They want the Ministry of Propaganda to inspect all footage that leaves the country. We couldn't abide by that, but we did have to meet with the Ministries of Information in every city. We told them we were covering the plight of the refugees from Afghanistan, which was true. We were escorted to some showcase refugee camps, but we also went on our own to some of the other camps where the refugees weren't treated as well. Nobody really knew what our mission was."

KIRO-TV photographer Richard Pauli poses with his Betacam, surrounded by his Afghan escorts. Pauli and reporter Hilda Bryant were smuggled into the country by freedom fighters.

According to Pauli, the Pakistani government is anxious to have its efforts to help the refugees publicized as an aid to positive world opinion. Nevertheless, getting tapes out of the country was a matter of concern to Pauli and Bryant.

"In some cases," Pauli says, "we

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To attract less attention in the Afghan countryside, Pauli and Bryant wore local dress. Pauli usually kept the Betacam under wraps because of its resemblance to a high-tech weapon.

got footage out by going directly to the U.S. Embassy and asking them if anyone was leaving the country. Then we'd put the tape in an envelope with a Federal Express label and have that person hand-carry it back to the U.S. and drop it off at Federal Express for delivery to the station." (He notes that the embassy prefers not to do this.) In addition, to protect against seizure of the tape, he and Bryant split up their crucial footage among various pieces of luggage in the hopes that not all cassettes would be stopped.

Pauli found working in a Third World country a whole different ballgame. "The whole shooting pace was much slower in Pakistan because of the electrical and protocol problems," he says. "Travelling was also very slow. The city traffic is crazy—you have camels, cars, motorized rickshaws, pedestrians everywhere." He adds, "The other tough thing is just the physical travail. The small size and light weight of the Sony equipment really helped."

Undercover negotiations

The informal networking that often exists among journalists was of limited usefulness to Bryant and Pauli in their efforts to enter Afghanistan. During their stay in Pakistan, they were stationed near the fabled Khyber Pass in Peshawar, where many European journalists work. The town, which is a staging area for incursions into Afghanistan, is home to between one and three million refugees, and Pauli says that many fear the city will become another Beirut.

According to Pauli, journalistic camaraderie was mixed with secrecy in Peshawar.

"The best way to get into Afghanistan," he advises, "is to get reliable contacts and not to let anyone else know about them." He adds, "A lot of people understood what our mission was, more or less. We got a lot of assistance in unofficial ways, such as people nodding and looking the other way, or warning us of danger." The actual border crossing had all the hallmarks of a good spy novel. "At 11:00 one night I got a call saying to be ready at 4:00 in the morning. At 4:00, a jeep pulled up. They were real quiet and fast about it. I left emergency instructions with our host. Then, with me in the jeep and Hilda in an ambulance, we drove south about five hours to the Jajit Valley."

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travelling in Afghanistan was downright dangerous. "I didn't think so at the time, but as I look back I think so," Pauli laughs. The danger necessitated some extraordinary travel procedures.

"One must be escorted at all times by someone who speaks the language," Pauli asserts. In addition to the escorts, he and Bryant wore traditional local garb to be less conspicuous. In Bryant's case, this meant a long chadorah and purdah face veil. The restrictive costume had some positive effects, however.

"Hilda was treated like royalty the whole time," Pauli says. "Because she was a woman we were offered a lot of opportunity and luxury that otherwise wouldn't have been the case." In the Islamic world, he notes, men are not allowed to talk to a woman they're not related to, or even to look at her face. This tradition is so strong that even at the border checkpoints, guards were not allowed to ask Bryant even to show her passport. During the crossing, Pauli rode in front in a jeep while Bryant followed in an ambulance supposedly headed for the front.

"When we were smuggled through the 12 checkpoints," Pauli continues, "most of them we'd be waved through because we looked like locals. If they stopped us [in the jeep], the driver of Hilda's ambulance would honk impatiently, and they'd usually let us through. If they then stopped the ambulance, they couldn't ask Hilda anything. If they asked the driver who she was, he'd say she was a nurse headed for the front, and they'd let them through." Pauli's costume, which included a blanket universally worn by the men in the region, also proved useful for hiding the Betacam, which resembled a high-tech weapon closely enough to make carrying it a possible source of danger.

Hospitality is another powerful tradition in Afghanistan, and the Afghan freedom fighters that escorted Pauli and Bryant took it seriously. "The sense of hospitality is legendary among the Pathans," Pauli notes. "They will lay down their lives for the safety of their guests. Everywhere we went, we got the first cup of tea, the first plate of food with the best food, and the nicest place to sleep. We were escorted everywhere." Leaving the escort could be hazardous, as he relates: "One time I tried to go alone to get a shot. Suddenly I was being shouted to in a foreign language and I found I was in a minefield."

Pauli continues, "The freedom fighters in Afghanistan very much want publicity. Even though they're divided into factions, they are serious and organized in their efforts. They regard foreign journalists with respect. We were never denied access to anything we asked to see. They were ready to take us right into the war zone, although retrospectively I'm glad we didn't go."

Pauli and Bryant may not have made it to the front, but they brought their viewers closer to the Afghanistan conflict than most Americans will ever be. **BM/E**

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Audio Production Notes

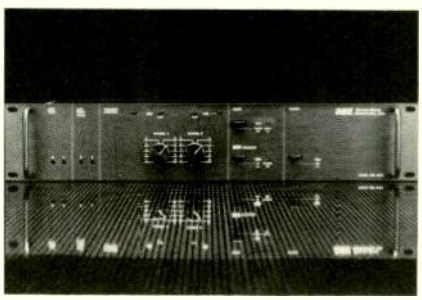
By Eva J. Blinder, Senior Editor,
and Michael Greenhouse,
Associate Editor

Barcus-Berry Electronics Processes Broadcast Audio

The first live use of the BBE Signal Processor, formally introduced at the AES Convention in October, took place last summer, at the Los Angeles Olympics. Processors were used on stage at the Olympic Jazz Festival, a four-concert event staged as part of the Olympic Arts Festival.

The new device can be used in a number of ways—in monitoring, recording, and transmission—but each application of the technology has the same result: the correction, and improvement, of the audio signal. In a live, on-stage situation, such as the Olympic Jazz Festival, the processor is used at the amplifier/speaker interface. Here the device corrects, or unmasks, the phase distortion or frequency band masking that occurs between amplifiers and speakers.

In recording, where the technology has not yet been applied, the processor is placed between the mixer and recorder. And in a broadcast situation, the processor corrects the signal prior to transmission. KFOX, an FM radio station in Los Angeles, has had the processor in for testing. Hubbard Communications is also currently evaluating it.



The Model BBE 202R—a multiband signal processor which improves sonic clarity.

BBE's processor utilizes a unique configuration of dynamic gain control and phase compensation. The incoming program signal is split into three frequency bands and delivered to a "surrogate" load. This load is actually a circuit possessing reactance characteristics similar to those of a dynamic speaker. The output signal derived from this synthesized load is then compared against the original program input and, where a difference exists, appropriate amplitude changes are applied to the high-frequency band of the signal, thus providing effective compensation for the limiting effects of speaker reactance.

The magnitude of gain change available is in the range of +12 dB to −5 dB. The amount of high-frequency boost or cut actually applied to the output signal is, however, determined by further analysis of the program content—partly by internal reference to the amplitude of the mid-frequency band and partly through arbitrary limits imposed by adjusting the front-panel controls on the processor while listening to the program.

Once the processor has been set up for a given sound system, acoustic environment, and type of program material, its operation is essentially automatic. Amplitude changes are developed only in response to application of a spectrally diverse program signal and are applied to the output only when needed to compensate for the effects of speaker reactance.

BBE processing also utilizes a combination of phase compensation techniques that cause the higher partials of any given sound to reach their full amplitude before the lower harmonics and fundamental frequency of that sound arrive at their maximum level. Such alignment of the "starting transient" formant structure is essential for the perception of a sharp, clean, incisive attack and for faithful preservation of the original tone character.

The importance of audio in the broadcast environment has never been greater. Visits to a few outposts of top-grade audio production illustrate the state of the art at the audio frontier.

Audio Delay Solves ABC Lip Sync Problems

By Kevin Dauphinee

When video frame synchronizers became available several years ago, the television industry adopted them widely because of their ability to conform incoming sync from remote feeds to plant sync. But the video delays caused by frame synchronizers can result in a discernable lip sync problem. In a typical network remote news pickup, the video might be cascaded through five frame synchronizers, for an average 83 ms delay, which viewers would find quite objectionable.

Kevin Dauphinee (right) and equipment planning engineer Achille Raspantini inspect a bank of Lexicon 1300 digital audio delay synchronizers at the network's New York central control.

At ABC Television, we currently employ a number of Lexicon Model 1300 digital audio delay synchronizers to solve these everyday lip sync problems. The 1300 also solved some unusual sync problems during ABC's coverage of both the Winter and Summer Games of the 1984 Olympics, and was also used extensively for ABC's election night news programming, which involved many complex remote pickups.

ABC first became interested in applying audio delay for lip sync problems prior to the 1980 political conventions. We evaluated and tested several units before choosing Lexicon's Model 91, which was successfully employed at the conventions and for our coverage of President Reagan's 1981 inauguration. It was also instrumental in maintaining lip sync for *World News Tonight*, especially when the program had anchors dispersed in Washington, Chicago, and London, but with central control in New York.

The Model 91, however, required an operator to dial in audio delay offsets manually, and considerable skill (and guesswork) was required to obtain correct lip sync. We therefore asked Lexicon to develop an enhanced model that could detect the frame offset imparted by a frame synchronizer and then automatically delay the audio by the correct amount of time. The ABC engineering staff worked closely with Lexicon's management, marketing, engineering, and design team to insure that the resulting Model 1300 would fully meet ABC's network requirements. When we took delivery of our first Model 1300 in July 1983, it passed all our tests and was ready for operational use.

Essentially, the 1300 is wired to any companion frame synchronizer to receive frame offset and hysteresis information. It will decode three types of incoming encoded signals: pulse width, wild-feed genlock, or serial data. When slaved to a frame synchronizer, it requires no manual adjustments. However, the new unit still contains means for manually dialing in additional delays, useful to compensate for additional frame synchronizers upstream.

We experienced an interesting video delay problem during ABC's coverage of the 1984 Winter Olympics in Sarajevo, where the 1300 was used for the first time in network programming. A number of feeds from remote venues were obtained from the Yugoslavian host broadcasters, and arrived at our control center in 625-line PAL. When we converted the feeds to the 525-line NTSC standard, delay was inherent. The 1300 was invaluable for restoring lip sync. All told, we deployed more than 10 1300s there, primarily to compensate for the frame synchronizers used on feeds from numerous venues.

At the Summer Olympics in Los Angeles, the 1300 helped us solve a difficult problem resulting from ABC's decision to broadcast the opening ceremonies from the Los Angeles Coliseum in stereo sound, to become the network's first live stereo TV broadcast in the U.S.

The stereo audio pickup was to be broadcast by KABC-TV to the Los Angeles area. We fed the stereo directly to KABC-TV from our stereo production truck at the Coliseum via the international broadcast center and the ABC unilateral center. However, the video—along with conventional mono audio—took a much longer route from the Coliseum to KABC-TV. From the unilateral center, it was uplinked via satellite to New York for commercial integration. Then it was uplinked back to Los Angeles. With two transcontinental satellite trips and several frame synchronizers in its path, the video and mono commercial audio arrived at KABC-TV a full 750 ms later than the stereo audio from the Coliseum. So we placed two Lexicon 1300s at KABC-TV—one for each channel—to delay the local stereo audio feed and restore lip sync. (The 1300 is now available in a stereo version.)

Other 1300s were used in the stereo production truck at the Coliseum to reduce PA system echo during podium speeches by the event's dignitaries. The podium microphones picked up a speaker's voice directly, but mics located in the stands for ambience pickup also received the speaker's voice via the PA system, after a 50 ms propagation time. The 1300s were inserted into the podium microphone lines for a compensating 50 ms delay to assure clean, echo-free audio when mixed with the ambience pickup.

During election night coverage on November 6, several 1800 audio synchronizers were used in New York central control to correct the audio of incoming remote feeds from key polling locations and candidate headquarters. Since many of the pickups originated with ENG units and associated frame synchronizers, there were upstream video delays. But the Lexicon audio delay synchronizers helped us deliver flawless audio to the ABC television audience.

Kevin Dauphinee *is equipment planning engineer, broadcast engineering, for the American Broadcasting Company.*

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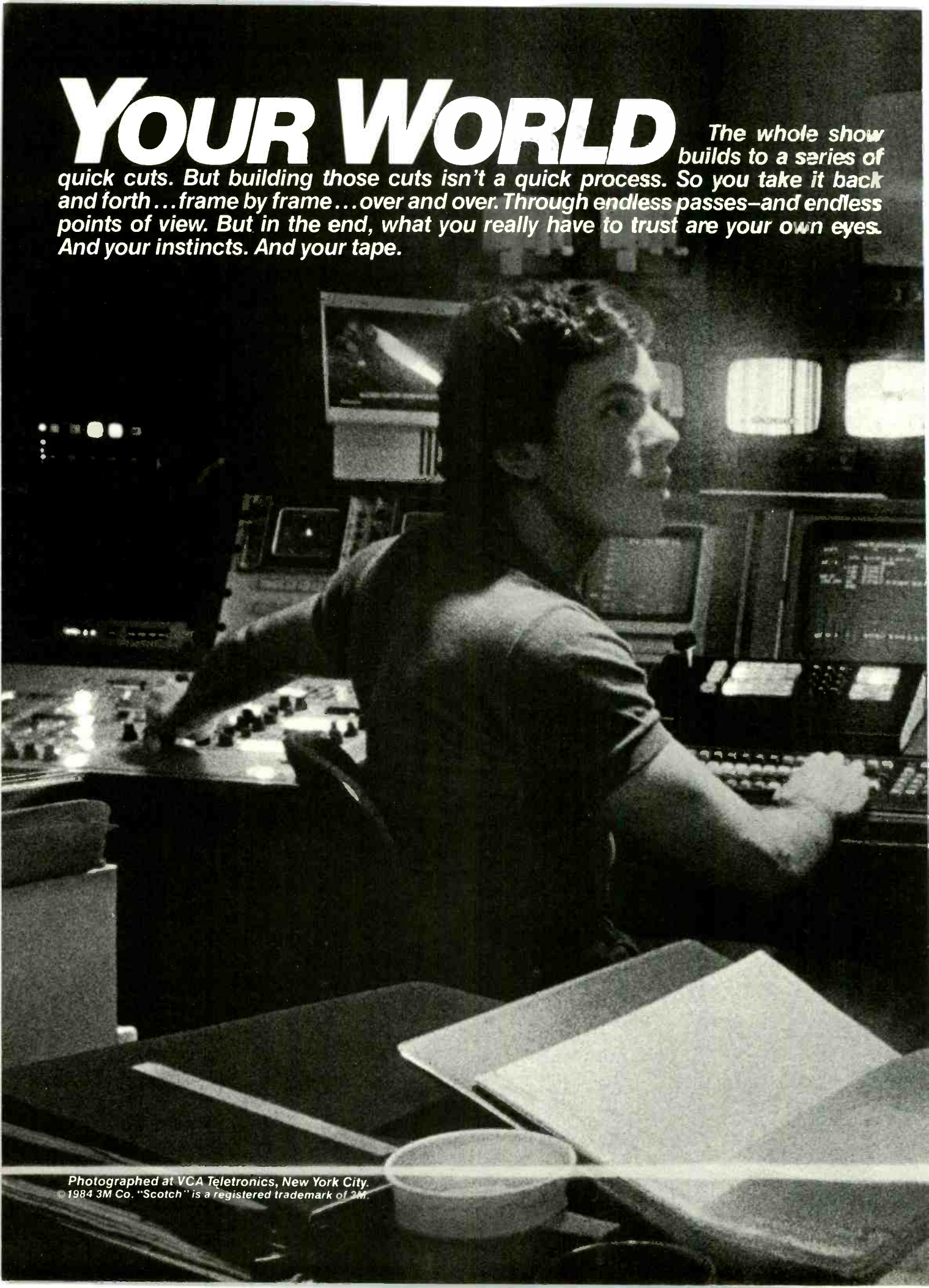

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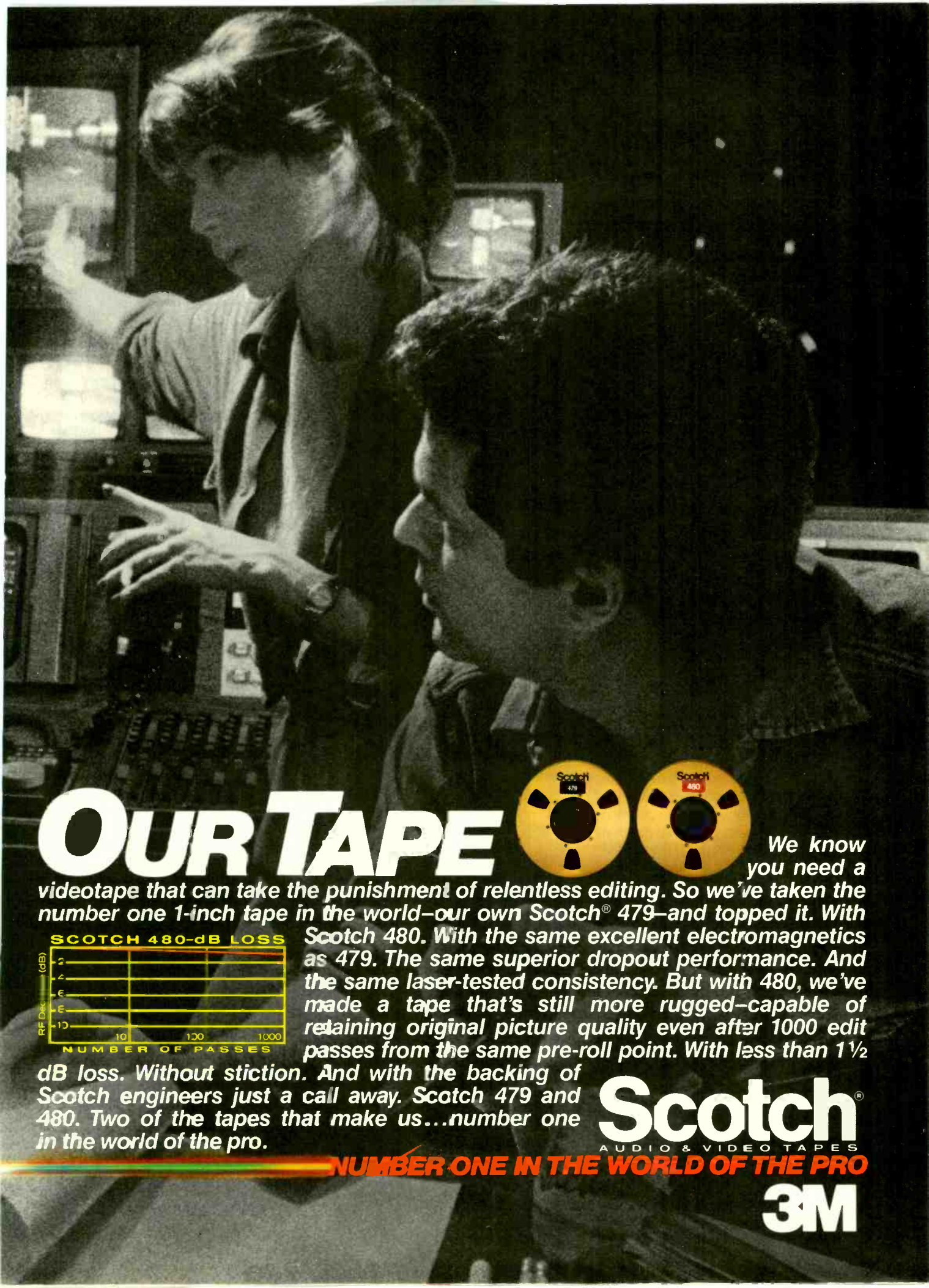

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Compusonics Delivers First System

Paul Vitello, right, working with his company's new Compusonics system. At left is engineer Joe Zappala. The console is a Harrison Raven.

In November the DSP-2000, Compusonics' digital recording/mixing system, was delivered to its first home, Paul Vitello Productions, Hollywood, CA. Since its introduction in May 1984, a number of radio stations have been looking at the DSP-2000 as a possible replacement for their cart decks, according to Compusonics. Sooner or later a Compusonics system will indeed find its way into a radio station; a Compusonics official strongly implied this back in September, when *BM/E* first covered the DSP-2000. But for now, this system, based on a unique data reduction scheme, has turned up in a sound effects/post-production house.

"It was the only system we found that had the editing and manipulation capabilities we need," says Paul Vitello. "Speed and quality both are outstanding."

The new DSP-2000 will, for now, store multitrack library sound effects in Vitello's two-room facility, replacing the company's half-inch four-track library system. These effects are produced in Vitello's Foley and ADR stage, and recorded with Otari MTR machines along with a 24-track Harrison Raven and BTX Softouch.

Back in November the DSP was put to work storing newly produced effects and background sounds for *Voltron*, an animated television series, and *A.D.*, an NBC miniseries.

As for the future of the system at the facility, Vitello has big plans. He will use it to handle all post-production sound work for the films and television work the company does. This will include all dialog, sound effects, and music editing. The DSP will also be used to mix and turn out the final product directly to film or video master.

Media General Automates with MasterMix

Media General, Memphis, TN, is something of a production factory. It produces—in the form of commercial packages—the equivalent of nine records a month for up to 300 radio stations. Ten recording studios, four multitrack rooms, and several other production rooms are used to create IDs and various other promotional products—jingles, contests, and generic music for backgrounds.

It was primarily for the production of this generic music, which the company calls "library productions," that Media General purchased and, in November, took delivery on the first Audio Kinetics MasterMix. The new disk-based automation system is used in one of the company's multitrack rooms, in conjunction with a Harrison MR-4 24-track console. MasterMix controls the console (it can be interfaced to a number of other manufacturers' consoles as well) for the mixdown of library spots as short as 30 seconds and as long as four minutes. The room, one of two used for multitrack music recording at Media General, also has an Otari MTR-90 24-track machine and JBL monitors.

The beauty of MasterMix, according to Glen Crawford, VP, director of engineering, "is that it's disk-based, and you only use one track (instead of two) to lock the disk drive of the MasterMix computer to the 24-track tape machine. The information stored on the disk is slaved to the tape machine with SMPTE time code." All control information, which of course is digitally encoded, is stored in up to four files in the data disk. This allows an engineer to compare mixes, going back and forth between two files and listening to both. Crawford says it is also easy to mute and control level with this system.

Looking to the future, Crawford says the company "anticipates having three units in operation," because three of the rooms at Media General are set up to do mixdowns. The MX644 computer portion of the MasterMix cost Media General $14,950. The Harrison console—like the Amek and Sound Workshop boards—is automation-ready and did not need any interfacing, which Audio Kinetics will provide. The console also did not need faders, which Audio Kinetics will also supply as part of a retrofit package.

MasterMix controls a Harrison MR-4 in one of Media General's four multitrack rooms.

THE WHEATSTONE SP-5 STEREO PRODUCTION CONSOLE

WHEATSTONE BROADCAST GROUP announces the SP-5 Stereo Production Console, the latest in a long line of high performance audio mixing systems from AUDIOARTS ENGINEERING, a company with an established reputation for technical excellence, quality production and product reliability.

Modular, and specifically designed for stereo broadcast production, the SP-5 offers true stereo subgrouping for mix-minus and stereo program work. Optional configurations allow mono subgroups and outputs, dual stereo line or mono mic/line inputs, and a wide variety of mainframe sizes accomodating 8 to 52 input modules.

Wheatstone Broadcast Group

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VCA Teletronics in Control with SSL Integral Synchronizer and Master Transport Selector

Audio engineer Don Wershba at the company's SSL 6000E console.

The audio post-production room at VCA Teletronics, New York, is almost literally full of audio and video recorders. There are Studer A-800, A-810, A-80, and A-710 audio machines. And there are Sony BVU-800 VCRs, and 1100 and 2000 VTRs. The room also features a console, of course: an SSL 6000E. In a sophisticated environment like this, how is control maintained? In this case, with an Adams-Smith synchronizer, a new SSL synchronizer/master transport selector (recently introduced at the New York SMPTE Exposition), and the SSL console. With this combination of units, the 24-track console is able to control the tape machines, keeping them "code-locked" through post-production.

Normally, at Teletronics the original material for a show (the rough cut, or guide material), which also contains audio and time code, is transferred to ¾-inch. The guide audio is also transferred to 24-track. Then the 24-track and ¾-inch cassette are used for overdubs and effects to the picture. The audio is finally mixed on 24-track; everything, of course, is laid back to one-inch.

According to Don Cuminale, Teletronics' head of maintenance, audio, "The SSL allows us to move multitrack around, and the picture will follow the audio." This video-follow-audio system involves the coordination of a number of sources, and the SSL system allows the engineer to control all of the various transports as if they were a single unit. Interfaced with the SSL 6000E, the only additional controls required are five buttons—in a single row—which determine which machines are selected into the system. A compact display houses indicators showing the absence of time code, the absence of phase lock, the locate mode, and the record status of each machine.

Sharing the resources of the SSL studio computer, the synchronizer displays a list of up to 32 available audio, video, and film transports. Any one of three machines can be selected as the master, and up to four additional machines can be designated as slaves. The entire system is then operated from the built-in keyboard and/or manual transport remotes as if it were a single machine.

If the offset values required to synchronize a set of tapes is unknown, each can be manually rolled to approximate sync positions and "marked" by a single keystroke. The time code values are displayed and may be incrementally nudged until exact frame lock is obtained. The computer then automatically calculates all offset values, and stores these on floppy disk as a "sync preset" for subsequent reference.

At Teletronics, the SSL has been interfaced with an Adams-Smith synchronizer, a system Cuminale says works "very effectively."

Compact Video Automates with Neve's Necam

The advent of multichannel television sound is having a profound effect on virtually every facet of the television industry. Compact Video, Burbank, CA, is certainly well aware of this. The teleproduction facility, which is gearing up to do post-production work on "film-style" television shows, has started to encounter stereo and, consequently, complex audio post-production that only an automation system could make manageable.

According to Kelly Kotera, chief engineer, sound department, the audio post-production room at the facility is staffed by just one person (there is also a recordist in the machine room). But for film-style shows, where "music, effects, and dialog are needed constantly," the mix is really a three-person job. And for stereo shows, it is even more complicated. There are "lots of effects, tracks, music, dialog," says Kotera. In order to handle the added complexity, Compact Video has purchased a Neve Necam 96 system.

Compact's audio post room features a Neve 5116 that has been customized to do television sound rerecording. It has an eight-bus output with four stereo pairs to handle dialog, music, effects, and stereo audience reaction. Also featured in the room are Ampex ATRs, an EECO synchronizer, Sony BVU-800 VCRs, and a Sony large-screen projector.

When the Necam 96 is in place, the engineer will of course have greater

One of Compact's sweetening rooms includes a Neve 5116 console, a voice over room, a Sony projection television, and a sound effects library.

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control over the 5116. The unit can control up to 96 faders. Grouping is simplified: move any fader in a group and the rest will move in perfect step. You can make as many groups as you like. A mute group can also be set up; switching any mute in the group switches the rest. The unit also has a rollback key if you miss a move or want to go over a move again. Auto merge lets you work on a few spots in the mix, then merges them with the rest of the mix automatically. Up to 999 snapshots of fader and mute settings can be stored for instant call up. Or you can crossfade to a store, over a time you select, or manually, at any rate you like. The 96 will also give up control of the deck to another system. It uses SMPTE time code or foot/frame counts. Data is stored on a twin disk drive.

Kotera says the facility has already done HBO's *Not Necessarily the News* in stereo, and anticipates doing much more. Assuming TV goes stereo the way he thinks it will, Kotera will be prepared with automation: "If television goes through the same metamorphosis film did when it went stereo, there will be a great need for automation."

MTV, VH-1 Go Digital With Dolby ADM Stereo

VH-1 may be MTV's second music video channel, but it is the first cable television network to use the Dolby Adaptive Delta Modulator to distribute its stereo sound in digital form. Delta modulation has been experimented with for several decades, but required too much bandwidth to make transmission practical. Dolby's adaptive delta modulation (ADM) system, however, cuts the bandwidth sufficiently for efficient transmission.

"At MTV Networks, Inc., we've been studying this system for a long time, and believe it's the best way to transmit stereo sound via satellite," commented Andrew G. Setos, MTV's senior vice president, engineering and operations. "In fact," he continued, "we are going to use it for MTV as well."

Affiliates who wish to receive either VH-1 or MTV in the ADM format will require an ADM receiver, which Wegener Communications will manufacture and supply "at a comparable cost to analog equipment." MTV will continue to transmit its standard analog stereo audio, and affiliates will be able to receive VH-1 in monaural with standard satellite receivers.

The Dolby DP-80 professional encoder will be used by VH-1 for its digital transmissions.

Because decoders for consumer receivers cost very little to produce, the Dolby digital audio system is also suitable for bringing audio into the home via DBS or terrestrial broadcasting. According to Dolby, several manufacturers are already licensed to build the decoders. In addition, Dolby says, the ADM encoded signal is inherently less prone to degradation during transmission than PCM or other digital systems, and does not require elaborate error correction.

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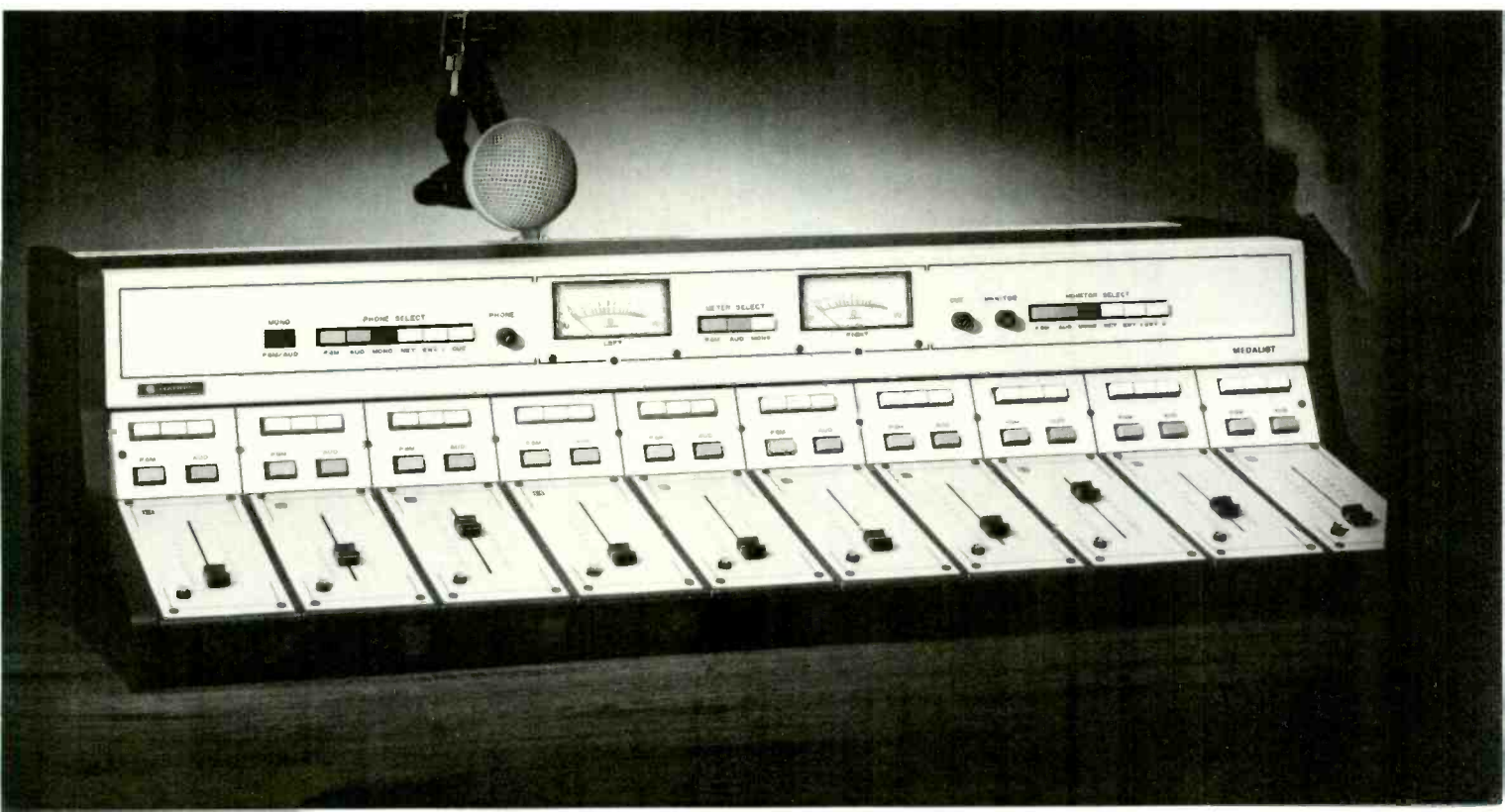

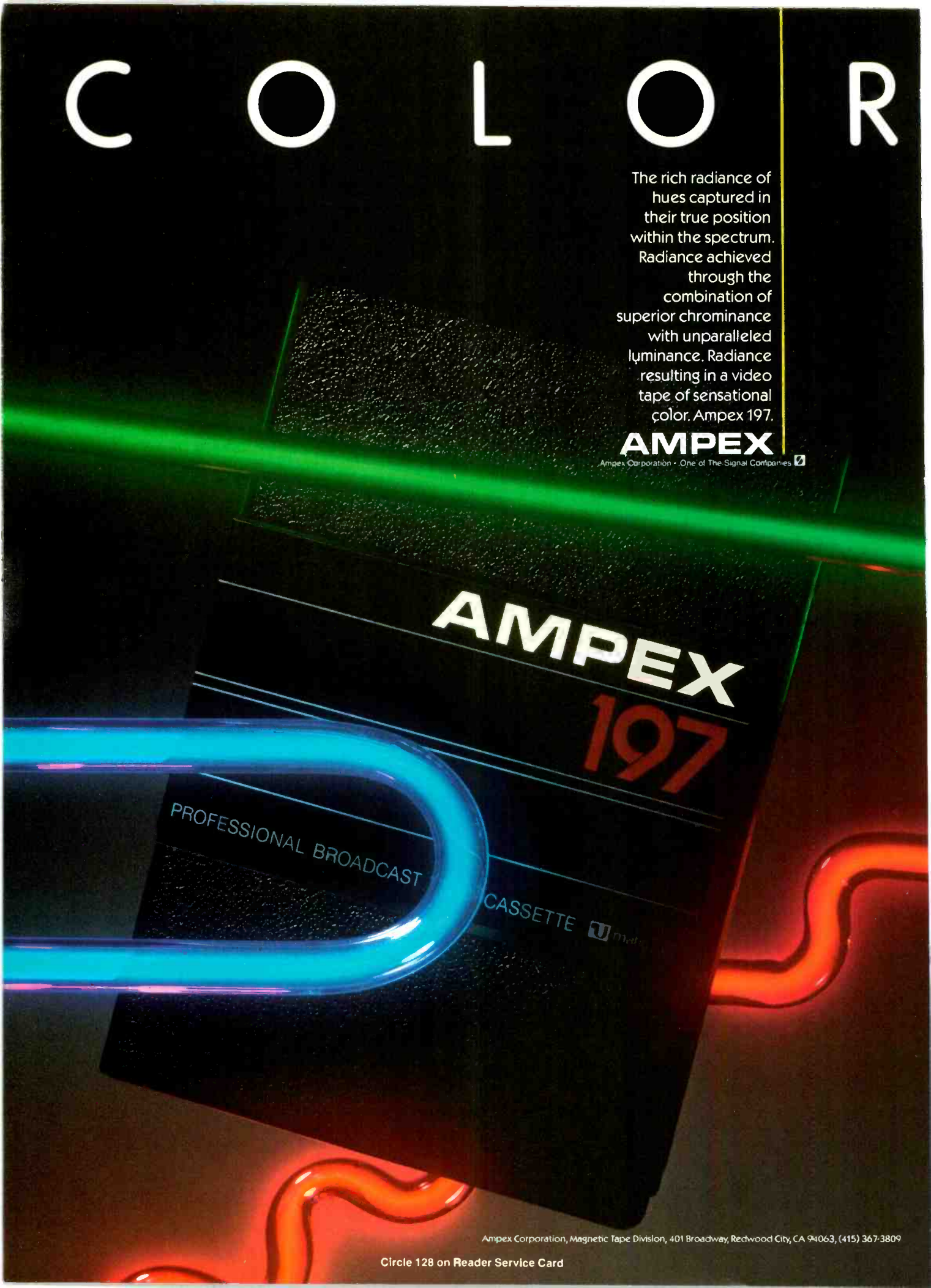

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ADM Post-Production Console Introduced

At the recent New York SMPTE Conference, ADM showed a prototype of Post-Pro, an audio console designed for audio-for-video post-production applications. The new console uses much of the same technology as ADM's VP Series. Parallel logic is standard and enables the Post-Pro to interface with virtually any editor or switcher that provides an analog control ramp and parallel output lines. Additionally, a serial interface is available for most editors utilizing serial control.

The Post-Pro is designed for ease of operation in both the edit control mode or the break (manual) mode. Individual inputs are assigned to an "A" or "B" bus and may be controlled individually or bus-by-bus through the editor/switcher.

All required functions such as module ON/OFF, VCA ramp up/down, output assignment, and monitoring, can be placed under editor control for complete hands-off operation. Total manual operation or override is possible via the "break" mode. Eight- or 12-input mainframe sizes are available, and a modular three-band equalizer with Hi/Lo pass filter may be added "in-line" to any or all input modules. Dual monitor buses for input, output, and VTR return monitoring are also included, as are output and monitor metering.

ADM's new Post-Pro.

There are two basic models: the Post-Pro 8 ($9500), with an eight-input mainframe and eight line inputs; and the Post-Pro 12 ($12,500), with a 12-input mainframe and 12 line inputs. Delivery is set to begin in February. Distribution agreements have been reached with a number of companies including Midwest Corp., Custom Video, Snader and Assoc., and A.F. Associates.

Audio Upgrade Uplifts Midwestern FM Station

Those familiar with radio station operations know that equipment can often spell the difference between excellence and mediocrity. At KJLS-FM of Hays, KS, a mere $20,000 of the latest stereo equipment combined with a new programming format, creative promotion, and some tender loving care to bring the former third place station to the top in its market in just six months.

When the station recently changed hands, general manager Mike Rogers thought he could convince the new owners to upgrade. "I saw an opportunity to hype our technical facilities," he recalls. "We were working with equipment that was cumbersome and a drag on the type of programming and production that I had planned to put in place when I arrived here two years ago." The go-ahead given, Rogers began the search for new gear.

"My first priority was a new on-the-air console for the broadcast room," he continues. "I had a relatively modest budget to work with and was discour-

KJLS-FM program director Doctor Ken Charles operates the station's new RAMSA console during his on-air shift.

aged when I saw the prices of conventional high-ticket equipment that promised to give us the kind of sound reproduction we were looking for." Tapping his knowledge of concert audio equipment from his commercial production days, Rogers finally selected a Panasonic RAMSA WR-8724 sound reinforcement mixer as the station's main on-air console. He is pleased with the performance and features of the inexpensive board.

"I don't know if it was expressly designed for commercial broadcast use," he asserts, "but we've put it through its paces 24 hours a day for the last seven months and we've had absolutely no problems." Besides the board's flexibility, ease of operation, and simplicity of maintenance, Rogers particularly likes its sound control properties. "We're able to equalize sound at the high, low, and mid ranges," he says. "The system gives us the sound I was looking for—I like to call it 'major market' sound. We've added punch to our music and commercials without losing natural sound properties." DJs assume most on-air engineering duties at KJLS, which has only one engineer.

In order to produce stereo, the slides on the console's 24 plug-in modules are tied together with "mickey" knobs that provide up to 12 stereo outputs.

KJLS's production studio is equipped with a smaller RAMSA WR-8210 recording console, also part of the modernization plan, that has given the station the ability to produce commercials in-house. Four Technics RS-M85MKII cassette decks are also on order, in addition to Technics SL-1200MK2 turntables and a 1500US reel-to-reel deck already in service at the station.

Overall, Rogers credits the audio equipment modernization for KJLS's current success. "You've got to have the tools," he maintains. **BM/E**

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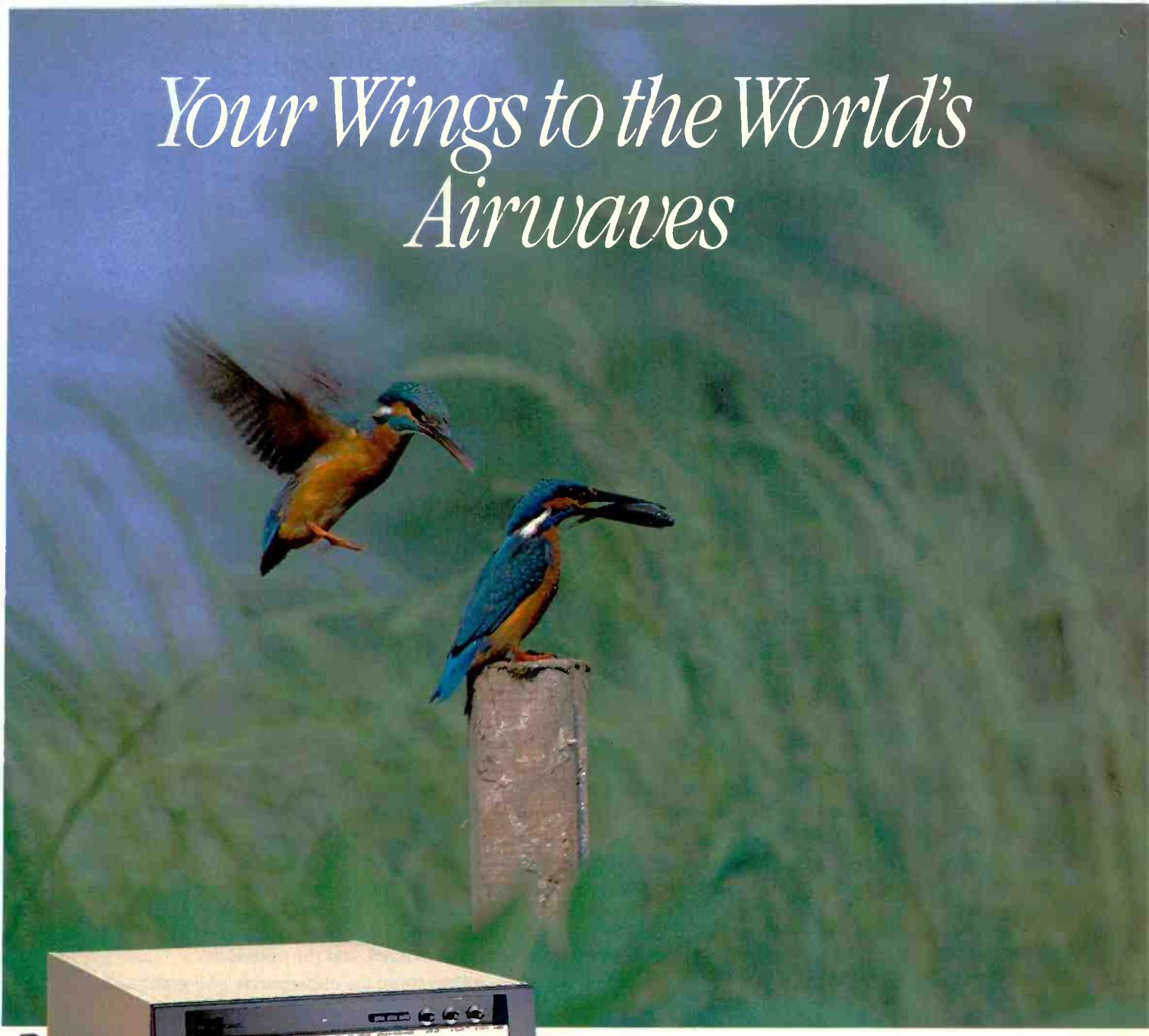

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TV Stations Gear Up For Stereo

Multichannel TV sound may have strolled to the starting line, but it has sprinted out of the blocks. Stations around the country are vying to be the first in their markets to bring stereo TV to viewers.

30 YEARS AGO WE INTRODUCED COLOR TV. NOW WE'RE GIVING YOUR EARS THE FULL PICTURE.

KOMO's stereo TV promotion included print ads like this one.

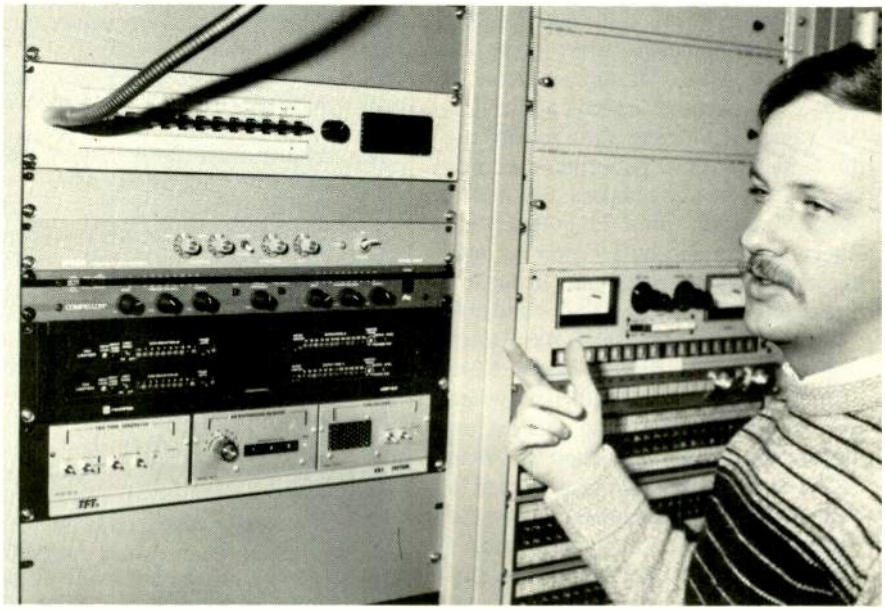
By Judith Gross
Contributing Editor

When TV equipment manufacturers announced new offerings in multichannel sound gear right around the time of last year's NAB, a lot of station engineers might rightly have dismissed all the enthusiasm as just plain jumping the gun on a newfound marketing fad. The networks seemed far from ready to send down stereo or bilingual programs, and many affiliates weren't even on the satellite systems yet, making the possibility of multichannel audio seem even more remote.

But now, less than a year after the FCC helped along the rallying around a single standard multichannel, the revolution is here.

The revolution isn't coming from the networks or the consumers, and only partially from the manufacturers. Instead, it's being born from the efforts of local TV stations, both independent and affiliated, who are clearing the path across the country.

At press time, some eight stations had started actual stereo broadcasting to date, one was making regular use of the second audio program (SAP) channel for broadcasts to the blind, several stations were synthesizing stereo, and the list of newcomers was growing weekly. 1985 looks to be the year stereo TV comes of age.



WTIC-TV, Hartford, synthesizes mono programming into stereo with an Orban stereo synthesizer, Aphex Compellor, and Harris AM limiter.

Spurred on by promotional opportunities, and in many cases by market rivalry, these stations are racing to be the pioneers of multichannel audio, just as their predecessors braved the new world of color video two decades ago.

What they have encountered in the process, in addition to the technical puzzles that need solving, is a real gap in programming (which this month's NATPE may change), plus the absence of complete stereo equipment packages in the form of production models ready for shipment.

Who's on first?

Hartford, CT, seems an unlikely place for a revolution. But a hot and

Engineering technician Dawn Skarset mixes the audio for a KOMO stereo production as (left to right) director of engineering Bob Plummer, station manager Patrick Scott, and general manager Monty Grau observe.

heavy competition to be the first TV station in the market broadcasting in stereo boiled over at the end of last summer between well-entrenched independent WTXX-TV, CBS affiliate WFSB-TV, and the new kid on the block, independent UHF WTIC-TV.

WTXX chief engineer Charlie Allen didn't want to be left at the gate waiting for stereo equipment to arrive, so he decided to build his own stereo generator. By his own account, he took a Moseley Associates SCG-9 generator for FM radio, added two low pass filters according to the BTSC standard for multichannel sound, plus 11-pole Cauer filters, matrix and buffer circuits, and the noise reduction IC card from dbx that is also a part of the BTSC standard.

The WTXX Townsend Associates transmitter was fitted with a Nera exciter and the transmitter bandwidth was widened by retuning the exciter and the klystron. Allen added an Orban 81-82 stereo audio processor, and a Tektronix 1450 demodulator to pass the wideband signal. Since the station's transmitter is within 500 feet of its studio, a direct wire carries the signal from one to the other, with the stereo subcarrier transported via a fiberoptic link.

In spite of trends toward ¾-,half- and now ¼-inch videotape, one-inch tape seems to be the tape of choice for stereo, according to station engineers. The station's Sony BVH-1100As and Ampex VPR-80s are all capable of stereo operation. WTXX will also use a Sony one-inch portable VTR along with an RCA TK-86 camera and Milab X-Y stereo condenser mic to produce *Sound Traxx*, a music show scheduled for late Friday nights. The show will be taped live at rock clubs.

According to Allen, WTXX saved more than time by building its own stereo generator; the station also saved money. He estimated his total cost of converting to stereo sound as being under $10,000.

WFSB borrowed a prototype stereo generator from Modulation Sciences, the Brooklyn-based manufacturer that is currently in the forefront in providing stereo equipment to stations. Engineering manager Steve Vigneaux said that after the station's initial broadcast in September, a production model was purchased from the company.

Vigneaux pinpointed a major obstacle in the paths of stations looking toward conversion to multichannel audio: a lack of available equipment, especially a precision audio demodulator to insure the signal's accuracy.

"The problem is, we will be broadcasting stereo, but we won't be able to test it for months," Vigneaux explained. He said he believes manufacturers held back on the production of multichannel equipment because they were afraid of "getting burned" by putting research and development dollars into the wrong standard. By last spring, the Broadcast Television Sound

Must-Carry Puts MTS Plans On Hold

Early this year, according to John Reiser of the FCC's Policy and Rules Division, the Commission is expected to reach a decision on whether cable companies carrying stations broadcasting with multichannel audio must pass along the stereo and other program aural subcarriers.

A clear line divides broadcasters and cable operators on this issue, although a "middle ground" proposal from the NAB and the Association of Maximum Service Telecasters may provide an answer.

With the National Cable Television Association's estimate of a cost to the industry of $669 to $709 million to implement must-carry, most cable systems are supporting softer requirements—"may" as opposed to "must." Broadcasters, on the other hand, are concerned for the integrity of their programming as well as for possible loss of ad revenues. The compromise worked out by the NAB and the AMST would create two program categories: "must-carry" and "non-must-carry." It would allow cable operators to strip multichannel audio at will in non-must-carry programming, and to delete multichannel audio in must-carry programming if the deleted audio is not integrally related to the program content. Cable operators would also be let off the hook if they could prove that carrying the subcarriers would cost the cable system over $1000 (an arbitrary figure), except in cases where broadcasters were willing to pick up any expense above the $1000. Cable operators could also get a waiver of the requirements if equipment purchased before the end of last March was found to be incompatible with must-carry.

In filings to the Commission, the "middle ground" proposal received support from the Association of Independent Television Stations, ABC, CBS Network affiliates, Bonneville International Corp., Tribune Broadcasting, Gannett Co., Lee Enterprises, and the American Foundation for the Blind, among others. ABC and CBS both argued that conversion costs for cable operators would not be exorbitant. NBC supported the compromise except in cases where cable systems already provide stereo or second-language programming on any of their channels, including vacant FM channels.

Zenith Electronics, which is partly responsible for the development of the multichannel standard, opposed must-carry, as did Dolby Laboratories, in separate filings to the FCC.

Cox Communications favored a waiver of must-carry in cases where cable operators lack the necessary equipment; even where the system is rebuilding and opting to use old, noncompatible equipment.

Group W, Viacom International and Tele-Communications, Inc., all urged the Commission to delay a must-carry decision.

Must-carry was flat-out opposed by many cable operators, including American Cable Systems Corp., Perry Cable Corp., United Artist Cable Systems Corp., United Cable Television Corp., and Times Mirror Cable Television.

Ironically, in many cases, local stations that have switched to multichannel sound are apparently not having problems with nearby cable systems.

Seattle's KIRO is carried on several cable systems, and chief engineer Chuck Morris said, "Most cable systems we speak with are enthralled with the idea of carrying a stereo signal."

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Committee (BTSC) was considering three similar multichannel standards. Although no official adoption of standards was made, the FCC protected the standard developed jointly by Zenith and dbx, Inc., which has come to be known as the BTSC standard.

In addition to the dearth of demodulators, which won't be on the market until some time this year, Vigneaux lamented the shortage of complete stereo packages from any of the large manufacturers.

"The only manufacturer in the country that can deliver a full stereo generator is Modulation Sciences," Vigneaux said at the time this article was written. "They managed to beat all the biggies."

Several other "biggies"—Harris, McMartin Industries and Broadcast Electronics to name a few—have stereo equipment in the works, with some prototypes in use.

WFSB had installed a brand-new Harris dual transmitter with stereo capability, so no modifications were needed. The studio-to-transmitter link also had dual channels. Vigneaux said that this year he will select new switching equipment to complete the stereo setup; he said his choice would probably be a Grass Valley stereo routing switcher and a stereo master control console. Vigneaux will be adding more one-inch tape machines to the station's studios to accommodate stereo production this year as well. He said the station has made a firm commitment to multichannel sound.

"We're looking to an expenditure of $350,000 to $400,000 to accommodate stereo," he said. But WFSB isn't the only one.

"We made a decision to treat our sound very seriously from the start, so we're going with 20 percent aural at a time when other stations are cutting back to five percent," said Arnold Chase, president and general manager of WTIC, Hartford's new and very powerful UHF station. WTIC boasts a 5 MW omni visual signal and 1 MW aural, and planned the high power with stereo in mind.

"Stereo, SAP, and the pro channel all tend to degrade the signal-to-noise ratio, and we wanted our station to be the strongest possible," Chase explained.

WTIC had a Harris prototype stereo generator, but Harris is not in production with it at this time. The station went with Modulation Sciences also for its permanent stereo equipment. With a brand-new Harris 240 kW transmitter, stereo, SAP, and the pro channel are all possible. For monitors, WTIC uses both stereo and mono receivers, including two RCA 25-inch MTS receivers and two Sony Profeel monitors.

The station also installed two-inch stereo quad machines from Ampex and one-inch Ampex tape machines for production. The Ampex VPR-3 features three-channel audio which accommodates the SAP. A Grass Valley 1600 accommodates stereo and SAP switching, and the station has an Aphex synthesizer for nonstereo programs.

Who was really the first to broadcast multichannel audio on TV in the Hartford market? All three stations scrambled to have that distinction. WTIC announced that it would sign on for the first time in stereo on September 17. WTXX hurriedly cut over to stereo five days sooner than that, on September 12, and WFSB began three days later. But wise to its competition, WTIC beat them both at the finish line by broadcasting station promos in stereo on September 7, 10 days before the official sign-on.

In addition to syndicated music programs and movies that were originally filmed with stereo sound, the three Connecticut rivals recognize the great shortage of stereo programming. WFSB is a CBS affiliate, but so far that is the one network with no announced plans for stereo broadcast (see programming sidebar).

To solve the problem, all three stations are involved in their own stereo production, a task which has meant more problem-solving and more attention to selecting the right equipment. WTXX does a live, in-studio children's program five days a week, involving coordination of as many as a half-dozen mics on stage, plus a few more, at times, for audience reaction. That has meant reeducating an audio person, according to chief engineer Allen. WTIC has planned a local children's show as

Programming: Progress Slow But Steady

The most abundant programming available in stereo by the end of last year consisted of syndicated music video shows and the more recent movies, which are recorded in multitrack audio but are usually mixed down to two channels when they are edited for TV.

All three commercial networks have made commitments to stereo and eventually bilingual programming, but massive stereo offerings seem to be awaiting the time when more affiliated stations convert to multichannel on the local level, or join each network's satellite system.

NBC currently tapes two programs in stereo. *The Tonight Show* has been recorded in stereo since October 1982 and was experimentally broadcast that way one night last year by New York affiliate WNBC. *Miami Vice* is also recorded in stereo, but plans to arrange for simulcasts with FM stations never materialized. The network is planning to broadcast those two shows, plus *Friday Night Videos*, in stereo through this year, and will also offer "limited specials and sports" in stereo, according to a spokesperson.

ABC has announced plans for stereo and SAP programming this year as well, with nothing definite scheduled as yet. At the end of last year, converted Seattle affiliate KOMO was gearing up for an ABC special, "Ewok." KOMO said the network would send the program down in mono, but would use two channels off the ABC radio network to send stereo audio which the station would pick up via satellite. A delay between video and audio could be corrected by the station by recording the program onto video with both sound and visuals synchronized, and aired with a slight delay at the same time.

CBS says it is committed to stereo programming but has announced nothing so far. A network spokesman said most CBS programs are not the type that would be enhanced by stereo, such as music or entertainment. He also said the network believes the switch to stereo would be "evolutionary, not revolutionary," presumably meaning that it would emerge as more affiliates convert to multichannel sound.

The Public Broadcasting Service has been sending stereo programming to member stations for about a decade. Previously most of the programs were simulcast by public FM stations. As PBS stations convert to multichannel sound, simulcasts will probably become a thing of the past, except where they have benefitted the FM stations. PBS stations are ideally set up to receive stereo broadcasts from the service, since for several years they have been part of DATE, a digital satellite system which facilitates the transmission of multichannel audio.

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well, while WFSB taped the annual Hartford "carol sing" at Christmas. All engineers agreed that live stereo production poses some tricky problems, perhaps the most obvious of which is phasing.

Two mics are generally used for live recordings. If there is a phasing problem, one whole channel can be missing from the audio. This will result when the L+R and L-R cancel each other out. Engineers emphasized the importance of monitoring stereo recordings in mono to determine if there is a phasing problem, and reversing the fields or installing a reversing switch if the equipment is out of phase. Other station engineers said there usually isn't a problem with some of the newer audio equipment. In resolving stereo phasing problems, TV station technicians are now experiencing what audio recording engineers have always learned to deal with.

West coast pioneers

Just like their east coast counterparts, stations in at least two western cities, Seattle and Los Angeles, have decided to become pioneers and begin broadcasting multichannel sound.

Another CBS affiliate, KIRO-TV, Seattle, was the first station in the northwest to send out a stereo signal. KIRO tested its multichannel capabilities on August 11 of last year, then had its two newscasters on separate mics for newscasts the following two days. From August 25 on, the station has been broadcasting in stereo using an Orban synthesizer for programs without two-channel audio.

KIRO first used a Modulation Sciences prototype stereo generator, then switched to the company's production model once it became available. As chief engineer Chuck Morris put it, "This thing [the finished generator] didn't even exist when we ordered it."

Morris is anxiously waiting for a Modulation Sciences demodulator as well, but right now he uses a spectrum analyzer to set the signal, which he compares to mono stations on the station's Zenith stereo TV sets. Morris replaced his audio consoles with ADM controls both in the main control and in the production studio. The station uses one-inch Ampex tape machines for most stereo programs, but the Ampex cart machines used to play commercial spots can't accommodate stereo, and this poses another challenge for Morris. He is working on a method of conversion for them.

In addition to widening the bandwidth in the transmitter, Morris found that KIRO's RCA notch diplexer would only barely accommodate the extra width required for stereo, and would not be suitable if the station decides to make use of the SAP or pro channel. Morris expects to replace the diplexer with one designed by Harris which will handle the wider bandwidth, and he will do so "sometime next year." For nonstereo programs, Morris also chose an Orban synthesizer, and he is impressed with the sound. "You get a big sound from it," he said, "even though you can't pinpoint the exact location of each sound, as you could with true stereo."

Like the other stations at the forefront of stereo sound, KIRO has had to produce some of its own programming in order to broadcast in true stereo. Movies have provided some multichannel audio as well. But KIRO also waits patiently for CBS to come up with some concrete plans for network stereo broadcasts.

Not far away, another Seattle station

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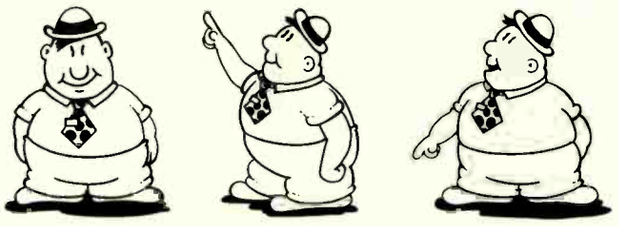

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has been broadcasting stereo audio since August 21 of last year. ABC affiliate KOMO-TV started out with a stereo setup built by its own engineering staff, but had every intention of switching over to a Modulation Sciences generator because, according to chief engineer Jack Barnes, "We didn't want to get into the business of building stereo generators."

Barnes, like WTXX's Allen, used an FM stereo exciter and added the dbx noise reduction. Barnes explained that he had to move the generator's pilot tone and phase-lock with the horizontal sync of the video signal. In the RCA F-line transmitter, Barnes bypassed the input transformer and lifted the preemphasis. In the generator, he added equalization and preemphasis to the L+R. He also designed and built 215 kHz bandpass filters to meet the specs of the BTSC system. Another audio channel had to be added onto the microwave link carrying the signal from studio to transmitter.

To KOMO's Grass Valley 164-S switcher, Barnes added a second audio keyer that Grass Valley is selling for stereo audio and upgraded the board for multichannel sound. The station's one-inch tape machines were capable of handling stereo, but for audio control, Barnes uses a multiline control board with each audio channel taking up one line. With its remote production truck the station had no problem at all; it was already setup for multichannel. The most amazing part of Barnes's task was not the conversion of existing equipment into stereo generating facilities; it was the time it took him to complete the work. He said it took only three or four days to convert the station's audio, and adds, "The system is working flawlessly."

Down the coast in Los Angeles, independent KTLA-TV is using both stereo and SAP capability to become the market leader in multichannel sound. Manager of engineering Ira Goldstone said it's not surprising that independent stations are paving the way.

"That's because the independents have their own source of programing, while the affiliates have to rely on the networks," Goldstone observed.

KTLA started stereo broadcasts on October 15 with a Modulation Sciences prototype generator, later switching to the production model. With a 35 percent Hispanic community in the area, and with the station's heavy local news commitment, Goldstone opted as well for the SAP and pro channel generators Modulation Sciences manufactures.

KTLA is sending Spanish translations of *Love Boat* and the station's 10:00 p.m. newscast over the SAP. The Spanish *Love Boat* audio is inserted by an outside production house and costs the station $600 per hour-long show. Goldstone said the station hopes to sell Spanish advertising to pay for the extra expense.

The pro channel controls the station's two ENG satellite stations. KTLA also uses an Orban synthesizer for nonstereo shows, and Goldstone said the station will be testing a prototype Orban stereo generator for use as a backup system in the near future. A relatively new Harris transmitter the station bought was planned from the start for multichannel capability. Goldstone also added a Micro Communications dual cavity notch diplexer because he thought the single cavity would not get a good audio response.

Through a Harris STL, Goldstone is sending discrete stereo (left in one channel, right in another). This is con-

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verted to matrix stereo (L-R in one channel, L-R in another) in the stereo generator itself. Goldstone is also using a Tektronix 1450 demodulator, although he would rather have one designed just for TV multichannel sound.

"Ideally I would like a real monitor, but they won't be available until around March," Goldstone said. He currently feeds the Tektronix's aural spectrum into a stereo decoder attached to a Sony Profeel monitor. He monitors the SAP channel right off the air with special SAP decoders. KTLA's conversion to multichannel comes at a good time for Goldstone. He is in the process of installing a new master control and can plan his equipment needs around the station's stereo and SAP requirements. He said he would most likely buy a Grass Valley 16004S switcher and a Neve or Ward production audio console.

According to Goldstone, KTLA is all set with its one-inch Ampex tape machines, but the two-inch Ampex ACR-25 and RCA TCRs are used for commercials and pose a problem since they only have one audio channel. However, he is looking into a method developed by Grumman Aerospace that would add a second audio channel into the horizontal blanking interval—a method which some cable companies use for scrambling.

While most new equipment now being marketed has been designed with stereo capabilities in mind, Goldstone pointed out a problem involving Sony's automated Betacart system. It is set up for two-channel audio, but does not have the third channel necessary if a station wishes to play spots with both stereo and a foreign language translation. At this writing, Goldstone was waiting for word from Sony on a possible resolution to this problem.

As of press time, KTLA was the only station in Los Angeles broadcasting multichannel audio. KABC-TV used a prototype from McMartin Industries to broadcast the opening of the summer Olympic games in stereo; but the station is awaiting McMartin's production model and plans to begin stereo broadcasts early this year, according to chief engineer Bill Dryer.

Public stations

The first station in the country to broadcast regularly in stereo was public station WTTW-TV in Chicago. The station started using the Telesonics system, one of the original three competing standards, in 1983. But last spring, when the FCC issued its statement protecting the BTSC standard, WTTW was forced to switch over. Since August 7 of last year, the station has been using a prototype TZ-30 stereo generator from Broadcast Electronics. Chief engineer Larry Ocker also modified the transmitter, which had stereo capability, to the BTSC standard. WTTW is producing some of its own programming in stereo, such as *Sneak Previews*, which is aired by other PBS stations. The station also has the advantage of taking the many stereo broadcasts directly from the PBS satellite and airing them as is, instead of resorting to simulcasting as many other public stations have been doing for several years.

In Princeton, NJ, WNJT, one of four public stations operated by the New Jersey Network, is using its SAP subcarrier as part of a community service involving the New Jersey Library and the state government. Special programs for the blind, mainly a reading service, are being broadcast over the SAP channel. Assistant director of en-

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gineering Larry Will said the audio has no connection to WNJT's regular programming.

The station uses a Modulation Sciences SAP generator to send out the signal. The state government is supplying Blonder-Tongue SAP decoders to blind people who request them. Will said the same kind of programming may be offered on one or two of the other New Jersey Network stations. He also said the network is considering stereo broadcasting, but that any concrete plans will be contingent upon receiving the necessary funding.

As the end of 1984 approached, one other PBS station, WEDH-TV in Hartford, was gearing up for stereo broadcasts.

The next best thing

Two stations aren't actually broadcasting with multichannel sound but are synthesizing stereo on a full-time basis. They are WTLV-TV, Jacksonville, FL, an ABC affiliate, and WNBC-TV, NBC's O&O in New York.

WNBC is using equipment developed with RCA. The synthesis involves a comb filter with speech sounds placed in the center and a frequency divider to spread music sounds. The station had been testing stereo for NBC, which has definite stereo plans of its own (see sidebar), but is currently taking the network feed in mono while waiting for a channel switcher to be installed this spring.

Other stations' plans for stereo are growing from the emergence of low-power and UHF all-music video stations. At the time of this writing, Boston's WZTZ-TV was getting set to begin its 24-hour music format in stereo, and KRLR-TV in Las Vegas, which is already on the air in mono, has plans for conversion to stereo this spring.

By the end of this year, the number of stations broadcasting multichannel sound is estimated to total several hundred, and already the equipment manufacturers are having difficulty keeping up with the demand.

As the first handful of stations blaze the trail, it will get easier for other stations to follow. KTLA's Goldstone said one of the problems at the beginning is the lack of anything with which to compare the initial stereo equipment setups.

"There are no standards yet," Goldstone pointed out. "It's so new, nobody knows which equipment is the best quality yet."

The changeover from mono to multichannel TV is going to remind many broadcasters of the change from black and white to color in the 1960s, even down to station promos and announcements prior to stereo and bilingual programs.

KTLA begins a stereo or SAP broadcast as many other stations do, by saying, "The following program is brought to you in stereo [or Español]." Some stations use a "headphones" graphic to explain it visually, but many are trying to come up with a symbol for both stereo and bilingual TV that is a bit more enticing, and will excite viewers as much as the logos for color used to. Now if they could just come up with another "peacock"... **BM/E**

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Staff Report

Renville McMann

VP ADVANCED TV TECHNOLOGY CBS

"I feel the biggest priority is for broadcasters to decide soon whether they're going to go to the digital standard for the studio and production, or have an intermediate component analog standard. I believe we should try to go directly to the digital standard, albeit there will be component analog around. But that signal would just be digitized."

Julie Barnathan

PRESIDENT ABC BROADCAST OPERATIONS & ENGINEERING

"The two things we need most right now are developments and standardization in small-format recorder/cameras, be they half- or ¼-inch, and a commercial-quality on-air cart playback system. The cart machines are especially important for our stations—they're dying for them. The new cart decks we've seen so far are okay. But they don't have the quality we need to air commercials.

"On a more general note, we're looking for equipment to be errorproof and maintenance free—in other words, an improvement in what we already have, because you can't invent something new everyday—except for HDTV, or something like that. So we're looking for a gradual change to better quality systems."

Bob Lifton

PRESIDENT REGENT SOUND

"For broadcasters, I believe the mandate is to have a game plan for the distribution and transmission of stereo signals within their plants. Also, all broadcasters have to think about digital audio. I think it's going to have a tremendous impact in radio. I see digital audio replacing the cart machine. It will be a solid investment for even small radio stations. Digital audio in television will also end up being a very good price/performance technology. I'm talking here about disk-based systems."

John Lowry

PRESIDENT DIGITAL VIDEO SYSTEMS

"A lot of people are excited by the prospect of HDTV, and I believe it will come one day. But we've got to get into it gently. The way to do that right now is to set up the analog component studio, and have all the pieces in place. This way, we can use standard transmission channels and standard TV sets to deliver an even better picture."

Doyle Kaniff

PRESIDENT THE EDITEL GROUP

"I feel the main priorities in the coming year are to continue to improve sound quality, particularly for stereo; to further the use of computer graphics; and to develop a half-inch cart system for commercials."

Roger E. Johnson

PRESIDENT SOCIETY OF BROADCAST ENGINEERS

"Productivity is one of the prime concerns of management people in radio and television. Engineers will be required to do more in less time. The available manhours in the industry will continue to decline for engineering jobs. We're going to have to increase our skills. TV has done a much better job of continuing education than radio has. The technology of radio has come a long way. Continuing education is one of the problems we are going to face. The question is, where is the time to keep up with new technologies?

"I see a continued, growing demand for good engineers. There's a tremendous need for people with good productivity and state of the art skills."

Neil Feldman

PRESIDENT
VIDEO POST AND TRANSFER

"Our interest is further developing interfaces for devices like the Montage [Picture Processor], which we just put in, and coming up with a system that allows more creativity in a pre-line system, and allows us to conform in video later. Right now Montage has not yet allowed a full interface for the on-line session. We intend to try to develop a full interface for Montage.

"My personal goal is to place high priority on a number of R&D projects. Our future is entailed in having things no one else has. We're not looking to buy those things on the market as much as to develop them ourselves. We think that in the future—maybe five years from now—the whole structure of video on-line will be different, much more like conforming film than it is today. Devices like Montage are starting to make that possible."

Tom Keller

SENIOR VP
SCIENCE AND TECHNOLOGY
NAB

"One of the most important things is to make sure we guarantee a future for terrestrial broadcasting. We just completed a study trying to improve the quality of AM broadcasting. We're supporting the development of technologies that will reduce skywave signals and increase groundwave. We're also promoting the improvement of receivers. In FM, we have to improve the quality—particularly in stereo. We're now supporting the development of technology that will overcome the 23 percent signal-to-noise loss when you go to stereo. In general, as an industry we need to get together and avoid situations like AM stereo."

Stan Baron

CHIEF OF ENGINEERING
THOMSON-CSF/CHAIRMAN
SMPTE WORKING GROUP ON DIGITAL VIDEO STANDARDS

"The real task over the next year is for the industry to decide where it's going. With video sources in the home, DBS, cable, and low-power TV, there are all kinds of factors that broadcasters didn't consider 10 years ago. It's like handling an amoeba. You're not quite sure what it's going to look like. And this impacts all the way down the line. What kind of programming is going to be needed? And for manufacturers, what kind of equipment is going to be needed?"

Emory Cohen

PRESIDENT
PACIFIC VIDEO

"Our priority is still a viable and affordable single-camera editing system. We're a Montage owner, and we're working with EditDroid. We'll be receiving an Optical Disc Corp. laser disc recorder within the next few weeks. We're in the process of working on a timing system and on high-throughput video dailies. But the electronic laboratory still isn't there, and it's the key.

"There needs to be some resolution of the issues of digital video and digital component video. People like us don't know if we should look at Betacam and M-format seriously, or if they will be replaced by a digital system in a few years."

Andy Butler

VP AND DIRECTOR OF ENGINEERING
DOUBLEDAY BROADCASTING

"My overall concern for broadcasting is the declining profit margin of traditional broadcasting. We have controlled operating costs as much as possible, and there is still pressure to generate a better rate of return.

"The FCC's deregulatory moves have us all watching closely. Any great and dramatic change creates wobbles, and after the major surgery we've had, you expect the patient to be unsure of his feet, even if the operation is successful. We're looking to see who's left in control.

"Engineers, especially in radio, are becoming lonely people, a staff of one, if you have the luxury of one station to tend. Engineers I talk to across the country feel vulnerable and insecure, 'surviving the '80s,' as one put it. And because engineering is inescapably an expense item, something management would not mind doing without, it's now necessary to market engineering's desirability."

John H. Battison

DIRECTOR OF ENGINEERING
WOSU-AM-FM-TV

"Probably one of the most pressing issues is stereo and second-language TV. It's been approved and it's being initiated, but there isn't very much [receiving] equipment available. It's sort of a chicken and egg situation.

"Getting knowledge of digital operations will be a big priority for both radio and television broadcasters. Digital audio is pretty much a fait accompli. We're using Sony CD players on the FM side. But we need more music on CD. Digital video is a little way in the future. It's not as close as TV stereo, but it's coming along fast. Digital video will bring the possibility of a truly international video standard."

WHILE EVERYONE ELSE HAS BEEN PROMOTING A FORMAT, SONY HAS BEEN PERFECTING A SYSTEM.

Over the last three years, Sony's rivals in the combination camera/recorder arena have spent considerable time inventing wonderful things to say about their new formats. But apparently, they've overlooked inventing many wonderful new products to go along with these formats.

Sony has taken a different course.

In 1982, Sony introduced Betacam™ and the BVW-10 playback unit. An evolutionary system that didn't force stations to abandon their existing ¾″ and 1″ equipment.

Then, in 1983, Sony expanded the system with the three-tube Betacam, the BVW-40 edit/recorder, and the world's first battery-operated ½″ field playback unit.

And this year at NAB, Sony announced a major breakthrough in cart machine technology with Betacart.™ A system

that demonstrated the Betacam format's strength beyond the newsroom, beyond the studio, and beyond field production.

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Each of these products is the result of Sony's dedication to the needs of the ENG and EFP industry. Work which has earned the Betacam format widespread acceptance by television stations and production companies around the world.

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Broadcast

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In all respects, the A810 is the most advanced analog recorder available. With microprocessor control of transport, audio functions, and audio parameter settings. Digital memory storage of audio parameters for two tape formulations. Four speeds. Advanced phase compensation circuits for superior square wave response. Plus a serial interface option for external computer control. The list goes on.

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A810-TC shown with Studer TLS4000 modular synchronizing system.

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Rich Thorne

SENIOR VP
THE POST GROUP

"I'm looking for more of a standard or cooperation between manufacturers. I mean a standard protocol and/or method by which there is a universal language or interface for digital effects, graphics devices, and so on. I've been talking about a subcontrol panel which can control all these devices so they can speak to each other. It would be nice to have something universal."

Alex Weil

CO-OWNER
CHARLEX

"From my end of the industry, the number one priority is to continue to create creative depth. Our technicians and designers need to continue to move forward and break barriers. As far as tools are concerned, we need a digital box that can play back and record many passes without losing quality. We're also waiting for a high-quality image-mapping system."

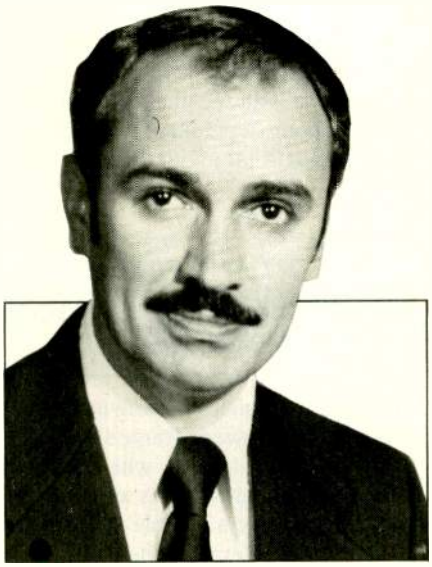
Ken Davies

ASSISTANT DIRECTOR OF TECHNOLOGY PLANNING
CBC

"Television distribution by satellite and rapid improvement in receivers are delivering better entertainment to viewers. Broadcasters should upgrade their production facilities, especially in audio. The broadcaster is also going to have to move into component and CCD cameras, and move away from U-Matic.

"Graphics devices are becoming affordable production tools. We think broadcasters are going to have to look more carefully at graphics and still stores. Also, the digital video recorder is approaching rapidly; it will probably appear on the market in late '86. It will have an impact on production.

"In HDTV, current pressure from Japanese and European marketers is forcing the development beyond where it is ready to be. A full system is not realistically within our grasp. But spin-offs—lenses, monitors, recorders—are going to spill over into existing production before HDTV is ready."



Richard Martinez

DIRECTOR OF TECHNICAL OPERATIONS
ABC RADIO NETWORK

"Over here at ABC we've been doing so much in developing engineering planning in the past few years. 1984 for us was a year of building a new plant and of coordinating massive outside broadcast events. We've set 1985 as the year of getting our organization in better shape. When we sit back and take a look at what we're doing, we recognize that in a high-tech plant like ours people are our most important resource. Unless you build a good staff and upgrade people's technical knowledge, a terrific plant will get you nowhere fast.

"Over a year ago we started an organized training program, which we're continuing to refine. We're going to start building a library of VHS training cassettes, some from equipment manufacturers and some produced by us during training sessions. Without that, I feel we're not going to be able to support a plant like ours over the long term.

"There's really no training ground anymore for operators and engineers. People move into these areas 'out of the shadows.' There's really no avenue into broadcast engineering. It's one of those professions that takes a whole lifetime to learn. Broadcast engineering tends to be almost a blind profession—you almost don't know what you're getting into until you're into it. It's not like other sciences where when you get out of school you're pretty well abreast of the latest techniques in the field. In broadcasting, you've only just started when you get your first job. A broadcast engineer is made, not graduated."

Bob Thomas

SENIOR EQUIPMENT PLANNING ENGINEER ABC/CHAIRMAN SMPTE WORKING GROUP ON 1/4-INCH STANDARDS

"As chairman of the SMPTE working group on ¼-inch video recording standards, I would place the highest priority on achieving a compromise in time to allow manufacturers to solidify designs so that ¼-inch can be available to broadcasters, and can compete in the ENG market. I'm looking forward to our meeting in February, when we can finally establish a definite direction for ¼-inch.

"Also, the work that is being done on mechanical and electrical interfaces will eventually give broadcasters more choice in camera and recorder combinations. And, it should stimulate ENG camera design because of the broad market that would then exist for a variety of camera and recorder combinations."

Tomlinson Holman

TECHNICAL DIRECTOR OF AUDIO
LUCASFILM

"The broadcast industry needs to upgrade its audio plants, equipment, and techniques in order to accommodate stereo properly. Films like ours lack a great deal of the theater experience on television. TV broadcasting needs to produce some of the same qualities as a film. Right now in the sound area, TV cannot reproduce a film. Signal-to-noise ratio, for instance, is much poorer than a theater."

Birney Deyton

VP ENGINEERING
GRASS VALLEY GROUP

"Certainly the highest technological priority facing our industry is defining and implementing a path to higher quality television pictures in the home. The solution must be one which allows orderly upgrading while maintaining downward compatibility with the delivery systems that provide service to today's receivers. Concurrently, improved delivery systems must be developed to deliver tomorrow's studio quality to tomorrow's receivers."

James Gibbings

DIRECTOR OF TECHNICAL FACILITIES AND STRATEGIC PLANNING NBC

"Stereo, which is one of our top priorities at NBC, really presents a big challenge—aside from equipment issues. We must be aware of the capabilities and limitations of the system so we don't create something unrealistic for the viewer. New mixing techniques must be developed so we don't overwhelm audiences by overexpanding the stereo stage. We believe dialog should be centered with the picture. Audio has been the poor stepchild of television for many years. A lot of our thinking has to change."

Tom Wolzien

VP SPECIAL PRODUCTION NBC NEWS

"The biggest concern facing us today is that when we cascade frame synchronizers, as often happens when doing a large production such as election reporting, we have a terrible audio/video sync delay problem. By the time you're finished sending the video through effects and switching and graphics systems and the like, it can be several seconds out of sync with the audio. But although there are units which can delay the audio, there's no way of telling by exactly how much. The industry needs a new standard here. Something that will write a piece of information into a line in the vertical interval every time the frame goes through a synchronizer. At the end of the studio process, the audio/video sync delay would simply count up the number of marks in the VI, and then delay the audio accordingly."

Nick Hudak

MANAGER OF SYSTEMS DEVELOPMENT AND MARKETING PANASONIC

"We've got to get to the point where we can go through the entire studio process, from beginning to end, from shooting to multigeneration editing, to on-air playback, in a single format. The biggest problem facing the engineer today is that he's got to make a decision on which format to go with, and then he's got to sell that decision to his management. And with all the formats around, it's not an easy decision. But I think the key word is 'system,' and that's where we've got to go.

"Another thing we're all waiting for is a half-hour version of half-inch videocassettes for the analog component formats. That's going to make a real difference in how they can be used at every level of station operations."

S. Merrill Weiss

PRESIDENT IMAGEX CORP./CHAIRMAN SMPTE WORKING GROUP ON COMPONENT ANALOG VIDEO STANDARDS

"I believe one of the most important priorities for the industry in the coming year is to make the advanced technologies practical and accessible to users. Many technologies have been under discussion and development for a long time, and they hold much promise. Now, we must concentrate our efforts on making the benefits of those technologies available to users today, rather than concentrating on potential systems that are three to five or even 10 years away.

"To further this goal, the working groups within SMPTE which are developing standards for component video, in both analog and digital forms, are working jointly to answer the remaining questions which apply to component video systems in whichever form. The standards being developed are designed to integrate easily into an overall system and to work together to permit users to choose the best technique for each part of the system.

"New facilities can be built to these standards, but more importantly, existing facilities can easily incorporate them. The result is that superior pictures can be delivered to viewers as soon as users implement the systems. The difference that can be achieved is dramatic, even for delivery to the viewer in NTSC, let alone the newer delivery systems." **BM/E**

Conrac Model SNA-9/RBL for CCIR 625/50 Pal-B. $1000.00

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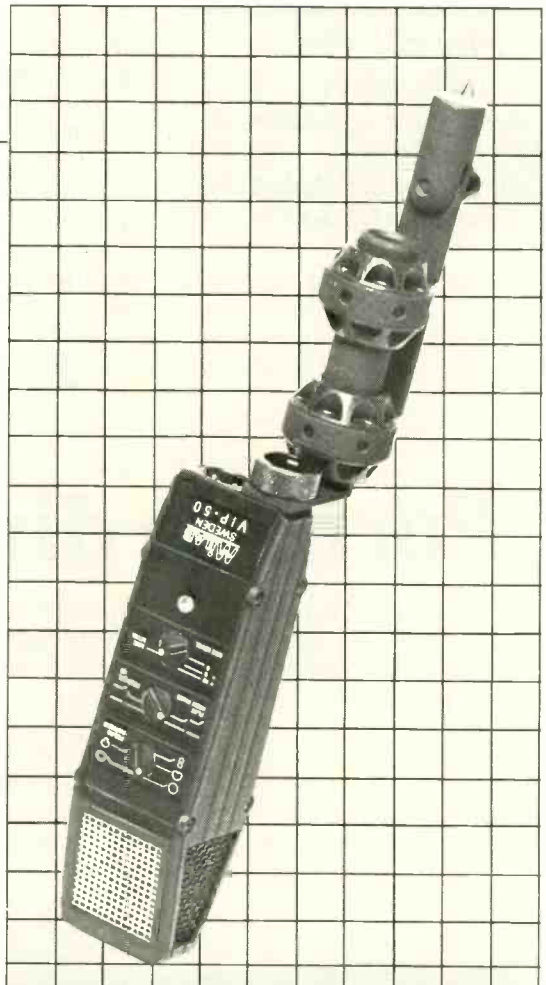

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SMPTE SHOW-IN-PRINT

A comprehensive analysis of the most significant developments at the New York show.

Staff Report

SMPTE Elects New President

"The number one priority of the society, since its inception, is the establishment of standards," said Harold Eady, president and CEO of Novo Communications, who was elected president of the SMPTE for a two-year term beginning January 1985. "We want to enhance our position as the force that's going to establish those standards. And toward that end, I'd like to improve and increase communications between the society and the broadcasters."

Eady acted on his words shortly after his election by holding a December meeting with engineering representatives of the major networks.

Eady's election follows on the heels of the most successful New York conference in the society's history. More than 12,500 persons registered for the conference—10 percent more than originally projected. In addition, with 169 companies participating, the 479-booth equipment exhibit was 20 percent larger than the 1982 New York conference.

Particularly well attended this year were meetings of some of the SMPTE engineering committees, subcommittees, working groups, and study groups—particularly those working on some of the thornier problems facing the industry.

One, the Subcommittee for Digital Control, chaired by Thomas Meyer, announced that it had nearly completed the basic architecture for a digital control network for television. Two basic documents have already been approved as U.S. national standards: ANSI/SMPTE 207M electrical and mechanical interface and SMPTE Recommended Practice RP 113, a supervisory protocol. Two basic documents remaining to be drafted are tributary interconnect and message architecture.

Analyzing the Analog Component Dream

Until recently, most broadcasters were ready to dismiss analog components as an engineering curiosity, or just another new format to confuse the already confusing standards question, or as a set of proposals put forward by manufacturers who had no idea of broadcasters' needs. Now, suddenly, it appears that many people are quite serious about analog components, that de-

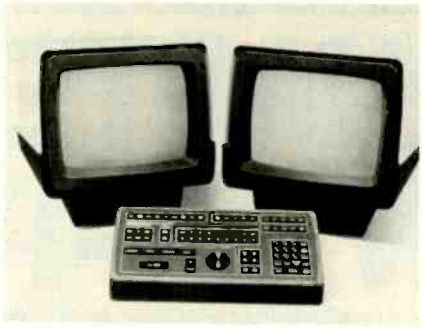
SMPTE STORIES IN THIS REPORT:

velopments are moving forward all over, and that some broadcasters are committing big money to these new developments. (One exception appears to be the CBS network, which is holding out for the arrival of digital recording, according to Bernie Dickens.)

This has been fueled, in part, by the tremendous impetus of both Sony and Panasonic with their analog component Betacam and M-format technologies. But this push alone is not enough to account for all the other analog component developments. Rather, it seems that the industry has woken up and realized that analog component encoding, if it can be kept up throughout the entire studio operation, can result in substantially better image quality than current NTSC.

One of the clearest demonstrations of this was the B-MAC transmission system being promoted by Scientific-Atlanta. What these people showed is that if analog components are multiplexed according to the B-MAC scheme, and transmitted over a standard satellite transponder with six to eight digital audio channels and a data channel, the image received on a standard TV set is far superior to a signal which is transmitted in encoded NTSC. The Scientific-Atlanta system is being proposed for services such as pay-per-view or premium cable distribution, or, perhaps more significantly, for a DBS service that could deliver a better-looking picture without going to an expensive HDTV system. But its impact on broadcasting cannot be overlooked. In fact, Australia has chosen B-MAC as a nationwide standard and has ordered 200 downlinks for delivery this year. S-A's Sidney Topol stated confidently, "We think this has the opportunity to become the global standard" for satellite broadcasting.

Also demonstrated at the conference by the SMPTE itself was S-MAC. S-MAC, as the preliminary draft of a standard for a single-channel component analog video waveform has come to be known, is the studio version of a multiplexed analog component scheme. It obviously will be far too costly to distribute three separate component signals around the plant; but the Y, R-Y, B-Y signals can be time division multiplexed together and fed through a single data line. The results cannot be distinguished from the original analog component signal, and the multiplexed signal carries all the data necessary to perform analog component processing of the signal, including



The Video Editing Workstation of EECO's EMME editing system.

brilliant chromakeying. S-MAC has already progressed to the point of becoming a proposed standard, meaning that within a few months manufacturers can begin turning out equipment that will cement the analog component studio together.

Meanwhile, numerous pieces of component gear are already beginning to show up, awaiting only the interconnection protocol that will allow them to form an entire system. Grass Valley, for example, an early leader in the analog component studio equipment field with its 1600-1LCV production switcher, is working on a less costly, more compact version of a component switcher to be based around the Model 100 switcher architecture. Meanwhile, at SMPTE, it introduced a new transcoder, allowing translation from RGB to Betacam (Y, R-Y, B-Y) signals.

Panasonic, too, is obviously concerned about being able to interface its M-format decks with other types of equipment in an editing configuration. New at SMPTE was an RS-422 serial interface box. Its effect is to interface the AU-300Bs with other one-inch and ¾-inch decks, and vice versa, tying them together into a single editing system.

Both Crosspoint Latch and Shintron also showed their component production switchers (See "The Analog Component Dream" in our October issue). The Crosspoint Latch Model 6116, a three-level switcher, has four inputs dedicated to analog component sources and an additional three inputs which accept composite video, meaning that although component and composite sources cannot be mixed together, the 6116 can handle all types of video signals.

Meanwhile, both Sony (Betacart) and Panasonic (MVP-100) were extolling the virtues of their half-inch cart playback systems. For both companies, the existence of the MERPS decks allows the Betacam and Recam formats to be promoted as an entire system, allowing the station to go from field recording through editing to on-air playback in a single format.

Other component developments are discussed in the story on digital processing developments at the show.

Post-Production: Real-World Considerations

The high-tech world of video post-production systems has been especially glitzy of late, with high-end systems from such companies as CMX, Convergence, and Montage sporting various sophisticated capabilities: voice recognition, trackball controllers, and frame-by-frame displays. With the NAB stardust beginning to settle, however, SMPTE gave manufacturers and users alike a chance to evaluate the new systems in terms of real-world considerations.

One thoughtful perspective on the future of video editing came from Emory Cohen, president of Pacific Video, who delivered a paper on what he called "The Electronic Laboratory." Cohen addressed the continued reluctance of film producers to take advantage of video editing, despite the strenuous exhortations of the video community. One problem, according to Cohen, is that true film-style editing is a process of *reediting*, a major weakness of most video editing systems. Some of the newer systems are beginning to address this, he noted, but acceptance is still in the future.

Another telling event was Montage's announcement, a week prior to the show, of a "baby brother" for its Montage Picture Processor. A limiting factor in the Picture Processor's popularity, however, has been price: at $260,000, the off-line system is clearly only for the very high-end post-production houses. Not to worry, though—the new Montage, known as the Picture Cutter, sells for a mere $125,000 and has almost all the features of the Picture Processor.

As the name implies, the Picture Cutter is a cuts-only system, reflecting the accepted wisdom that 90 percent of all edits are straight cuts. In fact, an editor can instruct the Picture Cutter to do a dissolve, which will be duly entered in the edit decision list; it simply won't be displayed.

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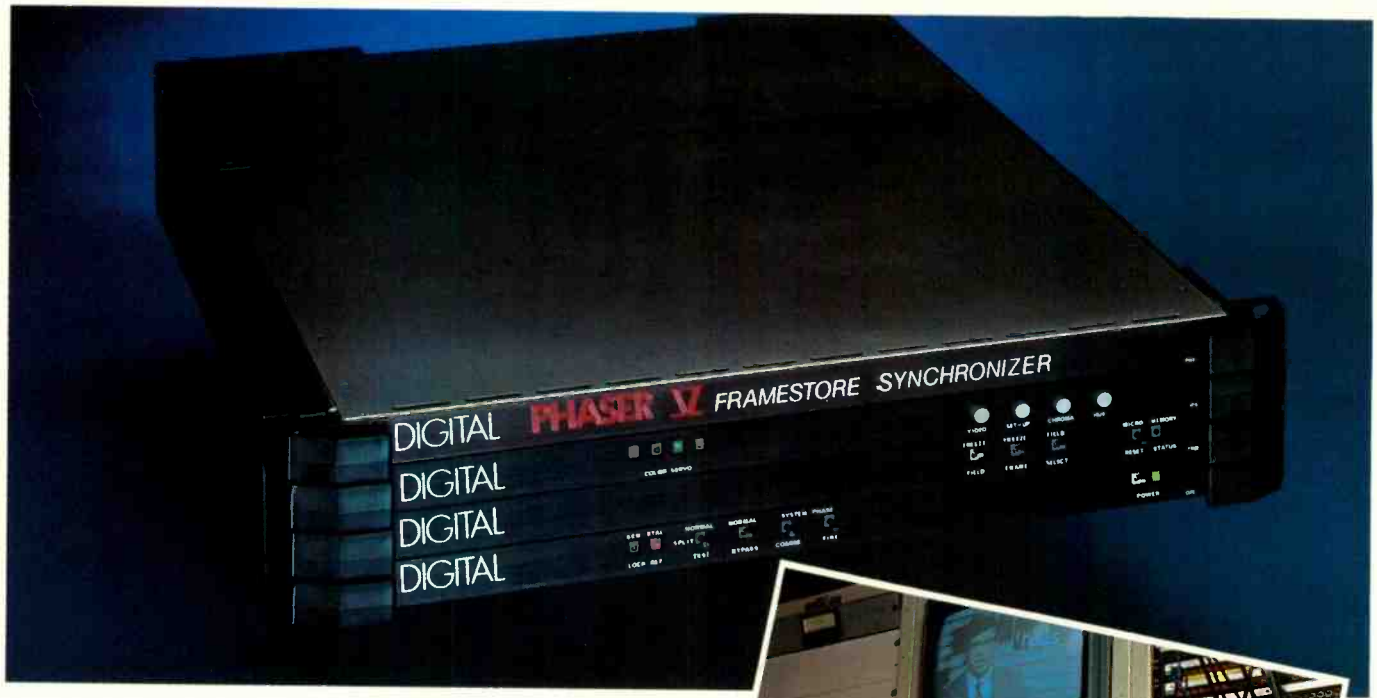

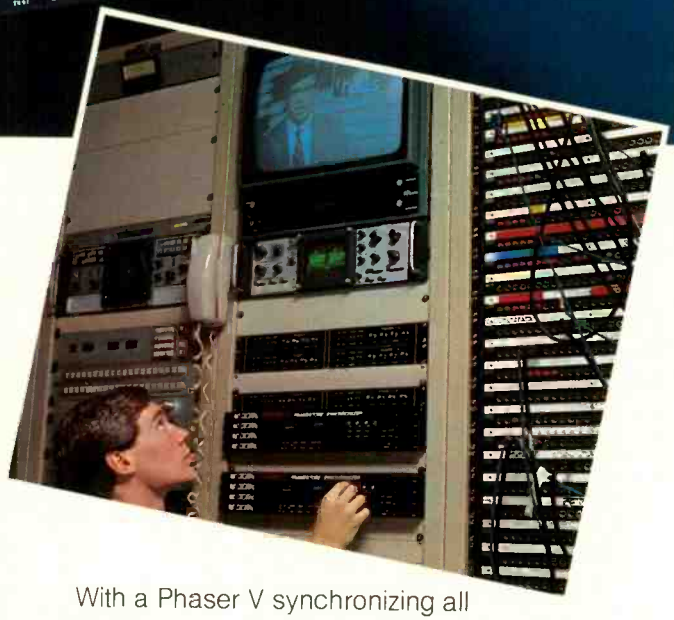

The smart framestore synchronizer

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Convergence had a large, busy booth at the Sheraton hotel, but no actual EditDroid. Rather, representatives of Droidworks, the joint venture of Convergence and Lucasfilms that is producing EditDroid, were tucked away in a corner with a videotaped presentation. This didn't seem to deter visitors, who crowded the screen for a glimpse of the "Star Wars" editing system. In addition, Ralph Guggenheim and Andrew Cohen of Lucasfilms presented papers describing EditDroid's design and editor interface. According to Droidworks, Beta sites were scheduled to receive EditDroid last month; delivery of production models begins next month with Complete Post in Hollywood.

While EditDroid is geared mainly toward video post-production of feature film, convergence is certainly not forgetting its roots in video. The main part of its SMPTE booth was dedicated to the established 200 Series editor, the modular, joystick-controlled machine for which the company is famous. The display featured the 204 editor with new software, including improved list management. Also new is an optional CMX-compatible eight-inch floppy disk drive (also compatible with ISC and Amex ACE editors), immediately available at $4500.

EECO, like many other editing companies these days, is paying close attention to the way different editors' styles vary. With this in mind, the company, in conjunction with Swiderski Electronics, introduced a new cinemagraphic editing workstation for its EMME multimachine editor to complement the previously shown video editing workstation. Unlike the latter, which is a dedicated keyboard with rotary shuttle knob, the cinemagraphic workstation has only one control—a single-button mouse, which can be rolled on any surface including desktop, clipboard, even one's leg—to move the cursor around the small monochrome monitor that displays the menu. All editing decisions are made with the mouse. A pair of color monitors display preview and picture information. Although the system uses time code internally, it displays no time code numbers (time code information is available with the video editing work station, however.) An optional alphanumeric keyboard is available.

The cinemagraphic workstation allows control of up to four VTRs; with the dedicated keyboard, EMME will control up to nine VTRs or ATRs.

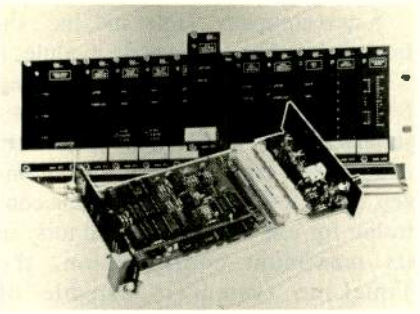
Paltex, which last year acquired the Datatron editing line, took the Vanguard editor to its logical conclusion with its introduction of the new Esprit editing system. According to Paltex director of marketing Al Paz, Esprit is a "Rolls Royce" system with all the features of the top-of-the-line Vanguard, plus a new editor interface complete with 10 user-programmable keys and an ASCII comments keyboard. The system, which should be deliverable this month, includes the electronics rack, three VTR interfaces (with interface to the new Ampex VPR-6 available), the keyboard, serial switcher interface, 500-event memory, amber display monitor, and Backtrac and Smartscan software—in other words, everything except a printer and disk drive for the EDL—all for $54,000, the same price as the old stripped-down Vanguard.

Another new editing system that generated some excitement at the show was EnVision, a touchscreen-based editor on view at the BHP booth. EnVision, an off-line ¾-inch system, again reflects the video industry's increasing fascination with film-style editing techniques. The basic three-machine system is expandable to 24 machines.

EnVision will edit material originated on either film or videotape and intended for release on either medium. EnVision is supplied as a complete packaged product including furniture, monitors, tape decks, controller, printer, and even a chair for the editor. According to Jack Behrens, who presented a paper describing EnVision, the user needs only a 110 V ac outlet "and a room to keep the rain out."

Control Video, recently acquired by ADDA Corp., was in the ADDA booth with its advanced list management system (ALMS). The system functions as a standalone unit to manage CMX-format edit decision lists, or as an option to Control Video's Lightfinger touchscreen editor. Features of ALMS include an "undo" function that deletes mistakes or accidental keystrokes, a help function that provides information about any key's functions, list sorting, unlimited notes and comments, sublists, tape reel directories, insertions or deletions in the list, list cleaning and ripple, and other management functions.

Apert/Herzog's latest item is The Step (for "select the edit point"). This device stores two seconds of video as 32 digitized images, displayed frame-by-frame on a monitor, to allow the operator to select an exact edit point with the aid of a joystick (for shuttling through the 32 frames) and a 16-button keypad (for selecting any of the 16 frames displayed at one time). The Step, which also operates in an audio mode, interfaces with all SMPTE time code edit controllers and all half-inch, ¾-inch, one-inch, and two-inch VTRs that provide RS-170 or CCIR signals with at least 35 dB S/N, according to the company. The first unit has already been delivered to Video Post & Transfer in Dallas.



EV-BLOC, a modular system from Evertz, has time code, video DA, and other modules.

Comprehensive Video introduced an enhanced version of its Edit Lister, an edit list management program for Apple and IBM PCs. Edit Lister allows off-line editing systems to compile edit lists either on a control track system, using window dubs, or by transmitting information directly from a controller's RS-232 output. Features include 995-event memory, reedits, and insert/delete edits.

With the increased emphasis being placed on audio production for TV programming, time code and time code synchronizers continue their development. Sony Pro Audio unveiled Syncmaster, an innovative new synchronizer which draws on video editing technology to create a system that easily fits into the post-production environment. The Syncmaster, which locks together and controls up to four machines, is built around a central keyboard/display unit that provides an audio edit decision list with management capability.

A.F. Associates showed the Scantex audio follow system, which AFA represents in the U.S. on an exclusive basis. The system can be directly controlled from an editor or switcher; interfaces are available for Grass Valley switchers and Convergence, Ampex, Paltex, and ISC editors. It sells for $2800 to $8000, depending on configuration.

A new company, TimeLine, Inc., introduced its Lynx time code module, a $2450 unit that combines a wideband SMPTE time code reader, multistandard SMPTE time code generator, audio/video tape machine synchronizer, and RS-422 communications controller for use with external editors. In its maximum configuration, the TimeLine system is capable of synchronizing and remotely controlling up to 32 machines, on-line and simultaneously. The system can also be used as a standalone chase synchronizer for two or more machines.

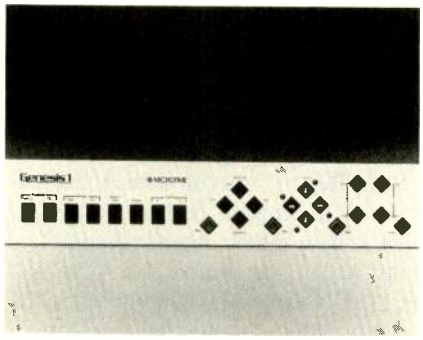
Another modular system was introduced by Evertz Microsystems, represented by Amtel in the U.S. The EV-BLOC system allows the user to arrange time code, video DA, and other modules in any quantity needed. Initial modules include a time code generator (LTC and VITC), time code reader/translator, source ID encoder, SC/H phase meter, video DA, 8 by 1 video switcher, character generator, and computer editor interfaces. The system uses VITC user bits to send the time code and source ID information through the routing system. The modules mount side-by-side in Eurocard racks and can be used singly or in interactive blocks.

Skotel demonstrated "evolution, not revolution" of its full time code product line, according to the company's Stephen Scott. One new feature is front-panel controls for character insertion.

Effects and Graphics Under $50,000

For some time now it's been apparent that although digital effects started out as the plaything of the rich, affordable only by the largest stations and teleproduction facilities, there's now a movement afoot to bring digital effects prices down to earth and to put some form of effects, if not also digital still storage, into every station and facility. The magical number here appears to be $50,000 (although many companies are making digital systems for far less).

Harris, one of the most important companies aiming at the under-$50,000 price range, introduced Iris C at SMPTE. The full-function/dual-channel still store differs from the Iris II in that it's limited to two users, whereas the II supports a multiuser environment. But its price (under $50,000) and



Microtime's compact Genesis 1 effects system sells for only $21,990.

extremely small size (under 24 inches of rack space) make it perfect for smaller installations. Its processing power comes from a new Model 654 frame synchronizer with four frames of component coded memory, and up to four NTSC encoded outputs.

On the other hand, ADDA continues to reduce even further the price of its ESP II still store. With the newly introduced single-channel processor priced at $19,500 and a new 80 megabyte fixed disk drive capable of storing 200 frames priced at $5500, the system price can come down as low as $25,000. The system can be upgraded to a two-channel unit for $9990.

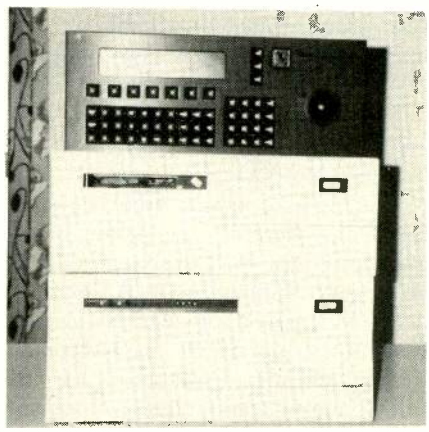
Harris was also showing the HDE-100 digital effects system, also priced under $50,000. The basic package includes standard video effects, plus Montage, Multifreeze, Reflect, and Orbit. The basic unit can also be expanded with modules that add dual-channel operation, and automatic events sequencing of 150 events in nine blocks.

As had been predicted for some time, Microtime is swinging heavily into the digital effects area, putting its frame synchronizers to more use than as simple passive correctors. The new system introduced at SMPTE was Genesis I, priced at only $21,990. The compact unit features a full range of digital effects: V and H compression, crop, border, zoom, flip, tumble, posterize, mosaic, and so forth. It can take either composite or component inputs and has a full-preview keyer. Spatial anti-aliasing is incorporated to help cut down on jagged lines caused by quantization.

The Illusion system from DSC is also making considerable headway in this market. $39,900 buys the basic digital effects system with an awesome lineup of digital effects including flips, rotation, barrel roll, spiral, strobe, and so forth, all under x,y,z-dimensional joystick control. A 3D perspective option is available for another $9900. A digital key manipulator adds only another $2000.

NEC E-Flex owners will be happy to learn of two extremely low-cost software updates for the basic effects package. The first, picture cropping, involves the ability to individually manipulate the key signal rather than having it follow the video. This allows the creation of mask areas within the frame, or the main video signal itself to be cropped. This software upgrade is $150.

Also available immediately is the Cube Maker software upgrade for the E-Flex Optifex 3D module. The new $100 software upgrade greatly simplifies the creation of six-sided rotating cubes. The perator defines the size, position, perspective, and path of the first face of the cube. In successive passes, the Cube Maker automatically determines these values for succeeding faces. Each face of the cube is built in a single pass.



The Abekas A62 records 50 or 100 seconds of video on a Winchester hard disk.

For its digital effects system, Abekas introduced the A52 combiner, which allows two single-channel units to be operated as a dual-channel system from up to four control panels. An assignment matrix permits extremely flexible operation, allowing the channels to be simply split apart or combined.

Not exactly in the under-$50,000 category, the Bosch FGS-4000 has some new software that adds capabilities to its already mind-boggling graphics. The most important new feature is smoothshading—the ability to add both shading and highlights to any object, be it round or flat, concave or convex. This technique, carried over from industrial CAD/

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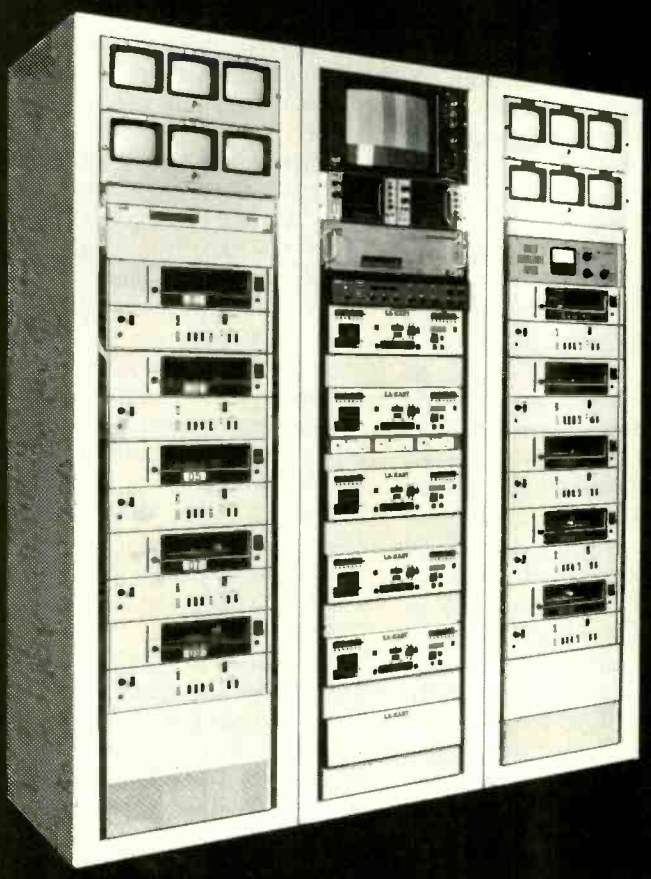

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CAM applications, is one of the cornerstones of solid modeling, but is rarely achieved in real-time as in the Bosch system. Another major new piece of software is the trajectory editor, which allows objects to be added into or taken away from animation trajectory sequences by simple reprogramming. Other new software includes the pain program introduced at NAB, a 3D editor which allows a two-dimensional object to be instantly transformed into 3D, and the HQAS high-quality animation editor for adding glows, streaks, sparkles, and so forth.

Bosch also revealed that The Post Group in Los Angeles has purchased a second FGS system.

MCI/Quantel also had software additions. Encore, the company's digital effects device introduced at NAB, was shown with several new features—the most notable being "Spacetrak." It is a tracking system with two sets of crosswires that gives the operator a true spatial representation of picture sweeps, greatly simplifying complex perspective moves. The system also now features soft focus for enlarged pictures; a live front-back source selection with different pictures on each side of a surface; a dedicated input freeze store that permits manipulation of a live image on one side and a frozen picture on the opposite side of a surface; and an internal nonvolatile memory capable of storing up to 5000 sweeps.

In the production switcher department, Ross, represented by its American distributor Adcom, was featuring add-ons for its production switcher line. Among these is Encore, a microprocessor-based memory system with five memory pages, each of which holds 20 events. Also featured was the UltraKey, an RGB chromakeyer priced at $3780 which is integrated into the switcher. It can track a key on up to four separate camera inputs.

Central Dynamics also featured additional switching capabilities in the form of a new microprocessor control module, the ISO Chroma Key system. The system is designed to switch multikey effects in fast-moving live sequences without degradation of the key signal and precisely and automatically recall all key preset operating parameters such as hue, delay, shadow, soft levels, and so on. The system has CDL's new integral chromakeyers, both RGB and encoded.

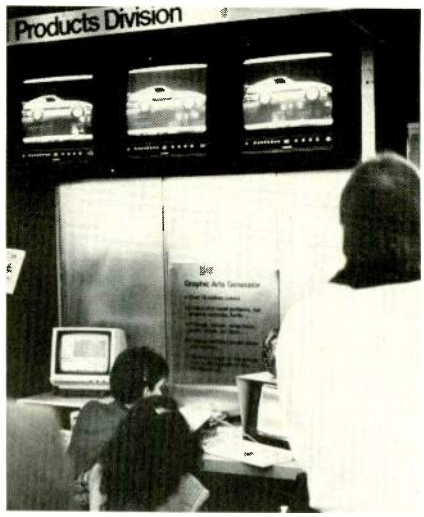
Shintron continues to make advances into more sophisticated production switchers with the introduction of EMPRESS—Events Memory Programmable Effects Switcher System. Designed for both production and post-production, this is an A/B, program/preview design with lots of features, effects, and interface capabilities. One of its most significant advances, based on the microprocessor-control design, is that the status of all the crosspoints and settings is continuously displayed on a data screen, allowing the editor to have an instant reference when trying to establish a carefully controlled effect.

Crosspoint Latch had an impressive array of new switching gear at the conference, including the 6116 component/composite switcher described earlier. The company also introduced the The 6112 AK, a new microprocessor-controlled version of the company's 6112 production switcher. It has nine inputs and two mix-effects generators, each with frame-accurate programmable duration timers and countdown display on seven readouts.

Crosspoint also announced it has started delivering its newest Auto Drive Controller. The 7239 is an eight-bit computer controller capable of storing the entire configuration of the 6112 and 6139K production switcher series and interfacing with most computer-controlled editors. The price, with editor interface, is below $14,000.

The character generator market is likely to heat up a bit now with the somewhat surprising introduction by Dubner of a real character generator—Texta—capable of high-resolution (37 ns) lettering. One of the big selling points for Texta is its low price. For a base price of only $42,000 you get a full-blown system capable of proportionally spaced characters; unlimited bordering and drop shadowing; nine-speed roll, crawl, and slow reveal; diagonal typing; 3D shadows; tumbling and rolling; 64-color logos; and a host of other graphics features. In addition to the text mode, there is also an ability to automatically draw geometric forms such as circles and ellipses. A video digitizer is optional, as is a weather service interface for automatic recording of weather displays.

Featured at Quanta was its amazing new font compose for the Q8, available as a $2995 extra circuit card and software update option. The first step in logo creation is to scan in an image from any video camera, selecting the correct capture level from the Q8 keyboard. The logo is stored as run length

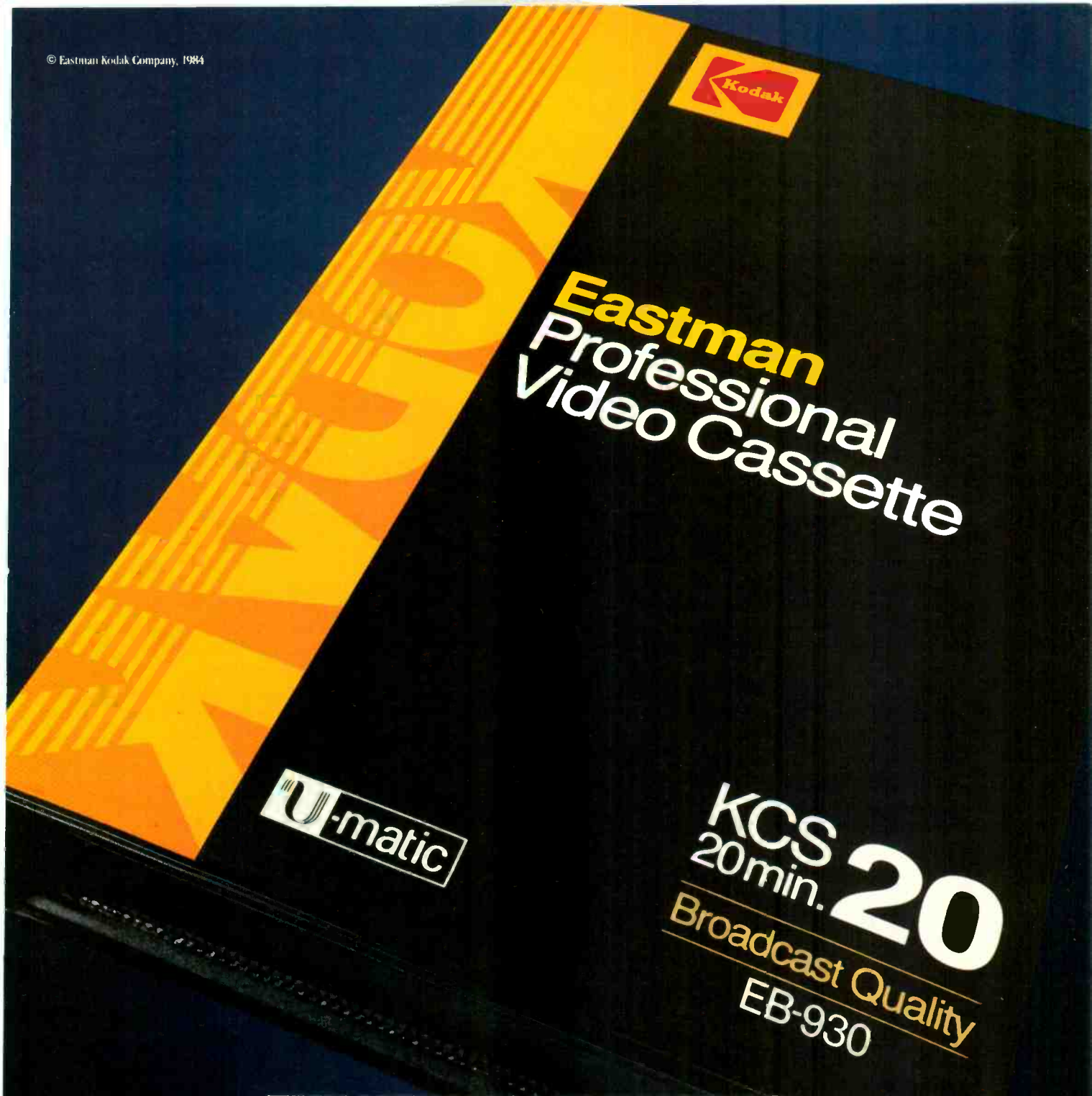


New Graphic Arts Generator from 3M has a palette of over 16 million colors.

encoded data in 96 scan line blocks; larger characters are automatically stored as interlocked groups of 96 scan line pieces. Once stored, the character can then be cropped in eight-line increments, compressed in one-line increments, moved about, and ultimately added to a font library in any character position. One of the most interesting byproducts of the run length encoding approach is that characters can also be quite easily expanded vertically. Multicolored fonts can be created by multiple captures which are then stored on different memory planes one behind the other.

Chyron highlighted the production model of its 4100 EX, which the company introduced in prototype form at NAB. EX stands for expanded system, which essentially means that the font and computer memory have been doubled. New computer software allows for a number of new features including automatic kerned fonts; two-dimensional rotation of characters (pinwheeling); and three-dimensional rotation with perspective and depth of characters. Also, MGM software has been changed to allow cutting and pasting with resizing capabilities, and type styles can be modified automatically.

3M showed a prototype of its Model MFA 24-bit-plane paint system, a more powerful "big brother" of the company's BFA system. The MFA, which will sell for $50,000 to $60,000, features "true color" painting capabilities and photographic image grab quality. The company also demonstrated its D-5000 character generator, and showed an audio-only addition to its H Series routing switcher line.



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Is Videotape the Right Medium?

The folks at Abekas asked this leading question in a suite at the Sheraton Centre where they demonstrated the brand-new, much heralded A62 digital disk recorder. Based on Winchester hard disk technology, the system can simultaneously record and play back single frames of video at any speed, on a random access basis, with a total system memory of either 50 or 100 seconds (only the 50-second version was demonstrated).

The concept is that the new disk recorder should emulate a high-quality Type-C VTR—in both price (the 50-second version is $98,500 and the 100-second version $148,500) and performance (but without the color framing problems and other hassles of videotape recorders).

To understand the impact of this new development, consider its possibility for doing station promo work. Only one set of frames of the entire full-length promotion need be recorded, using a video camera, a computer graphics system, or any other NTSC input. Once recorded, the frames can be played back in any sequence, allowing a producer to build up as many different spots as he or she chooses from the raw material.

Optical Disc Corp. showed its DRAW videodisc recording system.

Abekas was not the only company to introduce a new recording technology at the conference. Optical Disc Corporation (ODC) also chose this place and time to reveal the inner workings of its new LaserVision-compatible DRAW videodisc recording system.

ODC, which has actually been in business for about two years, chose to formally introduce its system in a paper by Don Hayes, senior member, technical staff. This introduction coincided with the delivery of ODC's first system to Spectra-Image, Burbank. The post-production facility plans to use the low-volume, fast-turnaround system to do disc-based editing. Pacific Video has the same thing in mind for its new system, which the facility took delivery of in late November.

The ODC 610 system sells for about $200,000. A playback machine, which the company does not provide, is also necessary; the discs produced on the ODC system are compatible with any laser disc player currently on the market. ODC also sells blank discs for $100 each.

The 610 is a real-time system. A half-hour show could be encoded and recorded in about 45 minutes. The 612 encoder will insert required and optional control and address signals, as well as specified VITS and VIRS into the vertical interval of a video signal. The encoded video can then be used to feed the recorder, or create a fully encoded

Get it out of your system.

Television is an electronic medium. Yet TV graphics still involve messy paints, glue, air brushes, razors, and other paraphernalia.

MCI/Quantel's Paint Box can put your TV graphics into the electronic medium.

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It gives you over 16 million colors. If that's not enough, you can mix your own, just like you'd do with paints.

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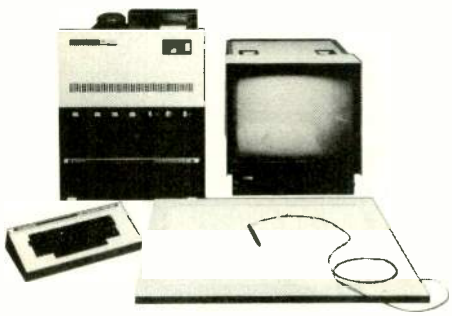

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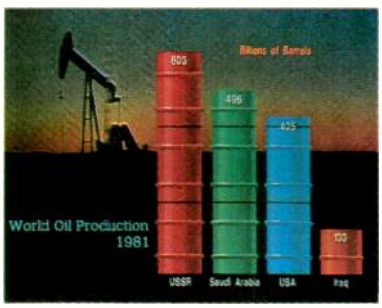

Graphics like this are easy on the Paint Box.

videotape which can be sent to disc manufacturers for mass replication.

Despite the "alternatives" offered by Abekas and ODC, videotape certainly will be the medium of choice in most applications for a long time to come. And, as *BM/E* reported in September, Ampex introduced the brand-new VPR-6 Type-C VTR, with production capabilities in many ways the equal of the VPR-3 but with a price — $72,500 — more like the current VPR-2B. Ampex stresses that although the 6 will eventually replace the 2B as the intermediate machine between the low-cost VPR-80 and the top-of-the-line VPR-3, it is infinitely more sophisticated than the current 2B model.

The features are well thought out. There is, for instance, an automatic end-of-tape sensing mechanism that slows the rewind transports (achieving up to 500 ips in shuttle speed with viewable picture to 450 ips) when approaching the end of the reel, thereby avoiding both head and tape damage.

Ampex announced at the show the sale of 20 VPR-6s to National Video Center, the New York City teleproduction facility—a contract worth $1.5 million.

Though images from its Super Motion "super slow motion" system are by now familiar to sports viewers on ABC, Sony introduced the system formally to the industry at SMPTE. Utilizing some of the technology developed by Sony for its HDTV system, the Super Motion system eliminates much of the blur and fuzziness associated with conventional slow-mo by recording three times as much information. The Super Motion BVP-3000 camera scans at 90 frames per second, resulting in RGB bandwidths three times that of conventional NTSC. The 90 Hz-scanned signals are then digitally converted to the standard 30 Hz rate, resulting in three separate NTSC pictures. The signals are then recorded on a specially modified BVH-2700 Type-C VTR with three recording heads and a tape speed three times normal Type-C speed. The result is that every high-speed frame scanned by the camera is recorded at the equivalent of normal speed, so that the full-bandwidth playback images can be slowed or stopped with no degradation in quality from regular NTSC.

Also introduced by Sony at the show was the BVH-2180, a three-hour record/play version of the Sony Type-C VTR.

Some developments in half- and ¼-inch recorder/cameras have been covered in the discussion on cameras themselves. Bosch, however, amid reports that the SMPTE ¼-inch committee may be leaning back in the Bosch direction, unveiled its BCF/9/10, the studio recorder/player unit that completes the Quartercam system. Meanwhile, Bosch also revealed its role in the ABC Los Angeles Olympics coverage. In addition to Quartercam cameras, Bosch had two field editing systems on hand—modular units in which the field recorder itself can be plugged into the editor to serve as a source or record deck. The tests apparently met even Julie Barnathan's expectations.

Tentel brought a new tape tension gauge designed especially for the Sony BVH and Ampex VPR Type-C video recorders. Both companies have approved the new Tentelometer, which sells for $690 with a viscous damping option.

Audico introduced a new videotape duplicator that loads recorded videotape onto cassettes from a single

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Flash. *Every major TV set manufacturer plans to put multichannel units on the street by 1985.*

Flash. *NBC announces The Tonight Show and Friday Night Videos will soon be recorded in stereo.*

Flash. *ABC tests bilingual broadcasts of The Fall Guy in Spanish markets; ratings soar.*

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Cameras and Lenses Eye the Future

The camera field was relatively quiet at SMPTE, with manufacturers apparently resting up in preparation for NAB. Nevertheless, several companies introduced new cameras, especially at the low end of the price scale.

Ikegami, long known for its high-end, high-quality video cameras, made a play for the economy market at SMPTE with its introduction of an inexpensive studio camera aimed at budget-conscious stations. The SC-500, a studio version of Ikegami's ITC-730, has three ⅔-inch pickup tubes and prism optics, along with a range of automatics that simplify operation, all at a price in the $20,000 range. Automatics include centering control, auto iris with weighting system, auto cap for tube protection, white and black balance, and black level. Should your camera operator take an extended vacation, a nonvolatile memory will retain all automatic correction data for several years.

Ikegami introduced an economical studio camera, the SC-500.

In addition to the SC-500, Ikegami had its ITC-730A lower-cost three-tube ENG camera in a Plumbicon version, the ITC-730AP.

The big camera news at Thomson-CSF was that the company is now offering Betacam in two French-built versions, the TTV 1623 (Plumbicons) and TTV 1624 (Saticons). The Betacams, which may be operated with or without the attached half-inch recorder, were shown in an auto-setup version with a microprocessor-based automatic control box that adjusts geometry, registration, and black and white shading. To function with the auto setup system, the 1623 or 1624 camera head is modified with a rear adaptor containing the genlock and automatic control functions and a lens with a built-in diascope. Thomson also displayed its top-of-the-line TTV 1525 C fully automatic studio camera, introduced at NAB.

Betacams were also in the news at Sony, which showed a new Plumbicon version of its three-Saticon BVW-3 Betacam, the BVW-30. The $36,000 BVW-30 features a higher resolution viewfinder tube plus audio level indication and control in the viewfinder. The camera also has an external switch to provide access to the zebra pattern ON/OFF control. Deliveries of the new camera were scheduled to begin last month.

One of Sony's big marketing pushes is the variety of Betacams it offers, on both the high and low ends. The company further illustrated this theme with its announcement that its new low-cost camera, the BVP-150, is now in full production. The BVP-150 is a broadcast version of Sony's industrial DXC-M3 with NTSC and Betacam outputs; it lists for $8900. Also on the low end, Sony showed its compact

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Circle 157 on Reader Service Card

BVW-2 Newsmaker Betacam, a one-tube version that weighs nine pounds. Deliveries of the $8000 camera are expected for the first quarter of 1985.

RCA and NEC continue to do battle on the CCD camera front, and the hostilities appear to be heating up. Both companies are balking at naming purchasers of their CCD cameras, each apparently waiting for the other to do so first.

RCA had no new announcements since last spring's introductory fanfare for its CCD-1 camera. Visitors to its booth in the Hilton were directed to a suite upstairs for a repeat of the CCD-1 suite demonstration given at NAB, showing the camera's ability to stop action when equipped with a 1/500 second rotary shutter.

NEC, which continues to be the only other company with a broadcast-quality CCD camera, took a more aggressive stance with the introduction of a new generation of its SP-3 three-chip camera. The SP-3A contains an entirely new chip, built by NEC, which the company says increases the camera's light-handling capabilities for a virtual absence of smear and increased sensitivity (f/4 at 1500 lux). S/N is 58 dB. The camera will interface with half-inch Beta, ¾-inch U-Matic, or ¼-inch tape formats and boasts all the advantages of CCDs, including permanent registration free of geometric distortion and EMI-immune, and freedom from burn-in, sticking, and comet-tailing. The camera lists at $18,500, about half the price of RCA's CCD-1, and is deliverable in 60 days.

Hitachi's new FP-Z-31 three-tube auto setup ENG camera, shown in prototype at NAB, is now ready for delivery, the company says. A low-end entry into Hitachi's Computacam line, the camera is a good example of the kinds of advanced features now appearing in "economy" broadcast cameras. For a mere $8000, the user gets one-touch auto centering, auto registration, black set, black balance, and white balance, with backup battery memory. The camera also offers fault diagnosis and registration correction, along with a wide range of accessories. Hitachi is still emphasizing its SK-970 and SK-97 Computacams; at SMPTE, the company proudly announced a contract to supply the Canadian Broadcasting Corp. with 20 SK-970s and 10 SK-97s.

Besides RCA, another company exploring the advantages of shuttered video cameras is Nisus Video. Nisus builds a rotary shutter mechanism that is infinitely adjustable from 1/500 to 1/10,000 of a second—while the camera is operating. According to a spokesperson, this lets the camera operator monitor the signal while determining the optimum shutter speed for the light available. Maximum light loss with the shutter is approximately two f/stops.

Nisus, which has been in existence about a year, has been selling primarily to the military market until now. Talks with the three television networks over the past six to eight months, however, have led to a contract with CBS for modification of Ikegami HL-79s. The company also supplies what it calls the Nidus N-3, a Sony DXC-M3 camera modified with the rotary shutter for around $17,500. Nisus will supply either camera in modified form, or will modify a new user-supplied camera.

SMPTE produced little news in lenses beyond what manufacturers had

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A unique, concealed fold-out control panel groups editing functions and separates edit controls from the main control panel.

In short, it's the ultimate 1" for networks, affiliates or teleproduction companies. Don't consider your next 1" purchase without looking into it. Contact Hitachi Denshi America, Ltd., Broadcast and Professional Division, 175 Crossways Park West, Woodbury, NY 11797. (516) 921-7200 or (800) 645-7510. Hitachi Denshi, Ltd. (Canada), 65 Melford Drive, Scarborough, Ontario M1B 2G6. (416) 299-5900.

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Hitachi

shown at NAB. An exception was Canon, which introduced an 18X ENG zoom, what it calls the longest range ever for an ENG lens. In addition, the lens has a built-in extender, lengthening its focal range to 18-324 mm (9-162 mm without the extender). Maximum relative aperture is f/1.7 to 116 mm, dropping to f/2.4 at 162 mm. Company VP Jack Keyes also described a Canon-developed f/1.2, four-piece prism for ⅔-inch format cameras in a paper presented at the convention.

The latest entry from Angenieux was a new 14x9 ENG zoom, first introduced at IBC earlier in the fall. The lens has an f/1.6 to f/1.9 maximum aperture over the entire zoom range, even with the built-in 2X extender in use. Its light weight of just 3.3 pounds is enhanced by a center of gravity that has been shifted back toward the camera, resulting in less weight resting on the camera operator's hand.

Schneider emphasized two relatively new lenses, the 14.5X wide angle for studio cameras introduced at NAB and the 14X ENG lens, which a spokesperson says is selling well.

An interesting item from Arriflex was the Lightflex, which the company recently acquired from Lightflex International, Ltd., of Birmingham, England. The on-camera accessory is mounted in front of the lens and reflects light back into the lens, effectively raising the pedestal without raising noise. Originally designed for film cameras, Lightflex works with any video camera, pulling more detail out of shadowy areas and increasing overall picture detail.

Lighting, Power, and Support to Play Increasing Roles

"The importance of lighting in communications is usually underestimated by communicators. Please don't fall into this trap," cautioned E. Carlton Winckler, an expert in TV lighting since the 1940s and now senior production consultant at Imero Fiorentino Associates, in his paper "The Objectives of Lighting."

From a technological point of view, however, there has never been a greater number of quality tools for strengthening communications than at this year's SMPTE.

One of the most significant new products on the market was introduced by Camera Mart. Softube is a portable, lightweight lighting unit that uses ultra-high output tubes which give the light output and quality of a softlight with the added advantage of interchangeable tubes to match many lighting situations. The four-bulb unit with remote ballast draws only 4.6 A with an output of 125 to 150 fc at a distance of six feet, and gives a spread of nine feet.

Like Winckler, LTM's Thomas Denove says his company finds itself in an ongoing campaign to educate broadcasters about lighting. As a result, LTM plans to start offering turnkey installations of small studios, from 15 by 15 to 30 or 40 by 40 square feet, probably during NAB. For this show, it introduced eight portable kits, Pepper Paks, based on its Pepper fresnels. At the other end of the spectrum, LTM unveiled the Luxarc 12000, a 12 kW HMI fresnel.

Colortran unveiled a new dimmer rack, the D-192, and a new lighting control console, the System 2. In addition, it brought out the Dimension 5

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The Incredible Canon J18x9B IE

The Canon J18 x 9 BIE lens greatly increases the capability of portable cameras. It gives you an 18X reach, then gives you even more—up to 36X with its built-in extender. Yet, *It's lighter in weight,* and easy to handle.

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- Angular Field of View: 52.1° x 40.3° at 9mm, 3.1° x 2.3° at 162mm
- Minimum Object Distance: 0.9 meter (2.9 feet)
- Weight: 1.7kg. (3.7 lbs)

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Christie marketing VP Fred Benjamin holds the CASP charger/power supply.

computer console, which Colortran claims is the most advanced lighting console available, with 512 control channels by 999 dimmers.

For the first time at SMPTE, Belden displayed its Lee 8 kW HMI light with solid-state, flicker-free ballast, which it says will provide competition for the Brute. Belden anticipates distributing a full line of these lights with other lampheads of 4, 2.5, 1.2 kW, and 575 W.

Frezzolini introduced an inverter, the LPS-1, to supply 100 W of line-isolated power for its popular Mini-Fill lights. Additionally, Frezzi showed a new MFDC dual configuration Mini-Fill available with 12 and 30 V operation, and a 30 V, 250 W Mini-Fill with lower color temperature.

Strand Century showed attendees its new 575/1200 W HMI ParLite with accessories and solid-state ballast for flicker-free operation.

DeSisti had on hand its new line of Leonardo fresnels measuring 6, 10, and 12 inches with 1, 2, and 5 kW.

Comprehensive Video showed its own new line of lights and accessories (see *BM/E*, November 1984, p. 113) all employing the SMPTE modular stud.

Kobold Lighting brought out a new flicker-free daylight fresnel, the DLF 270 EL, which it says delivers nearly the same effect as a 575 W HMI while using only half the power. The light lists for $2950 with delivery starting this month.

In the camera support area, Karl Heitz introduced fluid heads for cameras up to 50 pounds, and heads for cameras up to 100 pounds; levelling balls with headlock for Gitzo and other fluid heads; and a Mono-Tripod for cameras up to 10 pounds.

Sachtler showed the Video 20 and O.B. pedestal. The pedestal, a tripod with a pneumatically supported center column, is intended to be used with Sachtler's Video 20 steerable dolly.

Autocue brought its new 706 Mini Video Prompter, which it is targeting for small stations and studios. The 706 fits on small cameras and tripods.

As for power supplies, certainly the most important development was the CASP (charger/analyzer/sequencer/power supply) from Christie. The company has taken its revolutionary "burping" fast charge system, which injects a high voltage spike into the charge cycle to prevent battery overheating, and incorporated it into a unit that will charge all types of batteries. When not being used as a charger, CASP will power up to six units requiring different voltages.

Frezzolini premiered the Model CFC1 compact fast charger for all Frezzi or Anton/Bauer nickel-cadmium on-board battery packs.

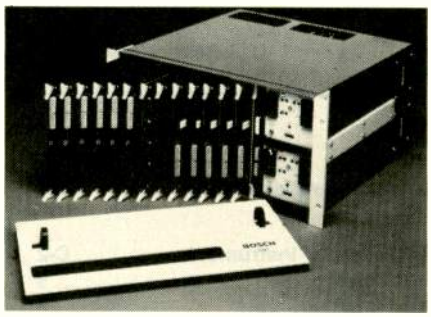
Perrott Engineering showed the new MP 500 Mini, a miniaturized charger for silver-zinc batteries, selling for $475.

Automation Dominates Master Control, Routing Systems

The market for technical automation systems has suddenly begun heating up again. Perhaps this is due to the declining power of unions in society as a whole, allowing stations to pursue dreams of man-free operation. Perhaps it is because of the promise of the new cart deck systems such as Betacart, the MVP-100, La-Kart, and the system from Broadcast Video. Or perhaps it is simply because automation systems as a whole are simply becoming more reliable.

A major new force in machine control is Grumman, which has only actively been pursuing the broadcast market for two or three years. Already it has scored a major sale to NBC, which is using a custom machine control system at its Burbank studios. The Grumman unit controls 200 machines by routing messages from up to 50 studios and computer controllers. A variety of data processing signals is used, depending on the machines being controlled — everything from one-inch VTRs to telecines. The system also controls NBC's video/audio routing and distribution switching network.

HEDCO, celebrating its fifth ann-



Bosch brought eight new control panels for its TVS/TAS-2000 switcher.

iversary, has made an unusual warranty offer. The existing two-year warranty on its products has been retroactively extended to five years, meaning that every product the company has ever manufactured is still covered by warranty. President Peter Hughes vows the policy will continue, and that a six-year warranty will be offered next year.

Meanwhile, HEDCO also announced that its brand-new Hedline Series self-powered, self-contained audio and video routing switchers and DAs would be available in January. The series includes eight-output video DAs and equalizing amplifiers with 30 MHz bandwidth; six-output audio DAs and remote gain audio DAs; and 4 x 1 video and audio switchers. Ten of the self-contained units can be installed in a three-rack unit frame, or three units in a single-rack frame.

Bosch is making a big impact in the master control switcher market with its MCS-2000, a microprocessor-controlled system that offers maximum operator ease with maximum system flexibility. The switcher performs all normal MC functions, but adds some not found on other systems: mix keys, key mixes, wipes, wipe keys, bordered wipe keys, and so forth. An interesting feature is a bypass mode that allows the switcher's functions to be used for limited production work at the same time that it is feeding an uninterrupted on-air signal; as soon as the bypass button is pressed a second time, the switcher returns to on-air status for commercials and other tasks.

Bosch also had eight new control panels for its TVS/TAS-2000 distribution switching system.

Image Video is one of the companies recognizing very early that the move to multichannel TV audio means more than just adjusting the transmitter. Its master control switcher is now available with stereo audio channel switching.

Crosspoint Latch, too, had its Model 6150 BK master control switcher, which features 16 inputs and microprocessor control. It has an optional second audio channel for expansion to stereo audio and is priced at under $13,000.

Videotek continues to expand its routing switcher line with the brand-new RS-182A. It's especially appropriate for introduction at this time because in addition to the 18 x 1 basic video switching matrix it features three audio levels per video channel allowing stereo audio plus time code to be switched. Videotek also introduced an economical 12 x 1 video switcher, the VIS-1200.

A major force in the audio DA field, BSM Systems, is making a move into the total signal routing and distribution field with the 5000 Series routing switcher, which can be configured up to a maximum of 150 by 250 crosspoints (10 by 10 building blocks), in up to eight levels of video and audio. RS-232 coax party line connection is used between all units in the system, with controllers ranging from a master CRT terminal to individual machine controls. The price is said to be some 20 percent lower than comparable systems.

Processing in the Digital Era

Nova Systems, which last year came out into the broadcast market with a single product, the Model 500 ($6450) digital TBC operating in direct color mode, this year rounded out its product line. The new Model 490 ($5850) operates in the heterodyne mode; and the new Model 510 ($7450) is switchable between heterodyne and direct. All units operate with 8-bit, 4 x fsc sampling supply 32 lines of video storage. All fit into a single 1.75-inch rack unit.

ADDA continues to make strides with the VW Series TBC/frame synchronizers. The latest addition is the new VW-3, priced at $13,750. This includes a dropout compensator, and 64K of dynamic RAM for a full-function, infinite window TBC.

Microtime caused quite a stir with the introduction of its T-220 FIT, which is believed to be the first digital TBC with format interchange capability. The $15,000 top-of-the-line TBC allows multiformat selection input with simultaneous multiformat outputs from any heterodyne, M-format component or dub VCR. Freeze frame, operation with Dynamic Tracking, and 40x forward and reverse visible picture are some of the other features complementing the infinite window TBC and DOC functions.

NEC continues to make headway with its FS-19 19-bit/4 x fsc sampling frame synchronizer. Modular options to the basic system ($12,500) include a TBC, freeze frame, and memory expansion for four-field color processing.

Other Significant Developments

ROH is manufacturing a unique transmission test signal generator that displays, in sequence, all the signals normally needed for signal testing on a standard color picture monitor—including bars, pulses, and a vectorscope display. The under-$3000 system is portable, and can be used for field setup of VTRs and can be mounted in the studio. Digitally programmed

ADVERTISER'S INDEX

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The Nova 510 TBC is switchable between heterodyne and direct modes.

with EPROMS, it can be customized at the factory to include special signals or special sequences of signals.

Of interest to those planning to install multichannel TV service is the Tektronix announcement that its 1450-1 precision demodulator is being upgraded with a wide bandwidth audio section capable with the BTSC multichannel sound signal. All 1450-1s delivered after March 1 will have this new section, with a price increase of $500 to $14,900. An upgrade kit for existing 1450-1s will also be available in March, for $1850. The upgrades also include quasi-parallel detection to reduce the buzz that might occur on the detected signal due to IF modulation as it passes through the demodulator's Nyquist filter when the intercarrier mode is used.

Videotek continues to expand its routing switcher line with the brand-new RS-182A. It's especially appropriate for introduction at this time because in addition to the 18 x 1 basic video switching matrix it features three audio levels per video channel allowing stereo audio plus time code to be switched. Videotek also introduced an economical 12 x 1 video switcher, the VIS-1200.

Quante brought its 1000 Series fiberoptics system, which provides a multipurpose transmission system for component or composite signals, and not just video. The system can be bidirectional on the same fiber with up to four 140 Mb/s channels.

Sennheiser introduced a new line of wireless mic transmitters, the SK-2012 body pack and SKM-4031 handheld, both with one channel and built-in ac-dc converters. The handheld transmitter runs on penlight batteries and can provide full output with only 1.5 V. The receivers are portable or rack mounted, with slide-in sections for up to six channels.

Television Equipment Associates introduced a lightweight headset, the Freedom-1, which is designed for stability with ultra lightweight.

Corporate Communications Consultants introduced a new color corrector, the System XL2000, with Betacam and M-format interface for tape-to-tape color correction. The XL2000 has a new autosafe capability and also provides correction-profile waveform output.

Anton/Bauer introduced LightLink, a fiberoptic linking system which sends genlock, intercom, camera control, and video over a lightweight, pure optical cable up to one kilometer. The company also introduced the MicroPhase genlock system. MicroPhase creates an adjustable delayed black burst video signal without requiring a sync generator. By providing phase adjustment at the control end, MicroPhase allows total remote control in multicamera shoots.

Asaca showed two new monitors. The CM-99A is a nine-inch high-resolution monitor that sells for $2350. The CMM-26-11 is a 26-inch delta gun monitor. It sells for $9450. Both monitors have two-year warranties. **BM/E**

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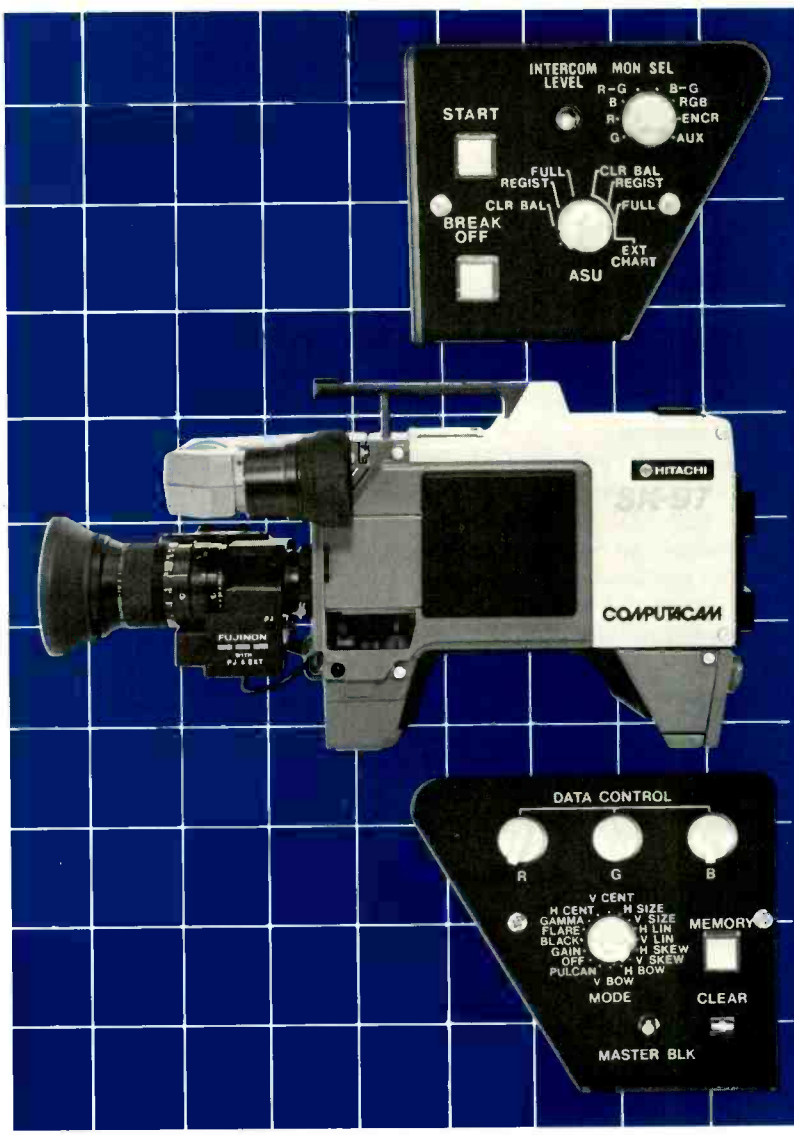

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Each camera contains an on-board computer that allows simultaneous set-up of up to 42 cameras within two minutes. Plus only one camera is affected in case of auto set-up failure.

Hitachi's SK-970 and SK-97 Computacams.

Our SK-970 and SK-97 Computacams offer superior noise-free video (59 dB signal-to-noise-ratio!)

Combine all this with other advanced features such as 700 horizontal lines of resolution, high gain in 3 dB steps from 0-21 dB, completely interchangeable boards, and built-in auto diagnostics, and you can see why our SK-970 and SK-97 Computacams stand alone!

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HITACHI

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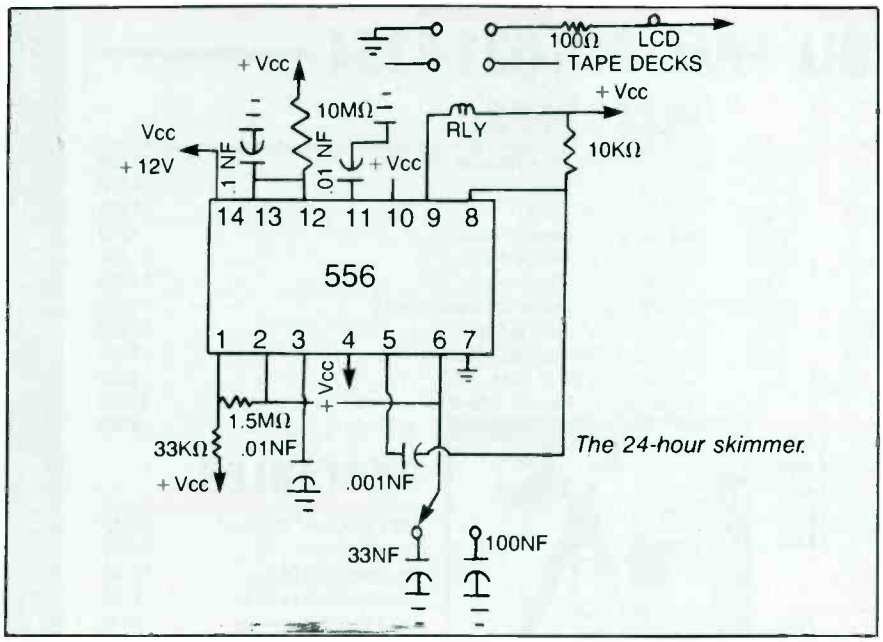
GREAT IDEA NOTEBOOK

The 24-Hour Skimmer



The 24-hour skimmer.

By Frank Hogan, CE, WFIL-AM, WUSL-FM Philadelphia, PA

In a highly competitive radio market such as Philadelphia, stations are constantly monitoring their competition to determine contests, on-air promotions, and, most importantly, music rotation. I was asked to design a circuit that would allow our stations to obtain a 24-hour composite of the competitions' music rotation on a daily basis.

The concept behind this is to activate a tape or cassette deck for every 10 seconds every two and a half or three and a half minutes, depending on the format. We have determined that 10 seconds is long enough to identify a musical selection.

I designed the circuit using a TTL 556 dual timer. The first half of the timer is an astable circuit, with a switchable time constant of two and a half or three and a half minutes. The second half of the timer is a monostable circuit with a time constant of 10 seconds. Due to component tolerances, I had to experiment with the values of the capacitors to obtain the desired time constant. I simply coupled the output of the first timer (pin #5) to the input of the second timer (pin #8) via the .001 μF capacitor. I used the output of the second timer to sink a relay coil to plus Vcc. Using a pair of normally open contacts, I brought out two contact closures on miniplugs, so that by using two cassette recorders at the same time, the programming department can skim our station and the competition simultaneously.

After designing the circuit, I constructed it on a 2.5x4-inch printed circuit board. I installed the board, along with a power supply, in a standard 4 by 6 plastic box. I also installed an outboard LED to indicate when the 10-second timer is activated.

I constructed the entire circuit for under $20. Our programming department claims that it has helped us to maintain an edge over our competitors. **BM/E**

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Panasonic S1, 440 lines	CALL
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Panasonic WV888	CALL
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*Lens optional

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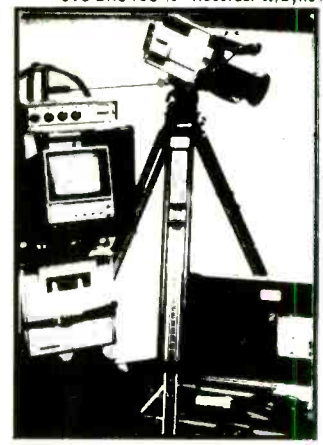

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JVC CR6060 ¾" Recorder/Player	$1250
JVC BR8600U ½" Editor	$2090
JVC BP5100U ½" Player w/4 Heads, Remote	$450
JVC BP5300 ½" Player w/Sync	$1090
Panasonic ½" Recorder NV8200 (used)	$390
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JVC BR6400 ½" Recorder w/Sync	$1390
JVC7100	$390

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MISCELLANEOUS

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Circle 171 on Reader Service Card

The Limiting of Deregulation

By Harry Cole, FCC Counsel

With surprisingly little hoopla, the Commission adopted a Report and Order closing out General Docket No. 83-114 in early November, 1984. The rather low-key approach taken by the Commission with respect to this major proceeding is somewhat puzzling, since it appeared to some to be a rule-making proposal of substantial, if not all-encompassing, breadth when it was instituted in February, 1983. Nonetheless, the broadcast industry should probably breathe a sigh of relief that the Commission has apparently decided, at least for the time being, to limit the scope of its deregulatory activities to some degree.

General Docket No. 83-114 was begun on February 17, 1983, with the adoption of a Notice of Inquiry and Proposed Rule Making intended to permit the Commission to "examine technical regulations with the intent of eliminating those that no longer served useful purposes, replacing those that were overly burdensome with less constraining regulations, and retaining those found acceptable." At the time it was released, many observers in the broadcast industry believed that the FCC's game plan was to do to the technical rules what had been done to many of the non-technical rules—that is, deregulate them to permit marketplace forces, rather than governmentally developed and enforced standards, to regulate the technical operation of broadcast stations. As the editors of *BM/E* wrote in an editorial in the June 1983 issue, General Docket No. 83-114 "would in effect take apart the long-standing technical standards covering interoperability, interference control, and spectrum efficiency—and have the marketplace rule."

The primary concern

The primary concern many observers expressed involved the fear that, contrary to the Commission's apparent article of faith, marketplace forces might actually encourage technical operations inconsistent with the optimal use of the radio spectrum. This fear was exacerbated by the fact that, at the time, enforcement efforts by its Field Operations Bureau had been cut back substantially, giving rise to the possibility that technical violations which might be encouraged by the marketplace approach would go unpenalized. Further, it seemed from the Docket 83-114 proposals that the Commission was heading away from the establishment of technical standards at a time of major technological development—a time when the lack of such standards could inhibit that development and create unnecessary problems for established broadcasters and technical innovators alike. The Commission's decision not to adopt particular standards governing AM stereo systems had demonstrated to many that a lack of technical standards can have a devastating effect on the acceptance and ultimate success of that technology in the marketplace.

Perhaps because of the all-encompassing nature of the proposals in Docket No. 83-114, or perhaps because of the controversy those proposals stirred up, the proceeding was not placed on a particularly fast track. While other deregulatory items were proposed and adopted, Docket No. 83-114 did not go anywhere. It was not until November, 1984, almost two years after it commenced, that the proceeding was resolved. And, judging from the Commission's own press release describing its action, the proceeding seems to have ended not with a bang, but with a whimper.

It appears that the Commission decided it was not necessarily a good idea to attempt any across-the-board technical deregulation, at least at this time. As a result, the decision in Docket No. 83-114 is a blend of generalized policies and statements of purpose, along with a limited number of specific actions eliminating a couple of particular rules which had outlived their usefulness. In short, the much-feared cataclysm did not occur. Instead, the Commission chose simply to articulate some general principles which will govern its consideration of technical matters in the future.

Four purposes

In formulating guidelines relative to technical regulation, the Commission decided that four primary purposes underlie such regulation. Those purposes are interference control, spectrum efficiency, interoperability, and technical quality. In other words, any proposed technical regulation must be targeted at one or more of those four before it can be justified.

In terms of priorities, the Commission assigned the highest priority to interference control. Obviously, it is essential to the proper functioning of a complex radio communications system that the various uses of the radio spectrum not interfere with one another. The Commission recognizes this, and has apparently agreed that it does have a duty to regulate radio usage in such a way as to control, and ideally eliminate interference where possible. Thus, any existing or proposed rules intended to effect that purpose will likely be maintained as long as they do not, in the Commission's words, "have unrelated side effects." This means that the Commission intends to continue to enforce its rules and policies directed against interference. This will be done with the understanding that if any such rule or policy creates too much of a burden on the Commission or the radio user, that rule or policy might be replaced, as long as some alternative regulation can be formulated.

The Commission also assigned a "high priority" to the factor of spectrum efficiency. This, of course, is a matter of mounting concern, as new technological developments combine with the ever-increasing demand for conventional radio systems to create a need to utilize the limited radio spectrum with maximum efficiency. Interestingly, the

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Commission noted that its rules "should be structured to set efficiency standards rather than mandate a specific technology." This statement appears to be directed at those critics who berated the FCC's reluctance to endorse specific technical systems, such as in the case of AM stereo. The FCC seems to be saying that it is not going to establish any one type of equipment or system as the governmentally approved one. This, of course, is not a problem, as long as the Commission's rules do not unnecessarily discourage technological development and public acceptance of such development (as appears to have happened in the case of AM stereo). To the Commission's credit, though, it must be pointed out that its recent actions—particularly in connection with the development of stereo television and narrowband remote pickup services—strongly suggest that the FCC is not likely to repeat the AM stereo debacle.

With respect to the factor of "interoperability," the Commission acknowledged that some Commission "intervention" may be necessary "for new services involving large public participation." Having said that, however, the Commission turned around and said that the interoperability "can be left to the marketplace" in many services, especially those involving "non-distress systems." Here the Commission seems to be saying that, while it may be inclined to adopt some technical rules to get major league communications systems up and running, it will probably be more inclined to let the marketplace govern. The same is true with respect to the factor of "technical quality" which, according to the Commission, can be left to the marketplace "in almost all cases except those dealing with distress systems."

The bottom line

The bottom line on all this is that the Commission seems to be backing off the "marketplace uber alles" approach—the basis for much of the concern expressed when Docket 83-114 was instituted. Rather than eliminate its technical rules across the board, the Commission has drawn up a blueprint for approaching future questions of technical allocations. That blueprint appears to contain specific provisions for continued Commission regulation in order to preserve the integrity of existing communications systems. The blueprint does, obviously, also contain indications of the FCC's continuing fascination for the marketplace. Those indications appear, for the time being at least, not to be uppermost in the Commission's mind, however. This is the significant aspect of this action from the broadcaster's point of view: interference control and spectrum efficiency are being accorded a high priority by the Commission, high enough to override its inclination toward the marketplace approach.

At present, the Commission seems to have heeded the concerns expressed by broadcasters worried about the possible degradation of service which could arise from abandonment of technical regulation. As long as the FCC continues along this path, the Commission, the industry, and the public are all likely to gain. But if the Commission ever does again evidence an inclination to abdicate its regulatory responsibilities in the technical area, broadcasters should be prepared once again to make their feelings known. **BM/E**

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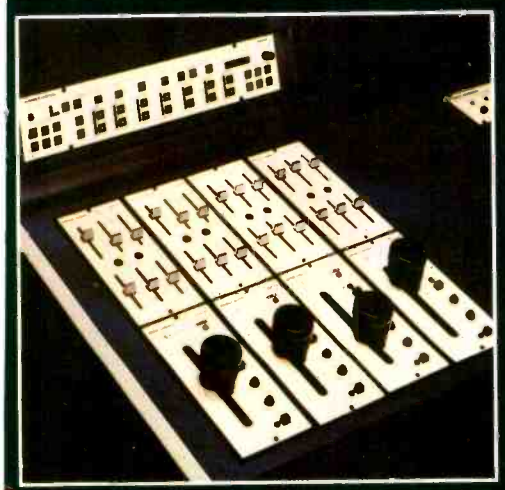

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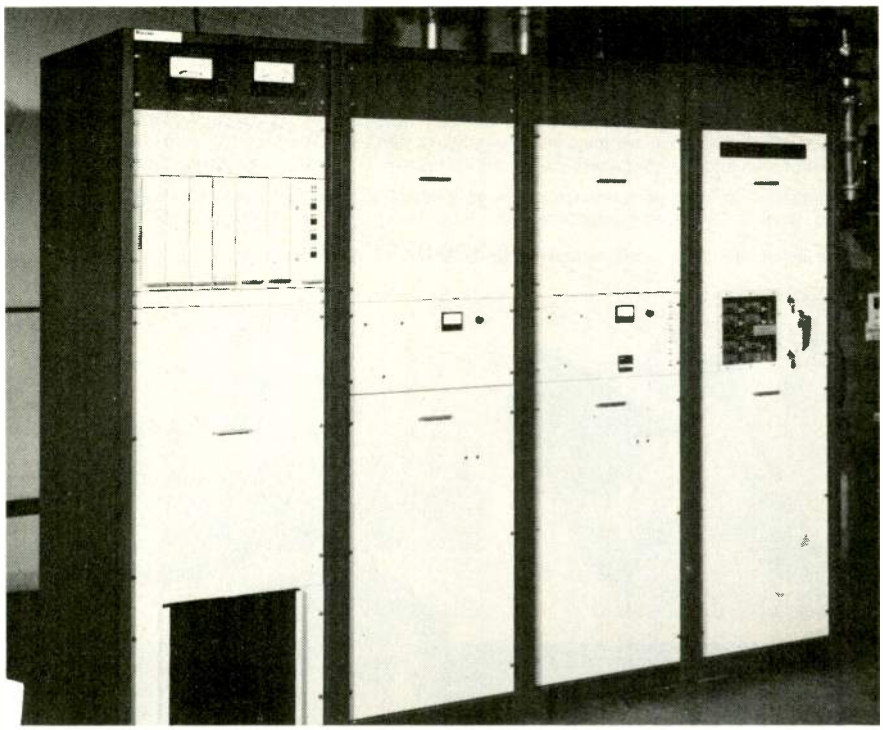
broadcast EQUIPMENT

New TV Transmitters from Marconi 260



The 7500 Series is Marconi's new line of Band III television transmitters. The series ranges in output power from 1 to 25 kW. Each transmitter features the B7500 drive unit.

The smallest in the range is the B7530 1 kW transmitter which, along with the 2 kW B7531, is totally solid-state. These two transmitters are equipped with a new design of output combiner which maximizes the efficiency of the power amplifier devices. The B7532 5 kW and B7533 10 kW transmitters incorporate air-cooled tetrodes—the latest in tube technology from Philips. With both units, the singe tube is used in the vision chain while utilizing solid-state amplifiers for vision tube drive and sound output.

The 25 kW B7536 is the only transmitter in the series to employ two tubes. A YL1630 tetrode is used in the vision output, with a YL610 (the B7532/33 vision tube) providing the sound. The B7532, 33, and 36 transmitters are equipped with an output combiner derived from the Marconi "Rotamode" design.

The series is available in Systems B,M, or N, with NTSC, SECAM, or PAL color. Also, the B7500 drive unit can be configured for dual-sound capability.

For More Information
Circle 260 on Reader Service Card

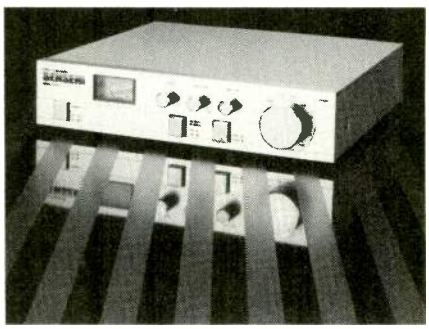
Comprehensive Introduces Portable Mic Mixers 261

New from Comprehensive are the MX-1001 three-channel mic mixer and the MX-1002 low-impedance mic mixer. The MX-1001 features three input channels with individual switch selection for line level, mic level, or phantom power of condenser mics, along with individual input volume control. The unit also has two output channels with XLR connectors that can be set for mic-level as well as line-level output. Low-cut filter switches reject low-frequency wind and handling noise, and 20 dB attenuator switches prevent overload distortion. The mixer can be externally powered from a 12-volt dc source.

The MX-1002 features three inputs with individual volume control, enhanced by switchable phantom 18-volt dc power for condenser mics, and normal mic level for dynamic mics. The single-channel output is switchable between a balanced +4 dB, or unbalanced −20 dB output. The MX-1002 costs $249, and the MX-1001 is $599.

For More Information
Circle 261 on Reader Service Card

Senseni Joins Receiver Field 266



The new Senseni Satellite Receiver is a compact, easy-to-operate TVRO receiver which offers quality video without a lot of knobs and buttons to control. The receiver comes complete with detent tuning, a built-in RF modulator, and a format reversal switch used to control polarization. It is available only in mono audio.

One of the notable features, not available on comparable models, is a number of outputs allowing the viewer to connect the receiver to other gear. Unclamped baseband RF, audio, and video outputs are standard. The unit also features advanced circuitry, including SAW filtering, making for superior picture quality.

The receiver is being distributed and serviced by the authorized dealers of Satellite Technology Services, Inc.

For More Information
Circle 266 on Reader Service Card

EQUIPMENT

New Component TBC from Fortel 255

Fortel has introduced the CCD Y/C time base corrector. The CCD Y/C uses the same circuitry found in Fortel's CCDHP TBC, but the CCD Y/C also processes separate luma and chroma (Y/C) "Dub" component video.

The CCD Y/C incorporates performance characteristics of Fortel's Y-688 Total Error Corrector (including Dub processing) into its Y/C processing technique, making the CCD Y/C ideal for use with Sony 5800 ¾-inch VCRs.

The CCD Y/C also features full proc amp control, noise reduction, horizontal enhancement, and an internal sync generator for a full range of sync outputs. And like all Fortel products, the CCD Y/C is covered by a one-year warranty for parts and labor.

The company originally set out to design this TBC to create top-quality ¾-inch pictures for under $10,000. It has succeeded: the price is $8995.

For More Information
Circle 255 on Reader Service Card

New Audio Measurement System from Amber 268

The Model 5500 measures virtually every audio performance parameter including frequency response, weighted and unweighted noise, and harmonic and intermodulation distortion. The totally automatic system can be controlled by an external controller using an IEEE-488 interface or an RS-232 serial port.

The system offers high performance, with distortion as low as 0.03 percent, and high-speed operation with readings yielded in typically two seconds or less. The system contains a generator with output capability to over +30 dBm balanced.

The analyzer can measure level in volts, dBV, dBm, or watts. It measures frequency to five digits, noise with four or eight selectable weightings, total harmonic distortion and intermodulation distortion to SMPTE, DIN, IHF, or CCIF requirements. Measurements can be true rms, average, or quasi-peak. A built-in spectrum analyzer with four selectable bandwidths allows noise floor characterization and crosstalk measurements. The basic system price is $6500.

For More Information
Circle 268 on Reader Service Card

Panasonic Introduces Ku-band Block Downconverters 263

Panasonic has introduced two low-noise block downconverters for satellite reception on smaller antenna sizes for the Ku-band market. The Model LNB-25P uses a CR-62 antenna interface, while Model LNB-25PW uses WR-75 as its antenna interface.

The converters operate in the FSS portion of the Ku-band, 11.7 to 12.2 GHz. The typical low-noise specification is 2.3 dB. The converters utilize GaAs FETs in a two-stage FR amplifier configuration. The stable ceramic resonator local oscillator assures years of service with minimum drift for temperature variations.

Wideband communication performance is ideal because of low-input and output VSWR, and tightly controlled gain variation. The converters are powered by dc voltage, which is supplied to the converter through the IF output connector. The converter incorporates an internal IC voltage regulator.

The converters, which are available for $400 in quantities up to 100, are packaged in a cast aluminum case with an integral waveguide flange. The units are also waterproof.

For More Information
Circle 263 on Reader Service Card

EQUIPMENT

Orban Introduces Compressor/Limiter 265

The 412A is Orban's entry into the general purpose compressor/limiter market. Familiar attack time, release time, ratio, and output attenuator controls make operation quick and intuitive. Both threshold and input attenuator controls are available, so you can adjust the amount of G/R according to the needs of your application. The 412A can keep above-threshold output level or below-threshold gain constant, depending on which control you adjust. And Orban's proprietary low-distortion Class-A VCA lets you adjust the threshold control without compromising headroom or signal-to-noise ratio: they stay optimized over the control's 20 dB range.

Attack and release times are program-controlled: the attack time and release time controls simply scale the complex time constants faster or slower. The unit is also simple to operate, and can be used as a "hands-off" device, or as a creative tool. For either use there is an "automatic transmission." The threshold of limiting interacts with both the attack time and ratio controls to keep the peak output approximately constant regardless of control settings.

For More Information
Circle 265 on Reader Service Card

Crown Introduces Cardiod Microphone 267

The 160 is Crown International's new phase coherent cardiod (PCC) microphone. The PCC principle allows the use of a directional element while taking advantage of placement near a boundary, or reflecting surface, to eliminate the problem of acoustic phase cancellation, or comb filtering, caused by noncoherent arrival of reflections at the microphone.

The PCC is designed to be used on a relatively large boundary surface such as a stage floor, table, news desk, or lectern. The PCC uses a subminiature, professional-quality supercardiod element. The placement of this directional element in the near proximity of a primary boundary allows sound at all wavelengths in the audible spectrum to arrive in-phase, or coherently, at the diaphragm. The benefits are a wide, smooth frequency response free of

phase interference, excellent clarity and reach, and a "half-supercardiod" pattern (based on the hemisphere created by the large boundary plane).

The PCC 160 requires remote powering in order to operate. Power may be obtained from any phantom-type remote powering from 12 to 48 volts.

For More Information
Circle 267 on Reader Service Card

New Center Track ATR from Sony 264

The new JH-110C-3-TC is a two-track recorder/reproducer with the capability of recording and reproducing time code or pilot tone on a track in the center of its ¼-inch tape.

Precision engineering eliminates crosstalk between audio and time code channels. When the tapes are played on machines without the center track electronics, the code stripe is not reproduced, creating total compatibility between tape formats. Code can be recorded before, during, or after audio, greatly simplifying production techniques involving synchronization. Although the code record and reproduce heads are physically separated from the standard audio heads, delay line circuitry aligns all signals for razor-sharp editing.

The JH-110C-3-TC is available unmounted for standard 19-inch rack installation, or in variable profile (VP) or high profile (HP) cabinets.

For More Information
Circle 264 on Reader Service Card

BUSINESS BRIEFS

Mitchell Brill, left, director of sales at LRP Video and Thatcher Drew of Drew Associates flank sports personality Frank Gifford during a break in the shooting of LTV Corp.'s news magazine.

In a major industry deal completed at the end of December, **Harris Corp.** agreed to sell its satellite antenna manufacturing operation in Kilgore, TX, to **Vertex Communications.** Harris's satellite communications division will market the Vertex antenna line under the Harris label.... The intended purchase of **ADDA Corp.** by Orrox has fallen through. No reasons for the change were given.... **Scientific-Atlanta** has reported a significant increase in earnings for the first quarter of fiscal 1985. In comparison to the same period last year, earnings were up 33 percent.

Ampex's Audio-Video Systems Division recently announced the establishment of a **northwest regional office**, to be operated out of the San Francisco Bay area.... **Video Services** has organized a new subsidiary, VideoTape Distributors, which will market videotape stock to industrial and broadcast users.... Production house **E.J. Stewart** has established a new programming department, which will promote its video programming capabilities.... **Commercial Video**, Los Angeles, CA, recently acquired larger facilities at 712 N. Citrus Avenue in Hollywood.... **Paltex** has moved to a new facility in Orange County, CA.... **Video West**, Salt Lake City, has opened a branch office in Los Angeles.

Seattle and Minneapolis production house **Starstream** recently completed work on two 30-second spots for Kawasaki Motors. The productions were shot on one-inch videotape, film, and Betacam.... **National Video** has edited promotional spots for each city in which *Greater Tuna*, the popular off-Broadway comedy, has stopped on its road tour.... Editel/NY has developed the effects for a *Scientific American* commercial which is airing nationally.

WCVB-TV, Boston, recently took delivery of a Conus mobile satellite newsgathering (SNG) uplink truck.... **Metcalf Communications** has completed a $400,000 television production center for the First United Methodist Church of Houston.

Media Group has installed the Edge editor from CMX/Orrox, as well as a Chyron character generator and three Sony 5800 Series frontloading videotape players.... **Bonneville Media** recently equipped its Studio A with an Audio Kinetics Q-Lock 310-3 synchronizer, an Ampex 1100 16-track audio recorder, and an MCI one-inch C format audio layback machine.... **Image Transform** has announced the on-line operation of its Betacam half-inch tape services.... **Swiderski Electronics** has completed design and installation of a video post-production facility for Logan productions in Milwaukee.... American Pacific Video recently added the **Hitachi HR-300** to its line of duplication equipment.... **GHL Audio Engineering** has completed the final tests of its new remote audio facility, which features a 36-input Harrison MR-4 with ARMS automation, two Otari MRT-90/II24s, and a JVC CR-6650 ¾-inch VCR.

TV personality Frank Gifford recently visited New York's **LRP Video** to tape the studio portion of an LTV quarterly video news magazine.... **Universal City Studios**, **Advanced Cinema International**, and **Kodak** have announced a joint effort to develop equipment that will utilize Kodak's Datakode magnetic control surface. Datakode, when applied to the back of motion picture film, can retain digital data that can be used to automate many phases of the post-production process.

Continental Electronics has named J. Eugene Harrison as president and CEO. Harrison had previously served as president of the Southcom Division of Loral Corp.

Autographics recently appointed Carolynn Berti general manager.... At **Ikegami**, Harvey Caplan has been named national sales manager for professional products, while Thomas Laury becomes national service manager for nationwide customer service activities.... **Sony** has named Jim Hansen national sales manager for video communications.... **Ampex** has selected Robert Natwick national sales manager, Audio-Video Systems Division.... At **Bosch,** Anthoy Pignoni has been appointed VP of business development.

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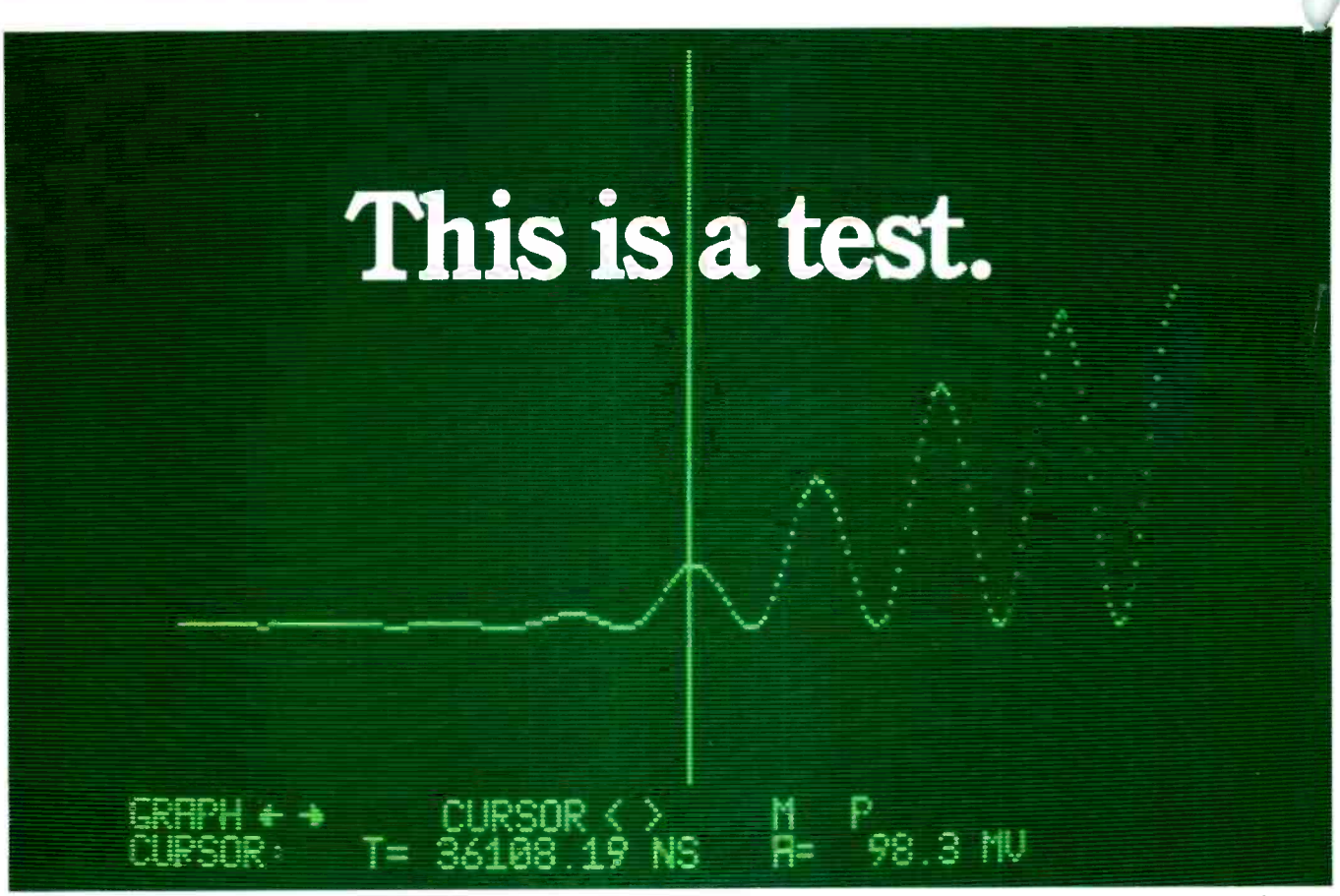

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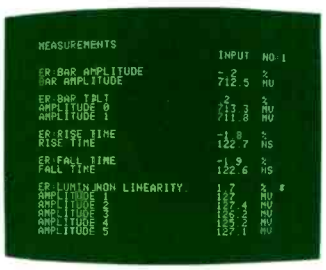

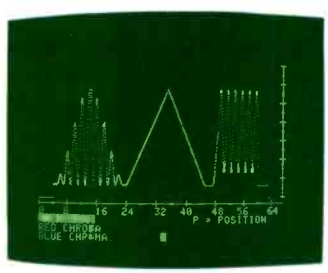

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