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July 1984/$3

NAB wrap-up

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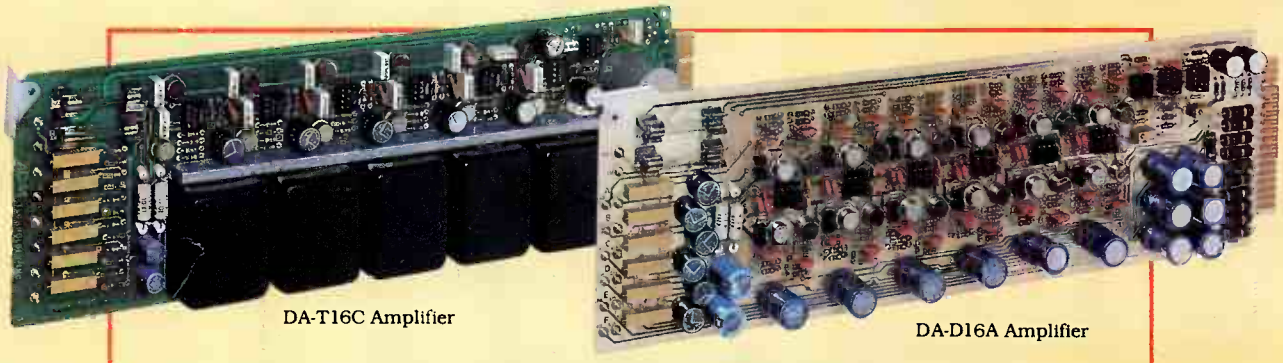

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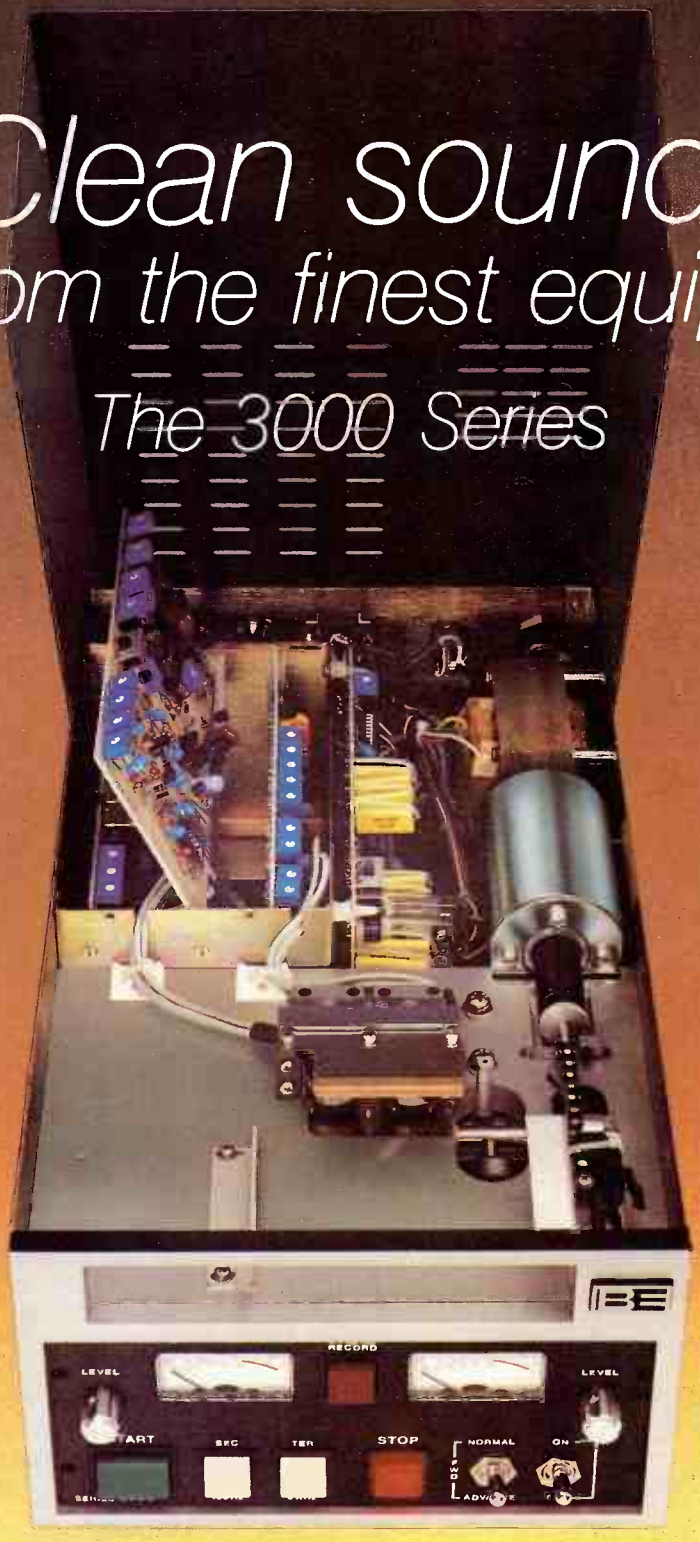

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BROADCAST engineering

The journal of broadcast technology

July 1984 • Volume 26 • No. 7

THE COVER shows scenes from NAB-'84 that only hint at convention activities, attended by a record number of exhibitors and interested observers. This issue concludes the new equipment trend coverage that began in our June issue and offers an overview of radio and TV engineering meetings at the convention.

Coming events

Sept. 21-25
International Broadcasting Convention (IBC), Brighton, England

Oct. 8-11
AES 75th Technical Meeting & Exhibits, New York, NY

Oct. 27-Nov. 3
SMPTE 126th Annual Conference, New York, NY

Oct. 28-Nov. 1
Scientific-Atlanta Earth Station Seminar

Dec. 3-5
Radio Television News Directors Association (RTNDA) International Conference, San Antonio, TX

Dec. 5-7
Western Cable Show, Anaheim, CA

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NEXT MONTH:
- Creative audio processing
- Audio cart machine roundup
- IBC-'84 – a preview

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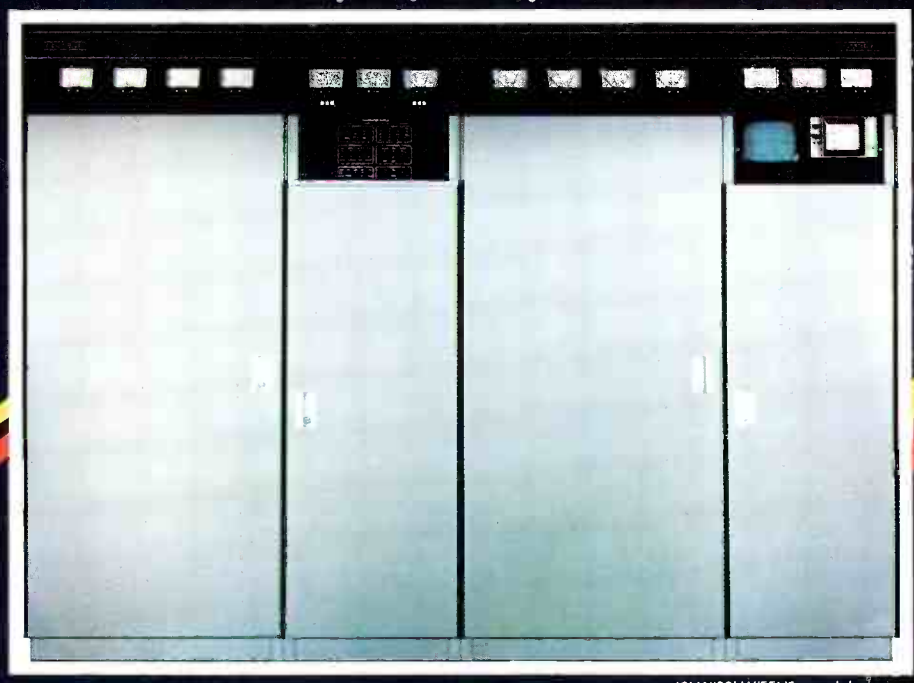

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BE receives Dynair's Corporate Commander Award

Dynair's Order of the Iron Test Pattern presented their 1983 Corporate Commander Award to **Broadcast Engineering** for 25 years of service to the TV industry. Presenting the award at the NAB-'84 Convention in Las Vegas is Dynair's Bob Vendeland, vice president of marketing. The award is presented annually to members who have served the broadcast community in a technical capacity for at least 15 years. Currently, Dynair's order has approximately 2000 worldwide members.

Receiving the Corporate Commander Award from Bob Vendeland (right), Dynair's VP of marketing, is Cameron Bishop, publisher of **Broadcast Engineering, Video Systems, Sound & Video Contractor** and **Radio y Televisión** magazines.

Interaction falls short of predictions

Industry trends, like the weather, are not always predictable. One example is the industry's forecast that consumer use of interactive communications will increase substantially in the near future. At least 40 million homes are expected to be interconnected through personal computers, videotex terminals and home televisions to databases and electronic services by the year 1990, according to the computer industry. A recent survey by Warwick Advertising, however, indicates that the number could be closer to 10% of the 83.3 million TV homes in the United States. Misguided marketing and the desire to do business with people rather than machines may have caused this turn of events.

Personal computer sales have plunged to an unprecedented low, causing financial woes for nearly every manufacturer. Reasons for poor sales include intimidating advertising, far too great an emphasis on games software, a failure to show cause for owning a home computer and lack of understanding by sales staffs in computer retail and software outlets. With only Commodore Business Machines remaining profitable as the Consumer Electronics Show opened in June (Chicago), hopes of many in the interactive communications fields dipped even lower.

Various enterprises, including video banking and electronic catalog buying services, are finding their systems difficult to develop and to promote. The services are expensive to set up and operate, e.g., $20 million is the reported investment by Chemical Bank of New York for a $12-a-month system for owners of Atari, Apple and IBM PC computers. And only one of eight families in the

Continued on page 135

BROADCAST ENGINEERING

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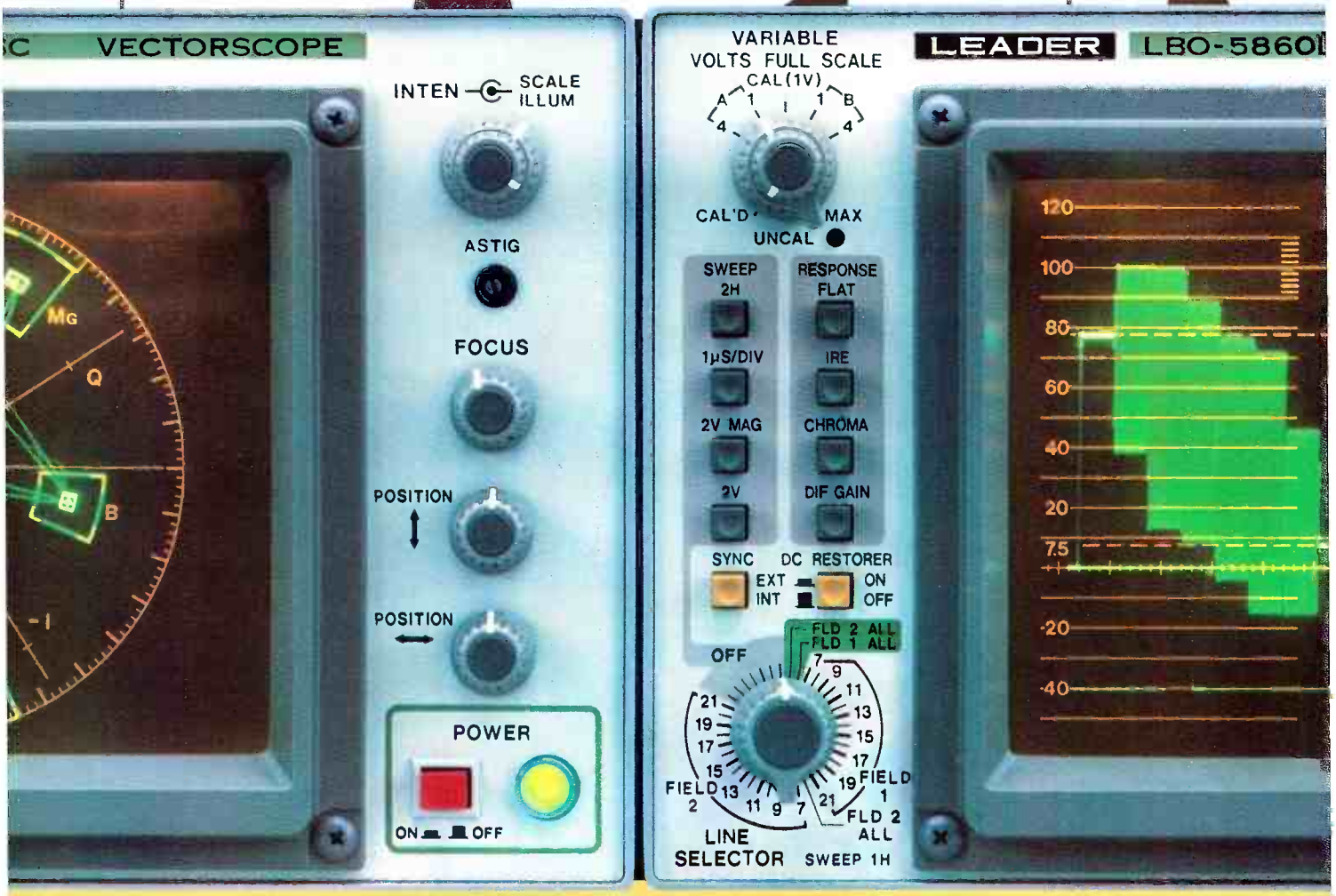

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FCC update

July 1984

Harry C. Martin, partner, Reddy, Begley & Martin, Washington, DC

NAB report

At the recent NAB convention in Las Vegas, various FCC commissioners and staff members spoke about the future of broadcast regulation. The following are some of the more notable comments:

• Mark Fowler, FCC chairman, speaking at the closing luncheon, said broadcasters must use the new freedoms that they have been given as a result of deregulation to ensure that the public's interests and needs are met. He said the industry must better define its goals and voluntarily take on added service responsibilities or face a public outcry that could cause re-regulation.

The chairman also listed the following areas in which broadcasters can expect further relief from regulation: the 7-station multiple ownership rule; simplified major change standards for FM, TV and LPTV applications; commercial TV deregulation; noncommercial FM and TV deregulation; and expanded AM subcarrier authority. Fowler cautioned broadcasters that although many rules have been replaced or revised, those that remain will be enforced aggressively.

• Mimi Dawson, commissioner, said that the current 7-7-7 multiple ownership restriction is arbitrary and that the commission may relax the rule soon. She said she favors establishing a transitional period during which the agency could study the impact of a relaxation on diversity of media ownership. Dawson also said that lotteries may be used to determine the winners of the new FM frequencies to be made available as a result of the Docket 80-90 proceedings. Dawson said she deplored the past FCC practice of launching new services without first finalizing application processing procedures.

• Henry Rivera, commissioner, said that although he has been a critic of some recent FCC deregulatory actions, he believes most have been beneficial and in the public interest. Rivera, with the concurrence of commissioners Patrick and Dawson, denied that the FCC has been lax in its enforcement of equal employment opportunity rules.

• James McKinney, chief, FCC Mass Media Bureau, said he believes the duopoly and one-to-a-market rules will remain in force, but said he expects action soon on revision of the 7-station rule. McKinney also said that holders of LPTV construction permits who do not build their stations within the allotted 1-year construction period will not get extensions. McKinney said he has no intention of letting lottery winners "warehouse" LPTV permits.

On another issue, McKinney said the FCC will not use hearings to process the thousands of new FM applications the agency expects to receive after its Docket 80-90 proceeding is completed. Lotteries will be necessary, he said. Finally, McKinney said that the FCC's TV deregulation proceeding will be completed this summer with the adoption of an order similar to the one that deregulated commercial radio.

FCC application processing times released

The latest projections of processing times for clean applications for FCC construction permits are presented in Table I. Petitions to expedite an application may shorten these time periods if proper justifications are advanced.

TV aural power minimum eliminated

The FCC has eliminated its rule requiring the aural radiated power of a TV transmitter to be licensed to operate at a specified value not less than 10% nor more than 20% of the peak radiated power of the visual transmitter. Also eliminated was the requirement that applicants and licensees file for specific aural power values. The commission's action allows operation at any aural power not to exceed 22% (including tolerance) of the visual power.

The rule change is based on the commission's recognition that broadcasters face rising electric power costs. A relaxation in the rule may benefit those who can reduce power without degrading service to the public. The commission said it assumes that because the financial success of a TV station depends on the ability of its viewers to clearly hear and see its transmissions, there will be no perceivable degradation in service to the public as a result of the rule change.

Table I.

Service	Major change	Minor change
TV	Three-four months	Two-four weeks
AM	Six months	Three-four months
FM	Six months	Six months
Auxiliary	Six-seven weeks	.....

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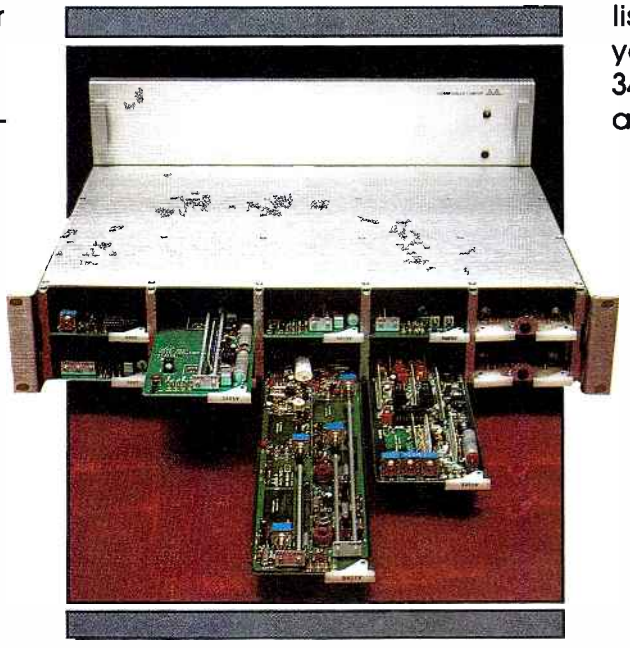

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The gold rush of '84

Although it lacks the romance and character of the rush to the mother lode in 1849, there is a gold rush under way in our industry. The rush is not to California, but to the FCC. The attraction is not a precious metal, but radio frequency spectrum. Broadcasters are involved—now more than ever—in a tug of war with other services for the finite spectrum available for practical usage. Like it or not, the rush is on, and our industry must begin staking its claims.

Deregulation of the broadcast industry by the FCC, although the subject of much controversy, generally has been favored by radio and TV stations. Most broadcasters would agree that recent moves in this direction have been beneficial to the industry. We should not believe, however, that we can get something for nothing. The policy of deregulation can be a 2-edged sword that can adversely affect the broadcast community unless our industry aggressively defends its present claims on the radio frequency spectrum, and works to expand spectrum allocations where needed.

The FCC seems to be headed toward a new policy in which broadcasters will be taking a much more active role in managing their various portions of the spectrum. The vanguard of this effort has been the frequencies used for remote pickup units, studio-to-transmitter links (STLs) and intercity relay (ICR) stations, covered under Part 74 of the *FCC Rules*. The status of these services was discussed in some detail during the NAB convention session on spectrum management.

A paper written by Alex Felkner and Kenneth Gordon of the FCC's Office of Plans and Policy also was presented, outlining a proposal for a decentralized spectrum management plan in which licensees—not the commission—would determine how spectrum should be used in a given area. As stated by a footnote to the paper, the views expressed are the authors' and do not necessarily reflect those of the FCC.

The paper poses questions that we might see in a future Notice of Proposed Rulemaking. It covers ideas on how to evaluate competing needs, ways to account for regional differences in spectrum usages and means to make the introduction of new technology easier. One of the most interesting concepts explored is the idea that spectrum management to date usually takes into account only the frequency dimension, and ignores time and space.

One statement made in the paper, however, cannot go unchallenged. The authors support the sharing of bands (in some cases) for fixed and mobile users. Unfortunately, it cites the 2GHz and 7GHz broadcast video microwave bands as examples of successful sharing. As anyone involved with Part 74 coordination knows, spectrum management groups have been doing their best to make 2GHz a mobile ENG band and 7GHz an STL and ICR band. Fixed and mobile links *do not share spectrum well.*

The FCC is in a transitional period, best summed up by Mark Fowler, chairman, in an NAB address:

"The government is no longer something to be feared, or coddled. Time was, a commissioner could walk through an NAB convention, and broadcasters would leap out of his path in fear. The only thing missing was the theme from *Jaws.* The FCC viewed itself, and you viewed us, as the *A-Team* of the airwaves, *Magnum PI* of the megahertz.

"Enforce we will, and enforce we must, those rules that soundly remain on the books. But we've changed our image—an FCC commissioner, this one included, is neither King Kong nor Santa Claus. We know it, and I hope you now know it."

This policy represents an excellent opportunity for broadcasters, but it carries with it certain added responsibilities. Those responsibilities include cooperative lobbying for the requirements of the broadcast industry. The days when the commission could be relied upon to protect broadcasters from other services—and indeed from themselves—are gone. As an example, consider the sorry state of affairs in the aural STL band of 947-952MHz.

This thin slice of spectrum supports nine usable aural channels, as presently structured. Any radio market with more than nine stations has the makings of a spectrum management problem. Many urban centers experienced STL overdose years ago. Now, even small market broadcasters are seeing the available spectrum disappear as more stations choose (or are forced) to abandon their leased land lines. The increased options available to broadcasters, made possible by recent deregulation, are adding further to the STL problem. The increased use of FM subcarriers and the move to AM stereo is complicating a situation that was bad to begin with. Yes, sharing of STL channels does occur successfully, but the potential for interference is rising constantly.

Continued on page 138

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Satellite update

By John Kinik, satellite correspondent

High definition television

The new technical frontier in TV broadcasting is high definition television (HDTV), and this was clear at the recent NAB convention in Las Vegas. The spectacular displays of flawless television offered evidence that it is only a matter of time before HDTV becomes a viable commercial technology. Satellite broadcasting will play a key role in this development because it will be the primary distribution medium for the higher-grade versions of HDTV, which will require wider transmission bandwidths than those currently available. Three grades of HDTV are evolving, each aimed at a different market initially, but ultimately hoping for a large portion of the mass market.

The high grade HDTV systems, equivalent to those displayed at the show, require a significant amount of transmission bandwidth to handle color video basebands of 16MHz or so (digitally compressed from approximately 30MHz of actual baseband), and thus must use two satellite transponders. The two signals are recombined in a specially designed receiver to reconstruct the high definition picture (1050 lines).

The planned CBS HDTV system is designed on this basis for transmission via the high power DBS satellites to be launched in 1986. The CBS system will transmit a normal 525-line picture with a 4:3 aspect ratio over one channel, and a second 525-line picture with a 5:3 aspect ratio plus the sides of the first picture in the second channel. The receiver will display a 1050-line picture with a 5:3 aspect ratio that will provide an extremely high quality picture for CRT displays and a high quality picture for large-screen displays.

It is anticipated that this service will provide the equivalent quality of 35mm motion picture film when projected onto large video display screens, opening up possibilities for direct electronic delivery of programming to "video theaters" as well as to homes in the higher income bracket. Other applications of this type of technology will include 1-way (broadcast-type) video conferences involving distant audiences that will be able to view a high quality picture on a large screen.

The medium grade HDTV systems now being developed are aimed at providing a much higher quality signal than currently is possible, but within the bounds of reasonable costs. A typical system in this category would use a nominal 12MHz baseband, with optimized baseband coding and transmission parameters to deliver a 650-line picture via a single transponder. This would provide a much higher quality TV picture to a large screen, with a reasonably priced projector, than currently is possible, and would create opportunities for direct delivery of movies and other programming to markets such as universities and colleges.

The low grade HDTV systems evolving will use the existing 525-line NTSC format, modifed to remove transmission inefficiencies and with digital processing of video information to provide a better subjective quality in the delivered picture. It is expected that an "improved" NTSC signal, artificially enhanced to provide an apparent higher definition, will be of sufficient quality to satisfy the majority of the mass market. Obviously, this also is the lowest cost approach because the same transmission bandwidths can be used and the receiver technology would be in the same cost bracket as the current mass-produced satellite TV receivers.

Table I summarizes major characteristics of the three HDTV systems in terms of transmission capacity required, receiver complexity and approximate availability date of the systems.

The high power Ku-Band DBS satellites to be launched in the 1986-1988 time period will operate in the 12.2-12.7GHz frequency band and will have 24MHz of bandwidth per transponder. This bandwidth is not adequate for high grade HDTV, and thus the signal must be divided between two transponders. The 24MHz transponder bandwith also is inadequate for medium grade HDTV, so it is likely that high power DBS satellites will be used to transmit high grade or low grade HDTV systems, but not medium grade. By contrast, the medium power Ku-Band satellites that will be launched during the next three years are suited more ideally to handle medium grade HDTV because of their wider transponder bandwidths, typically 43MHz or 54MHz, and, in the case of 54MHz transponders, perhaps even the high grade system could be handled in a single transponder. Thus it is conceivable that medium power Ku-Band satellites might provide a much lower transmission cost and a resulting less-complex receiver (single, not dual) for the high grade HDTV systems than currently is planned via high power DBS satellites.

HDTV system developers will be considering the tradeoffs between transmission cost, receiver simplicity and picture quality in determining the optimum parameters for their systems, to satisfy the requirements of the market segment they are targeting.

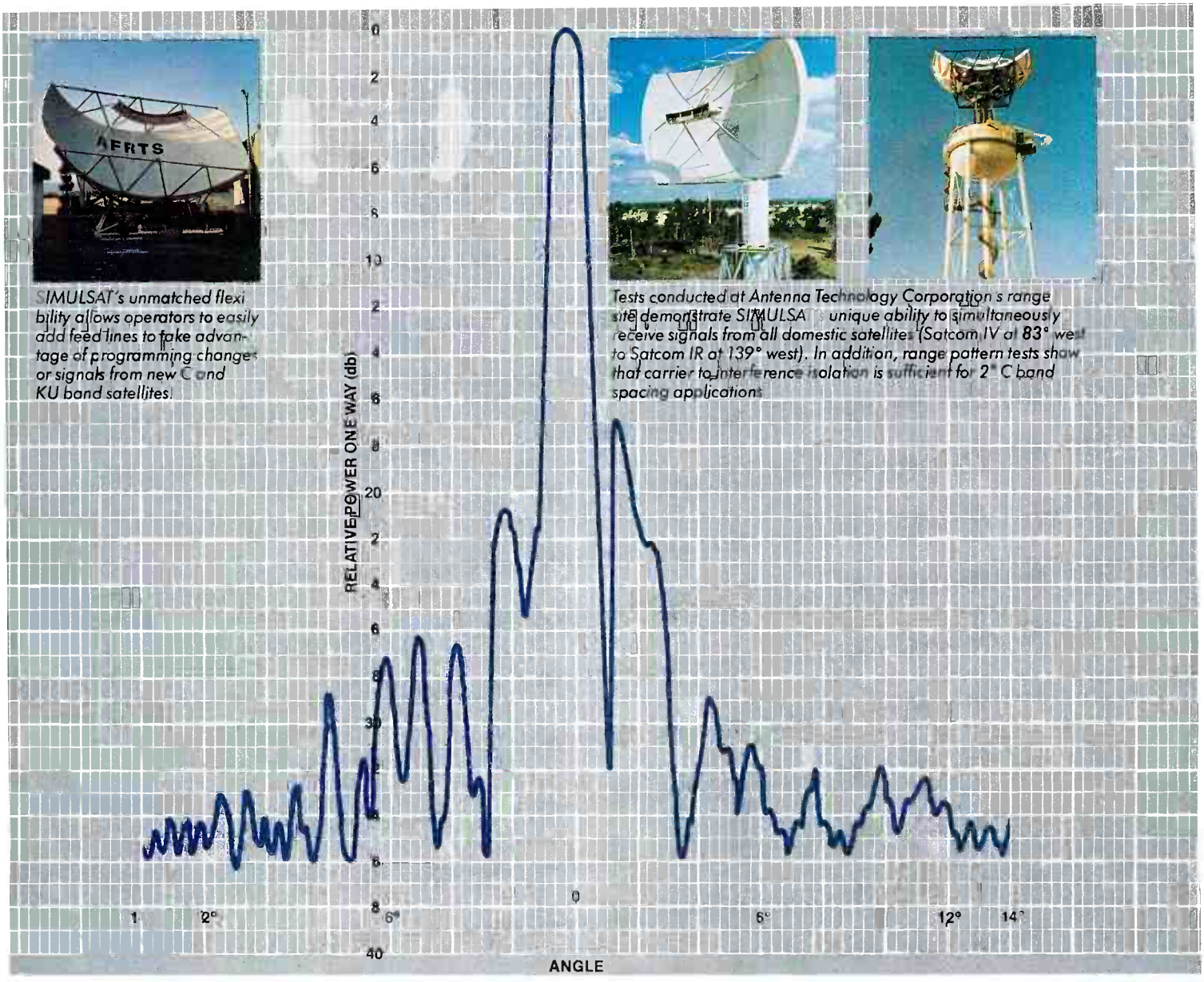
By 1986, the TV broadcast and motion picture industries probably will have several HDTV system options to choose from for direct electronic delivery of programming.

Table I.
Comparison of HDTV systems.

Quality	Transponders required	Receiver	Date available
High grade	2	Dual	1986
Medium grade	1	Enhanced	1985
Low grade	1	Basic	1984

SIMULSAT's unmatched flexibility allows operators to easily add feed lines to take advantage of programming changes or signals from new C and KU band satellites.

Tests conducted at Antenna Technology Corporation's range site demonstrate SIMULSAT's unique ability to simultaneously receive signals from all domestic satellites (Satcom IV at 83° west to Satcom IR at 139° west). In addition, range pattern tests show that carrier to interference isolation is sufficient for 2° C band spacing applications.



SIMULSAT: Range-tested and job-proven quality and flexibility

Independently monitored far range tests prove that SIMULSAT can see all domestic satellites simultaneously with the consistent broadcast quality of a conventional parabolic antenna capable of viewing only one satellite. In fact, SIMULSAT quality is a reality now, and it will continue to be a reality even with the FCC ruling allowing satellites to be positioned at 2° orbital increments.

SIMULSAT OPERATIONAL AT 2° SATELLITE SPACING.

While many earth station operators are concerned about the FCC's 2° orbital allocation, most C band spacings will occur at 2.5°, 3° and 4°, with the majority at 3° and 4°. In addition, signals will be transmitted on two separate bands: the C band (3.7GHz to 4.2GHz) and the new KU band (11.7GHz to 12.2GHz). This means that C band and KU band satellites will be interwoven throughout the orbital arc. As a result, the incidence of satellites spaced at 2° transmitting on the same band will be substantially reduced.

Flexibility Key to SIMULSAT superiority.

SIMULSAT's unique one-antenna concept combines high performance and unmatched flexibility. That means you'll save money on real estate now (one foundation, one installation, one site), plus you'll save even more as C band "and" KU band satellites are added or programming is changed. You can easily add a feed to SIMULSAT in minutes to take advantage of extra profit-opportunities.

SIMULSAT's unequalled advantages have been demonstrated repeatedly on our test range and on the job. We welcome the opportunity to prove SIMULSAT's capabilities to you with test data and user testimonials.

Circle (8) on Reply Card

Please send me additional technical data and benefits on SIMULSAT 3, 5 & 7 meter equivalent earth stations and their two-year warranty.

Name _____

Company _____

Address _____

City _____ State ____ Zip _____

Phone Number _____

BE7/84

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Suite C-103
Scottsdale, Arizona 85255
602/264-7275
TLX 165-782 INTELEX-SCOT

By Jerry Whitaker, radio editor

AM stereo at NAB-'84

As expected, AM stereo was a hot topic of discussion at NAB-'84. In addition to developments announced by manufacturers, technical and management sessions were presented. The technical side of AM stereo activity in Las Vegas is covered elsewhere in this issue. (See page 36.) The management session dealt with selling AM stereo to the public, a critical part of the success equation.

Session moderator Fred Walker of Broadstreet Communications (New Haven, CT) characterized AM stereo as a "baby on the AM side," and called for a game plan that would achieve, over a period of six years, what it took FM radio 12 years to accomplish.

Panelists included Wayne Eddy, KYMN (Northfield, MN), representing small market radio; Don Dalton, KFI/KOST (Los Angeles), representing large market radio; and Jon Strom, Sony Corporation Audio Products (Park Ridge, NJ).

Eddy urged all AM broadcasters to give their listeners and advertisers the best that technology has to offer by jumping on the AM stereo bandwagon. He outlined the ways that KYMN has successfully promoted the new service in its area, including media relations efforts and awarding stores that sell AM stereo receivers free advertising time.

Dalton told session attendees, "Our job is to sell stereo receivers no matter who manufactures them." He added, "The more people who buy receivers, the sooner AM stereo will become a reality."

Strom introduced Sony's multimode automobile radio and briefed the audience on Sony's first-ever national AM stereo campaign. He told the NAB session, "The current market demands a multisystem receiver, and that's why we have it. As soon as you start broadcasting in AM stereo, people are sure to buy one."

NRBA reveals survey results

A recently completed survey of AM radio stations across the country indicates that the move to stereo operation will be a slow transition for the industry. A survey conducted by the National Radio Broadcasters Association (NRBA) shows that nearly half of the 1255 stations responding to the group's questionnaire have not prepared for stereo operation in their studio and terminal equipment. The NRBA reports that 10% of the stations responding to the survey currently are broadcasting in stereo, 2% have ordered AM stereo transmission equipment and the remaining 88% are not broadcasting in stereo. On the positive side, more than a third (39%) of the stations not currently broadcasting in stereo told the NRBA that they have (or are constructing) stereo-capable facilities.

AM stereo equipment choices for stations already broadcasting in stereo break down as follows:

- 40% report they are using the Motorola C-QUAM system;
- 30% report use of the Harris AM stereo system;
- 24% report they are using Kahn equipment; and
- the remaining 6% report use of the Magnavox AM stereo system.

These results are based on a questionnaire mailed in mid-April to every AM radio station in the United States. By the cutoff date, 26% of the stations had responded to the survey.

Manufacturers reach agreement on chip production

Motorola and Toshiba have announced an *alternate* source agreement for Toshiba to produce Motorola's C-QUAM AM stereo decoder chip. Under terms of the agreement, Motorola will provide technical information to Toshiba for production of the single-chip bipolar linear device.

The agreement is expected to expand the adoption of the C-QUAM system by Japanese radio equipment manufacturers, according to a Motorola spokesperson, by making the decoder chips more readily available through local sources in Japan.

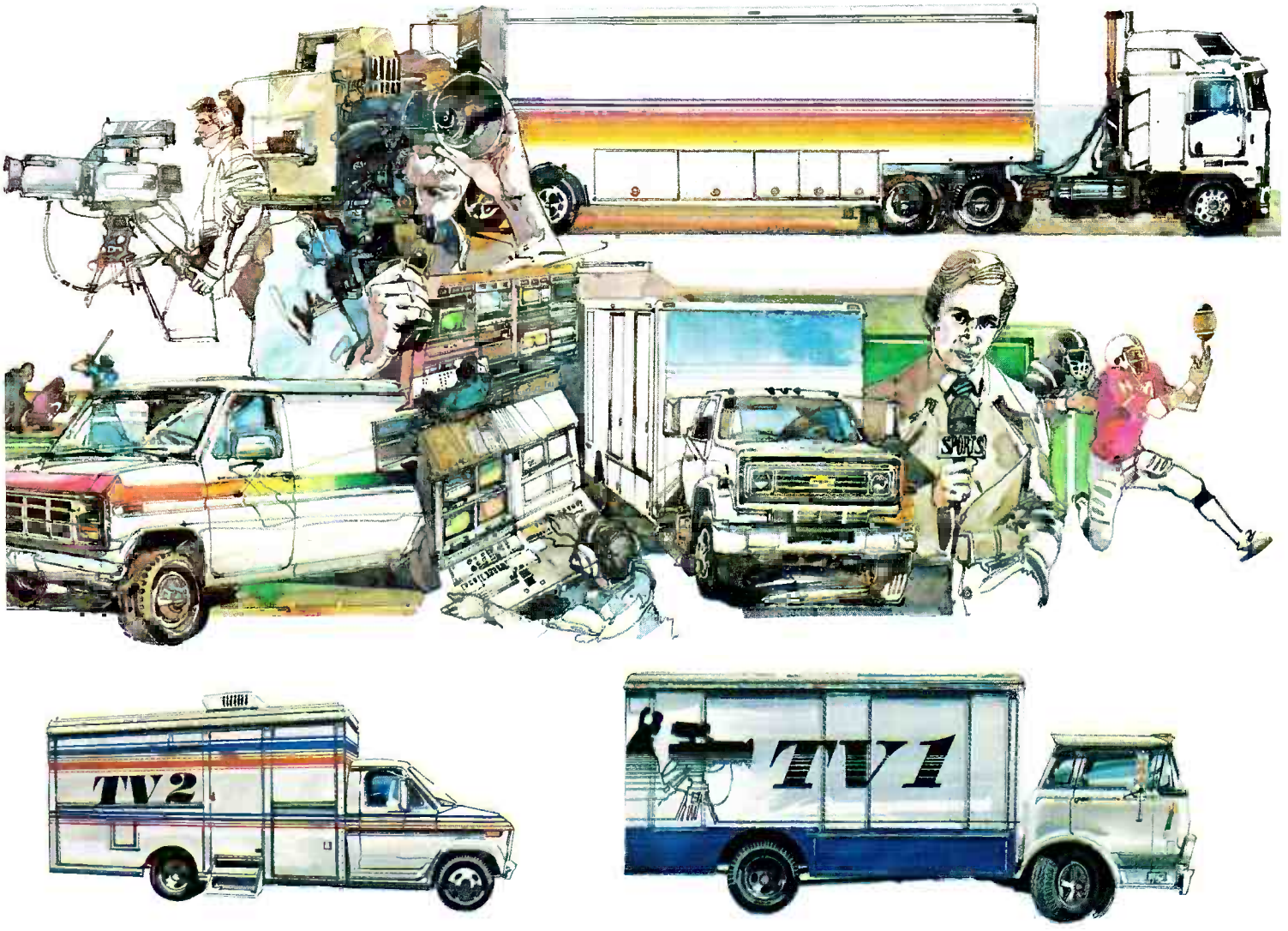
The AM stereo decoder chip is designed for automotive and home audio system applications, and performs the complete AM stereo signal decoding function in electronically tuned radios.

Motorola creates hi-fi decoder

Motorola has reported that it has developed circuit techniques allowing the MC13020 C-QUAM decoder chip to yield a full 50dB of separation and less than 0.2% distortion, with frequency response to 10kHz (or higher).

Continued on page 138

MOBILE TELEVISION UNITS



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NRBA calls for radio-only deregulation bill

In a statement issued by the NRBA, the radio industry trade association announced its intention to push for a radio-only deregulation bill in this session of Congress.

The statement, which appeared in full in NRBA's March 26 edition of its weekly newsletter, *Monday Morning Memo*, said in part, "It now appears virtually certain that efforts to construct a meaningful broadcast deregulation bill in the House Telecommunications Subcommittee will not be successful in the current session of Congress....While we were never optimistic about the chances for passage of the Tauke-Tauzin Bill (H.R. 2382), we hoped that this measure might prove to be a step toward truly effective deregulation legislation."

NRBA's statement continues, "(Because) that has not happened,....NRBA intends to press for radio-only deregulation legislation in this session of Congress, and if necessary, in the next Congress. In our view, one of the main defects of the Tauke-Tauzin Bill and of the other proposals that have been made is the insistence on coupling radio and TV legislation in one bill....As we feared, this tactic has proved fatal to the interests of both radio and television."

Association for Broadcast Engineering Standards
2000 M St., NW
Suite 600
Washington, DC 20036
1-202-331-0606

ABES protests new daytimer extended-hour ruling

ABES recently protested the FCC action granting reconsideration of the FCC's September 1983 First Report and Order in BC Docket No. 82-538. By abandoning the groundwave interference protection criteria upon which the First Report and Order was based, the FCC has sanctioned severe and widespread interference to the existing, local groundwave service of full-time regional (Class II and Class III) stations to be caused by co-channel daytime-only stations, according to the ABES. The interference will be worst in the winter months when the northern half of the United States is in darkness during the new daytimer post-sunset operating period. Audiences used to service from local full-time stations in that region will feel the adverse effects of the new rule to the greatest extent.

Wallace E. Johnson, president and executive director of ABES, said that the FCC decision is indefensible, because

Continued on page 137

BIG NEWS.
SMALL PACKAGE.

Announcing Thomson Betacam.™ The smallest, lightest ½" camera/recorder ever. All in one neat package. With superior signal-to-noise performance. Designed with *both* ENG and EFP operators in mind. For on-the-spot news gathering or complicated field production, now there's a system just right for you. And your budget. Because Thomson Betacam also carries the lowest price tag.

Available in one- or three-tube camera models, Thomson Betacam utilizes the newest electronics and manufacturing techniques. A ⅔" 'Mixed Field' Saticon tube design that virtually eliminates beam defocusing. A VTR featuring a rugged new recording format with greater chrominance bandwidth and signal-to-noise ratio. Built-in Dolby® noise reduction for high-quality audio. And a cassette player with TBC as standard, providing full broadcast quality output. Plus, the playback unit can be interfaced with U-Matic® and one-inch editing systems. This makes Thomson Betacam the ideal complement to your existing production equipment.

It's the smallest, lightest, most precise, camera/recorder system. It's easy to operate. And it's energy efficient. Thomson Betacam is setting new standards for performance and flexibility in a fully integrated camera/VTR system. All of it at a very affordable price.

Get the whole story. Call or write Thomson-CSF Broadcast, Inc., 37 Brownhouse Rd., Stamford, CT 06902. Tel. (203) 965-7000. TWX (710) 474-3346. Telex 6819035. Answer Back 6819035 TCSB UW.

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You've Got What It Takes

By Jerry Whitaker, radio editor

The NAB's 62nd Annual Convention—a record-breaking extravaganza by any standards—is now history. Virtually everyone whom **BE** staff members spoke with at the gathering agreed that the show was a success from presentation and business standpoints. Manufacturers reported brisk business and solid sales leads, in contrast with previous years when buyers were more cautious. The general upturn in business done at the show is a good sign for the industry, demonstrating that radio and TV stations are making money, and that manufacturers are making equipment broadcasters need.

The convention's exhibits, engineering sessions and hospitality suites drew more than 35,000 people from some 35 countries to Las Vegas. A

TASCAM's complete audio system brings video production in-house with ease and economy.

Eliminate Outside Production Costs. Move Inside With Tascam.

You've been thinking about making the move to in-house video. Or expanding your present modest set-up into a fully professional environment. You've had to depend on outside sources for on-line work. And possibly off-line as well. You've been watching money drain out of your budget. Lots of it. Money put to far more profitable use in-house.

Now you can bring your production inside. Allowing yourself the control, time, and creative flexibility your work deserves. TASCAM is ready to help you make the move. Quickly. Easily. Economically.

From training to point-of-purchase videos, from the assembly line to the board room, TASCAM recorder/reproducers and mixers give you the dependability, quality and versatility essential to keeping pace with the rigorous demands of SMPTE production and post-production.

Our 58 recorder/reproducer syncs you into video interlock with a single connector. This rugged ½" 8-track gives you the performance capabilities and engineering depth of a 1" machine. But at a fraction of the cost. Full microprocessor 3-motor servo control provides unsurpassed editing speed and precision, taking you rapidly to the point you're after and stopping on the dime.

Our 58's unique Omega Drive ensures smooth tape handling and uniform tape tension. It keeps tape from stretching or bouncing no matter how often you start and stop. And assures clear, clean signal reproduction.

Compatible with any professional system.

The 58 links superbly to a complete TASCAM system. Our M520 mixer gives you the fast signal routing, logical, easy-to-use board layout, and full creative control vital to your professional video productions.

And when you're ready for layback, our 52 provides exceptional mastering capabilities, with the same dependability, accurate SMPTE control, and precise audio performance as the 58.

For less elaborate productions, our 4-track 44B keeps SMPTE up to speed for fast editing. Or integrate it as a mastering machine for layback from multi-track.

When you've got to balance sophisticated audio capabilities against your budget constraints: Don't! TASCAM offers the uncompromising audio quality and sturdy reliability of equipment costing much more. At any price, TASCAM is the professional's total audio system for video interfacing. At this price, what are you waiting for? Your TASCAM dealer has full details or write TASCAM, TEAC Professional Division, 7733 Telegraph Road, Montebello, CA 90640 (213) 726-0303.

TASCAM
TEAC Professional Division

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One session presented at the convention was a one-on-one conversation between Edward Fritts, NAB president (left), and James McKinney, chief, FCC Mass Media Bureau. A 20-year veteran of the FCC, McKinney made his first NAB appearance this year. Topics included ownership rules, FM allocations, TV deregulation, VHF drop-ins and low power television.

total of 650 exhibitors—using more than 300,000 square feet of display area—were on hand to show broadcasters the latest equipment designs.

NAB happenings

With the election year theme "You've Got What It Takes," Edward Fritts, NAB president, delivered the keynote address at the convention's opening general assembly. Fritts said that broadcasters have a special responsibility to the American public and that the industry should rededicate itself to "excellence in public service."

A number of other addresses were given at convention events, including luncheon speeches by FCC Chairman Mark Fowler, *CBS News* correspondent Charles Osgood and political satirist Mark Russell. Several senators and representatives were featured in panel discussions on media issues of the '80s—including cable TV copyrights, cable "must carry" rules and broadcast industry deregulation. A panel of FCC commissioners discussed issues of importance to broadcasters, and James McKinney, chief, FCC Mass Media Bureau, appeared with Fritts for a one-on-one conversation on the status of broadcasting.

NAB awards

The NAB Engineering Award for 1984 was issued during the convention to Otis Freeman, director of engineering, Tribune Broadcasting, and senior vice president for engineering, WPIX, New York. The presentation was made at the NAB Engineering Conference Luncheon, addressed by McKinney.

Freeman is credited with leading the move to erect the transmitting tower on top of the World Trade Center to improve TV reception in New York. He also developed the genlock system, which allows pictures to be incorporated from a remote location.

Otis Freeman (right) receives the 1984 NAB Engineering Award from Tom Keller, NAB senior vice president for engineering.

Freeman is president of the TV Broadcasters All-Industry Committee, which is composed of the 10 New York City TV stations. He also is a member of the Society of Broadcast Engineers, Institute of Electrical and Electronics Engineers and the Society of Motion Picture and Television Engineers.

This year's NAB Distinguished Service Award—the industry's highest honor—was presented to Elton Rule, former ABC vice chairman and president. In his remarks, Rule spoke of the industry's election year campaign. "It's not often that we can unite in a project that is good for our country, good for our communities, good for our audiences and good for ourselves, all at the same time," he said. "This is one of those times. Let us all give it our very best."

Peter Kenney, former vice president, NBC Washington, received the Grover C. Cobb Award, given annually to a broadcaster or public servant demonstrating unusual dedication to improving broadcasting's relationship with the federal government.

Stanley E. Hubbard, chairman and founder, Hubbard Broadcasting, St. Paul, MN, was given the Spirit of Broadcasting Award at the convention. The newly created award recognizes Hubbard's outstanding contribution to the professional standards and vitality of the broadcasting industry.

Session highlights

In our show coverage this month, we highlight some of the radio and TV techical sessions with special reports from our consultants. The articles are listed here with page numbers to help you locate them easily.

Product review

In the June 1984 issue of **Broadcast Engineering,** we reviewed many of the new products shown at NAB-'84. In this issue, we conclude our coverage with a look at additional companies and products. Radio exhibitor listings begin on page 44, and TV exhibitor listings are found on page 60. The listings feature Reader Service Numbers to allow you to obtain information from manufacturers.

Next year

The 1985 NAB Convention will be held April 14-17, again in Las Vegas. The Saturday engineering sessions are expected to be repeated, because of their generally good reception at this year's convention. The NAB is looking forward to an even bigger show, with more exhibitors, technical sessions and workshops.

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Engineering sessions

By Brad Dick, director of engineering,
KANU/KFKU Radio, University of Kansas, Lawrence, KS

For most engineers, the annual NAB convention represents a time for training on technical subjects and an examination of the latest equipment. This year was no exception in terms of overall structure. The convention also provided some new program additions and a record number of technical papers.

The NAB Engineering Committee went all out to add many more sessions to the technical part of the program. Instead of starting on Monday, the technical sessions began on Saturday and ran all day long. The Tuesday sessions, in fact, began at 8 a.m. and continued until 10:15 p.m. The additional time allocated and increased number of sessions seemed to be appreciated by engineers attending the convention. The late evening sessions were well-attended, despite other attractions available in Las Vegas. The Saturday radio and TV sessions generated much interest on the part of engineers, and indications are that the Saturday programs will be repeated next year.

TV engineering sessions

The TV session topic that generated the greatest amount of interest at the convention was multichannel TV sound (MTS). A detailed session on the implementation of MTS covered a wide range of topics, including stereo audio production and post-production, uses of the second audio program (SAP) channel, transmitter plant conversion for MTS and monitoring the MTS signal. The session made it clear to engineers that multichannel TV sound has arrived and that, although MTS may require a substantial amount of work to implement in some cases, the benefits realized should far outweigh the costs to stations that choose to take advantage of the new technology.

A companion engineering session on the EIA-approved MTS system also was presented at the convention to brief engineers on the Zenith transmission method and the dbx noise reduction system that now has received the blessings of the FCC. In addition to transmission theory and techniques, receiver design possibilities and options were discussed by various industry representatives. A description of the detailed testing procedures used by the EIA in its examination of the proposed multichannel TV sound systems also was described.

Other TV engineering sessions included one on new technology, which looked at the new generation of multicassette machines, new developments in HDTV, the state of video recording technology and other topics. Sessions also were conducted on TV production engineering, satellite system developments and operation, recent progress toward more efficient UHF TV systems and the current work of the NAB's Advanced Television Systems Committee.

The biggest topic of discussion at the TV engineering sessions was multichannel TV sound (MTS). Shown is the panel of experts at the "Implementing Television Multichannel Sound" engineering session, held on April 28. A companion session on the MTS system itself was held on April 30.

One of the radio engineering sessions that stimulated much interest among engineers was the "Radio Subcarriers" discussion. Shown is a portion of the panel.

Radio sessions

One of the *hot* radio topics at the convention this year was the use of FM subcarriers. Recent FCC action permitting higher modulation levels by FM stations when subcarriers are transmitted peaked the interest of many engineers attending the convention. For those concerned about a loss of stereo coverage area when subcarriers are transmitted, Harrison Klein of Westinghouse Broadcasting said that the addition of two subcarriers on an FM system with a total transmitter modulation of 110% would cause only a 1dB loss of program level. Eric Small of Modulation Sciences discussed his company's new data subcarrier generator and outlined various methods of modulating the carrier. Small said that data speeds of as much as 56kbits/second now are possible, although at that speed receiver costs are high.

The ingredients of Varian's new S-Tube bring super-high efficiency.

Varian's new "S-Tube" klystron operates at super-high efficiency—translating to significant savings in electric utility costs for UHF-TV broadcasters. The new S-Series, 5-cavity klystron provides significant improvement in operating efficiency through a unique configuration of tuning and cavity loading.

Efficiency-tuned for 10% improvement.

The new S-Series klystrons are tuned to maximize efficiency while maintaining useful gain. The Q of the second cavity is reduced by external loading and the output cavity is optimized by use of a variable visual coupler. These tubes will provide efficiency improvement of up to 10 percentage points over current high efficiency types when used under equivalent conditions.

Interchangeable with Varian H-tubes.

The most practical aspect of the new S-Series tubes is the complete interchangeability with the Varian VA-953H-Series tubes, providing broadcasters maximum flexibility in planning new equipment acquisitions.

More information on Varian's new S-Tube is available from Varian Microwave Tube Division, or any Electron Device Group worldwide sales organization.

Varian Microwave Tube Division
611 Hansen Way
Palo Alto, California 94303
Telephone: 415•424-5675

Varian AG
Steinhauserstrasse
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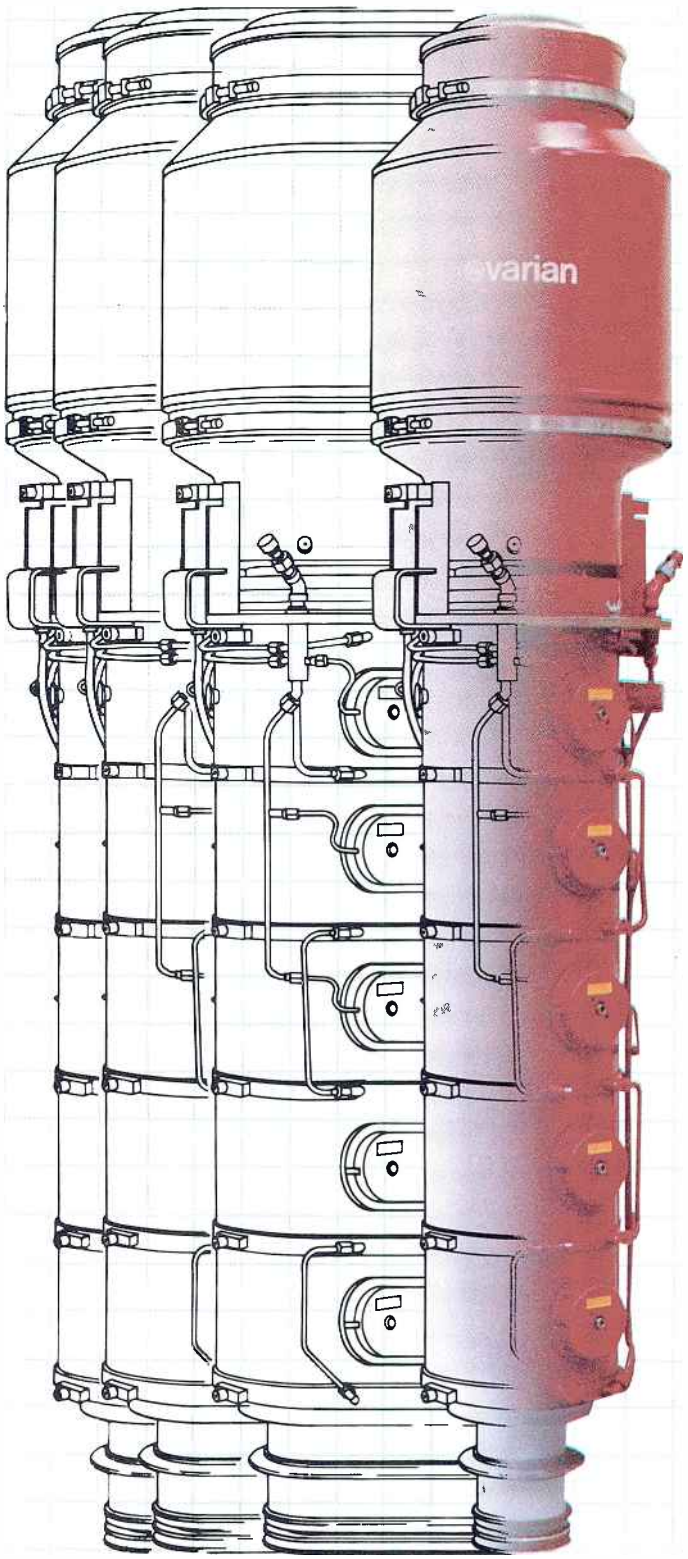

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Much of the enthusiasm generated by some members of the SCA panel was dampened by Al Lucas from Motorola. Lucas reviewed his company's research into the typical ranges that might be expected with an SCA paging system. Those ranges were not nearly as great as one might expect. The Motorola study showed that with a 100kW ERP transmitting system at 1000 feet, 99% coverage to the first floor of most buildings extended out to just five miles. Coverage at 11 miles was found to be only 50%, according to Lucas.

Motorola's research showed that a full power FM station has little more than a 5dB advantage over the typical radio common carrier paging service. Lucas said that the usefulness of an FM SCA paging service in an urban area likely would be limited. He added, though, that acceptable performance probably could be achieved in rural areas, where high buildings are not a problem.

Another new and interesting session at the convention dealt with interference being generated by TV antenna preamplifiers. Ed Williams of the NAB Office of Science and Technology delivered a brief paper on preliminary investigations into interference caused by mast-mounted TV antenna preamps.

The work shows that some FM broadcasters have been charged with causing interference to TV signals while the actual interference was being generated by a TV preamplifier. Williams said that the interference problems typically occur when a TV station is located 40-70 miles from the viewer and the FM station is located nearby. The high energy from the FM station can overload the preamplifier, causing harmonic distortion. The FM station's second harmonic then is reradiated along the downlead, causing interference not only to the local TV receiver, but also to other receivers in the same neighborhood. Williams said that second-order intermodulation distortion and cross-modulation in the preamplifier also can result in interference complaints to the FM station. Unfortunately, William's paper is not printed in the *Proceedings*, but he did say that stations would be kept posted on future developments.

Much of the rest of the radio sessions centered on hard-core practical information for the practicing engineer. Papers on remote-control systems, AM grounding methods, transient overvoltage protection, radio production techniques and many other topics rounded out the convention.

The "New Technology" radio session featured a number of important

Continued on page 26

Save $10,000 every year for 20 years with the new Harris 60 kW UHF transmitter

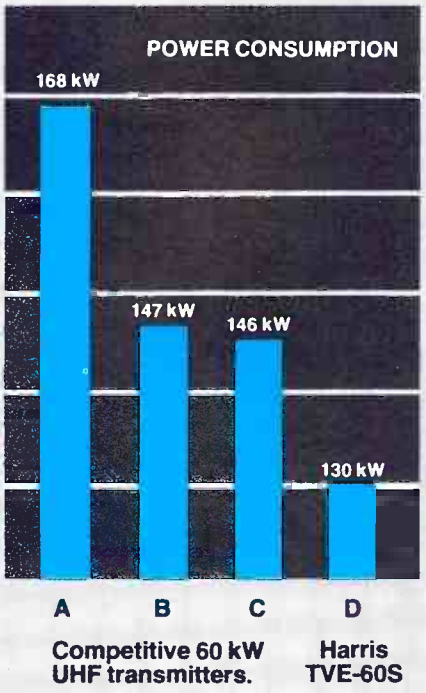
The new Harris TVE-60S is the most efficient 60 kW UHF-TV transmitter on the market today. And that translates directly into improved bottom line results for your operation.

With the TVE-60S, you can actually save an average of $10,000 annually* on your power bills. Multiply this by the average 20-year life of a transmitter, and you come up with *a $200,000 savings!* Without considering inflation.

How We Got There

The very latest in high power UHF technology has been incorporated into the TVE-60S. For instance, a single Varian 5-cavity VKP-7550 "S" Series klystron is used for full 60 kW visual power output.

This new integral-cavity klystron is an improved, ultra-high-efficiency version of the Varian VA-950 Series that has been field proven in hundreds of UHF transmitters worldwide.



When operated with a variable visual output coupler and a mod anode pulser—both supplied as standard in the TVE-60S—the new klystron provides visual beam efficiencies ranging from 63% to 68%.

Add to this an aural klystron coupler and an efficient vapor phase heat exchanger, and you have a 60 kW transmitter with power consumption of 130 kW or less. No other UHF transmitter in this power range comes close.

No Performance Sacrifices

There has been no sacrifice of performance for high efficiency. The MCP-2U visual exciter, with its Quadrature Corrector and unique, adjustment-free VIDEO SAW filter, provides unmatched color specifications and highest reliability. Also, the TVE-60S is designed for TV stereo, teletext and other services.

For complete information on the new TVE-60S, or the 120 kW and 240 kW versions, write or call: Harris Corporation, Broadcast Transmission Division, P.O. Box 4290, Quincy, Illinois 62305. 217/222-8200.

*Figured from the National Average Power Cost as published in "Electric Power Monthly", based on a 20-hour broadcast day, and compared with the published power consumption specification (as of Feb., 1984) on the next closest competitive 60 kW UHF transmitter. Comparisons in chart based on published specs as of Feb., 1984.

HARRIS

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THE NEW TEKTRONIX 1750: HEADS OFF PROBLEMS YOU DIDN'T KNOW YOU HAD...UNTIL IT WAS TOO LATE!

Our new 1750 signal monitor gives you a unique, dynamic display of SCH phase relationships.

You can see at a glance if a video signal is properly SCH phased . . . or just as easily, compare two signals for color frame matching.

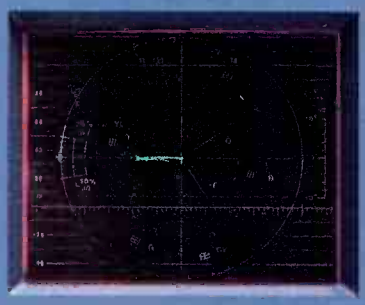
Hit-or-miss SCH phasing may have been tolerated in the past—but now it's costing you time and money every day.

The Tektronix 1750 can help you regain control. By maintaining consistent SCH phase . . . or by seeing potential problems *before* a glitch occurs, you'll avoid the frustration of multiple passes and enjoy getting it right the first time. Saving time saves you money and makes the best use of your valuable resources.

SCH phase, of course, isn't the only parameter you need to keep on track, and SCH display is only part of the 1750's comprehensive signal monitoring capabilities. At the push of a button it also displays vector mode . . . or waveform mode, enhanced by digital line selection through the vertical interval . . . or R-Y/sweep mode for easy interpretation of differential phase distortions.

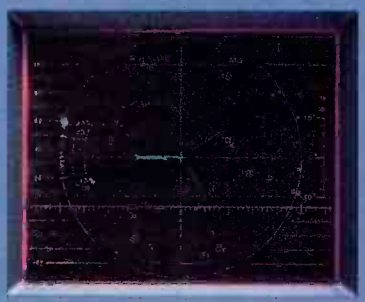
Whether used for monitoring video in production and editing environments, or for making fast and accurate measurements during equipment maintenance, the 1750 Series is a new benchmark for comprehensive performance in both NTSC (1750) and PAL (1751) standards.

A compact 5.25 inch package, mechanically interchangeable with many other "half-rack" packages, allows easy installation in new or existing facilities.



Correct SCH phase relationship is clearly displayed on the 1750 when dot on the calibration circle is aligned with the vector on the −x axis.

Dot placement on the +x axis indicates an error in the color frame matching of two signals.



This 17-degree offset, indicating a 17-degree SCH timing error, would be impossible to perceive on an ordinary waveform monitor display.

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Continued from page 22

topics for broadcasters, including switched-diversity mobile FM reception, amplitude compandored sideband transmission, microprocessors in transmitters and a status report from the NAB AM Improvement Committee.

Other engineering sessions included an examination of non-ionizing radiation and its potential risks, satellite technology and digital network interconnection.

Engineering workshops

A wide variety of engineering workshops was presented at the convention again this year. Topics included transmitter maintenance, conducting AM stereo proofs, improving studio acoustics, designing microwave paths and dealing with the "new" telephone company.

Looking forward

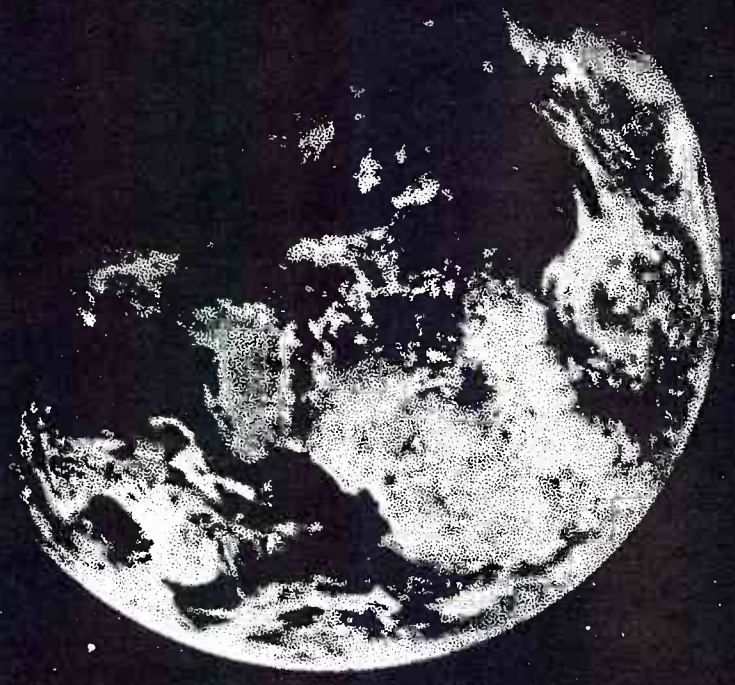
From comments heard by this observer, most engineers thought that NAB-'84 was an excellent convention. Some, however, complained about the lack of *hands-on* sessions. These engineers wanted the opportunity to look inside equipment or perhaps even be able to make their own adjustments on demonstration gear.

One engineer commented that most of what he heard in the sessions could be read in the *Proceedings*. Instead, he wanted the opportunity for some one-on-one training with new technology.

Naturally, it is impossible to allow thousands of engineers each to have a test bench and run their own measurements on a piece of equipment. Perhaps it is time, however, to re-examine how the engineering sessions are conducted. One radio management session provided the opportunity for participants to get some hands-on experience with personal computers. Could some of that type of training be arranged for engineers? Could engineers sign up in advance for special training sessions to be held at the convention? This would permit small groups to receive more specialized instruction on specific topics. Reasonable fees also might be in order for some subjects.

The *Proceedings*

The NAB's increased emphasis on getting technical session papers printed in the *Proceedings* and available at the convention is a valuable service to the industry. For engineers unable to attend the convention, copies of this year's convention *Proceedings* are available by contacting the NAB Services Department, 1771 N Street, NW, Washington, DC 20036. For price information call 800-368-5644.



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Spectrum management issues

By Richard A. Rudman, **BE** spectrum management consultant

Spectrum management sessions during the 1984 NAB Convention featured topics that ranged from extended hours for daytime AM stations to changes in SCA and FM modulation rules to new developments in TV microwave. These and other spectrum management issues discussed at the convention are particularly important to the broadcast industry because the FCC seems to be headed toward a new policy in which broadcasters will be taking a much more active role in managing their various portions of the spectrum. The vanguard effort has concentrated on frequencies broadcasters use for remote pickup unit (RPU), studio-to-transmitter link (STL) and intercity relay (ICR) stations, covered under Part 74 of the *FCC Rules*.

The convention was a huge show; it was impossible to cover everything in depth or in person (as 35,000 pairs of aching feet will confirm). Although the convention's official theme was "You've Got What It Takes," the week's activities might be summed up with just one word: *more*. There were *more* new cameras, recorders, switchers, transmitters, receivers and field production equipment for audio and video. In short, *more* of everything a broadcaster could want to produce any type of sight or sound for radio or television.

Now comes the classic question. What gift could you possibly envisage for an industry that seems to have everything?

For those of us who have to get that "everything" back to the studio, or from the studio to the transmitter, or from the transmitter back to the studio, the answer is easy: *more spectrum*.

Awareness of spectrum politics and economics—and an elementary course in the physics of electronics—tells us this may be wishful thinking. For this reason, many broadcasters and industry representatives have been working on a number of projects that try to make better use of the limited amount of spectrum that the FCC has allowed for *backstage* activities of broadcasting. Of course, the backstage work makes possible the varied foreground entertainment we broadcast.

Convention activity

Fortunately, this year's convention was not totally void of good news for those concerned about spectrum management issues. There were some bright spots on the display floor, in the technical sessions and—strangely enough—on the regulatory front.

One of the stated goals of the Society of Broadcast Engineers National Frequency Coordinating Committee (SBE NFCC) is to foster new technology that promotes spectrum efficiency. It was, therefore, rewarding to see an important paper presented during the convention by the Hughes Microwave Communications Products Division. Hughes has adapted amplitude modulation techniques used for years in CATV service for a new line of 13GHz radio equipment for broadcast use. The company has perfected a method of sending a broadcast-quality signal (aural and visual) in 6MHz, rather than the 18MHz (or more) required by frequency modulation techniques. Ten-mile paths at 13GHz with greater than 99.99% reliability are possible, according to Dr. Thomas Straus, R.T. Hsu and W.C. Margiotta of Hughes.

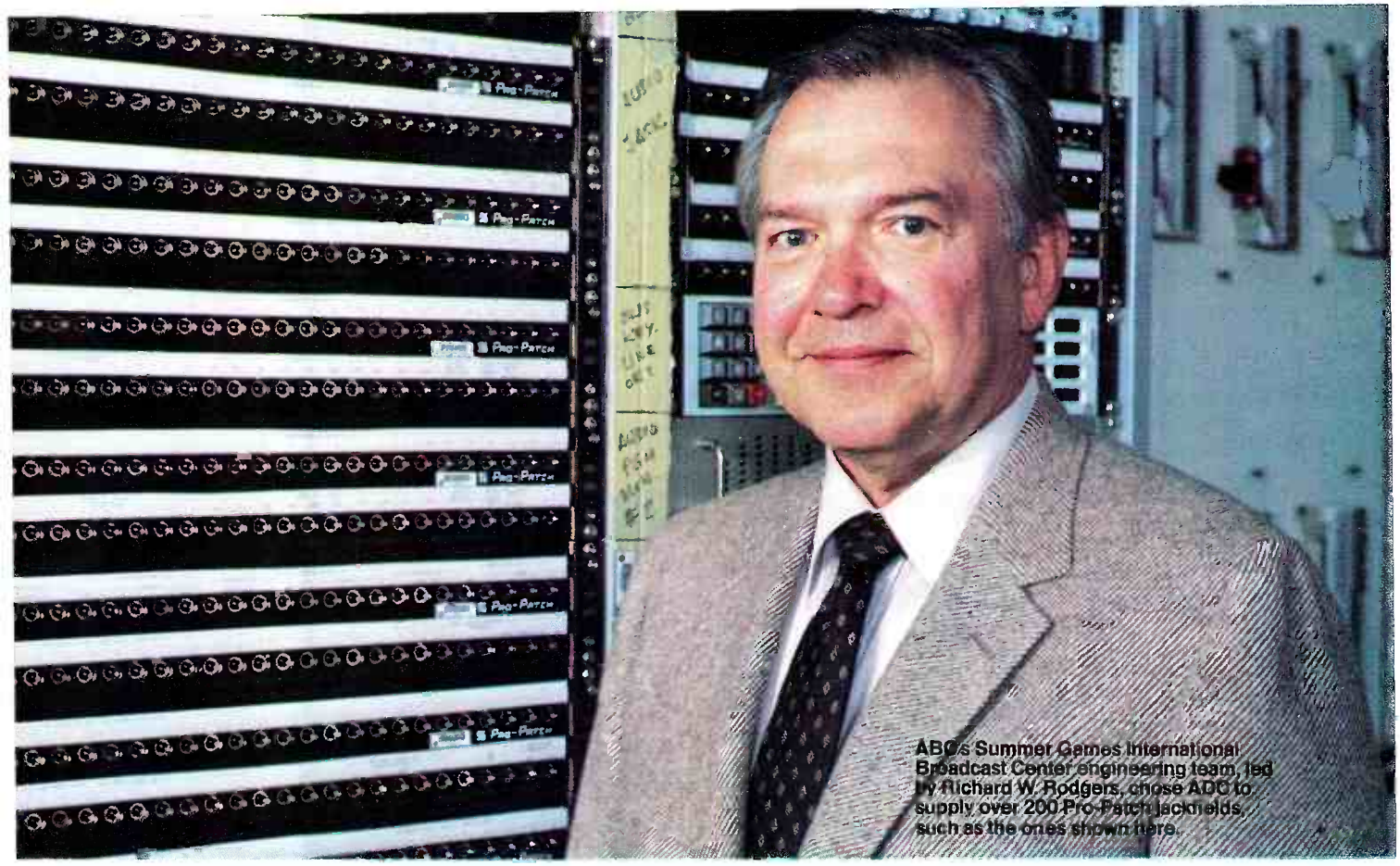
Straus, who presented the paper, "Spectrum Conservation With High Performance SSB Microwave Carriage of Multiple TV Signals," said that the Hughes test measurements do not exactly match the RS-250B transmission standard. He reminded engineers attending the "Broadcast Auxiliary Systems" session that RS-250B is being rewritten with more careful attention given to the requirement for only four IRE units for field time distortion (FTD) from a filter network that would need 4.8MHz of bandwidth. This is hard to accomplish, because RS-250B says that the video must occupy no more than 4.2MHz of bandwidth! Test data for the Hughes system show—using the existing RS-250B criteria—an FTD value of six IRE units.

Shown is the "Broadcast Auxiliary Systems" panel, which discussed a wide range of topics, including the Hughes TV microwave system, aural STL booster systems, propagation characteristics for the 18GHz aural broadcast band and the status of FCC regulation of *backstage* broadcast frequencies.

Straus also said that the Hughes system misses the 69dB S/N figure of the RS-250B standard by 2dB, measures 2% differential gain (0.5% is the magic number) and exhibits 0.5% differential phase (0.2% is called for). The system meets or exceeds all other existing RS-250B specifications for a single-hop system using 2W typical power output and 6-foot dishes.

Hughes is marketing the system to interested broadcasters that have a need for greater efficiency, as well as to licensees in the common carrier band (10.7-11.7GHz), where six complete video and audio signals can fit in

*The author also is engineering manager at KFWB Radio in Los Angeles, and chairman of the Society of Broadcast Engineers National Frequency Coordinating Committee.



ABC's Summer Games International Broadcast Center engineering team, led by Richard W. Rodgers, chose ADC to supply over 200 Pro-Patch jackfields, such as the ones shown here.

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a 40MHz channel. Adjacent-channel transmitter-to-studio link (TSL) operation also is possible, according to Straus. The system's receivers use the latest in surface acoustic wave (SAW) filter technology, which, in part, makes this possible.

Hughes engineers say they can bring this technology down to the 7GHz band if they see a market for the equipment. Because 7GHz is becoming the band of choice for STL operation, this possibility is intriguing. At a sneak preview of the paper during the April meeting of the Southern California Frequency Coordinating Committee, licensees in the most congested region of the country had a chance to see a link operating under test conditions that simulated a long path length, and fully modulated upper and lower adjacent-channel interference.

Note that this technology is expensive today, even by broadcast standards. However, for stations that need a link and have no alternative, the equipment costs may not be a barrier.

A paper delivered by General Telephone and Equipment (GTE) on 18GHz aural path propagation shows that this part of the spectrum can deliver propagation reliability of 99.99%. The GTE paper summarized a yearlong study of an 18GHz path measuring approximately 10 miles in the Pacific Northwest. The paper concluded that in regions where storm cells with large, wet flakes are rare (or do not occur), this frequency band can offer what amounts to virgin spectrum that can be coordinated carefully to provide maximum protection from interference. The paper discussed the impact of snowflake size on 18GHz propagation, and suggested that ¼-wave-diameter snowflakes will cause path disruption. (As most engineers in congested regions of the country know, interference can cause more problems to STLs than weather in bands in which fixed and mobile links are intermixed.)

The GTE paper concluded that 18GHz paths longer than 10 miles can be practical, even in areas with an appreciable amount of rain, because rain storm cells rarely exceed a diameter greater than 10 miles, and the probability of two such cells aligning along a signal path is small. In short, it may be worth the risk for a station to go to 18GHz if no other spectrum is available, and if the station wants the increased reliability of an interference-free, well-coordinated frequency band. At least one manufacturer has FM equipment available for use at 18GHz.

Among broadcast equipment manufacturers at the convention showing new hardware important to spectrum management efforts was Harris Corporation, with its new line of 2GHz microwave gear. The equipment offers continuously variable power output levels between 3W and 12W. This introduction by Harris is termed a response to requests by the SBE NFCC and many local coordinating committees, and joins equipment already in the field, made by other venders, with one level of power cutback.

New antenna technology (discussed by Vince Rocco of Nurad during the "Broadcast Auxiliary Systems" panel) and the development of antennas with selectable polarization also are making spectrum efficiency easier to accomplish.

Other developments

NAB staff engineer Mike Rau delivered a paper to the session on broadcast auxiliary systems titled, "A Review of the Broadcast Auxiliary Service." Because the commission recently released Docket MM 84-280 ("Amendment to Frequency Assignment Procedures in the Broadcast Remote Pickup Service to Facilitate More Efficient Use of the Available Spectrum"), this review was timely. The paper showed how the auxiliary services spectrum is organized and used. The most significant rule change discussed relates to Docket 82-334. The proposed shared use of

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Part 74 2GHz and 7GHz spectrum was deleted from the original notice, but reference was made to a current Petition for Reconsideration filed by the NAB, which seeks to modify spectrum sharing with private operational fixed service licensees at 13GHz. An appendix to the paper shows how each band allocated for broadcast auxiliary services is configured, and lists with whom we share spectrum space. Unfortunately, the 450-451MHz and 455-456MHz bands were omitted from the listing. Nonetheless, the paper is another good reason to acquire the *Proceedings* of the convention.

A paper by John Kean, senior engineer for National Public Radio in Washington, covered recent commission authorization of on-channel booster repeaters in cases in which a line-of-sight path does not exist, and in which sufficient isolation can be obtained between the system input and output. The paper discussed a system designed by NPR that is working at member station WNYC in New York for a 7.6-mile dogleg path.

This technology now is authorized for aural and visual microwave transmission for STL and ICR links when channels are scarce or path losses exceed the values needed for passive reflector systems. As the Kean paper concluded, "The relaxed nature of the commission's new rules will permit broadcasters a large degree of flexibility in planning and operating aural broadcast STL and ICR systems employing boosters."

Ralph Haller, recently named chief, Technical and International Branch of the FCC's Mass Media Bureau, presented an engineering paper to the same session, giving an overview of amplitude compandored sideband technology. He briefed broadcasters on how this new adaptation of basic single-sideband transmission can help meet the needs for voice communication channels now that there is little or no chance of adding new narrowband FM users to VHF and UHF auxiliary spectrum in many medium and major markets.

An overview

The NAB, manufacturers, radio and TV station engineers, and the FCC have come a long way in the past five years in dealing with real world spectrum management issues.

A special note of thanks is needed for two men from the FCC whose participation added much to several engineering sessions at the convention, including those on spectrum management and broadcast auxiliary systems. Haller and John Riser seemed to be everywhere, and this level of involvement was appreciated by engineers attending the various sessions. |:-)))|

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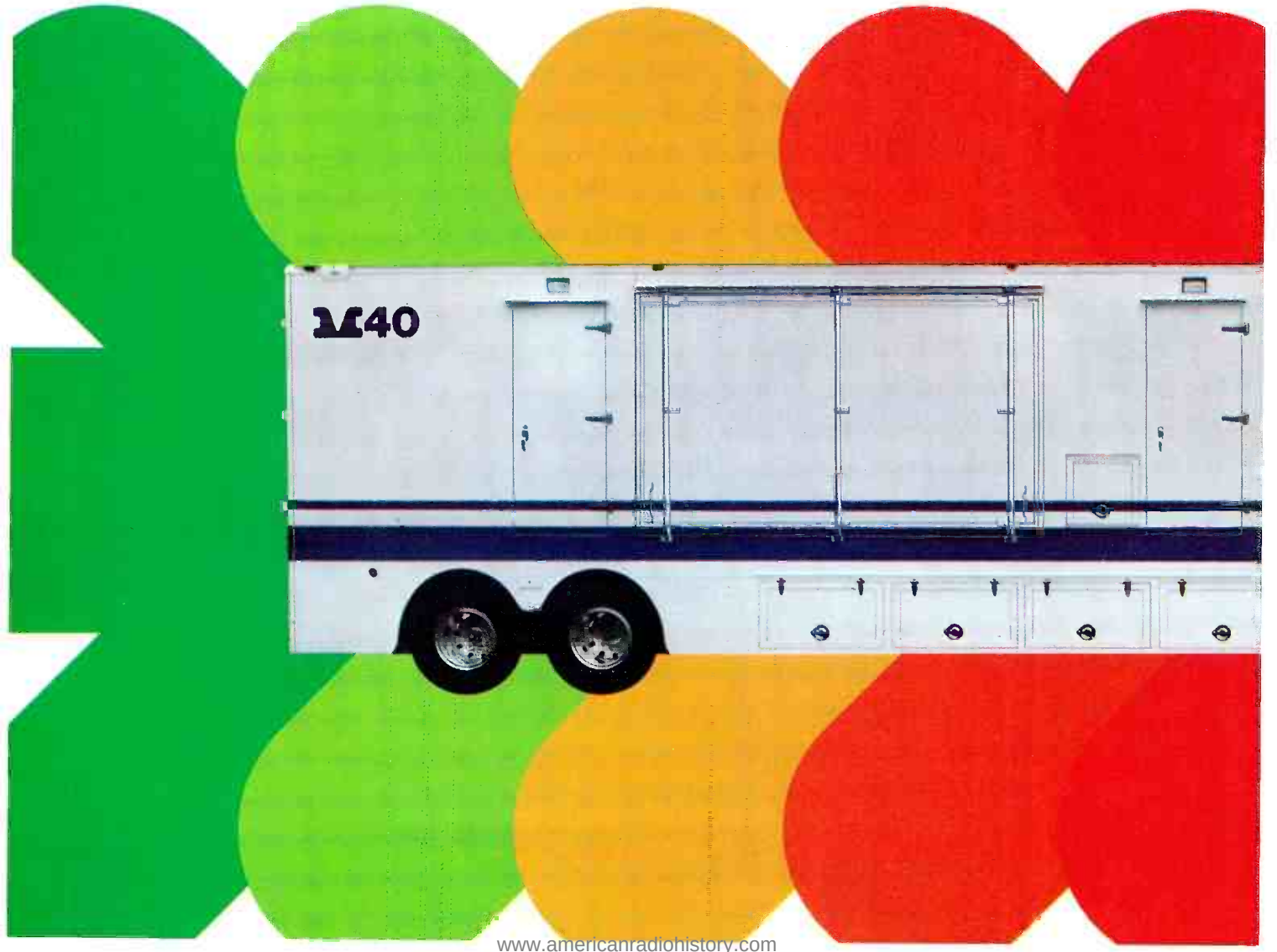
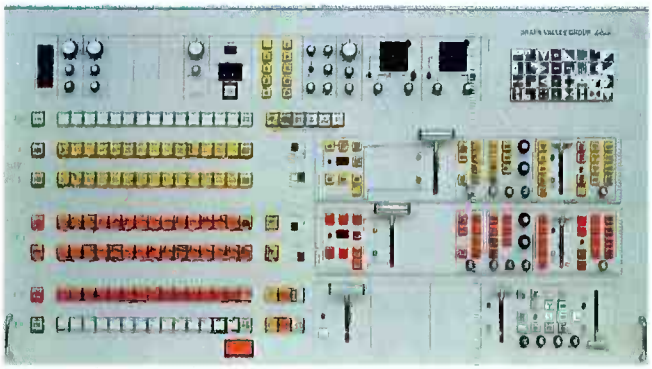


in all the best parts



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AM stereo activity

By Andy Laird, chief engineer, KDAY, Los Angeles, CA, and audio engineering consultant

The marketplace battle over AM stereo continued at NAB-'84, with receiver availability, capability and quality being the hot topics of debate. More than 300 AM radio stations now are broadcasting in stereo in the United States, but only a small number of receivers are in the field to decode the transmissions. A primary sales pitch heard from the big three stereo system proponents (Harris, Kahn and Motorola) was: "We have receiver manufacturers committed to our system, come and listen." Or, engineers would hear: "Go over there and listen to those radios. Do you want your radio station to sound like that while competing with FM stereo stations?"

Through the arguing and one-upmanship came three significant announcements at the convention:

- Pioneer Electronics has committed itself to manufacture an automobile radio unit using C-QUAM technology.
- Harris is lowering its pilot tone from 55Hz to 25Hz so that the system can be decoded on C-QUAM receivers.
- Sony will begin a substantial promotion of its two multisystem radios.

The Pioneer move

Pioneer Electronics (USA) announced its plans at a press conference, stating that Pioneer endorses the Motorola C-QUAM system and wants to add its weight to the drive for an industry standard AM stereo system. During the last 10 years, Pioneer has distributed more than 6 million automobile units in the United States. Jack Doyle, Pioneer president, told reporters, "We've supported the 1-system concept from the beginning. From a combination of technical and marketing factors, Motorola seems to us to be the clear choice."

The new Pioneer AM stereo receiver will be an electronically tuned model with an FM receiver and cassette deck built in. The radio is expected to retail at approximately $300, with availability probable by the fall.

The Pioneer announcement expands to 10 the list of companies that are manufacturing, or soon will be manufacturing, Motorola C-QUAM-compatible receivers. This list includes Chrysler, Concord, Delco, Jensen, Marantz, McIntosh, Potomac, Samsung and Sherwood.

The Harris move

Harris announced at the convention that it is lowering the pilot tone frequency for the STX-1A AM stereo exciter from 55Hz to 25Hz. New FCC type acceptance is not required for the change, because it does not affect the system's method of operation.

According to E.W. Jaeger, vice president and general manager, Harris Broadcast Division, "Harris has encouraged and promoted the availability of multisystem radios capable of receiving any of the four approved systems. It appears, however, that both single-system and multisystem receivers will be available for a period of time. This means that broadcasters wishing to serve the largest number of listeners with AM stereo will need to use a system compatible with both types of receivers."

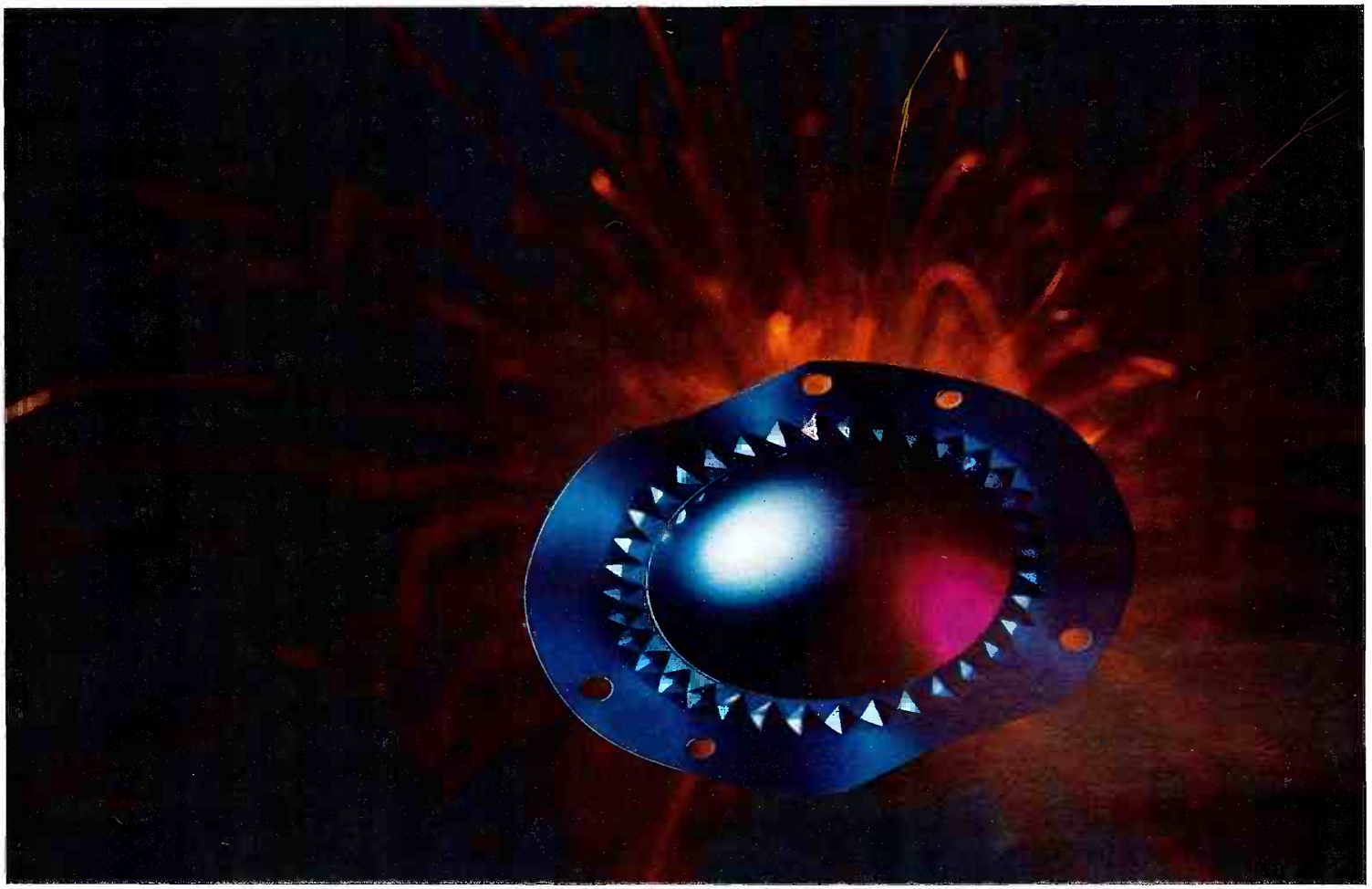
Jaeger said that the Harris move would encourage the use of high quality AM stereo by broadcasters, and make it available to more listeners in a shorter time period.

Harris said that listening tests using a Motorola AM stereo generator and a Harris AM stereo generator indicate that the received program material from the two systems is comparable in quality on a Delco AM stereo receiver. Also, according to the company, the change in pilot frequency does not affect reception of the Harris system on multimode receivers.

The Sony move

A number of AM stereo stations have expressed irritation in the past at Sony's low profile in promoting its

Perhaps the most controversial engineering session at NAB-'84 was the AM stereo discussion, chaired by Michael Rau of the NAB. The session began with a look at the status of AM stereo development, and concluded with a lively discussion among representatives of competing transmission systems, receiver manufacturers and the audience.



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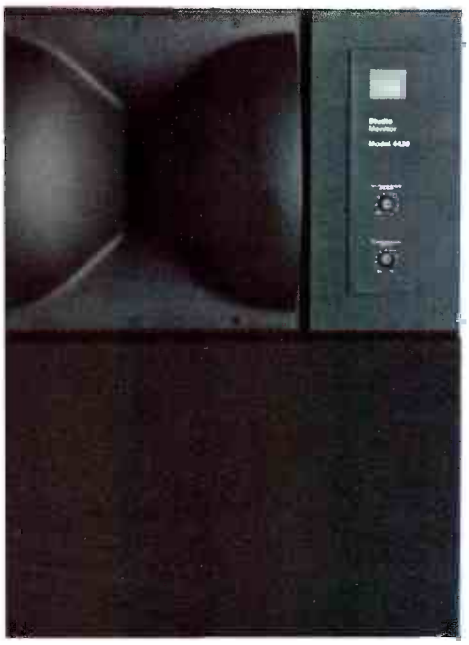

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two multimode radios. Although the Sony products have been available since last fall, there has been virtually no company-supported advertising of the receivers. Most advertising has been done, instead, by radio stations broadcasting in stereo through various types of promotions. Many retail stores have the radios, but often sales people know little about the AM stereo feature. It has seemed to many in broadcasting that Sony was not really committed to marketing its multimode radios.

At NAB-'84, however, in what was good news to many broadcasters, Sony announced a major promotional campaign for its AM stereo product line. Sony also announced the addition of a third multimode receiver for automobile applications that should be available in 8-10 months.

The exhibits

Motorola had the greatest visibility on the exhibit floor at the convention, with three cars in the satellite dish parking lot equipped with Delco, Chrysler and Concord C-QUAM receivers, respectively. A fourth car containing a 1985 Delco radio was available for inspection at the Motorola booth on the convention floor. Several other radios and hi-fi component receivers also were shown. C-QUAM stereo exciters manufactured by Broadcast Electronics, Delta Electronics and TFT also were shown at the convention.

Kahn demonstrated its system with a receiver tuned to a Las Vegas AM station operating in stereo. Air checks of other Kahn stations across the country also were available for listening. The company's hospitality suite allowed critical evaluation using the Kahn Communications Stereo-Stereo car radio. Besides being multimode, the radio allows the listener to select upper or lower sideband reception to reduce adjacent-channel interference problems.

The Harris booth included a demonstration of the STX-1A stereo system operating through one of the new SX series transmitters. With a stereo pilot frequency of 25Hz, the signal was received on a Delco Electronically Tuned Radio (ETR), showing that the lower pilot tone allowed the Harris system to be decoded on C-QUAM receivers.

The Magnavox (PMX) system was shown on the convention floor by Continental Electronics, which manufactures the exciter and monitoring equipment used in the Magnavox transmission system. An operating demonstration was not provided.

Session highlights

Receiver fidelity was the main topic of conversation in the Tuesday afternoon AM stereo engineering session. The meeting was devoted to questions and answers with representatives of each of the four stereo system proponents, four receiver manufacturers (Panasonic, Delco, Sansui and Sony) and the FCC.

Delco received a fair amount of criticism from the large group attending the session for what some thought was the limited bandwidth of the company's AM stereo receiver, and Delco's decision to build a single-mode—rather than multimode/receiver. William Gilbert of Delco told the session that for a multimode radio to be attractive to the consumer, it must be totally automatic, with no extra knobs to adjust. He said that such designs may still be 2-4 years from reality. According to Panasonic, the price of a multimode radio also is important. The company sees single-system decoders adding from $5 to $15 at the retail level, while an automatically switchable multimode receiver might add $40 to $50. Panasonic views this price factor with concern, believing that the consumer is very price-conscious. Sony said, however, that its manually switched

Continued on page 42

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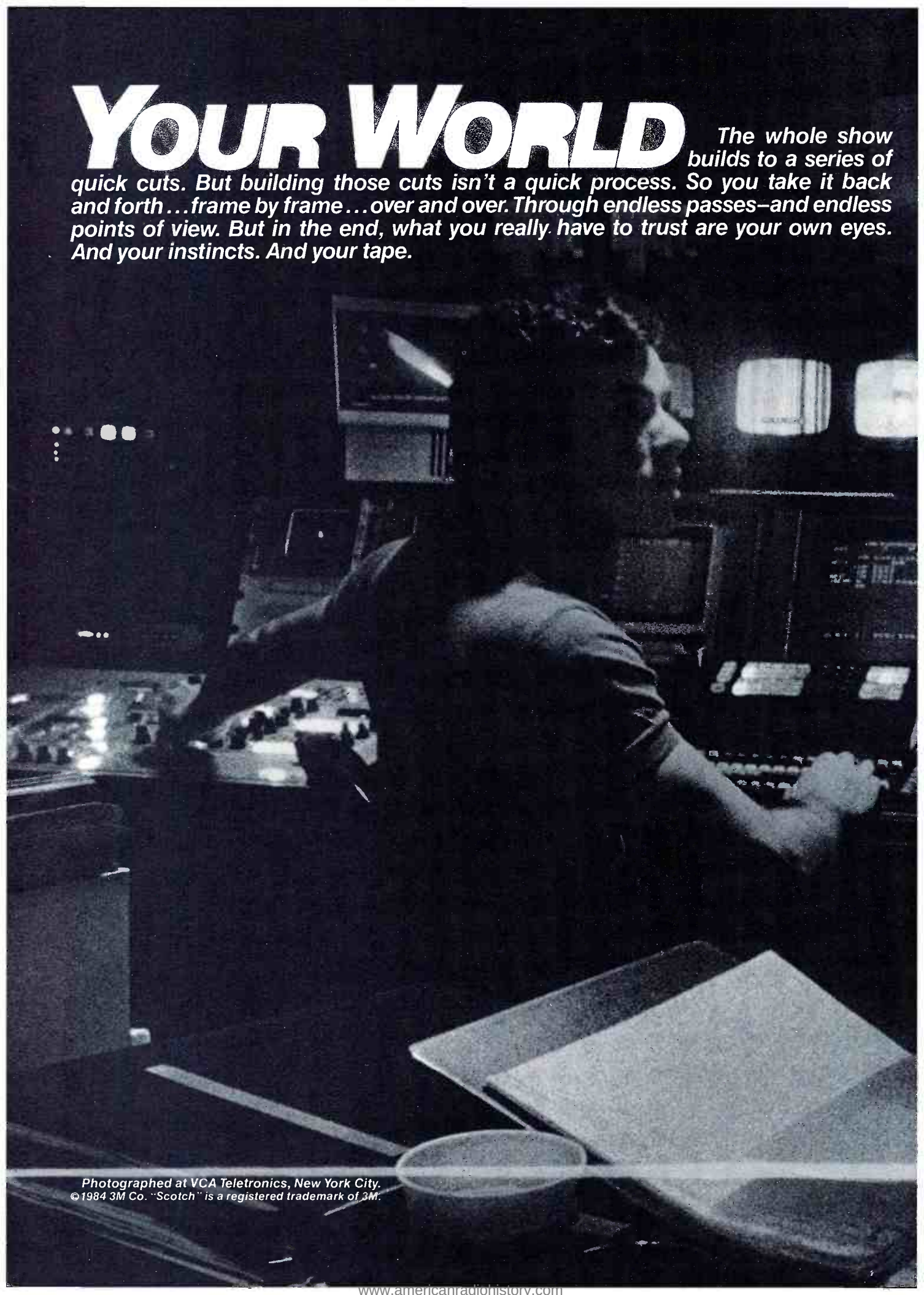
YOUR WORLD

The whole show builds to a series of quick cuts. But building those cuts isn't a quick process. So you take it back and forth... frame by frame... over and over. Through endless passes–and endless points of view. But in the end, what you really have to trust are your own eyes. And your instincts. And your tape.



Photographed at VCA Teletronics, New York City.

OUR TAPE

We know you need a videotape that can take the punishment of relentless editing. So we've taken the number one 1-inch tape in the world–our own Scotch® 479–and topped it. With Scotch 480. With the same excellent electromagnetics as 479. The same superior dropout performance. And the same laser-tested consistency. But with 480, we've made a tape that's still more rugged–capable of retaining original picture quality even after 1000 edit passes from the same pre-roll point. With less than 1½ dB loss. Without stiction. And with the backing of Scotch engineers just a call away. Scotch 479 and 480. Two of the tapes that make us…number one in the world of the pro.

Scotch®
AUDIO & VIDEO TAPES

NUMBER ONE IN THE WORLD OF THE PRO

3M

Circle (33) on Reply Card

Continued from page 38

multimode AM stereo decoder costs consumers about $25 and that the public is willing to pay the extra money for a high quality system.

The question of possible adjacent-channel interference generated by the Motorola C-QUAM system was discussed at the session. According to Frank Hilbert of Motorola, the company has monitored many of the stations using the system on the air, and they do not seem to be experiencing a problem. Leonard Kahn, however, said he believed there was an interference problem and theorized that was one of the reasons Harris moved its pilot frequency down to 25Hz. if the FCC should order the C-QUAM exciters off the air, Kahn said, Harris then will have turned defeat into victory, because the Harris system can be decoded by C-QUAM radios. Roger Burns of Harris said that was not the company's strategy, even though it believes the Motorola system has a bandwidth problem. Burns said the decision to switch pilot tone frequencies was made to improve the company's market position.

Burns told the engineering session that the decision to change pilot frequency was made after extensive listening tests of the Harris signal received on C-QUAM radios. According to Burns, the study results show that the average consumer is not likely to hear a difference, especially on a car radio.

The question of possible platform motion under strong co-channel interference conditions also was brought up. All systems except Kahn's can be subject to this problem. Frank Hilbert of Motorola said that the problem was real, but that it only occurred in cases in which reception was so poor that people would not be listening anyway. One broadcaster, however, said that the problem was not confined to fringe coverage areas, but also showed up within a station's primary coverage area.

Other developments

Robert Orban of Orban Associates presented an engineering paper that included measurements made on the Delco (C-QUAM), Sansui (multimode) and Sony (multimode) AM stereo receivers. The three units have substantial high frequency roll-off, with the flattest response from the Sony radio and the greatest amount of roll-off from the Delco radio.

The Orban curves showed that a substantial amount of transmitter pre-emphasis still was needed to give a reasonably flat received frequency response. Orban added that a standard for receiver IF response and de-emphasis had not yet developed. He told the session that a standard will be necessary for AM stereo receivers to achieve predictable sound quality for the consumer.

The battle

Overall, it seems as though Motorola has all of the pieces in place to become the dominant AM stereo system in the United States. The company unquestionably is in a good market position, with two sources of C-QUAM stereo exciters and monitors and two more sources awaiting FCC type approval; the C-QUAM AM stereo decoder chip; a second-source agreement for C-QUAM chips with Toshiba; 10 receiver manufacturers building or planning to build C-QUAM receivers; and more than 125 stations using the C-QUAM transmission method.

There are, however, more than 200 radio stations broadcasting with different AM stereo systems, and questioning problems they perceive with the Motorola method. Stations are pushing for more and better promotions of existing multimode receivers, thus freeing broadcasters to use whatever system they think performs best for their specific situations.

CLARITY

The purity of images attained from the absence of distortion or imperfections. Purity from using only premium magnetic materials and the most advanced production techniques. Purity resulting in a video tape of magnificent clarity. Ampex 196.

AMPEX

Ampex Corporation • One of The Signal Companies

Ampex Corporation, [illegible] 401 Broadway, Redwood City, CA [illegible]63, (415) 367-3809

Circle (35) on Reply Card

Radio exhibitors

AT&T COMMUNICATIONS

Skynet: Transponder and satellite communications services, via C-Band technology, include 1.5 service private line for voice, data or video; audio service for radio networks; transponder service for analog broadcast television or digital data; and TV service for 2-way commercial programming requirements.

Circle (475) on Reply Card

ALLEN & HEATH BRENELL MBI/AHB

Audio mixers: Syncon Series B and System 8 consoles designed for sound reinforcement and recording, with applications in broadcasting.

Circle (476) on Reply Card

ALLIED BROADCAST EQUIPMENT

WX-120 radar: The 3M Stormscope weather-mapping system displays track, speed and relative intensity of weather conditions for radio or TV talent; to improve reports for listeners.

Line equalizer: A product of Tellabs improves line audio quality for a local remote, remote control or other equalized line needs.

AK-10 Mark II: Direct-drive turntable isolator reduces acoustic microphonics by 20dB.

Elgin telephone interconnections: Mass-feed and recorder coupling products for news and sports department remote call-in applications.

A-Line console: Providing a studio atmosphere to the control room, the console places equipment at the operator's fingertips, with storage areas for records and tapes.

Circle (477) on Reply Card

AMERICAN DIVERSIFIED

Diversicom: SCA data distribution via FM broadcast.

Mobira Pocket: FM SCA paging receiver for nationwide paging service with LCD display of messages recalled from 6-message storage device.

Circle (478) on Reply Card

ARRAKIS SYSTEMS

500SC: Rotary fader console addition to the SC series provides 8-channel mixing from 22 balanced inputs with VCA control and stereo tracking within 1dB.

Series 1000: A complete line of studio furniture made of hardwood plywood with solid oak trim; matching table-top cart racks and rack cabinets; custom designs available.

3000 series: Modular audio consoles in 8-, 16- and 24-channel formats with two channels per input, P&G slide faders and pre-fader patch points; in solid oak trim.

Circle (479) on Reply Card

AUDIO ENGINEERING ASSOCIATES

Representative: Coles 4038 ribbon microphone; a bidirectional unit developed in cooperation with the BBC; Schoeps collette series microphones.

MS-38 matrix decoder: Transformerless device provides decoding of the Mid and Side (sum and difference) signals into conventional left and right stereo.

Circle (480) on Reply Card

AUDITRONICS:

300 series: For four or eight outputs with discrete stereo and mono mixes; up to 32 channels have P&G slide faders for VCA control of levels on inputs and outputs. Many accessories are enhanced by optional VCA input grouping and submaster control.

Circle (481) on Reply Card

see ads on page 85 and 114

BGW SYSTEMS

Distributor: Tannoy audio monitors and Nakamichi DMP-100 digital mastering processor.

Distribution network: Passive balanced splitter with one balanced input providing 24 balanced outputs; may be wired for one stereo unbalanced input to 24 unbalanced outputs; handles audio or time code signals.

Circle (482) on Reply Card

BELAR ELECTRONICS

Model SCM-2: Monitor unit comparable to FMM-2 monitors; features four subcarrier frequencies with low distortion circuitry.

Stereo demod: Stereo demodulator as found in FMS-2; packaged separately for greater than 70dB separation; distortion less than 0.01%; designed for demodulation of STL composite links for AM stereo applications.

Circle (483) on Reply Card

see ad on page 130

BLACK COMMUNICATIONS

Search & Compare: Computer software with product information service available by computer disk for Commodore 64, IBM, Kaypro, Apple, TRS80 and Sony SMC70.

Circle (484) on Reply Card

BROADCAST CARTRIDGE SERVICE

Distributor: Cartridge tape products including Aristocart, Fidelipac, 3M Scotchcart and the Capitol/Audiopak AA-4 unit.

Associated products: Cartridge storage systems, reloading services and alignment tools.

Circle (485) on Reply Card

CSI ELECTRONICS

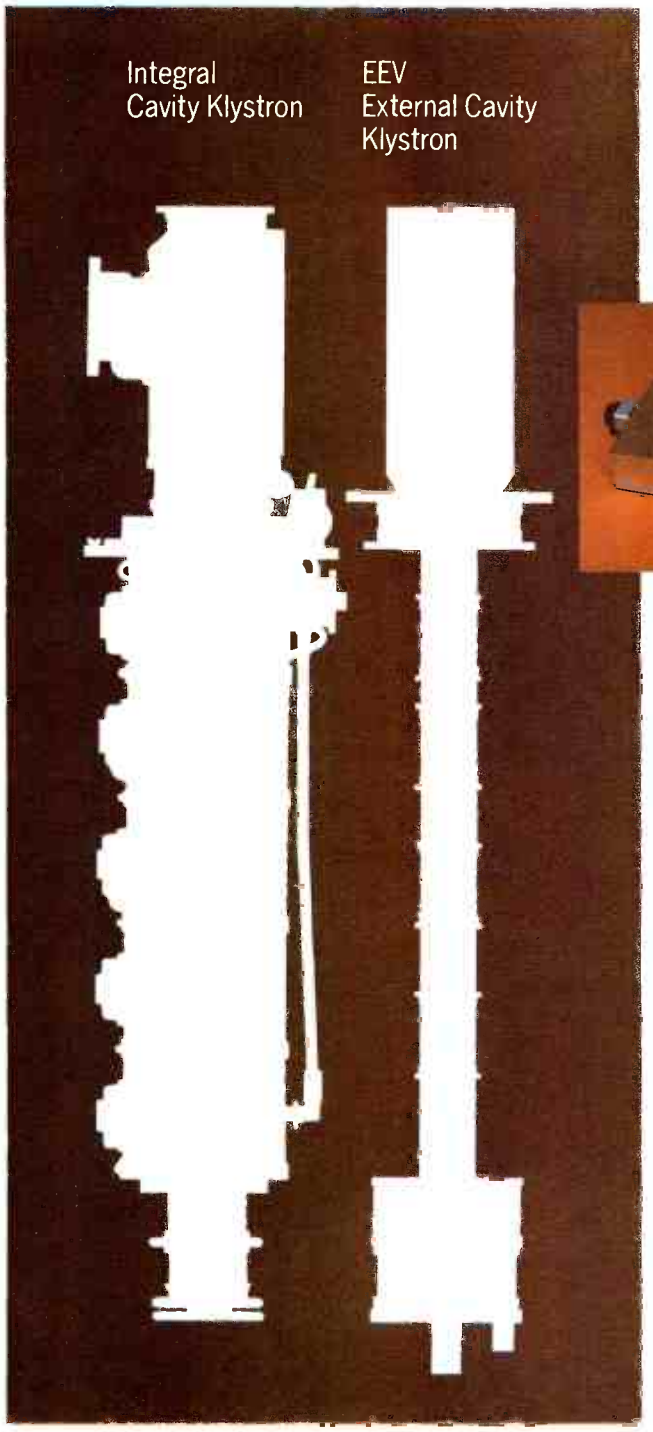
T-100-A1 AM transmitter: 110kW-rated transmitter system capable of operating on an assigned frequency from 500kHz-30MHz with high efficiency Class C power output section; front access to all major tuning and adjustment controls.

T-5-A2: AM broadcast transmitter rated at 5kW.

Circle (486) on Reply Card

see ad on page 136

THE SHAPE OF THE KLYSTRON YOU USE DETERMINES YOUR OPERATING COSTS.



How are you shaping up on reducing your UHF transmitter operating costs? Not as well as you should be if you aren't yet using EEV external cavity klystrons.

The latest external cavity klystrons from EEV are achieving major savings for an increasing number of users.

With compatible drivers enabling efficiencies well above 40% compared to as low as 30% on some integral cavity installations, EEV klystrons are saving as much as 55 kW on beam power – and efficiencies above 60% are achievable with Beam Control Device (BCD) operation.

EEV was first to produce a high power (45-58 kW) wide band external cavity klystron to cover the whole UHF TV spectrum. What is more, instead of 6 different tubes, now only one is needed for either water or vapor cooled applications. This also applies to EEV's medium (30 kW) and low power (15 kW) klystrons – which all means a substantial saving in spares inventory!

All this adds up to a package which could pay for itself within three years and is easy to install. Simple on-site tuning of these alumina ceramic external cavity klystrons allows greater efficiency than the pre-tuned integral types.

This is why we believe EEV external cavity klystrons are the shape of things to come.

If you'd like to know more, call us today.

EEV Inc, 7 Westchester Plaza, Elmsford, NY 10523, USA. Tel: 914 592 6050. Telex: 6818096.
EEV Canada Ltd, 67 Westmore Drive, Rexdale, Ontario M9V 3Y6. Tel: 416 745 9494. Telex: 06 989 363.
EEV, Waterhouse Lane, Chelmsford, Essex CM1 2QU, England. Tel: 0245 261777. Telex: 99103.

EEV Klystrons

Circle (36) on Reply Card

CABLEWAVE SYSTEMS

FLC cable: Low loss foam Wellflex cable in ½-, ⅞- and 1⅝-inch OD sizes, providing maximum frequency operation at 8GHz, 5GHz and 2.5GHz, respectively, with 88% velocity of propagation.

Circle (487) on Reply Card

CALVERT ELECTRONICS

Distributor: Tube products include EIMAC, Thomson-CSF and RCA transmitting power tubes as well as RCA Saticon II camera tubes.

Computer lens: ⅔-inch format zoom lens covers 10-120mm with f/1.6 aperture and MOD of 1m, with macro feature to 50mm from lens. Two types cover Matsushita, Sony, Hitachi and Ikegami cameras.

Circle (488) on Reply Card

see ad on page 14

CELWAVE RF

Transmission line products: Antenna systems and hardware, transmission line and line pressurization equipment, coaxial cable and wire products, as well as patch panels and associated cables.

Circle (489) on Reply Card

see ad on page 27

CETEC ANTENNAS

JSDP FM system: True circular polarization from directly grounded element broadband antenna system; wideband system has sleeve dipole design to allow one antenna to serve more than one high power station.

Circle (490) on Reply Card

see ad on page 12

CHANNELMATIC

Spotmatic: Random-access commercial insertion system allows up to 100 spots per cassette; expands to control 32 non-modified Sony Type 5 U Format VCRs, for multiple-channel automation. (Spotmatic Jr. operates one VCR.)

Logmatic Jr.: Automatic 4-channel commercial insertion logging system with printout of time, date, channel ID, advertiser and spot information.

CVS-3000A: Commercial verification system for positive auto logging of commercials in terms of quality, time and date of presentation.

LPS-3000A: LPTV local program system automatically controls 10 VCRs for up to 10 hours of continuous programming or programming with commercial breaks.

PCM-3000A: Microprocessor-based, programmable 7-day clock with 1-minute resolution for automated switching of signal paths.

ALD-3000A: Audio level detector module improves reliability of satellite tone decoder system.

Circle (491) on Reply Card

CHEMIGRAPHIC PRODUCTS

289-1 studio/location cart: Ferno Salesmaker transport cart carries up to 300 pounds of equipment, with legs that lock into place on unloading from vehicle, yet easily fold on reloading.

Circle (492) on Reply Card

CLYDE ELECTRONICS

Beta consoles: Modular and flexible mixing consoles allow easy reformatting of the system from one application to another; for stereo or 2-group use.

Circle (493) on Reply Card

COMPUTER CONCEPTS

TSA: Total System Automation combines the business and logging end of the radio broadcast station with Broadcast Electronics Control 16 automation equipment.

Circle (494) on Reply Card

COMREX

PLX II transmitter: Frequency extender system operating from Shure M67 remote mixer; ac or 18Vdc powering; integral telephone interface circuitry.

RLX II: Desk-top frequency extender decoder with integral telephone coupler, compatible with all Comrex single-line encoders; includes bypass switch allowing use as standard telephone coupler for incoming phone line feeds.

Circle (495) on Reply Card

see ad on page 26

COMTECH DATA

Dart 384: A digital audio receiver terminal operates from the Comtech 3.8m receiving dish antenna for network audio directly from the satellite with full fidelity and operator control.

Circle (496) on Reply Card

CONTINENTAL ELECTRONICS

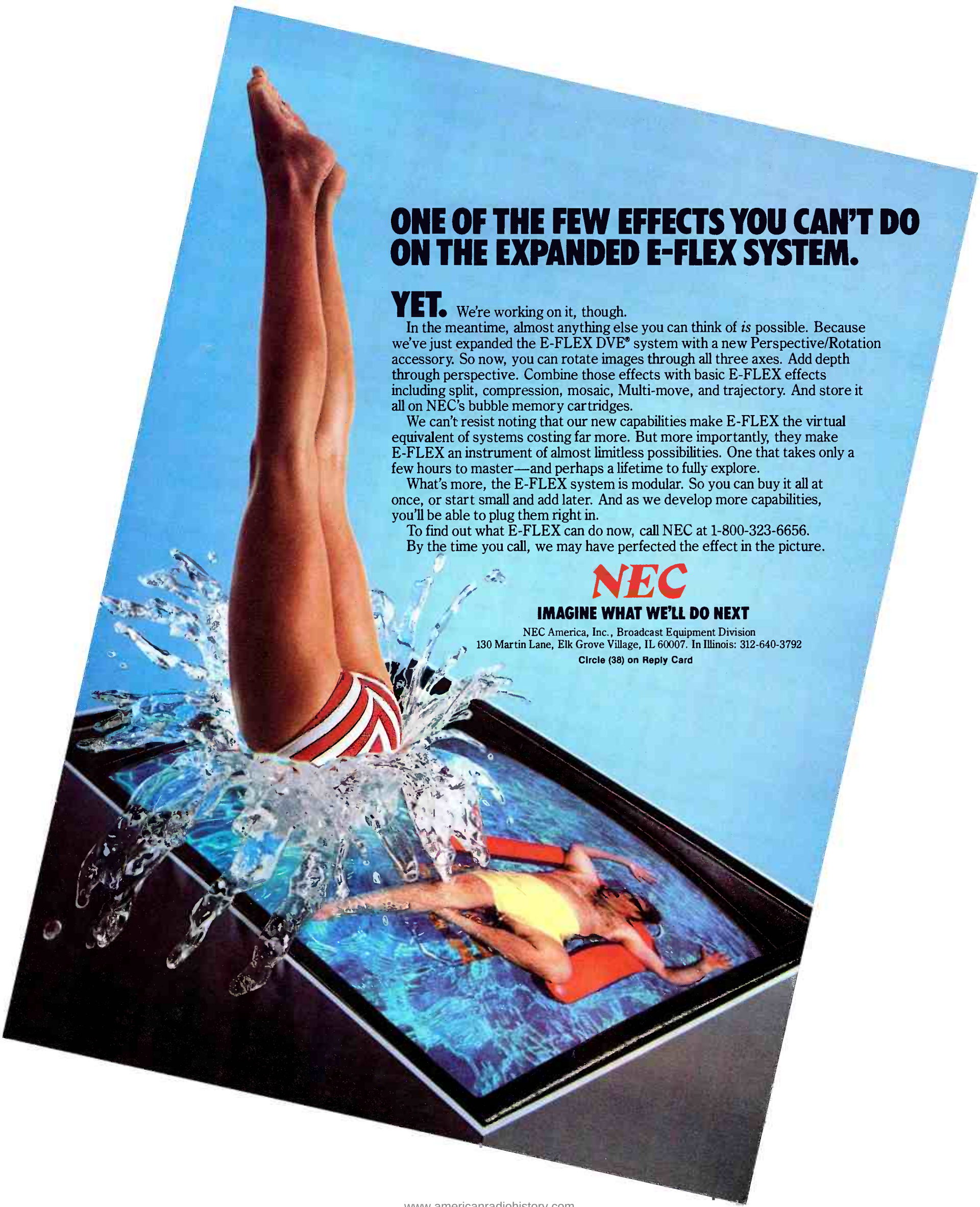
518SW-1 switch: A 4-port coaxial transfer switch offering high isolation, low VSWR operation with high power capability and action measured in milliseconds.

802A exciter: Solid-state FM exciter includes 5-50W variable output with integral harmonic filter, allowing use as a low power FM transmitter.

817A transmitter: FM broadcast system using broadband solid-state driver with single 4CX40000G EIMAC final in re-entrant ½-wave cavity amplifier; rated 60kW; microprocessor system provides system monitoring and remote-control interface over voice-grade circuit.

Circle (497) on Reply Card

see ad on page 76



CREST AUDIO

POWERline: Power amplifiers rated at 680W (EIA) and 950W (EIA) into 8Ω loads with response of 0, −0.2dB from 30Hz-20kHz, showing −50dB crosstalk at 20kHz and −100dB hum/noise rating (A-wtd).

1001A/1501A: Audio power amplifiers for 130W and 280W into 8Ω loads by EIA rating of 1% THD at 1kHz; response suggested 0, −3dB from 5Hz-130kHz; IMD less than 0.04%; and −95dB hum/noise A-wtd.

Circle (498) on Reply Card

CUSTOM BUSINESS SYSTEMS

Computer products: Total radio station business software system with Wang hardware.

Circle (499) on Reply Card

PETER W. DAHL

Rectifiers: High voltage rectifier products to handle up to 40kV PIV with 25A forward-current capability.

Transient suppressors: Selenium and metal oxide varistor (MOV) technology, primary transient suppressor devices.

Circle (500) on Reply Card

DATAWORLD

Information services: A variety of computer-based information services available through the Eclipse S/140. Data areas include AM, FM, television, LPTV, translator, LTFS/MDS information, tower studies and FLAG for FCC releases that affect your station.

Circle (501) on Reply Card

ELCOM-BAUER

ET-1 transmitter: Designed for emergency use, a synthesized FM exciter combined with 250W PA in a portable cabinet; small for easy transportation to hard-to-reach locations.

Circle (502) on Reply Card

ELECTRONIC RESEARCH

Series 1000 antennas: FM panel antenna designs for single-and multiple-station operation.

Series 400 transformers: Isolation transformer units to couple FM power across the base insulator of an AM tower used jointly as an AM/FM radiator, in power ranges from 10-50kW.

Circle (503) on Reply Card

ELECTRONIC SYSTEMS LABORATORIES

Distributor: EELA Audio products, including S22 Reportophone, designed for Dutch NOS network to interconnect remote reporters via phone lines; S150 on-air console, using XLR connectors for all external interconnection of audio signals.

Circle (504) on Reply Card

EMCOR PRODUCTS

Enclosures: Six product lines of rack and console sections, hardware and accessories for the control room, edit suite or elsewhere, with modified products available upon special request.

Circle (505) on Reply Card

EVENTIDE

SP2016 enhancements: For the versatile effects processor/reverb system, additional software, now offering reverb, Digiplex echo, robot voice, musical combs, chorus effects, delay, selective band delay and flanging/phasing.

Circle (506) on Reply Card

FENWAL

Fire suppression: Protection for station equipment with Halon 1301; leaves no residue to destroy or damage equipment.

Circle (507) on Reply Card

FIBERBILT

808 Supercase: Transportation case of high density polyplex with heavy-duty hardware; features tongue-in-groove valance and gasket for moisture protection.

Circle (508) on Reply Card

FICON BROADCAST

Computer system: Based on IBM PC computer, software for radio traffic and accounting needs, including billing, programs logs, avails, projections, sales analysis and general ledger.

Circle (509) on Reply Card

FIDELIPAC

CRT 100: Dynamax tape cart machines for A and B carts, with Cart Scan mono-stereo/phase sensing and automatic compensation, variable speed, elapsed time counter, cleaning switch, cue tone sensing at any speed and other requested features.

Dynamax tape: Three formulations provide standard, HOLN and HOLN-DX broadcast tapes on back-lubricated, 1 mil Mylar base film. Cross-linked urethane resin binder increases life to 10,000 plays with minimal oxide shedding.

Dynamax reload kits: A and AA Fidelipac carts are reloaded within 60 seconds from drop-in kits with new pressure pads; available in all standard time lengths.

Master Cart DX: With bias compatibility to other high output, low noise tapes, for record levels to 400nWb/m without overload; in all standard lengths of series 700 HOLN-DX magnetic medium materials.

Circle (510) on Reply Card

see ad on page 39

GENERIC COMPUTERS

Computer software: Logging function program for the IBM and Apple PC systems.

Circle (511) on Reply Card

GORMAN-REDLICH

Receivers: Specialized receivers for National Weather Service and EBS emergency alert systems.

Circle (512) on Reply Card

DAVID GREEN

Distributor: Audio and broadcast products for the industry.

Circle (513) on Reply Card

GREGG LABS

2040 console: Mixes 24 inputs through 14 mixing channels into three stereo outputs plus three mono outputs for on-air applications.

MatchBox: From Henry Engineering, interconnects consumer and semipro equipment to professional studio systems.

Turntable controller: Henry Engineering product adds full remote-control capability to popular direct-drive turntables. Each interface unit controls two turntables.

Circle (514) on Reply Card

INOVONICS

TVU display: Unit connects in video line to superimpose bar-graph display of stereo audio levels into a corner of the TV image.

260: Stereo processor with slow, gain-riding AGC and split-spectrum average level compressor/peak controller conforming to the 75μs curve.

387 amplifier: Reproduce-only magnetic preamp module with metering, trim control, 3-group level set and 3-point EQ preset for NAB, IEC and SMPTE characteristics.

Circle (515) on Reply Card

KAHN COMMUNICATIONS

AM stereo system: Exciter and receiver products for the Kahn AM stereo format.

Circle (516) on Reply Card

LPB

AM series: Low power AM transmitters at 50W, 100W and 150W ratings in rack-mounted subassemblies (exciter, RF power amp and power supply) are remote-controllable.

AM-25 transmitter: Replacing the TX2-20 system, the Silver Anniversary special unit is rated 25W into a 50Ω unbalanced load, generated from a solid-state crystal oscillator operating at 6X the output frequency.

Circle (517) on Reply Card

LIGHTNING ELIMINATION ASSOCIATES

Continuous Power Source: Autonomous power source provides user with uninterrupted, safe, regulated power for sensitive electronics.

Circle (518) on Reply Card

MCG Electronics

Surge-Master: Heavy-duty ac power line protectors for defense against overvoltage transients.

TM-115 monitor: Detector for transients and surges that cause electronic failure or malfunction.

DPL-8109: Data line protectors, to reduce transients on RS-232 signal lines.

Circle (520) on Reply Card

see ad on page 138

MAGNUM TOWERS

Triangular towers and knock-down tower sections for broadcast.

Circle (521) on Reply Card

MARTI ELECTRONICS

Remote pickup transmitter/receiver products, remote-control systems and STL units.

Circle (522) on Reply Card

McCURDY RADIO INDUSTRIES

CS9400 intercom: Digital control allows programmability of each key panel from master control console via a single pair of wires for each panel, with full redundancy.

SS8810E console: 10-mixing-channel audio control board.

Circle (519) on Reply Card

MEADOWLANDS COMMUNICATIONS

Starlink: Audio and video uplink services, in association with AT&T.

Circle (523) on Reply Card

MICROTEK COMPUTER CONSULTANTS

Time-Slot: Software scheduling system to handle administrative personnel needs for the broadcast station, for apple and IBM.

Circle (524) on Reply Card

MODULAR AUDIO PRODUCTS

IMPAC series enhancements: Additional modular products include the 4820 series audio DA and 4046 line mixing amplifier.

Other new products include the 2100 power supply module, 7102 modular stereo compressor system and 7301 newsroom switcher.

Circle (525) on Reply Card

see ad on page 132

KEITH MONKS AUDIO

Record care products: Phono disc cleaning systems.

Circle (526) on Reply Card

MOTOROLA COMMUNICATIONS & ELECTRONICS

SCA1000 pager: Using signals from FM broadcast subcarriers, a portable battery-operated radio pager with programmable code module for binary digital signaling.

Circle (527) on Reply Card

IT'S YOUR CHOICE...

248 ANY WAY YOU MIX IT!

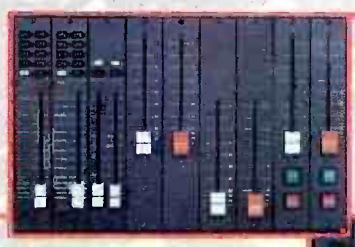
Your choice of:

5 INPUT MODULES

Mic/Line Equalized Mono Input — Transformerless, or Microphone Input Transformer; 4 to 1 Stereo Mix, or 1 of 4 Stereo Select Line Input, and a 4 Input Mic Mixer (not shown).

8 CHANNEL ASSIGNMENT MODULES

2 Channel, Mono or Stereo Source; Stereo PGM/AUD Channels, 4 Channel, Mono or Stereo Source, and 8 Channel Mono or Stereo Source. These Modules can also be used for re-assignment of Sub-master Outputs.



9 FADER MODULES

VCA Mono Fader, VCA Stereo Fader, VCA Dual Group Master Fader, Top Position Mono or Stereo Faders, Mono or Stereo Faders, and Mono or Stereo Faders with Start-Stop Switch.

7 OUTPUT GROUP MODULES

Echo Fader with Mono Output, Mono Output, Stereo Output, Cue/Reverb Output and Output Equalizer, 4 Channel Program/Tape Monitor Mixer, and 4 Channel Bus/Film Composite Mixer.

Whatever your need or application — Film, Recording, Live Sound, Fixed Installation, Broadcast Production or Post Production, the **248 Component Series** from **QUAD EIGHT/WESTREX** can be configured to suit your *exact requirements.*

Circle (41) on Reply Card

quad eight/ Westrex

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Telephone: (01)-578-0957 Telex: 923003

NITTY GRITTY

Distributor: Loftech products TS-1 audio test set by Phoenix Audio Lab.

Circle (528) on Reply Card

OTARI

EC-400: Resolver products for improved tape-speed sensing and control.

DP-80 series: High speed tape duplication products.

Mastering recorders: MTR-20 for studio and audio post-production or BTR-20 for broadcast production, on-air use and editing; with automatic record calibration of level, bias, HF, MF and phase compensation; 4-speed; four cue-point storage.

Circle (529) on Reply Card

PHILADELPHIA RESINS

Electrostatic fitting: Trumpet-shaped tower guy fitting to reduce problems resulting from electrostatic fields concentrated around grounded broadcast towers; flux reduction by a factor of 8:1.

Circle (530) on Reply Card

POTOMAC INSTRUMENTS

RC 16+: Automatic remote control provides 16 telemetry and status channels with 32 control functions; expands in groups of 16 to 64 telemetry and status channels with 128 control functions.

FIM72: UHF field-strength meter covers 470-960MHz with continuous tuning, selectable peak or averaging detector, wide or narrow IF and 140dB range from 1μV-10V.

MPC-11: Modulation and power control system accommodates up to three power levels and/or antenna patterns for main or alternate transmitters, with carrier shift compensation.

Circle (531) on Reply Card

see ad on page 42

PROCART

Representative: Monroe Electronics 6002/6003 remote-control systems using digital codes to control and monitor unattended locations. The 6002 connects via telephone lines and the 6003 includes radio applications.

Circle (532) on Reply Card

PROGRAMMING PLUS

Computer software: Auto-rotator, a music-select system, operates on Zenith, IBM, COMPAQ, Eagle, Columbia and other similar computer systems.

Circle (533) on Reply Card

QSC AUDIO

PowerLimit 1: Octal input module for Series 1 or 3 amplifiers forms comp/limiter function to avoid overdriving speakers.

1080: Series 1 moderate power amplifier for professional or commercial systems with delayed turn-on, instant turn-off with pop filter, active balanced inputs and recessed calibrated gain controls.

Circle (534) on Reply Card

RF TECHNOLOGY

Microwave systems: Fixed, portable, camera-mounted and airborne equipment for use in ENG bands at 2GHz, 2.5GHz, 7GHz and 13GHz, with matching receiver systems, low noise amplifiers and power amplifiers.

Circle (535) on Reply Card

RADCOM

Distributor: Audio and radio products from many popular manufacturers.

Circle (536) on Reply Card

RADIACION Y MICROONDAS SA

Antenna systems: Antenna systems, coaxial products and transmission accessories for all forms of radio communications.

Circle (537) on Reply Card

REGISTER DATA SYSTEMS

Computer systems: Station business systems cover the many financial needs of the broadcaster.

Circle (538) on Reply Card

RICHARDSON ELECTRONICS

Distributor: All major brands of camera and transmitter power tubes in stock.

FM-1kW-IPM: Solid-state power amplifier system covers the entire 88-108MHz FM band.

Circle (539) on Reply Card

RUSSCO ELECTRONICS

RT-700 turntable: Direct-drive system uses fully electronic quartz crystal control of stable, selectable speeds. Membrane switching adds reliability.

Circle (540) on Reply Card

SANSUI ELECTRONICS

DC-PCM: Digital transmission system combines near-instantaneous companding PCM with differential PCM for greater efficiency with improved signal-to-quantizing-noise ratio.

X-balanced systems: Applicable to line and power amplifiers, an electronically balanced system operates independently of ground; requires a floating power supply.

Circle (541) on Reply Card

SCHAFER

Distributor: Denon Compact Master digital audio disc player with total random selection of any segment of 100 CD discs; worse case access time at 13 seconds.

Circle (542) on Reply Card

SCREEN SOUND

Mediacalc calculator: Shirt-pocket calculator for film/time code conversions.

Laserdisc sound access: Menu-driven system allows access to effects or music cues from laserdisc storage medium.

Circle (543) on Reply Card

SINGER BROADCAST

Distributor: Many product lines; include audio/tape recorders, mixers, audio processing systems, automation systems, microphones and turntables.

Circle (544) on Reply Card

SONO-MAG

Series 800: Model 450-452 carousel automation systems; microprocessor-controlled logic allows bidirectional action for half the access time.

ESP-2 automation: Fiber-optic cables link control head with system for up to 300-foot control lines without RF pickup; 7-day programming; 4000-event memory, expandable; CRT displays of status in English.

Circle (545) on Reply Card

SONY PROFESSIONAL AUDIO

Wireless mic: Frequency-synthesized VHF wireless mic, operating on any one of 48 frequencies in 174-216MHz spectrum.

Sync master: Time-code-based synchronizer for audio, video and film production; uses SMPTE/EBU studio bus protocol.

JH—110C-3-TC: Two-channel audio recorder/reproducer with center time code track on ½-inch magnetic tape.

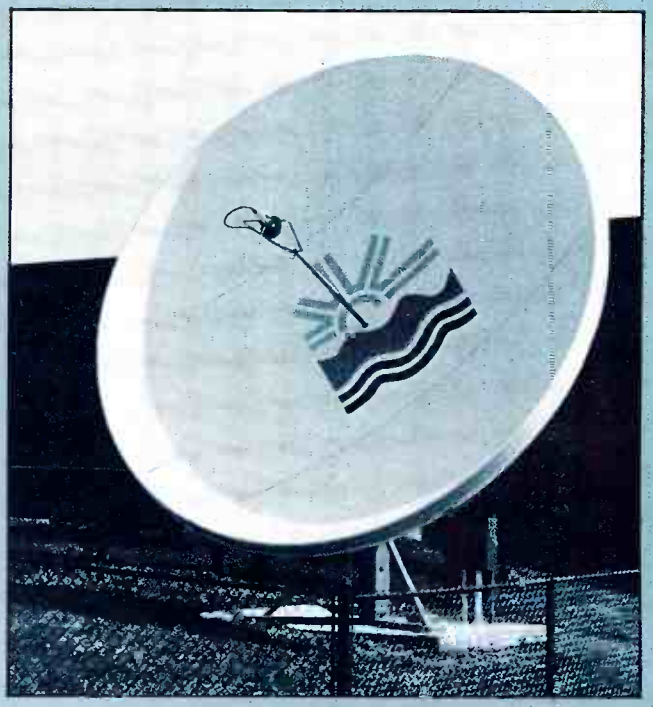
JH-800 enhancement: Option 23, a video editor interface, connects the audio mixer to the editing control system.

CDP-3000 player: Compact digital disc playback system with CDS-3000 control unit to handle up to eight players with 1-frame accuracy at start and stop points.

Circle (546) on Reply Card

Our Message Is Clear

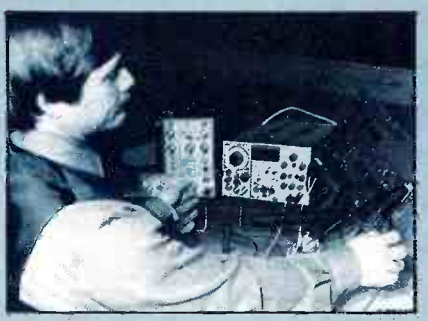
- Communications will shape the future . . .
- Electronic & Broadcast technologies at Hocking Technical College will provide you the skills to be a part of this exciting transformation.



Hocking Technical College, a two-year, state assisted, Associate Degree granting college, in rural Southeastern Ohio, serves 4000 students in over thirty programs. The College offers unique programs in Recreation and Wildlife, Forestry, Heat Processing, Ceramics, Tree Care, Compressed Natural Gas/Automotive, Oil Drilling and Production, Travel and Tourism, Hotel-Restaurant Management and Culinary Arts where students operate the full service Hocking Valley Inn. The College operates Lang Hall, a resident dormitory on campus.

Join these successful graduates in the Electronics & Broadcasting Industries . . .

DAVID RILEY
Media Technical Supervisor



RON LANNING
Electronics Instructor

JOSE PEREZ
Audiovisual Technician

Please Write: Admissions Electronics/Broadcasting
Hocking Technical College Nelsonville, Ohio 45764
or Phone 1-614-753-3591 for more information.

Circle (42) on Reply Card

SPECTRUM PLANNING

Engineering consultants: Frequency engineering and consultant service, applications assistance and coordination.

Circle (547) on Reply Card

SPENCER BROADCAST

Distributor: Howe Audio and Auto-Path Associates consoles and audio components as well as DA-1 digital audio recorder; lines include EFI filtering products and surge suppression devices.

Circle (548) on Reply Card

STRAIGHT WIRE AUDIO

3D/RP retrofit: Module for older ITC 3D and RP cart machines provides improved sonic performance.

MTX-2 matrix: Optimizes FM stereo coverage by separate compression of L + R and L – R signals.

Circle (549) on Reply Card

SYSTEMATION

X-7 automation: Full random access of audiocassette for 7-day walk-away operation; interfaces to satellite-programmed stations with control of up to 63 cassette decks from TEAC, TASCAM or Studer Revox.

Circle (550) on Reply Card

TFT

7700B series: IF-modulated STL with synthesized frequency control improves S/N rating and distortion of conventional frequency multiplication-type units.

TFT 8300: STL system designed for dense RF signal environments in 950 MHz spectrum with selectable receiver bandwidth, selectable gain RF preamp, IF modulation and automatic switchover.

FM monitors: 844 FM/baseband/stereo and 845 FM/SCA monitor products for remote and on-site use; 844 offers automatic bandwidth selection, while companion 845 allows up to 3-subcarrier frequency selection.

C-QUAM products: 840 exciter and 841 transmission monitor for the Motorola AM stereo system.

830 generator: For subcarrier operation with FM or television for multichannel sound, paging, data transmission or programming, includes sync lock input for multi-channel TV sound use.

867 FM-SCA receiver: Factory set to a desired frequency between 88-108MHz with switch-selected main channel or SCA channel monitoring.

SCA4 FM SCA module: Plug-in assembly as a system component in FM-SCA applications, allows expanded SCA channel use for paging, data and special audio transmissions.

Circle (551) on Reply Card

see ad on page 123

TTC/WILKINSON

XL1000TU: UHF TV transmitter combines Philips modulator with XL1000AU power amp, featuring internal diplexing and PIN-diode attenuator control of power output from 300W-1.2kW.

FM–3500E: FM stereo transmitter using FME-10 exciter, solid-state IPA (FM-700J) and grounded grid 3CX3000 final amplifier, featuring 800% overcurrent and 400% overvoltage protection; rated to 3.5kW.

LTU series: Antenna tuning units for AM systems with ratings from 1-50kW.

Circle (552) on Reply Card

TELEPAK SAN DIEGO

Gaffer's bag: Water-repellent nylon construction, padded with cross-linked polyethylene foam, four externally zippered compartments with accessory pockets inside.

Circle (554) on Reply Card

TERMINAL SYSTEMS

Newsroom terminal systems: Acorn and Copy Control IV computers for wire service, editor/reporter applications and news bureaus, with complete word processing, modems, printers, disk storage, CP/M, MP/M operating systems.

Circle (555) on Reply Card

TORPEY CONTROLS & ENGINEERING

T-900 translator: Telcom Research VITC to LTC time code translator system automatically selects NTSC or PAL operation; produces true reverse LTC.

Circle (556) on Reply Card

TWEED AUDIO LTD.

Custom systems: Specialized designs for audio in radio, TV and production facilities.

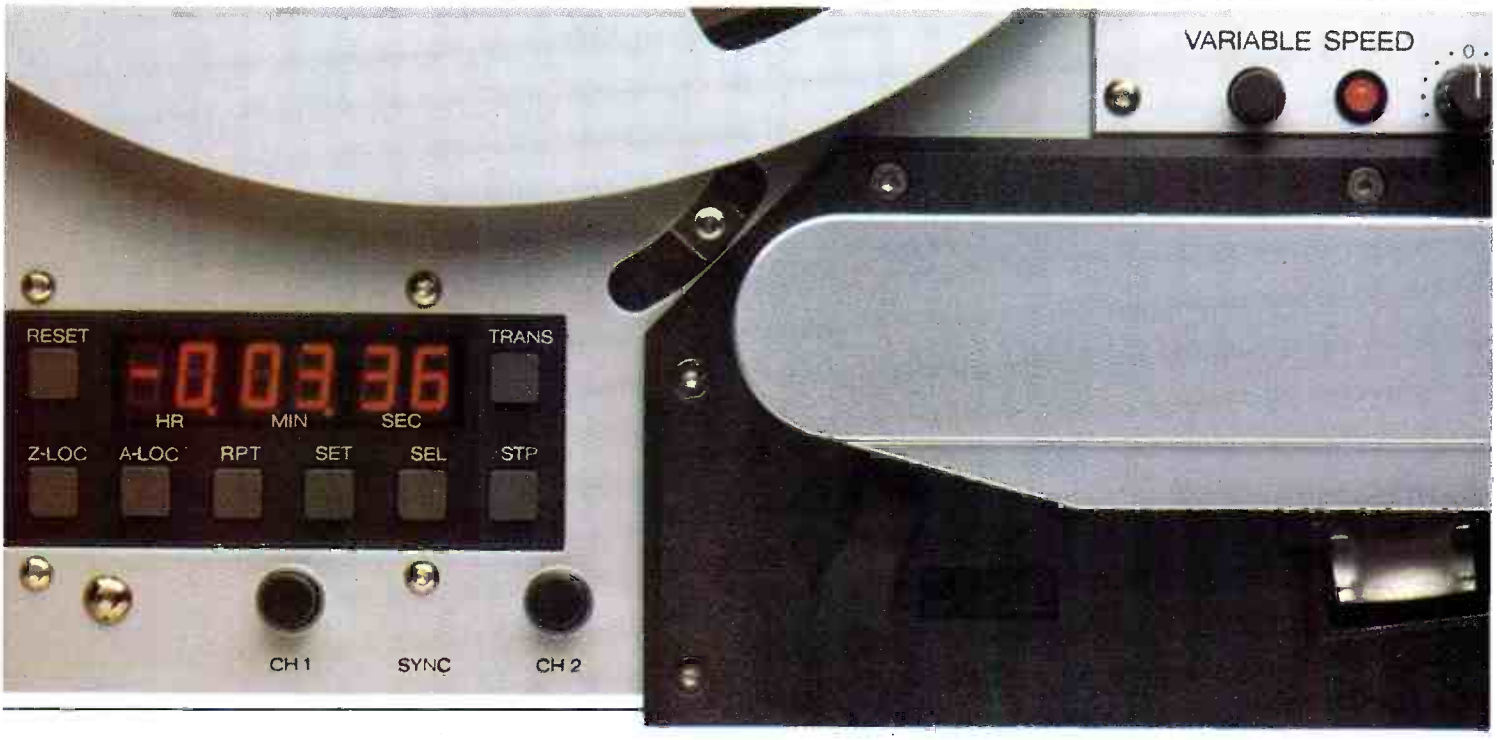
Audio switcher: See "Routing Switcher Update" on page 112.

Circle (557) on Reply Card

UREI/JBL

CallCount: Answers and greets telephone callers, tallies the number of calls and provides an RS-232 interface to show the totals on a video display or unit read-out.

Circle (558) on Reply Card



On adding time-saving production features to a proven audio recorder design.

The updated PR99 MKII, now offering a microprocessor controlled real time counter, address locate, zero locate, auto repeat, and variable speed control, can improve your audio production efficiency. And, as before, it's built to meet strict Studer standards for long-term reliability.

Welcome to real time. The PR99 MKII's real time counter gives a plus or minus readout in hours, minutes and seconds from −9.59.59 to +29.59.59. Counter error is less than 0.5%, and the microprocessor automatically recomputes the time displayed on the LED counter when you change tape speeds.

Fast find modes. Press the address locate button and the PR99 MKII fast winds to your pre-selected address, which may be entered from the keyboard or transferred from the counter reading. Press zero locate and it fast winds to the zero counter reading. In the repeat mode, the PR99 plays from the lower memory point (zero or negative address) to the higher point, rewinds to lower point, and re-activates play mode for a continuously repeating cycle.

Pick up the tempo? When activated by a latching pushbutton, the front-panel vari-speed control adjusts the nominal tape speed across a −33% to +50% range. The adjustment potentiometer is spread in the center range for fine tuning of pitch.

Future perfect. The PR99 MKII also offers a serial data port for direct access to all microprocessor controlled functions.

Much gained, nothing lost. The new MKII version retains all features of its highly regarded predecessor, including a die-cast aluminum chassis and headblock, balanced and floating "+4" inputs and outputs, self-sync, input mode switching, and front panel microphone inputs.

European endurance. Designed and built in Switzerland and West Germany, the PR99 MKII is a product of precision manufacturing and meticulous assembly. Every part inside is made to last.

To discover more about the world's most versatile and dependable budget-priced recorder, please contact: Studer Revox America, Inc., 1425 Elm Hill Pike, Nashville, TN 37210; (615) 254-5651.

STUDER REVOX

PR99 MKII with optional carrying case and monitor panel. Roll-around console also available.

Circle (44) on Reply Card

SONY TRINITRONS HAVE BEEN YOUR PICTURES CAN LOOK

1 An Aperture Grille, which doesn't warp, instead of a shadow mask, which does—for high color purity.

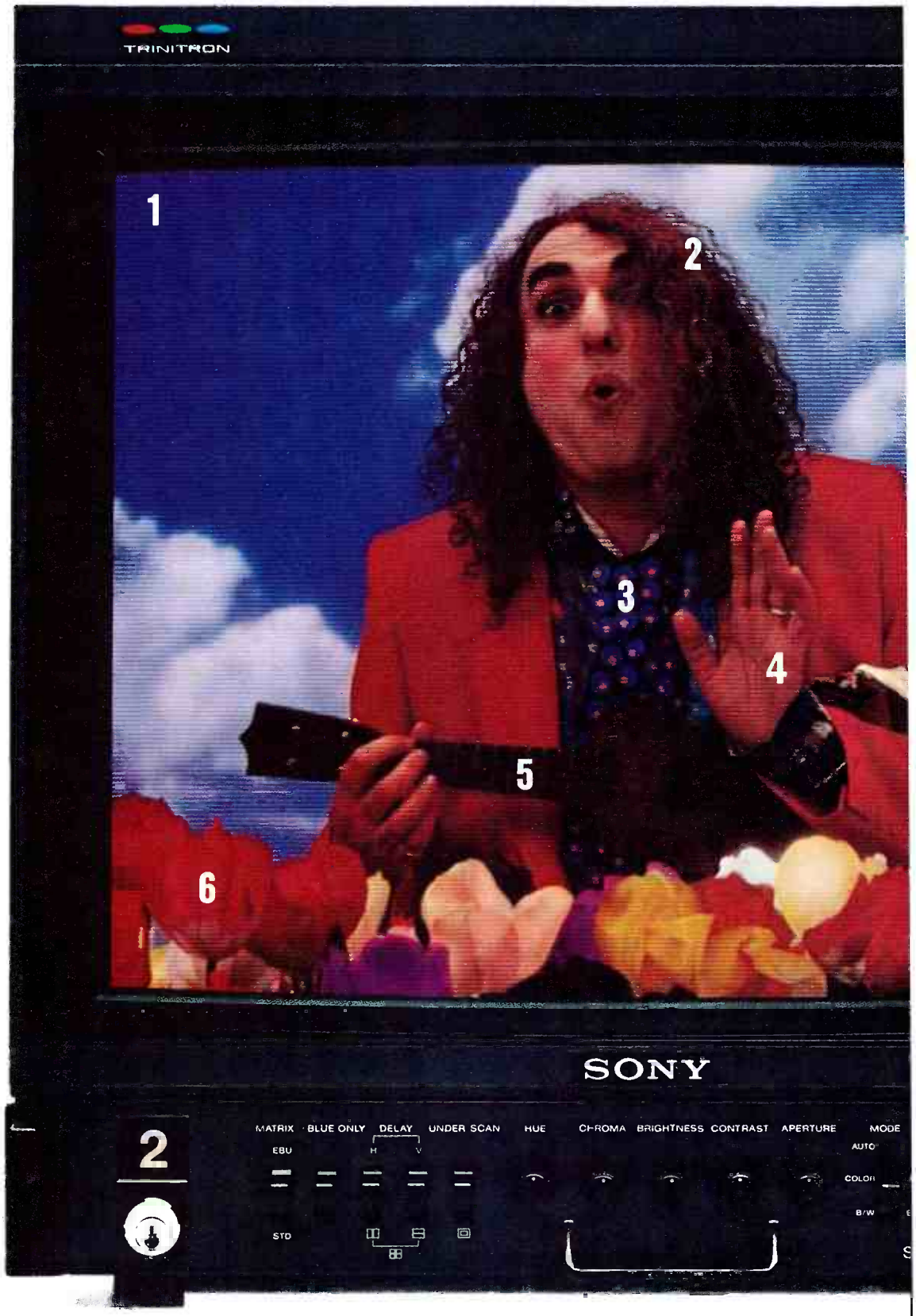
2 Nine-hundred TV lines for the highest resolution of any master control CRT—so details are sharper, and noise is never hidden.

3 Advanced comb filter—to achieve excellent luminance/chrominance separation with minimum artifacts.

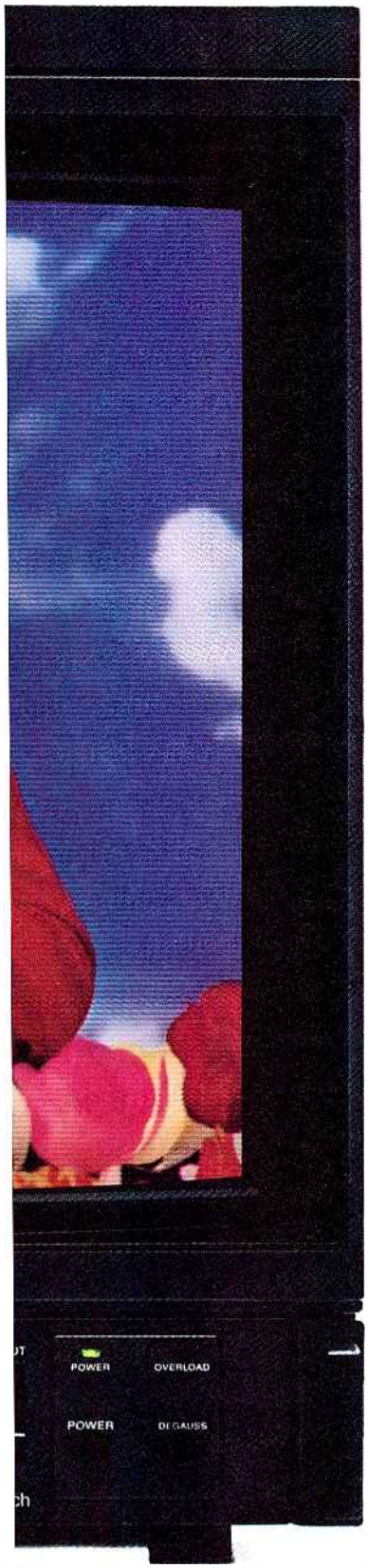
4 ±.5 mm convergence within center circle—to prevent outlines from appearing around images.

5 One-percent linearity in center lines—to ensure perfectly proportional images.

6 Current feedback circuitry—to reduce color temperature drift to 1% over 500 hours.



DRAMATICALLY IMPROVED SO THEIR ABSOLUTE WORST.



If this were live, and you were critically evaluating your video signal, you would be looking blissfully at one of the most revolting pictures you ever saw.

You would, that is, if you were viewing a new Sony BVM-1900 or BVM-1201 Broadcast Trinitron®.

The new BVM Master Control Monitors have been completely re-engineered to reproduce your signal precisely the way it was fed into them.

If Tiny Tim's hair was covered with snow, or his ukulele was making too much noise, you'd know it. Because these Trinitrons offer the highest resolution available—900 TV lines.

This degree of resolution has been made possible through Sony's extensive research and development in high-definition TV.

However, the real reason they're the state of the art in broadcast CRTs is that they give you the highest resolution without ever compromising color purity or brightness.

That's because instead of using a shadow mask, which suffers from the disadvantage of being spherical (therefore causing it to warp from heat), Sony uses an exclusive Aperture Grille. It's cylindrical, and is rigidly held straight at the top and bottom, enabling it to resist thermal or mechanical bending and ensuring white uniformity.

And thanks to another exclusive Sony feature, Automatic Beam Control, when Mr. Tim goes tiptoeing through the tulips, they won't turn into pansies right before your eyes. Because the monitor reads its own signal and instantly corrects for color drift.

Plus, all phosphors used in BVM Broadcast Trinitrons now match the industry's U.S. standards.

For more information on the one piece of test equipment you shouldn't be without, the one with mixed video capability, that's ready to accept computer graphics, and you don't have to be Tiny Tim to afford, contact Sony Broadcast today.

In New York/New Jersey call Sony at (201) 833-5350; in the Northeast/Mid-Atlantic (201) 833-5375; in the Midwest (312) 773-6045; in the Southeast (404) 451-7671; in the Southwest (214) 659-3600; in the West (213) 841-8711.

SONY® Broadcast

ULTIMATE SUPPORT SYSTEMS

Tubular supports: A variety of tripods, utility stands and lighting trees, designed from tubular aluminum for reduced weight.

Circle (559) on Reply Card

UNITED PRESS INT'L.

UPI-1 computer: For the news, business and traffic departments, the Zenith Z-150 personal computer, with dual 5¼-inch floppy disk, optional Winchester drive, 128kbyte (expands to 640kbyte) memory and graphic capability.

Circle (560) on Reply Card

UNITED RESEARCH LABORATORY

Auto-Tec recorder: Reel-to-reel ATR with dual capstan drive and closed-loop transport servo for accurate speed.

Distributor: Audio equipment parts and accessories from ACS, Telex, Nortronics, Ampex, Saki, 3M and Crown.

Circle (561) on Reply Card

UTILITY TOWER COMPANY

Tower products: To serve radio and TV broadcasting, as well as microwave, CATV and LPTV with towers, lighting systems and AM base insulators.

Circle (562) on Reply Card

VDO-PAK PRODUCTS

Power belts: Series P and N professional power belt assemblies are based on gell-electrolyte and nicad batteries, respectively, in popular power ratings for VCR, camera and portable light use.

NP484 NI-PAK: 12V power for ENG/EFP work from a 4.4A nicad pack, in ABS plastic housing, for wearing on a belt or attaching to carrying strap.

VDO-Lite: For ac/dc operation, with LH10 250W 110V lamp or LH30 75W 12V lamp, mounts on the camera for occasional extra light needs.

Circle (563) on Reply Card

WEGENER COMMUNICATIONS

Satellite transmission products: Subcarrier, SCPC and band-edge SCPC audio transmission systems, including PANDA II noise reduction equipment, data transmission systems and vertical interval data insertion, reception and deletion products.

Circle (564) on Reply Card

WHEATSTONE BROADCAST GROUP

SP-5 console: Stereo production mixer with true stereo subgrouping for mix-minus and stereo program work; optional configurations for mono subgroups, in mainframe sizes to 52 input modules.

A-500 on-air console: Broadcast mixer with stereo program, audition, aux and mono sum outputs, mic and line inputs modules and insulation displacement connector block with ribbon wiring.

Circle (565) on Reply Card

WHIRLWIND MUSIC

Cabling: Prepared wiring and cabling for audio, including Medusa multiple wiring systems with junction box, 50-foot or 100-foot cables and all necessary connectors.

Circle (566) on Reply Card

WORLD TOWER

Tower products and services: For AM, FM, television, CATV, 2-way communications, LPTV and microwave.

Circle (567) on Reply Card

NOT ALL ROUTING SWITCHES ARE CREATED EQUAL...

DATATEK MAKES THE DIFFERENCE IN QUALITY–RELIABILITY–PERFORMANCE!

Industry-leading technical performance.
For example, maximum audio output is +30dBm without requiring transformers and noise is over 105dB below maximum output.

Inherent reliability.
For example, the D-2000 avoids putting multiple inputs and outputs on a common PC board, and avoids reliance on a central microprocessor system. Instead, each input and each output bus is on individual plug-in modules and each output bus has its own independent microprocessor control system. A fault therefore can only affect one input or one output and not the entire system.

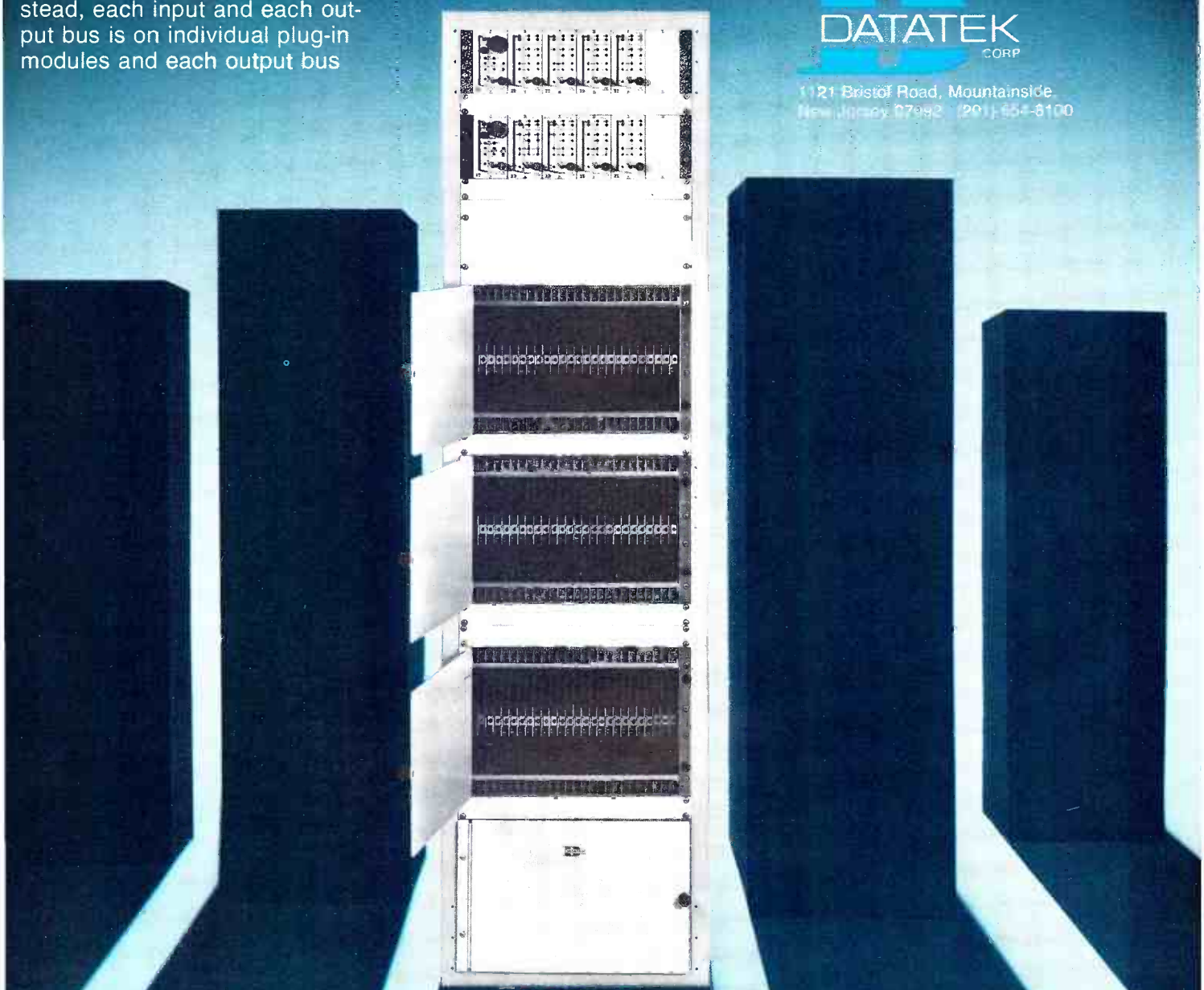
Expansion Capacity to 500x500 Systems, with up to 8 control levels. There is no need to specify initially the ultimate matrix size.

Large Selection of Control Panels.
For example, there are over 30 different standard control panels, including individual pushbutton, keypad, alpha numeric and CRT matrix status display. Datatek can also design control panels for special requirements. Control is over a single coax line.

For More Information, Write or Call:

DATATEK CORP

1121 Bristol Road, Mountainside
New Jersey 07092 (201) 654-8100



D-2000 ROUTING SWITCHERS

Circle (46) on Reply Card

Television exhibitors

ADC MAGNETIC CONTROLS

Humbucker: Eliminates 99.6% of 10V p-p 60Hz ground induced, common mode hum in a 200-foot RG-59B/W coax run.

SJ2000: Self-normalling coaxial jacks provide color phase compensation for cross-patching, with no phase shift between self-normal and patch cord.

Circle (250) on Reply Card

see ad on page 29

AT&T INFORMATION SERVICES

Quorum: Conference room system, a NASA-specified teleconferencing system, with programmable control, 1-button dialing of frequently called numbers and a local PA system.

Gemini: Electronic conference system with graphics capability for the teleconference.

Picturephone: A meeting service portable modular system, with all equipment for the 2-way video conference housed in a single console.

System 75: Digital communications system for business with 40-400 users, with voice, data and system management capability.

3B computers: Series of 32-bit architecture computers with UNIX System V, and 256k memories for office to LAN applications.

Horizon: Call management system with voice response for instant polling, etc.

Teleseer: Station message detail reporting (SMDR) stores 28,000 call records, provides records for accounting by extension, time of day and call length.

Merlin: 4-line, 10-station communications system, aiding reporters in collection of fast-breaking news stories.

Circle (254) on Reply Card

ACCURATE SOUND

Distributor: A wide variety of audio recorders, mobile recording systems, disc mastering and duplication products, as well as replacement heads, motors, mics, tape and accessories.

Circle (255) on Reply Card

ACRODYNE

TRH/10KV, TRH-10KV: VHF transmitter for 10kW rating with low level diplexing and IF modulation, and single tetrode Thomson TH-561 Hypervapotron for highband assignments. Driver may be solid-state circuitry or RCA 8791 tetrode.

TRU-10KV: 10kW UHF transmitter, with single tube driver and single final PA stage.

TL-/TR- series: Translator and transmitter systems for 10W and 100W assignments, covering all VHF and UHF frequencies.

TLU series: TV translator/transposer systems with 1W, 10W and 30W ratings, cover all US VHF and UHF bands in FCC and CCIR formats.

TCU/TCV upconverters: Frequency-synthesized equipment based on broadband amplifiers, protective logic, modular design and integral diagnostics.

SX series solar power: From Solarex Corporation, photovoltaic modules for remote location power of LPTV and translator/transposer equipment.

Circle (256) on Reply Card

ADAMS-SMITH

System 2600 enhancements: MTC/STC, master/slave transport controllers are made more efficient through the use of DEC data entry controllers with CD controller displays. In the edit suite, the EEC module adds audio editing versatility.

Circle (257) on Reply Card

ADVANCED IMAGING DEVICES

CompuTrace 1500: A product of Wavetek Indiana links video with hard copy, producing full quality, continuous tone, 4-color separation negatives in about 90 seconds.

Circle (258) on Reply Card

ADVANCED MUSIC SYSTEMS

RMX-16: Nine popular reverb programs are supplied with each unit, but unlimited delay effects are possible with the digital reverb system, available in the United States through Harris Sound Services.

DMX 15-80S: Information in the system memory of the computer-controlled stereo digital delay system can be locked in and edited through a special Loop Editing System (LES), allowing effects, drums, voice, etc., to be accurately placed for backgrounds or dialog replacement.

Circle (259) on Reply Card

AGFA-GEVAERT

PEM-469 mastering tape: New oxide formulation on improved, rugged backing. The tape is available in all audio formats/sizes.

Circle (260) on Reply Card

see ad on page 33

ALAMAR ELECTRONICS

MC1000 sequencer: Comprehensive information on a display terminal shows system status and simplifies input programming. Other system components include a central control unit and intelligent master machine control interface. Individual slave modules for each controlled device are required for operation of up to six automated channels, with 128 events per channel and a total of 4300 events stored on floppy disks.

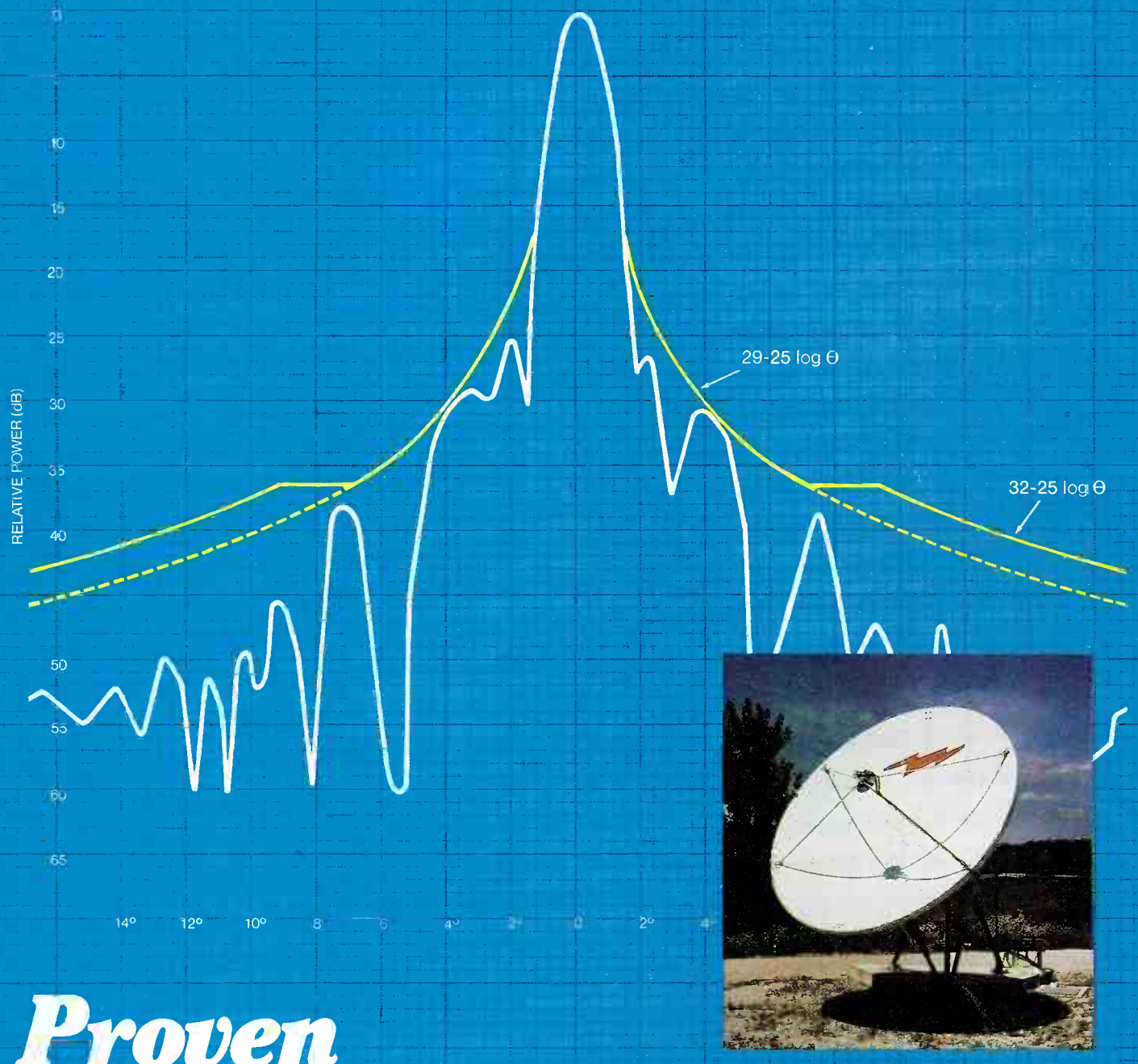
Circle (261) on Reply Card

ALAN GORDON ENTERPRISES

Distributor: Elemack Cricket dolly and Tipula jib arm; Cinema Products Mini-mote with remote-controlled pan/tilt head; Wilson Mini-Com II VHF walkie-talkies.

Sit-Code: Time code products, requiring no modification to cameras or recorders; camera clock plugs into camera, sound clock into the recorder.

Trans-Vid wireless: Small-sized TV



Proven

"Proven" means that the new Andrew 4.5 metre receive-only earth station antenna has been thoroughly evaluated on our automated test range. Far-field range testing provides essential proof of antenna performance. As can be seen in the pattern range data shown above, 2° performance is available today. This 4.5 metre antenna will minimize adjacent satellite interference. It's 4 GHz patterns surpass FCC requirements—for 2° satellite spacing—enacted in August 1983.

The 4.5 metre antenna embodies the same quality and state-of-the-art technology characteristic of all Andrew products. Patented beam shaping feed technology and superb reflector surface accuracy produce high gain and excellent pattern control. Segmented reflectors are utilized for efficient handling and low shipping costs. Rugged metal construction throughout.

Prove it to yourself. Call or write Andrew for full 360° measured pattern data and complete specifications in Bulletin 1296. Andrew Corporation, 10500 West 153rd Street, Orland Park, IL 60462. Telephone (312) 349-3300. Telex: 25-3897.

ANDREW

Our concern *is* communications.

Circle (47) on Reply Card

transmitter, connects to camera to transmit ½-mile, line-of-site to any TV receiver.

Super Grip series: New products to solve camera, sound or light mounting equipment in difficult and unusual locations.

CEVAX: Up to 16dB of gain enhances contrast from image recovery system for use in low light situations; compatible with new Eastman Kodak high speed stock.

A.G.E. Sound Collector: Crown PZM microphones simplify mic placement and reduce setup time for clear, live audio recording.

Film-Tape Safe: ATA-rated cases in various sizes hold film or video tape with lead lining to avoid X-ray degradation of information.

Battery discharger/tester: For Sony BP90 battery systems.

Anti-mist eyepieces: For Sony 330 video and Arri film cameras.

Q Master reciever: Wireless receivers work by induction principles from loop of wire around desired coverage area driven from small audio amp.

Circle (262) on Reply Card

ALLEN AVIONICS

MVFL series: Delay equalized NTSC low-pass filters, in a miniature package, provide maximum insertion loss of 2dB with cutoff frequencies ranging from 0.1-10MHz.

Circle (263) on Reply Card

ALLIED TOWER

Tower products: Fabrication, design and construction of towers followed up with maintenance services.

Circle (264) on Reply Card

AMCO ENGINEERING

CRFFX cabinets: EMI-shielded rack cabinet and console products conforming to recent FCC emission control regulation and providing attenuation on varied frequencies to 54.5dB. Cabinets are available in popular AMCO colors and styles.

Circle (251) on Reply Card

AMERITEXT

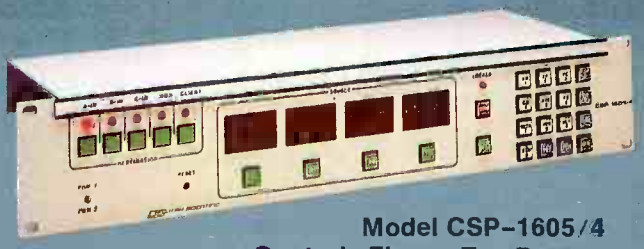
Teletext system: Proponents of World System Teletext, based on technology and products used in the United Kingdom, planned for Zenith and Sanyo receivers.

Circle (265) on Reply Card

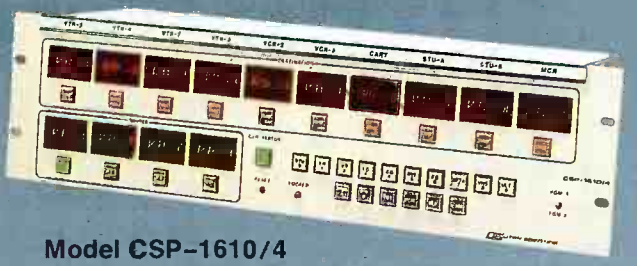
AMPEX

VPR-3 animation: Software package adds animation capability to

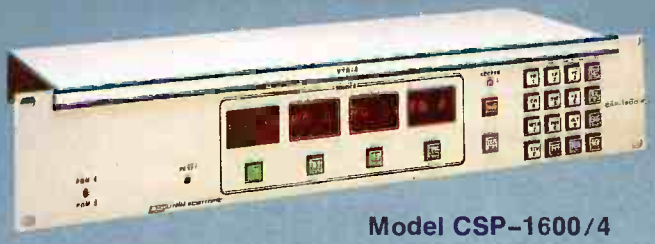
FOUR-LEVEL ROUTER CONTROLS from UTAH SCIENTIFIC



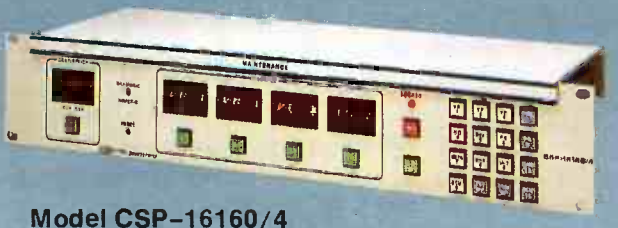
Model CSP-1605/4
Controls Five or Ten Busses



Model CSP-1610/4
Controls Ten or Twenty Busses



Model CSP-1600/4
Controls One or Two Busses



Model CSP-16160/4
Full Matrix Controller and Diagnostic Panel

This new series of microprocessor-based panels has been designed by Utah Scientific to meet the needs of the broadcast and tele-production industries for individual control of source selection on multiple switching matrices (levels).

Each panel includes four alphanumeric displays to indicate either current *Status* (steady display) or a *Preset* source selection (flashing display) on each switching level. An alternate-action *Clear* button associated with each display plus an *All Clear* button permits toggling the displays between *Preset* and *Status* modes.

The touchpad features sixteen *group name* selections (beware of panels allowing for only ten) which, with either one or two *numeral* keystrokes, accommodates up to 1600 possible source names. Each panel can be provided with a *Program Select* switch that doubles the number of controlled busses at no extra charge.

Multi-bus panels provide instantaneous statusing of all four levels each time a new destination is identified. Instantaneous confirmation of changed status is also provided each time a new Take Command is entered.

The model CSP-16160/4 panel is specially programmed for maintenance/diagnostic duties as well as for full matrix control. It operates in either *alphanumeric* (source and destination names) or *numeric* (matrix input and output numbers) modes and can perform various diagnostic routines to permit rapid isolation of system faults.

UTAH SCIENTIFIC
a DYNATECH company

1685 WEST 2200 SOUTH, SALT LAKE CITY, UTAH 84119
PHONE: (801) 973-6840 TOLL FREE: (800) 453-8782
TWX: 910-925-4037

Circle (50) on Reply Card

all present and future VPR-3 recorders, operating in insert or assemble edit modes in SMPTE and EBU Type C formats.

X-STAR: Option to AVC series switchers, based on 3.5-inch discs, stores 400 individual switcher setups.

Tape demonstrations: In chamber at 90°F and 80% relative humidity, there was no significant RF loss from 196 tape, no stiction problems and no VPR-80 failures with 690 passes logged. In multiple-generation tests, after 1313 passes, picture quality remained acceptable.

In the U-matic 197 experiment on still-frames, the total test time was 9 hours, 56 minutes for more than 4 million head scans, with little change in output signal or picture quality.

Circle (266) on Reply Card

see ads on pages 9 and 43

ANCOM (Alcoa-NEC)

DBS antennas: Ku-Band offset-fed parabolic antenna systems from 0.6-1.2m and symmetrical 1.8m, for DBS reception with radiation patterns rated for 2.5° spacing.

Antenna-mount LNC: NU-All low noise converter block downconverts 12GHz DBS signals to 1GHz range for demodulator.

Demodulator: From a 1-1.5GHz input signal, keyboard selection of any of 32 possible DBS channels, using phase-lock demodulation and threshold extension to 8dB C/N.

Circle (252) on Reply Card

ANDREW

Ku-Band antenna: Gregorian dual-reflector optics comply with 2° spacing in 3.7m earth station antenna for 11.7-12.2GHz and 14-14.5GHz.

C-Band antenna: 7.3m earth station antenna with Gregorian dual reflector for 2° compliance, with optional ESC-200 controller and 4-port combiner for full frequency reuse.

UHF TRASAR: UHF TV transmitting antenna system in side- and top-mount configurations; 2-element section handles 80kW visual + 20% aural.

Circular waveguide: Low attenuation, high power capability, low signal distortion and reduced wind loading.

Circle (267) on Reply Card

see ad on page 61

ANGENIEUX

12X lenses: 12x12.5mm for 1-inch and 12x16mm for 1¼-inch cameras offer f/1.5 and f/2 constant apertures, MOD figure of 0.95m, high performance optics and diascope design.

15X lenses: 15x13mm for 1-inch and 15x17mm for 1¼-inch cameras with integral 2X extender, diascope for automatic setup systems, MOD of 31 inches and 52.5° angle of view.

Circle (268) on Reply Card

ANIXTER BROTHERS

TVRO systems: Earth station antennas for radio, television, CATV and LPTV.

Circle (269) on Reply Card

ANVIL CASES

Rack-mount cases: Standard 19-inch or other EIA specification widths provide secure shock-isolation protection for video and audio equipment during transport, while casters reduce setup times and crew fatigue.

Circle (270) on Reply Card

APERT-HERZOG

The STEP: *Select The Edit Point* shows a matrix of 16 images in compressed time for easier selection of the right edit point. Once the image is chosen, a bar-graph representation simplifies finding the appropriate audio point.

Circle (271) on Reply Card

see ad on page 114

APPLIED DIGITAL TECHNOLOGY

Relecon: Frame accuracy in color balancing and video processing, as the unit stores settings according to SMPTE time code, with capabilities to 48 functions per scene and floppy disk memory for extended eventscount.

Circle (272) on Reply Card

ARIES ANTENNAS

Antenna services: Specialists in installation supervision, consultation, emergency service and measurements for TV and FM antenna systems.

Circle (273) on Reply Card

ASACA/SHIBASOKU

CP2115/4115: RGB video or TTL signal inputs provide medium resolution displays on 0.56mm or 0.4mm pitch, in-line P22 phosphor CRTs.

CD902A decoder: NTSC signals are decoded on IQ axes, then matrixed to produce RGB output signals.

CD10A1 decoder: Input NTSC signals, decoded on I/Q axes generate RGB and Y/R – Y/B – Y output signals, as well as drive signals.

TP15A6: A 3Vx5H high resolution test pattern generator for 1125-line applications.

TG91A6: RGB outputs form zone, multiburst, step, ramp, $\sin^2$ bar, crosshatch and color bar patterns for tests for 1125-line video equipment, transmitters and related systems.

TG53A1: Test signal generator with 8-bit high speed digital/analog converter delivers six test signals and includes RAM for user-programmed patterns.

AG15A oscillator: Ultralow distortion sine wave signals cover 5Hz-110kHz for use with an automatic analyzer. Generator distortion is less than 0.0001%.

Circle (253) on Reply Card

see ad on page 32

ATLANTIC RESEARCH

Consultants: Design and analysis services, including FCC EMI standards.

Circle (274) on Reply Card

AUDIO-TECHNICA US

AT800 series: Additions to product line include 803a and 831a battery- or phantom-powered miniature lapel mic in omnidirectional or unidirectional response patterns.

Circle (275) on Reply Card

AUTOCUE SALES

Wordbox II: A lightweight prompting system, designed for single-camera shoots or studio applications.

Circle (276) on Reply Card

AVANTEK

AIC-2000 Cancellor: Suppression equipment reduced C-Band satellite reception interference by 20dB without distortion or loss of desired signal.

Circle (277) on Reply Card

BIW CABLE SYSTEMS

TV14 Triax: Camera cable materials with #14 AWG-stranded center conductor, cellular polyethylene dielectric and double #34 AWG copper braid shields.

Duraguide fiber-optic cable: Optical fiber provides at least 200MHz bandwidth with less than 5dB/km loss; #20 AWG copper conductor handles power; two protective jackets and strength member give durability.

Circle (278) on Reply Card

BTX

The System: A multitransport controller/interface (7000 series) to synchronize master and slave equipment in any combination of multitrack audio, video or film transports, including configurations for digital audio.

7800 CCS: Cine Control System interlocks a Rank Cintel telecine with a VTR.

SHADOWPAD: Dual-transport controller adds new capabilities to presently installed Shadow systems.

SOFTOUCH extension: Provides Softouch users storage of Softkey and Softouch memory registers offline with print-out capability and interfaces to Harrison Systems console automation.

Fluke takes the trouble out of broadcast troubleshooting.

The Fluke 9010A. Now, a fast troubleshooter that cuts critical microprocessor-based equipment downtime to an absolute minimum.

The Fluke 9010A offers a refreshing solution to the broadcast engineer's problem of repairing microprocessor equipment by converting costly downtime to productive uptime.

The 9010A plugs into the microprocessor socket of your camera, VTR, video router, video switcher or graphics generator. It has a complete array of built-in preprogrammed tests to make fault isolation fast and foolproof. And operation characteristics so clear and straight-forward that no lengthy training is needed for effective troubleshooting.

The result is fast, easy, low-cost repairs without complicated hardware hookups, or excessive board inventories. All at a price that can pay for itself with time savings alone.

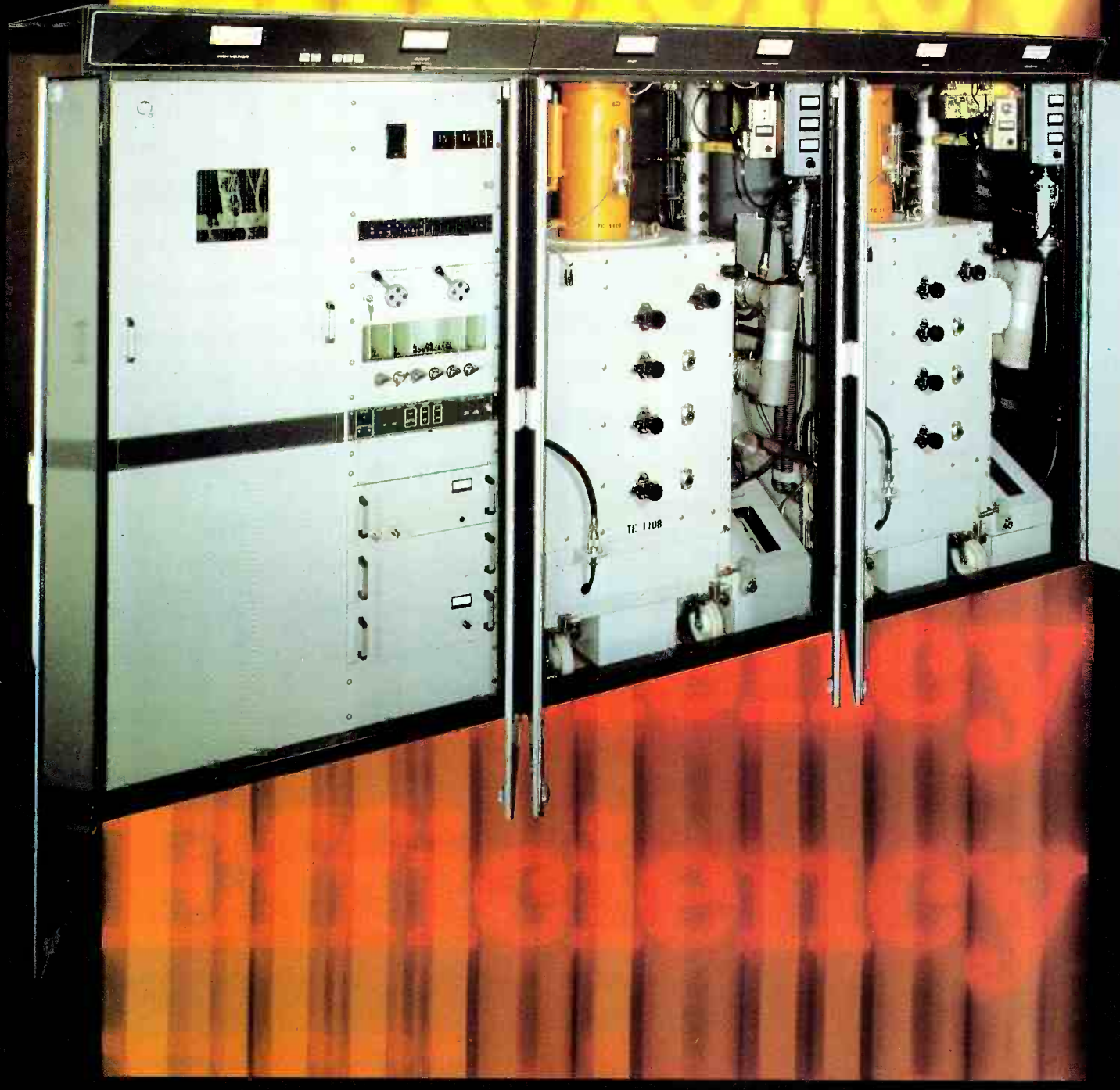
So, if your position involves the testing and repair of broadcast equipment, contact your local Fluke representative or call our toll-free hotline **1-800-426-0361** for more information on the Fluke 9010A. And take the trouble out of broadcast troubleshooting.

IN THE U.S. AND NON-EUROPEAN COUNTRIES:
John Fluke Mfg. Co., Inc.
P.O. Box C9090, M/S 250C
Everett, WA 98206
(206) 356-5400, Tlx: 152662

IN EUROPE:
Fluke (Holland) B.V.
P.O. Box 5053, 5004 EB
Tilburg, The Netherlands
(013) 673973, Tlx: 52237

FLUKE®

Efficiency



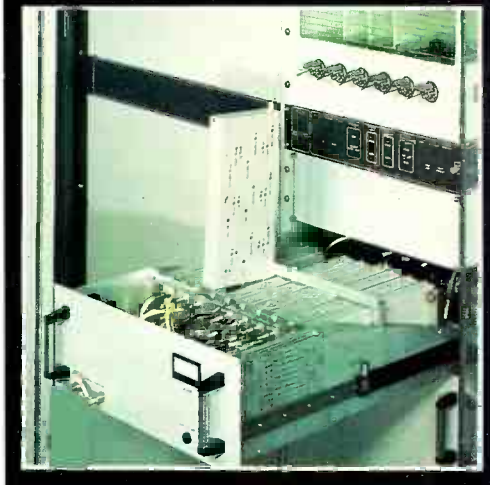
PHILIPS

Television Transmitters

Nearly 2000 transmitters in 70 countries worldwide. That is the solid fact of Pye TVT's success.

And if you look more closely at our range of UHF television transmitters you will understand the reasons why.

Naturally you can take for granted high reliability and performance. Really exceptional, however, is the low cost of ownership – resulting primarily from the use of Beam Control Klystron tubes. Initially developed by Philips, these tubes bring significant economies in the electrical power consumption of medium and high power transmitters. Yet they still retain the inherent advantages of the Klystron – high reliability, long life and freedom from catastrophic failure. On top of that, they need minimal maintenance and low spares holdings. Apart from the Klystron, they are completely solid state. They are also easy to instal and – for their output – the most compact available.



Pye TVT UHF transmitters cover peak sync powers from 10 to 110kW. All incorporate a highly sophisticated i.f. modulated drive system with solid state control logic for unattended operation and modern safety features. (You can, if desired, update the existing exciter of your current transmitter). All cover the whole UHF frequency range.

Pye TVT is constantly striving for state-of-the-art perfection. To stay even further ahead.

Reader enquiry no. 100

PHILIPS

A world of experience
Monitors of quality & economy

High stability, quality, reliability – at a very reasonable price. These are the reasons for the international success of the Philips LDH6200 14" color monitors.

These rugged yet stylish monitors have a high specification and many operational features only found on more expensive units. And monitor to monitor matching is excellent.

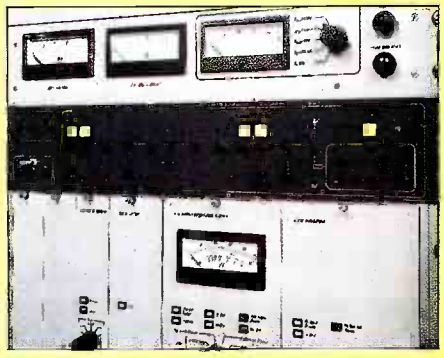
Reader enquiry no. 102

Radio Transmitters

The Type LDM 1200 series of FM radio transmitters (15W to 40kW) is outstanding for its sound quality, reliability and its low cost of ownership. Common drive modules allow maximum systems capability and minimum spares holdings.

Designed to work unattended in a variety of operational configurations, the range meets or exceeds the world's most exacting broadcast standards.

Reader enquiry no. 103



Now with RGB

The LDK14 family of color television cameras is world renowned as the go-anywhere camera system with high performance capability wherever it is used – for ENG, EFP or in the studio.

Now to extend its capability, Philips has introduced the LDK14-RGB. This camera retains all the quality and virtue of its famous family while offering the extra facility of full bandwidth RGB outputs for chroma-key in addition to the normal CVBS video outputs.

Reader enquiry no. 104

For further information use the reader reply nos or send the coupon to:

PHILIPS TELEVISION SYSTEMS, INC.

900 Corporate Drive, PO Box 618, Mahwah, New Jersey 07430, USA
Tel: 201–529–1550 Telex: 37–62558
Canada. Electro & Optical Systems Ltd., 31 Progress Court,
Scarborough, Ontario, Canada M1G 3V5 Tel: (416) 439–9333 Telex: 065–25431

Please send me further information on

	Inquiry no.
☐ UHF Television transmitters	100
☐ LDM 1170 Transmitter exciters	101
☐ LDH 6200 Color monitors	102
☐ FM Radio transmitters	103
☐ LDK 14 Television cameras	104

Name
Organisation
Address

BE 5 7 84

Time code products: Board-level products based on an intelligent processor, including SMPTE generator, reader, character inserter and event controller, with VITC capability, format conversion and jam sync functions.

Circle (279) on Reply Card

BASYS

Computer systems: Newsfury, Clipfury and Personal Assistant systems, aiding the newsroom and videotape library management departments, from Basis, a subsidiary of Independent TV News Ltd., United Kingdom.

Circle (280) on Reply Card

BEAVERONICS

DSK-4-DLB: Downstream keyer system designed for character generators, accepting video and key signals from four titlers or other video sources. Capabilities include multiple inserts, edge effects, matting, cuts or auto fade-to-black at any of four rates.

Circle (281) on Reply Card

BELDEN COMMUNICATIONS

MEI(HMI) lamp-heads: 8kW lighting units, the Lee square-wave drive, flicker-free luminaire with supporting electronic ballasts; also in 575W, 1.2kW, 2.5kW and 4kW ratings.

Circle (282) on Reply Card

BELDEN CORPORATION

Wiring/cabling: Interconnection products, including audio, hookup and microphone cable; coaxial products; and fiber-optic materials. Also in the product line are cable products and connectors for data applications.

Circle (283) on Reply Card

BIRD ELECTRONICS

4030 element: Relative field-strength element for Thruline wattmeter with flexible receiving antenna, high-pass filter network and variable gain RF amplifier detector.

4410 series elements: Plug-ins cover 0.1W-10kW levels over a spectrum range from 0.2-1000MHz.

8570 series loads: Termaline air-cooled, air-dielectric high power RF load resistor systems for 15kW (8570) or 25kW (8572) power ratings.

Circle (284) on Reply Card

BOGNER BROADCAST EQUIPMENT

Mobile radio antenna: For the mobile base station operating in 800-900MHz spectrum, a sidefed dipole design with 12dB omnidirectional gain, 100MHz bandwidth, constant beamtilt/heavy null fill and various horizonal patterns.

Circle (285) on Reply Card

ROBERT BOSCH

KBF-1 QuarterCam: VRC system based on ¼-inch Lineplex format of BCF-9 portable recorder, BCF-10 studio recorder and BCF-20 field editor; now in production.

MCS-2000 switcher: Versatile master control switcher with programmable switch buttons that light to show the assigned source; key/wipe and audio control functions standard; interfacing to Bosch routing switchers and serial communications for automated control.

FGS-4000 enhancements: Software products include 3-D editor to add depth to 2-D images, HQAS high quality animation, paint capabilities and single frame editor for machine control of automation VTR recording.

FRP-60 programmer: Film reproduction programmer interfacing to FDL-60 CCD telecine for frame-by-frame color correction.

MC-22 monitor: Precision 9-inch color monitor packaged as a portable unit.

Automatic camera tester: Measurement and evaluation of picture content and convergence automatically with print-out to show current camera specifications.

Custom programming: Software system based on Apple and Franklin computers to make data I/O PROM programming changes.

TCS-1 control panel: Machine control system panel is dynamically labeled from information stored in system memory.

Control panels: Options for distribution switchers, including single-bus 10-key selector with LED display; lever-wheel selector switches with LED display; desk-top control panel; 3-level alphanumeric lever wheel switch input selectors with LED display as well as microprocessor-based control configurations with LED status displays.

Gray level control: Automatic gray level adjustment enhancement for Class I monitors with self-converging in-line CRT and delta-gun tubes through beam current stabilization.

Circle (286) on Reply Card

see ad on page 121

BOWEN BROADCAST SERVICE

TELEHO: Maintenance aid system includes terminal at the maintenance location, using telephone access to maintenance information database with hard-copy print-out.

TCR-100 program: Refurbishing program for RCA TCR-100 systems.

Circle (287) on Reply Card

BROADCAST AUDIO

BA-120: Shown in prototype form, a rack-mount monitor amplifier/speaker system designed for reproduction of the program material.

Circle (288) on Reply Card

BYERS COMMUNICATIONS

Mobile 7 Teleport: 7m transportable uplink for C-Band satellite networking from designer and maintenance organization of turnkey communications systems.

Circle (289) on Reply Card

CAMBRIDGE PRODUCTS

RF connectors: A wide variety of RF and UHF coaxial connectors include FastFix connectors for quicker field repair of connector-related failures.

Circle (290) on Reply Card

CAMERA MART

Sales/rental: Distributor and rental house for all major brands of video, cine, audio and lighting equipment.

Circle (291) on Reply Card

CANARE CABLE

Mic cables: Ultralow noise cable for improved audio in any studio or production area.

Circle (292) on Reply Card

CECO COMMUNICATIONS

Video department: Now in stock, a large selection of video products and video accessories from manufacturers such as Hitachi, NEC, Panasonic and Sony.

Circle (293) on Reply Card

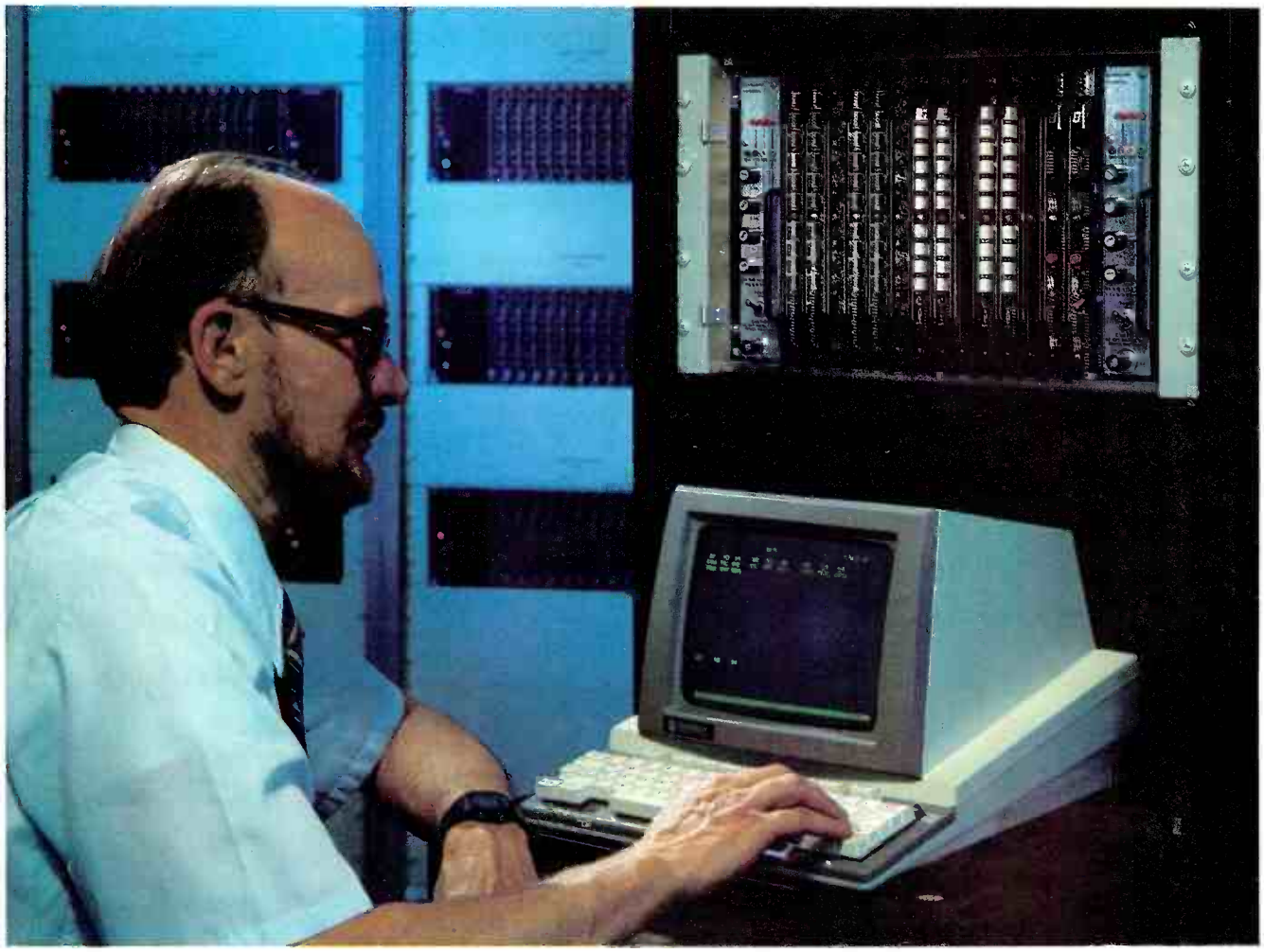
CENTRAL DYNAMICS

Control interface: Allows Series 80 switcher to operate the NEC E-FLEX digital effects video processor through the CAP system and auto-transition options.

Series 80 enhancements: Flexi-Wipe, soft-key processing approach forms a wipe pattern from a logo or any captured image; soft/colored wipe and analog key borders; CAP general/purpose control interface for auto control of 17 functions and seven potentiometer values of peripheral equipment; and serial interfaces for editing systems communicating via RS-232 and RS-422 ports.

280: Series 80 2-bus switcher with program processor module allows expansion to 4-bus and 6-bus switcher systems.

SDS-2 router: 32x32 matrix routing switcher with one video and three audio levels, with MicroPatch



The Personal Routing Switcher

For mind stretching control power over those rapid-fire multiple-input, multiple-output switching requirements, hitch a personal data terminal costing less than $500 to your DYNAIR Series 25.

This twenty-input, twenty-output video, audio routing switcher and terminal is THE right combination for those complex situations which require frequent rearrangement of facilities.

It allows you to PRESET the next matrix set-up and SALVO the switch at the right instant. Check status of the matrix at any time. Change one or all of the input-output combinations... on a single or multiple basis.

Video-audio splits? Of course!

Write or call DYNAIR. Give us the opportunity to tell you about our ready-for-the-future, 35 MHz Series 25.

DYNAIR

5275 Market Street, San Diego, California 92114 Telephone: (619) 263-7711; TWX: (910) 335-2040

Circle (52) on Reply Card

operating software, CRT terminal and keyboard control; features eight salvos, three breakaway groups, security locks and matrix status.

Circle (294) on Reply Card

CENTURY PRECISION OPTICS

Fisheye lens: For C-mount cameras in ⅔-inch or 16mm, a 1.9mm f/1.8 wide-angle lens, rated T2.8, gives 180° field of view.

Circle (295) on Reply Card

CETEC VEGA

66A receiver: Four 9V batteries operate the wireless mic receiver outside, while an ac supply is available for in-studio use; featuring Dynex II processing.

Circle (296) on Reply Card

see ad on page 111

CHESTER CABLE

Consultant services: Assistance and design services with new cable concepts.

Circle (297) on Reply Card

CHRISTIE ELECTRIC

MaxERASE-16: A 30-second 1-pass total erasure is possible on all high coercivity videotape formats and sizes.

Circle (298) on Reply Card

CHYRON TELESYSTEMS

Expanded Chyron IV: 27ns character resolution, with additional fonts (including international sets), VIDIDISC or hard disk storage, 512-color palette and more standard features, with second channel, multimode graphics, drawing tablet, sports scoreboard, Digifex and right-to-left writing options.

Circle (299) on Reply Card

CINE 60

Lifeguard series: A 4-unit Fast charger or single-unit Quik and universal Quik charge system for a variety of nicad battery products in C to F sizes.

S-1200 Swintek pack. Operates Swintek pack for 12 hours on single charge with integral overnight charger, cord and auto reset circuit breaker.

PP13/15: Canon lens battery pack, permitting remote servo focus operation for up to five hours, with charger, cord and auto reset circuit breaker.

#3014/3014FC belt: 30Vdc at 4A or 14.4V at 8A switchable battery belt for sungun and other 12V, 13.2V, 14.4V, 24V and 30V battery lights.

#OC-14 battery: For all Sony BVP cameras.

Newspak batteries: On-camera batteries for many cameras.

Circle (300) on Reply Card

CINEMILLS

HMI ballasts: From OPtech, uses 230V input for 12kW output.

12kW Fresnel system: Greatly improved lifespan for Fresnel light with one-half the weight and size of others that are comparable.

Circle (301) on Reply Card

CIPHER DIGITAL

Series 9000: Translator products converting VITC time code LTC forms, include reader and generator units.

Circle (302) on Reply Card

COLORTRAN

Patchman control panel: 10-scene present (two live, eight in memory), variable rate cross fader, softpatch keypad for up to 512 dimmers, 96 control channels.

Circle (303) on Reply Card

COLUMBINE SYSTEMS

5381: Broadcast station computer

A U D I O P R O C E S S I N G

for the Digital Era

THE ENTIRE AUDIO INDUSTRY IS MOVING RAPIDLY INTO THE AGE OF DIGITAL RECORDING AND SIGNAL TRANSMISSION. THAT'S WHY SIGNAL PROCESSORS PURCHASED TODAY MUST HAVE WIDE DYNAMIC RANGE, FREEDOM FROM DISTORTION, AND THE EXTENDED BANDWIDTH NECESSARY TO PERFORM IN BOTH THE ANALOG AND DIGITAL DOMAINS.

AUDIO & DESIGN IS THE INDUSTRY LEADER IN AUDIO PROCESSING TECHNIQUES AND TECHNOLOGY. YOU'LL FIND OUR EQUIPMENT IN SUCH DIVERSE APPLICATIONS AS BROADCAST, SATELLITE UPLINKS, RECORDING, FILM, VIDEO AND EVEN SOUND REINFORCEMENT. AFTER ALL, AUDIO & DESIGN OFFERS THE BEST AND MOST COMPLETE LINE OF PROCESSING GEAR IN THE WORLD WITH PRODUCT RELIABILITY AND CUSTOMER SUPPORT SECOND TO NONE.

BE READY FOR TOMORROW'S CHALLENGES BY MAKING THE RIGHT EQUIPMENT DECISIONS TODAY. CONTACT AUDIO & DESIGN FOR ALL THE DETAILS.

AUDIO & DESIGN RECORDING, INC.
P.O. Box 786 Bremerton, WA 98310 Phone 206-275-5009, 206-275-5010 Telex 15-2426
AUDIO & DESIGN RECORDING, LTD.
Unit 3 Horseshoe Park Pangbourne, Reading RG8 7TH Berkshire, England
Phone (0734) 53411 UK Telex 848722

Audio+Design

THE HIT SOUND IN AUDIO SCIENCE.

Manufacturer of: Compex® and Vocal Stresser® compressor-limiters/SCAMP® modular products/Transdynamic® tri-band processor/PROPAK™ EIAJ interface/Expanders/Gates/AGC amps/EQ and Filters/De-Essers/Preamps/D.A.'s/SMPTE & EBU time code products/Effects units and other accessories.

system from IBM uses S/38 CPU to handle business, news and inventory.

5160: IBM personal computer system with Varicom broadcast system software.

Circle (304) on Reply Card

COMARK COMMUNICATIONS

S series: NTSC and CCIR UHF TV transmitters, covering 10-220kW range, with CTE-20 broadband exciter, CCP-145 envelope delay and ICPM corrector, and wideband, high efficiency external cavity klystrons suitable for pulsed operation.

CCP-145 IF corrector: 4-band adjustable system to reduce sync pulse spiking caused by ICPM and distortions caused by envelope delay, handled at IF frequencies.

CTS-20/CTP-20: Variable-modulated anode bias supply and high power modulated anode pulser system, allowing higher efficiency of klystron PAs in UHF TV service.

CM-100S modulator: Forming a part of the CTE-20 exciter, the CM-100S incorporates IF SAW filter techniques for proper band shaping.

Magic Tee: High level RF switching system for CTT-U-110S and 60S transmitters with local or remote phase control provides efficient connection between transmitter outputs and diplexing system with diplexer bypass switching.

Automatic diplexer: CAP-110M includes aural detuner to handle stereo audio signals.

Circle (305) on Reply Card

see ad on page 3

COMPREHENSIVE VIDEO SUPPLY

Miniproduction system: Designed for remote shoots, the MS-1000 miniswitcher includes plug-in cartridge technology for effects; MS-2000 includes more sophisticated effects with control of the VCR from the switcher control panel.

Computer-aided video packages: Computer software to speed and simplify the work of video professionals in film and video management, including budget, scheduling and production run-down functions; Edit Lister to save studio editing costs; and PowerScript word processing.

IBM-PC software: Associate Producer and Edit Lister for IBM-PC and PC-compatible computers with PowerSpell and DataFax electronic card index.

MX-1001: Portable mic mixer with three inputs for line-, mic-level or phantom-powered sources, individual channel level control, slate tone and VU metering.

Bilora 1473 head: Fluid effect tripod head for cameras to 30 pounds, includes tilt safety stop, dual handles and built-in camera quick release.

Speedcharge 6000 system: Multichannel battery charger from PAG of United Kingdom, for up to eight batteries of mixed voltages and capacities simultaneously.

Circle (306) on Reply Card

COMPUTER GRAPHICS LAB

CAAS II: Graphic system involves modular hardware and software packages integrated to create full animation projects to be recorded on tape or film; incorporates Images, Scan, Tween, Tweep and Record functions.

Images II: A low-cost still-frame graphics creation device.

3-DV system: For full-color, shaded 3-D surfaces, capable of multiple light sources with resolution to 1024x972 pixels.

Circle (307) on Reply Card

COMSEARCH

Communications services: Consultants, frequency interference studies, network designs, frequency planning, FCC application preparation and more for LPTV, AM, FM, TV, cellular radio and microwave.

Circle (308) on Reply Card

CONTROL CONCEPTS

ISAFIL: Magnetic isolator and active transient filter removes unwanted power spikes and protects equipment to 5kVA loads.

ISLATRON: Provides equipment protection from damaging spikes, transients and lightning-induced voltages.

Circle (309) on Reply Card

CONUS COMMUNICATIONS

Newstar: Satellite newsgathering van from the combined efforts of United States Satellite Broadcasting and Hubcom. The van uses Ku-Band technology.

Circle (310) on Reply Card

COOL LIGHT

Starpak kit: Four Mini-Cool lights, two stands, spare lamps, lens and filters with mounting accessories, dimmer and power cores in a small foam-padded transportation case.

Circle (311) on Reply Card

CORPORATE COMMUNICATIONS CONSULTANTS

SYSTEM EBM: Tape-to-tape color correction system designed for use with Betacam and other discrete component formats. Options include use with NTSC and PAL encoded C Formats.

Circle (312) on Reply Card

see ad on page 92

COUNTRYMAN ASSOCIATES

ISOMAX TVH: Hypercardioid pattern for lavalier mic with reduced room noise and reverb and integral high-pass filter to cut wind noise and rumble.

ISOMAX III: Matte black extension tube on microphone for recording and sound reinforcement in various patterns.

ISOMAX IV: Extension tube on microphone may be shaped as required for hand-held interview and high quality voice applications.

Circle (313) on Reply Card

CROSSPOINT LATCH

6112AK: All the features of the 6112 production switcher with microprocessor control through a smart interface for bidirectional communication via RS-232 or RS-422 ports at any standard baud rate from 300-19,200.

Circle (314) on Reply Card

see ad on page 144

CUBICOMP

CS-5 design system: Software for IBM-PC and compatible computers includes Easel graphics for wire form and solid 2-D and 3-D images with full-color paint capability; Video-5 module synchronizes the computer with external video.

Circle (315) on Reply Card

CYBERNETIC DATA PRODUCTS

SCA message system: LED arrays spell and scroll messages received via FM broadcast subcarriers.

Circle (316) on Reply Card

DX COMMUNICATIONS

Receiving antennas: For terrestrial broadcast as well as satellite and DBS reception.

Circle (317) on Reply Card

DATATEK

See "Routing Switchers Update" on page 112.

see ad on page 59

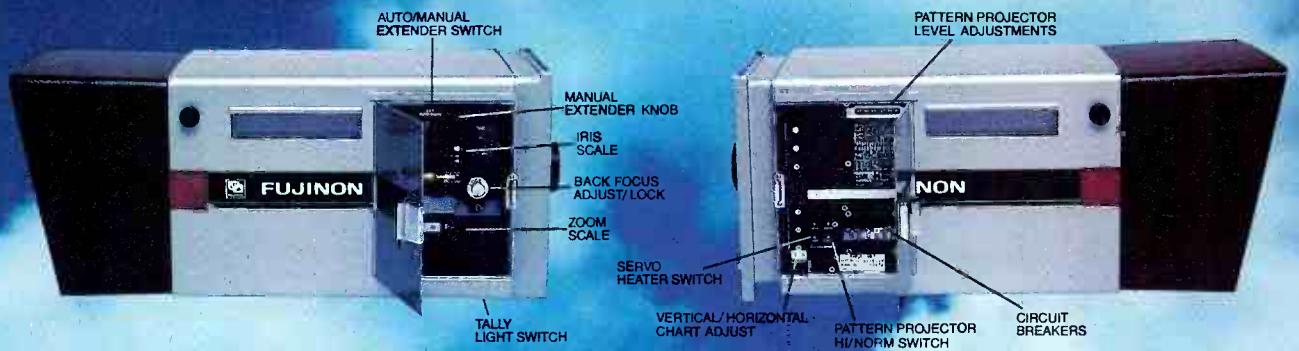
DATATRONIX

See "Routing Switchers Update" on page 112.

DATUM

9550-501 inserter: Decimal time and alphanumeric characters shown in multirow display on color or

FUJINON'S revolutionary 2-door zoom lens.



It works the way you do.

FUJINON's new 17X studio zoom will permanently change the way you use and feel about a lens. More than refining the studio zoom, FUJINON has revolutionized it to give you greater control, flexibility and efficiency than ever before.

Downtime for adjustments and repair is drastically reduced. And the need to remove a shroud is virtually eliminated. For instant access to all important adjustments, just open one of the two doors.

The new 17X zoom incorporates more "FUJINON firsts" than any lens in our history. For example, you can pre-set limits on the zoom range to match the lens' outstanding ramping characteristics to the lighting levels of every production. (If necessary, you can still override the limit from the pan bar.) To change the slow/fast zoom speed, you do it on the new pan bar zoom control instead of somewhere inside the lens. You also have the option of adjusting servo focus and zoom control tension—to get the exact "feel" you want.

With the new 17X studio zoom, every major component is modular to make user servicing a practical reality.

FUJINON's new 17X zoom is the first generation studio lens of the future. And it's here, now.

For more information on the P17X16.5ESM studio zoom lens and other fine FUJINON products, contact the FUJINON office nearest you.

FUJINON INC.
672 White Plains Road
Scarsdale, NY 10583
(914) 472-9800
Telex 6818115

FUJINON INC.
2101 Midway
Suite 350
Carrollton, TX 75006
(214) 385-8902

FUJI OPTICAL SYSTEMS, INC.
118 Savarona Way
Carson, CA 90746
(213) 532-2861

4855 Atherton Avenue
San Jose, CA 95130
(408) 866-5466

Circle (54) on Reply Card

FUJINON

monochrome video signal.

5300 series: Product line of intelligent SMPTE/EBU time processors and time code systems (formerly by Datatron).

Circle (318) on Reply Card

DAVID & SANFORD

FM-25 head: A 4"x4¼" camera platform accommodates cameras to 25 pounds, with dual-handle capability and fluid head action.

Circle (319) on Reply Card

DELCOM

Control room designs: Complete outfitting of a custom-designed control room for broadcast, industrial or teleconferencing; includes furnishing and cabinetry for efficiency and pleasant surroundings.

Circle (320) on Reply Card

DESISTI AMERICAS

RC25 Torch: Lightweight sungun light; hand-held for 30V operation; 150W, 250W and 350W ratings.

Ditiziano: 200W lighting unit; operates from ac ballast or batteries for flicker-free, dimmable illumination.

Caravaggio: 200W lighting instrument using PAR 36 lamp.

Circle (321) on Reply Card

DIGIVISION

DRGB-343: Improved resolution (to 1000 lines) with noise reduction from NTSC or RGB video signals.

Circle (322) on Reply Card

DILOR INDUSTRIES

Litepak enhancement: #1224 high density dimming system in a competitive 12-pack configuration for rental market.

1200 system: Expandable manual control console including direct or cross-fade submaster selection, *Bump* or *Solo* button and split dipless cross-fades.

Circle (323) on Reply Card

DI-TECH

See "Routing Switchers Update" on page 112.

EEG ENTERPRISES

EN230 encoder: Dual-line capabilities of the unit allow captioning or other data to be placed on two lines in the VBI.

DE201: Decoder for VBI data with addressability capability.

TE-510: Video data bridge for teletext.

CSR text entry: Computerized Shorthand Reporters entry system for closed-captioning of recorder and live events; portable.

Network systems provide control and alert functions.

Circle (324) on Reply Card

EMCEE

TTS10GA: For MDS transmissions, 10W solid-state system uses NTSC standard in 2.5-2.7GHz spectrum; applicable to multichannel MDS installations; can drive an external PA.

Circle (325) on Reply Card

E-N-G

ENG systems: A variety of products including ENG vehicles, the K-82 backpack system and a remote-control system for microwave.

Circle (326) on Reply Card

ERA

Distributor: Lines cover a wide variety of products for broadcast use.

Circle (327) on Reply Card

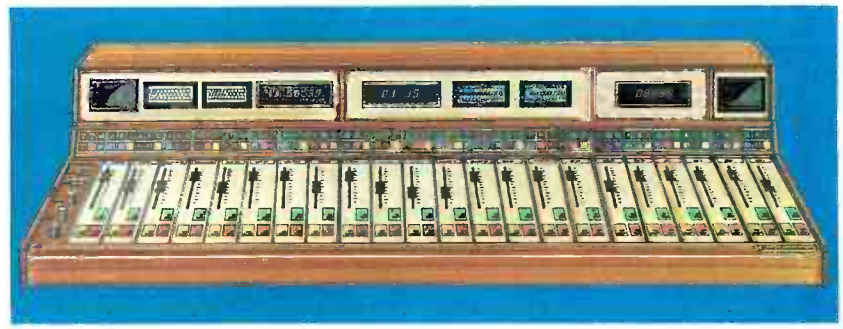
Series 9000...
the expandable solution!

There isn't another audio console that compares with the Series 9000 by Howe Audio!

- **Sealed membrane switches** and the best quality faders available. TTL Digital Logic for machine controls that is assignable to the input you have selected on each fader.
- **Monitor Control Section.** Volume controls for monitors, headphones, and cue. Stereo/Mono monitor select and meter select switch.
- **Input and output selects.** 3 inputs and 3 outputs for each channel, including mix-minus.
- **Cue Speakers.** Built in on the front of the console. Smaller units have 1, larger units have 2.
- **Metering through regular Analog V.U. Meters.** Optional Vacuum Fluorescent meters also available.
- **Your Choice of a Clock or Timer** standard in smaller units, both standard in larger units.

howe audio productions, inc.
3085 A Bluff Street
Boulder, Colorado 80301
303/444-4693
For more information: 800/525-7520

...the only Modular Audio Console without a Main Frame!

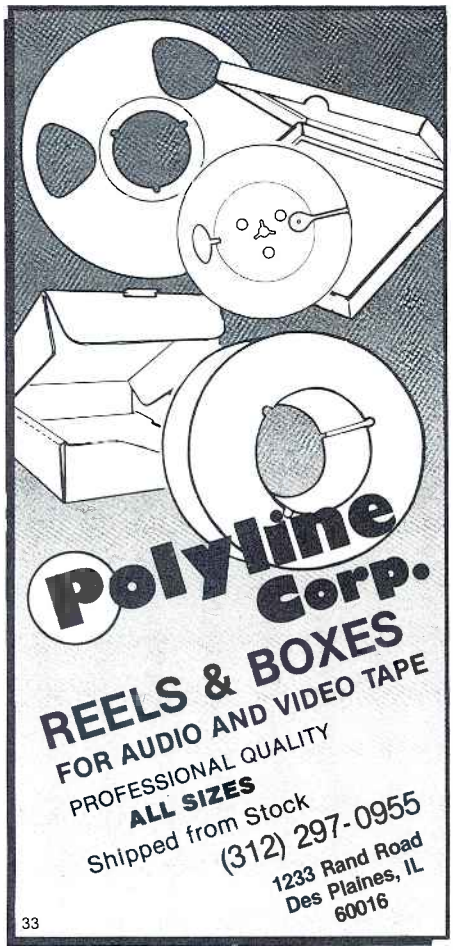


The **Series 9000** consoles are available in sizes from 8 to 22 channels.

Howe Audio Series 9000 . . . a new concept in consoles. The only modular consoles that do not require the broadcaster to purchase an expensive mainframe. This means a substantial savings to you, yet still affords you the ability to add on channels and features at a later time.

The **Series 9000** consoles are expandable at any time by adding more channel modules, adding to the metering section, and adding options such as another clock or timer, another cue speaker, etc.

Circle (56) on Reply Card



ESE

ES212 interface: Telephone hybrid with classic transformer-balanced bridge circuit, tailored response in receive and more natural sound without AGC.

ES257: Time code reader/comparator shows when SMPTE code, displayed on LEDs, agrees with that set into one of two groups of thumbwheels.

ES258: Expander unit for 257, includes two sets of thumbwheels to enter SMPTE code values and BCD data input for code source.

Circle (328) on Reply Card
see ad on page 137

ECONCO BROADCAST SERVICE

Tube rebuilding: Reduces retubing costs by reconstruction of your reduced-emission transmitter tubes.

Circle (329) on Reply Card

ELECTRO CONTROLS

Celebrity: 2-scene preset dimming control system for up to 96 channels with master memory for up to 48 scenes; expandable with Celebrity Plus to 125 channels and 200 scenes.

Circle (330) on Reply Card

ELECTROHOME LTD.

EVM series: Monochrome monitors with P4 or other phosphor options.

ECP 1000 projector: Laser-aligned dichroics automatically converge colors for high luminance images through a single-lens system. Inputs may be NTSC or RGB.

Circle (331) on Reply Card

ELECTRO-VOICE

ELX-1 mixer: One rack unit high with four balanced transformerless inputs, switching from mic to line level, LED meter with clip indicator, tone source, transformer-isolated output and phantom power.

8408 series: Reinforcement mixers with outputs for right, left, mono, monitor, aux 1 and aux 2; fluorescent bar-graph meters, EQ, pan, linear slider faders and effects sends/returns.

Sentry 100EL: Self-contained power amplifier drives Super-Dome tweeter and 8-inch woofer in vented enclosure with fourth-order Butterworth tuning.

Circle (332) on Reply Card

FALCONE INT'L.

ATS-800: This automatic program and commercial insertion automation, handles up to eight playback machines with video/audio switcher, machine control and preview switcher.

Circle (333) on Reply Card

FARRTRONICS

Series 525 intercoms: Station with tally system, including 2-way, IFB and P/L modules.

Circle (334) on Reply Card

FELDMAR WATCH

Seiko stopwatchs: LCD quartz-based stopwatches with memories as well as the RR-01A, which interfaces to the SP-11 thermal printer.

Circle (335) on Reply Card

FLASH TECHNOLOGY

ElectroFlash beacon system: Tower obstruction lighting systems using high intensity xenon flash tubes for a conspicuous 20,000 effective candela (cd) at twilight, 4000cd at night.

Circle (336) on Reply Card

FORTEL

Color Ex chroma reduction: Operates with any NTSC composite signal to reduce chroma noise up to 12dB without affecting luminance. Faroudja design avoids frame-to-frame or field-to-field averaging to reduce motion artifacts.

Digibloc series: Combined synchronizer/TBC/mini still-store product, based on functional modules, which forms systems for specific needs, without unwanted functions.

TBC^{32}: For all major C, VHS, and U Format VTRs, with 30-line correction window, dynamic tracking, shuttle-mode viewing, velocity compensation, and selectable 8- or 9-bit sampling.

Digitest generator: Five front-panel selectable video test signals, two reference signals and nine audio test signal combinations.

Dubber TBC: Full bandwidth Y-688 dub signals and Y/R – Y/B – Y component processing, with proc-amp control, noise reduction and horizontal enhancement.

AS-2 audio synchronizer: Digibloc unit decodes hysteresis and frame offset data from frame synchronizer to correct audio timing.

TBC^{32} DE: Effects for U or C Format VTR playback and live feed signals, with 32 effects at 10 transition speeds.

Circle (337) on Reply Card

FORT WORTH TOWER

Towers: Complete tower services, from design and construction to maintenance needs.

Shelters: Mobile fiber-glass shelters in standard and custom designs.

Circle (338) on Reply Card

FOSTEX

Reference monitor: Coaxial mid-

FINALLY, AN "UNDER $10,000" NEWS CAMERA WHOSE BIGGEST SELLING POINT ISN'T THAT IT COSTS UNDER $10,000.

There's no shortage of portables out there that sell for under $10,000. The trouble is, price isn't the only thing they're short on.

The new Sony BVP-150, however, is another story. Its MF diode gun Saticon™ tube delivers performance that rivals cameras costing twice its $8,900* price. Like 650 lines of resolution at encoded output and a S/N ratio of 57 dB. Not to mention how it achieves a new height in depth of modulation for cameras in this class.

There's also the BVP-150's considerable range of automatics to consider. Along with the fact that it can generate composite output for recording on ¾″ or 1″, as well as component outputs for direct recording on Betacam™. And, in either case, it's legally airable. Because, unlike many cameras in this class, the BVP-150 is equipped with an RS-170A sync generator and a true I and Q encoder.

But to get the whole picture, you should call: in NY/NJ, (201) 833-5350; in the Northeast/Mid-Atlantic, (201) 833-5375; in the Midwest, (312) 773-6045; in the Southeast, (404) 451-7671; in the Southwest, (214) 659-3600; in the West, (213) 841-8711.

And find out about the new BVP-150.

The "under $10,000" news camera that gives you something even better than a low price: high performance.

SONY® Broadcast

*U.S. list price (lens not included). Sony Broadcast Products Company, 1600 Queen Anne Rd., Teaneck, NJ 07666. © 1984 Sony Corporation of America. Sony is a registered trademark and Betacam a trademark of Sony Corporation.

high drivers for point source reference with edgeless SLE subwoofer.

RM 765/780: Coaxial 6.5- and 8-inch reference monitor systems, with regulated phase and time coherent design.

Circle (339) on Reply Card

FUJINON

P17x16.5ESM: 17X lens system provides improved access to adjustments, auto/manual extender switch and pattern projection system; rated f/2.1 from 16.5-218mm for 1¼-inch cameras. R17x12.5ESM available for 1-inch formats.

P20x15ESM: Flat f/2.1 aperture from 15-210mm (to 14X of zoom capability), with 20X total range, MOD of 0.75m; available for 1- and 1¼-inch cameras.

A44x9.5ESM: For ⅔-inch formats, a 44X zoom, f/1.6 from 9.5-249mm, f/2.8 at 420mm position; 2X extender, auto iris and manual zoom/focus are standard.

Weatherized lenses: A17x9ERM and A14x9ERM with or without pattern projector module, are weatherized; provide higher resolution at corners and show reduced longitudinal chromatic aberration.

S14x6.6ERM: For ½-inch format, f/1.4 aperture from 6.6-87mm (13.2X of zoom), with MOD of 0.08M and 2X extender. 12X lenses: S12x6.6ERM and S12x6.6RM, with f/1.4 aperture, MOD of 0.95, macro and 2X extender on ERM model.

Circle (340) on Reply Card

see ad on page 73

GTE/SYLVANIA LIGHTING

RoughNeck lamps: DNT/FMD (750W) and DNV/FME (1kW) tungsten halogen units, offering 25% more light output than the incandescent units they replace, for high wattage, medium pre-focus base fixtures.

RoughNeck improvements: Performance, strength and precision are included in glass envelope, ceramic base and greater optical performance, from 300W-1kW.

Supplemental light: For use with extra illumination with video cameras, ranging from 42-250W.

PAR lamp: The 200W Brite Beam in a PAR 36 form, available in very narrow spot, narrow spot, medium flood and wide flood; produces 70lm/W.

Circle (341) on Reply Card

GARNER INDUSTRIES

Tape eraser: Model 1200 high energy videotape erasing system for 1-inch material to 10½-inch reels; provides erasure to 90dB in less than 16 seconds.

Circle (342) on Reply Card

GERSTENSLAGER

Mobile production systems: From smaller self-propelled vehicles to 40-foot, expandable semitrailer systems, Gerstenslager provides custom outfitting for the needs of production companies.

Circle (343) on Reply Card

see ad on page 50

GROSH SCENIC STUDIOS

Studio equipment: Designers, manufacturers and installers of scenery, draperies and rigging systems. Representatives of Ziller Technik suspension systems and Tru-Climber motorized winches.

Circle (344) on Reply Card

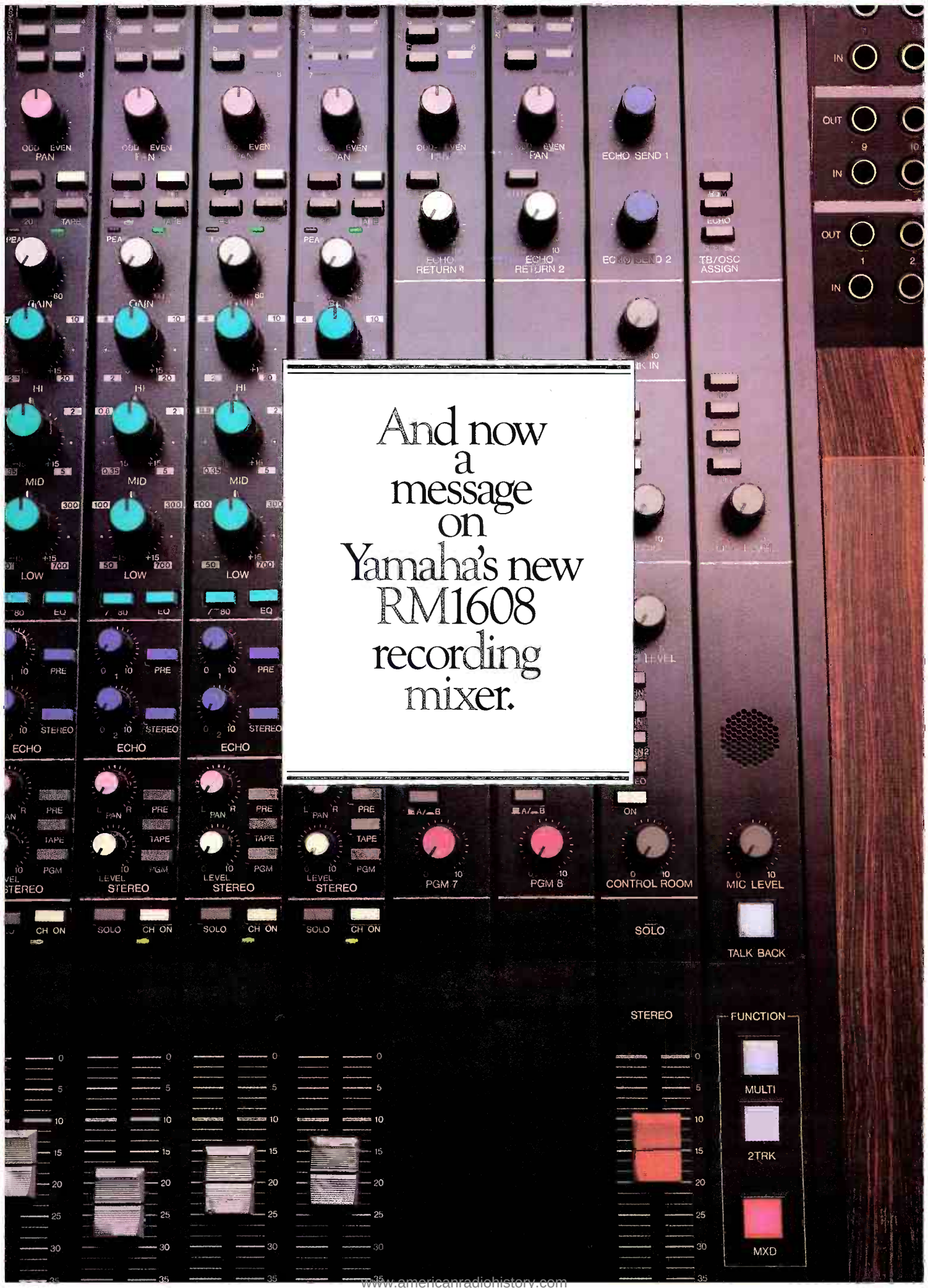
GRUNDER & ASSOCIATES

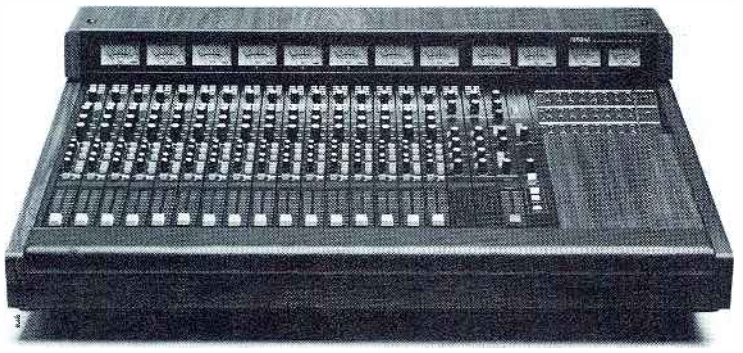
Distributor: Handles CEL Electronics Ltd. P147-20 digital framestore synchronizer/TBC/effects system and P151 effects controller.

Circle (345) on Reply Card

HA SOLUTEC

Commercial insertion: Automatic broadcast system for LPTV and CATV





RM1608

SPECIFICATIONS

TOTAL HARMONIC DISTORTION (T.H.D.)
Less than 0.1% at +4dB *output, 20Hz to 20kHz (all Faders and controls at nominal)

HUM & NOISE (20Hz to 20kHz) Rs = 150 ohms·
(INPUT GAIN "–60")

–128dB	Equivalent Input Noise (E.I.N.)
–95dB	residual output noise: all Faders down.
–80dB	(84dB S/N) PGM Master volume control at maximum and all CH PGM assign switches off.
–64dB	(68dB S/N) PGM Master volume control at maximum and one CH Fader at nominal level.
–73dB	(77dB S/N) STEREO Master Fader at maximum and all CH STEREO level controls at minimum level.
–64dB	(68dB S/N) STEREO Master Fader at maximum and one CH STEREO level control at nominal level.
–80dB	(70dB S/N) ECHO SEND volume at maximum and all CH ECHO volumes at minimum level.
–75dB	(65dB S/N) ECHO SEND volume at maximum and one CH ECHO volume at nominal level.

CROSSTALK
–70db at 1kHz: adjacent Input.
–70db at 1kHz: Input to Output.

MAXIMUM VOLTAGE GAIN (INPUT GAIN "–60")

PGM	74dB: MIC IN to PGM OUT.	ECHO	70dB: MIC IN to ECHO SEND.
	24dB: TAPE IN to PGM OUT.	C/R	74dB: MIC IN to C/R OUT.
	34dB: ECHO RETURN to PGM OUT.		24dB: 2 TRK IN to C/R OUT.
	14dB: PGM SUB IN to PGM OUT.	STUDIO	74dB: MIC IN to STUDIO OUT.
STEREO	74dB: MIC IN to STEREO OUT.		24dB: 2 TRK IN to STUDIO OUT.
	24dB: TAPE IN to STEREO OUT.		
	34dB: ECHO RETURN to STEREO OUT.		

CHANNEL EQUALIZATION
± 15 dB maximum
HIGH: from 2k to 20kHz PEAKING. MID: from 0.35k to 5kHz PEAKING. LOW: from 50 to 700 Hz PEAKING.

HIGH PASS FILTER –12dB/octave cut off below 80Hz.

OSCILLATOR Switchable sine wave 100Hz, 1kHz, 10Hz

PHANTOM POWER 48V DC is applied to XLR type connector's 2 pin and 3 pin for powering condenser microphone.

DIMENSION (W x H x D) 37-1/2" x 11" x 30-1/4" (953 mm x 279.6 mm x 769 mm)

Hum and Noise are measured with a –6dB/octave filter at 12.47kHz; equivalent to a 20 kHz filter with infinite dB/octave attenuation.
*OdB is referenced to 0.775V RMS.
• Sensitivity is the lowest level that will produce an output of –10dB (245mV), or the nominal output level when the unit is set to maximum gain.
• All specifications subject to change without notice.

The specs speak for themselves. But they can't tell you how natural, logical and easy the RM1608 is to work. All the controls and switches are logically arranged to help you get the job done quickly and accurately.

And in the tradition of Yamaha's sound reinforcement mixers, the RM1608 sets new standards of reliability as well as ease of operation. For complete information, write: Yamaha International Corporation, P.O. Box 6600, Buena Park, CA 90622. In Canada, Yamaha Canada Music Ltd., 135 Milner Ave., Scarborough, Ont. M1S 3R1.

YAMAHA

Circle (61) on Reply Card

with switching control through encoded signals or manual selection.

Circle (346) on Reply Card

HEIWA SEIKI KOGYO

VSF-3000 tripod: Combines a true fluid pan/tilt head, capable of handling 33 pounds, with a lightweight tripod adjustable from 33.5 inches to 61 inches.

Circle (347) on Reply Card

HIPOTRONICS

Peschel Regulator: Automatic voltage regulation systems in wye-connected configuration; maintains line within 1% of nominal voltage.

Circle (348) on Reply Card

see ad on page 78

HITACHI DENSHI AMERICA

FP-5 camera: This ½-inch camera with single frequency separation Saticon; character display in viewfinder allows titles, dates, etc.

FP-7 Camera: A ⅔-inch 5MHz striped-filter Saticon tube system offers high resolution, sensitivity and S/N rating with exceptional shading characteristics and colorimetry.

HR-230 VTR: A non-contact air support system prolongs head and tape life for more gentle tape handling; 30-second segment recue in 3.5 seconds; – 1X to 3X speeds; programmable time compression/expansion; and TC-230 TBC system.

TC-230: Time base correction with 2-H correction window, 9-bit sampling at 4X subcarrier, advanced dropout compensation and line-by-line velocity compensation.

SB-30 controller: Slow-motion control system to enhance HR-230 VTR, allowing sequence of slow speeds to be memorized and recalled, with cue point storage to 99 events and high speed shuttle to 50X FF/REW.

Circle (349) on Reply Card

IBM

Computer systems: Broadcast-applicable systems using S/3600 and S/3800 mainframes as well as smaller-based applications involving the PC-100.

Circle (350) on Reply Card

IMAGE VIDEO

8010 switcher: For master control with 10 video/audio inputs, five separate audio inputs, 5-source key bus, auto take or manual fader, matte generator and other features.

8020 master switcher: 20 video/audio inputs, five audio-over inputs, breakaway operation, and optional 20-event storage, assignable crosspoints and stereo audio with many other features.

7707K switcher: Under monitor display selector with alphanumeric keypad to update message data on a display.

Models 601, 602, 6030, 9320 and 9300: See "Routing Switcher Update" on page 112.

Circle (351) on Reply Card

see ad on page 98

INFLIGHT SERVICES

VSTAR5: TV projector system.

BarcoData projector: For data, graphics, video and image processing in PAL, SECAM, NTSC or RGB; 5-inch, liquid-cooled CRTs produce 440lm output.

Circle (352) on Reply Card

INFORMATION TRANSMISSION SYSTEMS

ITS-235: UHF transmitter rated at 5kW visual output power with IF modulation, broadband composite audio for multichannel sound service and remote control; subscription TV applicable.

Circle (353) on Reply Card

INNOVATIVE TV EQUIPMENT

T3 tripod: For ENG use, with ball-leveling bowl, for loads to 25 pounds, and usable heights from 15-62 inches.

H100FD head: Pan/tilt head for loads to 250 pounds; gives ± 53° tilt range, 360° pan rotation and fluid drag damping action.

D8 dolly: With load capacity to 250 pounds; spreads to a diameter of 48 inches, folds to 31"x16" package for storage or transport.

P2 pedestal: Pneumatic studio pedestal product for use with camera loads up to 290 pounds.

Circle (354) on Reply Card

INTERACTIVE MOTION CONTROL

Animation systems: 4-axis animation stages demonstrated at exhibition to illustrate Sony BVH-2500 animation VTR and Ultimatte keying equipment.

Circle (355) on Reply Card

JEFFERSON DATA SYSTEMS

AutoSelect: Software for IBM PC allows control over music selection as well as inventory, format and scheduling functions.

Circle (356) on Reply Card

K & H PRODUCTS

Porta-Brace cases: Quick-Draw camera cases and production cases available for many popular cameras, including the Panasonic RECAM and Sony BETACAM systems; hold equipment securely and safely with accessor pocket for all the extras.

Circle (357) on Reply Card

KAMAN SCIENCES

Broadcast computer: Logs, projections, PSA/promo lists, FCC log analysis, tape cart inventory and billing; based on IBM System/38 mainframe.

Circle (358) on Reply Card

KANGAROO VIDEO PRODUCTS

Super-Tough case: For cameras and VCR combo systems; top-loading bag has TriFast zipper opening, triple hemming for durability, aluminum frame for support and closed-cell foam padding for equipment safety.

Circle (359) on Reply Card

KEYLIGHT PRODUCTIONS

Camera operator dolly: Called the Stand-up/Sit-down dolly; offers operator stability, yet allows the operator to move smoothly along halls and through doors; packs in 27"x27"x22" case.

Rental equipment: For video and film production needs.

Circle (360) on Reply Card

KINGS ELECTRONICS

Connector products: RF, coaxial and triaxial connectors; video patch panels and patch cords; field service connector kits.

Circle (361) on Reply Card

GEORGE KLEINKNECHT

Electrical contractors: Engineering and contracting services for broadcast systems.

Circle (362) on Reply Card

KLIEGL BROTHERS

Performer enhancements: Software updates for Performer control systems, including *Record and Track, Halt/Back* and *Remainder/Dim* functions.

Circle (363) on Reply Card

KOBOLD LIGHTING

DL 200 PAR: Lamphead with igniter circuit; uses brite beam PAR 36 type lamp.

Profi minilight: ENG fixture for battery- or ac-powered lights with easily changed lamps.

200/CID Reporterlight: 200W CID lamp from electronic square-wave ballast; operates from 4Ah or 7Ah belt or battery pack-driven power source.

Circle (364) on Reply Card

LTM OF AMERICA

Pepper fixtures: From Fresnel to flood to framing, with 100-650W HMI lamps and fast-focusing push-pull T-bar beam control.

Circle (365) on Reply Card

LANG VIDEO SYSTEMS

Two-Shot: Portable production system in a small case includes two video switchers, source ID, mic/line mixer, two color monitors and audio cue/program monitor; dc operation from wide range of voltages.

Circle (366) on Reply Card

LARCAN COMMUNICATIONS

TEC-IV exciter: For transmitter updating or new systems; a VHF TV exciter designed around SAW filtering for improved frequency response.

TC-10000FH: IF-modulated high-band VHF TV transmitter uses only one tube for 10kW rating with completely solid-state aural section.

Circle (367) on Reply Card

LASERVIDEO

Videodisc services: Mastering and replication of laser videodiscs.

Circle (368) on Reply Card

LeBLANC & DICK COMMUNICATIONS

Antenna, tower and turnkey: LeBlanc & Royle and Alan Dick & Company Ltd. combine forces for antenna and tower design, construction and installation with ongoing maintenance services through Telcom Tower Services.

Circle (369) on Reply Card

LEITCH VIDEO

AVS-481 switcher: See "Routing Switcher Update" on page 112.

CTG-240N: NTSC standard calibration test generator; a stand-alone source of most commonly used video test signals; includes scope trigger signals with stairstep/ramp, multiburst, window, pulse/bar, color bar and dot/bar outputs.

DTG-1010N: This updated version of the DTG-1000 generator includes modulated pedestal and sync without setup outputs.

VPA-331N: NTSC proc-amp cleans up incoming feeds from Telco or satellite links to the master control room or VTR area.

HDS-481 switcher: See "Routing Switcher Update" on page 112.

Polaris scrambling: Data encryption system used by Oak Communications for signal security in CATV or satellite-relayed signals.

Circle (370) on Reply Card

see ad on inside back cover

LOGICA

MicroTEXT products: Editing terminal and transmission equipment for use with World System Teletext visual text systems.

Circle (371) on Reply Card

LYON LAMB

VAS V: Rack-mounted controller connects via RS-232 with computer graphics and imaging equipment in NTSC and PAL formats; controls ¾-and 1-inch VTRs for frame-by-frame animation editing.

Circle (372) on Reply Card

M/A-COM

MA-40MX link: TV camera relay link uses 40GHz spectrum for nearly interference-free 28-channel band of ENG operation.

Circle (373) on Reply Card

MPCS VIDEO INDUSTRIES

Distributor: Representatives for all major manufacturers of broadcast- and production-applicable equipment.

Circle (374) on Reply Card

MACROTEL

Teletext/videotex: Products for NABTS teletext and NAPLPS videotex systems, in association with Norpak Corporation.

Circle (375) on Reply Card

MAGNASYNC/MOVIOLA

Specialist series: Microprocessor-controlled record/playback reel-to-reel decks in 10-, 20-, 30- and 40-channel models, with integral time code generator/reader modules and automatic search.

Circle (376) on Reply Card

see ad on page 58

CHARLES MALCOLM VIDEO

The TEAM: Combined capabilities of a Commodore 64 computer and Chyron VP-1 character generator for text processing.

Circle (377) on Reply Card

MARCONI ELECTRONICS

See GEC-McMichael—as a result of recent business merger.

MATTHEWS STUDIO EQUIPMENT

Production accessories: An assortment of clamps, reflectors, stands, grip heads and frames.

Focustrack: 1-piece high impact molded material forms low friction track for improved movement of all camera dollies.

Circle (378) on Reply Card

MAXELL CORPORATION OF AMERICA

BQ U-matic tape: Rugged videotape cassette material for editing.

HGX pro tape: These ½-inch videotape materials combine epitaxial coating with ferric oxide for improved response in color and mono.

Hi-fi videocassettes: These ½-inch VHS and BETA format cassettes are for recording and duplicating.

Circle (379) on Reply Card

MERLIN ENGINEERING

Speedscope ME-308: Single-tube camera simplifies measuring speed of distant object accurately to ± 1mph.

101 matrix: Wideband video universal component matrix permits component ½-inch VCRs to accept equiband RGB video for recording.

Circle (380) on Reply Card

MICRO COMMUNICATIONS

MDS/ITFS combiner: Multichannel combiner systems providing constant impedance to two or more channels for transmission from a single antenna. For MDS/ITFS 2.15GHz and 2.5GHz bands; up to 4-channel systems result from combining 2-input units.

Diplexers: Constant impedance waveguide notch-type MDS/ITFS diplexer products to combine aural and visual frequencies with high isolation and low insertion loss.

Waveguide antennas: Systems for 800MHz cellular radio (rated 5kW) and ITFS/MDS products (500W rated); constructed of heavy wall aluminum structural waveguide; omni and cardioid patterns available.

Circle (381) on Reply Card

MICROTIME

Mosaic transitions: An option for the E-120 A/B roll effects system creates a tile-like mosaic special effect in two tile sizes.

S-230D TBC: Time base correction and synchronizer functions handle hot switches with no detectable disturbance; for use with camera, ENG, satellite, remote studio feeds, as well as ½- and ¾-inch VCRs.

TSE-120: One 120D TBC and one S-230D TBC/synchronizer combine for freeze and auto mode switching with an E-120 A/B roll effects processor and effects control.

S²E-120: Two S-230D TBC/synchronizers, coupled with E-120 effects processor and control system, for flexibility.

Circle (382) on Reply Card

see ad on page 31

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.

So you can get all the messy paraphernalia out of your system. Digitally.

The Paint Box lets you do a lot more than you can do with traditional art materials. A lot faster. And with typical Quantel picture quality.

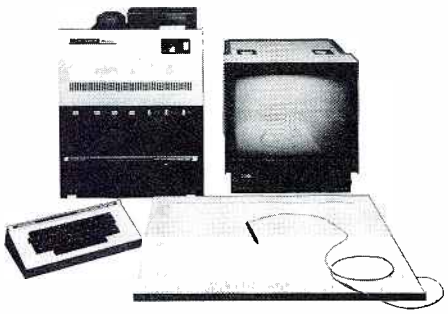
It gives you over 16 million colors. If that's not enough, you can mix your own, just like you'd do with paints.

It's incredibly versatile. You can produce the look of oils, watercolors, chalk, pencil. You can make stencils. Air brush. Cut and paste. Even animate.

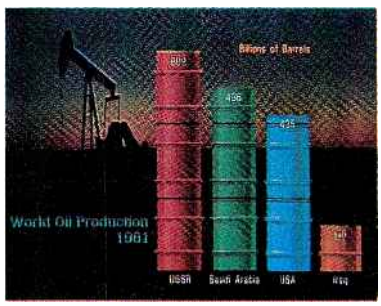
You can grab TV frames off the air, resize them, retouch them, mix them with graphics.

You can set type from a large variety of the highest quality fonts.

And you can interface the Paint Box to Quantel's DLS 6000 Library System for a totally digital still-picture system. It's awesome.



Call your local MCI/Quantel office. They'll be glad to show you a demonstration tape. Or get in touch with us directly at 415/856-6226. Micro Consultants, Inc., P.O. Box 50810, Palo Alto, California 94303.



Graphics like this are easy on the Paint Box.

MCI/QUANTEL
The digital video people.

Circle (135) on Reply Card

MICROWAVE MOBILE SYSTEMS

Microwave transmission services: FCC-licensed common carrier service for point-to-point microwave, satellite uplinks/downlinks and production services.

Circle (383) on Reply Card

MODULATION SCIENCES

Stereo TV sound generator: Generator product designed in accordance with EIA's Zenith/dbx system.

TV-Sidekick: Second audio program (SAP) generator for use with multiple audio channel TV sound system.

Demodulator: A QEI product for precision demodulation of aural baseband for reference and parameter measurements.

Circle (384) on Reply Card

MYCRO-TEK

MAX character generator: A 32k user memory system stores 120 pages of eight 32-character lines; 70ns resolution characters with eight colors for characters and backgrounds; wire service and weather sensor inputs.

Mycro-Vision systems: Supra and SupraTwo character generators for alphnumeric video display requirements.

Circle (385) on Reply Card

N-DEPTH

3D-TV: One camera, with special periscope-type mirror system, forms offset images, while viewer glasses include optical wedge to force superimposition of images.

Circle (386) on Reply Card

NADY SYSTEMS

PRC product enhancements: Single- and double-muff headset systems in the personal radio communicator series.

49VR/LT and HT: Wireless mic systems for intercommunications with TV camera operators.

823/828 series: Wireless intercom systems.

IRT200 series: Infrared stereo headphone system allows listening comfort without cabling.

TH-15 series: Headset allows hands-free communications.

ICX-1/ICX-3 stations: Wireless intercom products link to existing hardwire intercom systems for wireless capability.

PRC series Easy Talk communicators: Provide simplex and duplex communications in 49MHz band.

Circle (388) on Reply Card

NATIONAL TELECONSULTANTS

Consultant services: System design to total turnkey construction.

Circle (389) on Reply Card

NYTONE ELECTRONICS

VSS-1/2/3: Broadcast slide reproduction systems; 80-slide Carousel capacity; color bar generator; flying spot scanner system providing 450TVL resolution; optional fade between slides and random access.

TSC-1/2/3: Flying spot slide scanner system does not include bar generator.

Circle (390) on Reply Card

OKI ELECTRIC

LT1210 converter: VLSI technology provides standards conversion freedom without module change (PAL-M optional), with TBC, synchronizer and freeze capability.

Circle (391) on Reply Card

OLESEN

Distributor: Stage, screen and TV lighting products, including Kobold ReporterLite 200 series; TTI Wizard lighting control system and RP18 dimmer modules.

Circle (392) on Reply Card

OPTICAM MOTION GRAPHICS PHOTOGRAPHY

Animation services.

Circle (393) on Reply Card

J. OSAWA & COMPANY

YEC/Photron products: SG-100 dual sync generator, meets RS-170A; FS-1000 frame sync/encoder creates standard NTSC or PAL from RGB computer signals; VS-1000 generator meets RS-170A and provides various test signal outputs.

Circle (394) on Reply Card

PEP

XL Super Charge: Improved nicad batteries.

DAC2 charger: Battery charging system includes a 2-channel analyzer system for battery conditioning.

ES800: Interface system allows VHS C-Format on-camera VCRs to be interconnected to BVU800 editing control.

Circle (395) on Reply Card

PFB CONCEPTS

Nova series 4445: Control room design services and products to make a more functional working environment.

Circle (396) on Reply Card

High Definition Audio

For the complete picture

The new 300 Series Audio Production Console has been specifically designed to complement the latest audio and video technology. It's the only console in its class, offering mono or stereo inputs each available with or without equalization, output submastering, audio-follow-video capability, a comprehensive user-programmable logic system, and a wide range of accessories for custom tailoring to your specific requirements. Available now. Call us collect for further information.

auditronics. inc.

3750 Old Getwell Rd.
Memphis,TN 38118 USA
Tel: (901) 362-1350
Telex: 533356

Circle (64) on Reply Card

PATCHBAY DESIGNATION

PatchPrints: Easy-to-read custom labeling for any patch bay, control panel, mixing panel and rear-illuminated button switches.

Circle (397) on Reply Card

PEERLESS SALES

ETV 1540 cart: Jumbo equipment cart for 19- to 25-inch receivers or monitors, with 3-shelf design, 8-inch pneumatic wheels.

Jumbo casters: 8-inch pneumatic tires on rigid or swivel casters use ball bearings for smooth motion without harmful vibration and jolts.

Circle (398) on Reply Card

PHILIPS TEST AND MEASURING INSTRUMENTS

PM 5651M: Studio VITS signal generator; digitally generated NTC-7 signals may be selected from setup matrix to insert on Lines 11-21 (Field 1) or Lines 10-21 (Field 2).

PM 5630: Color sync generator, includes gen-lock, sync/subcarrier phasing per EBU and RS-170A; output color field ID; parallel output of all desired receiver and monitor alignment signals, in PAL and NTSC forms.

PM 5631 generator: Color sync generator with gen-lock and multiple-pattern capability in PAL and NTSC formats (SECAM version #5632). IEEE/IEC bus interfacing allows automated control of digitally generated information.

PM 5645 teletext source: For the British standard, a 4-page teletext generator with adjustable eye-height, adjustable white noise and co-channel sine wave interference.

PM 5634 sync test: Generator provides jumping line signal with offset to 8% from nominal line frequency, jumping subcarrier to ±800Hz off 3.579545MHz, anti-PAL signal.

PM 5669 modulator: TV test modulator shows accurate display of rest carrier. Highly stable, double sideband video modulator with IF and low VHF outputs.

PM 5671: TV modulator for UHF and VHF applications uses SAW filter with pre-corrected group delay and vestigial sideband characteristics; for LPTV, closed-circuit.

PM 5672 TV modulator: Combined visual and aural modulator with dual audio channel capability conforming to German standard.

PM 5673 modulator: Complete TV visual/aural modulator for CATV.

Circle (400) on Reply Card

PHOEBUS MFG.

ULTRA ARC series II: Keylight fixture using Osram Halomet HTI 400W lamp with lamp zoom control.

Syncrolite systems: Computer control over motion, color changing, multiscene memory with floppy disk.

Circle (399) on Reply Card

PICTURE MANAGEMENT SYSTEMS

PhotoStore: Access to any of 15,000 images in seconds from videodisc playback system—easily interfaces to studio still-store processors.

Circle (401) on Reply Card

PINZONE

Earth station products: Receiver systems coupled with antenna controllers.

Circle (402) on Reply Card

POLAROID

CS 35mm slides: Instant photo materials for 35mm format without a darkroom; requires auto processor unit.

Circle (403) on Reply Card

PRECISION ECHO

VFR-series: Video frame recording systems with random access through RS-232 or IEEE488/RS-422/optional bus configuration; computer-controlled absolute tracking, capacity of 200 frames/discassette side, 400 frames/disc.

Circle (404) on Reply Card

see ad on page 26

QUAD EIGHT/WESTREX

WESTAR: Modular audio mixing system with eight auxiliary sends to 52 inputs, 24- to 48-track interface, grouping controls, variable filters, interchangeable VCAs and digital microprocessor control automation with 10Mbyte hard disk storage system.

Circle (405) on Reply Card

see ad on page 51

QUANTA

Select 7 Special: NTSC version of teleproduction graphic titler with three resident fonts plus 30 topical graphic/display symbols and instant sizing with FONT-FLEX.

Q8 titler: Face-loadable graphic/titling system with expanded software in single- and dual-channel configurations includes FONT-FLEX size control.

QUANTANEWS: Newsroom computer system for broadcast includes high speed local area network capability with Datapoint ARCNET circuitry.

Circle (406) on Reply Card

see ad on page 95

QUICKSCAN SYSTEMS LTD.

Electronic publishing: Conversion of raster-scan video into retrievable pages of full-color pictures and text, batch-delivered via broadcast or cable to the home, office or VCR.

Circle (407) on Reply Card

QUICKSET

Pan/tilts, scanners: Environmentally sealed pan/tilt and scanning units for CCTV, security, antenna positioning or instrument positioning, with microprocessor-based control systems.

Circle (408) on Reply Card

R-COLUMBIA PRODUCTS

UL-85 series: Ultralight headphone and mic with mono or stereo ear pieces; plug in to 6058 compact telephone unit for hands-free operation in ENG and IFB activities. 6058/T plugs into modular telephone jack for pulse or tone dialing.

CC/IC-85 headphone: Replacement unit for intercoms by various manufacturers using 4-pin XLR connectors.

Circle (409) on Reply Card

ROH

DAS 220: Single-channel digital recorder/announcer allows messages from 2-20s for IDs and other spot announcements; contains no moving parts to fail.

Circle (410) on Reply Card

RECORTEC

Evaluators: Videotape cleaning and evaluation systems for ½- and 2-inch, U-Format and C Format tape products. Evaluation results may include print-out of effects, while display shows tape length.

Circle (411) on Reply Card

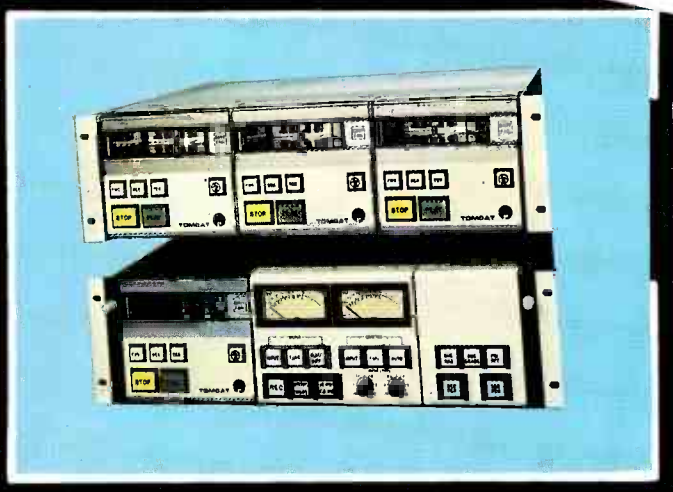
REGIS-BLT

FSC 781 synchronizer: PAL-based system with TBC function, dropout compensation, auto freezer, auto/manual component coding video processing and integral interface to digital effects unit; 8-bit sampling.

Modulo Uno effects: Performs compression/expansion, squeeze, multiple image, inversion, mosaic, posterization, scramble, negative image, multifreeze and other effects.

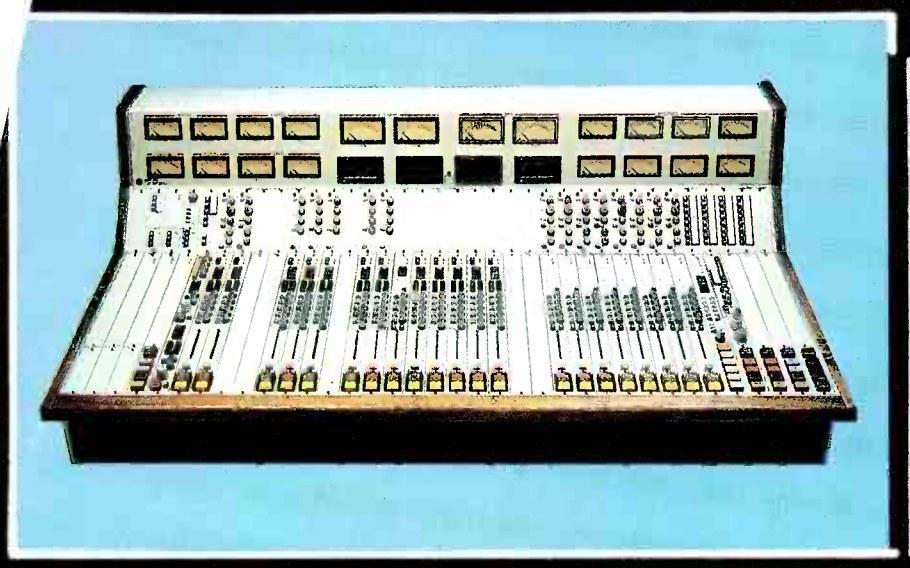
NT 1000 telecine: Digital flying spot system for 16mm and 35mm formats; electronic adjustment to cinemascope formats; one control console handles up to five film and tape transports.

NM814 color monitor: For all color



TOMCAT — The preeminent [illegible] recorder and reproducer, offering superb reproductive quality. Matrix, 7½ and 15 IPS, MONO/STEREO, 3 tones and fault detection are standard.

BMX — The undisputed leader of on–air audio consoles. Exacting design and construction yield optimal performance quality. Modularity combines user–friendliness with maintainability. Source machine control is standard in 10, 14, 18, 22 and 26–input consoles.



ABX — This new WORLD–CLASS OPERATIONS console is the first console designed for production requirements of radio broadcasting. In 18, 26, and 34–input sizes, the ABX provides the positive attributes of BMX in a 2, 4 or 8–TRACK production configuration. With additional busses, 2 MIX/MULTITRACKING, SLATE/OSCILLATOR, multi–studio TALKBACK, 4 SENDS/RETURNS, full metering, 4 telephone MIX–MINUSES and much more, the ABX is unique.

PACIFIC RECORDERS & ENGINEERING CORPORATION

Call TOLL–FREE 800–874–2172 for your full–color brochures on TOMCAT, BMX, ABX, STUDIO CABINETRY systems or other quality PR&E products.

Circle (65) on Reply Card

standards, modular circuitry drives standard CRT version to 450TVL resolution or high resolution version to 700TVL; two composite as well as RGB video inputs.

NT850 analog telecine: Multiplexing telecine system uses simultaneous multiprojection for special effects with new prism system; 1-inch lead-oxide pickup tubes produce PAL color.

Circle (412) on Reply Card

ROSCO LABORATORIES

Precision paint: Paint products with precision pigments improve chroma-key production effects. Also, Ultimatte paints.

Designer patterns: New series of gobos for lighting effects.

Circle (413) on Reply Card

ROSS AMERICAN LOGIC SYSTEMS

System 860: Computerized lighting effects control, programmable in terms of frames, cues and shows, with dimmer levels, timed fades, timed cross-fades and animation rates; for 768 independent 600W circuits.

Circle (414) on Reply Card

JOHN B. RUDY

Distributor: Audio and video wiring and cabling supplies, microphones, connectors and special custom cable assemblies.

Circle (415) on Reply Card

SWR

Transmission line: Supplier of coaxial transmission line products and associated components.

Circle (416) on Reply Card

SCHNEIDER CORPORATION OF AMERICA

14.5X zoom lens: For 1- and 1¼-inch cameras (LDK6) covering the 13-190mm zoom range; with 2X integral extender and maximum aperture of f/1.7, features improved color correction throughout zoom range.

Circle (417) on Reply Card

SCIENTIFIC-ATLANTA

7555 exciter: Ku-Band video exciter, microprocessor-controlled upconverter synthesized in 500kHz steps for TS-250B and NTC-7 standards with sync tip reference modulation; includes synthesized audio subcarrier modules.

Transportable C-Band systems: 4.5m spun aluminum antenna with motorized drives on a 42-foot drop-deck trailer, includes controlled-environment operations shelter, redundant electronics, monitoring and test equipment with 60kW diesel generator.

DAT-800 terminal: Digital audio system allows multiple satellite access capability for point-to-point and point-to-multipoint network use; based on SCPC concept.

7622 RF matrix: Interconnection replacing power dividers and coaxial relays among up to four receivers with two dual-polarized antennas.

Circle (418) on Reply Card

SENNHEISER ELECTRONIC

HD 424 headphones: Open-Aire headphones with 16Hz-20kHz response. The unit weighes 6 ounces without cable.

HME-410 headset: Combined headphone/microphone product, available with various configurations of connectors and electret or carbon-button mic.

Circle (419) on Reply Card

see ad on page 124

SHINTRON

EMPRESS 2000: Event memory-programmable effects switching system with two Z-80 microprocessors for the edit suite; interfaces to editing control through RS-422 bus.

Microdyne's Multiple Satellite Feed System lets you add to your programming instead of your debt

Saves the cost of a new dish

With new programming constantly being added, you may want to pick up programs from several satellites. Previously, this would involve the expense of another dish. Now with Microdyne's multi-feed system you may be able to add programming from additional satellites at about 1/5 the cost of a new dish.

The Multiple Satellite Feed System can receive up to five satellites on the same parabolic reflector when the satellites are located in close proximity. In a TVRO system designed with adequate margins, the MSF will provide quality pictures on all feeds.

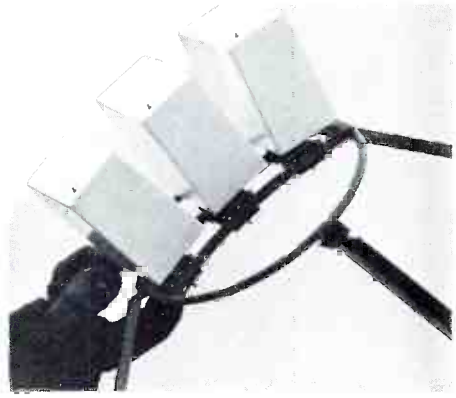
Easily retrofitted

Existing Microdyne antennas can be easily retrofitted to accommodate this new system. Only the struts and brackets of the feed support hardware must be changed—no other antenna changes are required. This simple modification can be done by the user or by Microdyne field service personnel.

Even if you purchased your existing antenna from another manufacturer, it may still be possible to modify it for use with the Microdyne Multiple Satellite Feed System. Please give us a call.

Increases Capability

So, whether you are planning a new system or expanding an existing installation, the MSF can provide increased capability while saving both the cost and the real estate required by a second dish.



When installed on a 5-meter antenna, isolation between beams is better than 20 dB, with a loss of about 1 dB at 4°off boresight.

Free Information

If you would like more information on our Multiple Satellite Feed System, contact your nearest Microdyne distributor, or give us a call at (904) 687-4633.

Microdyne Corporation

P.O. Box 7213 • Ocala, FL 32672 • (904) 687-4633 • TWX: 810-858-0307

Circle (67) on Reply Card

MC-1 Intermatrix converter: Inputs component signals in RGB, Y/I/Q or Y/R-Y/B-Y are converted to any of those three formats.

690ET: Everything Timecode includes SMPTE/EBU time code generator and reader for ITC and VITC operation.

12X switcher & Hi Rel series: See "Routing Switcher Update" on page ooo.

270 audio switcher: A companion to EMPRESS series switchers, a 12-input, 3-channel mixer, controlled from its own front panel or from the video switcher.

391 switcher interface: Encoded video version of 390 component switcher/editor interface system for PAL or NTSC video.

Circle (420) on Reply Card

SKOTEL

Editon systems: West German g.t.c. machine synchronizers in EBU/SMPTE formats.

TCG-80N/80P: LTC time code generator and integral reader allowing jam sync and slave functions.

DM-100 metronome: Digital metronome with resolution to 0.01 frames and headphone and line outputs; calibrated for video and film rates; fits in the attaché case.

Circle (421) on Reply Card

SOLWAY

Telcom c4: Models 231, 232 and 233 noise reduction units following the ANT Telecommunications c4 design, providing noise reduction for Type C VTRs or ATRs, available in 1-, 2- and 3-channel versions.

Circle (422) on Reply Card

SOPER SOUND MUSIC LIBRARY

Computer software: MusicSelector and PFS Personal Filing System database programs for Apple II, ClearLight Super Star and Bell & Howell microcomputers, for quick location of information about music libraries.

Circle (423) on Reply Card

STAINLESS

VERDA lighting deterrent: Mounts on the TV or microwave tower to prevent or reduce damage to the tower and associated systems, and to reduce fire hazard of secondary sparking.

Circle (424) on Reply Card

STANTRON

Cabinets/racks: Cabinet and rack enclosure products available in various colors and finishes, conforming to EMI radiation specifications.

Custom and standard designs are available.

Circle (425) on Reply Card

STEP

Maste
master
capstan or
servo-operate
drive system
2-track, ½-inch t
Q-II autolocator:
mable memory loca
count storage, includi
nel assignment and shu

Circle (426) on Reply C

EJ STEWART VIDEO PRODUCTIONS

Starliner: 48-foot semitrailer van-based mobile production unit, equipped for transmission or recording; separate access doors to videotape, video, maintenance, audio and production control areas.

Distributor: Videoplex multi-image display by TDV of Germany.

Circle (427) on Reply Card

STRAND CENTURY

Solid-state ballast: Electronic power regulation to HMI lighting equipment, with fixed frequency square-wave output to 575W or 1.2W Parlites for high efficiency, independent of input variation.

Light Palette Two: Lighting dimmer control system with 800 channels controlling up to 1500 dimmers or 16 CD80 dimmer racks.

Circle (428) on Reply Card

SYMTEC

PGS III graphics: NTSC and RGB graphics capabilities using the PBM PC computer with 22 text fonts, 16 colors on the screen from a palette of 4096; color cycle automation and optional 2-page storage and 2-page display with page switching.

Digi-Pad 5: Graphics digitizer products from GTCO Corporation.

VideoSlide 35: Graphics camera from Lang Systems, for use with Ektachrome slide film or Polachrome 35 instant materials.

Circle (429) on Reply Card

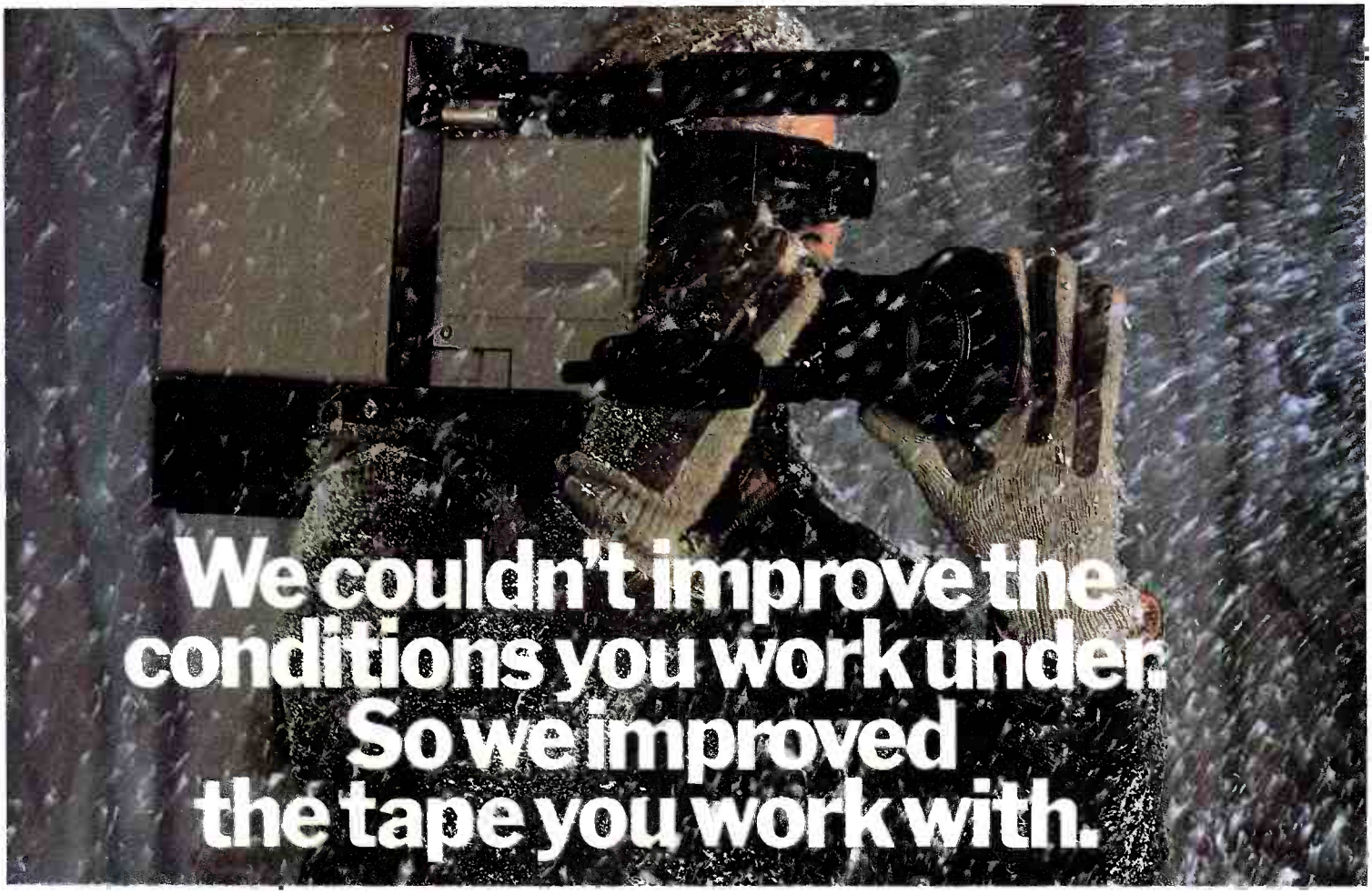
SYSTEM ASSOCIATES

Distributor: Product lines cover audio, video and some RF products for the broadcast industry.

Circle (430) on Reply Card

TAMRON COMPANY LTD.

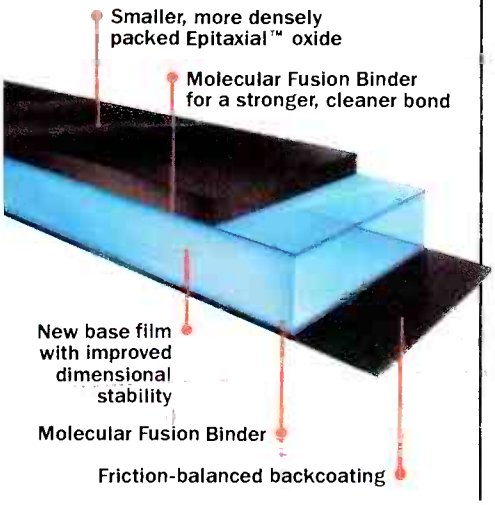
87H lens: A 13X zoom lens starting at 8.5mm includes a 2X extender;



HGX Pro ½" Videocassettes

Differences you can see, hear. And retain.

At last, tape performance impervious to the whims of weather and the rigors of editing. Harnessing new tape technology, Maxell brings ENG dramatic improvements you can see, hear and retain.



The Epitaxial™ contribution: higher video, brighter chroma.

A new, smaller oxide achieves unprecedented packing density. Expect enhanced signal-to-noise. Better definition. And extended replays without signal loss.

Molecular Fusion Binder: longer life bonding for truer-to-life performance.

A bond immune to time, temperature or mechanical stress. With no need of plasticizers, so none can creep to the surface. Anticipate far fewer dropouts, less clogging and extended tape and head life.

New base, binder, backcoating. Better support for the signal.

No static. No noise. No dust. The molecular-fused backcoating assures diminished mechanical and magnetic noise. And optimum running smoothness, even in high heat.

A shell made to the industry's toughest standards.

Ours. The transport is quiet, jam-proof. The housing immune to temperature extremes.

From open reel tapes to a complete line of KCS/KCA U-Matics, audio and VHS/Beta cassettes, we're getting quality down to a science. And in your hands, our science turns to art.

HGX Pro ½" Videocassettes in Beta and VHS.

maxell®

Maxell Corporation of America, 60 Oxford Drive, Moonachie, N.J. 07074 201-440-8020

Circle (70) on Reply Card

macro function; maximum aperture f/1.6; MOD 0.8m; for ⅔-inch cameras.

76H lens: ⅔-inch zoom lens with 12X range starting at 9.5mm; maximum aperture of f/1.6 and MOD of lm; macro function.

466HB: ⅔-inch optical system with f/1.6 aperture and 12X, 9-126mm zoom range.

981H: ⅔-inch lens system with 10.5-105mm 10X range; 8.3X macro feature; f/1.6 aperture; MOD 1.1m.

976H: ⅔-inch camera lens includes 2X extender, f/1.6 aperture, and 9.5-114mm 12X zoom range.

Circle (431) on Reply Card

TELESCRIPT

DIGIS systems: Digital prompting systems operate from IBM, Columbia and other compatible PC units; Commodore 64 version also available.

Circle (432) on Reply Card

TELESOURCE

BUZ 2000: A TV or radio newsroom management system, designed to include a local area network configuration and based on redundant processors and work station terminals.

Circle (433) on Reply Card

TELESPEC

Satellite communications products: Upconverters/downconverters, FM modulators/demodulators and transmit system control products for C-Band and Ku-Band activities.

Circle (434) on Reply Card

TELEVISION ENGINEERING

Distributor: Line includes many popular brands of TV production products, as well as several models of remote production vehicles built on Ford chassis.

Circle (435) on Reply Card

TELEX COMMUNICATIONS

FMR-2 diversity receiver: Elimination of mic wires by using dual diversity, with automatic phaseshifting to compare signals for the strongest and/or best S/N ratio for program use. The 12Vdc or 120Vac receiver includes two ⅝ wavelength antennas.

WT-200 beltpack: Easily concealed beltpack wireless mic transmitter will also work for electric guitar hookup.

Circle (436) on Reply Card

THEATRE SERVICE & SUPPLY

Tough/Cyc: Strong, improved durability fabric for seamless cycs, in lengths up to 150 foot; natural or 60% reflectance gray.

ECLIPSE: Modular microprocessor-assisted lighting controller from Zero 88 (UK); featuring 2-scene presets, level and channel memory, auto faders, programmable chaser and cartridge effects.

Circle (437) on Reply Card

THERMODYNE

Equipment transport cases: Many sizes of Shok-Stop and Rack-Pack shipping, storage and operating racks and cases for broadcast equipment.

Circle (438) on Reply Card

TIFFEN

Adapter rings: Wide assortment of lens adapter rings for many popular lens systems.

Magnetic filter head: Allows simplified, faster filter changes.

Rezinar: High quality resin filters for special effects, including fog, diffusion, low contrast and star effect, as well as color gradients.

Sunset filters.

Circle (439) on Reply Card

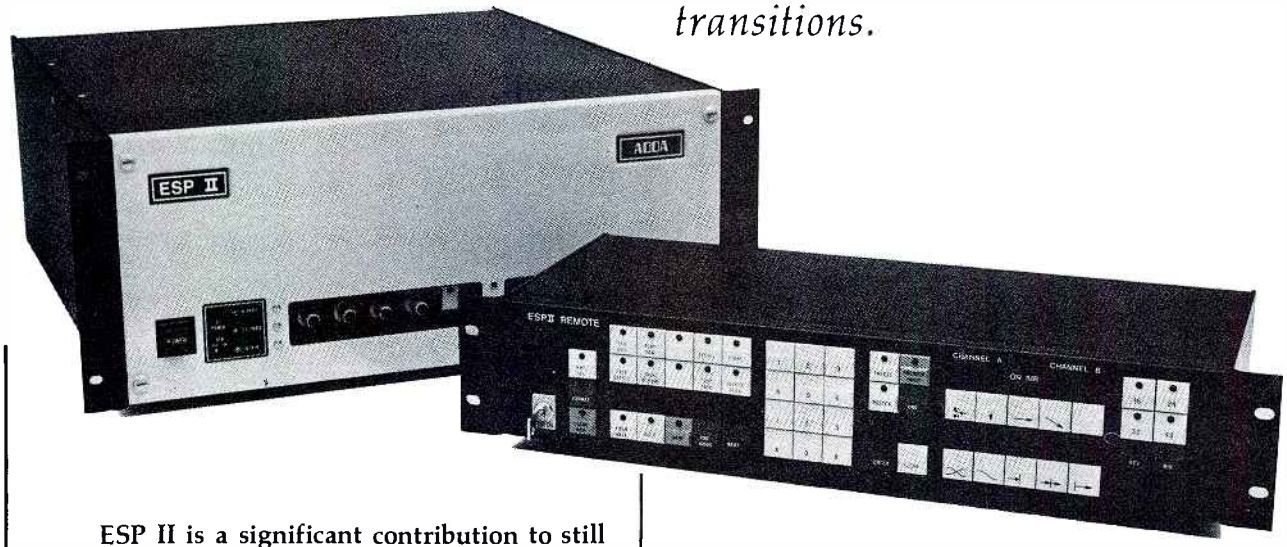
TOSHIBA

56UT-PA: 400W-rated UHF TV power amplifier, all solid-state, operating from 24Vdc on any single UHF channel.

63VF-PA; 2kW VHF power amplifier, also applicable for FM broadcast, uses power MOSFET devices; covering a 6MHz channel

ADDA does it again.

ESP II . . . dual-channel digital still store combines high signal transparency and modular convenience for cost-conscious graphics generation, still storage and retrieval . . . *plus digital effects transitions.*



ESP II is a significant contribution to still store technology, combining improvements in disk storage with innovative work in integrated circuits and electronic packaging to create a low-cost, modular system which extends this versatile production tool to users with smaller budgets.

The two-channel system with digital effects and a 400-still capacity is priced at $25,990 plus drives.

ESP II can function as two independent freeze frame synchronizers, with a separate third channel for digital effects transitions . . . horizontal and vertical wipes, fades and dissolves and *pushes and pulls* (effects not found on normal production switchers).

Now, smaller TV stations, cable operations and production houses . . . even industrial and educational systems can move up to the benefits of quality still store graphics generation and control.

ADDA ESP II . . . Affordable Excellence!

ADDA CORPORATION

Affordable Excellence

130 Knowles Drive, Los Gatos, CA 95030 (408) 379-1500

Circle (72) on Reply Card

between 40-190MHz.

65MR-PA/MO: High efficiency 3kW amplifier for AM radio broadcast using PDM series modulation method. Operates from 270Vdc between 531-1602kHz.

Circle (440) on Reply Card

TOWNSEND ASSOCIATES

Microwave system: Point-to-point microwave in the 2-18GHz spectrum, operating from 10mW-2W with subcarrier modules for program audio, stereo, data or telemetry.

Multichannel microwave: Block converter product for CATV converts six CARS band channels to UHF frequencies; then to 70MHz IF.

TA-100-ASL update: Solid-state design 100W VHF transmitter with external diplexing for LPTV.

TTA-5000-CU: 5kW UHF amplifier with tetrode tube, serves as aural, visual or combined TV final amplifier.

TA-25TTH: 25kW VHF highband transmitter, solid-state except for final EIMAC triode.

TA-1000NTU: 1kW UHF transmitter for LPTV; with choice of TN-2EU or TSA-1EU exciters for diplexed or multiplexed outputs.

Universal klystron amplifier: Special transmitter design allows klystrons from EEV, Valvo and Varian to be used with only slight modifications regarding output coupling, mounting and operating parameters.

Circle (441) on Reply Card

TROMPETER ELECTRONICS

Patching products: Patch panels, cable assemblies and connectors for coax, twinax, triax and quadrax cabling requirements.

Circle (442) on Reply Card

TYLER CAMERA SYSTEMS

Film camera accessories: 35mm middle-mount includes operator's seat with totally adjustable camera support system for Arriflex IIC camera.

Circle (443) on Reply Card

UTAH SCIENTIFIC

CSP-1600 controllers: Four alphanumeric displays for preset or status of each of four switching matrices, 1600 possible source names through 16-button touchpad, integral diagnostics, single coax party-line link, for 1-/2-, 5-/10- and 10-/20-bus controls.

CSP-16160/4: Full matrix controller doubles as a maintenance diagnostic panel, operating in numeric or mnemonic modes and provides a cross-reference listing between input devices and output connections.

PLMC-1 control panels: MCSP-1, control/status for one VTR/telecine; MCSIP-1 combination machine control, status and interface panel; and MIP-4, machine interface panel.

ESP-500 event processor: Option for master control switcher provides 99 preset events with single-keystroke airing, designed for easy conversion to automation with stereo audio.

Circle (444) on Reply Card
see ad on page 63

VIDEO ASSOCIATES LAB

IBM-PC MicroKey: PC overlay system gen-locks to input video, with adjustable horizontal and burst phases, NTSC output and RGB or NTSC keying.

Accessories: RGB card for use with Apple IIe with 64k memory, 80-column capability and all available Apple colors; accessory cable for RGB card.

MicroKey character generator: Titling for Apple IIe with background matte, auto proportional spacing, line justification and shape editor.

Circle (445) on Reply Card

VIDEOMAGNETICS

Videocassette changer: OEM product based on Sony U Format VCRs; provides random access control in automation.

Circle (446) on Reply Card

VIDEOMEDIA

EAGLE III editing system: Complete U Format or ½-inch editing system with Echolab SE3 switcher and customer software; 250-event memory; Auto-Match, Auto-clean, Auto-tag software; and programmable multilevel transitions.

Circle (447) on Reply Card

VIDEOTEK

TSM-5A line select: Waveform monitor line selection enhancement for single line (from 14 to 21) of either Field 1 or 2; for observing VITS, VIRS or captioning data.

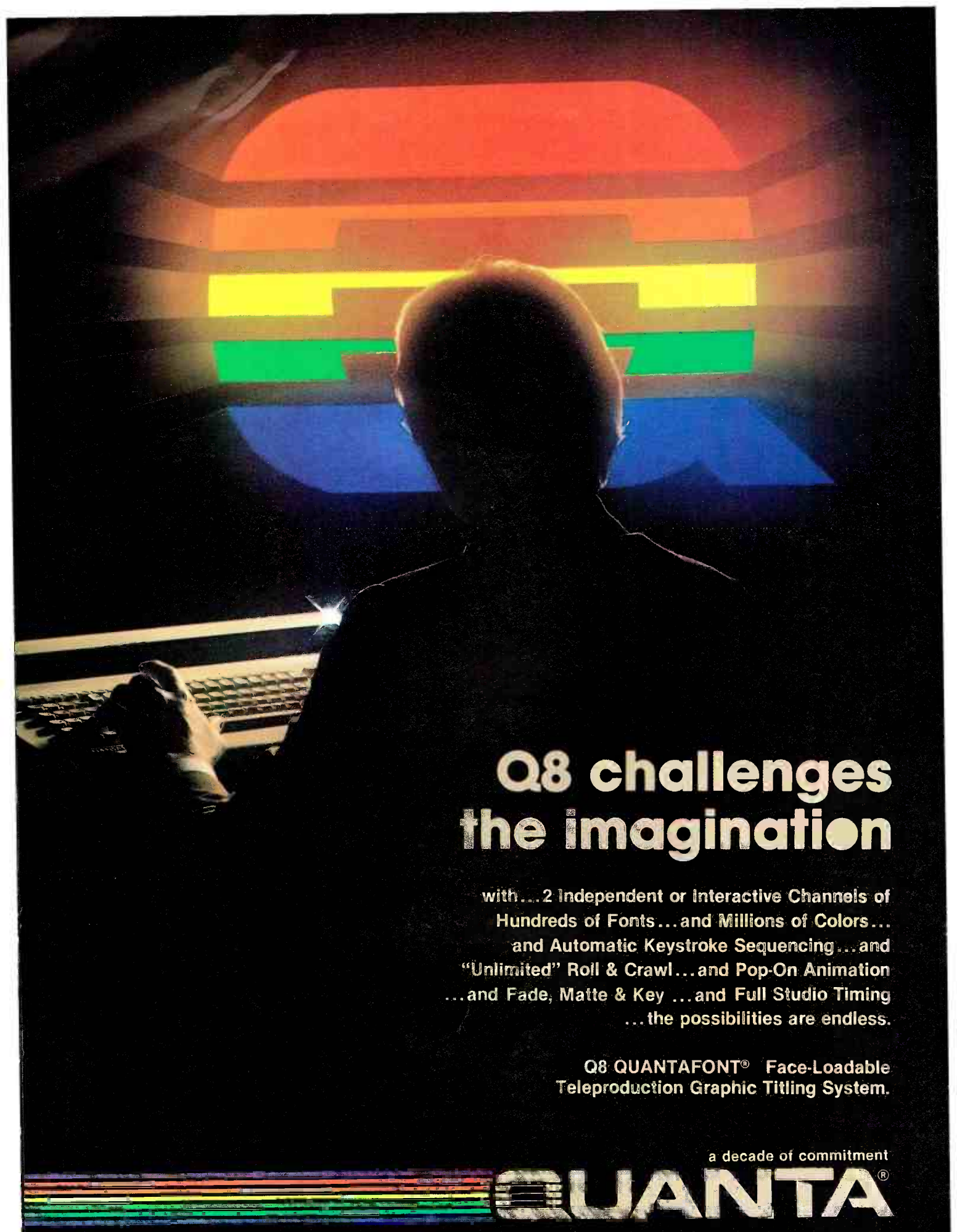
VSG-100: RS-170A capable sync generator with SC/H-phase indicator on front panel, including test signals of full-field bars or split-field/red for head banding checks.

Studio-13 monitor: A 13-inch CRT color monitor system; rated 380TVL resolution; three looping NTSC inputs, A/B split-screen display and blue-gun-only.

VM-5T: Ac/dc portable color monitor includes BNC video inputs as well as 8-pin VTR connection and audio capabilities. Optional battery pack available for VM-5T or RM-5T monitor receiver model.

APM-12: Audio monitor system handling up to 12 balanced audio inputs with 3"x5" speaker as well as headphone jack.

Circle (448) on Reply Card
see ads on pages 100 and 102



Q8 challenges the imagination

with... 2 Independent or Interactive Channels of
Hundreds of Fonts... and Millions of Colors...
and Automatic Keystroke Sequencing... and
"Unlimited" Roll & Crawl... and Pop-On Animation
... and Fade, Matte & Key ... and Full Studio Timing
... the possibilities are endless.

Q8 QUANTAFONT® Face-Loadable Teleproduction Graphic Titling System.

a decade of commitment

QUANTA®

Quanta Corporation • 2440 So. Progress Drive, Salt Lake City, Utah 84119 • (801) 974-0992 TWX 910-925-5684

Circle (82) on Reply Card

VIKING CASES

Cases: ATA shipping, CarryLite and VikiLite molded transportation containers in a wide variety of sizes, with foam padding for equipment protection.

Rack-mount cases: Accepts standard width and custom size equipment for easily moved operating systems as well as secure and protected shipping.

Circle (449) on Reply Card

VITAL INDUSTRIES

3000 series: Video production switcher features double-level mix/effects systems capable of airing five separate keys simultaneously; without microprocessor control.

Circle (450) on Reply Card

WARD-BECK SYSTEMS

MicroC LS series: Stereo consoles for TV production feature true stereo submaster, master, auxiliary, solo and monitor outputs, as well as mono master, auxiliary and PFL channels; internal routing switcher handles 64-input capability.

Circle (451) on Reply Card

see ad on back cover

WESTERN GROUP

Nova II Night Vision: Image intensifier tube amplifies existing light to allow extreme low light level condition shooting with regular TV cameras.

Mini-TP: Registration and optical alignment device for portable and ENG cameras; attaches directly in front of lens; gives precise test pattern at infinity focus.

Circle (452) on Reply Card

WILK POWER AND VIDEO

Series 4400: Computer-controlled titling with floppy or hard disk memories allow multiple keyboards, input from telephone line, four supplied fonts, proportional spacing and much more; also software for AF, BN or Dow Jones stock displays.

VAR 1010S: See "Routing Switcher Update" on page ooo.

Circle (453) on Reply Card

WIREWORKS

MSJ/MSC series: Multipin input microphone splitter products providing up to three female inputs, a direct output and up to three isolated male outputs in various configurations.

MPS series: Connector products to handle phantom mic powering requirements.

MYJ/MYC series: Microphone multicable prism components allow mixing of different channel system configurations into a single system.

Circle (454) on Reply Card

WOLD COMMUNICATIONS

Network services: Satellite relay services including series of syndicated programming and videoconferencing.

Circle (455) on Reply Card

FRANK WOOLEY & COMPANY

MotionMaster: Animation effects through the use of polarized light.

Circle (456) on Reply Card

YAMAHA INT'L.

REV-1: Reverberation system allows control of room size, shape, contents, acoustic absorption coefficient and listening positions; up to 40 early reflections and 99 seconds of subsequent reverberation possible.

R1000 reverberator: Digital system allows preset parameters with 3-band parametric equalizer and remote-controlled bypassing.

YDM2600 delay: Rack-mount unit and remote control use LCDs to indicate selected delays and bypassed outputs; 12 user-programmable memories (RAM) allow special setups; calculates distance between speakers and listeners.

Circle (457) on Reply Card

Five alarm hotel fire, 400 guests, three competitors and one news editor who eats cigars for breakfast.

Don't trust it to ordinary video tape.

Get it fast.
Get it right.
Get it done.

The pressure in this business is extraordinary.

Which is why Fuji gives you professional video tape that can take anything you can throw at it.

Consider the latest advance in Fuji technology: the ¾ inch H521BR U-matic video cassette. It gives you the absolute minimum number of dropouts possible—less than 4 per minute. Its video and color S/N ratio are boosted up to +2dB over the outstanding specs of our H521.

Superior back-coating technology and precision-engineering ensure that Fuji stands up to all the punishment dished out in the editing room. In fact, stop-motion capabilities increase to over 180 minutes. And Fuji's smoother, denser BERIDOX coating makes sure your tape heads suffer less abrasion than ever before.

To find out more about the new ¾ inch H521BR and the other extraordinary video tapes we make, all you have to do is a very ordinary thing.

Just call Fuji.

FUJI.

Nobody gives you better performance.

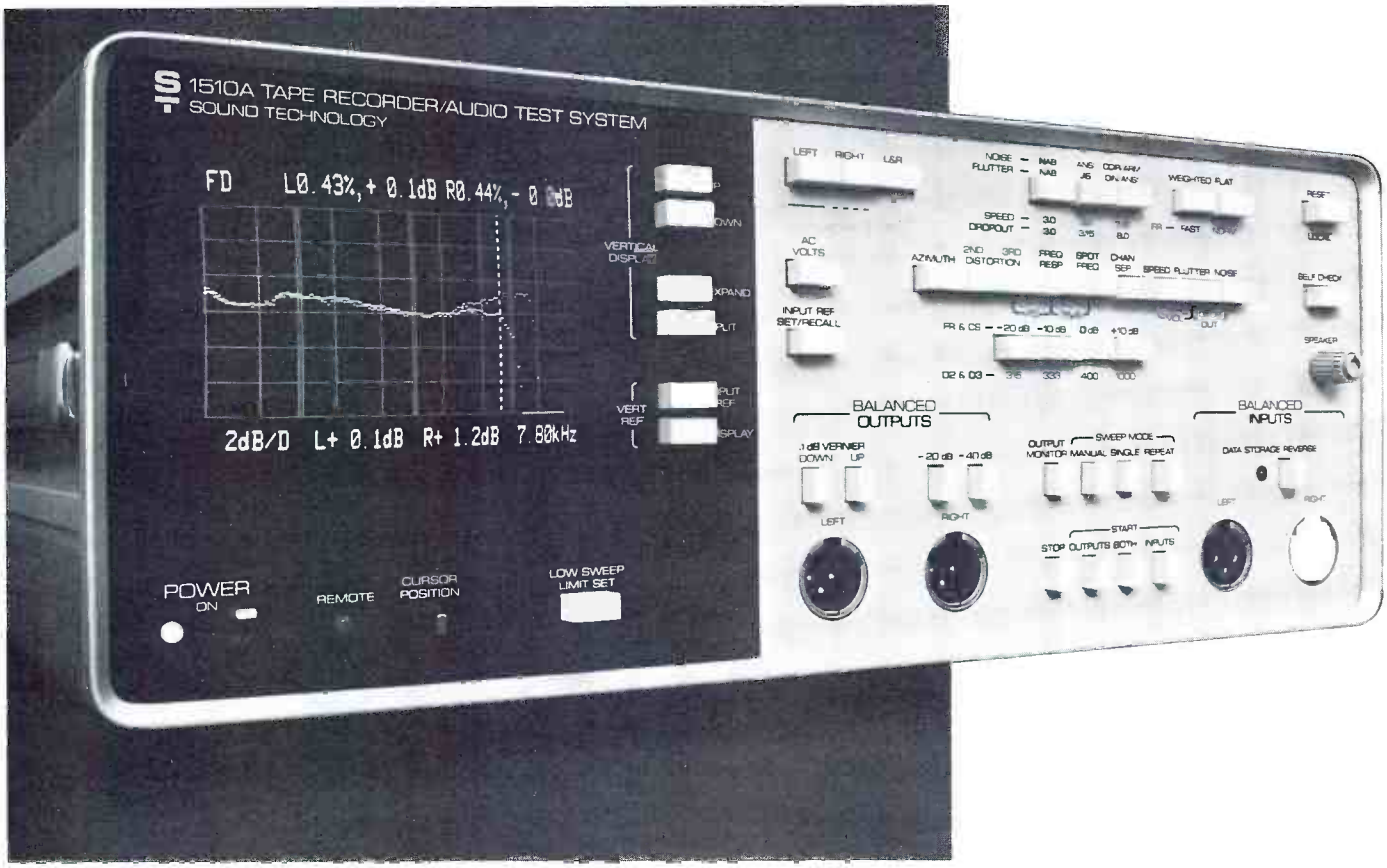
Circle (62) on Reply Card

Plant our Ramko Research

By Jerry Whitaker, radio editor

Ramko Research, located in Rancho Cordova, CA, has a long history of innovative broadcast audio products. The company manufactures more than 56 products, including the Primus line of audio components. Ramko was established in the late 1960s in the belief that developments

Ramko Research manufactures a line of 56 audio products, the Primus audio series and the Phase Master cartridge machine.



Clean Up Your Audio with the Sound Technology 1510A AUDIO TEST SYSTEM.

The 1510A Audio Test System should be in every video/film and teleproduction facility.

WHY?

If you're striving to meet the demands of media production houses and are involved in post-production of quality audio for film or video or on-location recording for radio, television, and CATV, the **1510A *insures*** delivery of a sound product, each and every time!

DESIGNED TO GIVE YOU THE COMPLETE PICTURE.

The Sound Technology 1510A features a built-in CRT. . . differential inputs. . .and electronically-balanced outputs with a clean, low-distortion signal source (typically .005%) from +30 to −70 dBm.

EVERYTHING YOU NEED TO KNOW ABOUT YOUR AUDIO.

Fast, accurate evaluation of audio quality for VTRs, including:

- ☐ channel separation vs frequency
- ☐ dynamic range vs frequency utilizing the 1/3 octave spectral noise analyzer
- ☐ selectable, tuned dB voltmeter for analyzing audio/video crosstalk and hum/noise-related problems
- ☐ depth of erasure and discrete harmonic analysis
- ☐ complete spectral analysis of wow and flutter components
- ☐ phase vs frequency

What's more, the 1510A is a complete audio test system that solves ***all*** your audio requirements, including:

- ☐ all-inclusive diagnostic evaluation of signal processors and audio special effects
- ☐ verifying "state-of-the-art" mixing console specifications
- ☐ complete mechanical and electronic testing of tape recorder, cart, and film machines
- ☐ exclusive asynchronous inputs and outputs for remote location testing (tape-delay stereo simulcast, satellite transmission, etc)
- ☐ thorough analysis of audio parameters for film, video, and audio tape (drop-outs, MOL-tape saturation)
- ☐ evaluating and appraising new products prior to purchase
- ☐ in-house product development

STEREO TV OR FM SIMULCAST?

The 1510A is the only two-channel test instrument in today's market! During recorded or live simulcast feeds from cable stations, the 1510A satisfies any and all technical needs.

CALL SOUND TECHNOLOGY.

Are you involved in the production or post-production of audio, video, or film? Is your firm ultimately concerned about the ***audio quality*** of your projects? Then give Sound Technology a call at 408-378-6540. We'll be glad to discuss how you can clean up your audio with the Sound Technology **1510A Audio Test System!**

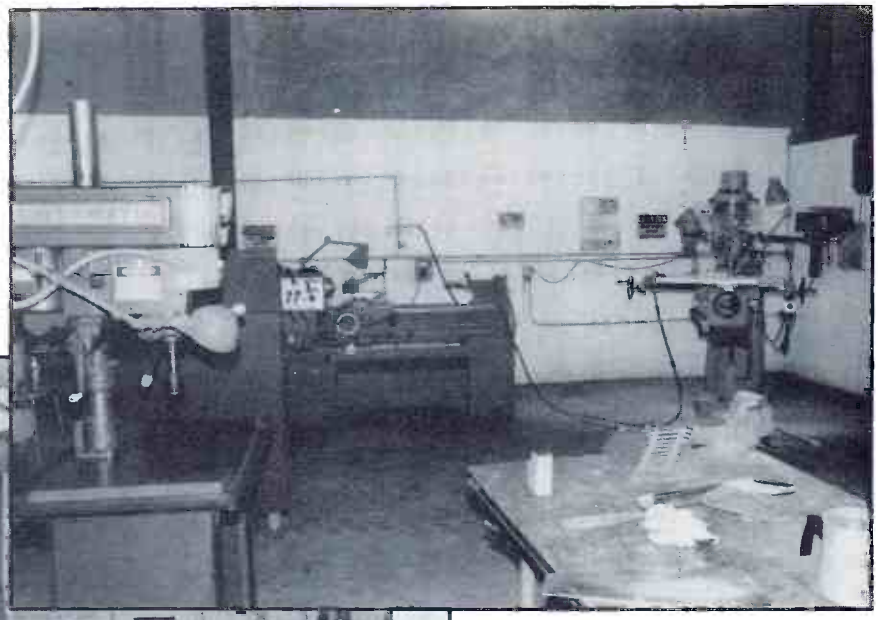
Leaders in Test and Measurement for over a Decade

SOUND TECHNOLOGY
1400 Dell Avenue, Campbell, CA 95008
(408) 378-6540 Telex: 357445

Circle (86) on Reply Card

in integrated circuit technology would open new frontiers in the state of the broadcast audio art.

The Rancho Cordova plant (located near Sacramento) is a self-contained facility at which all steps of a product's development and production are performed. New system-design work is done in-house and pro-



Shown is part of the metal fabrication and machining shop at the Ramko plant.

Printed circuit board processing and silk-screen work are done on-site at the plant.

Varian GEN II KPA. Pushing earth terminal technology through the 80's.

Designed specifically for today's modern world of earth terminal communications, the new Varian GEN II KPA simplifies complex communications problems with its advanced computer interface options. Easily adaptable, GEN II can be programmed to IEEE 488, RS-232 and RS-422 data busses.

Smaller, more modern design.
Modular construction includes a proprietary,* digitally-controlled, all solid-state, low noise regulated power supply.

Integrated in the RF section is a digitally-controlled PIN diode attenuator to provide precise setting of the RF output.

Controls/Monitors/Logic section circuits use C-MOS high noise immunity digital techniques to energize, protect, control and monitor KPA performance. The modern front panel features all-LED indicators and digital meter displays.

Enhanced Varian klystron for high efficiency.
GEN II utilizes the original, field-proven Varian VA-936 series klystron, with enhanced specification including 24-channels for top performance.

GEN II provides high efficiency with only 12 kVA for a full 3.35 kW tube, less than 1 kVA in standby and automatic 10% reduction of heater voltage for extended klystron life.

*Patent applied

More information on the new GEN II KPA for the 80's is available from Varian Microwave Components and Subsystems Division. Or the nearest Electron Device Group sales office. Call or write today.

Electron Device Group
Microwave Components and
Subsystems Division
3200 Patrick Henry Drive
Santa Clara, California 95050
Telephone: 408•496-6273

varian

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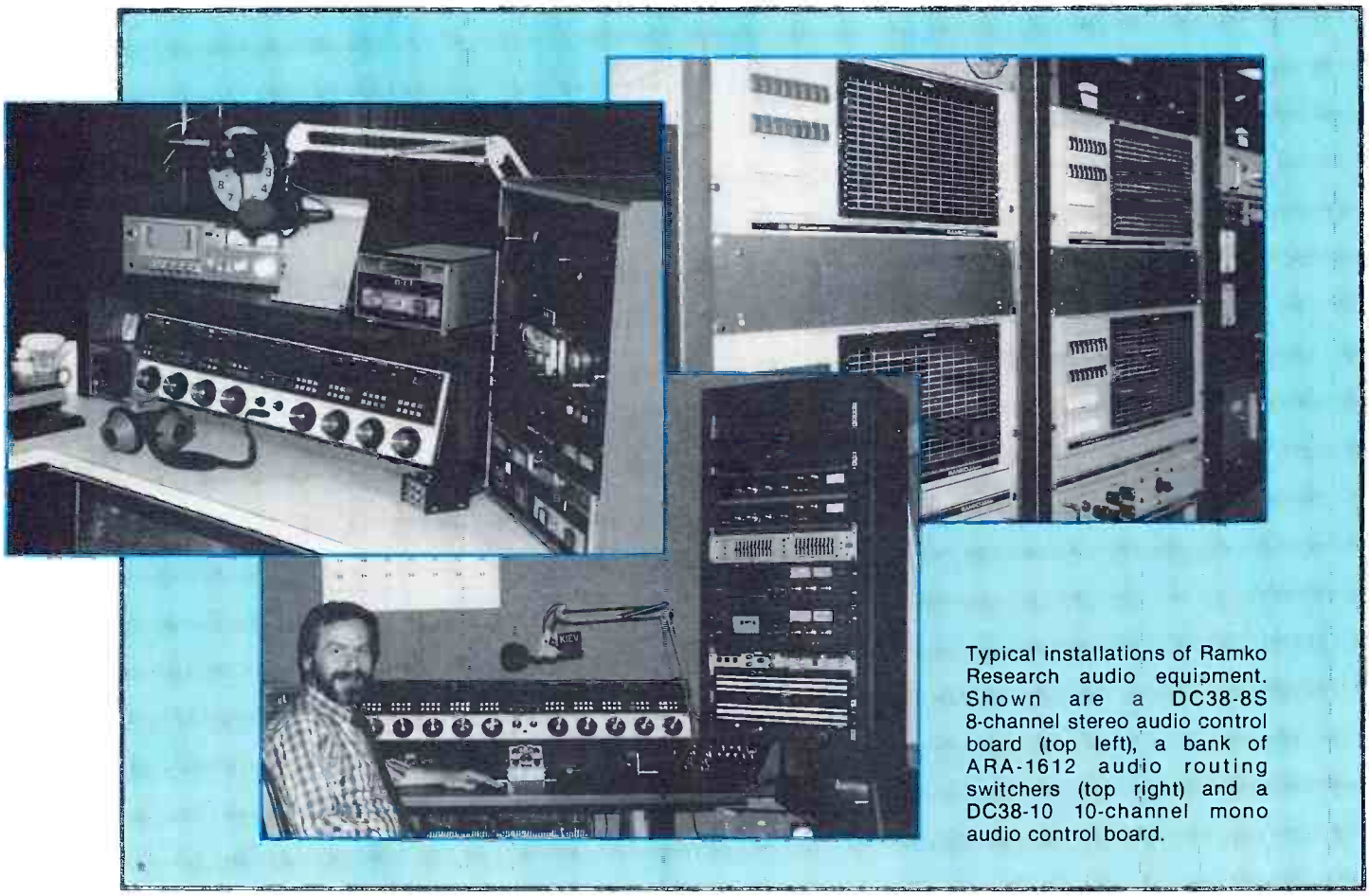


Typical installations of Ramko Research audio equipment. Shown are a DC38-8S 8-channel stereo audio control board (top left), a bank of ARA-1612 audio routing switchers (top right) and a DC38-10 10-channel mono audio control board.

A DECADE OF PROGRESS

RS-10A
10 x 1 Audio Follow Video Routing Switcher

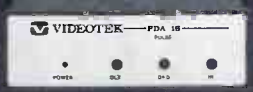
Two Audio Channels with Breakaway

VDA-16
Video Distribution Amplifier

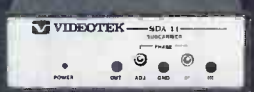
ADA-15
Audio Distribution Amplifier

VIDEOTEK™ INC.

PDA-16
Pulse Distribution Amplifier



SDA-14
Subcarrier Distribution Amplifier



RS-12
12 x 1 Video Only Routing Switcher

Bridging Inputs & Overnight Channel Memory

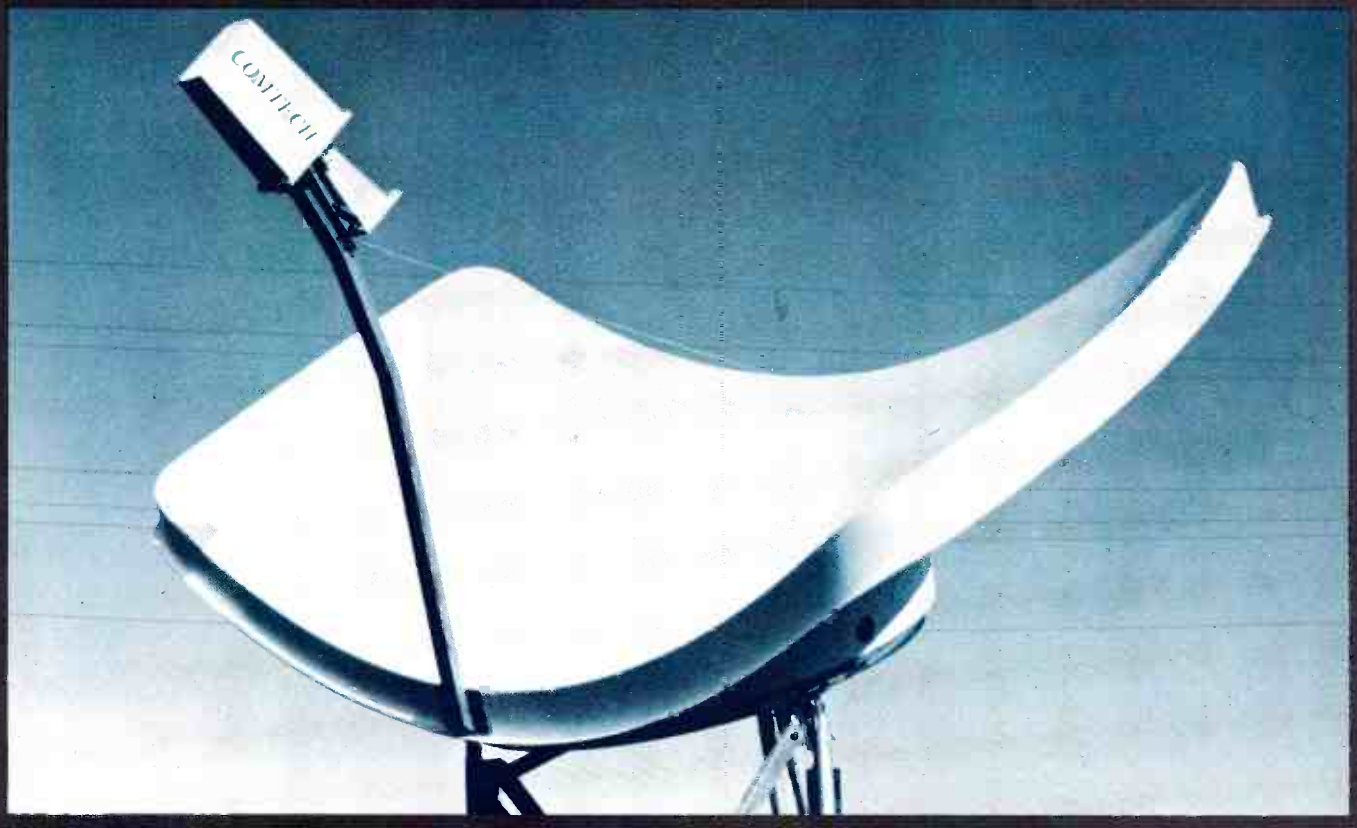
A DESIGN FOR THE FUTURE™

125 North York Street, Pottstown, PA 19464, (215) 327-2292, TWX: 710-653-0125/9625 North 21st Drive, Phoenix, AZ 85021, (602) 997-7523, TWX: 910-951-0621

Circle (89) on Reply Card

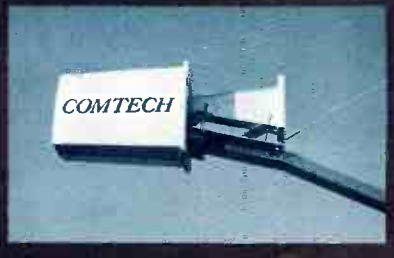
OFFSAT™

Comtech's Full Offset Antenna



At last. A small licensable antenna for KU and C-BAND

Here's a unique one-piece antenna design with an innovative offset feed that makes the "Offsat" the only antenna in its size category capable of exceeding all FCC specifications for 2° spacing. Comtech's "Offsat" is the intelligent response to the new stricter requirements and it has the surface tolerance necessary for KU band.



This fresh approach to the 2° spacing dilemma has one important advance over competitive systems: It works now and will work in the future – you can install the "Offsat" today and be set for tomorrow.

The idea is simple. The width of 5.5 meters creates the very narrow beamwidth needed to meet and exceed the 1983 FCC requirements. The offset feed assures zero signal blockage, totally eliminating feed support reflections. A reflector height of just 8 feet allows easy, one-piece shipping. The "Offsat" is available for uplink and downlink applications in EL/AZ, polar or transportable configurations.

This range-tested licensable transmit/receive antenna will make economical business data communications a reality. Find out more by contacting Comtech Antenna Corporation at 3100 Communications Road, St. Cloud, Florida 32769 **(305) 892-6111.**

TAKING THE LEAD IN SATELLITE ANTENNA SYSTEMS

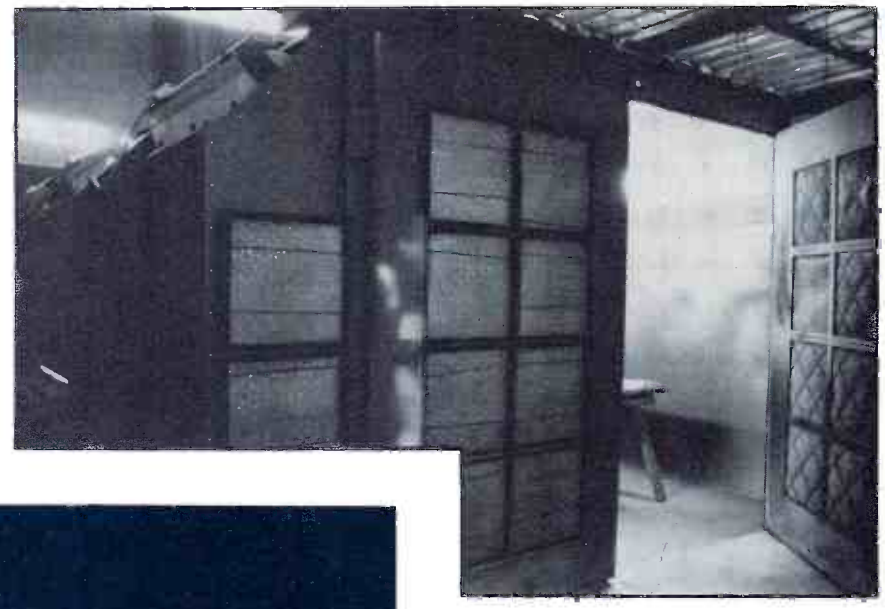
COMTECH *Antenna Corporation* **A subsidiary of Comtech, Inc.**

Circle (90) on Reply Card

totype units are built and tested by a design engineering group. The manufacturing facilities include a machine shop that turns raw stock into console front panels, amplifier chassis and tape deck components. Printed circuit boards are designed, etched and drilled at the facility, and front-panel silk-screening is performed on-site.

Although the audio products manufactured by Ramko vary widely in application and design, all follow a similar route through the development process. Before any product is designed, a need must be identified for the item. Once circuit details are complete, a prototype unit is assembled and tested. The new product's actual performance is compared with the designed performance, and a market-interest determination is made of the new idea. Because all work is done in-house, new products can be put into production on a rapid basis.

The company soon will begin using a new computer aided design (CAD) system for product development and refinement. The system will generate circuit boards of up to eight layers and draft them automatically. It also will create parts lists and assembly pro-



All cabinets and front panels are painted in the company's filtered painting booth.

Stock control is an important aspect of any manufacturing operation. A worker assembles a *parts kit* for each product or subassembly built in the assembly area.

IN SEARCH OF EXCELLENCE.

Long before it was a popular management theory, broadcasters were searching for excellence. Excellence of Sound.
The search is still on, but the goal is now within the reach of every FM broadcaster.

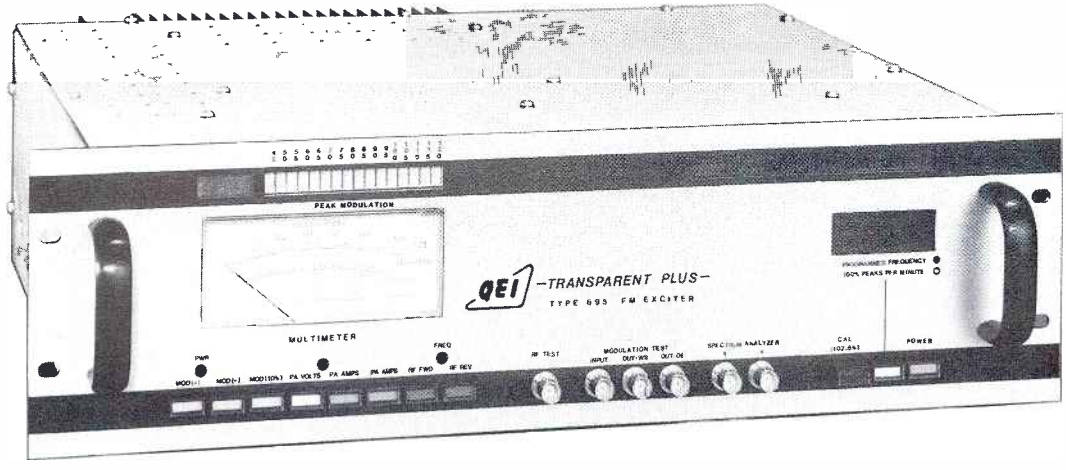
The 695 is an exciter without equal . . . in quality sound . . . in versatility . . . and in value. Any type of distortion you can name (THD, TIM, IMD) is less than .025 percent. This isn't an environmentally controlled lab figure, but rather one that is measurable over the operating temperature range of the equipment. Moreover, noise is so low that it's virtually impossible to measure.

QEI's 695 offers features that the competition has never even dreamed of. A peak counter with LED display, modulation measurements on the front panel, and a measurements grade linear demod built in. It is synthesized, has wideband circuitry, a 3-color LED bar graph for modulation display, a 10-position meter, and many other features that are best described in our new brochure.

For more information on QEI and the 695 Exciter just write or call us. You'll see why our search for excellence has produced the best value on the market today.

QEI Corporation

One Airport Drive □ P.O. Box D
Williamstown, NJ 08094 □ (609) 728-2020



Circle (92) on Reply Card

cedures for new products. The CAD system will allow Ramko to double its new-product design productivity.

The manufacturing process

All items that the company manufactures follow a similar route through the assembly process. The beginning point is the sheet metal and machining shop, which fabricates and assembles all cabinets and front panels. Specialized cast mechanical parts also are made in the shop.

All cabinet painting and silk-screen work is done in-house, as is the generation of printed circuit board artwork. Single-sided boards are processed and drilled at the plant, while 2-sided boards with plated-through holes are processed by an outside company.

Part supply kits containing all components needed to construct a particular circuit board or subassembly are put together for each product by the stock control department. Component packages then are matched with the proper mechanical hardware and

Part of the electronic assembly area of the facility is shown.

Adjacent to the electronic assembly area is a mechanical assembly section, where mechanical components are fitted together and circuit boards are installed in larger systems.

For 10 seasons now, you've taken the performance of Shure's remote mixers for granted. We haven't. Announcing the new Shure M267.

Over a decade ago, Shure introduced the M67 Microphone Mixer. Designed to provide on-location audio for major sporting and news events, the M67 became the most well known and widely used remote mixer in the broadcast industry.

Then came the new Shure M267. One look will tell you why we moved ahead.

Here are all the improvements audio engineers have asked for.

Every channel on the mixer now has a mic/line level switch for maximum flexibility. There's also a built-in limiter to keep the M267 from overloading at critical moments. The unit contains a built-in battery pack that utilizes three standard 9-volt batteries. Simplex (phantom) power and a peak LED are standard, too.

The M267 oscillator provides a clean 1 kHz tone, and is located on the front of the unit for simple access. The headphone output is also on the front and includes a level control.

And IC design, along with active gain controls, provides greater headroom and quieter operation.

For location work or even studio post-production, the M267 carries on Shure's reputation for reliability and ruggedness.

After all, just because you create one legend doesn't mean you can't build another.

For more information on the complete line of mixers, call or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204, (312) 866-2553.

SHURE®

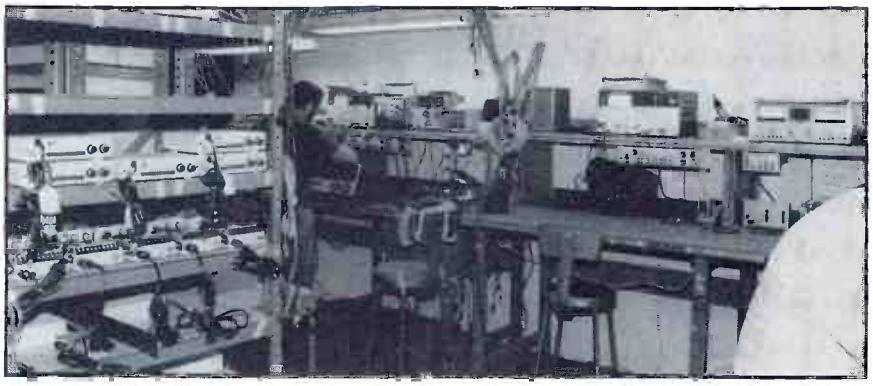
THE SOUND OF THE PROFESSIONALS®...WORLDWIDE

Circle (94) on Reply Card

cabinets (assembled elsewhere in the plant) and taken to the assembly area, where individual boards are populated and subassemblies are mated to form more complicated products. Any board containing CMOS devices is handled with special care in conductive plastic bags for device protection.

After assembly, the product is given a quality control inspection and is powered up. Following some tests, the product is burned in for a period of 24 to 48 hours. Experience has shown that the first 24 hours are the most critical to device survival, so the burn-in process reveals any faulty components (usually integrated circuits) that might be present in the circuit.

The quality control station is an important step in the assembly process. Circuit boards and assemblies are inspected and burned in to eliminate possible problems in the field.



Technicians at the electronic test and check-out area are responsible for ensuring that all products meet their published specifications.

Following the burn-in stage, the product is checked against its designed performance specifications at the electronic test station. After final check-out, the item is placed into inventory for shipment to customers. Each customer receives a quality control card stating that the equipment

Sound Advice

ITC announces a revolutionary departure from the traditional triple deck cartridge machine. The Delta III's advanced modular design gives you three independently removable decks. This means that you can remove a deck for easy maintenance and still stay on the air.

That's great news for you and your listeners because the Delta III's superior sound will spoil everyone who hears it. You won't want to settle for less, and neither will they.

The Delta III is part of the Delta series, ITC's new generation of cartridge machines. Mechanically, electronically and physically superior to previous models, the Delta Series is fast becoming the new standard of the industry.

That's something you need to know. Because you wouldn't want to miss the revolution.

The Delta III offers:

- three independently removable decks
- rugged modular design
- crystal-referenced servo motor
- toroidal power transformer
- non-magnetic stainless steel shaft
- now more affordable!

Don't Miss The Delta Revolution

INTERNATIONAL TAPETRONICS CORPORATION
2425 South Main Street / P.O. Box 241 / Bloomington, Illinois 61701
Call Toll-Free: 800-447-0414
From Alaska, Hawaii and Illinois call collect: 309/828-1381

3M hears you...

3M

Circle (96) on Reply Card

has been checked thoroughly, and that it meets the published specifications.

The factory's test and repair department works on any printed circuit boards with problems and conducts detailed tests on production or prototype equipment as needed. The company soon plans to install an automated quality control circuit board tester for rapid and detailed analysis of problem cards.

As a product moves through the manufacturing process, its progress is tracked by a computer, informing management of the finished product and raw stock inventory status, sales picture and plant productivity.

Shown is a portion of the electronic engineering area, where new products are developed and established products are evaluated.

Shipping cartons and containers are custom-built for the various Ramko products. All custom containers are foam-lined for equipment protection during shipment.

Customer service

Customer service is an important aspect of the company's operation. Ramko's customer service representatives are former broadcast engineers, and know the problems that can occur in the field. They also know how important accurate technical information and rapid parts delivery are to engineers in the field. The company has a standing rule that all parts ordered by a station must be shipped out the same day. The customer service function is separate from the day-to-day activities of the plant. The department's sole responsibility is to keep the customer happy.

The concept of modular product construction has been a great benefit to field engineers. For example, the factory can ship a customer a new printed circuit amplifier card for a console that is inoperative, eliminating the need to troubleshoot problems down to the component level. The use of plug-in integrated circuit chips also makes troubleshooting easier. All ICs used in Ramko equipment are socket-mounted.

The future

The future looks busy for Ramko, with approximately 17 new products being developed for the Primus line. Among the recently released items are the Primus P-4M/S stereo 4-channel portable production audio mixer and a new Primus digitally controlled audio routing switcher, both of which were shown at NAB-'84.

R-42 diversity receiver • Now with GaAsFET's.

Improved sensitivity and system range, with ultralow noise.

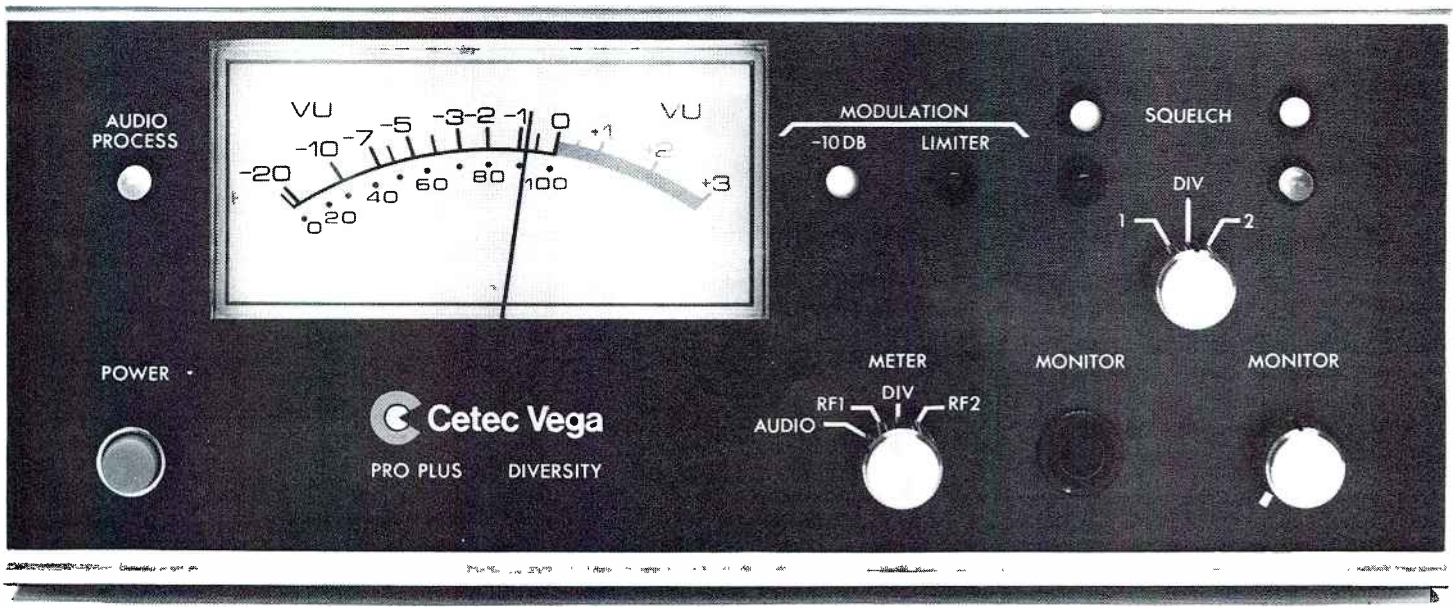
Cetec Vega's top-of-the-line PRO PLUS R-41 and R-42 wireless-microphone receivers have quickly become the worldwide standard of excellence. Overall quality of the PRO PLUS wireless system is equal to wired microphone systems, with respect to dynamic range, signal-to-noise ratio, distortion, etc. *We invite your comparisons.* Check these features of the new, improved PRO PLUS receivers:

- **GaAsFET front end.** Provides the highest achievable sensitivity for maximum system range. Also incorporates a high-performance helical filter.
- **Lowest distortion.** 0.25% maximum, 0.15% typical.
- **Measurably the highest signal-to-noise ratio and widest dynamic range.** Quiet as a wire. With DYNEX II (a new standard in audio processing), SNR is 101 dB (108 dB A-weighted). System dynamic range is 133 dB including transmitter adjustment range, from input for maximum nondistorting gain compression to noise floor.
- **"Infinite gain" receiver.** Improved performance in the critical threshold region, superior handling of multipath conditions, better SNR, and constant receiver audio output level.
- **Professional audio circuits.** Output is adjustable from +20 dBm to -60 dBm in four ranges. Also featured are selectable phasing and 0.2-watt independent headphone amplifier.
- **True dual-receiver diversity.** The R-42 diversity system is the most reliable method to avoid dropouts. The R-41 nondiversity receiver has all of the other features of the R-42.

PRO PLUS wireless-microphone systems achieve the highest performance possible with today's advanced technology.

Write or call for further information and location of your nearest dealer: Cetec Vega, P.O. Box 5348, El Monte, CA 91734. (818) 442-0782.

The best wireless gets even better.



Cetec Vega
...the professional's wireless

Circle (98) on Reply Card

Routing switcher

By Carl Bentz, television editor

Remember when the newly completed patch panel was the pride of the station. Remember the flexibility and versatility that the jack-filled panels allowed. And, remember the hours involved in wiring the system, getting rid of ground loops, finding cold solder joints and working out labels that the staff could understand. Today, even though two or more patch cords are still always in knots, the patching concept remains a valid method of signal routing for some situations.

When remote feeds became the vogue, patching did not always fill the bill. Instead, an extra switch installed in the control room mixer during a post-sign-off session selected the Telco line into one of the mixers. Not having to make the right patch in a matter of seconds during a station break made the on-air product flow more smoothly for the audience. But, as more extra sources were added in midnight mixer modifications, eventually a bigger on-air board was required or a dedicated routing switcher answered the control needs.

As more console positions were needed for multiple-source use, the single-bus, any-one-of-N-sources routing switcher was modified for bridging or looping inputs. With any of N sources routed to any of M outputs (with M switcher panels), if too many locations needed the same source, DAs maintained proper signal levels. Sufficient DA capability remains a sign of good engineering practice where signal-bus switchers form the distribution grid and space is not necessarily at a premium.

Distribution complexity has continued to grow and equipment to meet the requirements has grown as well. A system touted as the world's largest routing switcher was constructed by NEC for NBC. Before installation in the network center in Burbank, CA, the 40,500-crosspoint system was to be used in coverage of the 1980 Moscow Olympic games. However, when ideological intervention altered the game plan, the equipment was routed directly to Burbank, where another section brought the crosspoint total to 75,600. For each video link in the custom TKA-100 system, architecture allows four audio circuits.

Early in 1984, a second custom switching system, for intercommunications throughout the NBC Burbank center, was installed by ADM Technologies. One section interconnects 150 users with 30 trunk/party lines. An additional six trunks are assignable to any of the user stations. Section two forms a grid between 100 users and 20 trunk/party lines for engineering use. The third part is an instant-access 20-station intercom. The system is totally computer-controlled.

Most distribution and routing needs are not as complex as those of major network centers and many standard systems fill the requirements. If the project is to select a signal into the monitor, TBC, recorder or other device, and if timing (vertical interval switching, for example) is not critical, a single-bus video switcher, perhaps with one or two audio channels, may be just right. The following highlights apply only to fairly complex systems introduced from 1983 to the present, according to information supplied by manufacturers throughout that time period. Audio and video products designed for multiple input/multiple output use are included in the survey.

Reader Service Numbers have been provided in Table I to simplify obtaining information and assistance in planning your distribution switching grid system.

BSM BROADCAST SYSTEMS

Series 5000: The basic mainframe plan, a 10x10 matrix, uses IC/transistor architecture for audio crosspoints, while video switches are transistor/diode structures. No hybrids are used. Stacking allows expansion to a maximum 150x250 configuration. Inputs are buffered and outputs isolated. Up to eight levels of audio may be added, with an integral microprocessor handling salvo switching, real time programming, a CRT crosspoint status display and other functions. Many personal computers may control the matrix through RS-232C or RS-422 protocol, while a local X–Y panel or multiple-location control via party-line wiring also is possible.

Series 1000: For audio only, the 10x10 matrix uses a microprocessor for control of 25 time-function commands within a 24-hour period, while RS-232C computer interfacing allows unlimited switching events. FET analog crosspoint circuits are used.

BOSCH

TVS/TAS-2000: Joining the TVS/TAS-1000 and RKX series switchers, the latest system provides a broad range of user-configurable control panels. (See Bosch listings in "New Equipment Update," which begins on page oo.) Multilevel breakaway capability includes seven levels as standard with coax party line or RS-422 control. The matrix plan is based on 10x10, with a 50x10 audio and video or 110x10 audio or video configuration housed in an 8¾-inch rack panel. For automated systems, a TCS-1 machine control system may be interfaced.

CENTRAL DYNAMICS/ AMERICAN DATA

System SDS-2: MicroPatch software, a CRT terminal and a keyboard address the microprocessor-controlled matrix to reconfigure the crosspoints, call up diagnostics, etc. The basic high density RS-2000 matrix is 32x32 (2048 crosspoints) housed in eight rack units with one video and three audio levels. Field expansion is possible to 512x512. Standard features include eight salvo groupings, three breakaway groups, programmable security locks, matrix memory battery backup, CRT status display and a real time clock. Matrix control is possible from various discrete push-button and thumbwheel switch configurations or from a new X–Y multibus alphanumeric controller. From the panel-mounted keypad, routing selections are entered, then displayed for verification on a 6-line, 40-character fluorescent display panel.

MICHAEL COX ELECTRONICS

S series: Blocks of 8x8 for video and 8x4 for audio may be combined to achieve at least a 256x256 configuration with multiple layers of audio and video control for dual audio, time code, talkback and data, as well as component video applications. Particular attention to transient suppression in audio circuitry suggests suitability for on-air switching if re-

pdate

quired. The microprocessor-based system includes a degree of local software programming to consider needs for alternative audio assignment to video, 4-character mneumonics for ID, security mapping and host computer pre-programmed operation.

Table I.
Manufacturers of routing switcher products.

AD Data Systems	(570)
ATI-Audio Technologies Inc.	(571)
Amtel Systems	(572)
Arrakis Systems	(573)
Avitel Electronics	(574)
BSM Broadcast Systems	(575)
Bosch	(576)
Central Dynamics/American Data	(577)
Channelmatic	(578)
Michael Cox Electronics	(579)
Datatek	(580)
Datatronix	(581)
Di-Tech	(582)
Dynair Electronics	(583)
Grass Valley Group	(584)
HEDCO	(585)
Image Video Ltd.	(586)
Industrial Sciences	(587)
International Nuclear	(588)
Kaltronics	(589)
Lenco	(590)
Marconi Communications	(591)
McCurdy Radio Industries	(592)
Omicron Video	(593)
Pacific Recorders & Engineering	(594)
Pro-Bel Ltd.	(595)
Ramko Research	(596)
SANDAR Electronics AS	(597)
Scantex Labs	(598)
Shintron	(599)
Siemens AG	(600)
Telemet	(601)
Thomson-CSF	(602)
3M	(603)
Utah Scientific	(604)
Videotek	(605)
Ward-Beck Systems	(606)

DATATEK

D-2000 series: Compatible matrix frames include 50x25, 25x25 and 25x20 formats, which may serve as building blocks to arrive at systems for 256 inputs and eight levels of control. Field expansion is accomplished easily. Each output bus includes a microprocessor control system with LED status display. Serial data is carried between the control panel and the switching matrix via RG-59/U coax. No non-standard components are included in the design, allowing easy acquisition of occasionally needed replacement parts.

DATATRONIX

TELEPATH: Point-to-point, party line and IFB are stated as typical applications of an audio-only system designed around 16x16 or 32x32 matrices. An optional audio routing switcher may be added. Additional configurations include 64x64 and 128x128. The matrix is under programmable software, is expandable, and provides 2- and 4-wire control, remote machine control and 2-way radio control options.

DI-TECH

5850 system: The latest in the 5800 series has a general format of one video and up to three audio channels in the same chassis. The basic matrix for the system is 40x20 with expansion possible. A variety of controllers includes single-bus switches, thumbwheel selectors and keypad-type panels.

DYNAIR

Series 25: A 20x20 standard video/audio system includes redundant power supplies and control circuitry in a 10.5-inch unit. Follow and breakaway switching, as well as salvo groupings, may be controlled through coax control lines with serial data from an external controller. Standard data terminals may be used for control and a CRT status display. Also available are touchpad control and key-per-input panel options. The series differs from the earlier series 21 systems in matrix size/format.

GRASS VALLEY GROUP

Horizon: A new design differs significantly from Series 400 products in the use of an 8x16 matrix, resulting in a 30% higher density and flexible matching to a desired system input size. Specially designed ICs replace many discrete components to aid in the increased density, which also allows expansion to 128x128 with four levels of system control managed by a centralized microprocessor. Dual controllers allow automatic changeover in case of circuit failure. A battery-protected memory preserves the matrix map during power failures. Connection of control panels to the mainframe uses 75Ω coax for communications via high speed Manchester encoded serial data. X - Y control is available via RS-422, while RS-232 data serve for system setup and maintenance.

HEDCO

IRS systems: Switching systems, configured at 12x12 single channel, may be expanded to 24x24 with three audio channels. Off-the-shelf components are used throughout, with modules identified by matrix card slot for the controlling computer software. Total interchange is possible. Video buffering uses differential inputs for common mode and hum rejection. Audio inputs are balanced differential for levels up to +24dBm. Control uses a 6803-based keypad entry system, conversing via a shielded twisted pair in RS-422 protocol. Adjuncts to the keypad indicate the status of the matrix crosspoints. Additional members of the IRS series allow expansion to a 48x96 matrix and four channels of audio, video and time code data in any combination.

IMAGE VIDEO LTD.

9300 RGB switcher: A high density and broadband switcher design forms a 16x16 format for parallel RGB or other video component signals. The three component signals are switched simultaneously within vertical interval timing. Composite and non-composite video also may be routed

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with the system, but non-composite use requires external sync to be supplied. The system, constructed of standard semiconductor devices, fits into 12RU. Video only and AFV versions in the 16x16 and 32x32 matrices are available.

McCURDY RADIO INDUSTRIES

Century: A new product from McCurdy is based on microprocessor central control. The system allows distribution control of up to 200 inputs.

SHINTRON

12X-C4: A special form of the 12X series provides routing control for component video signals. Any of the 12 inputs may be selected to any of four independent outputs. The wideband capability of the system also suggests applications in HDTV as well as simultaneous control of three signals in RGB, YIQ or Y/R – Y/B – Y component formats.

TELEMET

7930 series: Remotely controlled CMOS-based ICs provide energy-efficient switching in a standard matrix of 20x10 or the expanded 400x400 maximum configuration. The completely modular system allows boards to be removed or inserted with power on. Stereo audio switching plus an auxiliary and breakaway audio are available. Versatile control and computer interfacing give programmable switching capability.

3M

Series H: Systems for one video and one or two audio paths are based on 16x16 switching matrix modules, with expansion to a maximum 1024x1024 size. Thick-film hybrid circuitry removes nearly all discrete components from the circuit boards, allowing seven basic hybrid modules for signal handling and control, resulting in a 40% more compact system than other design concepts. The addition at NAB-'84 of a 2-level audio-only configuration allows the overall system to be used for stereo or dual mono TV sound applications. Various formats of control are available.

TWEED AUDIO

16x8 switcher: Strictly for audio frequency signals, a 1x8 audio switch card uses JFET switching to select the desired output. With 16 of the boards in a system, typical routing to one of eight is possible, while combining of the inputs to any one or more outputs is achieved through a mixer board. RS-232 remote control is provided.

UTAH SCIENTIFIC

AVS-1 systems: Separate or simultaneous video and audio switching, based on 10x10 matrix boards, may be expanded to a 150x160 configuration. All circuitry and components are non-hybrid, mutliple-sourced parts for easy replacement. Regeneration of time code matrices is available. A party-line control system allows connection of various controller panels, including the latest CSP-1600 series 4-level/bus devices. Keyboard entry of security access codes may lock or unlock the system.

WILK POWER & VIDEO

VAR 1010S series: Expansion with 10x10 matrix cards builds switching capabilities in 10.5-inch rack assemblies with redundant power supplies and memory-only standby power. Each rack frame requires one control card that may be addressed locally or remotely from a standard RC-1010 remote-control panel, from thumbwheel selector panels or from a master computer system.

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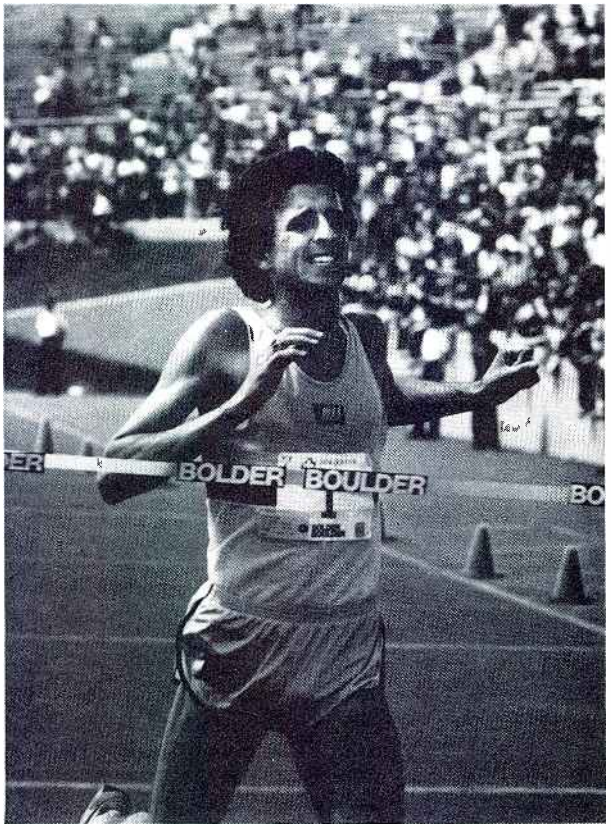

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ISC

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Distr'buting audio signals

By Walt S. Gradzki, president, Marionics, Toms River, NJ

If your audio chain is plagued with noise, mismatches and level problems, you are not alone. Many older studios still use the interconnection technique known as *bridging*, in which a source device with a relatively low output impedance feeds several high impedance loads. Today's more complicated and sensitive broadcast plant, however, demands a level of isolation and control that traditional methods cannot provide. The best answer to this need is a distribution amplifier system.

There is nothing basically wrong with the bridging method, as long as the engineer adheres to proper balancing practices. Until recently, most radio consoles used balanced transformer inputs, which were either 600Ω terminated or high impedance with a suggested input termination of 600Ω. The outputs were the same, 600Ω balanced transformers, providing an output level of +8dB at 0vu. All the source machines (cartridge decks and reel-to-reel recorders) also used transformer-balanced inputs and outputs. Also, the input and output levels were fairly consistent, with consoles having input levels of −10dB to −20dB and an output level of +8dB.

Today manufacturers, for a variety of reasons, are eliminating transformers from the audio chain and replacing them with active, differential-balanced operational amplifier (op amp) circuits. Such designs offer several advantages over the conventional transformer, including better transient performance and reduced cost. A common mode rejection ratio (CMRR) adjustment sometimes is provided to improve the noise rejection capability of the input stage. Should the input become unbalanced, however, the CMRR feature can work just the opposite, creating noise in the system.

An example of a common signal distribution arrangement is shown in Figure 1. The diagram shows a network audio feed bridged across an on-air console, production board, news mixer and portable tape recorder. If any of the inputs are unbalanced, the complete circuit becomes unbalanced, allowing the possibility of increased system noise and radio frequency interference (RFI), getting into the audio feed. Further, if the amplifier driving this system has a differential-balanced output stage with inadequate current limiting, the amplifier may be damaged by operation in an unbalanced arrangement. One-half of a balanced differential output circuit will effectively be shorted to ground when connected to an unbalanced load.

To prevent unbalanced conditions from developing, all equipment inputs and outputs should be well-isolated. The best way to accomplish this is through the use of a distribution amplifier (DA) on all common feeds. As shown in Figure 2, balanced and unbalanced loads can be fed without any effect on each other when a DA is used. Also, high or low impedance circuits can be fed individually, and output levels can be set to match the required input levels of the various consoles. A DA with individually adjustable output levels eliminates the need to use attenuator pads between source equipment and audio consoles.

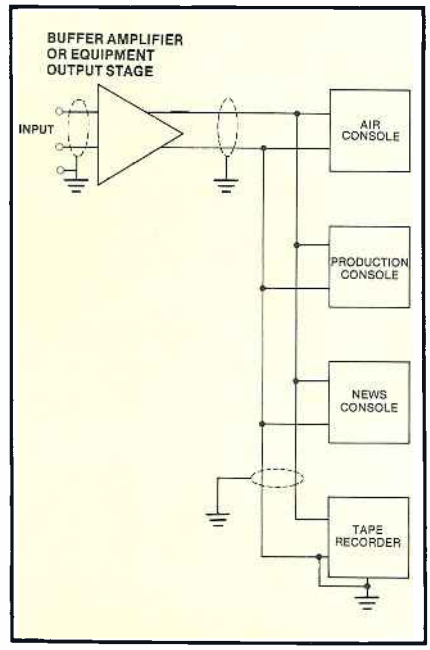

Figure 1. A typical bridging arrangement for distribution of a particular feed within the broadcast plant. Note that the tape recorder input is unbalanced.

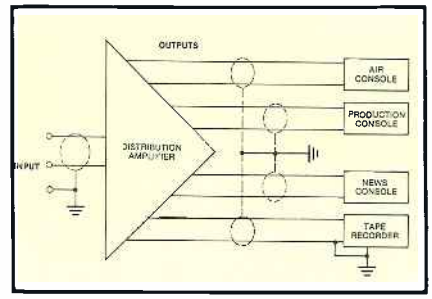

Figure 2. The same distribution requirement shown in Figure 1, but using a distribution amplifier to provide isolation and level control. Note that the unbalanced tape recorder input circuit has no effect on the rest of the system when a DA is used.

A distribution amplifier costs more than the bag of resistors needed for a set of attenuator pads, but a DA can save countless hours of installation time and future system troubleshooting. For example, if a short circuit develops in one of the loads shown in Figure 1, the level also will drop to all the other loads. A DA, on the other hand, will isolate the problem to its source and allow the rest of the system to operate normally. This feature is especially important when audio feeds are routed through a patch panel. The line almost always will be shorted to ground while the patch is being removed or inserted. With the conventional arrangement, the effects of such patching will be felt everywhere along the signal routing path.

The use of a distribution amplifier as an interface has solved countless problems at radio and TV stations. To allow for future system expansion, it is good practice to install a DA with several more outputs than needed. When selecting a DA, consider the method of cable termination provided. Screw-type barrier strips probably are the most convenient, although other arrangements may be preferable in some applications. If more than one DA is needed at a facility, consider using plug-in cards in a mainframe configuration or separate amplifier assemblies, as opposed to one chassis with many amplifiers sharing a common circuit board. The DA also should have individually adjustable output levels.

There are a number of manufacturers presently building high quality, reasonably priced distribution amplifiers. A listing of such companies can be found in the September 1983 *Buyers' Guide* issue of **BE.**

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NPR conference '84

By John H. Battison, P.E., director of engineering, WOSU-AM/FM/TV, and **BE** antennas/radiation consultant

The 1984 National Public Radio Conference—held April 8-12 in Crystal City, just outside Washington, DC—promised participants better times for the troubled NPR network. The atmosphere was much brighter in Crystal City than it was at last year's Minneapolis meeting, when it seemed likely that NPR would cease to exist because of serious financial problems. About 700 representatives of member NPR stations attended this year's conference, expressing an overall opinion that the corner had been turned and the network could now forge ahead.

Following the usual pattern, only a few items on the program were directed strictly to engineers. Dick Cassidy, vice president of NPR Engineering, is aware of the apparent lack of appeal to engineers. In more prosperous days, engineering seminars and papers were offered and other activities were scheduled to attract radio engineers. Cassidy plans to resurrect the NPR engineering committee, and hopes to improve the technical agenda for the next conference.

Despite the shortage of engineer-oriented programs, there were several papers that appealed to a broad cross section of the NPR community, including station managers, programmers and engineers. Two presentations on audio technology and maintenance were well-attended by engineering and non-engineering personnel.

Skip Pizzi of NPR's technical production department presented the paper, "Decibels Per Dollar," which gave a comprehensive rundown of equipment required for affordable remote recording sessions and suggested remote equipment packages that would not compromise quality. Murray Jason of NPR's engineering services department discussed cost-effective audio maintenance at a companion session. Jason addressed the question of preventive vs. corrective maintenance; the causes of equipment failure; distortion levels; and routine service schedules.

On Monday evening Western Union hosted an open house reception at NPR's headquarters on M Street in Washington. An overflow crowd of enthusiastic attendees was transported via buses. When the evening was over, I doubt that there was a single part of NPR's headquarters that had not been minutely examined by the eager and interested guests.

On Tuesday the perennial topic of AT&T divestiture was discussed, attracting great interest, and a number of horror stories as well. Several useful suggestions were overheard and the exchange of information deemed valuable to those who attended.

Although not strictly in the technical field, a new approach to audience-rating reporting was presented on Tuesday morning. All station engineers are aware of the importance of *The Book*, however the usual methods of data presentation generally are not interesting or eye-catching. Now, however, with the use of polarized glasses, David Giovannoni of NPR's office of audience research demonstrated a presentation method that makes audience data literally leap out of the screen with a 3-dimensional effect. The new presentation method makes audience level fluctuations easily identifiable.

Rep. Timothy Wirth, chairman of the Telecommunications Subcommittee of the House Energy and Commerce Committee, addressed NPR member stations and complimented them on a job well-done. Wirth said that public broadcasting should be the fourth major influence in people's lives, behind family, church and school. Still left unanswered, however, was the question of who will pay for the alternative voice of public broadcasting.

FCC activities discussed in a well-attended regulatory issues session on Wednesday included Docket #20735 (Channel 6 proceedings), Docket #80-90 (FM classifications), AT&T divestiture, FCC rule revision and the usual gamut of problems (real or imaginary) that the commission is studying.

During one of the luncheon meetings, a session on the use of FM subcarriers was attended by an overflow audience. The field of station opportunities for SCA and other subsidiary technology continues to evoke tremendous interest on the part of NPR station managers.

The annual Corporation for Public Broadcasting (CPB) banquet was held on Wednesday evening. Augenstine Dempsey, manager of CPB's station relations department, was the mistress of ceremonies. Bob Edwards, the star of NPR's *Morning Edition* program, received the Edward R. Murrow Award, presented by Sharon Rockefeller, CPB board chairman.

Outstanding microphone personalities received other awards and—as is the norm in most facets of broadcasting—engineers were ignored. There is hope for recognition of engineering accomplishments, however. One of NPR's engineers received an award at last year's Minneapolis gathering.

Editor's note:
Broadcast Engineering has covered the progress of the NPR network in numerous issues. Persons interested in the network's satellite interconnect system should consult our July 1980 and September 1980 issues.

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BOSCH

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Conversations

An interview with William Koch of Eastman Kodak

NAB-'84 provided the **BE** staff with an opportunity to talk to many industry leaders, including William A. Koch, vice president and general manager, Motion Picture and Audiovisual Markets Division, Eastman Kodak Company. This interview focuses on Kodak's entry into marketing videotape and the company's outlook toward program production for television.

Koch

Q: There is speculation regarding Kodak's entry into videotape marketing. How will this entry affect Kodak's commitment to the future of film production for television?
A: Our commitment to film as a production tool is as strong as ever. There probably never has been a time in the history of the TV industry when there were more or better opportunities for film producers. Most prime time network TV material continues to be produced on film. For more than a decade, 75% to 80% of all prime time network production has originated on film.

Recently we have seen one prime time program, *The Bob Newhart Show*, which was produced originally on videotape, switched to film. Also, a number of the newer 3- and 4-camera sitcoms are being shot on film. In 1983, of 114 made-for-TV movies produced for network and off-network programming, cable and PBS, only one of these movies was produced on videotape. That one was a special case in which the story called for the audience to feel as though it was watching a breaking news story.

In other words, there is no indication that the increasing number of TV channels will result in TV program production shifting from film to tape. I think there will be a call for both film and video productions to meet the growing need for programming.

Q: How much will the need for programming increase, and what percentage of it will be produced on film?
A: The experts believe that, because of the proliferating number of TV channels, the need for programming will increase from two to 10 times during the coming decade. I think the things that best can be done on film will continue to be done on film. Ask the people at MTM why they shifted the *Newhart Show* from videotape to film, and I suspect they will say that, for this particular program, which happens to be scheduled between two film shows, they wanted a film look as well as production flexibility. They also might be giving some consideration to the future.

If high definition television (HDTV) is a future reality for programming, it is important today to originate on film. Today's film easily can match the best of the proposed standards for tomorrow's HDTV display systems. Conversely, it is not likely that programs originated on videotape with NTSC standard 525-line resolution will be compatible with future HDTV requirements.

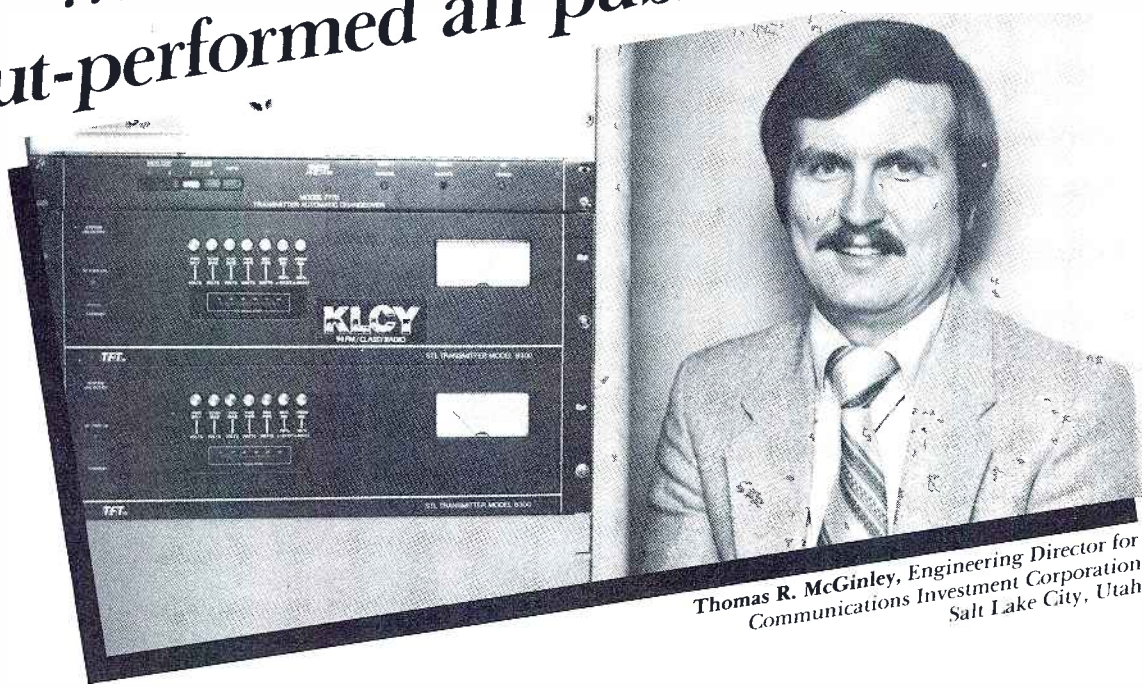
Q: Doesn't film production cost more?
A. Anyone who tells you there is a simple answer to that question is wrong. For film, you need to separate production and post-production costs. Because of the SMPTE time coding recorded on videotape during production, it has become feasible to speed up some electronic editing processes, often resulting in lower post-production costs. With advances in microprocessor technology, computer-assisted post-production will become more common. Parallel advances are being made in film-to-video transfer technology, as well as promising research and development work to automate many non-creative aspects of film post-production. It will not be necessary to produce on videotape to realize an economic advantage from computer-assisted post-production.

Q: Are videotape production-only costs less than film production costs?
A: It depends. When you say video costs less, you must account for the fact that different types of programming are produced on film and videotape for different reasons. When a producer shoots on tape instead of film, one motivation generally is to save money. With that expectation, you see less money spent on production, by not doing things you would do if you had a bigger budget. Given today's technology, if you tried to produce *St. Elsewhere*, *Remington Steele*, *The A-Team*, *Hill Street Blues* or other programs of that type on videotape instead of film, you could only save money by eliminating some of the production values and situations that make these shows unique.

Q: You said "...given today's technology." Will advances such as HDTV eventually allow electronic imaging to emulate more closely the film look and production techniques?
A: Kodak will make significant contributions to electronic imaging. In future video cameras and recorders, probably CCDs and maybe high density videotapes or other media, we will make electronic imaging more flexible and more capable of recording a higher resolution image.

One example is the Kodavision series 2000 video system, recently introduced by Kodak's Consumer/Professional & Finishing Groups. The combined camera/recorder, weighing little more than five pounds, is designed to use a new type of metal particle 8mm tape. Because it provides more area to magnetize, this metal-evaporated videotape is capable of storing 350% more information than

"... my TFT 8300 STL clearly out-performed all published specs."



Thomas R. McGinley, Engineering Director for Communications Investment Corporation Salt Lake City, Utah

As Engineering Director for a 12-station AM/FM group, as well as a 92-station regional network, all of Tom McGinley's equipment decisions are big ones. With this kind of responsibility, he knows he's got to be tough... and he is. Based on past experience with TFT monitors, he decided to give us a shot at upgrading his STL system at KLCY, competing against the leading suppliers in the industry. Here are the results:

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conventional tape. This helps reduce the size of the videotape cassette. It still records image and sound comparable with most ½-inch systems.

However, I have to add that film technology might be advancing at an even faster pace. During the foreseeable future, film will prove to be a fast moving target for electronic technology to emulate.

Q: To what film advances are you referring?

A: To begin with, our Emmy-winning high speed color negative film. Some programs and many made-for-TV movies are produced entirely on Eastman 5294 film. A majority of prime time, first-run programs are produced at least in part with this extremely light-sensitive 35mm color negative film. The trend has been to use the high speed film for interiors and night exteriors or in other situations in which there is a need or desire to work at very low light levels.

Q: What are the benefits?

A: We recommend an exposure index of 400 for this film, although many cinematographers treat it as an even *faster* emulsion. In comparison, medium speed color negative film 5247 is recommended for an exposure index of 125. The fastest video cameras have approximately the same sensitivity as the medium speed film. This means high quality images can be recorded with the faster film with only a fraction of the light previously necessary.

Lower light levels can reduce significantly the costs associated with lighting, including such factors as setup time, labor, equipment, power and air conditioning. You can shoot in places and at times of day that previously would have been regarded as impractical, if not impossible.

There are many creative ramifications. Some cinematographers opt for more depth of field, because the high speed film allows working at smaller lens openings. It is possible to integrate many special film effects, such as front and rear projection.

I think the production industry is still at the beginning of the learning curve when it comes to squeezing maximum creative and cost-saving potential from high speed film technology. The best is still to come.

Q: Then film is not a mature technology and there is room for future improvements?

A: We still are quite a distance from realizing the maximum potential of current film technology. It also is possible to look beyond to the evolution of T-Grain film technology as a future tool for the motion picture industry. Kodacolor VR T-Grain emul-

sions, with exposure indexes to 1000, are popular with still photographers. This technology provides a potential for faster motion picture films and finer-grained emulsions.

Q: Are there other consequences of higher speed films?
A: With high speed film emulsions, old film cameras do not have to be put on the shelf. The same will be true when T-Grain or other advanced technology films are available. In comparison, to realize the benefits made possible by the higher density 8mm Kodak videotapes, we needed a new kind of video recorder. Conventional recording heads simply would not read and write efficiently on the higher density videotape.

Q: How can some aspects of post-production be automated?
A: Several methods are being developed to *write* machine-readable time code on film during production. Aaton and Arriflex are both working with optical time coding methods. With Datakode magnetic control surface, as many as 100 binary bits per frame of data can be recorded during production. This is sufficient to apply time coding plus other machine readable data that the producer wants on the film. Datakode is a functionally, and optically, transparent coating of magnetic oxide. After we demonstrated this technology in June 1982, an ad hoc committee was organized to test the concept. A number of feasibility studies were undertaken, and the results are encouraging. With better understanding of what is needed in equipment and standards, a number of equipment manufacturers already are pursuing developmental projects.

Q: With so much activity in film, why did Eastman enter the videotape marketplace?
A: We saw the increasing number of TV channels and the amount of programming, in tape form, that will be required for these channels. We thought the time was appropriate for us to provide our customers with the best quality videotape for production and post-production purposes.

Q: Why did Kodak select TDK as a videotape supplier?
A: TDK has a reputation for quality products, as well as the manufacturing expertise and capacity needed for us to become an immediate factor in the videotape field. However, we are not merely putting the "Eastman" label on TDK videotape. We have worked closely with TDK on the definitions for the ¾-inch cassettes and 1-inch reel tapes we will sell. Magnetic and physical properties will match the best industry standards. We intend to offer significant improvements in some areas, such as reduced dropout and better S/N ratios.

We have established an independent quality assurance center at our Spin Physics Division in San Diego to monitor all of the videotape we sell. Stringent release procedures have been established. Our objective is to bring the same high level of consistency and reliability to the videotape field that we have brought to film.

We have established a nationwide technical support organization for videotape products. Our electronic specialists are working hand-in-hand with our film technologists. This is important because it is likely that most of the film produced for television eventually will be distributed on tape. And we will provide technical support services for people shooting film and videotape down to the station level.

Q: How about the long-term future?
A: Kodak is spending an estimated $3 million every working day on research and development projects, primarily in imaging technology. There is no aspect of imaging technology that the company is not exploring.

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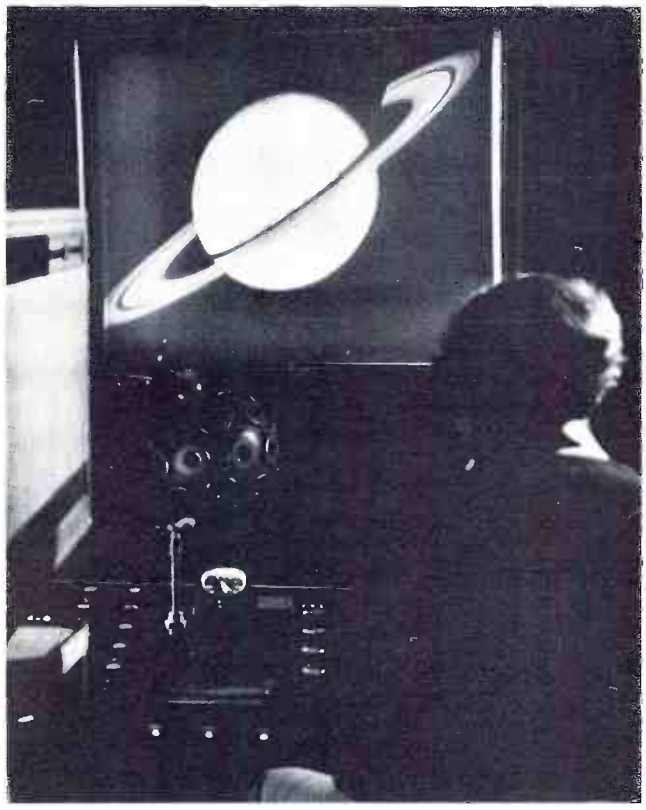
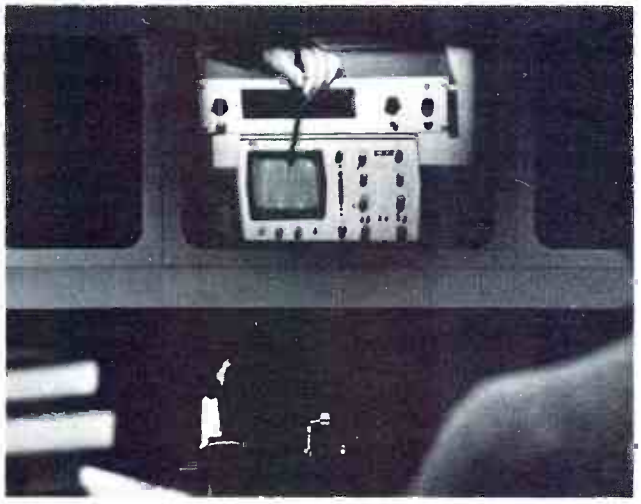


SELL-OUT CROWDS at Fiske Planetarium, Boulder, watched live NASA transmission presented by General Electric projector.



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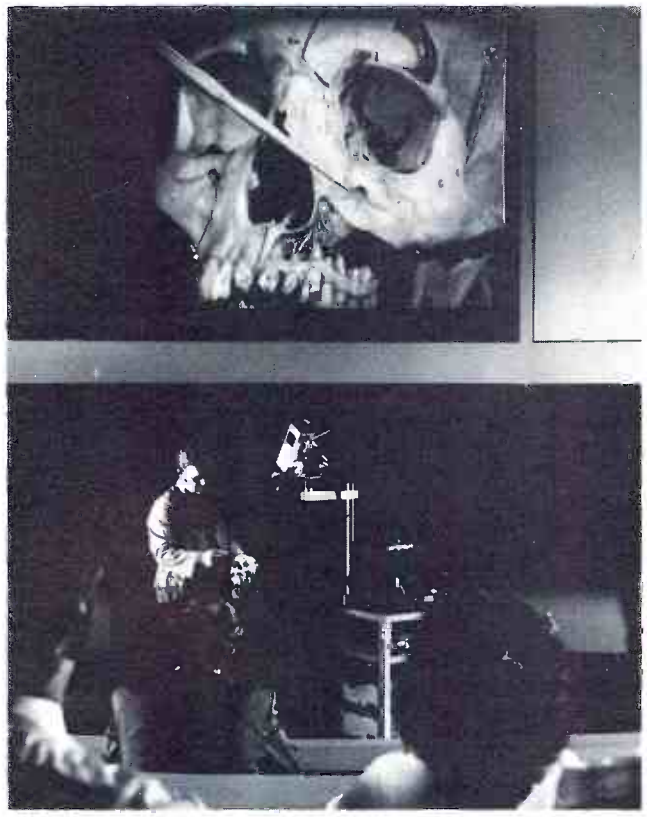

MINUTE DETAIL ENLARGED by General Electric projector for 150-student classes at Upstate Medical Center, Syracuse.

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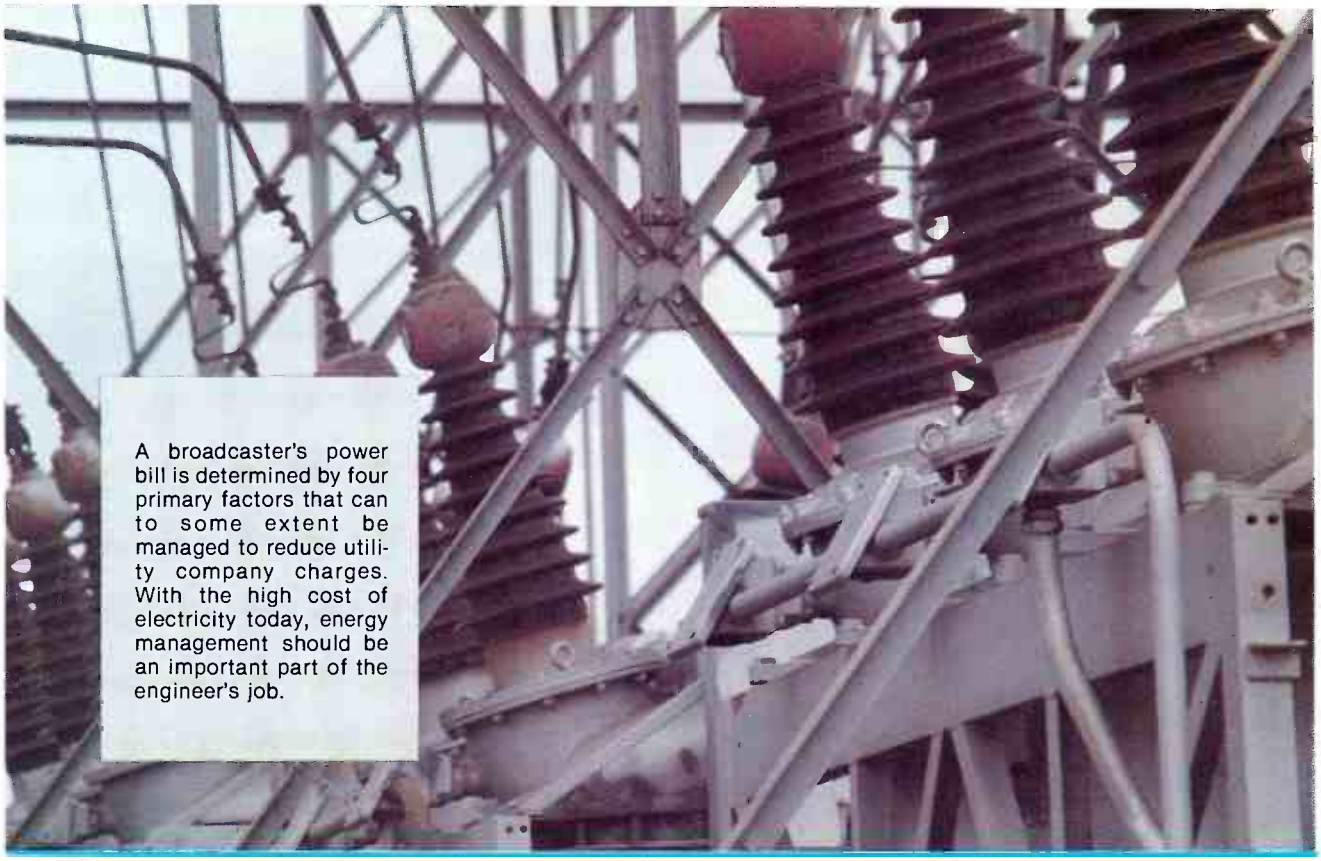

A broadcaster's power bill is determined by four primary factors that can to some extent be managed to reduce utility company charges. With the high cost of electricity today, energy management should be an important part of the engineer's job.

Photo: Merle Shuster

The efficient use of energy

By Jerry Whitaker, radio editor

Utility company power bills are becoming an increasingly large part of a station's operating budget. To reduce the amount of money spent each month on electricity, the broadcaster must understand the billing methods used by the utility. Saving energy is more complicated than simply turning off unnecessary lights.

The amount of money that can be saved through a well-planned energy conservation effort often is substantial. Reductions of 20% are not uncommon, depending on the facility layout and extent of energy conservation methods already in use. Regardless of any monetary savings that might be realized from a power-use reduction program, the items discussed here should be considered for any well-run broadcast facility.

Billing procedures

Utility company rate structures vary widely from one area of the country to another. Some generalizations can be made, however, with respect to basic rate-determining factors.

The four primary parameters used to determine a customer's bill are energy usage, peak demand, load factor and power factor. These items often can be controlled to some extent by the customer.

Energy usage

A customer's energy usage is measured by the number of kilowatt hours (kWh) of electricity consumed. A kilowatt hour is defined as:

$$kWh = \frac{\text{watts} \times \text{hours}}{1000}.$$

The kWh usage can be reduced by turning off loads such as heating and air conditioning systems, lights and office equipment when they are not needed. Installing timers, photocells or sophisticated computer-controlled energy management systems can substantially reduce a facility's kWh demand each month.

Common sense dictates conservation measures applicable to a particular situation. Obvious items include reducing the time high power TV studio lights are in operation, setting heating and cooling thermostats at reasonable levels, keeping office equipment turned off during the night and avoiding excessive amounts of indoor or outdoor lighting.

Although energy conservation measures should be taken in every area of a broadcast station's operation, the greatest savings generally can be found where the largest energy users are located. Transmitter plants consume much of the monthly power bill, so particular attention should be given to the equipment, physical layout and system efficiency at the RF facility.

Transmitter room heating should be accomplished with a logic-controlled PA exhaust recycling system, and air conditioning equipment should be planned for efficient operation by a knowledgeable consultant in the field. Tower light photocells should be inspected regularly for proper operation, as should antenna element heating control systems. A failure in either of these two circuits can result in a substantial increase in power consumption, or potentially dangerous system failure.

The efficiency of the transmitter itself is critically important to energy conservation efforts. Most transmitters available today are significantly more efficient than their counterparts of just 10 years ago. Station management often can find economic justification for replacing an old transmitter on the power company savings alone. Most new transmitters specify a typical ac power consumption figure for the rated RF output, and this point should be considered seriously when the purchase of a new unit is planned.

Comparing the efficiency figures of FM transmitters is a straightforward task, because the power consumption does not change with modulation. AM and TV transmitters, however, require further investigation. The overall efficiency figure of an AM or TV

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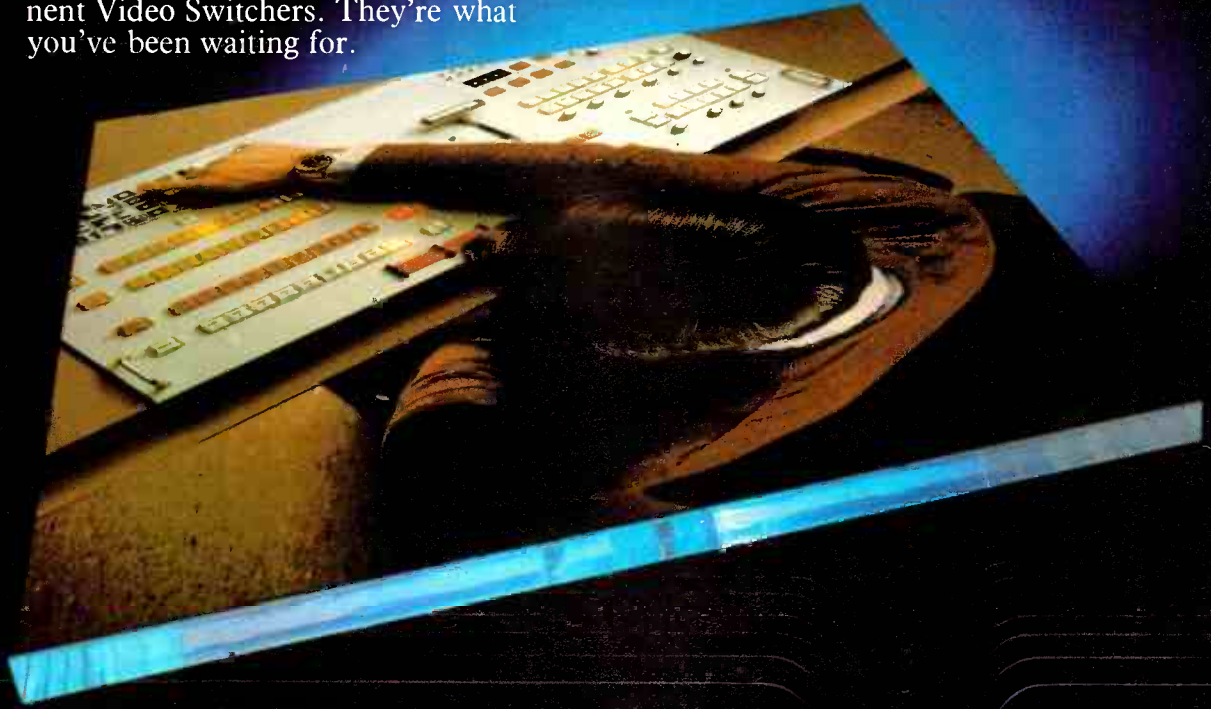

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transmitter at a carrier-only condition is of little comparison use, because the system is never operated that way. Many manufacturers, though, now are specifying overall ac power consumption at *typical*, or 100%, modulation for AM transmitters, and *average*, or black picture, in the case of TV equipment. These figures make the comparison process easier and more accurate. Engineers should be somewhat cautious, however, about the typical or average modulation value because of the wide variation that can be expected with respect to what defines typical or average.

After selecting a transmitter, the final amplifier stage efficiency should be monitored and any necessary tuning adjustments should be made to keep the unit operating at peak efficiency. A final amplifier even slightly out-of-tune can raise power consumption, not only because of inefficient stage operation, but also because of increased air conditioning requirements caused by additional PA stage heat generation.

Significant advancements have been made in recent years to improve the efficiency of UHF TV transmitters. Ac-to-RF conversion improvements can be found in many new UHF transmitters, and some manufacturers offer conversion packages for updating older equipment to the current state-of-the-art.

In almost any broadcast facility, energy conservation best can be accomplished through careful selection of equipment, thoughtful system design and good maintenance practices.

Peak demand

Conserving energy is a big part of the power bill reduction equation, but it is not the whole story. The peak demand of the customer's load is an important criterion in the utility company's calculation of rate structures.

The peak demand figure is a measure of the maximum load placed on the utility company system by a customer during a predetermined billing cycle. The measured quantities may be kilowatts, kilovolt-amperes or both. Time intervals used for this measurement range from 15-60 minutes. Billing cycles may be annual or semiannual. Figure 1 shows an example of varying peak demand.

If a facility operated at virtually the same power consumption level from one hour to the next, and one day to the next, the utility company could predict, accurately, the demand of the load and could size its equipment (including the allocation of energy reserves) for only the actual amount of power needed. For the example shown in Figure 1, however, the utility company must size its equipment (including allocated energy reserves) for the peak demand. The area between the peak demand and actual usage, then, is the margin of inefficiency that the customer forces on the utility. The peak demand factor is a

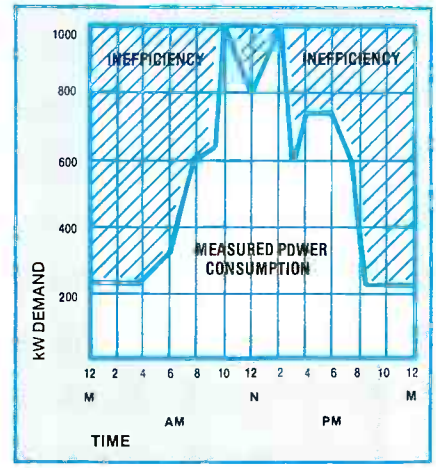

Figure 1. The charted power consumption of a facility not practicing energy management techniques. Note the inefficiency that the utility company must absorb when faced with a load such as this one.

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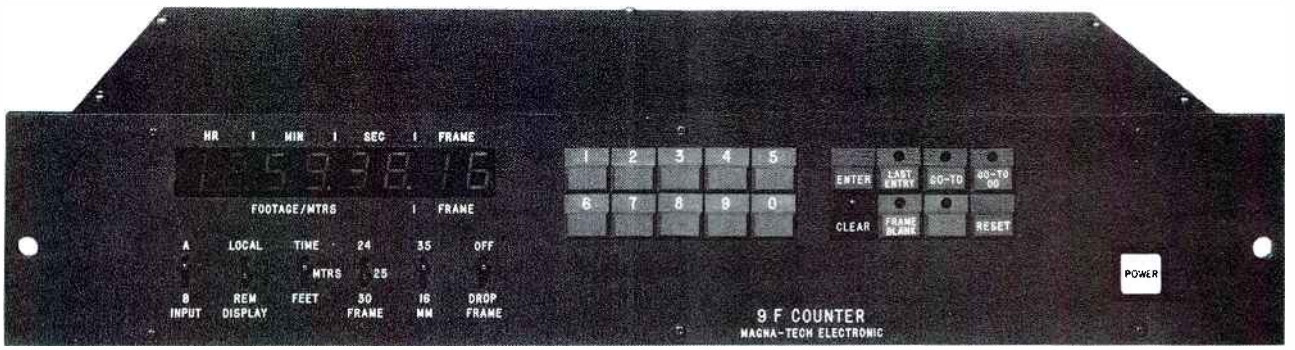

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method used by utility companies to assess penalties for such operation, thereby encouraging the customer to approach the more efficient (from the utility's viewpoint) state of operation.

Load shedding is a term used to describe the practice of trimming peak power demand to reduce high demand penalties. The goal of load shedding is to schedule the operation of non-essential equipment such that it provides a uniform power demand from the utility company, and thereby receives a better kWh rate.

Nearly any operation has certain electrical loads that can be rescheduled on a permanent basis or deferred as power demand increases during the day. Figure 2 illustrates the results of a load-shedding program. This more efficient operation has a lower overall peak demand and a higher average demand.

Peak demand reduction efforts can cover a wide range of possibilities. It would be unwise, from an energy standpoint, for example, to test a standby transmitter during the afternoon hours, when air conditioning units may be in full operation. Morning or evening hours would be a better choice, when the air conditioning is off and the demand of office equipment is reduced. For an AM plant, standby transmitter testing should be done during periods of low power operation, further reducing the peak-to-average ratio. Each broadcast operation is unique and requires an assessment of load-shedding options.

An effective method of controlling peak demand is through the use of a computerized power demand controller. A controller can analyze the options available and switch loads as needed to maintain a relatively constant power demand from the utility company. The system is programmed to recognize which loads have priority and which loads are non-essential. Power demand then is automatically adjusted by the computer, based on the rate schedule of the particular utility company.

Many computerized control de-

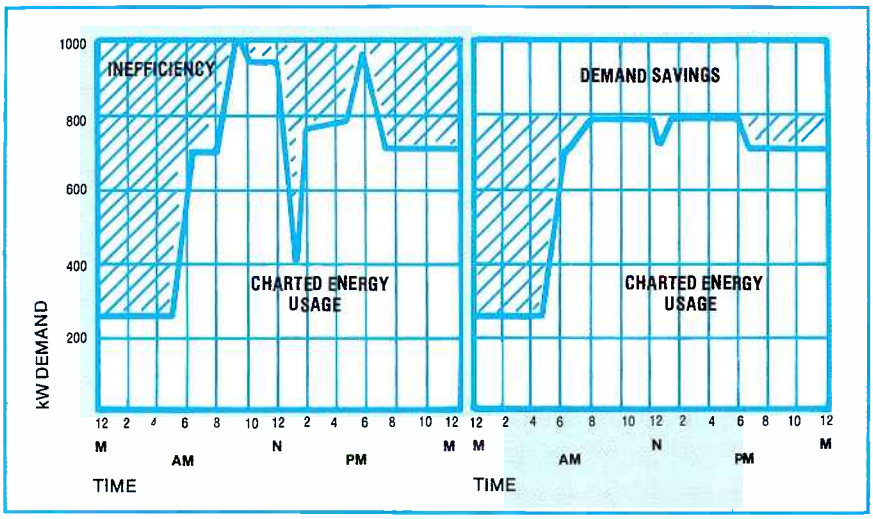
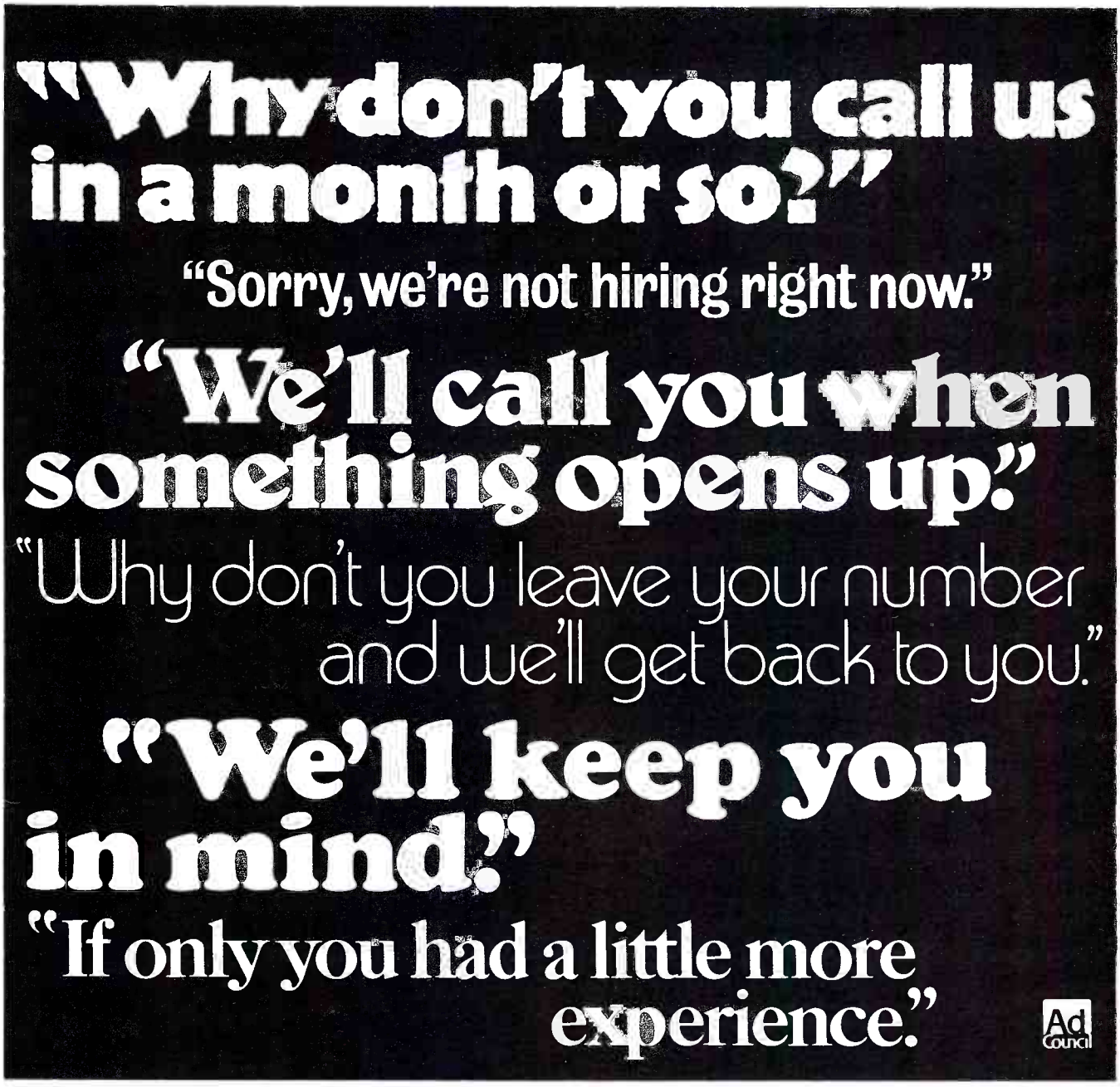


Figure 2. An example of the successful application of a load-shedding program. Energy usage has been spread more evenly throughout the day in the diagram on the right, resulting in reduced peak demand, and consequently, a better rate from the utility company.



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mand systems also will give the customer a print-out of the demand profile of the plant, further helping management analyze and control power costs.

Load factor

The *load factor* on an electric utility company bill is a product of the peak demand and energy usage. It usually is calculated and applied to the customer's bill each month. Reducing the peak demand or energy usage levels (or both) will decrease this added cost factor. Reducing power factor penalties also will help to reduce load factor charges.

Power factor

Power factor charges are the result of heavy inductive loading of the utility company system. A poor power factor (PF) will result in excessive losses along utility company feeder lines, because more current is required to supply a particular load with a low power factor than would be demanded if the load had a power factor close to 100%, or unity. A utility line looking into an inductive load (which most often is the case) is said to have a *lagging power factor*, while a line feeding a capacitive load has a *leading power factor*.

The power factor charge is a penalty that customers pay for the extra current needed to magnetize motors and other inductive loads. This *magnetizing current* does not show up on the service drop wattmeter. It is, instead, measured separately or prorated as an additional charge to the customer. The PF penalty charge can be reduced through the addition of power factor correction capacitors. The capacitors provide a leading power factor to offset the lagging power factor of an inductive load. When a balance is made, the PF is 100%.

Power factor meters are available for measuring a load's PF performance. However, it usually is less expensive in the long run to hire a local electrical contractor to conduct the PF survey and recommend possible correction methods.

The use of power factor correction capacitors usually is the simplest and most versatile method of PF improvement. The point of diminishing returns for PF correction is approximately 95%. Loads that exhibit a power factor below 95% may benefit economically by installing power factor correction components. An experienced electrical contractor and the local utility company should be consulted before trying to change a broadcast facility's power factor situation.

Possible sources of PF problems include transmitters, blowers, air conditioners, heating equipment, and fluorescent and high intensity discharge lighting fixture ballasts. Most transmitting equipment exhibits fairly good PF performance, with 90% to 95% being typical. When purchasing a new transmitter, this point should be taken into consideration, because of the increased operating costs that may be incurred from the power company due to PF penalties.

Plant maintenance

Any serious energy management effort should include an examination of present circuit layout and maintenance procedures. Ac power cables should be heavy enough to carry the full load demanded without heating losses. The system also should be examined for any loose connections, dirty contacts or cable insulation problems. Phase-to-phase load balance likewise should be checked on a regular basis at various points in the ac power distribution system.

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survey (13 percent) showed a favorable response toward interactive services.

In the present battle between technology and people, the people are winning. Until better marketing shows a realistic or compelling need for interactive communications, consumers are likely to remain victorious.

Comark visits China

Comark Communications senior operating officer Nat Ostroff entered the Chinese marketplace by presenting a seminar on UHF transmitter technology at the Beijing Broadcasting Institute in Beijing, China. During the first trip, in December 1983, the seminar covered klystron technology, exciter and linear corrector design, pulsers and UHF efficiency and system operation procedures. The 75 attendees included students and equipment users.

Ostroff and translator F. P. Cheng lead a seminar on UHF TV principles at the Beijing Broadcasting Institute.

"Comark UHF Television Transmitter Seminar" is the translation of this sign.

During the trip, Ostroff received signed contracts for two UHF transmitters, one for the Yunan province and one for the Beijing area. The two units will bring a total of five UHF transmitters to China, with NEC and Philips being in use in existing facilities.

Also a result of his 1983 trip will be what Ostroff describes as a constant stream of visitors from China to the Comark facilities in Pennsylvania and Massachusetts. The program is designed to exchange information with the Chinese, as well as to instruct them on operation of the newly installed transmission equipment.

Associations

Continued from page 14

it ignores the facts established by the record in the rulemaking proceeding.

"The record which was judged to be inadequate in September is the same record on which the commission now bases its radically different decision," Johnson said. "The only thing that has changed is the unprecedented political blitz which the daytimers have launched against the September 1983 decision."

ABES is awaiting release by the FCC of the text of the new rule before deciding on a subsequent cause of action.

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Francis to receive Broadcaster of the Year Award

Long-time radio and TV star Arlene Francis has been named Broadcaster of the Year by the IRTS.

Among her screen credits are *One Two Three*, *All My Sons* and *Harvey*. From 1950 to 1967, she was a regular panelist on *What's My Line?*, and she has just ended 24 years as host of a daily interview series for WOR Radio. Francis continues as co-host, with Joe Michaels, of the weekly public affairs series, *The Prime of Your Life*, seen in New York on WNBC-TV.

Previous winners have included Jack Benny, Johnny Carson, Walter Cronkite, Barbara Walters and Dinah Shore. Last year's recipient was *CBS News* correspondent Charles Kuralt.

Editorial

Continued from page 8

Some broadcasters expect technology to come to the rescue, but this is not likely in the foreseeable future. The laws of physics are closing in on us. A high quality STL system requires a certain amount of occupied bandwidth to deliver the performance expected. Any attempt to reduce the bandwidth of the current STL service will require a step in technology that, at present, does not exist.

Relief for broadcasters has been requested by the NAB and SBE (among others) through reallocation of the 942-947MHz band, which currently contains some 400 STLs that have been allowed to operate on a temporary basis since the section of spectrum was allocated to the land mobile reserve in the early 1970s. Higher frequency aural STL service also has been discussed for 2GHz and 18GHz. Whether any of these ideas will be given the blessings of the commission remains to be seen. Most observers are not optimistic about the outcome.

If broadcasters are to meet the challenge of the changing marketplace, many more than the present nine aural STL channels will be needed. This particular service, like other Part 74 bands, is in a bind, and the industry needs to recognize that fact. Failure in this regard will severely limit the future growth and technical quality of radio broadcasting.

The broadcast industry generally has been happy until now with deregulation, but the other side of deregulation is reduced protection. The true test of this policy is yet to come. The next few years will tell whether the gold rush made possible by deregulation is a boon or a bust for broadcasters.

Editor's note:
To gain additional information on problems experienced in the Part 74 frequency bands, **Broadcast Engineering** has included a questionnaire on interference problems at the back of this issue. Results of the survey will be combined with comments from land mobile users in a future article.

AM stereo

Continued from page 12

The development resulted from the needs of C-QUAM signal generator manufacturers for a "standard" on which to align their equipment, according to the company. The circuit designs are being passed on to hi-fi receiver manufacturers, Motorola said.

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ad index

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TRAINING

ELECTRONICS DEGREE by correspondence. Earn A.S.E.T., then B.S.E.T. Free catalog. Grantham College of Engineering, 2500 La Cienega, Los Angeles, California 90034. 7-82-tfn

FCC GENERAL RADIOTELEPHONE operators license through cassette recorded lessons at home plus one week seminar in Boston, Washington, Detroit or Philadelphia. Our twentieth year teaching FCC license courses. Bob Johnson Radio License Preparation, 1201 Ninth, Manhattan Beach, Calif. 90266, Telephone (213) 379-4461. 8-81-tfn

SERVICES

ONE STOP FOR ALL YOUR PROFESSIONAL AUDIO REQUIREMENTS. Bottom line oriented. F.T.C. Brewer Company, P.O. Box 8057, Pensacola, Florida 32506. 7-71-tf

HELIAX-STYROFLEX. Large stock—bargain prices—tested and certified. Write for price and stock lists. Sierra Western Electric, Box 23872, Oakland, Calif. 94623. Telephone (415) 832-3527. 1-73-tf

TRANSMITTER TUBES REPROCESSED—Save 40 to 50%. 3CX2500, 4CX5000, 4CX15000 and many others. Write for details. FREELAND PRODUCTS CO., Rt. 7, Box 628, Covington, LA 70433. (504) 893-1243. 6-79-tfn

MISCELLANEOUS FOR SALE

COPPER—Broadcasting's largest stock of strap, soft-drawn wire, ground screen, flyscreen. All sizes. 317-962-8596. Ask for copper sales. 4-84-4t

EQUIPMENT FOR SALE

WE OVERSTOCKED on UHF loop antennas for promotion durlng our sign-on. Good quantity of UHF loop antennas for sale at our cost. Contact George Sandoval, (303) 831-8831. 5-84-3t

SHIVELY 6810FM 8-BAY ANTENNA, 90.1, new, $4,000; new 240' guyed tower, $4,900. (216) 493-7000, (216) 497-9000. 5-84-3t

NEW EQUIPMENT IN UNOPENED SHIPPING CONTAINERS. Includes Grass 300 switcher, CMX editor, ADM audio console, etc. Call Clyde parker WOKR 716-334-8700 for listing and information. 6-84-2t

CHYRON IIIB BROADCAST CHARACTER GENERATOR and accessories: Font compose, Chyron clock, auto display, roll, crawl, font discs, program discs, support manuals. Immediate availability. $10,000. Dow Michigan Division, Television Network, 517-636-5703. 6-84-2t

OTARI DUPLICATOR SYSTEM, DP1010 with five slaves; Orban 111B Stereo Reverb, $550.00; EV Sentry 5 monitors, pair, $600.00; Ampex 440C, mono, in Ampex console, $1,500; Ampex 351 deck, mono, tube electronics, metal console, $450; Ampex 440 deck, mono, inovonics electronics, wood console, $950; Ampex 350 deck, mono, tube electronics, wood console, $450; Phillips 545 monitors, integrated amplification, pair $950. PRICES NEGOTIABLE, (213) 466-6141, STEWART. 7-84-1t

C BAND SATELLITE UPLINK: Complete Uplink Electronics with Varian dual TWT 400 W power amplifier and solid state driver. Frequency range 5.925 to 6.425GHz, includes Up/Down converter, Demod/Demux units and receiver. All equipment mounted in 19" racks. Meets all ICSC specifications. As new condition. Mfr. Calif. Microwave. Radio Research Instrument Co., Inc., 2 Lake Ave. Ext., Danbury, CT 06811, Tel: 203-792-6666. 7-84-tfn

EQUIPMENT FOR SALE (CONT.)

C BAND VIDEO BANDWIDTH MICROWAVE LINK: Frequency: 6565-6875MHz, Transmitter Pwr: 200mw, Carrier deviation: ±3MHz, Frequency response: ±.5dbm from 300Hz to 3MHz. Mfr. Motorola type MR-30. In stock for immediate delivery, "As New", fully tested. Radio Research Instrument Co., Inc., 2 Lake Ave. Ext., Danbury, CT 06811, Tel: 203-792-6666. 7-84-tfn

G.E. PJ5050 Video Projector. Like new (less than 400hrs) with standard and long-throw lenses, spare lamp, 250ft remote cable, and steel shipping case. Cost over $77,000. Best offer, call 707-963-9451 or write P.O. Box 208, Rutherford, CA 94573. 7-84-1t

COLLINS 831F-2 FM TRANSMITTER: 4 years old—like new condition. Call Bruce Harlan 216-821-1111. 7-84-1t

1959 RCA 250 watt AM transmitter. $800 or best offer. P.O. Box 225, Big Rapids, MI 49307. 7-84-1t

WANTED TO BUY

WANTED: Pre-1923 radio equipment and tubes. August J. Link, Surcom Associates, 305 Wisconsin Ave., Oceanside, CA 92054, (619) 722-6162. 3-76-tf

HIGHEST PRICES PAID for 112 Phase Monitors and for clean, one kw or greater powered AM and FM Transmitters. All duty and transportation paid. Surplus Equipment Sales, 2 Thorncliffe Park Dr., Unit 28, Toronto, Canada M4H 1H2, 416-421-5631. 2-79-tfn

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HELP WANTED

TELECINE MAINTENANCE ENGINEER needed to fill early evening shift. This unusual position requires a RANK CINTEL background and basic electronic design or fabrication experience. Excellent opportunity to participate in State-Of-The-Art Video projects. Reply to: Image Transform, Attn: Engineering Manager, 4142 Lankershim Blvd., North Hollywood, CA 91602, (818) 985-7566. 6-84-2t

NOTICE OF VACANCY—Broadcast Engineer: The Department of Speech Communication and Theatre in a small, church-related, liberal arts college is seeking a Broadcast Engineer for a non-commercial educational radio station and cable access television studio. Responsible for operation and maintenance of all equipment. BA degree in broadcasting and engineering experience required. Salary commensurate with education and experience. Application deadline: Until filled. Duties begin July 1, 1984. Send letter of application and resume, along with three letters of reference, to Dr. Jerry Martin, Chairman, Speech Communication and theatre, Muskingum College, New Concord, Ohio 43762. 6-84-2t

HELP WANTED (CONT.)

MAINTENANCE ENGINEER WITH GOOD TECHNICAL training and at least 5 years experience. New equipment being installed and more coming. Station committed to growth. Send resume to: Richard Westlund, Manager of Engineering, WGRZ-TV, 259 Delaware Ave., Buffalo, N.Y. 14202. 7-84-1t

RAPIDLY GROWING MEDIUM MARKET STATIONS (Greenville/Spartanburg, S.C.), WCKN-FM, 100,000 watts, and WAIM-AM, 1,000 watts, is looking for an experienced full time chief engineer. Contact Bob Nations, (803) 226-1511, or send resume to P.O. Box 650, Anderson, S.C. 29622. 7-84-1t

SUPERVISING RADIO COMMUNICATIONS TECHNICIAN: $26,535-$31,315. Seven years experience Electronic Communications Systems Maintenance, (three in supervisory capacity). FCC Commercial Radiotelephone Operator License (minimum Second Class or general certificate). Experience in electronic equipment maintenance, report analysis, documentation procedures, construction projects, good engineering practice, clear drawings, FCC licensing procedures, path profile analysis associated with land mobile and microwave point-to-point radio systems. Resume: Director of Personnel, NY State Police, Bldg. #22, State Campus, Albany, NY 12226. 7-84-1t

MICROWAVE COMMUNICATIONS SPECIALIST— $23,544-$27,344. Requires ability to repair and service 2 GHz Microwave, radio and multiplex equipment for voice, radio control, telemetry and data. Minimum FCC second class, some travel. Resume: Director of Personnel NY State Police, Bldg. #22 Campus, Albany, New York 12226. 7-84-1t

VIDEO TAPE ENGINEERS needed at Kodak's Video Technology Center in San Diego. Three years experience in tape-head-recorder engineering activities may qualify you for a challenging position on this new team. Responsibilities will include Quality Assurance testing, recorder/tape performance investigations and worldwide technical support activities for Kodak's video tape product line from 8mm through 1" broadcast video tapes. An exceptional opportunity to join Kodak—The first name in film...now the new name in video tape. Interested candidates are invited to submit resume to Mr. Patrick Dunlap, Dept. VTE, Spin Physics/Eastman Kodak Co., 3099 Science Park Rd., San Diego, CA 92121. EOE. 7-84-1t

ASST. CHIEF ENGINEER: Southern California, UHF Commercial Independent, needs engineer with at least 5 years maintenance experience and a solid knowledge of modern electronics. Should also have UHF transmitter experience. Equal Opportunity Employer. Send resume to: KDOC-TV 56, 1730 S. Clementine, Anaheim, California 92802, c/o Bell Welty (714) 999-5000. 7-84-2t

WEST COAST TELEVISION STATION seeks chief engineer. Good facility, moderate climate, excellent recreation. Modest housing costs. EOE. Broadcast Engineering, Dept. 611, P.O. Box 12901, Overland Park, KS 6621209981. 7-84-1t

NEW YORK CITY, state-of-the-art television commercial production company seeks senior videotape editor. Salary dependent on experience. Reply to: Dept. 614, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 7-84-1t

MOBILE UNIT MAINTENANCE SUPERVISOR needed for first class 43 ft. TV production truck. Individual should be familiar with maintenance of Ikegami, Ampex, Grass Valley and Quantel broadcast equipment. Some travel required. Contact: Russ Abernathy, YES Productions, 916 Navarre Ave., New Orleans, LA 70124. 504-486-5511. 7-84-2t

AGGRESSIVE BROADCASTING FIRM is accepting resumes and applications for Chief Engineers. We are a rapidly expanding corporation and need talented, aggressive, "hands on" engineers who understand and can maintain state-of-the-art computerized equipment. Salary commensurate with experience. Good benefits, etc., send resumes to Dept. 612, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 7-84-3t

TELEVISION ENGINEER III. Licensed or certified, studio and RF maintenance engineer. Plan, install, maintain, repair all phases of studio, remote and RF transmission facilities. Digital and UHF experience a plus. Five years broadcast television experience and 2 years technical training or equivalent combination. Assist in supervision of technical staff. KRWG-TV is licensed to New Mexico State University, with many associated benefits. Deadline for applications 8-1-84. Send resume and names of three professional references to: John Ramp, KRWG-TV, Box TV22, Las Cruces, NM 88003. NMSU is an EEO/AA Employer. 7-84-1t

VIDEO SERVICES TECHNICIAN to perform gen. maintenance, component-level diagnostics & repair of video production electronics w/high-quality equipment. Min. two years formal education + equiv. experience. Requirements & resume: Staff Engineer, United Cable TV of Scottsdale, 3720 N. Marshall Way, Scts., AZ85251. M/F AA EOE 7-84-1t

T.V. STATION IN ALASKA LOOKING for good Chief Engineer, salary negotiable, excellent beneffts. Send resume to 1840 S. Bragaw, Ste. 102, Anchorage, Alaska 99508. Attn: Mike Buck. 7-84-1t

FIELD ENGINEER FOR 9 STATION radio network. Position requires 5 years experience in broadcast audio and RF, including STL. Must be willing to travel. Send resume and salary requirements to Personnel, Minnesota Public Radio, 45 E. 8th St., St. Paul, MN 55101. MPR is an Equal Opportunity Employer. 7-84-1t

CHIEF ENGINEER—FIFTEEN YEARS' EXPERIENCE in broadcast engineering; or, ten years' experience in broadcast engineering and bachelor's degree in Electrical Engineering. Experience must include five years in a supervisory position. First Class or General Class FCC license is required. Send resume to Dept. 613, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 7-84-1t

SITUATION WANTED

TELEPRODUCTION ENGINEER with 10 years experience in all phases of television production seeks position with small growing company or specialized position in larger firm. Background concentrated in design, installation and operation of Audio, Communication and Video Editing Systems for remote vans, production and postproduction facilities. Experience provides evidence of Engineering/Management skills and potential (918) 446-9115, Box 571088. Tulsa, OK 74157.

people

Paul W. Krueger has been appointed manager of market support for Ampex Corporation's Audio-Video Systems Division. Krueger will be responsible for establishing policy and direction for after-market support of AVSD products. Initially, he will focus his efforts on spares, standard tapes and the printed wiring assembly exchange program.

The New Technology Products Group of the Panasonic Industrial Company has announced the appointment of **Nick Hudak** to the position of national manager for systems development and marketing. Hudak will be responsible for the development and marketing of broadcast systems products as well as for the proposal, design and installation of broadcast systems. He will also be project manager for RAMSA Sound Systems at the 1984 Summer Olympics in Los Angeles.

Joseph M. Bradley has been appointed vice president of marketing for Varian Associates' Electron Device Group (EDG). Bradley will manage the network of field marketing and sales offices in the United States and Europe. He will also be responsible for coordinating divisional marketing activities among the nine operating divisions of the group.

Michael Wilke has been named product manager for 1-inch and 2-inch professional videotape for the Magnetic Tape Division of Ampex Corporation. Wilke will be responsible for the 196 and 175 product lines.

Frederick H. von Stade recently retired from Taft Broadcasting Company after 31 years with the company, most recently as senior area vice president in the Taft TV Group. Von Stade joined Taft in 1953 as a floor director at WTVN-TV, Columbus, OH. He advanced through positions of director/producer, operations manager, local account executive and sales manager. In 1961, he was appointed general manager of WKYT-TV, Lexington, KY, which was at that time owned by Taft. In 1966, he returned to Columbus as vice president and general manager of WTVN-TV, a position he held until being named senior area vice president in 1982.

Harris Corporation has appointed **Ricardo A. Diaz** to the new position of vice president of manufacturing programs. Diaz will report to John T. Hartley, Harris' president and chief operating officer. Working with the company's operating divisions and groups, he will be responsible for the enhancement of all aspects of Harris' manufacturing operations in the United States and abroad.

W. Tom Beams has been named as vice president and chief operating officer at Aurora Systems. Beams was formerly with Ampex Corporation.

Marconi Communication Systems has announced the appointment of **R. K. (Robbie) Robertson** as its new managing director. This appointment follows a major reorganization within the company.

Use Reader Service Numbers

INTERFERENCE PROBLEM QUESTIONNAIRE

Interference between mobile and fixed *land mobile* users and radio and TV program relay transmission equipment has been a hot topic in the land mobile and broadcast communities. Has interference affected the quality of your reception? How do you deal with it? Please take some time to provide **BE** with details of your personal experiences and solutions to this industry bone of contention. The results of this questionnaire will appear in a future issue of **BE.**

1. What is your title? _____

2. Type of operation? _____

3. Are any land mobile base station transmitters located near your ENG/RENG receive antennas?

☐ Yes ☐ No

If yes, do you experience interference caused by:

☐ Out-of-band radiation.

☐ Desensitization of the receiver by land mobile gear.

☐ Intermodulation products.

4. What methods have you used to help solve your interference problems?

☐ Installation of cavity notch or bandpass filters.

☐ Placement of receivers farther away from land mobile transmitters.

☐ Relocation of receive antennas for greater horizontal or vertical separation from land mobile transmit antennas.

☐ Installation of more selective antennas.

☐ Use of new encoding/decoding techniques.

☐ Other _____

5. What steps could the industry as a whole take to reduce the interference problems that exist?

☐ Implementation of strict frequency coordination policies for broadcast and land mobile operation.

☐ Assignment of land mobile reserve bands.

☐ Implementation of new transmission technologies, such as Amplitude Compandored Sideband (ACSB).

☐ Use of vacant UHF TV channels for broadcast/land mobile communications.

☐ Better enforcement of *last in* interference control policies.

☐ Other _____

6. What problems in your operation have been caused by interference?

_____

_____

The results will be tabulated Sept. 1.

THANK YOU!

Name_____

Title_____

Company_____

Street_____

City_____ State_____

Zip_____ Phone_____

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TV Editor

READER SERVICE CARD For issue of July 1984 — Use until November 1, 1984.

After that date please contact manufacturer direct.

BROADCAST® ENGINEERING

1. IMPORTANT: Do you wish to receive/continue to receive BROADCAST ENGINEERING FREE?

☐ Yes ☐ No

Your signature is required *Date*

Please print or type:

Name _____

Title _____

Organization or firm _____

Street or box _____

City _____ State _____ Zip _____

Phone ( ) _____

SAVE TIME: Use peel off address label for faster service.

2. Please check the ONE type of facility or operation that best describes your business classification:

19 ☐ Low Power TV Station
20 ☐ TV Station
21 ☐ AM Station
22 ☐ FM Station
23 ☐ AM & FM Station
24 ☐ TV & AM Station
25 ☐ TV & FM Station
26 ☐ TV, AM & FM Station
27 ☐ CATV Facility
28 ☐ Non-Broadcast TV including Closed Circuit TV (CCTV)
29 ☐ Recording Studio
30 ☐ Teleproduction Facility
31 ☐ Microwave, Relay Station or Satellite Company
32 ☐ Government
33 ☐ Consultant (Engineering or Management)
34 ☐ Dealer, Distributor or Manufacturer
☐ Other _____ *(Please specify)*

3. If you checked 20 through 26 above, which of the following best describes your over-the-air station: (Check only one.)

A ☐ Commercial
B ☐ Educational
C ☐ Religious
D ☐ Campus Low Frequency
E ☐ Community
F ☐ Municipally Owned

4. Check the category that best describes your title: (Check only one.)

A ☐ **Company Management**—Chairman of the Board, President, Owner, Partner, Director, Vice President, General Manager (other than in charge of Engineering or Station Operation Management) and other Corporate and Financial Officials

B ☐ **Technical Management & Engineering**—Technical Director or Manager, Chief Engineer, Other Engineering or Technical Titles

C ☐ **Operations & Station Management/Production & Programming**—VP Operations, Operation Manager/Director, Station Manager, Production Manager, Program Manager, News Director and other Operations Titles

5. IMPORTANT: Check the statement that best describes your role in the purchase of major communication equipment components and accessories.

☐ Make final decision to buy a specific make or model
☐ Recommend make or model to be purchased
☐ Have no part in specifying or buying

SEND ME MORE INFORMATION about products or services I have circled.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
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577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608

FOR FASTER ACTION!!!

I have an immediate interest in the items I've indicated here. Please have a sales person call me.

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BROADCAST® ENGINEERING

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FOR FASTER ACTION!!!

I have an immediate interest in the items I've indicated here. Please have a sales person call me.

PLACE
FIRST CLASS
POSTAGE
HERE

Which one advertisement in this issue was of most interest to you?

Advertiser's Name _____ Circle No. _____

Comments on this issue:

BROADCAST ENGINEERING®

P.O. Box 12902
Overland Park, KS 66212-9981

PLACE
FIRST CLASS
POSTAGE
HERE

Which one advertisement in this issue was of most interest to you?

Advertiser's Name _____ Circle No. _____

Comments on this issue:

BROADCAST ENGINEERING®

P.O. Box 12902
Overland Park, KS 66212-9981

NTSC DIGITAL TEST GENERATOR
DTG-1010N

the multitasking machine...

STUDIO 1

STUDIO 2

VTR

MCR

MAINTENANCE

Dual feeds of 40 test signals to FIVE different locations with complete remote control.

Two new test signals for chroma noise measurements and transmitter power calibration.

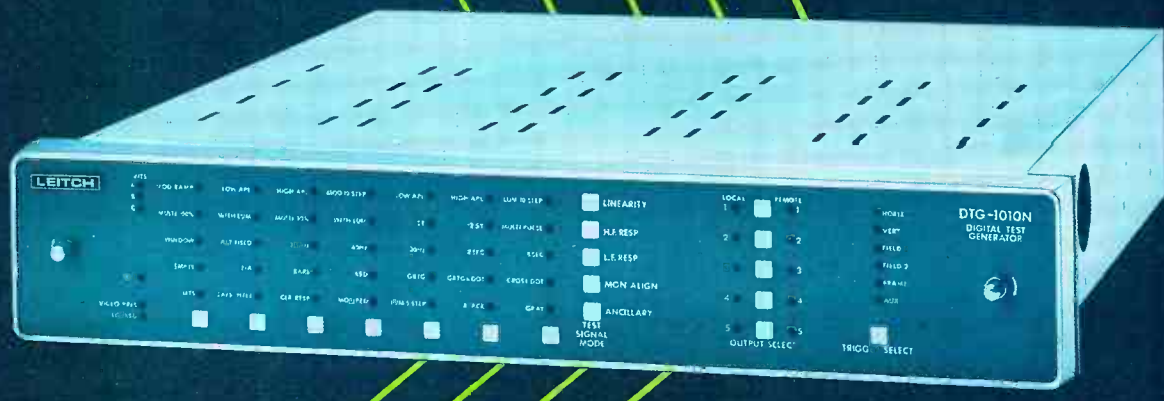
Three VITS packages.

Full range of trigger signals.

Variable H and V blanking.

Genlock.

RS170A ... of course.



Plus outputs of

SYNC

BLANKING

SUBCARRIER

TRIGGERS

LEITCH

Progressive Concepts in Television Technology

Leitch Video of America, Inc.
825K Greenbrier Circle
Chesapeake, VA 23320
Tel.: (804) 424-7920
Telex II: 710 882 4342

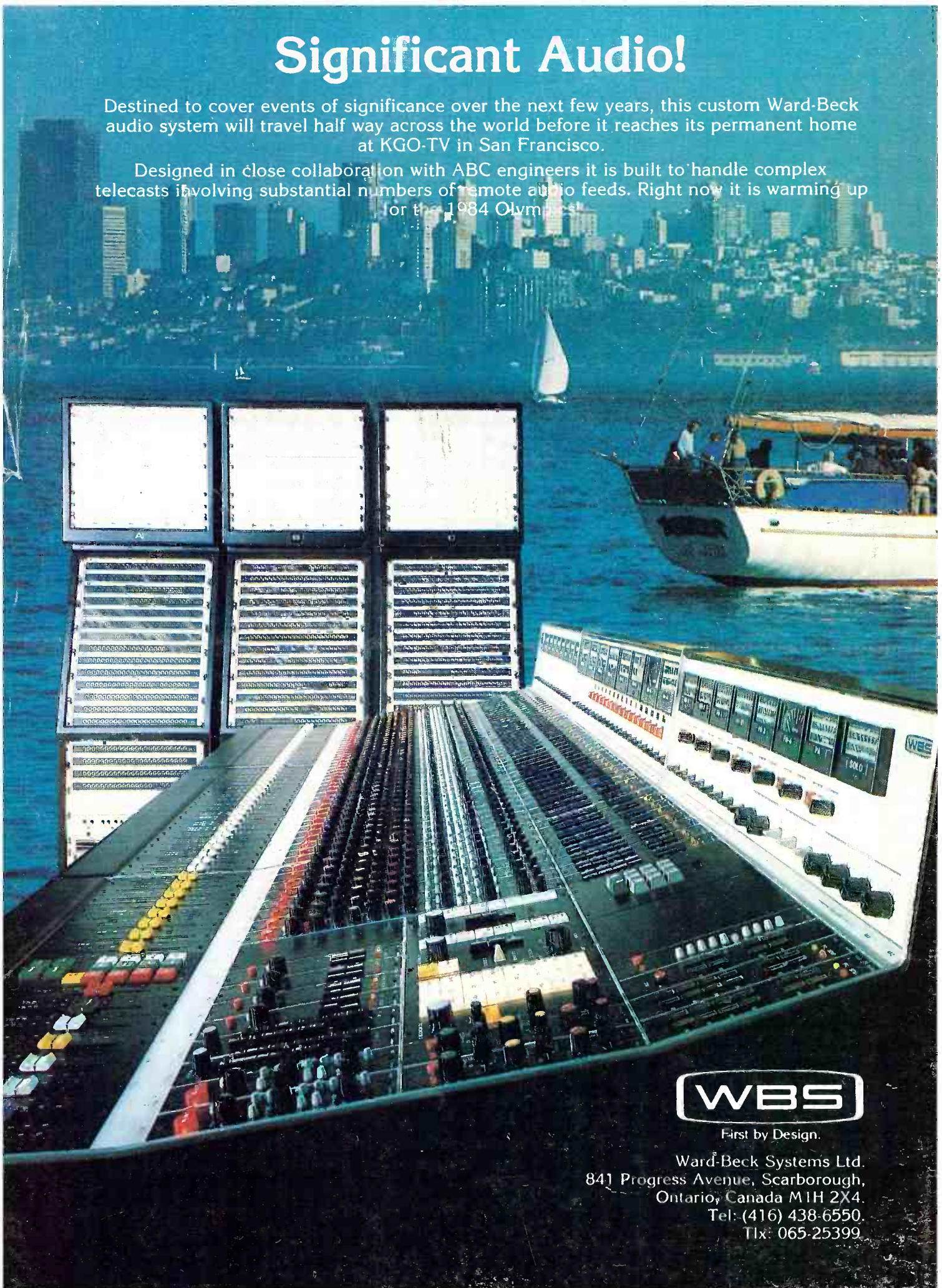
Leitch Video Limited
10 Dyas Road
Don Mills, Ontario M3B 1V5
Tel.: (416) 445-9640
Telex: 06 986 241

Circle (1) on Reply Card

Significant Audio!

Destined to cover events of significance over the next few years, this custom Ward-Beck audio system will travel half way across the world before it reaches its permanent home at KGO-TV in San Francisco.

Designed in close collaboration with ABC engineers it is built to handle complex telecasts involving substantial numbers of remote audio feeds. Right now it is warming up for the 1984 Olympics.



WBS

First by Design.

Ward-Beck Systems Ltd.
841 Progress Avenue, Scarborough,
Ontario, Canada M1H 2X4.
Tel: (416) 438-6550.
Tlx: 065-25399