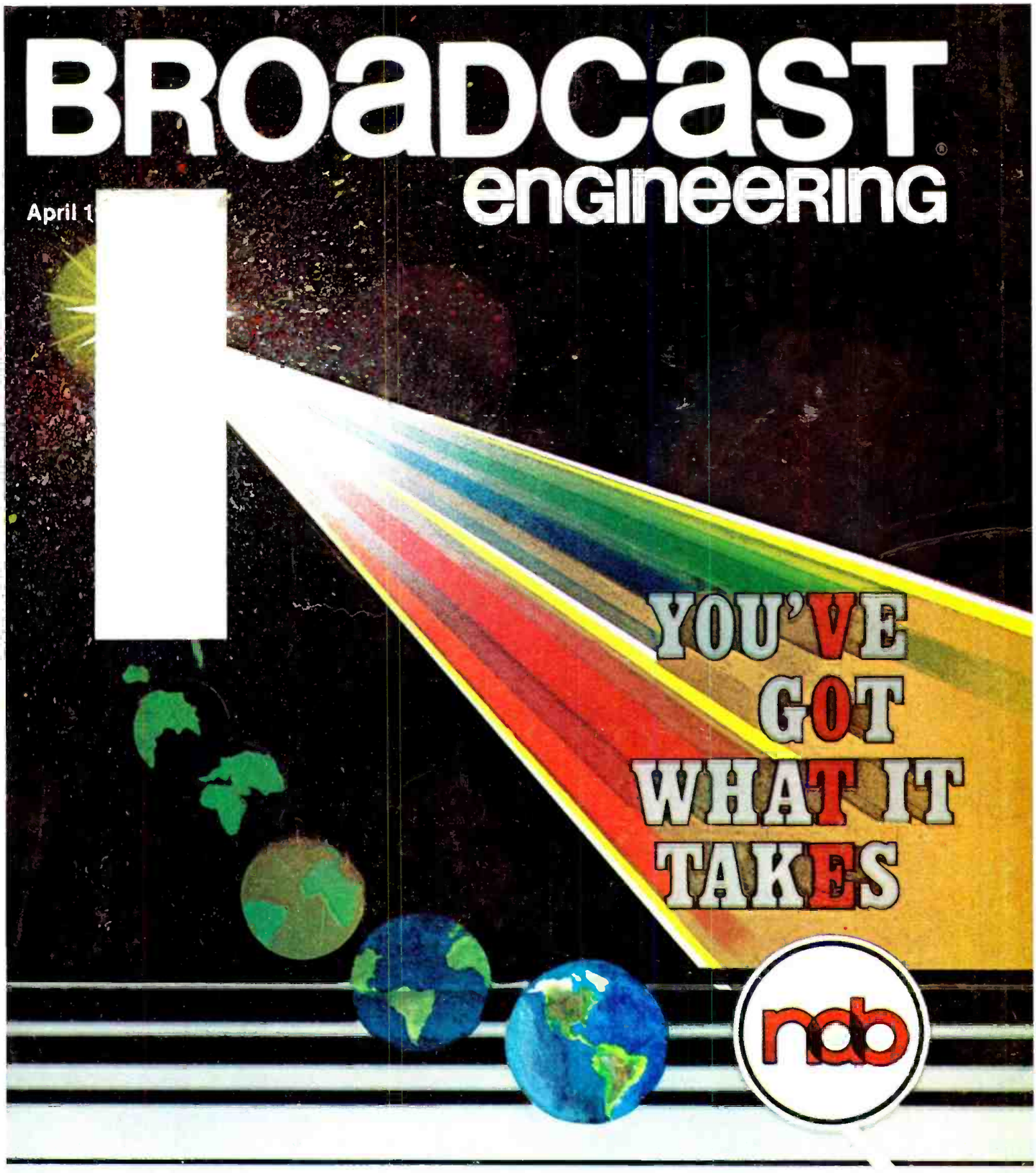
BROADCAST ENGINEERING

April 1



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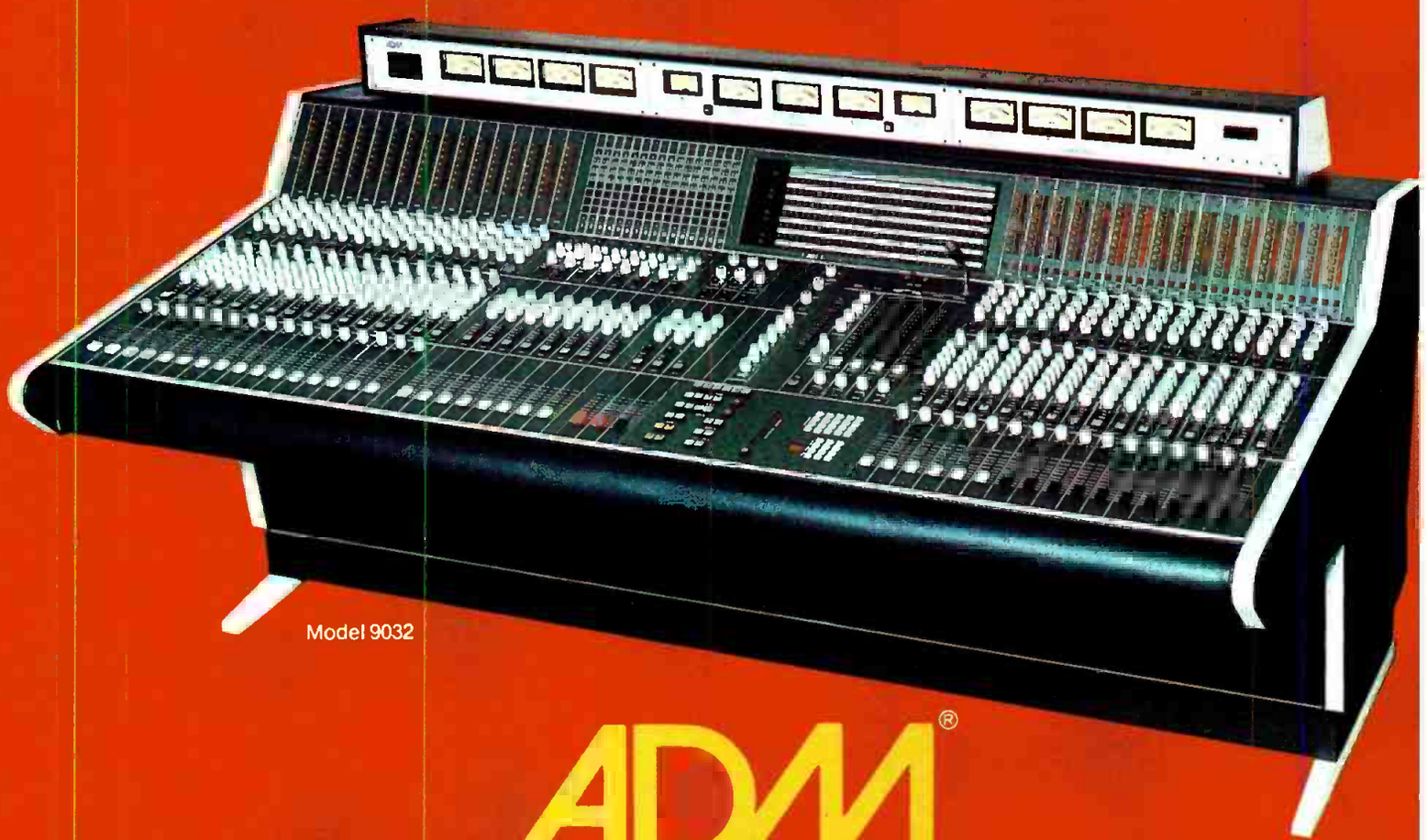

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BROADCAST engineering

The journal of broadcast technology

April 1984 • Volume 26 • No. 4

1984 NAB CONVENTION SPECIAL

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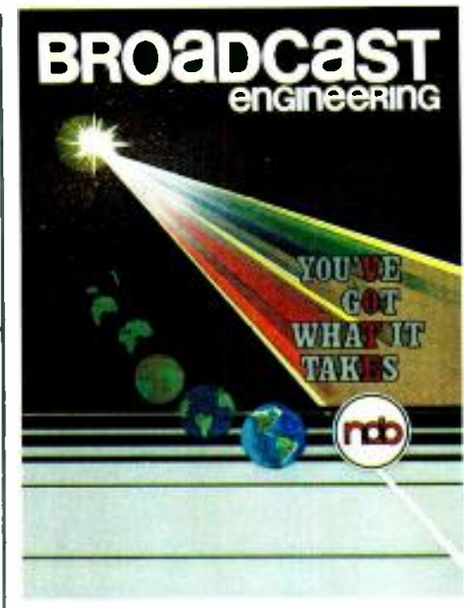

THE COVER this month is adapted from NAB brochures promoting this year's greatest broadcast equipment show: NAB-'84/Las Vegas. The 62nd Annual Convention and International Exposition's theme is *"You've Got What It Takes,"* recognizing that, in an election year, voters have the power to elect candidates who represent their views.

As **BE** goes to press, the NAB has not completed its brochure cover plans. So, we adapted the initial drawings to produce this cover. The rotating world denotes the convention's worldwide scope that makes it exciting and successful.

NAB-'84/Las Vegas

- April 29-May 2
- Las Vegas Convention Center

NAB CONVENTION GUIDE—Most of this issue is devoted to pre-show coverage of NAB-'84/Las Vegas. Extensive research went into compiling data from manufacturers exhibiting at this year's convention to make our exclusive coverage as detailed and complete as possible. The results, in terms of articles and special sections, can be seen in the contents listing to the left. This special coverage will help attendees plan for the show or make it easy to obtain data on new products for those who cannot make it to Las Vegas this year. In any event, look for **BE**'s extensive wrap-up in our June and July issues.

NEXT MONTH marks **BE**'s 25th anniversary of serving broadcasters around the world. Besides our usual offering of departments and articles, we will review some highlights of this dynamic, changing era of broadcasting.

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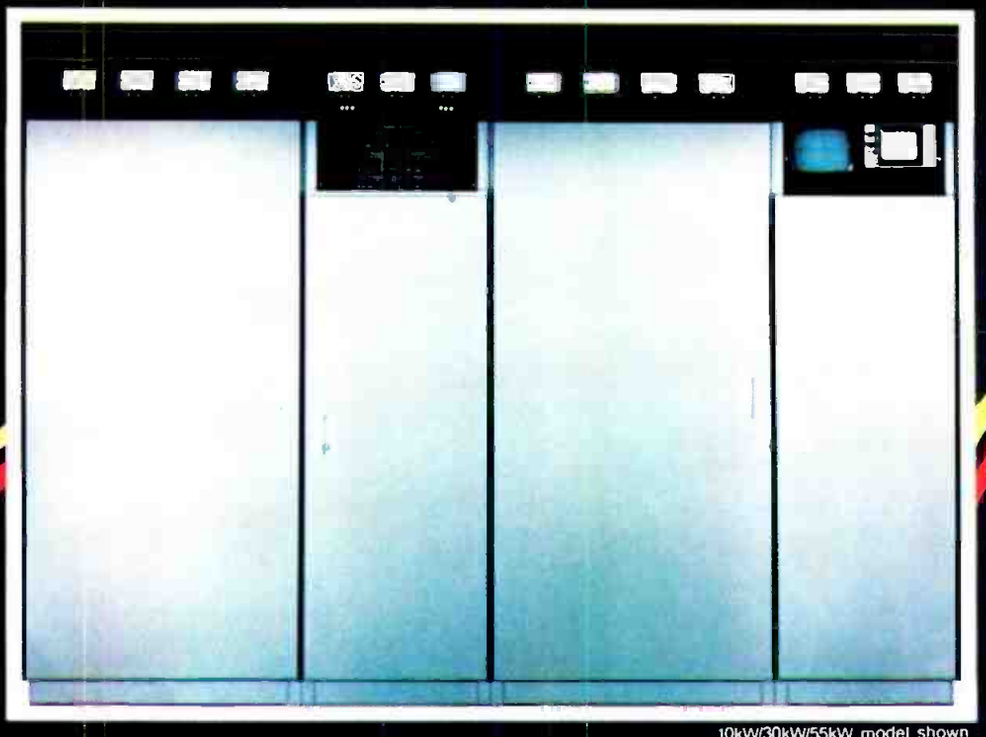

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Study predicts 8 million LPTV households by 1990

By 1990, some 8 million TV households will be receiving broadcast service via low power television. Of these households, 75% will receive advertiser-supported service, while the remaining households will subscribe to some form of pay LPTV.

These are the main conclusions of a recent study, "Low Power Television: Will it Take Off by 1990?" The study was prepared by Michael Couzens for the *New TV Reporter*, a broadcast technology newsletter. Couzens, a former FCC staffer who headed the commission's LPTV inquiry, currently practices law in San Francisco.

The heyday of LPTV construction will be during 1986 and 1987, according to the study. By the end of 1987, some 1370 stations are forecast to begin operations. By 1990, the station count is predicted to reach 2000.

Adequate broadcast spectrum is available to accommodate an average of two stations through the Top 50 markets, and an average of four in the second 50 markets numbered 51-100. The markets from 101-200 can accommodate an average of six new LPTV stations. Station growth is predicted to approach these limits by 1990 in the Top 200 markets, resulting in 750 new stations.

The remainder, or 1250 stations, are expected to start up in smaller communities, outside the Top 200. The new station estimate includes upgrading of approximately 500 conventional TV translator station repeaters.

In its analysis of competitors, the study said that the largest single obstacle to LPTV development by 1990 will be the difficulty of configuring mutlichannel LPTV stations under common management. Cable Television (CATV), direct broadcast satellites (DBS) and multipoint distribution service (MDS) all will be offering multichannel services. The study concludes that LPTV will enjoy higher circulation, but lower revenues, than either DBS or MDS by 1990.

Copies of the study are available for $10 from the *New TV Reporter*, P.O. Box 421956, San Francisco, CA 94142.

Whitaker to speak at NAB-'84

Jerry Whitaker, **BE** radio editor, will deliver a technical paper titled "Transient Overvoltages...Their Causes and Cures," during the upcoming NAB Convention to be held April 29-May 2.

His presentation will include a detailed analysis of the problems faced by broadcasters due to power company voltage surges and the damage that can be caused by such electrical disturbances at radio and TV facilities. Special emphasis will be placed on the methods available to broadcasters to protect sensitive transmission and computer-based equipment. To further the industry's understanding of the overvoltage problem, Whitaker will write a chapter on ac voltage power supplies and power conditioning for the soon-to-be-released *Seventh NAB Engineering Handbook*.

Whitaker also is scheduled to speak at the upcoming Ohio State University Engineering Conference (July 17-19) and will present a special engineering paper titled "Writing for Technical Publications."

Continued on page 338

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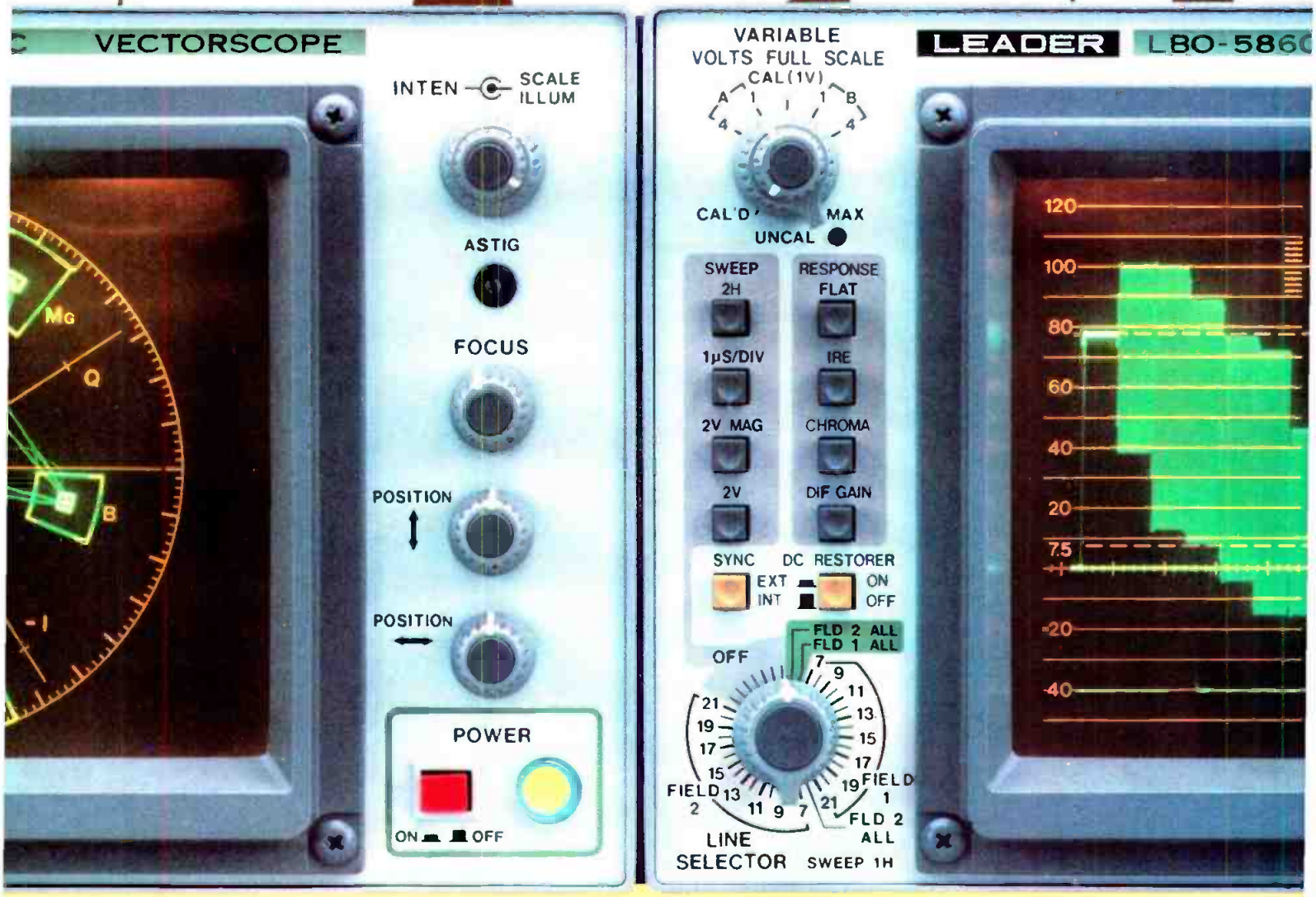

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FCC update

April 1984

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

New US-Canada AM broadcasting agreement signed

On Jan. 17, 1984, a new bilateral AM agreement with Canada was signed in Ottawa. The new agreement establishes standards and procedures that henceforth will govern the protection that the United States and Canada provide to each other's AM broadcasting services. It supersedes the North American Radio Broadcasting Agreement (NARBA) insofar as the United States and Canada are concerned.

The agreement incorporates a plan that includes all the AM assignments the United States and Canada have recorded as notified and accepted under NARBA, plus a list of approximately 650 additional AM assignments on the 32 channels that under NARBA had been classified as US and Canadian Class I-A clear channels (25 US and seven Canadian).

The mutual adjustments that made it possible to develop the list of protected new assignments have necessitated some modifications of the facilities proposed by both the United States and Canada. US applicants concerned were informed during the negotiations, and have consented to such modifications. The administrations of both countries wish to proceed further with carrying out the needed adjustments before the channels in question are opened up to the submission of further applications. This means that the freeze on the filing of applications for unlimited-time stations on the 25 US Class I-A clear channels will remain in effect for another six months. However, this freeze does not apply to applications for construction permits that are mutually exclusive with applications for license renewal, nor to mutually exclusive applications that are timely filed in response to cutoff lists.

Similarly, Canada has agreed to defer for six months the notification of assignments on the US clear channels and, to permit orderly transition to the newly agreed basis for the assignment by the United States and Canada of unlimited-time stations on each other's Class I-A clear channels, both countries also will defer for the same period the notification of new assignments on the seven Canadian Class I-A clear channels: 540kHz, 690kHz, 740kHz, 860kHz, 990kHz, 1010kHz and 1580kHz. This will not affect the continuing opportunity to apply for stations on these seven channels in locations more than 650 miles from the United States-Canada border.

Also, the new agreement permits post-sunset operation by US daytime stations for the first time, liberalizes the protection standards for pre-sunrise operations, and opens the way for a general nighttime power increase from 250W to 1000W for Class IV stations. The commission already has begun to implement the pre-sunrise and post-sunset arrangements and has issued a rulemaking notice concerning Class IV power increases.

Repeal of regional concentration of control rules proposed

In a Notice of Proposed Rulemaking issued in January, the FCC proposed eliminating rules that prohibit any party from owning, operating or controlling three commercial AM, FM or TV stations in cases in which any two stations are located within 100 miles of the third and there is primary service contour overlap between any of the stations.

These rules, which were adopted by the FCC in 1977 to eliminate the need for case-by-case resolution of regional concentration of control issues, have proved neither accurate nor consistent in identifying circumstances likely to involve concentrations of control. The commission said it thinks that the current rule may impose substantial and counterproductive costs on the broadcast industry. For example, restricting multiple ownership in the same region may preclude the realization of economics of scale and operational efficiencies that might permit the production and presentation of new programming, the improvement of existing facilities or even the activation of unused allocations.

Also, the commission said that there has been substantial growth in the number and variety of media outlets in recent years. Since 1977, when the rules were adopted, competition in the communications marketplace has been significantly heightened by the development of new technologies. This trend is expected to continue and expand with the introduction of low power television, new multichannel MDS and direct broadcast satellite services. These developments strongly suggest a need to re-evaluate the assumptions on which the regional ownership limitations were based.

The commission is asking for comments on the adequacy of the current rule, the impact of the growth of new media outlets on the diversity of voices and levels of competition in regional markets, and whether the rules should be changed or eliminated.

Common carrier applications accepted

The commission now is accepting applications from FM broadcast licensees wishing to offer common carrier services on their SCAs. Such services were authorized specifically in the SCA deregulation order in BC Docket No. 82-536.

The commission said that stations wishing to file applications (on Form 401) for common carrier authorizations at this time should be prepared to amend them, if necessary, in the event the deregulation order is changed on reconsideration.

Cuban interference issue addressed

The FCC has released a Notice of Proposed Rulemaking regarding payments by the United States Information Agency to AM stations in the United States for expenses incurred in mitigating the effects of Cuban interference. To implement this program, the commission is seeking to establish standards in three areas:

- identifying a threshold level of interference that would trigger eligibility for compensation;
- specifying the types of expenses that would be compensable; and
- setting up procedures to be followed to obtain compensation.

Because attempts to negotiate a solution to interference problems with Cuba have proved unsuccessful, the commission has issued special temporary authorizations to affected stations permitting power increases and alterations in directional patterns to restore service to at least parts of their normally protected inferference-free areas lost to Cuban interference. The Radio Broadcasting to Cuba Act, effective Oct. 1, 1984, contemplates providing compensation to licensees that have made changes for this reason.

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We've got what it takes

As we head into what appears to be another record-setting convention at NAB-'84/Las Vegas, we sense an unusual air of excitement. In part this may be attributed to the show's first politically oriented theme: "You've Got What It Takes." But that is only part of the picture.

Some careful thought unveils multiple implications behind this year's theme:

- As voters, we have the power to elect candidates who best represent our views on critical issues.
- As broadcasters, we have the most effective communications tool to reach out to the public and encourage them to turn out in record numbers to exercise their voting priviledge.
- As broadcasters, we have the communications power to help shape and form public opinion on candidates and issues.
- As broadcasters, we have the most effective communications channels to provide early, rapid reports on election returns and trends.

This final point already is surfacing to cloud the 1984 political arena. Congressional hearings have been held to consider muzzling broadcasters to keep them from projecting election results before the polls are closed nationwide. Rep. Timothy Wirth (D-CO), chairman of the House Subcommittee on Telecommunications, Consumer Protection and Finance, has spearheaded efforts to constrict broadcasters, but so far has not been successful. This problem of projecting election results emerged dramatically in 1980 when the networks predicted that Ronald Reagan would win some three hours ahead of the closing of polls on the West Coast. Compounding the situation, President Jimmy Carter conceded defeat while much of the nation was still voting.

The NAB-'84/Las Vegas convention will help broadcasters begin to perfect their communications and sales tools for riding the tide of politics in this election year. The program is loaded with sessions and panels focusing on what broadcasters can and cannot do in a deregulated environment.

But the convention is just a starting point. NAB plans to provide member stations with how-to kits that detail voter activities across the country, offer suggestions that have worked for other stations, show how to use the campaign as a promotional tool and identify source/location of election-year material.

It is easy to get wrapped up in new equipment at the annual NAB show. But, at NAB-'84, let us not lose sight of our show theme. Indeed, we *do* have what it takes. So, let us take what we have and put it to maximum use, but with the attitude of service and responsibility that makes broadcasting the greatest communications media on earth. |:-)))|

coming events

April 29-May 2
NAB 62nd Annual Convention, Las Vegas, NV

May 3-6
ITVA, Las Vegas, NV

May 12-15
Audio Engineering Society (AES), Anaheim, CA

May 20-23
Broadcast Financial Management Association (BFMA) 24th Annual Conference, New York, NY

May 30-June 2
American Women in Radio and Television 33rd Annual Convention, Chicago, IL

June 3-6
National Cable Television Association (NCTA) Annual Convention, Las Vegas, NV

June 10-15
Broadcasters Promotion Association (BPA) 27th Annual Seminar and Broadcast Association, Las Vegas, NV

June 24-27
CCBA Convention

Aug. 26-29
NAB Radio Programming Conference, Atlanta, GA

September/October
LPTV East

Sept. 6-8
Southern Cable TV Association, Atlanta, GA

Sept. 16-19
NRBA Annual Convention, Los Angeles, CA

Sept. 20-21
IEEE 34th Annual Broadcast Symposium, Washington, DC

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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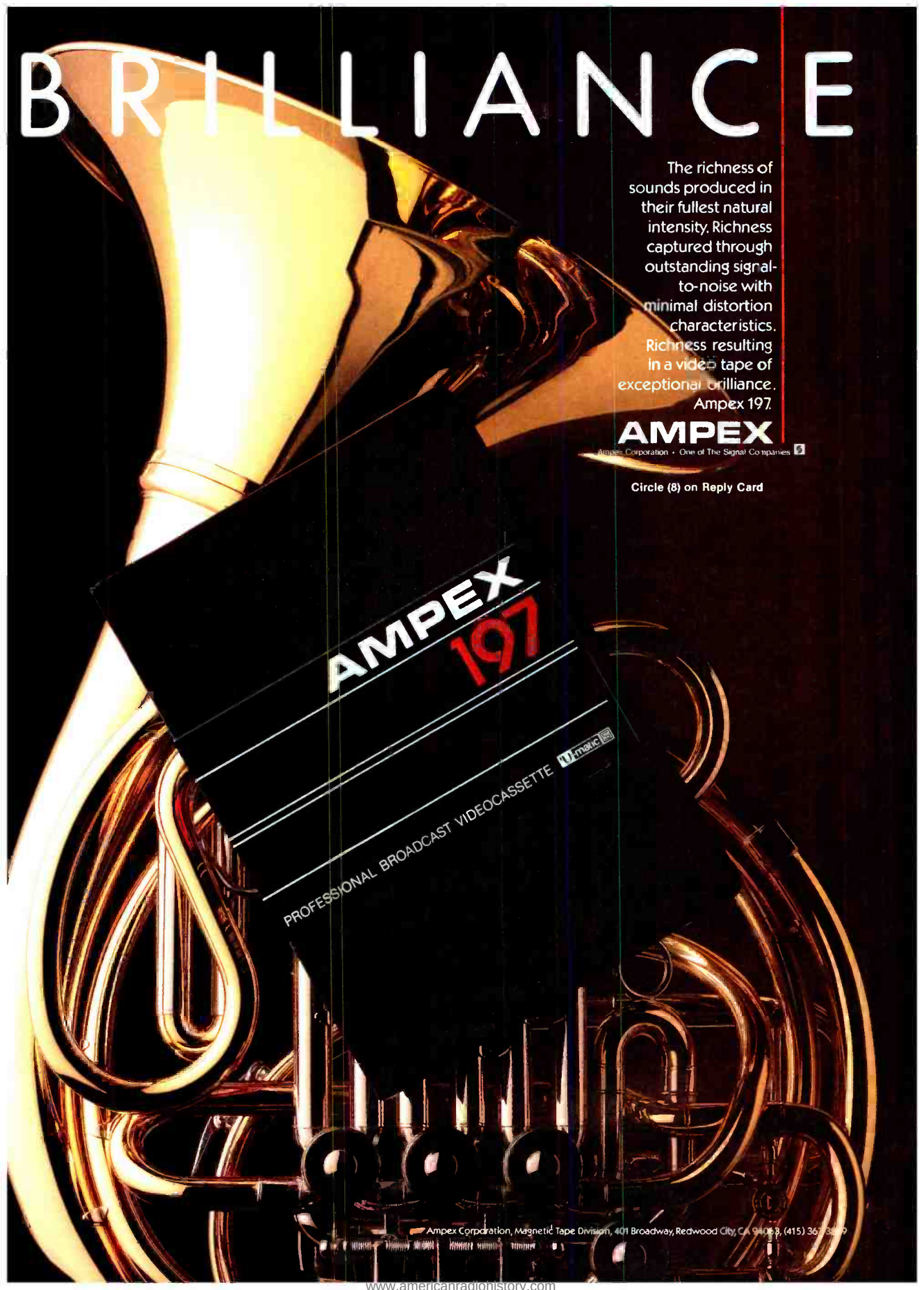

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associations

National Association
of Broadcasters
1771 N Street, NW
Washington, DC 20036
202-293-3570

UHF reassignment proposal for private land mobile use opposed

In comments filed with the FCC, the NAB has opposed a supplemental petition for rulemaking of the Los Angeles County Sheriff's Department to reassign UHF TV Channel 19 for public safety land mobile use and to reallocate Channels 14-20 in the largest urban markets. NAB has requested that the commission not institute a rulemaking on the sheriff's petition and, instead, consider proposals to meet public safety land mobile needs through new technologies and advanced spectrum management techniques.

NAB said that the lifesaving and emergency communications needs of the LA County Sheriffs would not be well-served because of the high potential for interference caused by *lawful* UHF TV transmissions. Furthermore, Channel 19 reassignment could create undue interference to UHF TV reception in the Los Angeles area.

The association said that the future expansion of both full-power and low power UHF television would suffer, as would programming diversity, if reallocation of Channels 14-20 in the largest urban markets became a reality. The proposal that UHF television use reallocated channels on a secondary basis is impractical and inconsistent with the Communications Act, NAB said.

The filing also said that changing the existing UHF TV taboos would serve neither the interests of the LA Sheriff's Office nor the public, and that their proposed elimination in favor of encouraging improved receiver technology should be evaluated realistically in the context of the present UHF marketplace.

FCC asked to correct FM translator abuses

Edward O. Fritts, NAB president, has asked the chairman of the FCC, Mark Fowler, to take action to correct FM translator violations. In a letter to Fowler, Fritts cited a resolution passed by NAB's Radio Board of Directors calling for the FCC to rectify a nationwide pattern of translator abuses.

He said several FM translators are violating commission rules that limit program origination to 30 seconds/hour and the agency's policy that restricts the airing of advertising matter only to those translator licensees that are legitimate community groups. He also said there is concern that several translators are receiving programs via microwave and/or satellite feeds—program sources not allowed under existing regulation.

The NAB president asked that the public, translator licensees and current and potential translator applicants be alerted to the commission's requirements and the penalties for violations.

Reliance on support facilities to be determined by NAB survey

The NAB is conducting a mail survey to determine how broadcasters rely on various telecommunications facilities, such as telephone, microwave and satellite systems, to reach the public. All TV stations and more than 2000

Continued on page 341

A partial 1983 list of broadcast industry leaders who've "captured sound" with Neve:

NBC

CBS

WNEW-TV New York

WCVB Boston

ESPN

Reeves Teletape

KTTV

Radio Quebec

University of Montreal

WKYS-FM

What they've said about Neve:

"Great sound, ease-of-operation, reliability and little or no downtime are just some reasons why we chose Neve."

—*Joe Commare, Director of Remote Engineering, ESPN, Connecticut*

"When our clients walk in and see that we have a Neve, they are very happy."

—*Bob Alexander, VP Engineering, Reeves Teletape, New York City*

Neve

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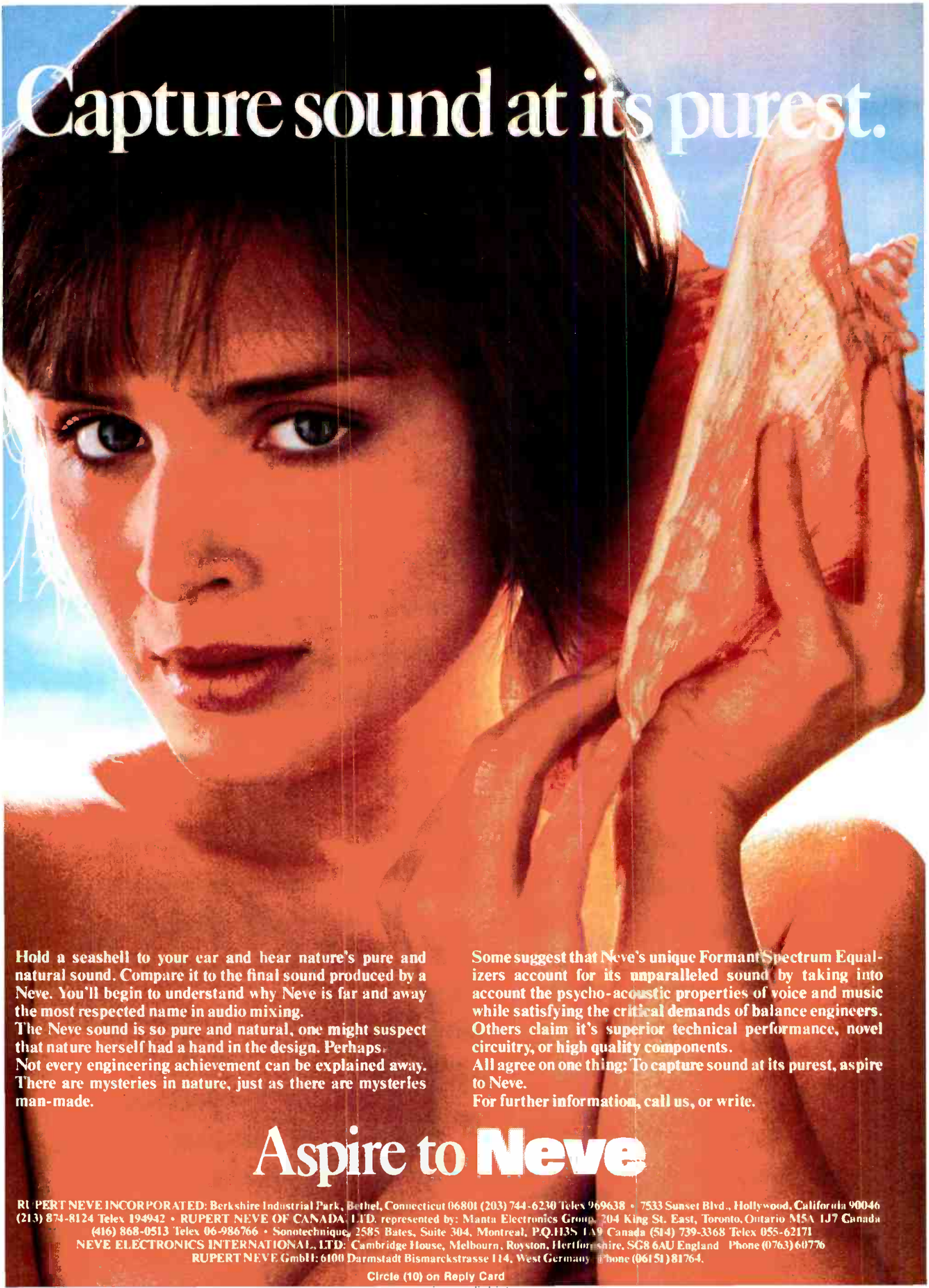

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The Neve sound is so pure and natural, one might suspect that nature herself had a hand in the design. Perhaps.

Not every engineering achievement can be explained away. There are mysteries in nature, just as there are mysteries man-made.

Some suggest that Neve's unique Formant Spectrum Equalizers account for its unparalleled sound by taking into account the psycho-acoustic properties of voice and music while satisfying the critical demands of balance engineers.

Others claim it's superior technical performance, novel circuitry, or high quality components.

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By Jerry Whitaker, radio editor

NAB looks at AM stereo

The status of AM stereo probably will be a hot topic once again at this year's NAB convention. An engineering session devoted to AM stereo has been scheduled for 4:30-6:30 p.m. on Tuesday, May 1. The session will be chaired by Mike Rau of the NAB, and will consist of a panel discussion on the status of AM stereo development and implementation. Panelists will include representatives from the FCC, various receiver and transmitter manufacturers, and attorneys. Proponents of each system will be invited to be present in the audience.

Another engineering topic scheduled for NAB-'84 of interest to AM stations now operating in stereo, or planning to convert to stereo, is scheduled for Saturday, April 28. The paper, titled "Broadbanding Directional Antenna Systems for AM Stereo," will be delivered as part of a radio engineering session set for Saturday afternoon.

Convention to feature equipment/demonstrations

AM stereo equipment manufacturers will be out in force at the convention again this year. Most companies plan to exhibit working systems on the convention floor, and outside demonstrations are planned by some proponents. Motorola, for one, will show its C-QUAM system in operation using 1984 Buick automobiles equipped with Delco AM stereo receivers.

The convention will see some new entries into the AM stereo equipment manufacturing group, including Time and Frequency Technology, Broadcast Electronics and Delta Electronics. Delta recently received type acceptance from the FCC for its C-QUAM (Motorola) exciter and modulation monitor.

New developments are expected at the convention in the AM stereo receiver field, which also should be of interest to stations involved in, or planning to convert to, stereo operation. Several receiver manufacturers have said that they plan to begin offering new AM stereo/FM stereo receivers to consumers in the near future. It is expected that these new entries into the AM stereo receiver market will give a substantial push to the move to get stereo AM radios into the hands of the listening public.

Kahn introduces stereo converter

Kahn Consumer Products has announced agreement with several AM stereo broadcasters to purchase and promote its new AM stereo adapter product that will convert any *Motorola-only* AM stereo car radio to a multimode receiver. The new All Four converter is designed to receive stereo broadcasts from any of the four FCC type-accepted AM stereo systems. Kahn said that the adapter, which will connect to a C-QUAM (Motorola single-mode) automobile receiver in a manner similar to the FM converters of 10-20 years ago, will cost less than $10 each in large quantities

Continued on page 252

Now Your Station Can Try An Eventide H949 Harmonizer®

FREE For 30 Days . . . With No Obligation.

• LIMITED TIME OFFER

For some time, we've been telling you why your station should own an Eventide H949 Harmonizer. Hundreds of stations have gotten the message. But if you're still "on the fence" . . . here's the offer you've been waiting for. Order an H949 Harmonizer from an authorized Eventide dealer by May 31, 1984. Try it for thirty days at your station. If you don't agree that the H949 is the most versatile audio production tool you've ever used . . . just send it back to your dealer and tear up the bill.*

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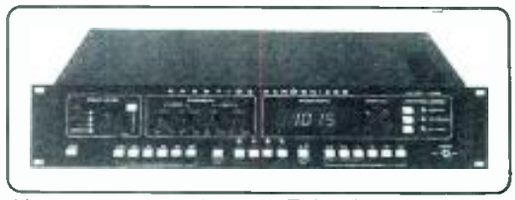
We're sure that once you get your hands on an Eventide Harmonizer, you'll find it irresistible. The H949 is a complete audio special effects department in a single box. Pitch change capabilities create new voices instantly. You can get variable delays, echo and reverb effects. Double tracking and chorus effects are available. For really way out sounds, there's time reversal and infinite repeat. The H949 is a super flanger, too. And the H949 can do more than one effect at a time. Combinations of the various effects, as well as variable mixes and recirculation of output/input let you create an infinite number of new vocal, musical and sound effects.



• IT'S A TIME COMPRESSION SYSTEM, TOO

Best of all, the H949 is a complete audio time compression system. You get the audio time compression and expansion capabilities of competitive single-purpose units costing well over twice as much. You can even control a VTR, by adding our economical PTC960 control module.

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This thirty day no obligation free trial offer must end on May 31, 1984. So, if you've been reading our ads, and thinking about getting an Eventide H949 for your station, now's the time to act. Contact your Eventide dealer, or call Eventide for more information.

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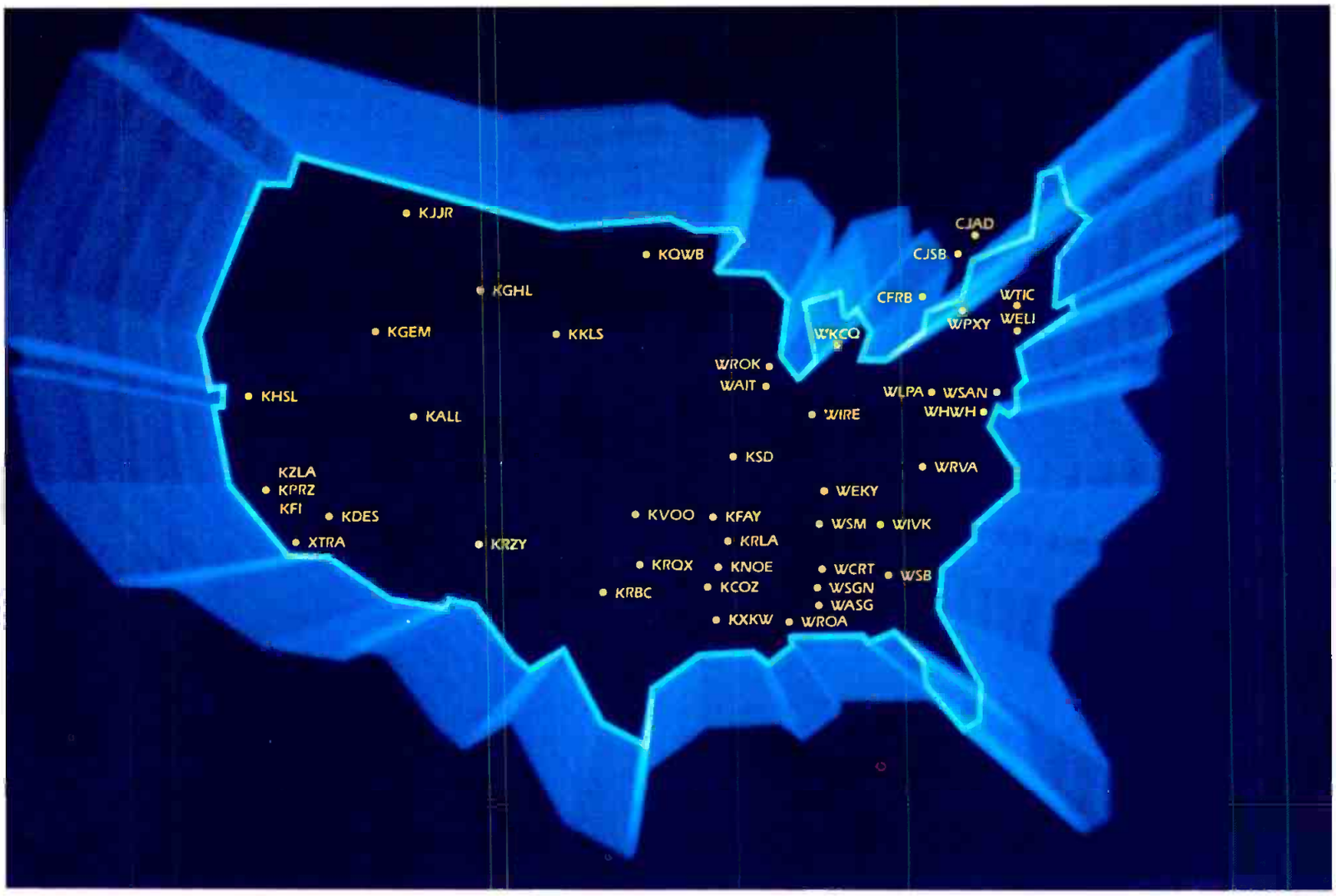

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It all started in 1982 with the Delco test at WIRE in Indianapolis. CRL was asked to provide an AM Stereo processor. After months of research and testing and working with our customers on prototype models, CRL AUDIO is now shipping the SMP 900 AM Stereo Matrix Processor. The first production unit was installed at KFI in Los Angeles in September. The results were outstanding. Not only is the stereo sound exceptional, but the MONO signal has never been better. Other customers, like WSM in Nashville (Home of the Grand Ole Opry), KSD in St. Louis, WSB in Atlanta, CFRB in Canada selected the CRL system . . . along with many others.

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Satellite update

By John Kinik, satellite correspondent

TV transmission techniques

TV transmission techniques for domestic satellite systems have remained similar over the past few years, because there has been no need to change. The basic FM transmission mode adopted for the Canadian Broadcasting Corporation (CBC) network via the Anik 1 satellite in 1973 was not optimal in terms of delivering the maximum possible performance, but it was adequate. The major growth that has occurred in cable television over the past eight years also has been based on the same transmission parameters, which were derived from practices used for terrestrial microwave links. The basic parameters that have been the satellite industry standard are as follows:

- video baseband: 4.2MHz;
- audio channels: subcarriers centered on 6.8MHz;
- maximum RF deviation: one-half of the available bandwidth less 4.2MHz (for example, 13.8MHz for 36MHz transponder);
- RF deviation by audio subcarrier: 2MHz;
- RF deviation by energy dispersal*: 0.8MHz; and
- RF deviation by video baseband: 13.8MHz - 2.8MHz = 11MHz

These transmission parameters are extremely conservative regarding RF bandwidth occupancy because the model assumes a direct addition of all contributors to RF carrier deviation. Thus, the RF carrier deviation due to the video baseband has been limited by this assumption, which in turn limits the video signal-to-noise (S/N) ratio performance. A more realistic model would consider the video and audio contributors to RF deviation to be non-coherent, allowing a greater video deviation (higher video level) and an overall link improvement of approximately 2dB in S/N. In fact, this has been demonstrated, in effect, over the years as signal originators have found that a larger number of audio subcarriers could be added to the composite video baseband without the degree of excess RF deviation that would be expected from the conservative transmission model. Even though this is true, the standard FM transmission method ultimately is limited by three factors:

- Audio subcarriers use up bandwidth, decrease video carrier-to-noise (C/N) and S/N, and are subject to color subcarrier interference problems.
- Video synchronizing signal is a waste of transmission capacity.
- The signals are susceptible to unauthorized reception.

Two major economic requirements in today's satellite broadcasting marketplace are changing the situation. One requirement is to protect pay TV signals from unauthorized reception by digital scrambling, and the other is to optimize transmission parameters to provide DBS-type services. Home Box Office (HBO) has announced plans to scramble its signals, and hardware to achieve this scrambling recently has been demonstrated. The technique used encodes the video and audio information digitally and also eliminates the need for transmitting the video synchronizing signal. Besides providing signal security, the technique promises to help C-Band and medium power Ku-Band satellite systems squeeze the maximum performance from their downlinks for the new DBS market.

A combination of optimized transmission parameters and digital signal processing at the receiver (to filter out C/N threshold effects) could provide an opportunity for C-Band DBS systems with antennas in the 4- to 6-foot diameter range, and could provide additional rain fade margin for medium power Ku-Band DBS systems. One such Ku-Band system already is in operation in the eastern United States (United Satellite Communications) and HBO also is considering DBS delivery via C-Band satellites similar to Galaxy or medium power Ku-Band satellites.

FM transmission will remain an attractive technique for delivery systems in which signal protection and/or downlink optimization are not critical. This will be true for the majority of satellite TV signals in which the inherent cost-effectiveness of FM and the need to adhere to standard receiver technology are more important. In those cases, optimized video deviation may be used to maximize video S/N performance and to minimize interference from adjacent satellites, which will become a more significant problem as C-Band satellites are spaced 2° apart. One type of application in which optimized FM transmission will be used is broadcast-type video conferencing.

Recently, a number of companies have used 1-way TV transmissions (with voice return hookups) to conduct meetings with geographically scattered branch offices, instead of bringing representatives to the head office or a central location. A significant cost saving can be realized, and the 1-way mode is effective for such applications, particularly if no need exists to protect the programming from competitors. In fact, the technique is so popular that one major hotel chain is planning to provide such meeting services as part of its regular package to attract more business customers. Because large projection screens are used, optimization of video S/N is mandatory; the low definition 525-line NTSC video signal needs all the help it can get.

Various enhanced video transmission techniques are being developed to improve image definition on large screens and, in some cases, this will involve greater bandwidth requirements. New medium power Ku-Band satellites will offer transponder bandwidths ranging from 43-72MHz, and new hybrid satellites (C-Band and Ku-Band) will provide some 72MHz C-Band transponders. This also will create opportunities to configure net-

Continued on page 252

*Applied to RF signal to minimize interference into 4GHz terrestrial microwave.

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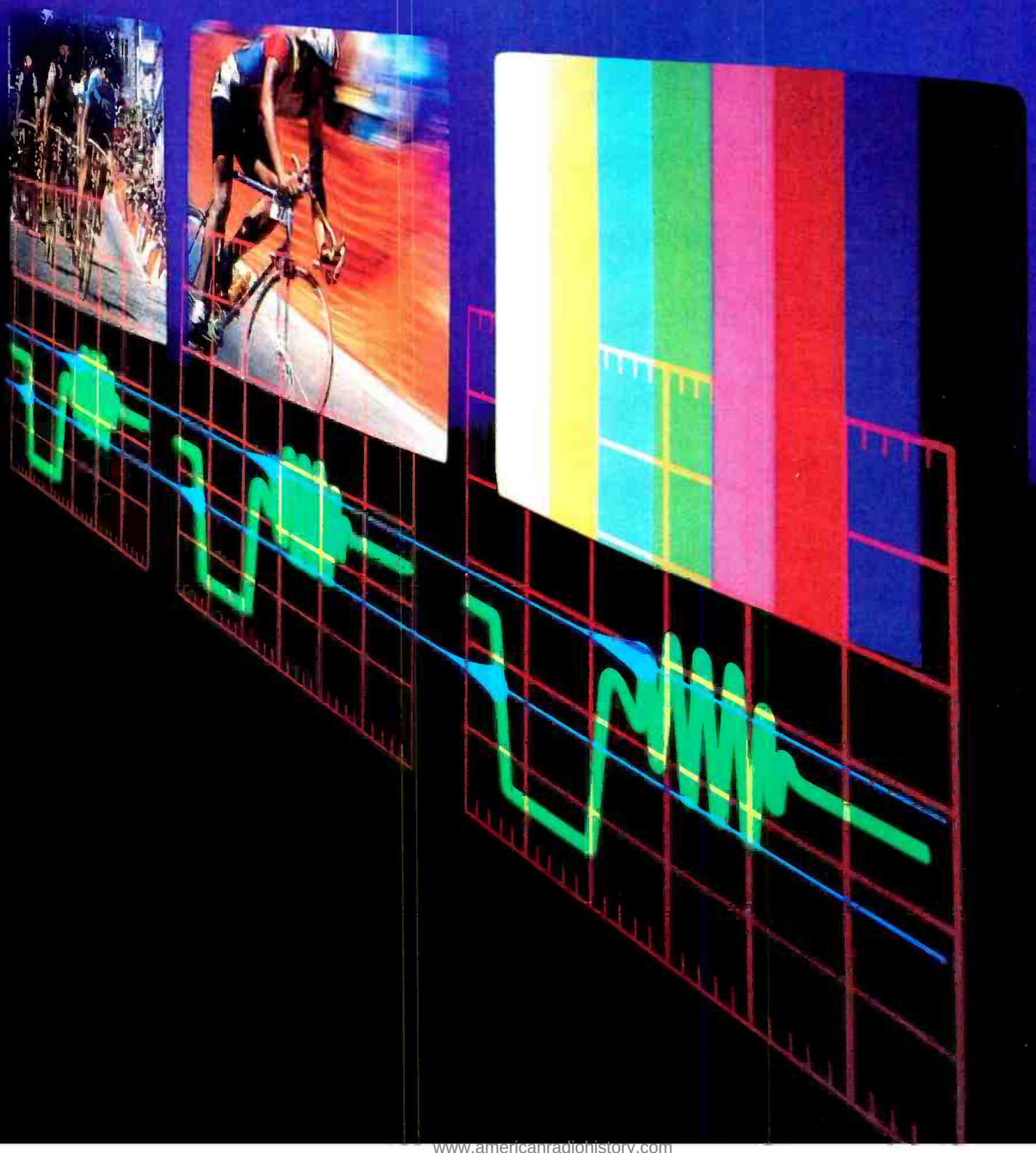

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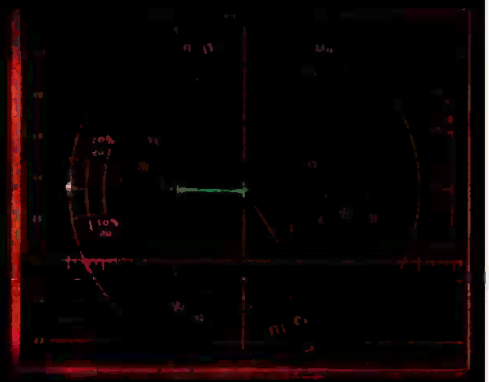
TEK TELEVISION PRODUCTS

SEE IT, SYNC IT, SAVE IT, TEST IT...GET A CLEARER

1740 Waveform/ Vector Monitor (Right) Tek's new waveform/vector monitor saves space, power consumption and cost. Both dc power and battery pack options are available. It's ideal for mobile vans and field applications.

118-AS Audio Synchronizer (Above) No more lip sync problems! Tek's new 118-AS provides a practical solution to the audio-to-video delay caused by four-field memory video synchronizers. The 118-AS features wide dynamic range, low distortion and automatic and manual delay correction.

1980 Automatic Video Measurement Set (Top center) Tek's Answer System permits continuous, unattended monitoring of all your incoming and outgoing video feeds. It generates complete reports automatically, alerts you when measurements exceed specified limits, and can be programmed to meet your changing needs.



Tek's newest product for television:—new measurement capabilities detailed on the following page. Take a look!

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BEHIND THE SCENES IN
QUALITY TELEVISION

PICTURE OF YOUR SIGNAL WITH TEKTRONIX!

2445 Portable Oscilloscope TV System (Left) Tek's state-of-the-art 150 MHz, 4-channel portable scope now offers a TV option with backporch clamp, display and readout of any line or field. Also available: a fully-programmable GPIB option.

494/494P Spectrum Analyzer (Above) An unprecedented value! Counter frequency accuracy, baseband through microwave coverage and unique HELP mode to guide less experienced users. Store up to nine displays and ten set-ups in non-volatile memory. Portable and rugged, the 494 is backed by a three-year warranty!

Behind the sets, the programming, the glamor of television, success still depends on signal quality.

No one gives you better tools for measuring and maintaining video signal quality—quickly, consistently, confidently—than Tektronix.

For more than 30 years, Tektronix technology has stayed a step ahead to help you solve problems in color television: Whether you're broadcasting live feeds from a bike race in northern California…or sending signals via satellite to thousands of television stations around the world—our products are helping you get a clearer picture of the video signal.

Tek instruments give you broad test and measurement capabilities. They are accurate, easy to operate, and compatible with other broadcast equipment. Above all, Tektronix television products continue to meet the broadcast industry's needs. Take it from us: no one watches television closer than Tektronix.

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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.

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.

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

If you see the advantages of comprehensive signal monitoring, you'll like what you see in the 1750.

For more information on this or other Tek television products, or for the number of your nearest Tek sales office, call our toll-free information service today: (800) 547-1512. In Oregon, (800) 452-1877.

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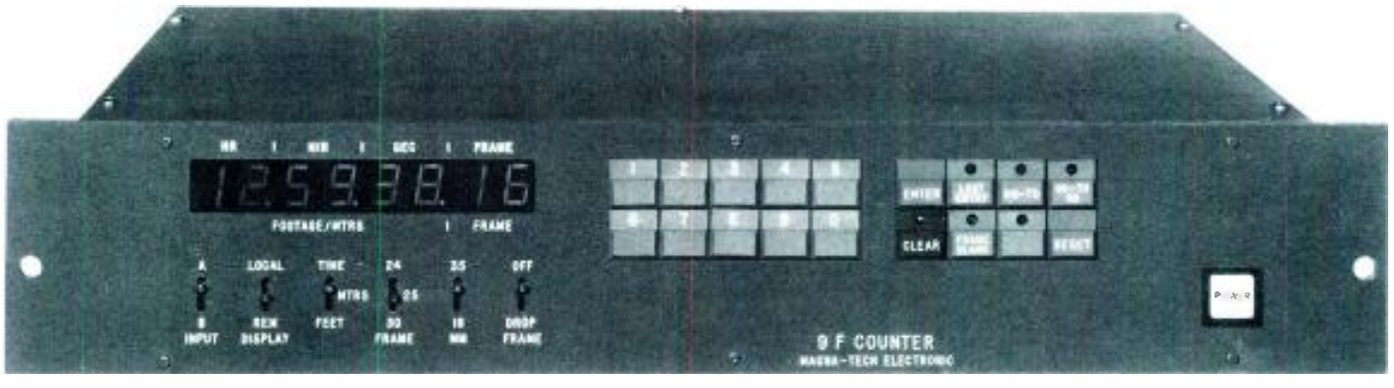

Frame rates of 24, 25 and 30 frames are selectable from the front panel with the 30 frame dropframe and non-dropframe selectable.

Counter automatically converts from footage/frames to meters to Hours/Minutes/Seconds/Frames.

Input either 2-phase TTL level with 90 degree phase shift or TTL level pulses and FWD/REV signal.

Tach pulse generated serial time code in SMPTE/EBU format.

Selectable frame rate 24, 25, 30 frames with drop-frame selection for NTSC.

Time code input for jam preset or time code readings.

Output of counter is 32 bit BCD or BCD.

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NAB-'84/Las Vegas

By the BE staff

Broadcasters are getting ready to flood Las Vegas for the industry's most prestigious convention: NAB-'84/Las Vegas, the 62nd Annual Convention and International Exposition. Exhibitors from around the world are feverishly working on booth displays and special surprises to make this year's show better than ever, with many companies taking additional booth space because the convention center has more space available.

This year's theme for the convention is "You've Got What It Takes," a theme to encourage broadcasters to use their persuasive power to get voters to turn out this election year.

In our opening article, "Engineering Conference of NAB-'84/Las Vegas: Bigger Than Ever," the NAB staff lays out the welcome mat and provides a glimpse of some of the planned activities. This is followed up with **BE**'s comprehensive exhibit coverage for NAB-'84.

Our coverage includes:

- a profile of one of last year's exceptional exhibitors;
- a complete listing of exhibitors, alphabetically, with *established* and *new products* listed by model number and name and description;
- a comprehensive product directory that lists product categories and exhibitors showing those products; and
- late exhibitor data received just before press time.

Details of the NAB-'84/Las Vegas show are still being released as **BE** goes to press. An updated map and exhibitor data will be distributed at the show to help you further. The final program will be available upon registration, but our pre-NAB coverage provides a broad outline of what is being planned for you at this year's exciting convention.

Our NAB pre-show coverage...

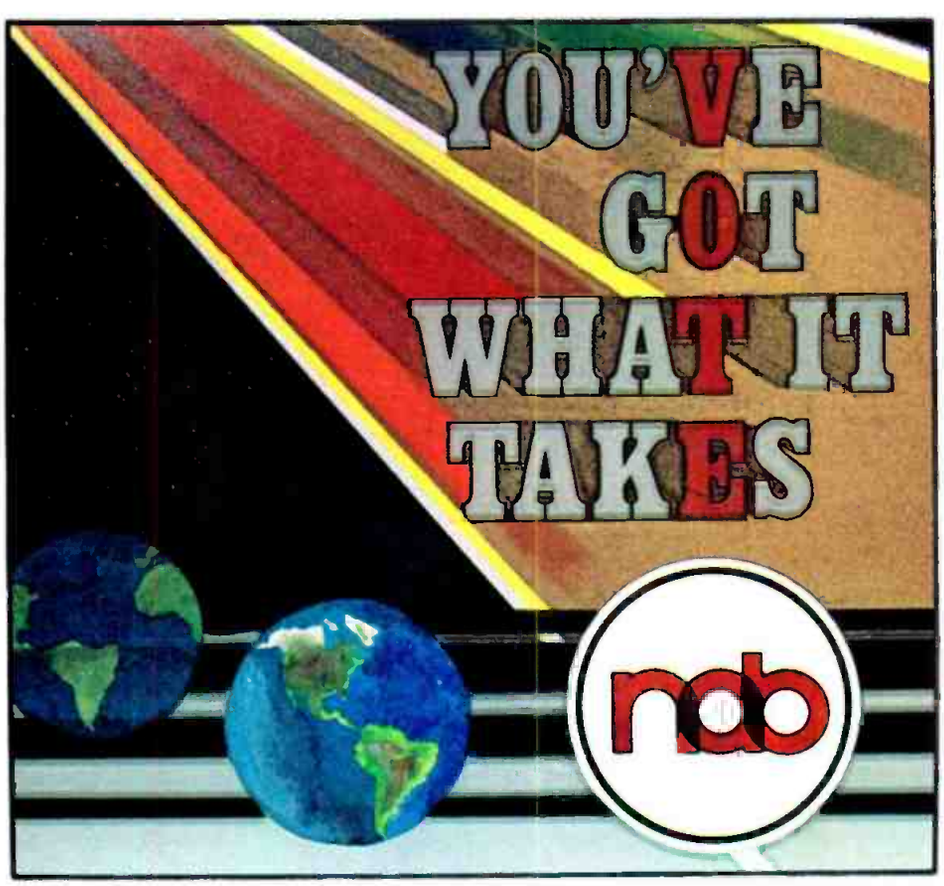
Engineering Conference of NAB-'84/Las Vegas: Bigger than ever 26
By Ed Williams, staff engineer, NAB, Washington, DC

NAB exhibit profile: Sony Broadcast 42

Exhibit roundup 46

Convention exhibitor guide 200

Product directory 218



- April 29-May 2
- The Convention Center Las Vegas, NV
- Most comprehensive exhibit for broadcast equipment
- More than 300,000 square feet of exhibit space
- Distinguished Service Award to Elton H. Rule, ABC
- Engineering Award to Otis Freeman, Tribune Broadcasting
- Major addresses by James McKinney and Mark Fowler, FCC
- Entertainment by Paul Anka

Exhibit hours:

- 9 a.m.-6 p.m. Sunday, Monday and Tuesday
- 9 a.m.-2 p.m. Wednesday

A special feature again this year: "free" time for managers and engineers to visit exhibits without missing technical sessions

- Radio: Monday afternoon
- TV: Tuesday afternoon

Registration hours:

- 9 a.m.-5 p.m. Saturday
- 8 a.m.-5 p.m. Sunday, Monday
- 9 a.m.-5 p.m. Tuesday
- 9 a.m.-noon Wednesday

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"Panasonic Recam™ made our

On Saturday mornings, children all over America are being entertained by a unique new CBS-TV series, "Benji, Zax and the Alien Prince." What makes this show unique is more than a lovable dog. It's the fact that this Mulberry Square Productions project is the first network series entirely shot and edited on ½-inch tape. And the system they selected was Panasonic Recam.

One of the reasons Joe Camp selected Recam is its incredible YIQ M-Format picture quality. Another reason is its portability. It makes changing scenes and locations fast and easy. And that's important on a tight production schedule.

What's more, this "Benji" production utilizes Recam's remarkable ½-inch off-line editing system, after which, each show is transferred to 1-inch for television broadcast.

Recam was also selected by ABC

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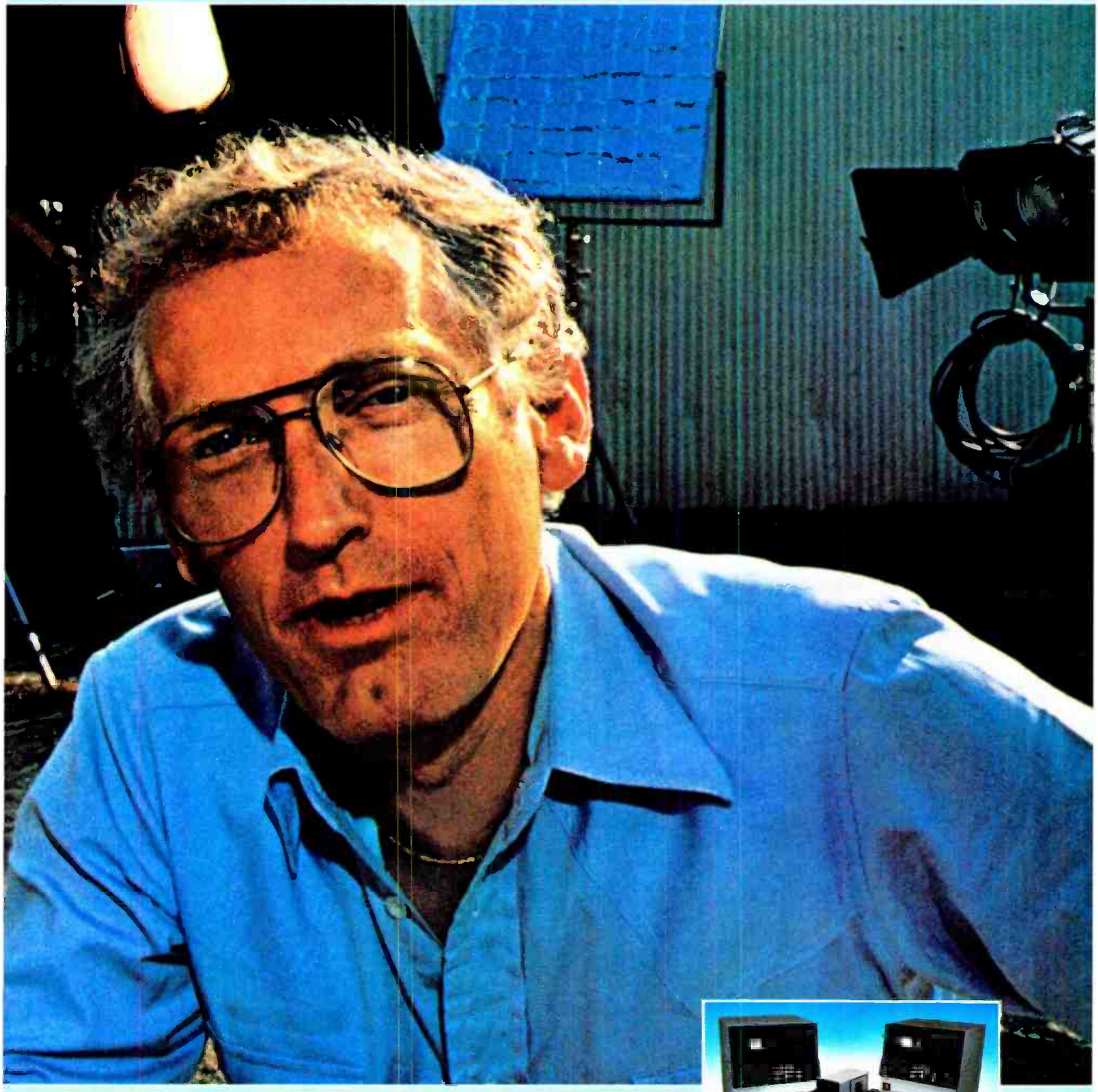
new Benji TV series possible."

Joe Camp, *Creator of Benji.*



Sports to record their momentous ascent of Mt. Everest for "The American Sportsman." And by the producers of the epic science-fiction film "Dune" to record "The Making of Dune" for TV broadcast in 1984.

You can see "Benji, Zax and the Alien Prince" on Saturday mornings.

But you can see Recam right now. Just call your nearest Panasonic regional office:
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Midwest: (312) 981-4826
Southeast: (404) 925-6835
Southwest: (214) 258-6400
West: (714) 895-7200

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Engineering Conference of NAB-'84/Las Vegas:

Bigger than ever

By Ed Williams, staff engineer, National Association of Broadcasters, Washington, DC

This year's NAB Engineering Conference begins on Saturday, April 28, with a full day of radio and TV production and engineering sessions. That's right—Saturday (the day before the main event begins). This is the perfect time for a distraction-free day of technical presentations and demonstrations. Plan to arrive Friday night, April 27 (a time, by the way, preferred by the hotels and airlines). Convention registration begins at 9 a.m. Saturday. Engineering sessions start at 11 a.m. and continue until 5 p.m., with a break for lunch.

Many station technicians and broadcast engineers have commented that the 1½ days allocated for technical sessions during past NAB conferences have not been adequate to cover the expanding range of technical expertise demanded of station engineers. The new Saturday sessions add one more full day to the conference at a time convenient to most registrants. This addition to the convention should be relatively easy to arrange with hotels and airlines, and should be economical compared to the cost of the entire convention. Added without cost to your schedule are engineering workshops beginning at 7:30 p.m. on Tuesday.

The Saturday program features two concurrent sessions. For radio, there will be a production engineering session followed hy radio engineering presentations. For television, the morning session will be devoted to implementing multichannel sound for television, followed by production engineering topics in the afternoon.

TV multichannel sound will be a hot topic at the convention this year, as evidenced by the displays of stereo sound TV receivers at the spring Consumer Electronics Show, the expression of interest by program producers and the FCC's publicly announced interest in avoiding an AM stereo situation. Also the Broadcast TV Systems Committee (BTSC) of the EIA has voted unanimously to recommend the adoption of a single transmission and noise reduction system as a broadcast standard. The Saturday session will present a series of papers and demonstrations on techniques for producing stereo and the conversion of TV plants and transmitters to the BTSC multichannel system. The Monday session, "Multichannel TV Sound—The System," will present papers on the new equipment and how it was developed and tested.

The Saturday session on radio production engineering will feature presentations on the difficult problems faced by radio stations in producing digital, stereo, talk and sports programming on a local level. Following this session will be a series of papers on important radio engineering topics, including multistation FM antenna sites, AM grounding systems and transient overvoltage protection.

After the Saturday engineering sessions, a good dinner (and maybe a show), Sunday morning can be devoted to the exhibits, followed by the formal opening of NAB's 62nd Annual Convention and International Exposition at 2:30 p.m.

Monday's sessions

Monday morning features the AM/FM allocations session with reports on a new omnibus FM docket affecting nearly all FM stations, and a wrap-up of changes in the AM band as a result of recent agreements between the United States, Canada and Mex-

Planned Engineering Conference sessions/events

Saturday, April 28:
- *Radio Production Engineering*
- *Radio Engineering*
- *Implementing TV Multichannel Sound*
- *TV Production Engineering*

Monday, April 30:
- *Radio Allocations*
- *Radio Subcarriers*
- *Television—New Technology*
- *TV Satellite Systems*
- *Multichannel TV Sound—The System*
- *Broadcast Auxiliary (special)*
- *Non-ionization Radiation (special)*
- *UHF Efficiency (special)*
- Ham Radio Operators Reception (evening)

Tuesday, April 21:
- *Radio—New Technology*
- *Radio Satellites and Digital Systems*
- *AM Stereo*
- *Advanced TV Systems*
- *Broadcast Interference (special)*
- Engineering Luncheon—Engineering Achievement Award
- Engineering Workshops (evening)

Wednesday, May 1:
- *Spectrum Management (special)*
- Tour of FCC Monitoring Van (all day)

Editor's note:
Session titles appear in italic type.

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HOW TO RELIEVE TENSION IN THE CONTROL ROOM.

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To more precisely control tape tension, and yours, our rugged transport is built with a full computer control on all three motors. Our autolocator function with Return-to-zero and Search-to-cue doesn't just start putting on the brakes when it hits the mark, it stops on the dime.

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To learn more about the hottest half-track in the under $2,500 class see your TASCAM dealer or write TASCAM Production Products, 7733 Telegraph Road, Montebello, CA 90640, (213) 726-0303.

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ico. This will be followed by a session titled, "Radio Subcarriers," with presentations on the possible paging, data and load management uses of subcarriers. FM transmitter performance requirements also will be discussed.

The Monday morning TV sessions are devoted to new technology, satellite systems and UHF transmitter efficiency.

The session, "Television—New Technology," features reports on the development of a new video cart machine, the state-of-the-art in video recording, solid-state imaging devices and other topics of general interest to TV personnel.

Substantial new developments in satellite technology will be reported in the TV satellite systems session, along with new information on 2° spacing, interference suppression, the torus antenna and Ku-Band network distribution.

A full special session on UHF efficiency will feature reports on the multiple-depressed-collector and other improved-efficiency klystrons and transmitters. Advanced UHF receiver design also will be examined.

Monday afternoon is free for radio engineers to tour the exhibits with their managers to inspect the latest in broadcast technology, consult equipment manufacturers, purchase hardware (and software) and renew acquaintances with old friends. Be sure to plan your tours to the exhibit area carefully, using maps and lists to avoid wasting time in finding the booths you plan to visit. Because virtually everything a station needs is shown in the exhibit halls, the convention provides the perfect opportunity to implement technical plans by purchasing or examining facilities slated for later purchase.

The Monday afternoon TV session is devoted to a detailed description of the EIA/BTSC-approved (and possibly approved by the FCC as well by the convention) multichannel TV sound system. This session, with the one Saturday on implementing the BTSC system, will give TV broadcast engineers the complete story on the new stereo transmission method.

Monday afternoon's two special sessions focus on non-ionization radiation and broadcast auxiliary systems. Although the EPA will not be releasing its proposed guidelines for radiation limits until sometime during the summer, the session on radiation limits is important to stations that want to be up-to-date on sources of reliable and accurate information on the topic.

Broadcast auxiliary systems are the life line for stations using STL links, RPU, ENG and other important auxiliary services. The session on these systems will feature reports on the state of the broadcast auxiliary bands, new frequency assignments and methods for improving auxiliary band spectrum efficiency.

Engineering Award to Freeman

Otis S. Freeman, director of engineering, Tribune Broadcasting Company, and senior vice president, engineering, WPIX, New York, will receive the 1984 Engineering Achievement Award. The award will be presented at the Engineering Conference Luncheon on May 1.

Freeman is credited with leading the move to erect the transmitting tower on top of the World Trade Center to improve reception in New York. Also, he developed the gen-lock, which allows TV stations to incorporate signals from a remote location.

After World War II, Freeman worked at the Dumont Laboratories on experimental TV station W2XWV (now WNEW-TV) and, as assistant chief engineer, helped design and build WPIX. He became chief engineer in 1953 and has served on the station's board of directors since 1965. Before being named to his present position, he was WPIX's engineering vice president.

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

He received his electrical engineering degree from New York University.

But that's not all for Monday, because at 6:30 p.m., the NAB-sponsored Sixth Annual Ham Radio Operators Reception gets under way with refreshments, door prizes and special guests. More than 600 persons attended this event last year.

Tuesday's sessions

On Tuesday morning, sessions are scheduled titled, "Radio New Technology" and "Advanced TV Systems." Radio engineers will find particularly interesting the presentations on AM improvement methods, optimization of directional patterns, enhanced FM stereo coverage, amplitude-compandored sideband transmission (ACSB), and use of microprocessors in transmitters to improve performance.

TV engineers will be treated to a full session on domestic and foreign advanced TV system developments. These are important presentations that foretell the ways in which television will evolve over the next decade.

After the Tuesday morning radio and TV technical sessions comes the engineering luncheon, during which the NAB Engineering Achievement Award will be presented to Otis S. Freeman, director of engineering, Tribune Broadcasting Company, and senior vice president, engineering, WPIX, New York. The featured speaker for this gathering will be James McKinney, chief of the FCC's Mass Media Bureau.

On Tuesday afternoon, TV engineers will be given time off to attend the exhibits with their managers and examine the latest equipment developments.

In the meantime, radio engineers can attend the session on satellite and digital technology, which is followed by a roundtable discussion on AM stereo. Although most radio stations have a satellite receiver, station engineers will appreciate presentations on network distribution via digital satellite systems, and basic satellite technology.

The state of AM stereo remains uncertain, with stations and receiver manufacturers cautiously approaching the engineering aspects until more is known about multisystem receivers or trends toward a single system. This problem is further complicated by the concern of AM stations that subcarriers for data or load management may be incompatible with AM stereo, and skywave interference from other stereo AM stations using different systems may cause receiver malfunctions. The session will address these and other issues in a lively roundtable discussion with, among others, the FCC, equipment manufacturers, lawyers and NAB staff members.

Interference to broadcast reception is the topic of a special Tuesday afternoon session that will feature reports on major interference problems faced by broadcasters. This is a growing

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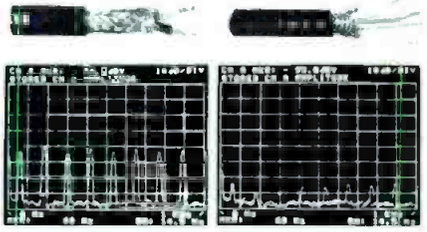

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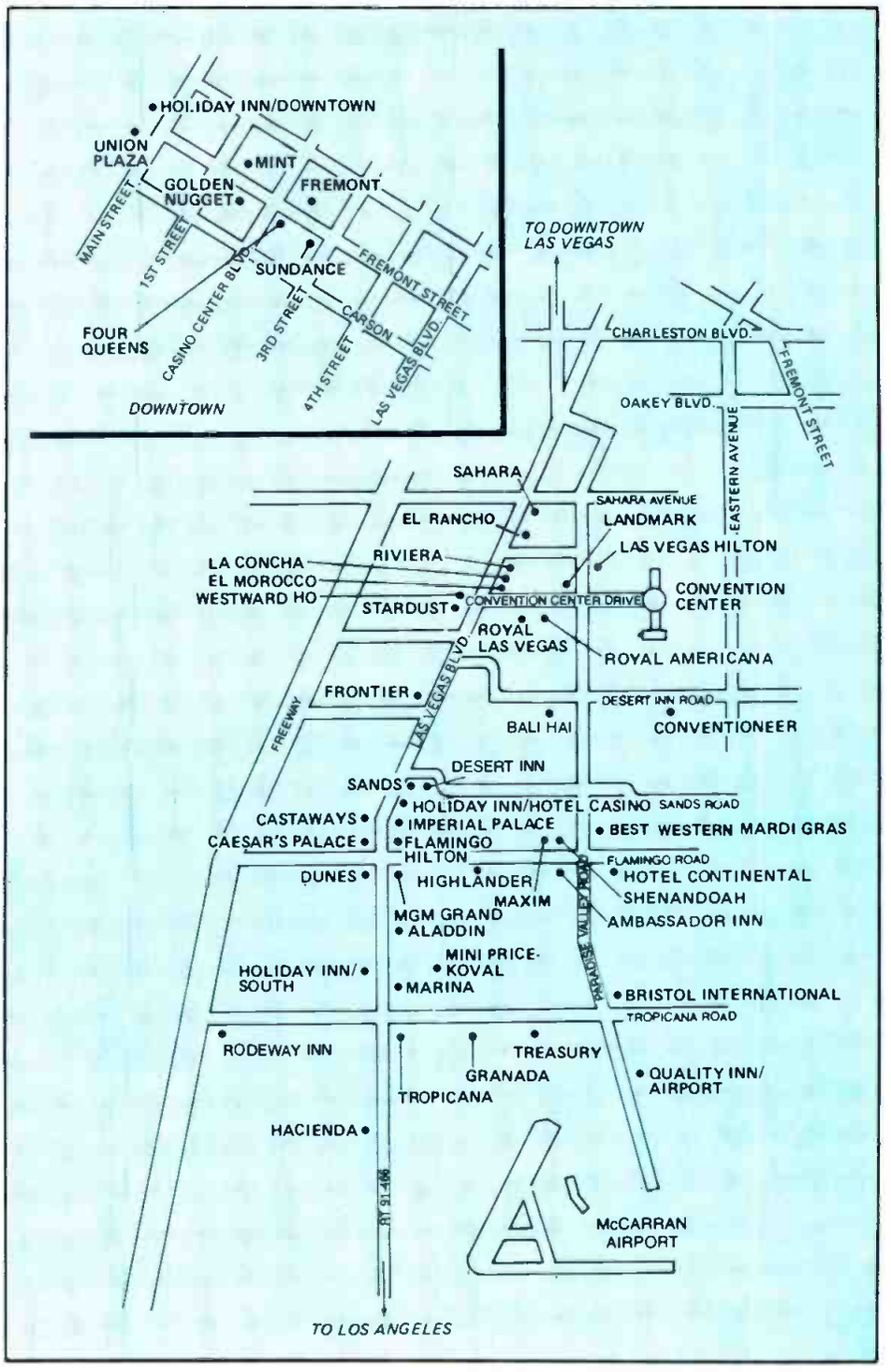

problem, and radio and TV engineers should keep abreast of the subject.

Activities on Tuesday will conclude with an evening series of workshops with experts on various subjects. The idea is to permit station engineers and technicians to work directly with the experts and personnel from other stations to solve problems and discuss certain issues. The workshops begin at 7:30 p.m. Be sure to check them out before making other evening plans.

Wednesday's activities

Wednesday morning brings the session on spectrum management for engineers, just before the FCC commissioners' forum. This year the main topic of the forum will be technical deregulation, current FCC technical rule enforcement policy and a description of the capabilities of the FCC monitoring van. There also will be a panel of FCC engineers on hand to answer questions from the audience. Sometime during the conference, the FCC monitoring van will be open for inspection and staff members will be available to explain its operation.

So that is it for the 1984 NAB Engineering Conference. No engineer should miss this convention.

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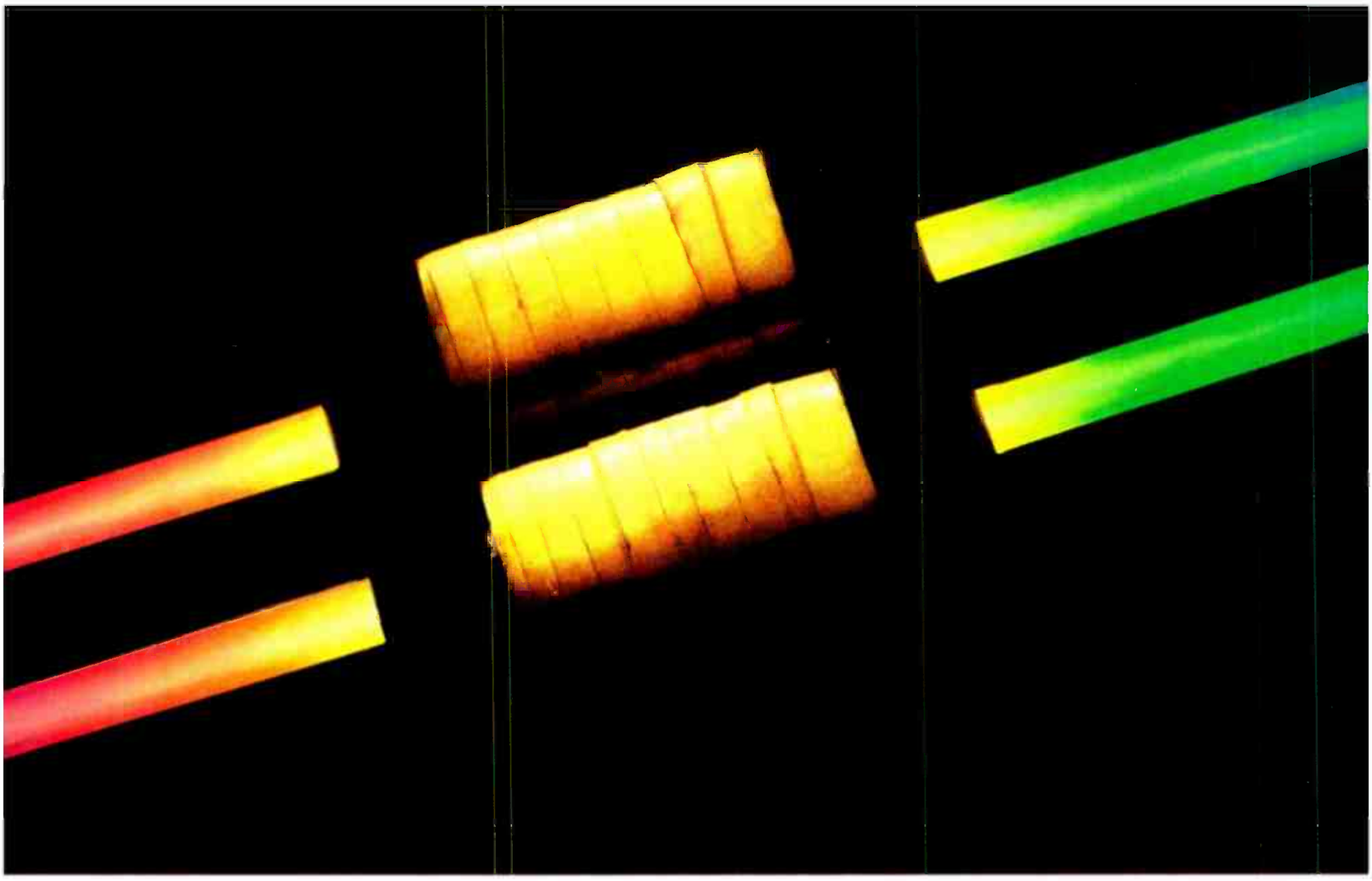

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OUR SCIENTISTS HAD TO OPERATE IN A VACUUM TO GIVE YOU A NEW QUALITY OF SOUND.

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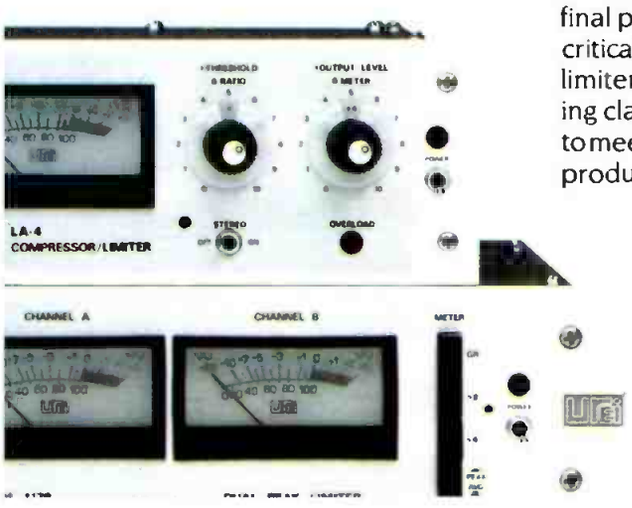
A vacuum tank, to be precise. An environment in which our transformer is created with an air expulsion process. Where air pockets are purged from multi-layers of the transformer's high grade core laminations, and the core made airtight with a special impregnating sealant.

This process gives us impeccable control of transformer function and quality. Which gives you the assurance of the most efficient transfer of power possible, and an end to the acoustical "buzz" that so often fights sound purity.

To a lot of manufacturers the lowly transformer is far down on the list of priorities. For us, every element in the sound system relies on the exacting performance of every other element, and must be painstakingly attended to.

Whether you're driving your studio monitors in a demanding final production mix with our 6000 Series amplifiers, or making critical adjustments to signal quality with our peak or RMS limiter/compressors, you'll find our audio science giving outstanding clarity to your work. To find out which system is designed to meet your needs, contact your authorized JBL/UREI professional products dealer today.



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Automatic, continuous, reliable broadcasting. Introducing the Panasonic® MVP-100.

Now broadcast automation takes a giant leap forward with the introduction of the MVP-100. To start with, it incorporates the YIQ ½-inch M-Format. And that means picture quality that not only surpasses ¾-inch and 2-inch, but actually rivals 1-inch tape. All with the reliability and economy of ½-inch, M-Format recording.

But the Panasonic MVP-100 will do more than make your programming look better; it will also make broadcasting easy. The reasons: its automatically threaded, computer-controlled tape transport systems. The MVP-100 lets you schedule in advance and automatically air program length material, news spots, editorials, commercials, station IDs and promos. All with time-code accuracy. It all adds up to totally reliable automation of your station's broadcast day. The MVP-100's spot player and recorder will even make those unfortunate moments of "dead air" disappear since protection copies are easily dubbed and are programmed to take over the moment broadcast continuity has been interrupted.

Still, with all the MVP-100 has to offer, you can put it to work at a surprisingly affordable price. Audition the Panasonic MVP-100. Once you do, don't be surprised if you end up carting your present video cart machine away.

For more information on what the MVP-100 can do for your station, call the Panasonic New Technology Products Group at (201) 348-7471.

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Toshihiko Yamashita
President
Matsushita Electrical Industrial Company Ltd.

"From a modest beginning in 1918, with an investment of $50 in an electrical socket, the Matsushita Electrical Industrial Company Ltd., has grown into a giant, worldwide organization. We now have more than 125,000 employees in 35 countries worldwide and manufacture more than 14,000 different kinds of products. In all, we have 46 manufacturing companies spread throughout the world, backed up by 34 sales companies. The result was a gross business last year that exceeded $16 billion. This ranks us among the major companies of the world.

"Currently, nearly 67% of our sales are derived from consumer products. But, within the next decade, I expect that percentage to drop to about 50%, as we place greater emphasis on the professional and business markets – areas that include semiconductors, robotics, personal computers, word processors, copiers and office automation equipment. We'll continue our dominance in the consumer products that have made us famous, of course, but we'll use our unique manufacturing and R&D capabilities to penetrate key new growth markets."

With a bold new change in organization and a dedicated focus on broadcast video, Panasonic Industrial Company suddenly has emerged as a major contender in the broadcast marketplace.

Recently, under a new management structure, complete with strengthened marketing and field engineering/service forces, Panasonic's image in the broadcast video market has undergone a rapid metamorphosis. This new Panasonic marketing approach is matched with products that meet today's professional market needs, with a substantial investment in R&D to create new products as the market evolves. Thus, Panasonic Industrial Company became a major force to be reckoned with, a supplier of M Format component video equipment that meets today's market needs as well as the future's.

In the eyes of many teleproduction and broadcast professionals, this moment at Panasonic has been a long time coming. Now that it has arrived, the market is quickly responding to the realignment of priorities at Panasonic Industrial Company.

Background and growth

The parent company behind the Panasonic operations is the prestigious Matsushita Electric Industrial Company Ltd. (MEI) of Osaka, Japan.

MEI now produces more than 14,000 different kinds of products; employs more than 125,000 people worldwide; and has 46 manufacturing plants and 34 sales companies.

The sales from this giant, complex operation amount to more than $16 billion annually, of which about 66% of the products are for consumer markets with products bearing the names of Panasonic, Quasar, Technics and National. With worldwide sales steadily growing, MEI's net income for 1983 exceeded $774 million, up more than 16% from 1982.

Because it operates on a global basis, MEI has had to develop strengths to compete in the worldwide economic environment. This has meant local and international attention to R&D.

R&D: The lifeblood

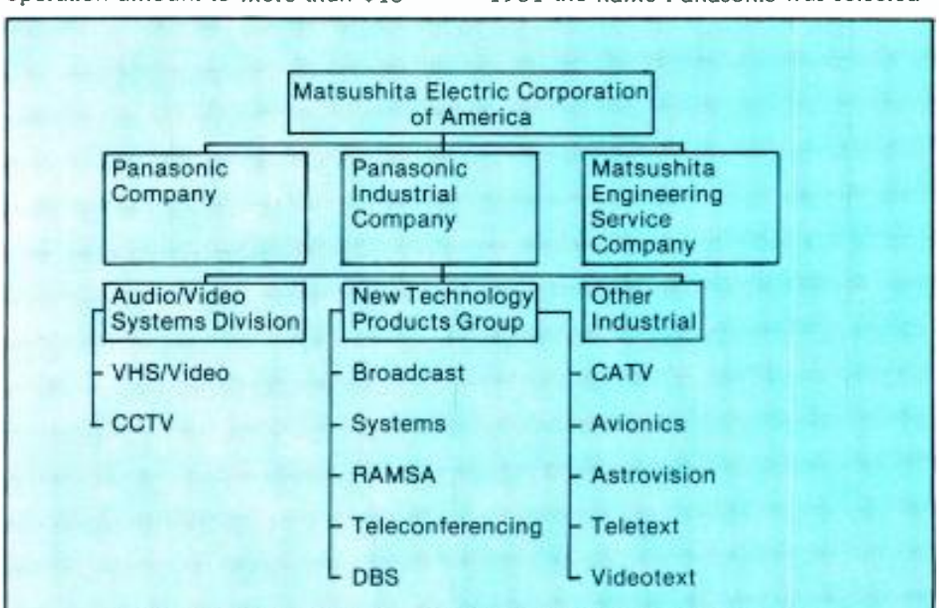
The only certainty in the electronics industry is constant and rapid progress – in technology, products and product facilities.

For a company to survive in this fast-moving industry, it must move equally fast in adapting its products to new electronics technology that is constantly emerging. But Matsushita Electric has done much more than simply keep pace. It has set the pace with the RECAM system, and new products derived thereof, such as the MVP-100 videotape cart machine.

MECA – A growing force in America

MEI activities were launched on the North American continent in 1953 with the opening of a New York office. The success of this venture led to the founding of Matsushita Electric Corporation of America (MECA) in 1959 – the same year that Alaska and Hawaii were admitted to statehood.

Even in its early years, MECA's growth was steady and impressive. In 1961 the name Panasonic was selected



The New Technology Products Group (NTPG) is a newly created division of the Panasonic Industrial Company as of Jan. 1, 1984. NTPG includes many high-tech, New Media product areas and will be the source for many high growth businesses.

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as a brand name, followed in 1974 by the acquisition of Quasar and adoption of the Technics brand name. In 1975 MECA moved into its present headquarters in Secaucus, NJ, and the stage was set for an accelerated growth and expansion in sales and staff.

In the United States alone, in the past 25 years, MECA has grown from a 3-man sales force to an organization of impressive statistics: more than 7000 employees and a network of six sales companies, seven manufacturing operations and one service and engineering company. Sales from this complex operation in 1983 exceeded $2.8 billion, with 20% of the North American sales coming from Western Hemisphere manufacturing plants.

The results include products with high performance and a strong image; a corporation that is eminently successful in its operations; and a productivity that is enviable.

In anticipating future growth, MEI is now shifting more effort to other markets – robotics, communications, office equipment and broadcast video.

By putting emphasis on these markets, without decreasing its attention to the consumer markets, MEI expects to increase sales in these growth markets up to 50% of its sales within the next decade. This is an ambitious undertaking, but none of the visions at MEI have been small.

Broadcast video

Broadcast video equipment is particularly attractive to Panasonic in its North American market, and it is the Panasonic name that will blaze the trail. The products that are spearheading this market penetration are the RECAM ½-inch camera/recorder system and the MVP-100 Multifunction Video Player.

The roots for these products go deep, but they burst into public view with dramatic impact at the 1981 NAB Convention in Las Vegas. Panasonic not only introduced its combined camera/recorder system, the RECAM, but it also introduced studio recorder/players and an edit controller – the *complete* package

Keiichi Takeoka
President
Matsushita Electric Corporation of America (MECA)

"In just 25 years, MECA has grown from a 3-man operation importing and selling portable radios out of a small office in New York City to one of America's leading electronics companies. Today, MECA has more than 7000 employees and annual sales of $2.8 billion.

"We are known in the United States largely by our Panasonic, Quasar and Technics products. But MECA produces and markets a wide variety of goods, ranging from electronic components to industrial robots. In all, we comprise 14 organizations in North America, including six sales firms, seven manufacturing operations and one service and engineering company.

"Through these companies, MECA is striving to become an organization contributing to American society by being deeply rooted in this country."

RECAM: The complete ½-inch M Format camera/VTR system

RECAM was developed as a professional studio system as well as for ENG/EFP production. As such, it heralds a new era of quality, lightness, portability and compatibility into professional video.

At right are shown the major components of the system: the camera, attachable VTR, edit controller and studio VTRs. However, besides introducing a new standard of excellence in equipment design with RECAM, Panasonic also introduced a new level of compatibility. Thus, the RECAM camera and VTR can be used as separate building blocks, with interfaces that allow the camera to function with any recorder and the recorder with any camera.

The AK-1020 Gen-Lock Adapter, when connected to the camera in place of the VTR, allows the AK-100 camera to be used with any conventional VTR. Alternately, the AU-S100 NTSC Adapter interfaces the AU-100 recorder to any conventional NTSC camera.

The new AK-30 camera and AU-220 portable field recorder add significant features to 2-piece field production and newsgathering. Especially valuable is color playback in the field.

Keeping all its customers in mind, Panasonic designed RECAM to be selected as a complete package or to be phased in as needed. Thus, although RECAM is revolutionary in terms of technology and performance, it can be considered evolutionary in terms of adaptability into a customer's facility.

The RECAM B-100 system comprises the in-camera VTR with AK-100 camera/AU-100 recorder; the AU-300 studio VTR; and the AU-A30 edit controller.

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The MVP-100: A revolutionary multicassette player system

The Panasonic MVP-100 M-Vision Player is a Multifunction Video Player that takes full advantage of the high quality video and unique features offered by the M Format technology. It is designed to provide the features and flexibility needed by many broadcast, teleproduction, cable, industrial and educational facilities. With the MVP-100, TV programming now enters a new era of ease-of-operation, reliability and long playtimes. And quality need not be sacrificed, from the point of picture origination, through post-production editing, right to the final playback. Distribution and exchange of program material is enhanced by the use of lower-cost, smaller, and lighter standard VHS cassettes, using M-Vision Component Video Recording.

Much of today's news, sports, commercials, documentaries and entertainment shows are taped on-site using ¾-inch tape format, with reluctant tolerance of video signal quality degradation. When better quality is demanded, higher cost, size and weight are the accompanying penalties in the use of 1-inch tape recorders. The response to the needs of the TV industry for lower-cost, better quality is the Panasonic M-Vision ½-inch tape format.

Most of the income revenue of the TV station is derived from the playback of short segment commercials through a cart or reel player. End users well understand the expense, limitations and problems encountered in using 1-inch and ¾-inch tape technology in these applications.

The MVP-100 plays *all* of the TV station's programming needs, short and long—automatically, economically, accurately, reliably and in high broadcast quality.

The MVP-100, with its innovative improvements, offers an attractive solution to these drawbacks of earlier equipment. In fact, for its intended video applications, users may come to refer to it as the *Most Valuable Player*. The basic model can be supplied with 4 to 24 transport decks. However, it can be arranged initially with fewer decks and provisions for future expansion.

The manual controller is capable of directing up to 24 transports into 24 random-access sequences. The computer controller adds memory in depth using 128K RAM for all-day programming. Information exchange from the traffic department is by floppy disc, IBM language compatible. An RS-422 port is supplied for communication from station automation devices. Log verification data is supplied besides the built-in printer. Users will be surprised at the forethought given to look-ahead error checking and correction, diagnostics and alarm systems. Extensive video and audio switching, redundant dual channel outputs, including dual signal processing and TBCs, make the MVP-100 a most reliable player. Instead of merely previewing a sequence, a spot reel can be instantly recorded in either of the two record decks supplied. Then the operator can double roll the sequence and a spot reel, or he can double roll two spot reels.

Combined with the RECAM system, the MVP-100 makes it possible to have an all-½-inch videotape operation in broadcasting or production. Furthermore, the customer has a full choice in satisfying his equipment needs. He can select a totally new installation or phase in M Format components as he retires other equipment.

MVP-100 features

1. Up to 24 separate transport decks and threading mechanisms for reliable, redundant playback.
2. Simple, fast automatic threading for error-free operation.
3. Decks are removable from MVP-100 for easy maintenance.
4. Two decks may be used to record the entire sequence of a station break for built-in spot reel playback.
5. Each cassette will hold 20 minutes of spot segments. T180 cassettes record 30-minute programs to provide play of all programming needs.

needed for professionals in broadcasting and post-production, covering both ENG and EFP. The M Format recording technique was developed for more purposes than just ambulance chasing for the news. M Format provides high quality, economical, convenient information storage and retrieval for all TV operations.

With the introduction of the ½-inch, M Format camera/recorder systems, 1981 represented a landmark in broadcast video. No longer would professionals be encumbered with the heavier, cable-linked cameras and recorders that were the industry workhorses from the early 1970s. Thus, with a combined camera/recorder system, producers of news and commercial programs now have a new freedom in recording that they never before have seen.

Interface units are included in the line so that the RECAM components can stand alone – the camera can be used with any recorder and the recorder with any camera, regardless of the tape size and format or the manufacturer. Thus, the professional who wants to phase-in a RECAM camera or recorder with other product lines can do so easily. This makes it possible for professionals to plan ahead for a total component RECAM system in the future without having to scrap NTSC ¾-inch equipment that is still providing good service: a concept as evolutionary as you, the customer, want to make it.

More recently, a second chapter in the RECAM was written. At the 1983 NAB Convention, Panasonic introduced its revolutionary videotape cartridge machine, the MVP-100. This product also established a landmark, the first major contribution to video insert and program playback since quad decks were introduced in 1969 and 1971.

As with RECAM, the MVP-100 is the next logical equipment addition to the Panasonic line, providing a specialized tool with high quality and versatility for broadcasters and production facilities. Based on the ½-inch M Format, the MVP-100 provides the quality that is needed when integrating multiple video sources for broadcasting. At the same time, the MVP-100 achieves play times compatible with the broadcast environment.

Now, for the first time in TV history, the MVP-100 makes it possible for TV broadcasters to consider seriously total automation for on-air broadcasts. But even if automation is not a major consideration, the MVP-100 adds a new dimension of freedom in inserting commercials. IDs, promos, news, editorials and public service messages into broadcast programs. Multiple spots of various lengths may be recorded on one cassette. A complete directory is indexed at the front, addresses are searched and spot-cued by time code. The directory consists of information stored in the time code track during the first few seconds of the tape. It contains the following listed contents that will be read into the computer memory, displayed on the menu monitor, and used to fast-forward the tape to park at the correct address for the spot designated by previously entered data:

1. Title and spot number
2. Spot duration
3. House ID
4. Agency ID
5. Directory ID
6. Time code address in
7. Time code address out
8. Number of times aired
9. Agency play priority
10. First air date/remove date
11. User-inserted information

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6. Many short spots may be recorded on one cassette. A complete menu is indexed at the front. Addresses are searched and spot cued by time code for significant cost reductions.

7. Standard, low cost cassettes are readily available with a reliability record of billions in use throughout the world.

8. Control of machines is by serial data access RS-422 compatible for MC automation.

9. Total editing system control with the ability to actuate playback and record, audio and video cueing, and on-line start sequences on any transport, in any combination.

10. Off-line sequencer for all-day spot reel assembly random access, multisource library for reliable, cost-saving programming.

11. Highly flexible systems switching configurations, monitoring and playback. 24 video, stereo audio and time code sources to A and B outputs.

12. 76"x46"x30", approximately 8 transports
76"x71"x30", approximately 16 transports
76"x96"x30", approximately 24 transports

Program-length material also is handled by the MVP-100 with the introduction of the 30-minute cassette. Thus, the entire station's playback may be channeled through the MVP-100, reliably, automatically, inexpensively and in top quality.

The crowning achievement in the MVP-100 concept may well be that all these advances are provided at a modest price, well within the budgets of most facilities. Thus, the MVP-100 provides a quantum jump forward in technology and capabilities at a price considerably less than that of traditional, more restrictive equipment.

Panasonic's new structure

The development of the RECAM and MVP-100, specifically for broadcasters and video producers, has firmly launched Panasonic into a new market – broadcast video. To properly serve this market, Panasonic created its New Technology Products Group in January 1984. Under the direction of Koichi Sadashige, Vice President, this group is responsible for spearheading Panasonic's push into a wide range of new market areas that will use the company's high technology capabilities to serve growth markets of the future. One of these markets is the broadcast video field, with Morris Washington as National Sales Manager and Nick Hudak as Systems Development and Marketing Manager.

But marketing is not the only concern of Panasonic. It must serve its customers, and that has meant the establishment of an appropriate engineering and service network to support sales. Today this network divides the United States into five regions. A regional sales engineer is available to service Panasonic Broadcast customers from their nearest field office, in addition to the national RECAM service center in Secaucus, NJ.

M Format: The turning point

As previously noted, the broadcast market has anxiously awaited Panasonic's attention to its field. The M Format has served as the turning point for Panasonic, allowing it to focus its full attention and expertise on a totally new market, competing with a new wave of high technology products for broadcast video.

We often read that ½-inch tape is nearly as good as 1-inch tape, but

Koichi Sadashige
Vice President
New Technologies Group
Panasonic Industrial Company

"The formation of our New Technology Products Group in January 1984 brings a new dimension to Panasonic's marketing thrust: using new technologies to spearhead growth in new areas of professional, broadcast, industrial and government markets.

"Already the move has shown remarkable success. But we're not being awed by the growth, nor are we being careless in our strategies. The wisdom here is in maintaining a careful balance in new media market growth and still providing the backup customer service support that has been the mainstay of Panasonic's success."

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Ken Kurahashi
President
Panasonic Industrial Company (PIC)

"The Panasonic organization goes back to 1959, but the Panasonic Industrial Company (PIC) was not formed until 1982. The formation of PIC was necessary to allow us to better focus attention on growing business in the areas of office automation, factory automation and new media communications products, as well as other professional and industrial markets."

M-Vision: The complete broadcast system, origination through editing to playback

The science of videotape recording has recently been augmented by a new technique—the technique of recording the luminance signal and the color signals on separate tracks. Known as *dual-track recording*, this technique eases considerably the problems of luminance-to-chrominance crosstalk, and removes many of the picture artifacts, such as moire and color misregistration, which have plagued the recording art since the earliest days of color recording.

It is the purpose here to offer a brief preliminary explanation of the system, to aid the reader in understanding the formal specifications of M Format recording.

A single chrominance channel is generated, but instead of summing this chrominance signal with luminance to produce a composite color signal, both the chrominance and the luminance are sent separately to the recorder, where each of the two signals is recorded on its own private track. No subcarrier is used. Instead, the I and Q components are converted directly to FM signals occupying differing frequency bands, and these two FM signals are recorded on the color track.

This system offers the two fundamental advantages of freedom from color-framing considerations when editing, and freedom from the hue errors which arise when a subcarrier signal on tape is time-modulated by head-to-tape speed variations. There is no contamination of video caused by subcarrier crosstalk, nor any video impairment caused by heterodyne or "color under" by-products.

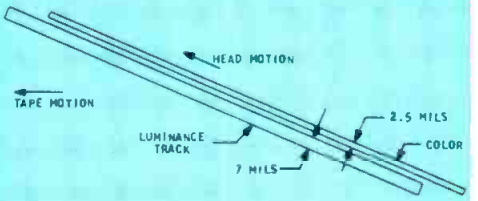

Figure 1

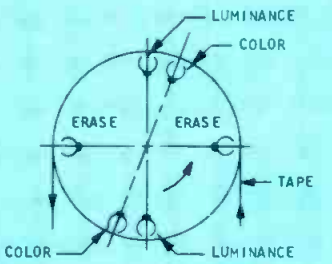

Figure 2

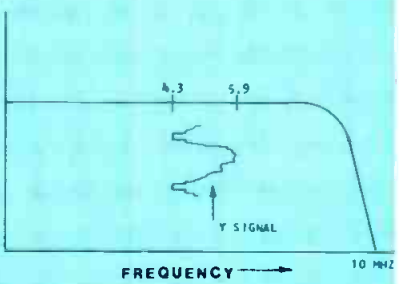

Figure 3

Track format

The video-track format of this dual-track system is shown in Figure 1.

As the figure shows, two parallel video tracks are written diagonally across the ½-inch-wide tape, at an angle of about 4.7°. The uppermost track of the pair is 2½ mils wide, and contains the color signal. The tracks are about 4.1 inches long, and are written by a pair of heads spaced about 5½ mils apart, with the luminance head lagging its associated color head by about an eighth of an inch.

In addition, there are four longitudinal tracks: two audio, one time code and one control track. The 30 mil Audio 1 and Audio 2 tracks are spaced apart by a 30 mil guard band, while the Time Code (Audio 3) track, at 15 mils width, is only 15 mils from the 20 mil control track at the bottom edge of the tape. These longitudinal tracks are recorded at approximately 8ips.

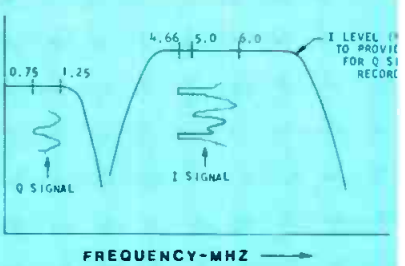

Figure 4

A top view of the drum (Figure 2) shows that there are two such pairs of luminance/color heads. Each head pair writes one field; each drum revolution writes a frame. Each pair is preceded by a flying erase head, mounted at 90° to the writing pair. These two flying erase heads enable the system to generate clean insert edits.

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'M systems

The luminance signal, which is either erived directly from the camera or ecoded from an NTSC signal, is onverted to an FM signal which eviates from 4.3MHz to 5.9MHz, as hown in Figure 3.

The I and Q signals, derived in the ame way as the luminance signal, are onverted to a 5.0MHz-to-6.0MHz-eviation FM signal (for I) and a .75-to-1.25MHz-deviation FM signal or Q). These FM signals are summed, nd the sum is recorded on the color ack, as indicated in Figure 4.

The Q signal is linearly recorded, ith the I signal itself providing the gh-frequency bias needed for such near recording.

In effect, there are three independent M channels in the system, with I and separated from each other by equency division multiplexing, and Y turn separated from I and Q by the se of a completely separate track. his 3-channel arrangement yields an ptimum match between the haracteristics an NTSC recording ystem must have and the recording apabilities of ½-inch videotape. Sync recorded in the Y and I signals to rovide an automatic timing reference etween the two tracks.

ual-track characteristics

The format described briefly above ffers the following advantages:

1. Editing without concern for color framing.
2. Freedom from color misregistration resulting from envelope delay.
3. Freedom from differential phase and gain distortions.
4. Greatly improved color signal-to-noise ratio for both fine-grain and streaky noise.
5. Freedom from subcarrier-caused moire.
6. Low tape cost, through use of VHS standard cassettes.
7. High quality multigeneration dubbing and editing.
8. High quality dual-channel audio, plus time code, due to 8ips speed.
9. Simple, uncomplicated signal processing. No TBC needed to dub or cut-edit.
10. Simple, uncomplicated mechanical handling of tape, for greater tape life.

pecifications

The full specifications of the Format are described in a paper that etails the track dimensions, transport eometry and signal processing for his recording method. We invite you to ead these specifications for a detailed nderstanding of how the system chieves its performance. For a copy of hese specifications, write Panasonic r call 201-348-7471.

Highlights of MECA and the RECAM Development

1959 – Matsushita Electric Corporation of America (MECA) established.

1961 – *Panasonic* selected as a brand name.

1975 – Headquarters moved from NYC Pan Am building to facilities in Secaucus, NJ.

1976 – MECA established Panasonic Company. The Quasar Electronics Company was purchased.

1978 – RECAM and other systems inventions listed. Applied for patents.

1979 – Design goals established. Matsushita began hardware development.

1980 – Matsushita working model of FM/FM chroma recording system, M Format, tested and accepted. Compression/expansion chroma system rejected.
– RECAM prototype shown to NHK.

1981 – RECAM working system consisting of recording cameras, studio recorder/players and an edit controller shown at NAB and Montreux conventions.
– First systems delivered.

1982 – NAB and SMPTE, *complete* M Format system products available.
– Format documents for interchangeability specifications submitted to SMPTE.
– Panasonic Industrial Company formed. Broadcast Group expanded.

1983 – MVP-100 Multifunction Video Playback cart machine prototype shown at NAB. Pre-production model shown at SMPTE. Customers on back order.
– Transmission over microwave for ENG.
– Interfaces available to all manufacturers' edit controllers.
– 30-minute tape for 30-minute programming demonstrated at SMPTE convention.

1984 – New Technology Products Group formed Jan. 1, 1984, of which Panasonic Broadcast Products is included.
– Production model of MVP-100 multifunction video player shown at NAB. Immediate deliveries available.
– Matsushita Electric Corporation of America celebrates its 25th anniversary of progress and dedication.

Nick Hudak
Manager, Systems Development and Marketing
New Technologies Group
Panasonic Industrial Company

"When we introduced the MVP-100 multifunction video player to the industry at the 1983 NAB Convention, we took a bold, dramatic step forward. Not since 1969 and 1971, when quad cart decks were introduced, has the industry seen such a dramatic approach to handling commercial inserts. Based on the new M-Vision ½-inch tape technology, the MVP-100 represents a quantum leap forward in airing combinations of inserts and programs, putting broadcasters for the first time on the brink of complete TV station automation.

"And, all this is possible while retaining the high professional quality available in the emerging ½-inch tape and systems technology. Furthermore, the MVP-100 system can be custom tailored, with a variety of multiple decks available to meet the differing needs of many customers. Thus, the features and benefits of the MVP-100 provide distinct advantages to everyone in the TV operation: management, traffic, sales, engineering, news, financial and programming."

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Morris Washington
National Sales Manager
New Technologies Group
Panasonic Industries Company

"When we unveiled the RECAM combination video camera/recorder system at the 1981 NAB Convention, we rocked the industry. Not only did we show a highly advanced camera/recorder unit, we showed a complete system with studio recorder/players and an edit controller.

"You need a total system to meet the needs of broadcasters and producers. With RECAM we go a step further and let end users make individual choices. Although they can use the RECAM camera and recorder as a unique pair, they may use them separately interfaced to any existing system – the camera to any recorder and vice versa. The beauty of this design is that the customer can buy a complete system or individual components as needed. He can start with a complete new system or phase in specific components. He's in command because he can adapt new equipment into his operating system without obsoleting existing equipment that he wants to keep in service."

without reference to a specific reason. The above noise comparison measurements of multigeneration recordings illustrate the differences. In the amplitude-modulated noise of luminance and chrominance measurements, ½-inch tape holds up well compared to 1-inch. However, the phase-modulated noise figures, or FM noise, of ½-inch is far superior to 1-inch performance.

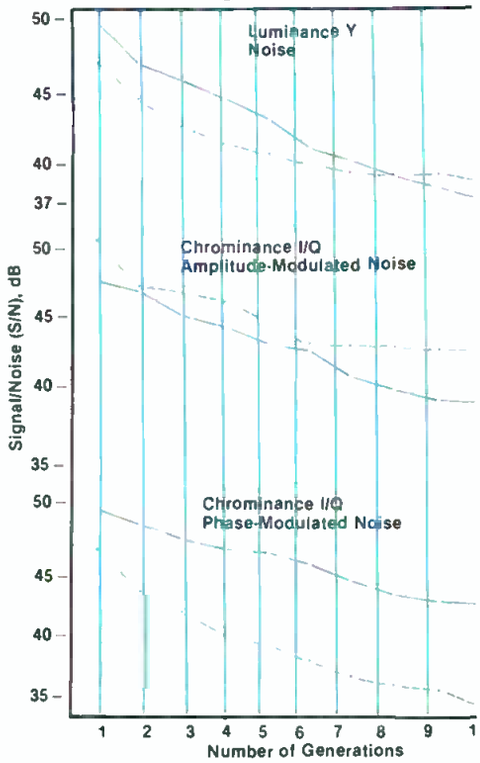
Why is that? Because of that elusive, difficult-to-measure, variable picture impairment called *moire*. Moire is caused by the heterodyne or beat frequencies caused by contamination of video signals wherever subcarrier is present. The herringbone suit or striped shirt illustrate this video contamination. Picture elements are generated into the video where none existed before. Consider the video impairment of several generations of NTSC recording.

In M Format ½-inch tape, there is no subcarrier recorded on tape. Therefore, there is no moire or spurious signal problem to impair true video fidelity, generation after generation. One-inch tape, because it is a composite video recording with subcarrier present to cross-talk into video, suffers from moire and spurious signal impairment. Therefore, 1-inch tape is nearly as good as ½-inch M Format tape.

The response in the marketplace has been gratifying. Acceptance of both the RECAM and the MVP-100 is growing rapidly, especially with products readily available to meet the increasing demands. Not since the introduction of the portable cameras in the early 1970s has the industry demonstrated such enthusiasm for a new line of video products.

Industry acceptance is illustrated by

Signal-to-Noise Comparisons for Multigeneration Recordin



the diversification of users: ABC's *American Sportsman* for the Mt. Everest climb; CBS's Saturday morning children's show, *Benji*; the movie preview of *Dune*; CNN news coverage in Philadelphia; *20-20*'s underwater documentary of San Ignacio's treasure; WNEV-TV for documentaries and now for news; and WHNS-TV and KMPH-TV for total automated playback of program length and short spot material, plus many, many more.

Although this is just a beginning, it is one that will serve as a benchmark for Panasonic's entrance into the broadcast video market.

Panasonic Broadcast Systems
New Technology Products Group
One Panasonic Way
Secaucus, NJ 07094

Bibliography

The following provides a brief guide to additional reading on the M Format ½-inch videotape technology.

"The Look of ½-inch at WNEV-TV." Karl Renwanz, WNEV-TV, *Broadcast Engineering*, January 1983, pages 19-26.

"An Introduction to Analog Component Recording." Koichi Sadashige, Matsushita, Paper No. 19, 17th Annual SMPTE Television Conference, Feb. 4-5, 1983, San Francisco, CA.

"Design Criteria for the New Broadcast Video Recording System Employing ½-inch VHS Cassette Tape." Ichiro Arimura and Koichi Sadashige, Matsushita Paper No. 22, 17th Annual SMPTE Television Conference, Feb. 4-5, 1983, San Francisco, CA.

"Field Report: Panasonic RECAM Camera/Recorder System." Karl Renwanz, WNEV-TV, *Broadcast Engineering*, March 1983, pages 276-285.

"Field Report on ½-inch M-Format." Karl Renwanz, WNEV-TV, Paper No. 82, 125th SMPTE Technical Conference and Equipment Exhibit, Oct. 30-Nov. 4, 1983, Los Angeles, CA.

"A Dual-Track Video Tape Recording System." Panasonic Publication, two pages, 1983.

"Interchangeability Specifications for a ½-inch Broadcast ENG/EFP Helical-Scan Videotape Recorder." Panasonic Publication, 10 pages, 1983 (contains format for interchangeability specifications submitted to the SMPTE in April 1982).

"Video from Heaven." George Bell Jr., *American Cinematographer*, December 1982, pages 68-82.

"Why I and Q?" R.N. Hurst, RCA.

"Why the Commitment to M-Format Video?" Jon Sweeney, Jaguar Television Productions, *Backstage*, Feb. 10, 1984.

RECAM and MVP-100 brochures, Panasonic Publications.

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NAB exhibit profile:

Sony Broadcast

The NAB convention, the world's leading show for broadcasters, provides an opportunity for exhibitors to do the unusual and unexpected. Within the framework of NAB restrictions on what exhibitors can and cannot do, companies devote a tremendous amount of time, talent and money to create exceptionally attractive and meaningful displays for the convention.

Each year we include in our NAB pre-show coverage an inside look at an outstanding exhibit from the previous year's convention. Last year we were impressed with the Sony display, and we asked the company to detail its efforts to develop the exhibit.

Although many people were amazed by its size and futuristic design, nearly everyone agreed that Sony Broadcast Products Company's 1983 NAB exhibit was a success. Titled, "Bringing Vision to an Industry," the 14,000-square-foot space center became a hot attraction for NAB's 30,000 visitors. The combination of innovative design and high technology was the key to the company's capability for displaying a wide range of products to a large number of attendees.

An insight into the planning, preparation and logistics involved in putting together an exhibit of such magnitude has been provided by Irwin Ungerleider, manager, shows and exhibits, Sony Broadcast Products Company, in this interview.

Q: In many ways, Sony Broadcast's 1983 NAB exhibit broke tradition. How was the initial concept formed? What were your goals?

A: In previous shows, we had employed the traditional fortress design, in which walls are set up around the perimeter of a booth area and all the hardware and demonstrations are held inside. For 1983, because we were working with the largest area that had ever been sold at NAB, management's idea was to create an open-air environment strikingly dif-

The huge Sony exhibit facility included a demonstration of high definition television (HDTV). The company's HDTV studio camera can be seen at the right.

Continued on page 276

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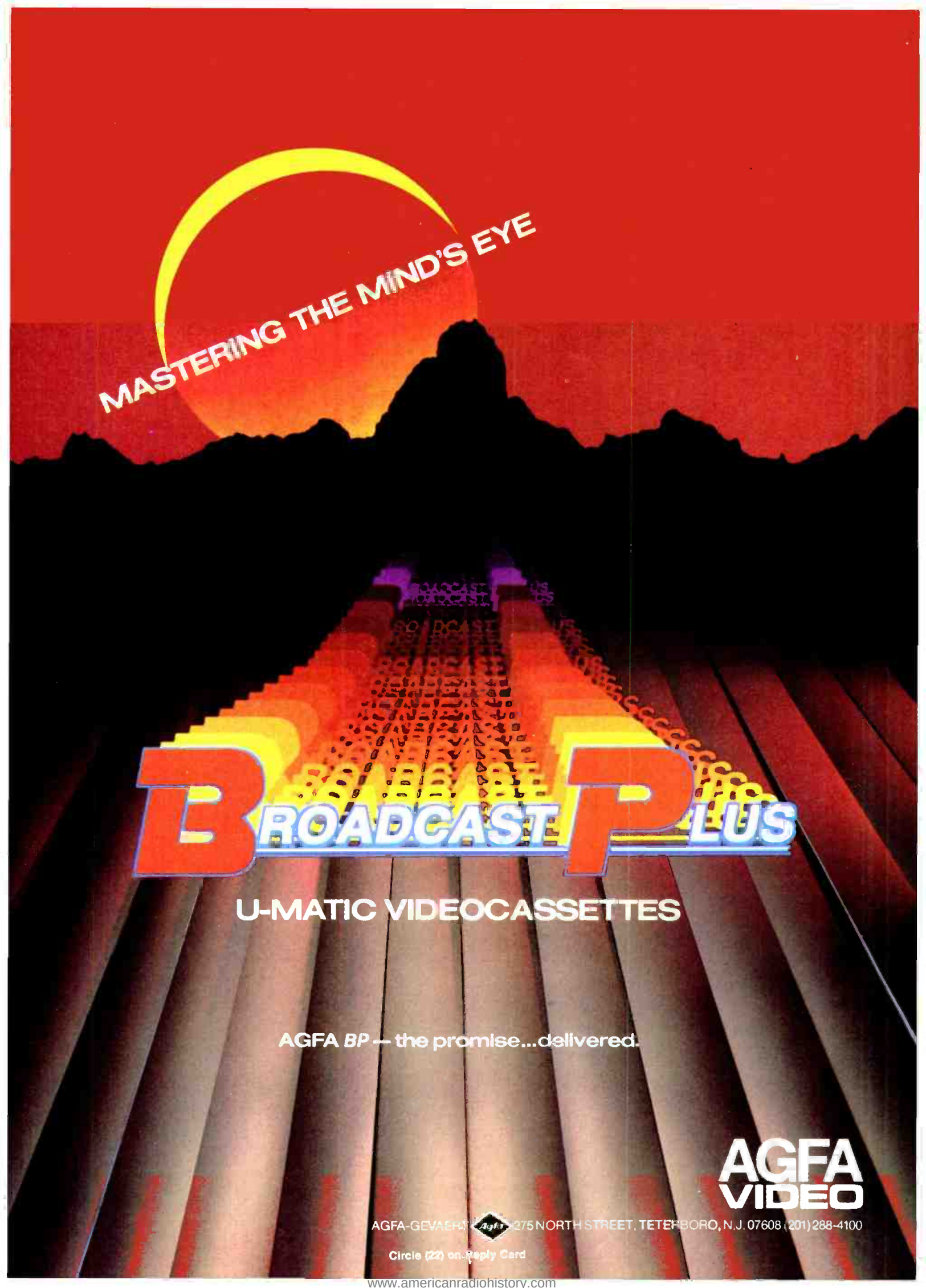

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The answers bear the simplicity of common sense: no good. Which is why Sony created the yardstick for all 1" videotape: the Sony V-16.

The V-16 is based on the assumption that the only good tape is a perfectly consistent tape. And to achieve this consistency Sony has developed exclusive tape production techniques, created special binding materials, lubricating oils and additives. And then each batch of V-16 is submitted to over 16 quality-control checks where meticulous attention is paid to every detail from dropouts to print-throughs.

Any Sony tape that isn't perfectly balanced in picture quality, runnability, durability and audio will never find its way into your editing suite.

So if you're looking for the best overall performance in a 1" tape, look for the one that's superior in 16 points, not just some of them: V-16 from Sony.

SONY
Industrial Tape Division

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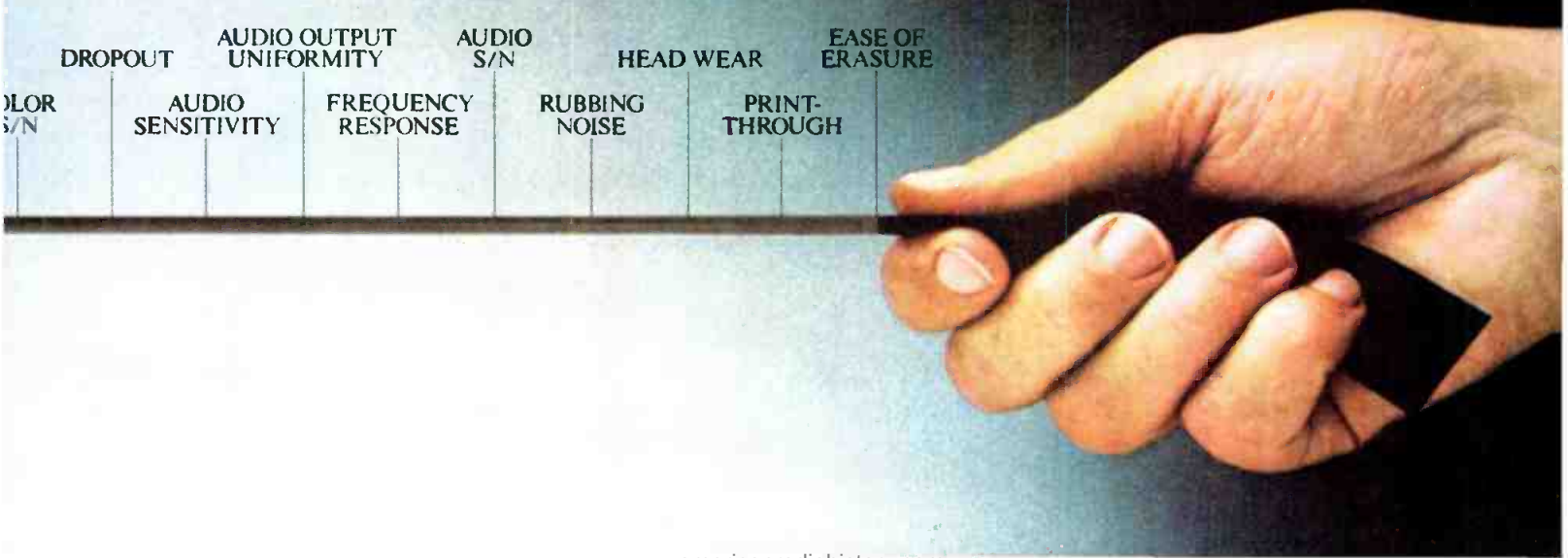

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NAB-'84/Las Vegas

Exhibitor roundup

This special section alphabetically lists the NAB-'84 exhibitors and previews products to be displayed in Las Vegas. The parenthetical number following the exhibitor name is the booth site in the convention hall. If a company did not have a booth at press time, an asterisk (*) appears in place of the number. A dagger (†) indicates that a company's NAB form was not returned by press time. In such cases, data was generated from the NAB listing and/or **BE** files.

Below each exhibitor listing is a number by which the Reader Service Card may be used to provide additional exhibitor data. Also, if the exhibitor is advertising in this issue, the location of the ad is indicated for additional details about the company's NAB-'84 exhibit products.

Although this section will be a valuable aid in planning convention activities, caution should be exercised. The listing here is comprehensive as of press time, but changes are still occurring in exhibitor sign-ups, products being shown and booth assignments. Check the final program at NAB-'84 to make your final plans. Look for the **BE** wrap-up of this convention in our June and July issues.

ABP Systems (1607A)†
See at booth
Circle (401) on Reply Card
see ads on pages 51, 138 and 139

ADC Magnetic Controls (1320)
Established products
Pre-wired audio and video jackfields
Audio connectors
Coaxial connectors
New products
Hum-bucking equipment
SJ2000: Self-normaling coaxial jack
Circle (402) on Reply Card
see ads on pages 51, 138 and 139

ADM Technology (1223)
Established products
9000 series: Stereo, microprocessor-based, on-air and production consoles
VP series: Audio post-production console, coupling video editing with audio
2442 series II: 168-input, 24-mix bus on-air or production console with four or eight submasters and two outputs
1642 series II: On-air and production TV audio console
ST series II: Radio on-air and production consoles
Audio DAs, patch bays, signal processors and related audio products
New products
Stereo TV on-air and production console with multiple stereo line preselection, stereo line input modules, stereo signal processing, submaster grouping and master output modules
Circle (403) on Reply Card
see ad on inside front cover

AEG-Telefunken
See Bayly

AF Associates (1611)
Established products
Turnkey systems and mobile units
Marconi B3410: CCD telecine
AVS6000: Digital standards converter
AFA custom products
New products
Protel computer support and automation systems for broadcast and film production and post-production
Circle (404) on Reply Card
see ads on pages 58 and 59

ATI-Audio Technologies (420)
Established products
P100: Encore series, phono preamp
P1000: MicroAmp series, phono amp
M1000: MicroAmp dual mic amp
L1000: MicroAmp dual line/buffer amp
DA1000/DA2000: MicroAmp audio DAs
New products
DA1000: Modular audio DA system
VU1000: MicroAmp series LED meter, power amp and 8x1 audio switcher
DA208/416: Encore series, dual 1x4 and quad 1x4 audio DAs
Circle (405) on Reply Card
see ad on page 240

AT&T Communications (407)†
Established products
Genesis graphics board
FCT graphic creation terminal
System 85 business management system
Dimension PBX telephone system
Transportable earth station terminals
New products
See at booth
Circle (406) on Reply Card

AT&T Information (1429)
Established products
Dial-It service
New products
See at booth
Circle (407) on Reply Card

AVC Systems (331)
Established products
AIR-7: Harrison radio console
PRO-7: Harrison video post-production console
MTR-10: Otari reel-to-reel ATR
MTR-90: Otari 24-track recorder
BTX: Machine synchronizer
New products
See at booth
Circle (408) on Reply Card

Abekas Video Systems (1620A)
Established products
A42: Video slide projector using 5¼-inch Winchester disk memory
New products
A52: Digital special effects system for on-air and production includes various image manipulations in single- or dual-channel forms with DataKey effects memory
Circle (409) on Reply Card

Accurate Sound (*)
Established products
AS-200: High-speed audiotape duplicator
180: Starbird deluxe studio boom
New products
See at booth
Circle (410) on Reply Card

Accu-Weather (1134C)†
Established products
Weather graphics display systems
New products
See at booth
Circle (411) on Reply Card

Acrodyne (1228)
Established products
TRH/10KA: 10kW high-band VHF TV transmitter
TRH/250A: 250W single-tube VHF TV transmitter

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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.

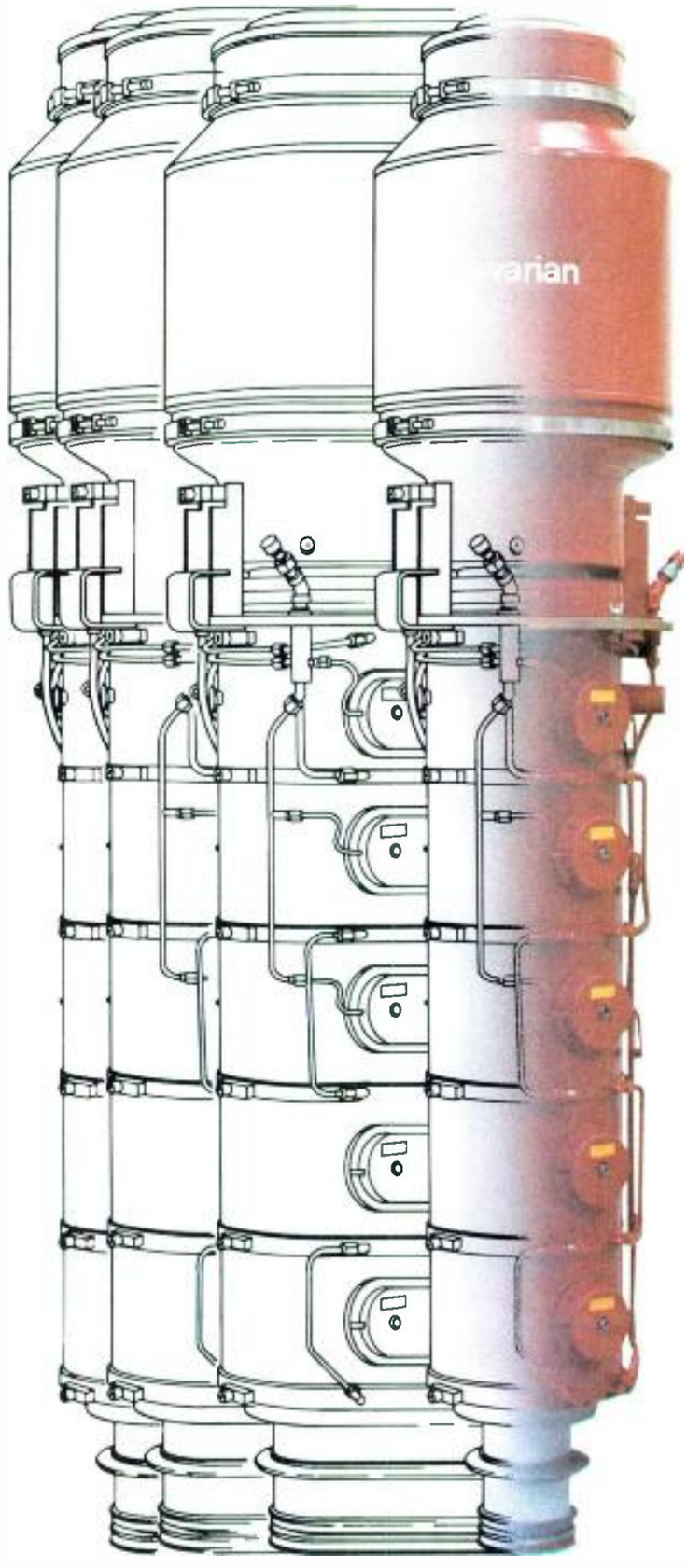
The most practical aspect of the new S-Series tubes is the complete interchangeability with the Varian VA-953H-Series tubes, providing broadcasters maximum flexibility in planning new equipment acquisitions.

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
CH-6300 Zug, Switzerland
Telephone: 042•23 25 75

varian



Circle (23) on Reply Card

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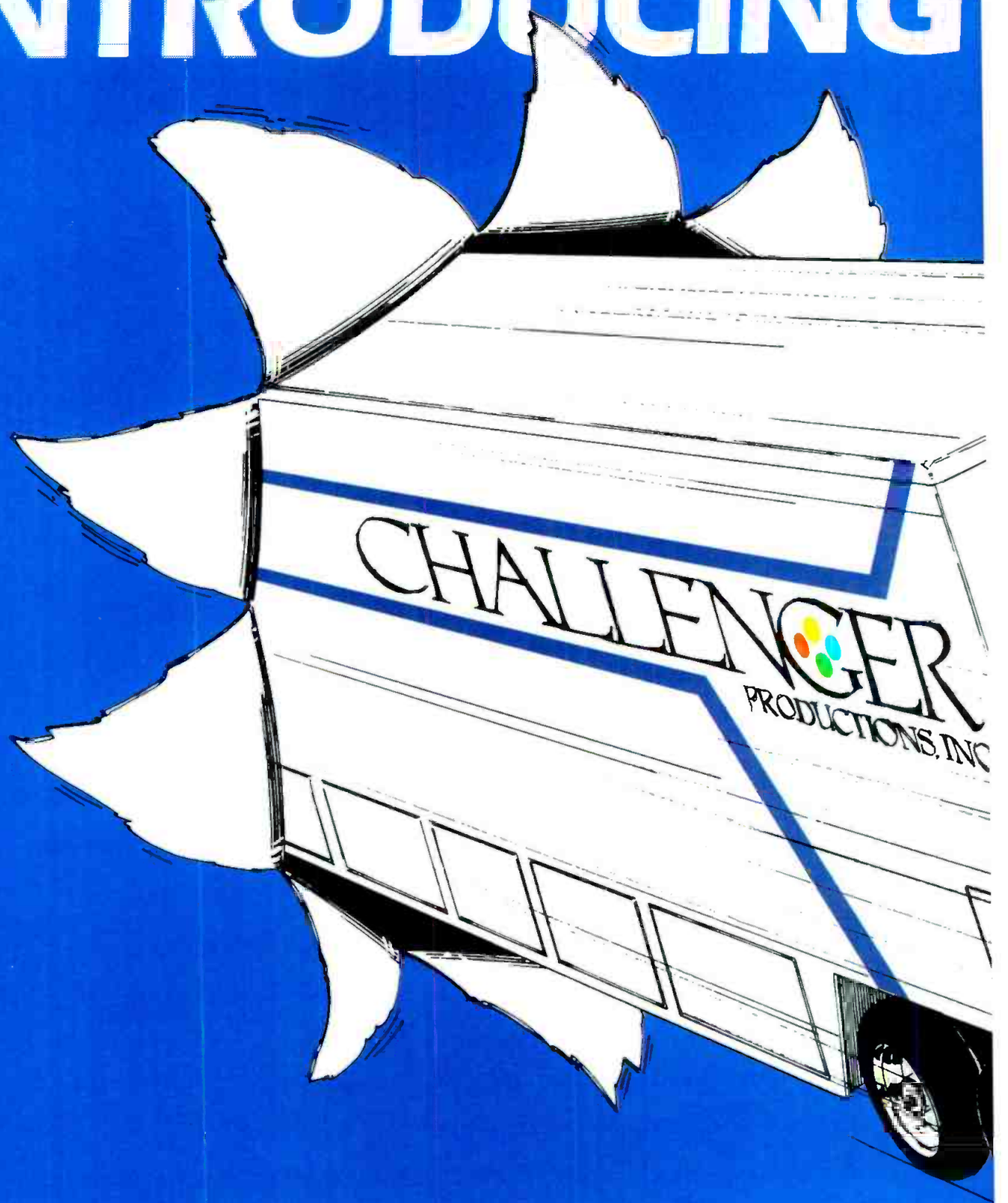
INTRODUCING



48 Feet Of Technical Excellence!

- **13' x 8.5' x 48' Trailer**
- **5 IKEGAMI HK 357AT2 Cameras**
  4 40-1 Canon lenses
  2 18-1 Canon lenses
- **3 IKEGAMI HL79E Handheld cameras**
  3 13-1 x 2 Canon lenses
  1 17-1 x 2 Fujinon lens
- **4 Ampex VPR2B Recorders**
  1 VPR 20B
- **Grass Valley 300-2AN Switcher**
  Dual Channel DVE
  Chyron 4100 Series
- **ADM Custom Audio console**
  64 mic inputs to 16 mixers
  RTS 40 station intercom
  RTS 12 station IFB

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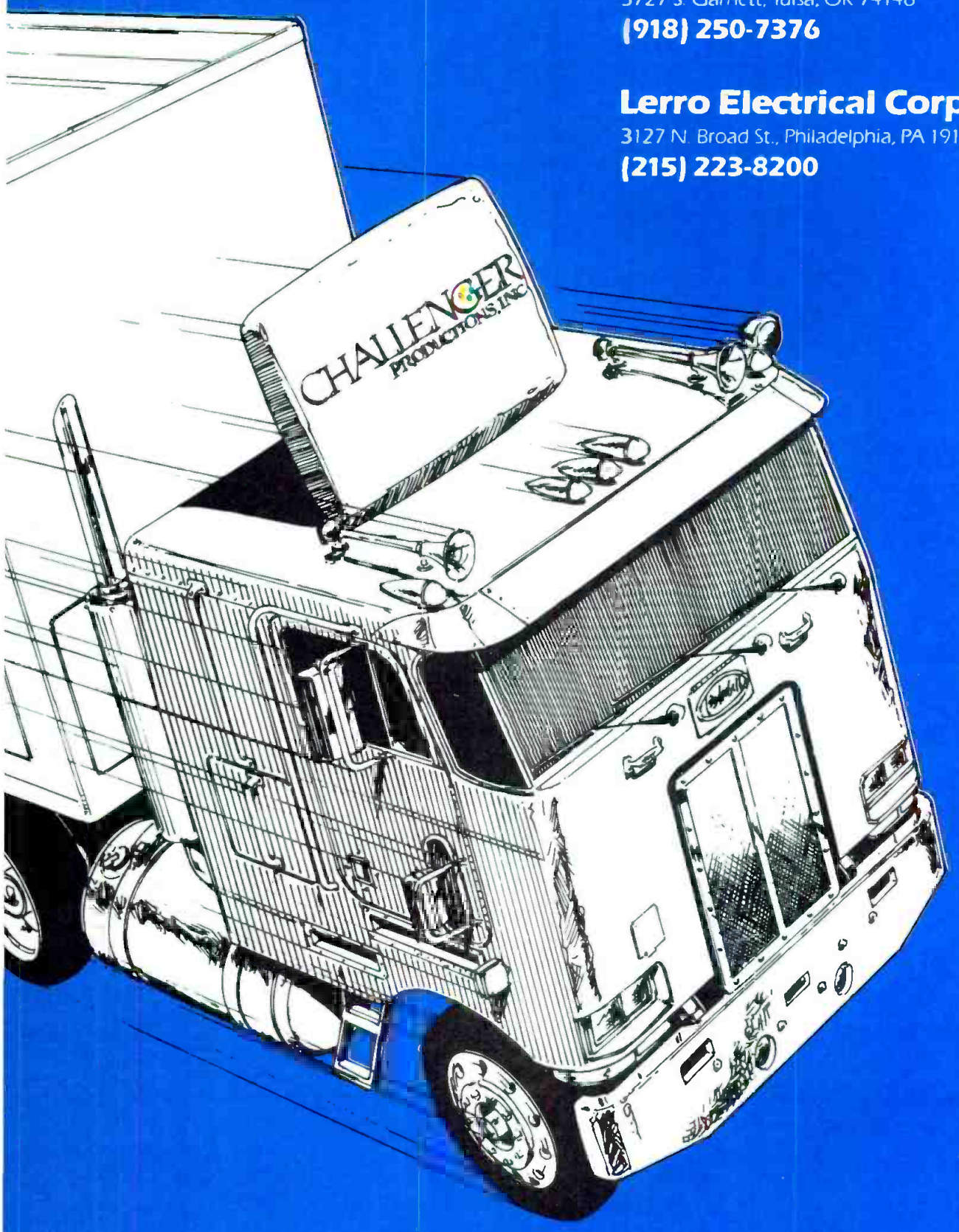
"CHALLENGER"

Challenger Productions, Inc.
5727 S. Garnett, Tulsa, OK 74146
(918) 250-7376

Lerro Electrical Corporation
3127 N. Broad St., Philadelphia, PA 19132
(215) 223-8200



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Acrodyne (1228)
Continued
TLV/10: 10W VHF translator
TRU/10KA: 10kW UHF TV transmitter
TRU/5KA: 5kW UHF TV transmitter
TRU/100A: 100W UHF modulated translator
TRU/1KA: 1kW UHF modulated translator
TRU/1KA: 1kW UHF transmitter
TLU/30: Dual 30W UHF translators in hot-standby mode
New products
See at booth
Circle (412) on Reply Card
see ad on page 157

Adams-Smith (1724)
Established products
2600LG/LR: Longitudinal time code generator/reader
2600VG/VR: VITC time code generator/reader
2600TI: Translator interface for VITC editing
2600CI: Character inserter
2600CR: Longitudinal time code restrorer:
2600SI: RS-232/SMPTE RS-422 serial interface
2600SY: Tape synchronizer
New products
2600MTC/STC: Master transport controller for automatic VCRs
2600DEC: Digital data entry controller
2600EEC: Event/edit controller for audio editing
2600CD: Controller display
Circle (413) on Reply Card

ADDA (1100)
Established products
ESPC: Electronic still-store and graphics system
VIP: Digital video effects system
AC20A: Dual-channel TBC or synchronizer with production effects
VW2: Frame synchronizer and TBC
New products
ESP II: Low cost broadcast still-store and graphics system with digital production effects
AC21A: PAL dual-channel TBC with production effects
Circle (414) on Reply Card
see ads on pages 296 and 297

Advanced Music Systems (1330)
Established products
RMS-16: Digital reverberator
DMX 15-80S: Digital delay and stereo pitch changer
A/V Sync: Digital audio delay synchronizer
New products
RMX-16: Enhancements including new reverb programs
DMX-15-80S: Enhancements including new editing facilities
Circle (415) on Reply Card

Advanced Videotech (*)
Established products
PRC-1: Voice-actuated, 2-way radio headset
MX5V: 5W, 4-channel, hand-held, 2-way radio
New products
PRC-3: Duplex, 2-way, wireless headset
Circle (416) on Reply Card

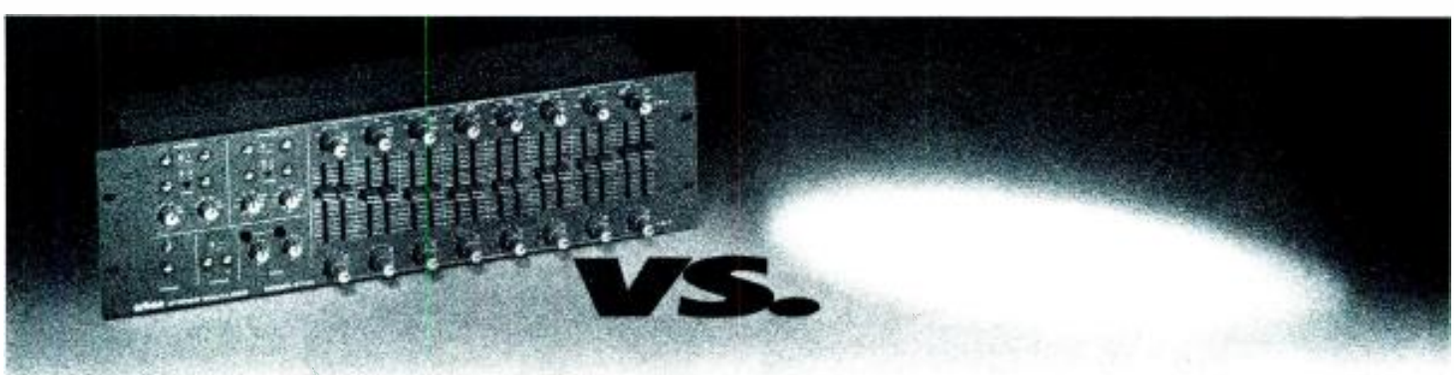
Agfa-Gevaert (1608)
Established products
Broadcast Plus: U-matic videocassettes, KCS and KCA types
New products
PEM469: Studio mastering tape
Circle (417) on Reply Card
see ad on page 43

Alan Gordon
See *Gordon, Alan*

Alden Electronics (1336)
Established products
C200R/S: Stand-alone color weather display system
New products
See at hooth
Circle (418) on Reply Card

Alexander Mfg. (1714)
Established products
In-board battery packs: BP20A-11, BP60A, JVC-1, BP90
Out-board battery packs: 7600, 7700
CR90-1: Battery charger
New products
See at booth
Circle (419) on Reply Card

Allen Avionics (1627)†
Established products



The unequalled equalizer.

Not all equalizers are created equal. You know that from experience. So do we. Our years of parametric design experience let us build so much performance and versatility into our 672A (mono) and 674A (stereo) graphic/parametric equalizers that *Modern Recording & Music* (October, 1981) described the 674A as "...the most powerful equalizing tool for pro audio work that I have yet to come across".

They clearly appreciated the versatility and functionality of eight bands of EQ with fully adjustable center frequency and bandwidth, plus the availability of 12dB/octave highpass and lowpass filters to limit signal bandwidth or to serve as a full electronic crossover.

No matter what your application—production, program shaping, room tuning, reinforcement work, or clean-up chores—you can count on Orban's heavy-duty professional construction and equally professional documentation and service. Find out why the Orban 672A/674A's are truly the "un-equalled equalizers".

orban **Orban Associates Inc.** 645 Bryant Street San Francisco, CA 94107 (415) 957-1067 TLX: 17-1480

Circle (284) on Reply Card

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ADC's NEW SELF-NORMALLING COAX JACK:

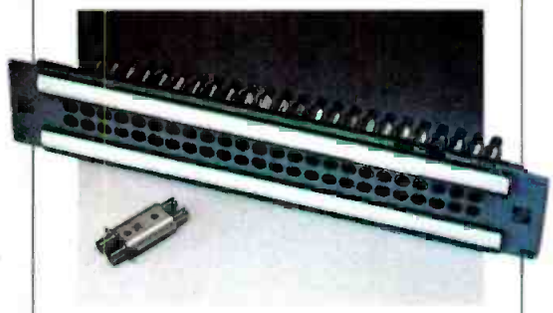
Delivered faster for less without leaving performance behind

In the past, many engineers felt that a 12-plus week wait was the price one paid for a reliable coax jack.

But the self-normalling, multi-purpose ADC SJ2000 has changed all that. SJ2000 gives superior performance without the delays. Or the expense.

The SJ2000 has the features you want: nickel or gold plating, terminating or non-terminating versions, and you can purchase it individually or loaded in panels.

What the SJ2000 doesn't have is a high price tag. That's because ADC



manufactures most of its own parts, employing the latest CAD/CAM technology.

Our high volume manufacturing capabilities also let us deliver from stock, either from our distributors or Minneapolis order center.

Check our claims yourself. **To order, just call (612) 893-3010.**

Custom orders are welcome.

ADC's New Humbucker
only $95.00 list
It will reduce up to 60dB of ground induced hum. Plus the price is less and the delivery fast. Call (612) 893-3010 for details.

ADC/Magnetic Controls Co.
4900 W. 78th St.
Minneapolis, MN 55435

Be sure to visit us in Booth 1320 at the NAB Show, April 29 — May 2 in Las Vegas.

Circle (24) on Reply Card

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Allen Avionics (1627)
Continued

Variable binary toggle switch delay lines
Binary strappable variable delay line
Infinitely variable delay lines
Rotary switch delay lines
Delay equalized low-pass filter
Rack-mountable slide switch variable delay lines
Rack-mountable strappable binary delay lines
Hum eliminator coil
Pre- and de-emphasis wave-shaping networks
Random noise measurement networks
Video delay lines
Equalizers: cable and signal

HEC-1000: Hum eliminator
New products
See at booth
Circle (420) on Reply Card
see ad on page 312

Allied Broadcast Equipment (639)
Established products
Mics, mic mixers, audio amplifiers and audio monitors
Audio recording equipment
New products
TELEMIX II: Telephone interface with software control for 15-line fully conferenceable talk-show control
Circle (421) on Reply Card

Allied Tower Company (409)
Established products
Towers
Tower equipment
Tower services
Prefabricated buildings
New products
See at booth
Circle (422) on Reply Card

Allsop (1177)
Established products
VHS and Beta video cleaners
Ultraline audiocassette deck and deluxe cleaning system
Orbitrac record cleaning system
58040: Record stylus care kit
79000: Microcassette cleaner
New products
67000: U-matic video cleaner with solution
67500: U-matic cleaner refill kit
60200: Ultraline VHS video cleaner
60210: Ultraline VHS refill kit
10086: Micro maintenance kits for computers
Circle (423) on Reply Card
see ad on page 241

Alpha Audio (210)
Established products
Sonex acoustic foam
New products
See at booth
Circle (424) on Reply Card
see ad on page 275

Altran Electronics (124)†
See at booth
Circle (425) on Reply Card

Amber Electro Design (422)
Established products
3501: Distortion/noise measuring system
New products
5500: Programmable distortion/noise measuring system
Circle (426) on Reply Card

Amco Engineering (1218)
Established products
Equipment racks, consoles, computer desks, desk-top cabinets, enclosures and work stations
New products
See at booth
Circle (427) on Reply Card
see ad on page 285

AMEK Consoles (1620)
Established products
BCO-1: Portable dc-powered field mixer
TeleVideo 1000/2500: Stereo live/production consoles
Matchless production/music mixer
M-4000: Film console modules for re-recording
New products
Telecine 7000: Telecine transfer preliminary
CLO-1: 2-stage limiters
Circle (428) on Reply Card
see ad on page 209

American Horizon (1122A)†
See at booth
Circle (430) on Reply Card

American Image (653)†
Established products

Stop using bad tape. Reduce tape dropouts. Improve video quality.

The RTI Videotape Evaluator/Cleaner finds control track and other physical damage that makes a tape useless. It can even print out exact damage locations. You'll know instantly which tapes shouldn't be used.

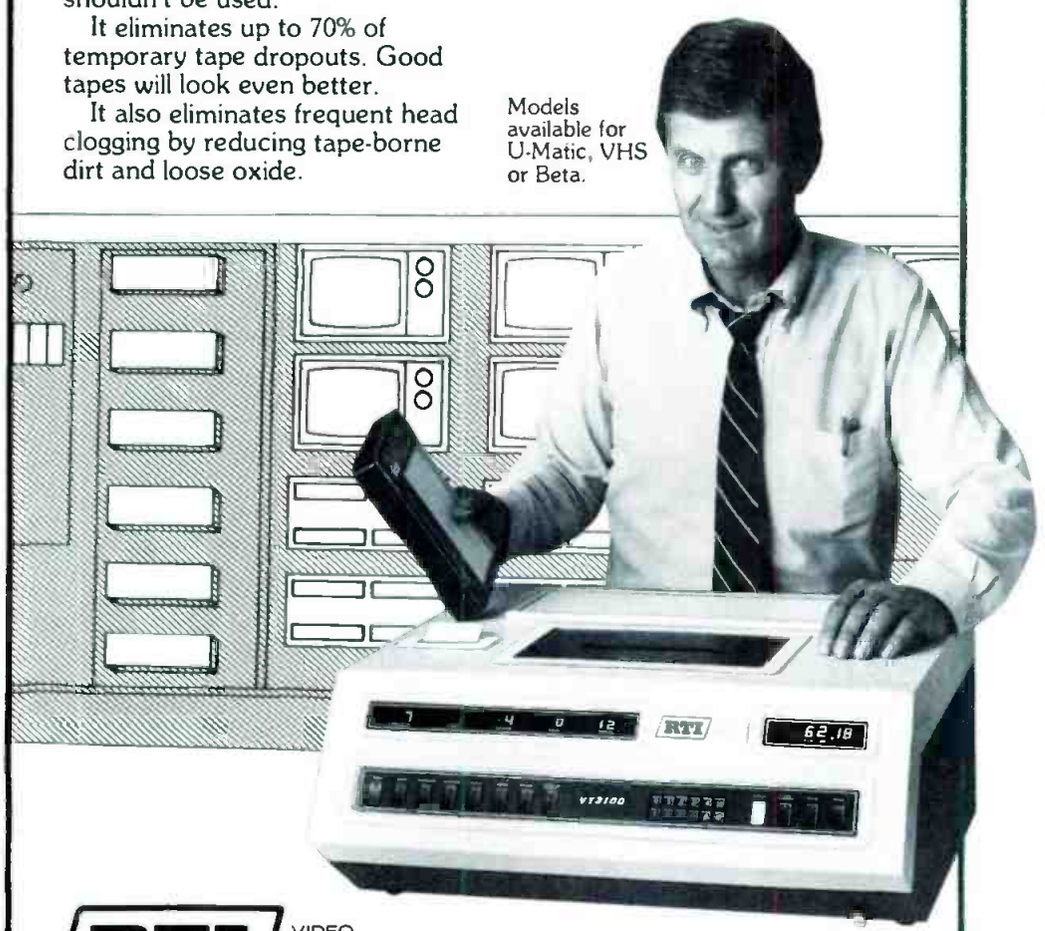
It eliminates up to 70% of temporary tape dropouts. Good tapes will look even better.

It also eliminates frequent head clogging by reducing tape-borne dirt and loose oxide.

Protect your tapes, your recorders *and* your reputation.

This machine will pay for itself in tape costs alone. For detailed information, write or call us toll free at 800/323-7520.*

Models available for U-Matic, VHS or Beta.



RTI VIDEO PRODUCTS COMPANY
A Subsidiary of Research Technology International

4700 Chase Ave., Lincolnwood, IL 60646
*Illinois, Alaska, Hawaii or outside the U.S.A., call 312/677-3000

Circle (25) on Reply Card

www.americanradiohistory.com

"WHY?"

WHY DO SEVEN MAJOR PRODUCTION HOUSES IN NEW YORK CITY CHOOSE FUJINON LENSES?

According to John Martin of Modern Telecommunications, Inc., MTI chose FUJINON P17 x 16.5ESM lenses because..*"the lens delivers the highest performance we've seen in any lens today...smooth zoom and focus ...sharp, clear pictures...FUJINON service before and after sales is unmatched by the competition. We deal with most of the major advertising agencies as well as all the networks and they are quite critical of the end product. We need great pictures to satisfy our customers. So, to get the best pictures, we chose the best lenses...FUJINON."*

Production House	Fujinon Lens	Production House	Fujinon Lens
CCR Video Corporation 135 East 55th Street	P44 x 18ESM P30 x 20ESM	Reeves Teletape 304 East 44th Street	P17 x 16.5ESM P30 x 20ESM
Matrix Video 727 11th Avenue	P17 x 16.5ESM	Unitel Video Services 510 West 57th Street	P16 x 17ESM P30 x 20ESM P44 x 18ESM
Modern Telecommunications, Inc. 1443 Park Avenue	P17 x 16.5ESM	VCA Teletronics Center Stage 503 West 33rd Street	P14 x 16.5ESM
National Video Center 460 West 42nd Street	P14 x 16.5ESM		

FUJINON

For more information on the P17x16.5ESM anc other high quality FUJINON products, contact your FUJINON office nearest you.

672 White Plains Rd., Scarsdale, NY 10583	(914) 472-9800
2101 Midway, Suite 350, Carrollton, TX 75006	(214) 385-8902
4855 Atherton Avenue, San Jose, CA 95130	(408) 866-5466
118 Savarona Way, Carson, CA 90746	(213) 532-2861

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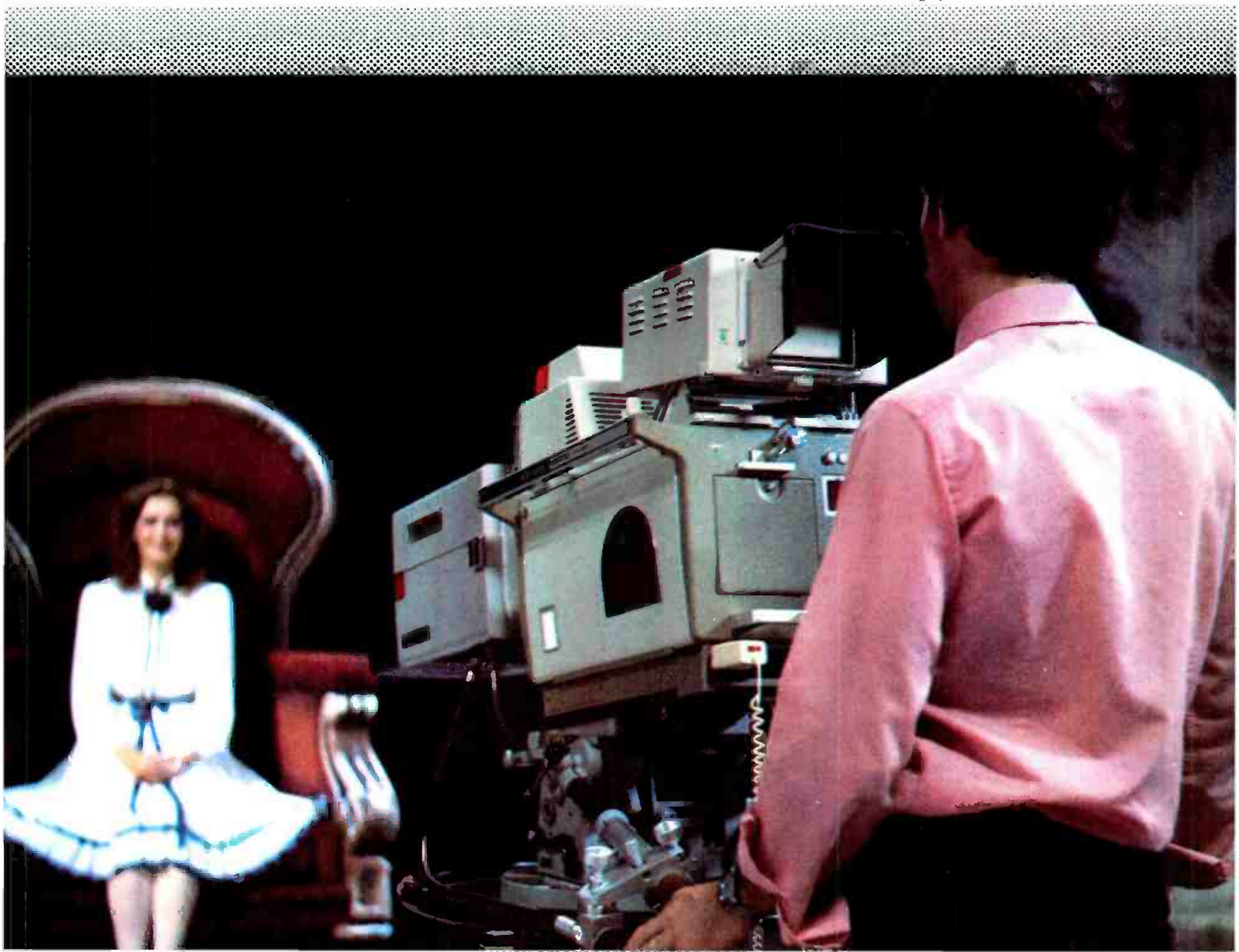
Photographed at Modern Telecommunications, Inc.



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Circle (27) on Reply Card

American Image (653)†
Continued
TV production
Syndicated radio programs
Broadcast consulting
Music library
New products
See at booth
Circle (431) on Reply Card

Amperex Electronics (1412)
Established products
XQ1427/2427/3427: ⅔-inch Plumbicon tubes
XQ1070/2170/3170: 1-inch Plumbicon tubes
XQ1410/4500: 30mm Plumbicon tubes
New products
XQ4087: ½-inch HS DG Plumbicon
83XQ: 30mm DG Plumbicon
XQ4187 (85XQ): ⅔-inch DG Plumbicon
XQ3457 (87XQ): ⅔-inch DG Plumbicon
S4083: ⅔-inch Plumbicon for low cost, high performance cameras
YK1263: Klystron
Circle (429) on Reply Card
see ads on pages 116 and 117

Ampex Corporation (1400)
Established products
VPR-3, VPR-80 and VPR-2B: Type C VTRs
VPR-5: Portable type C VTR
FPC-10: Portable ENG VRC camera/recorder
ACE and HPE: Editing systems
AVC 4100 series: Video production switchers
ADO: Digital special effects system
ESS-3: Still-store and graphics system
New products
See at booth
Circle (432) on Reply Card
see ads on pages 110a, 110b, 111, 112, 113 and 114

Ampex Tape Division (*)
Established products
196: 1-inch helical videotape
197: U-matic videocassettes
456: Grand Master professional audiotape
406/407: Professional audiotape
101/102: Beta/VHS videocassettes
175: Quad videotape
New products
See at booth
Circle (433) on Reply Card
see ad on page 11

Amtel Systems (1745)
Established products
ECM series: Edit code reader/generator, master with VITC and VITC reader/character inserter/translator
STG 300: Safe area/safe title generator
1260: Video character generator
1275A: Time display
Evertz time code products
New products
4900: VITC/longitudinal edit code reader/character generator
3600D: Edit code reader/generator/character inserter
4500: Portable VITC/longitudinal generator/reader
4600: VITC source identification system
DV8800 series: Modular DAs for audio, video, video clamping and equalizing, and regenerative pulse
Circle (434) on Reply Card

Anchor Systems (1618C)
Established products
AN100: Self-contained 25W sound system in walnut cabinetry
AN150: AN100 system in black vinyl
AN200: 55W sound system in walnut cabinetry
AN250: AN200 system in black vinyl
New products
Porta-Com: Cabled intercom systems
Snakes: Mic multi-input cables and boxes
Circle (435) on Reply Card

Andrew (1201A)
Established products
UHF-TV transmitting antennas for all power levels
Microwave antenna systems
Coaxial cable and rigid transmission line
Circular waveguide for UHF-TV
Standby antennas
Guyed and self-supporting towers
Fiber glass and concrete equipment shelters
Project management and field installation services
New products
See at booth
Circle (436) on Reply Card
see ad on page 105

Angenieux (1201)
Established products
TV and film zoom lenses, including:
15X7: System for ½-inch format
15X9 and 25X10: For ⅔-inch format
12X16: With 2X range extender
15X17: Lens assembly
New products
See at booth
Circle (437) on Reply Card
see ad on page 324

Anixter Brothers (1171)†
Established products
Antennas, point-to-point
Antennas, satellite
Antennas, microwave
Antennas, 2-way
New products
See at booth
Circle (438) on Reply Card
see ad on page 125

Antenna Technology (1737)
Established products
SIMULSAT: Multibeam antennas in 3.3m, 5m and 7m equivalent sizes
New products
SIMULSAT-7: 7m equivalent earth station antenna for TV broadcast
Circle (439) on Reply Card
see ad on page 271

Anton/Bauer (1337)
Established products
ProPac13/14: Snap-On nicad, 4Ah battery packs
ProPac90: Pro VTR battery
SV-13: Snap-On silver 13.5V/12Ah battery
30/13: Universal battery belt
LSQC/LSQ4: Lifesaver 8-hour single and quad chargers
LSFC: Lifesaver 1-hour fast charger
SPS-3/SPS-5: ac power supplies →

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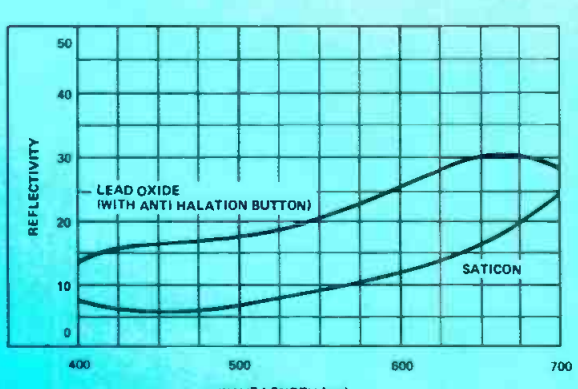
To know how good your camera tube is, look it straight in the eye.

For better color pictures, compare the color of the photoconductors.

This simple comparison demonstrates why you'll get better broadcast quality with Saticon* II. The dark red faceplate of Saticon II shows its selenium-arsenic-tellerium photo-conductor. The lighter reddish-yellow faceplate of the Plumbicon™ tube reveals its lead-oxide photoconductor.

This color difference indicates significant Saticon II advantages. Because the darker photoconductor absorbs more light, picture quality is enhanced. On the other hand, Plumbicon's lighter color photoconductor reflects more light at all visible wavelengths, as shown in the chart below.



Because Saticon II reflects less light, you benefit with reduced flare and less blooming. Low-light colors maintain their integrity and accuracy.

As a consequence, Saticon II does a remarkably good job of handling high contrast scenes in uncontrolled lighting conditions because of its low flare. What's more, Saticon II's photoconductor is a glassy, amorphous, high resistivity film. Its structure serves to ensure high resolution, high sensitivity and unmatched depth of modulation.

For more information on Saticon II, contact your RCA distributor or write to RCA Camera Tube Marketing, New Holland Avenue, Lancaster, PA 17603. Or call (800) 233-0155. In Penna., phone (717) 397-7661. Over- seas, contact RCA Brussels, Belgium. Sao Paulo, Brazil. Sunbury-on-Thames, Middlesex, England. Paris, France. Munich, W. Germany. Hong Kong. Mexico 16 DF, Mexico.

*Used by permission of trademark owner.

RCA

Take out the doubt.

Circle (44) on Reply Card

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Anton/Bauer (1337)
Continued

SNDS: Diagnostic battery evaluation unit
LG-UD: Black Beauty universal light head
Micro Control: Compact camera control unit
New products
MicroLight: Lightweight modular lighting system for universal portable applications
MicroControl: Unit for Ikegami 79E
Portable undercover VRC systems for up to 8-hour surveillance applications in any lighting situations
Miniature camera/monitor safe area generator

Circle (440) on Reply Card

Anvil Cases (1112)
Established products
Equipment transport cases for broadcast, teleproduction and cine equipment
GSA cases
New products
See at booth

Circle (441) on Reply Card
see ad on page 170

Apert-Herzog (1703)
Established products
Model A2: Digital frame synchronizer
Model H2: TBC-frame synchronizer
Model H: TBC-frame synchronizer
VBB-1: Distribution amplifier IC
1x24: 1-in/24-out DA
New products

Circle (28) on Reply Card

See at booth

Circle (442) on Reply Card

Aphex Systems Ltd. (513)
Established products
AXII—S: Studio aural exciter
AXII—B: On-air aural enhancer
AX-B: Low cost aural exciter
EQF-2: 3-band sweep EQ in powering rack unit
CX-1: Modular compressor-expander
15 37A: VCA IC
New products
Compellor: Intelligent, inaudible compressor, leveler and peak limiter for broadcast and production
MP-1: Quiet, ultrafidelity mic preamp

Circle (443) on Reply Card

Apis (1762)†
See at booth

Circle (444) on Reply Card
see ad on page 292

Applied Digital Technology (1730)†
Established products
Synchronizers. SMPTE time code
New products
See at booth

Circle (445) on Reply Card

Arbitron (802)†
Established products
AID applications for sales
Program and promotional graphics
TV meter services
New products
See at booth

Circle (446) on Reply Card

Aries Antennas (1770)
Established products
TV antenna systems and services. including installation. measurements. analysis and refurbishment of older systems
New products
See at booth

Circle (447) on Reply Card

Arrakis (211)†
Established products
100RS: Routing switcher
150SC: Audio console
5000SC: Audio console
2000SC: Audio console
2000R: Audio console
Mic mixers, pre-amps, power amps. audio DAs, LED/VU level indicators
New products
See at booth

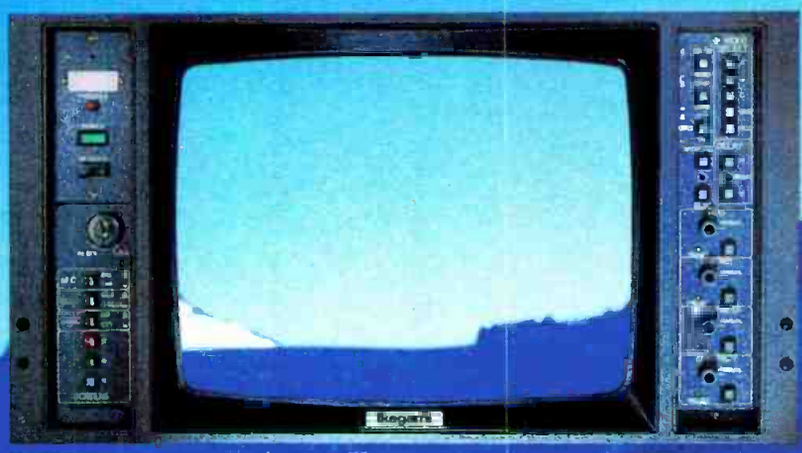
Circle (448) on Reply Card

Arriflex (1421)
Established products
35BL-3: 35mm motion picture camera
35-3: 35mm MOS film camera
16SR-2: 16mm film camera
Zeiss motion picture camera lenses
ARRI HMI lights
ARRI CineJib: Crane for film and video cameras
BTM 616: Film editor with video interface
New products
ATC: ARRI SMPTE time code unit for ARRI film cameras
Wheeled base for CineJib
ARRILITE: Portable tungsten lighting kits

Circle (449) on Reply Card →

www.americanradiohistory.com

Now there's even more to look into



TM14-9RH

TM20-9RH

Ikegami's new Broadcast Color Monitors

Ikegami has just made it impossible for any quality-minded high resolution color monitor user not to consider looking into an Ikegami monitor.

They call it the 9-Series, two new monitors (13V and 19V) with standard features that include a High Resolution Shadow Mask CRT with a Self-Converging In-Line Gun; American Standard Matched Phosphors; a Comb Filter to preserve luminance resolution; pulse cross and R-Y/B-Y outputs. We think you'll call it just what you've been looking for.

Along with its streamlined design and easily serviced modules, Ikegami's new monitors follow in a tradition of excellence. Each offers high stability, exceptional performance and proven reliability.

Together with Ikegami's Delta-Gun Series, the 9-Series provides yet another reason to look into the monitors that more and more video users are spending their time looking into.

Isn't it time you looked into Ikegami monitors?

Ikegami

9-Series monitors

Ikegami is the supplier of Color Monitors to ABC for its coverage of the 1984 Winter and Summer Games.

Ikegami Electronics (USA) Inc., 37 Brook Avenue, Maywood, NJ 07607: (201) 368-9171 • Northeast: (201) 368-9171
West Coast: (213) 534-0050 • Southwest: (713) 445-0100 • Southeast: (813) 884-2046 • Canada: (201) 368-9179

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Chances are we've already done one just like it! The fact is, we've designed, fabricated and installed video systems of every size and configuration—from ENG vans to large mobile production systems, from insert stages to multi-camera production studios, from 3/4″ editing rooms to state-of-the art post-production suites, film-to-tape facilities, videotape duplication centers, satellite network playback facilities, etc.

That's why more and more production and post-production companies, broadcasters, cable operators, corporate users and advertising agencies have come to rely on us—for our experience and engineering knowhow, and our ability to get the job done on schedule.

And they know it makes good economic sense, too. Because while we're doing what *we* do best, they can concentrate on doing what *they* do best!

So pick a video system. And then call us, today!

Please See Us at NAB Booth 1611

A.F. ASSOCIATES INC.

ADVANCED SYSTEMS AND PRODUCTS FOR THE VIDEO INDUSTRY

AFA SYSTEMS DIVISION 100 STONEHURST COURT NORTHVALE NJ 07647 (201) 767-1000

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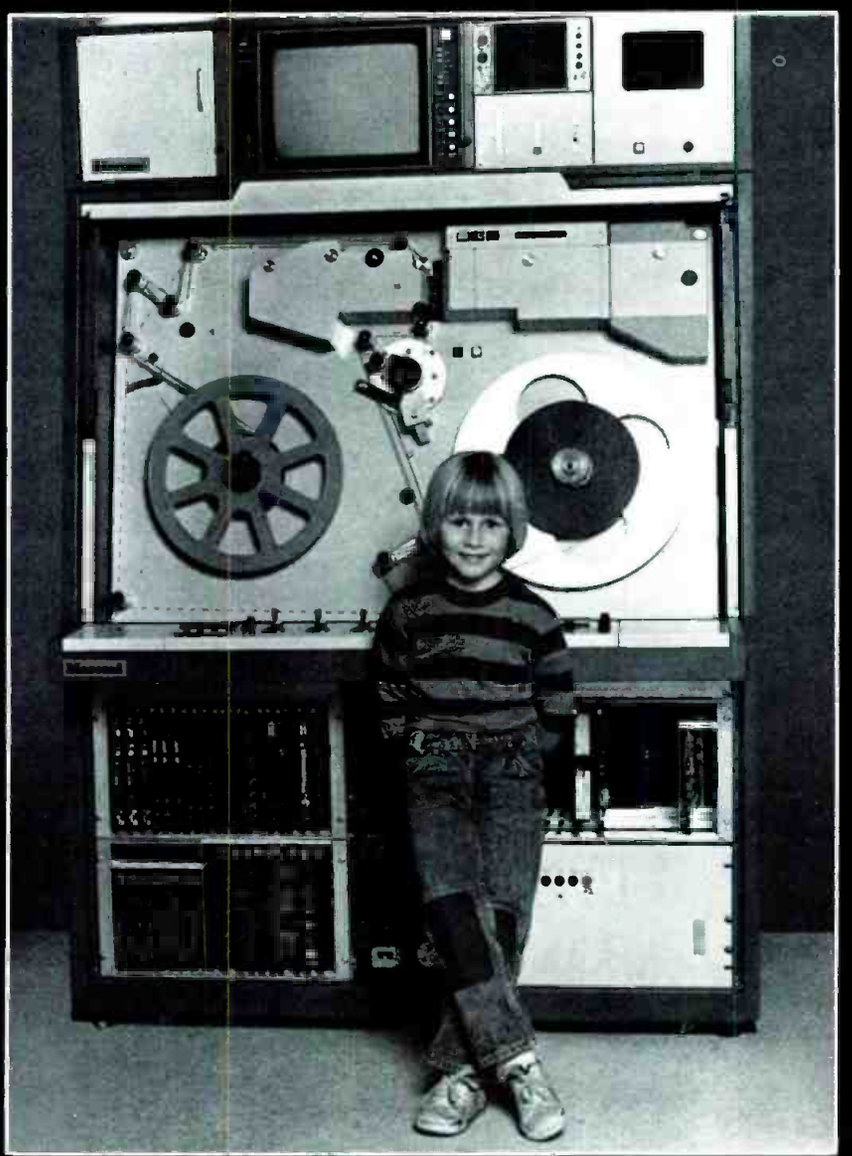
HE'S ALL YOU NEED TO START YOUR MARCONI FULLY DIGITAL TELECINE!



He's 5½ going on 6 and he isn't a genius. But the Marconi Line Array Telecine B3410 doesn't need a genius.

Unlike other telecines, the Marconi B3410 is fully digital. That means, among other things, it can deliver full performance within two minutes from the time you switch on. It does not require tweaking or day-to-day adjustments, and there is no registration drift or tubes to replace. The stability of its electronics is simply superb!

Once it's started, you'll appreciate the Marconi B3410 for its fully digital processing and CCD image sensors that provide an extraordinarily true video picture. Moreover, the Marconi B3410 has a light bias facility that resolves dark areas of the film. It converts into all international standards and interfaces with all available color correctors.

For more information on specifications and the cost of the Marconi B3410, call us in New Jersey (201) 767-1000 or in California (213) 466-5066.

Please See Us at NAB Booth 1611

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Artel Communications (1163)†
Established products
SL-2000: Fiber-optic transmission system for video/audio/data
EN-1000: Portable fiber-optic ENG/EFP transmission system
T/R-2000: Long distance video transmission plug-in modules
T/R-2150/2121: Dual-channel audio subcarrier system for SL-2000
T/R-2210: Data transmission subcarrier plug-in modules for the SL-2000
ACU-2000: Alarm control unit for multichannel fiber-optic video/audio/data systems
T/R-2020: Fiber-optic composite video/audio plug-in module system for the SL-2000
T/R-2013: High resolution fiber-optic video transmission system for computer graphics communications and high definition RGB video
T/R-2000L: Long distance transmission system for broadcast-quality video/audio
S-1000: Low profile card frame for SL-2000 fiber-optic function modules HDVT/computer graphic products
New products
Long distance fiber-optic system
Circle (450) on Reply Card

Asaca/ShibaSoku (1226)
Established products
925R: Video noise meter
CMM20-14/11: High-resolution color monitors
CMM20-14/7: High-resolution in-line color monitors
Digital signal generators
Video production switchers
Portable signal generators
New products
Video monitor for 1125-line TV system
VS13AO: 150MHz sweep generator
TG52A: Digital signal generator
AEV-300: Multi-image viewer
ACL-3000: Broadcast cart system
Circle (451) on Reply Card
see ads on pages 85, 327 and 338

Associated Press (419)†
See at booth
Circle (452) on Reply Card

Atlas Tower (443)†
Established products
Series: AM, FM and TV broadcast towers
New products
See at booth
Circle (453) on Reply Card

Auburn (1711)†
Established products
MC/1: Machine control system
New products
See at booth
Circle (454) on Reply Card

Audico (1343)
Established products
System III: Videocassette tape loader, reloader, rewinder for U-matic, VHS and Beta
619-P: Cassette-to-cassette transfer unit accessory for System III
200-9: Audiocassette timer, rewinder, exerciser
Cassette labels
Video splicers for U-matic and ½-inch formats
Audiotape loaders for cassettes, broadcast and 8-track discs and Nagra reels
New products
619-R: Video rewinder for U-matic, VHS and Beta formats to operate with other equipment in unloading and reloading cassette housings
Circle (455) on Reply Card
see ad on page 196

Audi-Cord (123)
Established products
A Series: Cartridge tape recorders and reproducers
B Series: Premium line cartridge recorders and reproducers
New products
TDS Series: Twin-deck cartridge tape reproducers
Circle (456) on Reply Card

Audio + Design/Calrec (402)
Established products
F769X: Stresser compressor/limiter with expander, gate and EQ
Express Limiter: Stereo compressor/limiter processor with expander
Easy-Rider: Dual mono/stereo compressor/limiter
Transdynamic: Multiband processor for AM, FM or TV
Ampak-8: 8W monitor amp
Scamp: Modular production processor
TCR1: Portable EBU/SMPTE time code reader/regenerator
E900: 4-band, dual mono or stereo EQ
CM2000 series: Condenser microphones
New products
Scamp: Enhancements to multiband processing system for AM, FM and TV
F601/D60: Super-dynamic limiter and delay line
PROPAK: Semi-pro to pro level interface plus EIAJ digital recording option
COMPEX-2: Compressor/limiter with expander and gate for broadcast or production
Minimixer: 2-output portable or studio mixer handles 8 to 16 inputs, with 19-inch, rack-mount model available
SOUNDFIELD: Totally coincident stereo mic
Assignable console places more than 100 channels within easy reach of one operator
SCAMP: Modules include S30 expander/gate and S31 compressor/limiter
Ambisonic mono/stereo compatible surround sound system with broadcast encoders
Circle (457) on Reply Card
see ad on page 217

Audio Broadcast (637A)†
See at booth
Circle (458) on Reply Card

Audio Developments (1737)
Established products
145: Pico and field mixers with 4 and 6 inputs
New products
See at booth
Circle (459) on Reply Card

Audio Developments (1743)
Established products
AD-062: Portable 8- to 16-input, 3-output audio mixer
AD-145: Portable 4- to 6-input, 2-output audio mixer
AD-160: Portable 3- to 4-input, 1-output audio mixer
New products
See at booth
Circle (460) on Reply Card

Audio Kinetics (1173)
Established products
Q-Lock 3.10-3/3.10-2: Synchronizer
Q.Soft-SFX: Sound effects assembly software
Q.Soft-ADR: Dialogue replacement software
Q-Soft-Conform: Audio track editing software
New products
Q.Lock 3.10 enhancements including software for digital audio editing
Mastermix: Console automation system, using floppy disk-based memory, adaptable to various concoles with retrofit packages available for non-automation ready systems
Circle (461) on Reply Card

Audio-Technica US (1141)
Established products
AT815a: Battery-powered shotgun mic
AT835: Battery-powered short shotgun mic
AT815R: Phantom-powered shotgun mic
AT836: Studio dynamic uni mic
AT802: Studio dynamic uni mic
AT813R: Studio electret condenser uni mic
New products
AT803a: Battery/phantom-powered miniature omni lapel mic
AT831a: Battery/phantom-powered miniature uni lapel mic
Circle (462) on Reply Card
see ad on page 195

Auditronics (505)
Established products
200 Series: On-air broadcast consoles
700 Series: Multichannel audio mixing consoles
1100 Series: Audio accessory systems
RTW peak program meters
New Products
300 Series: Audio production console
Circle (463) on Reply Card
see ads on pages 171 and 330

Aurora Systems (1312)
Established products
Aurora/100: Digital videographics and animation system
New products
See at booth
Circle (464) on Reply Card

Autogram (120)
Established products
AC Series: 6- and 8-channel audio consoles
IC-10: 10-channel audio console
Microgram: Microprocessor-controlled console with live-assist and automation capabilities
New products
See at booth
Circle (465) on Reply Card →

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Shure's new FP31 Mixer takes a big weight off your shoulders.

Introducing the most innovative field production mixer of its kind. Shure's FP31. You won't find another mixer this small with these features, dependability and ease of operation.

The FP31 measures only $6\frac{5}{16}$" x $5\frac{5}{16}$" x $1\frac{7}{8}$", and weighs just 2.2 pounds! Incredibly, it offers the same important features as much larger mixers. Plus, a few of its own.

Every channel has a mic/line level and a low-cut filter switch. And to prevent overload distortion, there's a built-in limiter with adjustable threshold.

The FP31 can be powered by two internal 9-volt batteries, or from an external 12-volt source. A green LED flashes to remind you that the mixer is on. Phantom and A-B power are also provided to operate lavalier and shotgun microphones.

A slate tone can be laid down on the tape for locating specific takes, and there's also a built-in mic for voice slating.

The mixer also has two separate mic/line outputs for 2-camera shoots and a tape output to feed a cassette. For monitoring, there are two stereo headphone jacks—one ¼-inch and one for miniplugs. The FP31's rugged nylon carrying case allows you easy access to every mixer function and lets you piggyback the mixer on your VCR or other equipment.

For ENG, EFP and film use, Shure's FP31 has everything you need to make your mix a perfect success. Coming from a mixer this small, that's quite an accomplishment.

For more information on Shure's FP31 Mixer, call or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204, (312) 866-2553.

SHURE

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Avantek (1742)
New products
See at booth
Circle (466) on Reply Card

B&K Instruments
See *Brüel & Kjaer*

BGW Systems (421)†
Established products
75: 25W/channel stereo power amplifier
150: 50W/channel stereo power amplifier
250: 100W/channel stereo power amplifier
750: 225W/channel stereo power amplifier
2242: Distribution amplifier
SRM10: Tannoy monitors
SRM12: Tannoy monitors
M1000: Tannoy monitors
New products
See at booth
Circle (467) on Reply Card

BIW Cable Systems (1405)
Established products
Camera cables and assemblies
VTR cables and assemblies
Triaxial cable and assemblies
New products
VTR cables with quick disconnect and armored features
Fiber-optic cables and assemblies
Circle (468) on Reply Card

BSM Broadcast Systems (637)
Established products
ADA Series: Audio DAs
New products
Series 200: 10x1 audio routing switcher
Series 1000: 10x10 audio routing switcher
Series 5000: 150x150 audio-video routing switcher with computer control
Circle (469) on Reply Card

BTX (1124)
Established products
4790: Softouch audio editing system
4700: Shadow II synchronizer
6000/6100: Cypher modular time code systems
New products
4735: Transport command console
7000: The System intelligent synchronizer/controller editor
4790 options: Mass storage unit and printer options
Circle (470) on Reply Card

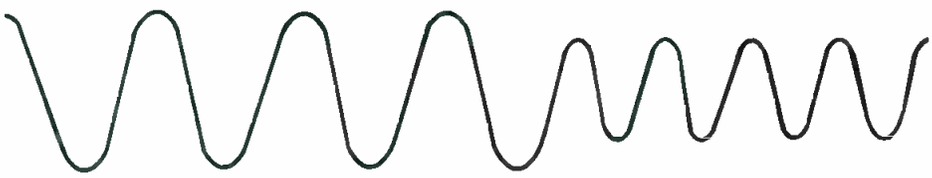
B-W Lighting Systems (1753)
Established products
ac power distribution equipment grid systems
Fixtures
Lighting control equipment
Cyclorama track and curtain systems
New products
20-201/T: Cyclorama lights and accessories
Circle (471) on Reply Card

William Bal (1614)
Established products
Custom carrying and shipping cases for audio and video equipment and accessories, featuring heavy-duty Survivor and Road case lines
New products
Silverlan: Superior strength and durability combined into carrying case line
Circle (472) on Reply Card

Barrett Associates (103)
Established products
Reconditioned used broadcast equipment covering spectrum from transmitters to turntables
New products
DB-8: Davbar Space Saver broadcast automation system
Circle (473) on Reply Card

Basys (1129)
Established products
Newsfury: Broadcast newsroom computer system
Clipfury: Library system for videotape
Personal Assistant: Single-user newsroom computer system
New products
See at booth
Circle (474) on Reply Card

Bayly Engineering Ltd. (124)
Established products
S3161: 100W FM solid-state transmitter
S3169: 500W FM solid-state transmitter
MDST3158: Solid-state stereo encoder
FM15H: 5W VHF hand-held transceiver



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Proper and steady voltage is esstential to the operating efficiency and tube life of a transmitter. Automatic voltage regulators are the most over-looked components of a transmitter installation. Don't ignore your transmitter's needs.

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Circle (307) "Have Salesman Call"

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Now is the Time to Cut Your Land Lines!

It's really very simple. Just switch from expensive phone lines to Comtech's new DART 384 (Digital Audio Receiver Terminal) and receive your network audio directly from the satellite with full fidelity, less cost, and greater control than ever before.

Six Major Benefits

Ordering the DART 384 Terminal gives you six immediate benefits:

1. 10-20% lower cost than the other guys (Lease or Purchase).
2. Better performance under marginal conditions.
3. Immediate off-the-shelf delivery.
4. Avoid phone troubles—forever.
5. User-friendly.
6. Quick response to customer's problems.

DART 384 is priced 10-20% below the other guy's model and yet our bigger 3.8 meter antenna gives it more performance margin per dollar. It gives you everything you need to match or exceed all network audio quality requirements. Comtech's 3.8 meter antenna also operates better under the proposed 2° satellite spacing compared to the competition's 2.8 meter.

The DART 384 is user-friendly. It is designed for easy installation and maintenance. The indicators are **really** useful for accurate antenna pointing and isolating problems. If you need help, Comtech and Allied are ready to respond quickly.

The DART 384 Terminal consists of Comtech's high-performance 3.8 meter antenna, low-noise amplifier, antenna-mounted down converter and demodulator shelf with 8-channel program capacity. Channels can consist of a mixture of audio channels and one voice cue channel.

And there you have it. Better service. Lower costs. The proven path to profits since the beginning of business.

For a closer look at this audio receiver terminal alternative, call Allied Broadcast Equipment toll free at **1-800-428-6954.**

ALLIED
Broadcast Equipment
1-800-428-6954

The DART 384 is produced by
COMTECH
Comtech Data Corporation *Comtech Antenna Corporation*
Subsidiaries of Comtech, Inc.

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With two dial telephone lines and the Comrex 2X, you can have a beautiful, quiet 5 KHz broadcast channel, instantly, easily and wherever you want.

For more information, call or write
P.O. Box 269, 60 Union Ave., Sudbury, MA 01776 617-443-8811

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AM BROADCASTING - HIGH FIDELITY
Are these terms mutually exclusive?
☐YES ☐NO ☐DON'T KNOW

Suprisingly, many broadcasters may not know that the correct answer to this question is no. Large sums of money are spent each year to purchase new transmitters, new studio equipment, new audio processing equipment and to modify antenna systems for improved AM sound. Unfortunately, until now, there has been no such thing as a professional quality AM monitor receiver. As a result, the perceived fidelity of an AM signal has been severely restricted by receiver performance.

Potomac has developed the SMR-11 Synthesized Monitor Receiver which will let you hear and measure the quality of your transmitted AM signal ... perhaps for the first time. Features include: Crystal Stability; 60 dB Signal to Noise Ratio; Audio Frequency Response ±0.5 dB, 20 Hz to 8 kHz; Total Harmonic Distortion less than 0.2% (95% Modulation) at audio frequencies above 40 Hz ... please write for complete descriptive brochure.

THIS DIAL WILL TUNE YOU IN TO THE NEW SOUND OF AM BROADCASTING

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932 PHILADELPHIA AVE.
SILVER SPRING, MD. 20910
(301) 589-2662

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Bayly (124)
Continued
FM14H: 4W UHF hand-held transceiver
FM25H: 25W VHF mobile transceiver
FM25H4: 25W UHF mobile transceiver
FM45V: 45W VHF mobile transceiver
Omniplexer: STL system
New products
See at booth
Circle (475) on Reply Card
see ads on pages 303 and 325

Beaveronics (1313)†
Established products
712: 4-bus, 12-input video production switcher with Eff/Key Amp and Mix Amp
BI-154: 4-bus, 15-input video production switcher with Mix/Eff/Key Amp and Mix/Key Amp
BI-156: 6-bus, 15-input video production switcher with two Mix/Eff/Key Systems
QMS: Favag precision master clock systems
DSK-6-DL: Stand-alone downstream keyer, specifically designed for character generator inserts
Clocks, master/slave
New products
See at booth
Circle (476) on Reply Card

Belar Electronics (203)†
Established products
Series: AM modulation and frequency monitors
Series: FM modulation and FM stereo monitors
Series: TV modulation and frequency monitors
Series: FM and TV SCA monitors
Series: AM, FM, TV RF amplifiers
New products
See at booth
Circle (477) on Reply Card
see ad on page 312

Belden Communications (1628)†
Established products
Series: Lee filters Colormedia
HMI: High wattage unit that replaces Brute arc lights
Lee resin camera filters
New products
See at booth
Circle (478) on Reply Card

Beston/McInnis-Skinner (1020)
Established products
Newscan: Computerized newsroom with unlimited workstations
Data Prompter: Prompting system for electronic newsroom
Marquee 2000/3000: Production character generators with optional font compose, animation programmer
New products
Data-Graphics: Direct-broadcast computer graphics system for maps, charts and graphics from bargraphs to intricate weather maps
Circle (479) on Reply Card

Beyer Dynamic (426)
Established products
M series microphones
CV series microphones
CK series microphones →

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Add Color to Your Audio

In growing numbers, broadcasters and postproduction houses are using the 200 to add ambience to their audio. The 200's Hall and Chamber programs add reflected energy to dry voices, delivering fullness while maintaining clarity and articulation. Simple adjustments of the 200's size control can produce ambiences that identify an unlimited variety of spaces, such as a wooden cabin, an empty factory, a long corridor, or a stone temple. Scenes and dialog acquire more meaning – and the audience's ears appreciate ambience as much as their eyes appreciate color.

A reliable, cool-running, affordable package.

Human-engineered panel controls for easy, intuitive operation.

On-board mixing.

Programmable nonvolatile memory for storing up to 10 user setups with instant recall.

Now with the Lexicon Model 200 Digital Reverberator, broadcast audio takes on new color.

Size control – from the smallest closet to grandest canyon.

Balanced input and output connections with a maximum signal level of +24 dBm – in full stereo.

Hall, Chamber, and Plate programs – each with 10 preset variations.

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with 30% fewer parts?

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Relax.

NEC PCN-1200 Series VHF-TV Transmitters with exciter output options have 30% fewer circuit parts than conventional-type transmitters. That's 30% fewer parts to worry about. You get more reliability, less maintenance.

And because conventional tuning capacitors and sliding-type inductances have been eliminated, you get broad-band frequency coverage with no tuning adjustment.

Find out what more you could do with a VHF transmitter with fewer parts. Call NEC at 1-800-323-6656.

NEC
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Broadcast Equipment Division
130 Martin Lane
Elk Grave Village, Illinois 60007
In Illinois: (312) 640-3792

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Beyer Dynamic (426)
Continued
DT series headphones and headsets
New products
MC734: Studio condenser mic
MC736: Short shotgun mic
MC737: Long shotgun mic
MPC50: Acoustical boundary mic
Circle (480) on Reply Card
see ads on pages 264 and 265

Bird Electronic (1625)
Established products
460-490 Series: Thruline wattmeters
8700 Series: Water-cooled Termaline coaxial load resistors
8600 Series: Moduload terminatins
6080: Digital calorimeter
4380 Series: Digital RF power analysts
3000-5000 Series: FM coax filters
3100 Series: Wattcher RF power monitor/alarms
New products
8572: 225kW forced-air dry load resistor
8570: 15kW forced-air dry reject load and termination
4030: Relative field-strength Thruline plug-in elements
Circle (481) on Reply Card

Bogen Photo (1705)
Established products
3069: Fluid head/tripod/dolly system
3145: Video caddy
3124: Tripod/fluid head/dolly system
3140: Tripod with mini fluid head
3126: Micro fluid head
3063: Mini fluid head
3061: Heavy-duty tripod
TSELC and TSELF: Cases
7000 and 7050: Quartz Lamps
3086: 8-foot light stand
2900: Super clamp
New products
7300: M-100 portable video light
2930: Magic Arm
7567: Custom pack for TSE cases
Circle (482) on Reply Card

Bogner Broadcast (1319)
Established products
High-power UHF-TV transmitting antennas
Low- and medium-power UHF and VHF slot and dipole transmitting antennas
CP FM transmitting antennas
MDS and ITFS transmitting/receiving antennas
LPTV transmitting antennas
New products
Base station antennas for 800-900MHz SMR and cellular radio
Circle (483) on Reply Card

Robert Bosch (1603)
Established products
KBF-1/KCF-1: QuarterCam VRC system
TVS-2000: Routing switcher
FDL-60: Telecine
RGS-4000: Graphics/animation system
Mach One: Videotape editing system
MC Series: Color video monitor
BCN Series: 1-inch B VTRs
RME Series: Production switchers
New products
RME: New switcher models
FDGR: Grain reducer for FDL-60
FRP: Color correction system for FDL-60
Circle (484) on Reply Card
see ads on pages 309 and 319 →

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N E W F R O M U T A H S C I E N T I F I C

A NEW DIMENSION IN MASTER CONTROL SWITCHING

Utah Scientific, the industry's number 1 supplier of routing switchers, has now applied its talents to an allied area—Master Control Switching. Designed for immediate conversion to stereo and / or station automation, Utah Scientific Master Control Switchers are designed to deliver superior performance today while accommodating your future needs as well.

- *Two models: two bus and three bus*
- *The industry's best performance specs*
- *Full preset capability with "goof-proof" single-button execution*
- *Integral edge, shadow, outline and color matte*
- *28 direct inputs plus two assignable from panel*
- *Alphanumeric readouts on assignable inputs*
- *All-digital interconnect via RS-422 lines*
- *Top quality switches*
- *Stereo-ready—just add the matrix and one card*
- *All panel functions software controlled*
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Telex: 84-6342

Circle (40) on Reply Card

Bowen Broadcast Service (1770)
Established products
Engineering design and consultant services
Quad VTR repair services
New products
See at booth
(Circle (485) on Reply Card

Broadcast Audio (319)
Established products
Series II: 6- to 16-mixer modular stereo audio consoles
System 14: Digitally controlled 14-mixer console
System 20: 20-mixer advanced console
System R: 8-mixer rotary pot console
System 5: 5-mixer rotary pot console
BA-235: Monitor amplifier
BA-6x4: Audio DA
New products
BA-120: Rack-mount monitor amplifier/speaker system
Circle (486) on Reply Card

Broadcast Cartridge (611)
Established products
Tape cartridges: Aristocart, Capitol/Audiopak, Fidelipac, 3M Scotchcart
Storage systems
Cart reloading service
Alignment tools and accessories
Fone box
New products
AA-4: Capitol/Audiopak cartridge
Circle (487) on Reply Card

Broadcast Electronics (303)
Established products
FM transmitters with 1.5kW, 3.5kW, 5kW and 30kW power levels
FX-30: FM exciter
Control 16X: Program automation system
SAT-16: Satellite automation system
Series 3000/2100: Single-deck cart machines
Series 5300: 3-deck cart machines
Series 5500: 5-deck cart machines
Series 12C: Turntables
Series 50, 150, 250 and 350: Audio consoles
Audio and transmitter accessories
New products
See at booth
Circle (488) on Reply Card

Broadcast Microwave Services (1749)
Established products
TBT 50A/TBR-50A: 2-lb. frequency-agile ENG transmitter/receiver
CGA-1: Gyro-controlled helicopter ENG system
TBT-202/TBR-202: Intercity link T/R systems
TBA-14: Low-cost video remote receiver
TBR-2K: Frequency-agile full feature portable microwave receiver
TBT-1K/TBR-1K: Rack-mount microwave T/R systems
New products
TBT-2K: ac/dc-powered, field serviceable microwave transmitter of modular, frequency-agile design
BES-5,6,7: Remote-controlled earth station with 30-station memory and auto "go-to" capability
Circle (489) on Reply Card

Broadcast Music (619)†
Established products
Syndicated radio program services
New products
See at booth
Circle (490) on Reply Card

Broadcast Programming Int'l (200)
Established products
Music programming for automated and live-assist radio stations
New products
Newly developed adult contemporary, album rock, album rock/CHR crossover and country formats
Circle (491) on Reply Card

Broadcast Supply West (112A)
Established products
Prorax all-mahogany cartridge racks in wall-mount or carousel styles
Proamp PP220: Stereo phono preamp
Probase turntable base for SP15 and SP25 Technics systems
ME3009R: Tonearms
S220: Syntec tonearms
New products
See at booth
Circle (492) on Reply Card

Broadcast Systems (1500)
Established products
BJ-200: Pre-wired audio jack panels
BJ-240A: Pre-wired audio jack panels
Custom TV system design and construction services
New products
DC-8: Video cart machines, designed for low-cost automated playback of commercials, PSAs and programs
PROPAK equipment consoles for editing suites, small production systems and mobile units
MC Series: Machine control panels for film and VTR equipment
Circle (493) on Reply Card
see ads on pages 335 and 343

Broadcast Technology (1701)
Established products
AU3101: Line amp
AD3108: 1x8 DA
AP3210: 10W power amp
AS3316: 16x1 audio crosspoint switch
PS3400: Power supply card +14V, 400mA
EG3501: Remote control 10-band graphic EQ
VU3722: 20-segment LED VU/peak indicator card
MA110: Meter amp
DA7111: 1x10 DA system
CF9101: Card frame
MM2121: Mix minus portable mixing consolette
PI2320: Program interrupt director station
HA1290: Battery-powered headphone amp
New products
Vector 4000: 24-channel single pair monitor DA system
Vector 1: 12-channel hard-line amplified selectable monitor system
MI2112: Mix minus console with 5-level priority interrupts
MI2326: 6x6 mix minus with program interrupt
Telephone hybrid with full AGC
Circle (494) on Reply Card
see ad on page 253 →

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Give people great sound and they'll come back for more!

Let's face it. Listeners will never know that the Delta Series, ITC's new generation of cartridge machines, has improved cart guides, a crystal-referenced servo capstan motor with a vapor-honed non-magnetic shaft, and high-speed recue. They won't care that the Delta's modular design makes alignment and service convenient.

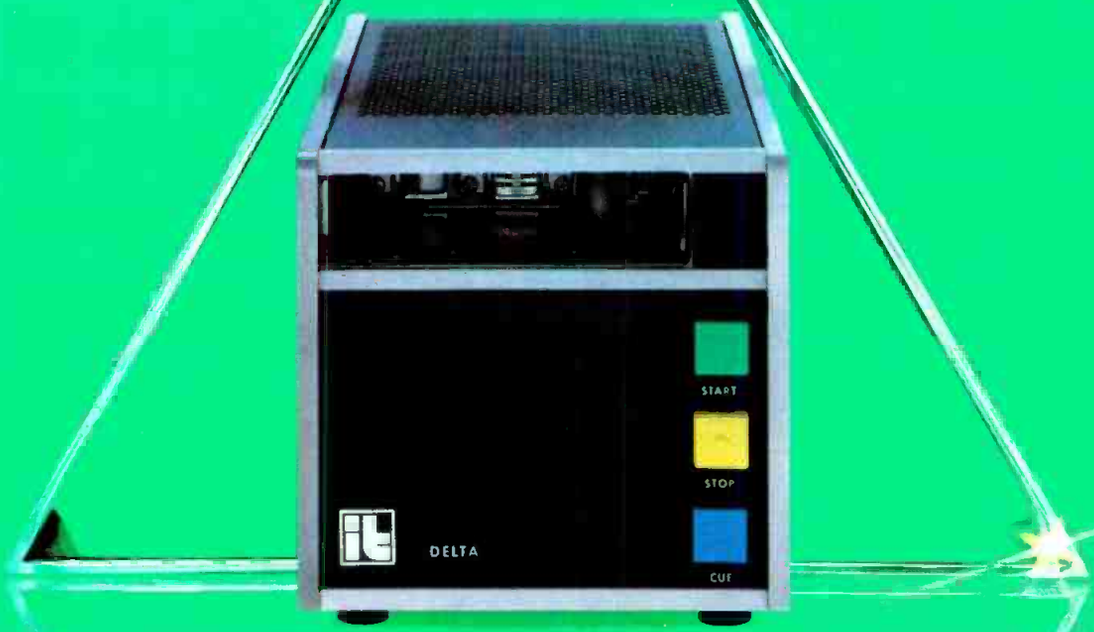
Listeners won't know about Delta's microprocessor-controlled digital cue tone detector and exclusive ITC playback head. Delta's compact size and choice of four configurations won't matter to them.

And the average listener won't know that ITC sells more professional cartridge machines than all other manufacturers combined. Or that the Delta Series replaces the Premium Line, previously the standard of value in the industry.

A lot of the things that make the Delta Series special. . . features that matter to you . . . don't matter to your listeners.

But that's okay. Because the thing your listeners care the most about is exactly what the Delta Series gives them . . . great sound.

The Delta Series sounds great... for you and for your listeners!



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Call Toll-Free: 800-447-0414

From Alaska, Hawaii and Illinois call collect: 309/828-1381

3M hears you...

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Broadcast Video Systems (1326)
Established products
COX 600J: Encoded color corrector with time code control
EV4060: Combined waveform/vector monitor
SA-101: Safe area generator
BVS video delay lines and filters
COX 303: NTSC/PAL encoder (dual standard)
New products
COX CVP-100: Video processor, accepting RGB from computer regardless on scan rates, encoding NTSC/RS170A video
BVS D-1000: NTSC decoder
COX component color corrector
COX component switcher
Circle (495) on Reply Card
see ad on page 342

Brüel & Kjaer Instruments (511A)†
Established products
Measuring microphones
Sound level meters
Acoustics analyzers
Sound sources
Sound measuring equipment
New products
See at booth
Circle (496) on Reply Card

Bryston Ltd. (517)
Established products
2BLP: 50W, single-rack unit audio amp
3B: 100W audio amp
4B: 200W audio amp
New products
2BLP enhancement: 50W, single-rack unit audio amp, with balanced XLR connections and front panel repair access
Circle (497) on Reply Card

Byline Magazine (506)
(CBS Radio Stations News Service)
Established Services
Multiple 90-second news feature broadcasts on subjects important to today's news-oriented adult radio listener
New services
See at booth
Circle (498) on Reply Card

CAT Systems (1014B)
Established products
5200/5250: Computerized remote control system for satellite facilities
6200: Computerized remote control system for broadcast
New products
6200A: Broadcast remote control system using light pen for operation
6300: Computerized RF switching schematic in color
7000: Security system
Circle (499) on Reply Card

CEI-Panavision (*)†
Established products
Foton: Studio color camera; 25mm and 30mm format
Panacam: Electronic cinematography camera
310SP: EFP color camera with "film look" special performance features
New products
See at booth
Circle (500) on Reply Card

CMC Technology (1425)
Established products
Refurbishing services for audio and quad video heads
Videomax TD-800: Bulk tape demagnetizer
Quadhead and VTR accessories
New products
Replacement video heads for C-format machines such as VPR 2B, 3 and 80, featuring an auto-tracking record/reproduce video head
Circle (501) on Reply Card

CMX/Orrox (1639)
Established Products
CMX 3400 and 3400+: Large-scale editing systems
The Edge: Medium-scale editing system
New products
See at booth
Circle (502) on Reply Card

CRL Audio (300)
Established products
SMP-900: Matrix AM stereo limiter
APP-400/SPP-800: Multiband mono and stereo AGCs
SEP-400A: 4-band compressor/expander
SMP-800: FM peak controller
PMC-300A: AM mono peak controller

AT NAB '84 SHINTRON ANNOUNCES...

EMPRESS 2000
A BRILLIANT NEW SWITCHER

690
A TIMECODE READER/GENERATOR

270
AUDIO FOLLOW VIDEO MIXER

And for component video people we will have...

MC1 LONG-AWAITED INTERMATRIX CONVERTER

12X SERIES ROUTING SWITCHER

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SHINTRON Europe, 198 Avenue Brugmann, 1180 Brussels Belgium Tel: 02-347-2629/Telex: 61202

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t prompt users
ough 18 reverb
effects programs
their 59 variations

Soft-labeled sliders for complete control of up to 32 parameters per program

Interface for tape storage of user-created reverb and effects variations

Self-diagnostics

Splits – two independent, 1-in/2-out, 15-kHz stereo reverbs in one package

Software expandable – ready to answer the needs of tomorrow

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224 XL

Reverberation/Effects Processor

the most critical recording
d listening environments,
e 224X has become the bench-
ark for value, sonic quality, and
eative potential. Now, with the
dition of the Lexicon Alphanu-meric Remote Console (LARC),* 224XL users can enjoy unparalleled ease of operation and expanded creative possibilities.

*Field conversion to XL is available for owners of 224X systems.

For more information, call or write for our new brochure that describes the XL's advanced features and includes a Lexicon "Glossary of Reverberation Terms."

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60 Turner Street
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(617) 891-6790
Telex 923468

Export: Gotham Export Corporation
New York, NY 10014

lexicon

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CRL Audio (300)
Continued
SCA-300: SCA subchannel generator
New products
FM stereo generator using a new technology in FM transmission
Circle (503) on Reply Card
see ad on page 15

CSI Electronics (507)†
Established products
T-1-A: AM transmitter
T2.5A1: AM transmitter
T-10-A: AM transmitter
T-1-F: IPA FM transmitter
FM3000E: FM transmitter
FM5000E: FM transmitter
FM12000E: FM transmitter
T-25-F: FM transmitter
EX-20F: FM exciter
T-25-A1: AM transmitter
Alarms: Status
Generators: Stereo, SCA
New products
See at booth
Circle (504) on Reply Card
see ad on page 197

Cablewave Systems (108)
Established products
4.5-inch jacketed coaxial cable
Wellflex coaxial cable in ⅞-inch, 1⅝-inch, 3-inch and 3½-inch OD sizes, with air dielectric
New products
FLC low-loss foam dielectric Wellflex coaxial cable, jacketed in ½-inch, ⅞-inch and 1⅝-inch OD sizes
Circle (505) on Reply Card
see ad on page 261

Calvert Electronics (125)
Established products
EIMAC transmitting tubes
RCA power and camera tubes
Thomson-CSF translator tubes
Miscellaneous replacement components
New products
See at booth
Circle (506) on Reply Card
see ad on page 165

Calzone Case (1179)
Established products
Various types of shipping and carrying cases for video production equipment
New products
See at booth
Circle (507) on Reply Card
see ad on page 244

Cambridge Products (1328)†
Established products
Series: RF and UHF coaxial connectors
New products
See at booth
Circle (508) on Reply Card

The Camera Mart (1018)
Established products
Numerous audio, video and film production products available for purchase or rental
New products
See at booth
Circle (509) on Reply Card

Canare Cable (1732)
Established products
L4E6S: Starquad audio cable
3C-2VS/5C-2VS: Low-loss video cables
R380: Cable reels with three brake positions
New products
See at booth
Circle (510) on Reply Card
see ad on page 30

Canon USA (1012)
Established products
J13X9BIE and J15X9.5B Series: ENG lenses
J20X8.5BIE, J25X11.5BIE Series: EFP lenses including PV40X13.5BIE and P40X18BIE Series: O/B lenses
Accessories for all types of broadcast lenses
New products
P18X15BIE and PV18X11BIE: Studio lenses for 1-inch and 1¼-inch format cameras
J40X9.5B: Field lens for ⅔-inch format cameras
J18X9: ENG lens for ⅔-inch camera formats
Circle (511) on Reply Card
see ad on page 135

Capitol Magnetic Products (206)
Established products
A-2: Broadcast cartridge
AA-4: Broadcast cartridge
New products
SGS-4: Lubricated mastering tape
Circle (512) on Reply Card
see ad on page 308

CeCo Communications (1010A)
Established products
Distributor for Amperex, EIMAC, ITT, RCA, Sylvania, Varian and Westinghouse receiving, industrial and transmitting tubes
New products
Video stocking department carries large selection of video equipment and accessories from Hitachi, NEC, Panasonic and Sony
Circle (513) on Reply Card

Celestrial Mechanix (441)†
Established products
Marketing programs to promote radio stations
New products
See at booth
Circle (514) on Reply Card
see ads on pages 248 and 249

Celwave RF (202)
Established products
Antenna systems and hardware
Transmission lines and pressurization equipment
Coaxial cable and wire
Patch panels and cables
New products
See at booth
Circle (515) on Reply Card

Central Dynamics (1409)†
Established products
CD480/4/16: Compact Video production switcher
CD480-10/24: Video production switcher
CAP2XL: Computer-assist production accessory
MC990-7/24: Master control switcher
APC-910: Machine control
VS-14RB: Small production switcher
APC-920: True time broadcast automation system
2170: 1-bus quadplexer-digital test signal generator
2300A: Full range video and audio distribution
8000: Amplifiers
CD480-65: Video production switcher
VMK3700: Video mixer keyer
VA2300: Video and pulse DAs
CAP 2xL: Computer assisted video production system
VMK 370: Video mixer keyer
Flexikey: Digital video effects
New products
See at booth
Circle (516) on Reply Card

Centro (1101)
Established products
Teleproduction and post-production facilities planning and design
Remote teleproduction units
New products
Broadcast facility design including KIHS-TV 46, Ontario, CA
45-foot teleproduction unit for One Pass, San Francisco
Teleproduction facilities for Paramount Pictures and Santa Fe Communications
Circle (517) on Reply Card
see ad on page 277

Century Precision Optics (1781)
Established products
Telephoto and wide-angle lenses for video
Custom lens service and modification
Wide-angle adapter for video zoom lenses
New products
Periscope (snorkel) lens for cine and video cameras features camera mount and lens interchangeability, based on f/3.8 (T/4) multicoated optical elements
Circle (518) on Reply Card

Century 21 Programming (204)
Established products
Automation programming services
New products
Super Cart: Instant delivery of music library on carts
Super Schedule: Music rotation schedules
Circle (519) on Reply Card

Cetec Antennas (509)
Established products
JTC: CP TV spiral transmitting antenna
JSCP: CP FM antenna
JHCP: CP FM super power antenna
JBCP: CP FM broadband antenna
JSP: CP FM spiral panel antenna
Radomes
New products
See at booth
Circle (520) on Reply Card
see ad on page 187

Cetec Vega (1401C)
Established products
77D: Pocket transmitter
R-31: Pro receiver →

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calendar

April-June

A 4-day course on digital image processing offered by Integrated Computer Systems will present topics including image acquisition; enhancement; tracking and coding; and image processing software and database structures. The course will be offered as follows: April 10-13, Boston; April 24-27, Phoenix, AZ; May 1-4, Palo Alto, CA; May 8-11, Washington; and June 19-22, Los Angeles. For more information, contact Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45405, Los Angeles, CA 90045; 213-417-8888.

April 8-12

National Public Radio (NPR) will hold its annual affiliates' convention at the Hyatt Regency Crystal City in Arlington, VA. Technical sessions are planned for two days of the convention, although at press time a listing was not available. Additional sessions are scheduled for programming and financial matters. A number of broadcast equipment manufacturers plan to attend the convention, although there will not be a formal equipment show.

April 25-27

EDS-'84 will be held in the Las Vegas Hilton Hotel, Las Vegas, NV. For the first time in the convention's 47-year history, distributors are invited as exhibitors. For more information, contact Electronic Industry Show Corporation, 222 S. Riverside Plaza, Suite 1606, Chicago, IL 60606; 312-648-1140.

April 29-May 2

NAB-'84 will be held in Las Vegas, NV. For more information, see our pre-convention coverage that begins on page 23, or contact NAB, 1771 N St., NW, Washington, DC 20036.

May 5-9

The *European Cable and Satellite Television Exhibition and Conference (EUROCAST-'84)* will be held in Basel, Switzerland. Awards will be presented for achievements in cable and satellite hardware and software. For more information, contact Cable & Satellite Television Exhibitions Ltd., Five Barratt Way, Tudor Road, Harrow, Middx United Kingdom HA3 5QG.

May 13-17

The Anaheim Convention Center in Anaheim, CA, will be the site of *Computer Graphics-'84*, the *Fifth Annual Conference and Exposition of the National Computer Graphics Association*. Included in the six technical sessions will be "Election-'84: Network Videographics for Political Coverage" and "Videodisc and Computer Graphics." For more information, contact Department YY, National Computer Graphics Association, 8401 Arlington Blvd., Suite 601, Fairfax, VA 22031; 703-698-9600.

May 14-17

The *International Conference on Communications (ICC-'84)* will be held in Amsterdam, the Netherlands. Topics include communication switching, communication networks, radio communications, and satellite and space communications. For more information, contact Dr. T.A.C.M. Claasen, Secretary ICC-'84, Philips Research Laboratories, WY-2, 5600 MD Eindhoven, the Netherlands.

May 15-18

Communications 84, an international exhibition, will be held in Birmingham, England. The biennial trade fair attracted more than 430 exhibitors from 17 nations in 1982. A 3-day conference program, organized by the IEE, will complement the exhibition activity. For more information, contact Kallman Associates, US Representative, 5 Maple Court, Ridgewood, NJ 07450; 201-652-7070.

May 20-23

The Grand Hyatt Hotel in New York City will be the site of the *24th Annual Broadcast Financial Management Association Conference*. Topics at the approximately 33 general sessions and workshops will include accounting standards, fraudulent billing, cable television, automation, public broadcasting and special concerns of BFMA's Canadian members. Gene F. Jankowski, president, Broadcast Group, CBS, will be the luncheon speaker on Tuesday May 22.

May 23-25

The *Eighth Annual Conference on Teleconferencing and Interactive Media* will be held in Madison, WI. The program will report on the current status of and trends in teleconferencing, computer conferencing, videotex and other interactive systems. For more information, call 608-262-2569.

June-July

A series of film and video workshops will be held in Rockport, ME. For more information, call 207-236-8581.

June 13-15

A course titled "Video Teleconferencing" will be held at George Washington University in Washington. The course covers progress in video teleconferencing technology and describes the latest systems. For more information, contact Chip Blouin at 202-676-8527, George Harrison at 202-676-6106, or either Blouin or Harrison at 800-424-9773 (Tuesday-Friday).

September 21-24

Learn about audio techniques from professionals at the *13th Tonmeistertagung Muenchen*. Subjects discussed will include radio, television, recording, film, video theater and public address audio applications. In addition to many technical sessions, an exhibition of sound equipment and practice-oriented field trips will round out the experience. For more details, contact das Bildungswerk des Verbandes Deutscher Tonmeister, Organizationsbuero, Postfach 101950, D-5000 Koeln 1 West Germany.

Sept. 21-25

The *10th International Broadcasting Convention, IBC-'84*, will be held at the Metropole Conference and Exhibition Center in Brighton, United Kingdom. The growing interest in higher definition and enhanced TV pictures and the distribution of programs and information by cable and satellite will be covered in depth. For more information, contact the IBC Secretariat, the Institution of Electrical Engineers, Savoy Place, London WC2R 0BL United Kingdom.

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THE REASON YOUR EDITING COMPONENTS DON'T WORK TOGETHER IS BECAUSE THE PEOPLE WHO CREATED THEM DIDN'T.

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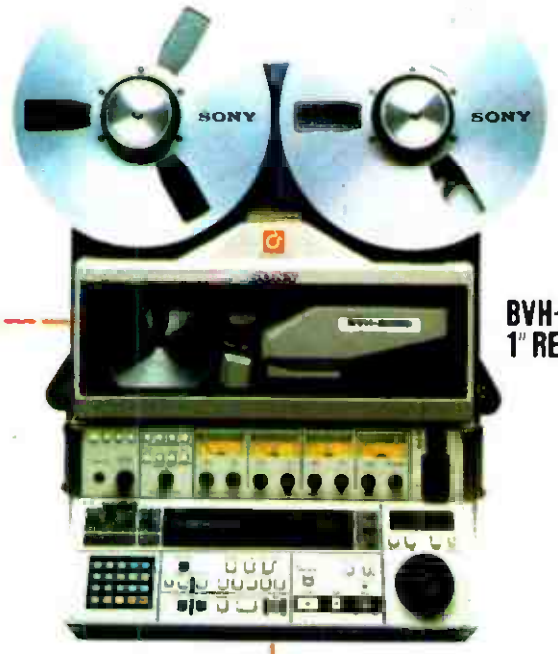
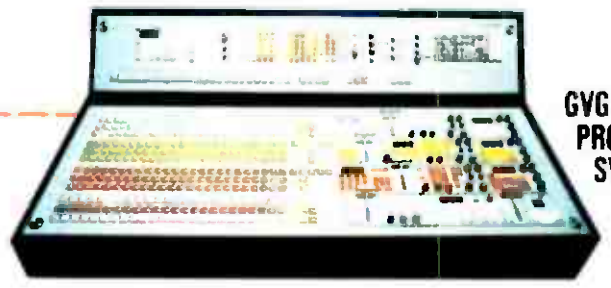
BVM-1201
BROADCAST
MONITOR



BVH-2000
1" RECORDER

BVT-2000
1" TBC

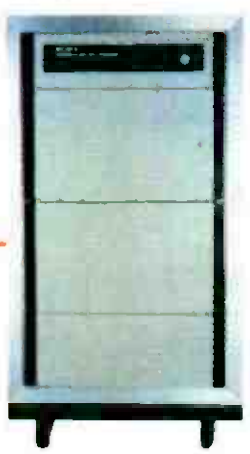


GVG 300 SERIES
PRODUCTION
SWITCHER

CPD-5001
DISPLAY
TERMINAL

RS-422

BVE-5000
COMPUTERIZED
EDITOR



You're looking at the utopian editing suite.

A system that takes you straight to productivity without passing through chaos.

One that truly breaks Murphy's Law. Because Sony mastered the seemingly impossible feat of asking a series of machines to work in perfect harmony with one another.

No longer must you take the hodgepodge approach to editing systems, which is purchasing one component from one company and another from a second. Through the Sony total system approach you're assured that all the interfaces will work perfectly. Because they're worked out in our labs, not your editing suite. So downtime is virtually eliminated.

Only Sony offers it. But then, only Sony developed each and every product on these pages. (Even the Grass Valley software interfaces for the 300 Series Switcher were co-developed by Sony.)

So if you want to spend more time counting profits and less time counting losses, contact Sony. And discover the joys of building an editing system that does what nobody else's can consistently do: Work.

SONY
Broadcast

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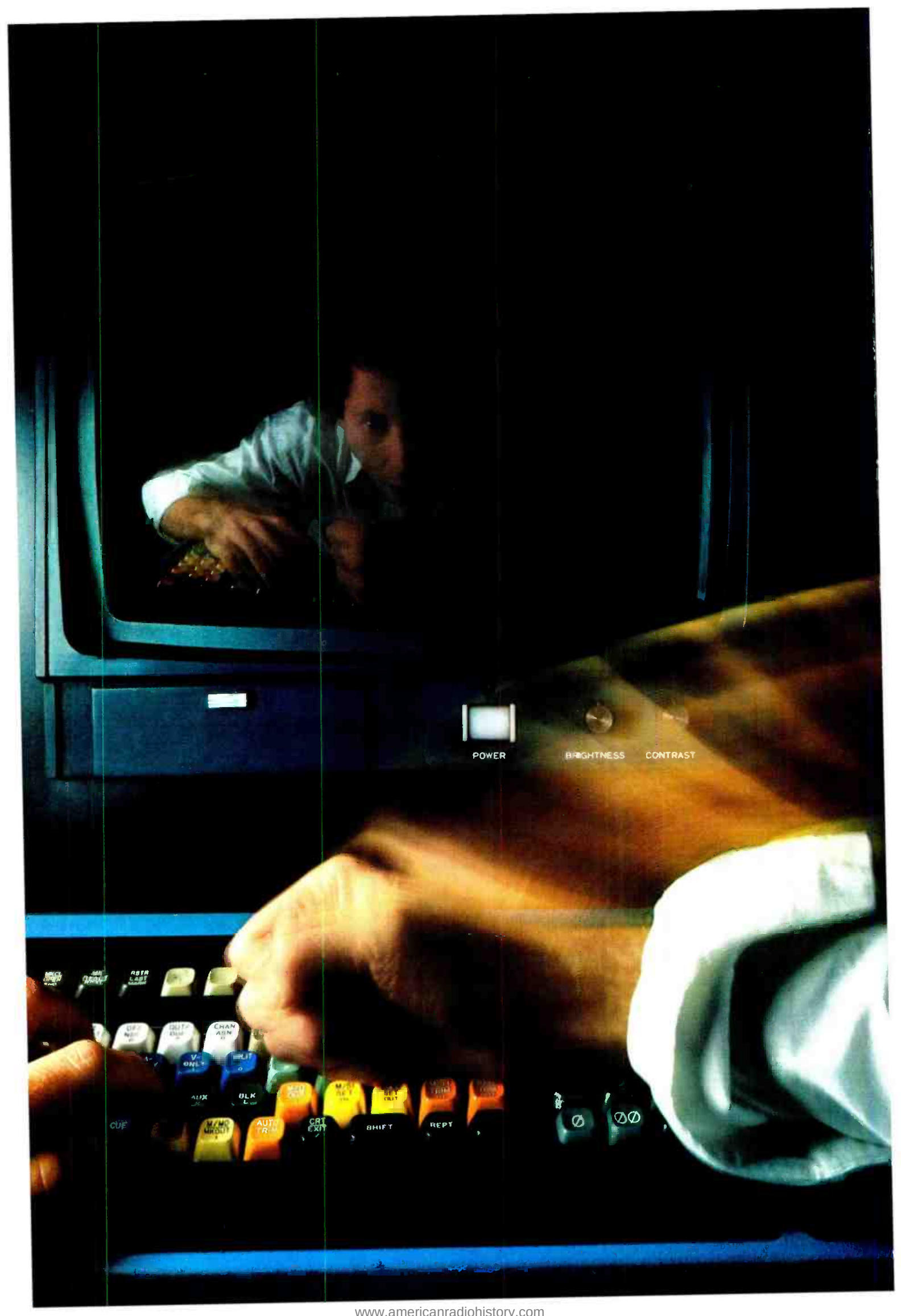

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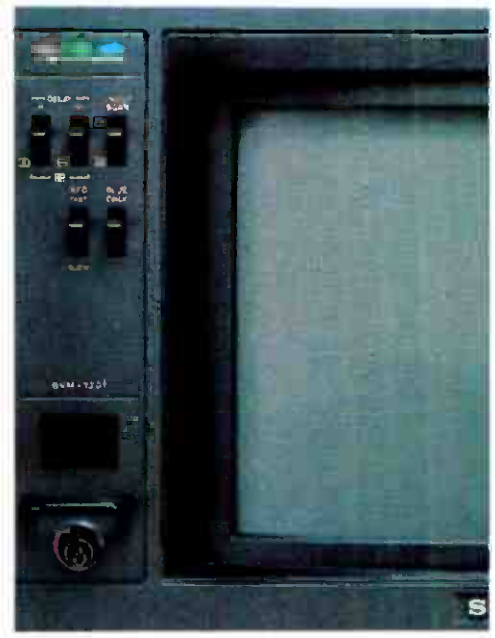
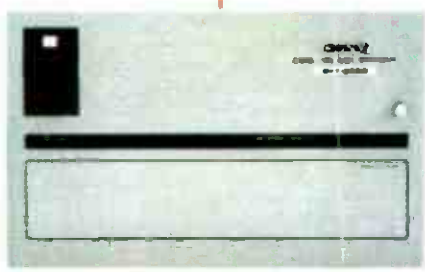
INTRODUCING THE FIRST TOTAL SYSTE

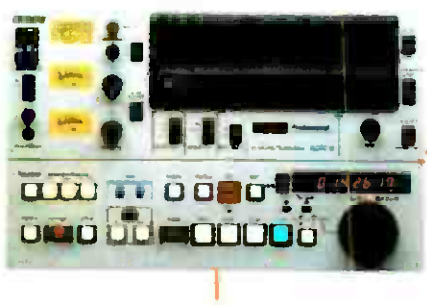
BVH-2000
1" RECORDER



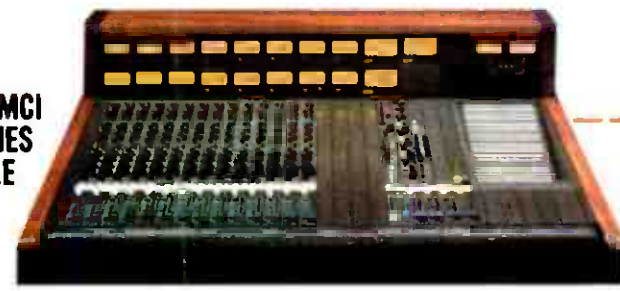
BVT-2000
1" TBC



BVU-820
3/4" RECORDER



SONY/MCI
JH-600 SERIES
AUDIO CONSOLE



BVT-800
3/4" DIGITAL TBC

BVW-40
1/2" RECORDER

RS-422

SONY/MCI JH-24
24-TRACK
AUDIO RECORDER

BVE-5000
CONTROL PANEL

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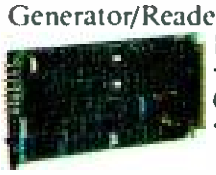
A SYSTEM IS ONLY AS GOOD AS THE SUM OF ITS COMPONENTS.

1" EDITING

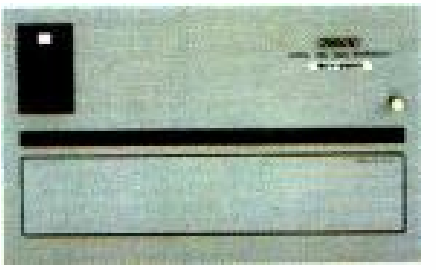
BVH-2000 IN CONSOLE
- Multiple machine configurations, changeable and upgradable.
- Wide DT range: from –1 to +3 × standard speed
- Video/Audio confidence replay
- Self-diagnostics with visual and audible malfunction alarms
- Plug-in Time Code Generator/Reader (optional)
- Plug-in Timebase Corrector (optional)
- 2 hours record/play time

BKH-2015 OPTIONAL PLUG-IN TIMECODE FOR BVH-2000
- Generator/Reader with VITC/LTC capability
- Character Generator
- User Bit Display

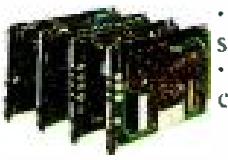


BVH-2500 RECORDER
All features of BVH-2000 plus:
- Full C Format compatibility
- Real time, variable and frame-by-frame recording, using DT head
- Full-color framing
- Instantaneous and repeatable rewriting by erasable DT head

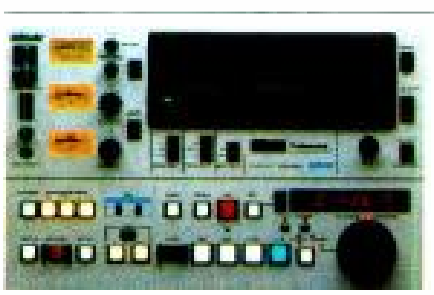
BVT-2000 TBC
- 9-bit, 4 Fsc sampling
- Drop-out compensation with Y/C separation
- Built-in Velocity Compensation, Sync Pulse Generator, Video Processor and automatic Advanced Sync Generator
- Full remote-control function
- DT playback with BVH-1100/1100A/1180/2000 and BVU-820 VTRs



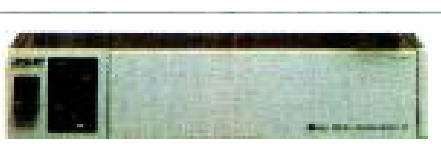
BKH-2100 OPTIONAL PLUG-IN TBC FOR BVH-2000
- Plug-in, 4-circuit board Digital TBC
- 8-bit 4x Fsc samplings
- Remote-control capability



3/4" EDITING



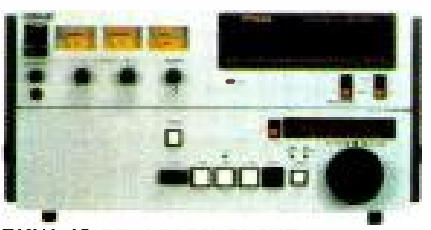
BVU-820 RECORDER
- Built-in, full-scale editing functions
- Dynamic Tracking
- Playback from –1 to +3 × standard speed
- Simultaneous video playback in record mode (Video Confidence)



BVT-800 DIGITAL TBC
- 15 H correction range
- DT operation with BVU-820 from –1 to +3 × standard speed
- Built-in digital DOC
- Single cable interconnect with BVU-800/820
- Remote-control facilities
- Recognizable monochrome pictures up to ±40 × standard speed

1/2" EDITING

BVW-40 BETACAM™ RECORDER
- Compressed Time Division Multiplex video recording system
- Built-in Timebase Corrector with Digital DOC
- Full Video/Audio insert and assemble editing, with preview/review, forward/reverse trim, selectable pre-roll and auto edit in/out functions
- 9-pin RS-422 serial and 36-pin parallel remote ports
- 7-pin Dub-in/Dub-out connection for BVU series U-matics™
- 12-pin Y/R-Y/B-Y component input/output
- Component and composite outputs



BVW-10 BETACAM™ PLAYER
- Full Shuttle and Jog functions
- Built-in TBC with Digital DOC
- Built-in Time Code Reader and LED display
- Selectable Dolby™ noise reduction
- Plug compatible with wide range of external systems
- Only front access required
- Component and composite outputs

At Sony, we do more than guarantee the best total system. We guarantee the best individual components.

The machines you see on these pages, which comprise the three established formats of the broadcast industry, represent only a small sampling of the Sony universe of post-production products.

Each component, while different in price and scope of features, shares five things in common. Unsurpassed quality, reliability, durability, ease of maintenance, and excellence of value that Sony is famous for.

So whether you buy the Sony system piece by piece, or an entire system at a time, you can be assured peace of mind.

For all the details contact Sony in New York/New Jersey 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.

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SONY
Broadcast

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CUSTOMIZED EXCELLENCE

WPMT Mohawk Broadcasting of York, Pa. had a clear vision of what they needed. They wanted a state of the art facility, turnkey operation, brought in on time and in budget. The Lerro Corporation came through on all counts.

The Lerro Corporation has the people, experience and creativity to design, engineer, install and provide the follow up support for your facility. Let us show you, face to face, what we can do for you.

For information, contact The Lerro Corporation, 3125 N. Broad Street, Philadelphia, Pa. 19132 • (215) 223-8200.

LERRO ELECTRICAL CORPORATION

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Enough. From now on we make our own tape.

www.americanradiohistory.com

...and here it is: Dynamax.™

Here's Dynamax.™ A new brand of brilliant audio tape, formulated to satisfy the special requirements of the broadcast professional. And not the mass production standards of consumer tape.

To create Dynamax, we built a brand new manufacturing facility, and had each piece of production equipment designed to our own specs. Now we can monitor and control the manufacture of every inch of tape we put in our cartridges.

As a result, the mechanical and electrical properties of Dynamax are superior to those of any lube tape available in the world today.

The 1 mil Mylar® base film used for Dynamax broadcast tape is almost twice as thick, and twice the weight, as that used in the ScotchCart.™ And our cross-linked urethane resin binder system guarantees the best possible bonding of the oxide, totally unlike the cheap vinyl adhesives used by 8-track manufacturers in consumer tape.

The bonding is so positive, so permanent, that oxide shedding, and the problems shedding creates are virtually eliminated. This combination of features means that tape life of 10,000 plays or more can be expected from Fidelipac cartridges loaded with Dynamax.

Fidelipac is making a new brand of broadcast tape, Dynamax, formulated to satisfy the special requirements of the broadcast professional.

Phase stability is enhanced by maintaining constant tape width, and smooth, clean edges. On our own tape slitting equipment, we can control tape width to 1/1000 of an inch. So, the stereo phase performance of our Master Cart,™ loaded with Dynamax, is truer than ever.

I'd like to send you a sample Fidelipac Master Cart loaded with Dynamax broadcast tape. Just circle our number on the reader response card in this magazine, or write me, Arthur Constantine, at the address below.

Test Dynamax broadcast tape yourself. Measure the long life. Delight in the transparent sound.

See us at NAB Booth 411.

Dynamax broadcast tape, in Fidelipac cartridges, will deliver 10,000 plays—or more!

FIDELIPAC®
BROADCAST TAPE PRODUCTS

Fidelipac Corporation ☐ P.O. Box 808 ☐ Moorestown NJ 08057 ☐ U.S.A. ☐ 609 235-3900 TELEX 710 897 0254 ☐ Toll Free 800 – HOT TAPE

™Dynamax trademark applied for. "ScotchCart" trademark applied for. ® Registered trademark of Dupont

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Cetec Vega (1401C)
Continued
R-41/R-42: Pro-plus receivers
QX-1/QX-2: Wireless intercom master stations
QT-1/QR-1: Wireless intercom transmitter/receiver system
C-466: Quad case holds four 66D or 77D systems
New products
66/D: Portable dc-powered receiver with Dynex II
67-A/D: dc-powered, diversity receiver
T-81: Hand-held transmitter with Shure SM58 cartridge
T-82: Hand-held transmitter with Shure SM85 cartridge
T-83: Hand-held transmitter with AKG C-535 condenser cartridge
ZC-177: Impedance converter for instrumental pickups
Circle (521) on Reply Card
see ad on page 84

Chester Cable (1320A)
Established products
Audio 22: Single-pair foil shielded cable
Audio 22C: Low capacity flexible audio cable
Audio 22PRJ: Shielded, jacketed audio pair trunk cables
Video 20: Precision 75Ω video cable
Video 20A: Highly flexible Video 20
New products
Consultant services to assist with new cable concepts and design
Circle (522) on Reply Card
see ad on page 189

CMX taste and a Convergence budget? ...Get Lightfinger™!

Now, the editor that made new technology, like touch-screen editing, affordable brings you Advanced List Management (ALM™). The result is a system that's ideal for both experienced pros and occasional editors. ALM features include:

Cut and Paste: Cut on an image instead of an edit boundary, to insert or delete material.

Scene Note Sorting: Evaluate and review alternative takes by using scene notes to sort, find or list.

Reel Directory: A touch-selectable "table of contents" for all of the information on your tape.

Film Edge Reading: Edge numbers from any format or brand of film can be transferred to, or read from, user bits. Actual edge numbers will also appear on your list printout.

Source/Record VTR Slaving: Source-Trak™ allows you to match your source machine to your record machine at any point within an edit.

List/VTR Sync: ListTrak™ lets you sync-lock your list and your record VTR, and move them together for visual list management.

Lightfinger can be easily expanded from a basic two machine system up to one with more than 16 machines, and such added features as multiple roll, interface to mixed effects switchers and VITC. Prices for a complete, two machine system start at $15,950. F.O.B. factory.

For full details, call or write.

Control Video
1640 Dell Avenue, Campbell, CA 95008
(408) 866-7447

Circle (46) on Reply Card

Christie Electric (1403A)
Established products
ReFLEX-20: Series of 20-minute "burping" chargers and super nicad battery packs
New products
SMT: Low cost ReFLEX-20 system
maxERASE: High-power bulk tape degausser, adjustable for various widths and types of high coercivity video and audiotapes
Circle (523) on Reply Card

Chyron (1610)
Established products
Chyron IV: Graphics and titling system with Digifex effects and MGM
Chyron RGU-2 Graphics and titling system with camera font composer
VP-1: Low cost character generator
VP-2: Low cost character generator
New products
See at booth
Circle (524) on Reply Card
see ad on page 143

Cine 60 (1423)
Established products
Rechargeable nicad batteries for belts, packs, VTRs and on-camera use
Universal nicad fast chargers
30V Sun-Gun lights and belts
New products
Switchable Sun-Gun battery belts and packs for 30V, 4A/7A and 14.4V, 8A/14A
On-camera batteries for operating 14V cameras and 14V lights simultaneously
4-channel lifeguard fast chargers for 2A and 7A batteries
On-camera battery light and Sun-Guns at 12V, 13.2V and 14.4V
Circle (525) on Reply Card

Cinema Products (1221)
Established products
Mini-Worrall: Geared head
Steadicam Universal Model III: Lighter, more streamlined design of Steadicam
Ikegami EC-35 camera with Cinema Products accessories
J-6: Joystick zoom control
Camraprompter: Portable camera prompting system
Universal studio matte box
GSMO 16mm camera
Co-ax digital remote control systems in NTSC and PAL-B standards
RDS/HMI Fresnel spotlights
RDS/HMI Uni-focus lighting system
Todd-AO-Video anamorphic video lens system
New products
Camraprompter L: Prompter system for 35mm and studio cameras
Mini-Mote: Remote controlled pan-tilt head for 16mm/35mm film and EFP/electronic cinemtography video cameras
CP EFP studio rig for film-style setup system for most popular EFP cameras
Skymount camera stabilizing system for aerial photography with film or video cameras
RDS/HMI dimmable, flicker-free ballasts and 6K Fresnel spotlight
RDS 4A, 6A and 8A batteries and quick charger
For more information, contact: Cinema Products Corporation, 2037 Granville Ave., Los Angeles, CA 90025

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200 VIDEO GRAPHICS SYSTEMS INSTALLED & WORKING

And We're Celebrating!

Our *LiveLine* System is the *industry standard* for news, weather and sports electronic graphic production!

Who's Got #200?
Congratulations to KSAT-TV, San Antonio, Texas!

With over 200 systems now in use at stations coast to coast, ColorGraphics far outsells all other graphics systems! Here's a partial list of major **LiveLine** system purchasers: Gannett, Metromedia, the CBS Network and O&O's, Corinthian, Outlet, United Television, Post-Newsweek, Times-Mirror, The KING group, Taft...and most of the nation's major station groups. Many of our **LiveLine** systems are **also** in use at market sizes 100 and lower!

Why Is *LiveLine* the Leader?
It's extremely fast; has an ultra-high resolution display; is simple to use; interfaces to major data bases like WSI, Accu-Weather, and Weather Central; has special graphics packages for live sports score display from National SportsTicker, election coverage results news graphics and weather animations; and is backed by our reputation for quality and service which is unequalled in the industry! In 1984, watch for new dial-up color radar and more!

Join the electronic graphics revolution with

ColoRgraphics Systems, Inc.

A **Dynatech Broadcast Group** Company

5725 Tokay Blvd., Madison, WI 608-274-5786

See Us at NAB Booth 1116

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Cinemills (1140)
Established products
DeSisti: Lighting kits
Daymax: Gas discharge globes
Series: Lee special effects gel and resin camera filters
Series: Cine 60 on-board and belt-type nicad batteries
New products
See at booth
Circle (527) on Reply Card

Cipher Digital (1606)†
Established products
700: SMPTE code reader with 4-keyer character generator
716: SMPTE code generator with jam sync
722A: SMPTE code reader/generator/character generator
733: Portable SMPTE code reader
710A: SMPTE/EBU code reader
735 Series: Full function SMPTE/EBU readers
760: State-of-the-art SMPTE/EBU reader
766: State-of-the-art SMPTE/EBU code generator with VITC option
9010: Vertical Interval Time Code generator/translator
9050: VITC reader/translator
700-1000 Series: High resolution character generator
New products
See at booth
Circle (528) on Reply Card
see ad on page 260

Clear-Com Intercom (1502)
Established products
MS-808: Mainframe housing up to eight intercom and eight IFB channels with a dedicated line
IFB Series: 1-way program interrupt IFB system
PIC-4/820019: Allows daisy-chain of two IFB program controllers for 8-channel outputs to talent
KB-112: Remote intercom station
KB-111A: 2-channel intercom station
CP-100: Portable remote intercom station
New products
CP-300: Portable remote station adaptable to Clear-Com and RTS systems, places two channels on a single mic cable
TW-12: Interface enabling Clear-Com systems to work with RTS type equipment
Circle (529) on Reply Card
see ad on page 160

Clyde Electronics (204A)†
Established products
ALPHA: Modular mixing desk
DELTA: Logic-controlled auto level-controlled push-button mixer/switcher
C-DUB: Multiswitcher IP mixer
CETB1: Talkback unit
New products
See at booth
Circle (530) on Reply Card

Colorado Video (1222)
Established products
250CT: Slow-scan/freeze-frame transmitter for 512x240-pixel stills in NTSC color within 7.5kHz bandwidth
250CR: Slow-scan receiver
New products
See at booth
Circle (531) on Reply Card
see ad on page 186

ColorGraphics Systems (1116)
Established products
NewStar: Computerized newsroom system
LiveLine III: Real time graphics for TV
New products
ArtStar: Paint-type graphics computer, featuring simultaneous work station, dual independent video, high resolution and low price
MiniStar: Scaled-down version of NewStar, but fully upgradable
Frame storage: Freeze-frame digital frame store
Circle (532) on Reply Card
see ad on page 83

Colortran (1205)
Established products
Pole OP fresnel lights in 1kW, 2kW and 5kW sizes
Dimension Five lighting control system
Patchman portable lighting control system
New products
Color Arc 2000 ST: Short-throw follow spot with xenon lamp
Dimension Five II lighting control system
Designer remote lighting system
Circle (533) on Reply Card
see ad on page 219

Columbine Systems (1323/118)
Established products
5360: IBM S/36 CPU →

NEW

Your best value in wireless.

Cetec Vega's R-31 PRO is your best value in a wireless-microphone receiver. When you compare the price, compare the performance too. And the size. And the features:

- **"Infinite gain" receiver technology.** Improved performance in the critical threshold region, superior accommodation of multipath conditions, better signal-to-noise ratio, and constant receiver audio level output.
- **High signal-to-noise ratio and wide dynamic range.** 97 dB (103 dB A-weighted) with DYNEX® II; 77 dB (83 dB A-weighted) non-DYNEX.
- **DYNEX® II, a new standard in audio processing.** Can be switched in and out, to accommodate transmitters with or without DYNEX® II.
- **Power-source flexibility.** Dual 115/230 Vac, 50-60 Hz operation, and external +12 to +24 Vdc for vehicular and portable use.
- **Attractive, compact case.** Only 7.15 inches wide, 1.72 inches high, and 8.25 inches deep.
- **True helical-resonator front-end filter.** Plus all of the other standard features expected in Cetec Vega's professional wireless equipment, famous for quality and reliability.

Write or call for further information on the R-31 PRO wireless-microphone receiver, and for the location of your nearest dealer: Cetec Vega, P.O. Box 5348, El Monte, CA 91734. (213) 442-0782. TWX: 910-587-3539.

Cetec Vega
the professional's wireless.

Circle (48) on Reply Card

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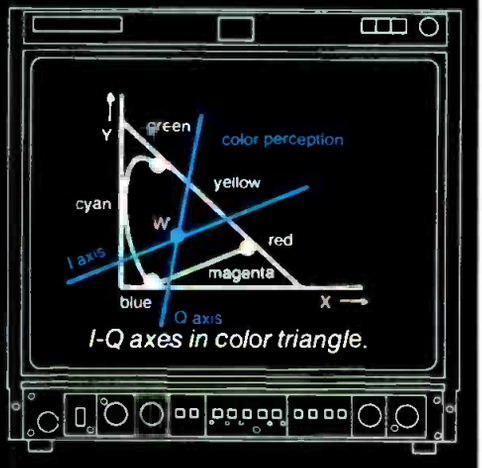
The Asaca/Shibasoku monitor like the human eye resolves certain colors best; reds, oranges, yellows, and flesh tones. The I-Q decoding system enables the monitor to display these colors at a higher resolution using wide band demodulation of 1.3 MHz rather than 0.5 MHz as in R-Y, B-Y systems.

We cared enough to give you a monitor with the I-Q to reproduce the best possible pictures. We know you're smart enough to buy it.

SMART

Asaca/Shibasoku's new high resolution monitors have the capability to deliver color performance other monitors simply cannot produce. Using R-Y, B-Y decoding no longer meets the demands of today's professional standards.



I-Q axes in color triangle.

SHARP

COLOR

FEATURES

- 20″ and 14″ models available—high resolution delta CRTs.
- I-Q wide band demodulation system.
- Complete board interchangeability between models.
- Switchable high performance comb filter and aperture correction.
- Multi-standard capabilities (NTSC, PAL, SECAM) on all models. Switchable from the front panel (20″ model). No adjustments necessary because of digital sync circuitry.
- Dynamic focus insures perfect focus on all areas of CRT. Adjustable from the front panel.
- Special feedback circuits guard against color changes due to variations in temperature.
- Active convergence—40 controls allow precise adjustment on all areas of CRT.
- Pulse cross with expanded vertical blanking interval.
- OPTIONS...Built-in color bar or cross hatch patterns. Built-in safe title marker generator. Multi-standards. RGB inputs.
- TWO YEAR WARRANTY ON ALL PARTS AND LABOR INCLUDING THE CRT.

ASACA ASACA ASACA

ASACA/SHIBASOKU CORP. OF AMERICA

12509 Beatrice Street Los Angeles, CA 90066 (213) 827-7144 (800) 423-6347

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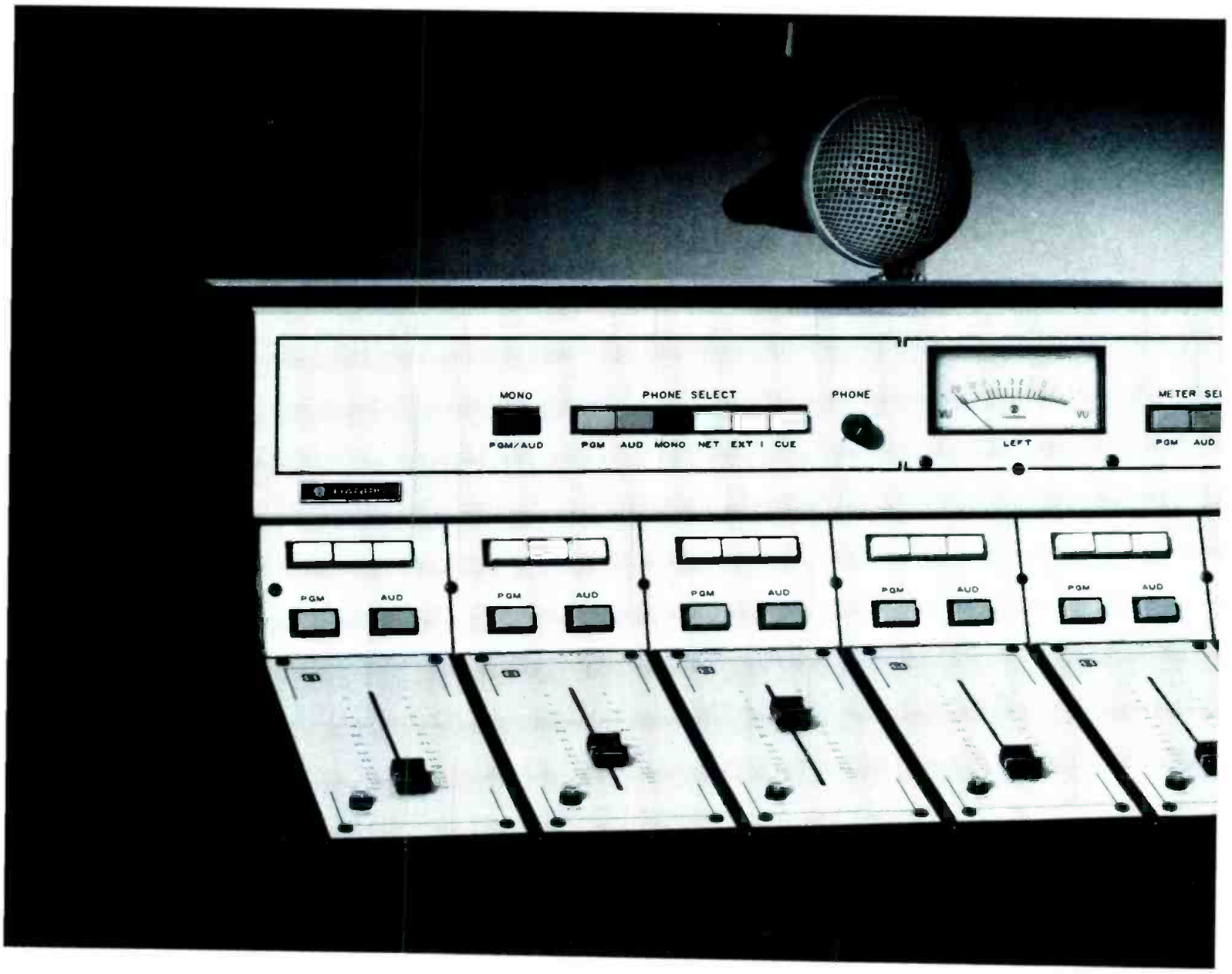
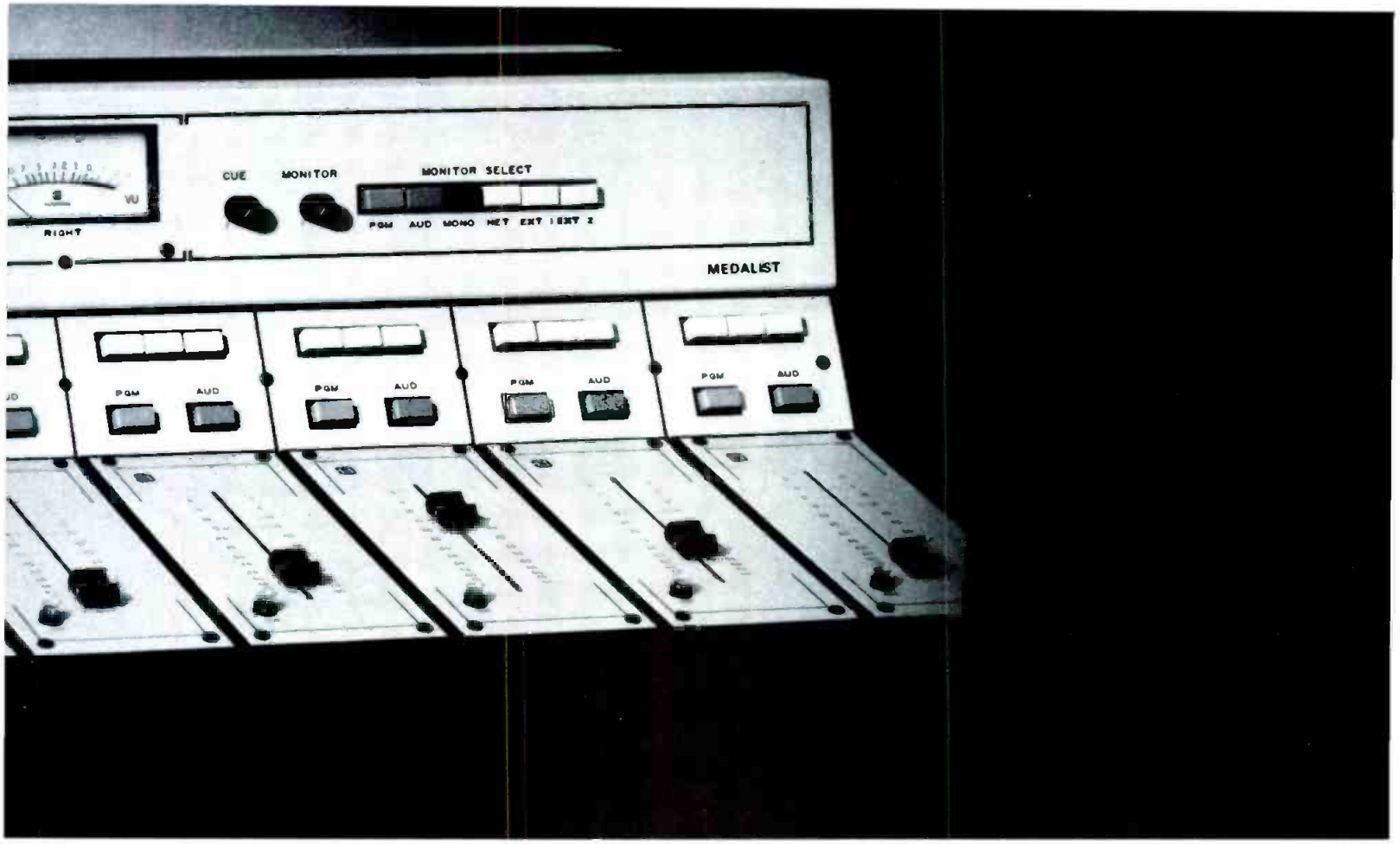


29 broadcasters bought the new Harris Medalist™ in its very first week! Here's why.

www.americanradiohistory.com



Wide input switching flexibility. Transparent audio performance. Choice of attenuators. Adaptability to any application. Excellent cost/benefit ratio. Broadcasters across the country cite these as major reasons for choosing the new Medalist dual stereo audio console over all others.

Switching Flexibility

Input selectors switch *after* the mic preamp, allowing intermix of mic and other types of sources on any channel. The Medalist also gives you six selector positions each for headphone and speaker monitoring.

Superb Audio Quality

Harris engineering makes the Medalist remarkably transparent. The Signal-to-Noise ratio of 95 dB beats the competition by 10 to 20 dB, and is typical of the Medalist's outstanding performance.

Linear Or Rotary: Take Your Pick

Harris gives you a choice—two styles of linear and two styles of rotary attenuators. Intermix rotary with linear if you like, to suit *your* station's particular needs.

Easy To Install... Easy To Maintain

The barrel terminals on the input and output circuits connect quickly and surely. Additional preamps and program amp interconnect with plug-in ribbon cables. Also, you can change attenuator modules—even while you're on the air—in about the time it takes to cue up a record.

Now In 8, 10 and 12 Channels

The Medalist is equally well suited for AM/FM/TV on-air and production applications. Take your choice of three models—8, 10 or 12 channels.

Learn more about the Harris Medalist family of audio consoles. Write Harris Corporation, Studio Division, P.O. Box 4290, Quincy, Illinois 62305-4290. 217-222-8200.

HARRIS

Circle (50) on Reply Card

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More Tests More Accuracy Less Time...

The QEI Model 691 Tuneable Stereo & SCA Modulation Monitor *

That's right, QEI's 691 performs more than 40 proof-of-performance, sound quality and troubleshooting tests (up to 4 tests simultaneously) with greater accuracy and in less time than possible before.

Most functions and test connections are on the front panel in easy to read, easy to use groupings. QEI's auto-ranging meters guarantee correct readings every time and SCA capability is a simple matter of an optional plug-in module.

* FCC Type Approval No. 3-244

For the full story and complete specs on the QEI 691, call us or write to:

QEI Corporation

One Airport Drive
P.O. Box D
Williamstown, NJ 08094
(609) 728-2020

QEI

Circle (51) on Reply Card

Columbine (1323/118)
Continued

5291: IBM CRT display
522: IBM printer
Traffic system software
Media, music, production billing software
Accounting, payroll, general ledger software
New products
5381: IBM S/38 CPU with broadcast software
5160: IBM personal computer with broadcast system software

Circle (534) on Reply Card

Comark Communications (1217)
Established products
UHF TV transmitters from 10kW to 220kW
Waveguide and coaxial transmission systems and components
Modulators, exciters, IF correction systems, diplexing equipment and RF components
Turnkey RF installations capability worldwide
New products
CTT-U-110S 110kW S Series: UHF TV transmitter
WTB-1500 Magic T: RF power combiner with switchless bypass system
CAP-110M: Auto multiplexed diplexer system
CBP-20: BCD/ABC pulsing system
CCP-145: ED and ICPM corrector system
CTE-20: Exciter system
CM-100S: Modulator with IF SAW filter
CTP-20: Mod anode pulsing system

Circle (535) on Reply Card
see ad on page 3

Comex Corporation (1508)†
Established products
Distributors for broadcast equipment, including Ultimatte, JVC, Texscan and Real World Technologies
New products
See at booth

Circle (536) on Reply Card
see ad on page 333

Communications Graphics (630)
Established products
Promotional materials, including window decals and bumper stickers
New products
See at booth

Circle (537) on Reply Card

Comprehensive Video Supply (1145)
Established products
MX-1002: Portable 3-channel mic mixer
IR-1000: Portable light dimmer wireless receiver
IRT: Portable light dimmer wireless transmitter
New products
MS-2000: Deluxe mini 2-camera switcher with effects
MX-1001: Pro 3-channel portable mic mixer
Associate Producer: Production/budget control software
PowerScript: Scriptwriting software
Apple Edit Lister: CMX-compatible editing software
480: Biflora fluid effect head and clamp assembly
SC6000 MK II: PAG sequential battery charger

Circle (538) on Reply Card

Compucon (1405D)
Established services
Engineering services for communications planning including:
Satellite earth station interference analysis and coordination (TVRO, T-R)
Terrestrial microwave frequency planning and coordination
Cellular, land mobile, LPTV, MDS and DTS/DEMS engineering
License application preparation,
Continued frequency protection
On-site field support
Communications marketing research
Systems design
Time sharing services
FM engineering, applications preparation
New services
See at booth

Circle (539) on Reply Card

Computer Broadcasting (624)†
See at booth

Circle (540) on Reply Card

Computer Concepts (404)
Established products
Broadcast computer systems for traffic, sales/management, billing/accounts receivable, co-op/copy, payables, payroll, general ledger, word processing, database management, music management/playlist production, electronic spreadsheet, background music billing, linked with program automation systems
New products
Broadcast computer system copy and co-op management system
Micro-Bridge 80: Allowing Wang hardware to run programs written for personal computers
Rate card optimizer program, allowing combinations of rate, spot load, spot length and dayparts to be analyzed for maximum profitability

Circle (541) on Reply Card

Computer Graphics Lab (1143)
Established products
Images: Image manipulation and graphic enhancement system
Tween: 2-dimensional computer-based animation
New products
CAAS II: Computer-assisted animation system, including hardware and software for full cartoon animation projects
Images II: Low-cost still-frame electronic graphics creation device
3-DV: 3-dimensional animation system for full-color shaded surfaces, multiple light sources and resolution to 1024x972 pixels

Circle (542) on Reply Card

Comrex (400)
Established products
PLX, RLX, TLX: Frequency extenders
SLX: Remote sports console
AGA: Auto gain adjuster
CTA, LPQRA: Cue system
CRA: TV aural monitor
202: Studio/telephone conferencer integrator →

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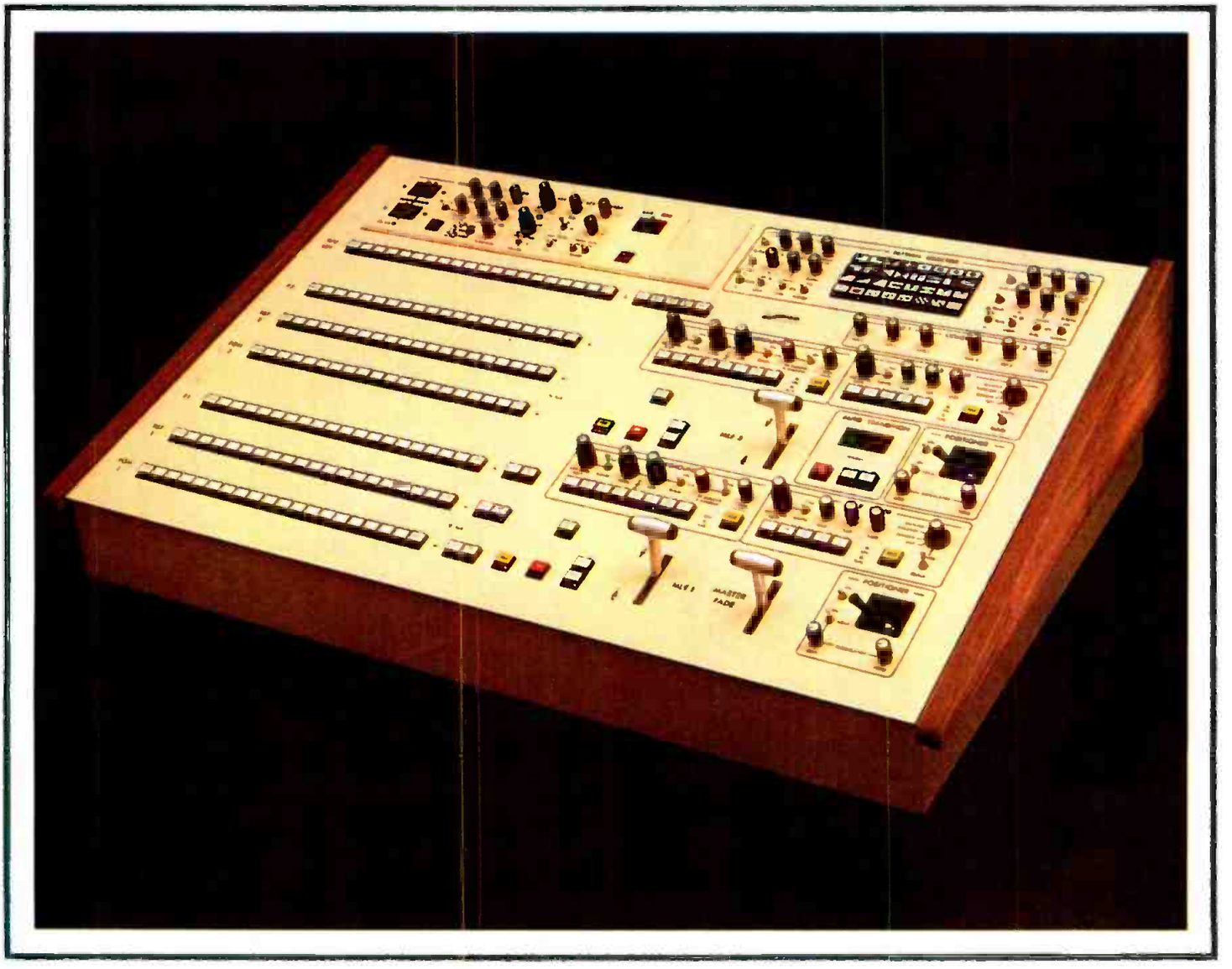
RVS-517
VIDEO PRODUCTION SWITCHER



A SUPERB SWITCHER FOR STUDIO, POST-PRODUCTION, OR MOBILE USE.

Just one member of the Ross Video family

Learn more about the complete line of Ross Video production switchers and the Encore Memory System at N.A.B. booth 1110

CANADA:
Ross Video Limited
9 Plaza Drive, P.O. Box 220
Iroquois, Ont. Canada K0E 1K0
613-652-4889 Telex 05-811579

USA:
Ross Video Inc.
P.O. Box 880
Ogdensburg, N.Y. 13669

ROSS®

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Comrex (400)
Continued
450RA/TA: Wireless microphone system
New products
PTLX: Portable 2-line frequency extender transmitter
RTLX: Rack-mount 2-line frequency extender receiver
PLX II: Frequency extender transmitter
RLX II: Frequency extender receiver
Circle (543) on Reply Card
see ads on pages 64 and 66

Comsearch **(1136)**
Established products
Service: Communication engineering services, satellite earth station interference studies with site acquisition, private network design, terrestrial frequency planning including STL & TSL, frequency protection, FCC application preparation, DEMS/DTS frequency coordination, microwave path surveys and RFI/EMI measurements
Service: LPTV engineering services and cellular radio services
New products
See at booth
Circle (544) on Reply Card

Comtech Data **(314)†**
Established products
RCV 350: Downconverter, SCPC, 3-channel converter
5m fiberglass transportable transmit/receive antenna
Series: 24-channel frequency agile receiver
RCV 350-10: Card-mounted frequency-agile receiver
250 AU/AD: Up/down converters
30 RO: Receive-only terminals
RCU 360: Local/remote receiver
900: Uplink terminals
CDM 1120: 52-88MHz channel modulator
CDM 1160: A/V modulator
Antenna: 7.3m, dual-axis
New products
See at booth
Circle (545) on Reply Card
see ad on page 63

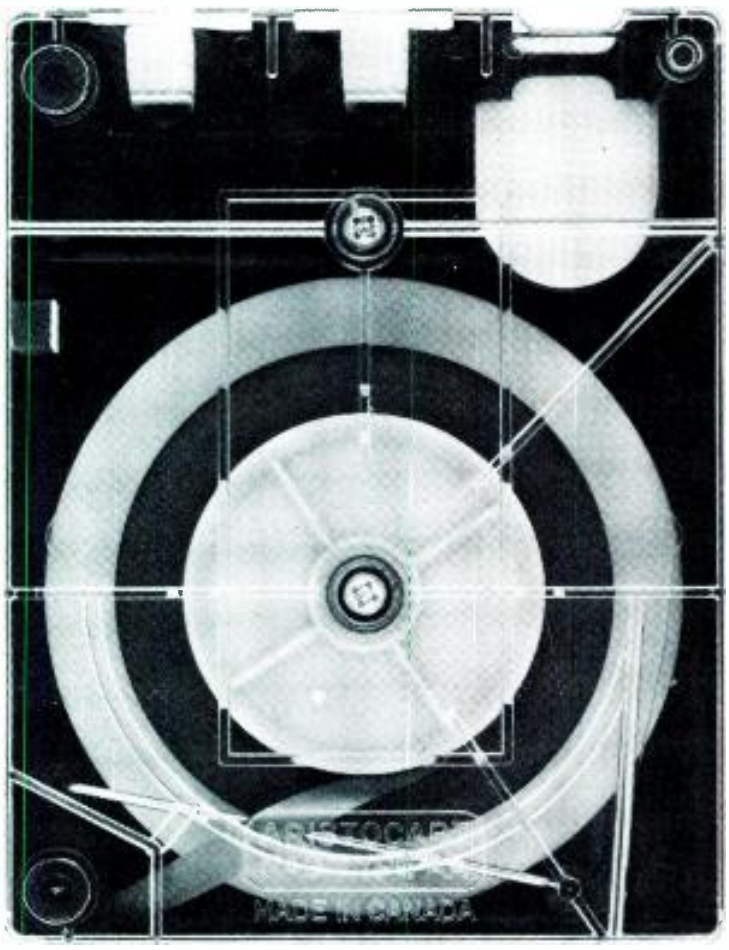
Com-Tek Communications **(1122B)†**
See at booth
Circle (546) on Reply Card

Concept Productions **(423)**
Established products
Concept 1: Adult contemporary program format
Concept 2: Adult rock program format
Concept 3: AOR program format
Concept 4: Country music format
New products
Concept 5: MOR radio format
Promotion: The Disneyland Radioaction Telephone Game
Circle (547) on Reply Card

Connect-Air Int'l. **(1764)†**
Established products
Cable assemblies: Camera, communications, broadcast, data
New products
See at booth
Circle (548) on Reply Card

Connectronics **(608)**
Established products
Musiflex: Wire and cables, including:
Multipair audio, instrumentation and data cables
Speakerflex sound reinforcement, monitor, lighting and communication systems cable
Rockflex musical instrument cable
Quadflex 4-way interconnection cable
Phonoflex audio interconnect and patch cables
Studiflex audio studio cable
Accessit: Audio signal processors
Great British Spring: Reverb unit
SECK Producer: Mixing console
New products
Key Technology XLR-type connectors
Circle (549) on Reply Card

Conrac **(1401)**
Established products
Model 6142: Master 19-inch color video monitor
Model 7211: 13- and 19-inch PIL CRT RGB monitors
New products
Model 6200: Class 1 master monitor in 13- and 19-inch PIL CRT sizes with switched NTSC/RGB inputs and Colormatch phosphors
Model 2600: 9-, 15- and 19-inch monochrome monitors for 800TVL resolution
Model 7300: RGB ultrahigh (1000-line) resolution, designed for flicker-free computer graphics
Circle (550) on Reply Card
see ads on pages 158 and 159



ARISTOCART

no other NAB cartridge meets these exacting standards

We designed the ARISTOCART cartridge 10 years ago. Its features have been widely copied but it continues to outperform competing products because we alone take the trouble to check each unit we ship for phase stability and frequency response in conformity with NAB specifications.

our guarantee

If any ARISTOCART cartridge should fail to meet NAB AM/FM performance specifications on a properly aligned cart machine, we will replace it at our sole expense.

WIC MANUFACTURED BY ARISTOCART DIV. WESTERN INTERNATIONAL COMMUNICATIONS LTD.
505 BURRARD STREET, VANCOUVER, B.C., CANADA V7X 1M6 TEL: (604) 687-2844 TELEX: 04-54639

Circle (53) on Reply Card

www.americanradiohistory.com

When Choosing Quality The Choice Is LEMO Electronic Connectors

LEMO Audio-Video Connectors

Designed to maximize communication capabilities within a minimum of space. Available in coax, triax, multipin and mixed coax-multipin configurations.

RELIABILITY: Positive locking mechanism and gold plated contacts assure consistent signal transmission to 1.5 GHz.

SPACE SAVINGS: Only finger clearance needed to engage and disengage connectors. No need to twist or turn locking ring.

RUGGEDNESS: Connector components are precision machined. Locking mechanism is totally protected by outer shell, virtually eliminating accidental disconnections and damage to locking mechanism, cables and contacts.

SPEED: Connectors engage and disengage simply and quickly by pushing and pulling axially on the outer shell of the plug.

Over $1 million inventory stocked in Santa Rosa, California, sold by a network of representatives in North America.

For technical data and catalog, as well as the name of your local representative, please call or write LEMO U.S.A., INC. (707) 578-8811, TELEX 340-933, P.O. Box 11006, Santa Rosa, California, 95406.

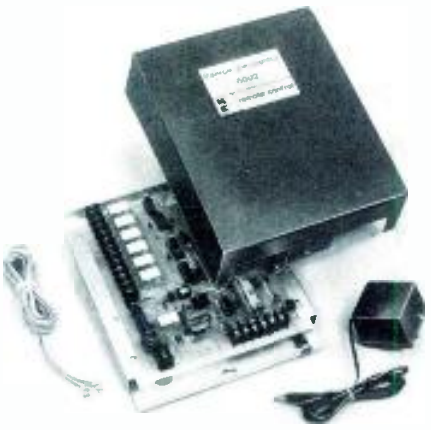
LEMO USA INC

Circle (54) on Reply Card

www.americanradiohistory.com

NEW

DTMF REMOTE CONTROL PRODUCTS FROM MONROE ELECTRONICS



6000 Series Remote Control From $395

Systems available for either telephone or 2/4 wire and radio communications to monitor and control unattended equipment.

- Selectable access code.
- 6 or 12 independent relays and status inputs.
- Audio input to monitor remote audio source.
- Internal test tone generator.
- Power supply for 117 VAC, 60 Hz.

Write or phone for further information or literature. Dealer inquiries invited.

MONROE ELECTRONICS, INC.

211 Housel Avenue
Lyndonville, N.Y. 14098
Phone: 716/765-2254 Telex 91-9188

In Canada: Maruno Electronics, Ltd.
299 Evans Ave., Toronto, Ontario,
Canada M8Z1K2
416/255-8231 - Telex 06-967578

Circle (55) on Reply Card

Continental Electronics (101)
Established products
AM transmitters in 1kW, 5kW, 10kW and 50kW power levels
FM transmitters in 2.5kW, 10kW, 20kW, 25kW, 27.5kW, 40kW, 50kW and 55kW power levels
302A AM stereo exciter
802 FM exciter
Audio consoles with eight and 10 channels
New products
See at booth
Circle (551) on Reply Card
see ad on page 268

Control Concepts (1751A)†
Established products
Islatron transient overvoltage suppressors
New products
See at booth
Circle (552) on Reply Card

Control Video (1157)
Established products
Light Finger computer-aided editing system
Sword computer-aided cuts-only editing system
Video sequencer for up to 31 VTRs
Sabor spot editor for video sequencing system
New products
A.L.M.S. advanced list management system
Film edge number writer
Disk editing system
Circle (553) on Reply Card
see ad on page 82

Convergence (1430)
Established products
Super 90: Single-source video editing system
202: Sync roll/cuts-only video editing system with list management and auto assembly
203: A/B roll video editing system with list management
204: A/B roll advanced list management system with two auto assembly modes
New products
EditDroid: Specialized post-production system for disk or tape, developed in conjunction with LucasFilm Ltd.
CI-90: Character inserter placing time code digits into video being recorded, providing window dubs
Circle (554) on Reply Card

Cool Light (1329)
Established products
TTDR01 Tri-Lites
New products
MCKTSP improved Starpak lighting kit includes four Mini-cool lights, two stands, lamps, lenses, filters and other accessories and grip items
Circle (555) on Reply Card

Corporate Comm. Consultants (1161)†
Established products
System 60XL: Computerized color correction; film-to-tape transfer
System 60B: Computerized color correction system for the Bosch FDL-60A2
System L-100: Computerized color correction for positive and negative film
System 30: Computerized color correction for the Sony BVX-30
System 60CZ: Color corrector for film-to-tape and tape-to-film transfers
New products
See at booth
Circle (556) on Reply Card
see ad on page 100

Countryman Associates (1720)
Established products
Microphones
New products
ISOMAX TVH: Hypercardioid lavalier mic
ISOMAX III: Directional flexible extension tube recording mic
ISOMAX IV: Directional flexible tube mic for high quality voice applications
Circle (558) on Reply Card

Crest Audio (204C)†
Established products
Audio professional power amplifiers
New products
See at booth
Circle (557) on Reply Card

Crosspoint Latch (1321)
Established products
6112: Production switcher
6112BH: Incandescent lamp button version of 6112
6139 Series: 8-, 16- and 24-input production switchers with LED or incandescent lamp buttons
6139K: Microprocessor-controlled switcher with serial RS232/422 I/O
6403: Programmable editor switcher interface
6124: Production switcher
New products
6116: Component switcher, including four component and three encoded video inputs with optional microprocessor-controlled editor interfaces
7239: Auto Drive controller for 6139K switchers and serial control for editor inputs
6150: Master control switcher for 16 inputs, with microprocessor control, clock and 2-event take
7209: 99-event controller for 6109 switcher
Printer driver option with serial I/O for editor control
Circle (559) on Reply Card
see ad on page 352

Crown Int'l (428)
Established products
Audio power amplifiers, including D-75, D-150A-2, PS-200, PS-400 and DC-300A-3 systems
PZM microphones
New products
PZM-180: Pressure zone microphone at reduced price for semi-pro and sound reinforcement market
12SP: Microphone for recording, reinforcement, broadcast and ENG applications
Circle (560) on Reply Card →

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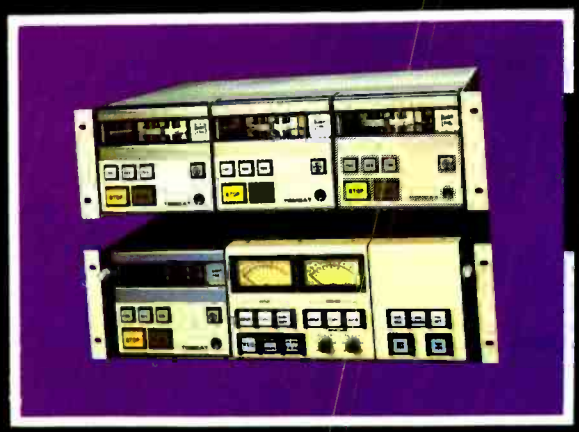
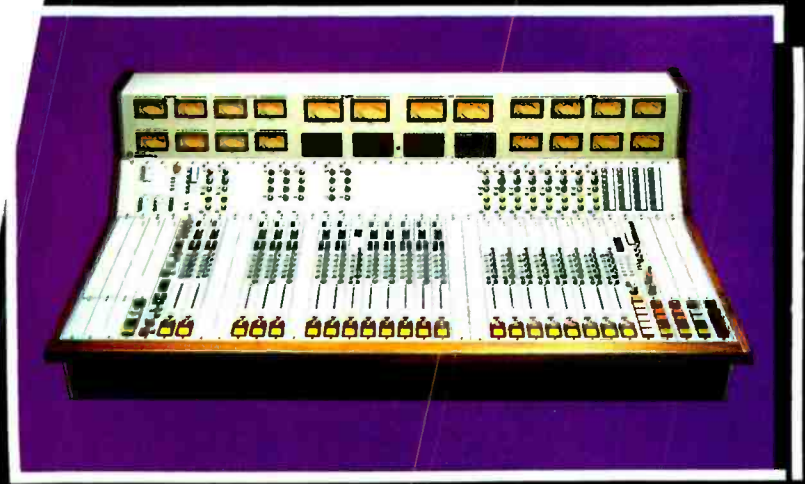


TOMCAT — The preeminent cartridge recorder and reproducer, offering supurb reproductive quality. Matrix, 7½ and 15 IPS MONO/STEREO, 3 tones and fault detectio are standard.

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 conso designed for production requiremen of radio broadcasting. In 18, 26, an 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 800-874-2127 for your full-color brochures
MCAT, BMX, ABX, STUDIO CABINETRY systems or
uality PR&E products.

NAB Booth 113

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Custom Business Systems (317)†
Established products
Radio Broadcast Business Computer System
Music Library Software
New products
See at booth
Circle (561) on Reply Card

Cybernetic Data (1134A)†
See at booth
Circle (562) on Reply Card

dbx (107A)
Established products
900 series signal processors
dBm meter
Voltage-controlled amplifiers
Type I and II noise reduction systems
Compressor/limiters
Sound enhancers
New products
700 digital audio processor
710 2-channel mic pre-amp module
700P playback-only digital audio processor
D700 digital disc-mastering delay
Circle (563) on Reply Card

Peter W. Dahl (612)
Established products
3-phase 5kW plate transformer
1kW and 5kW modulation transformers and reactors
High voltage rectifiers
Primary transient suppressors
New products
HV rectifiers for 40kV PIV and forward currents to 25A
Primary transient suppressors in MOV and selenium configurations
Circle (564) on Reply Card

Dalsat (1785)†
Established products
Earth stations: Transportable
Consulting: Engineering
Installations: Turnkey
New products
See at booth
Circle (565) on Reply Card

Bill Daniels Company (1706)
Established products
Catalogs: Broadcast equipment
New products
See at booth
Circle (566) on Reply Card

Data Communications (1014)
Established products
Business automation products and services for the broadcast industry
BIAS traffic system
REPLINE and SESAMI systems
New products
BUYLINE business automation, to link stations, representatives and agencies for speeding up the buy process
IBM PC software for financial applications with BIAS system interfacing
Circle (567) on Reply Card

Datatek (1428)
Established products
D-2000: Video/audio routing switchers
D-4300: Video/audio routing switchers
D-701: TV transmitter color phase equalizer
D-663: Video DAs
D-660: Source ID system
New products
D-2200: Bidirectional data matrix, destination oriented, SMPTE standard, expandable to large system configurations
Circle (568) on Reply Card

Datatron
See Paltex

Datatronix (1504)
Established products
Series 300: Modular amp systems and audio components
Series 500: Modular compressor/limiter, EQ, oscillator systems
Series 440: Conductive plastic illuminated scale faders
Series 7000: Remote-controlled amp systems
Series 8000: VU and PPM meter amps
New products
Series 2000: Smart intercom systems
Series 1000: Small studio smart intercoms →

From Porta-Brace™

The Classic Case

The PORTA-BRACE™ Video Recorder Case.

Our ENG/EFP special includes: leather handle • heavy-duty, non-skid shoulder strap • swivel hooks • waist belt • extra-capacity side pouch with mike pouch • front slip pocket • two sewn-in front pockets • cable strain-relief loops • velcro cable and headset hangers • sewn-in and removable white balance cards. **It's protection and portability and we care about the details.**

porta brace

K and H Products, Ltd.
Box 246, North Bennington
Vermont 05257 (802) 442-9118

Circle (57) on Reply Card

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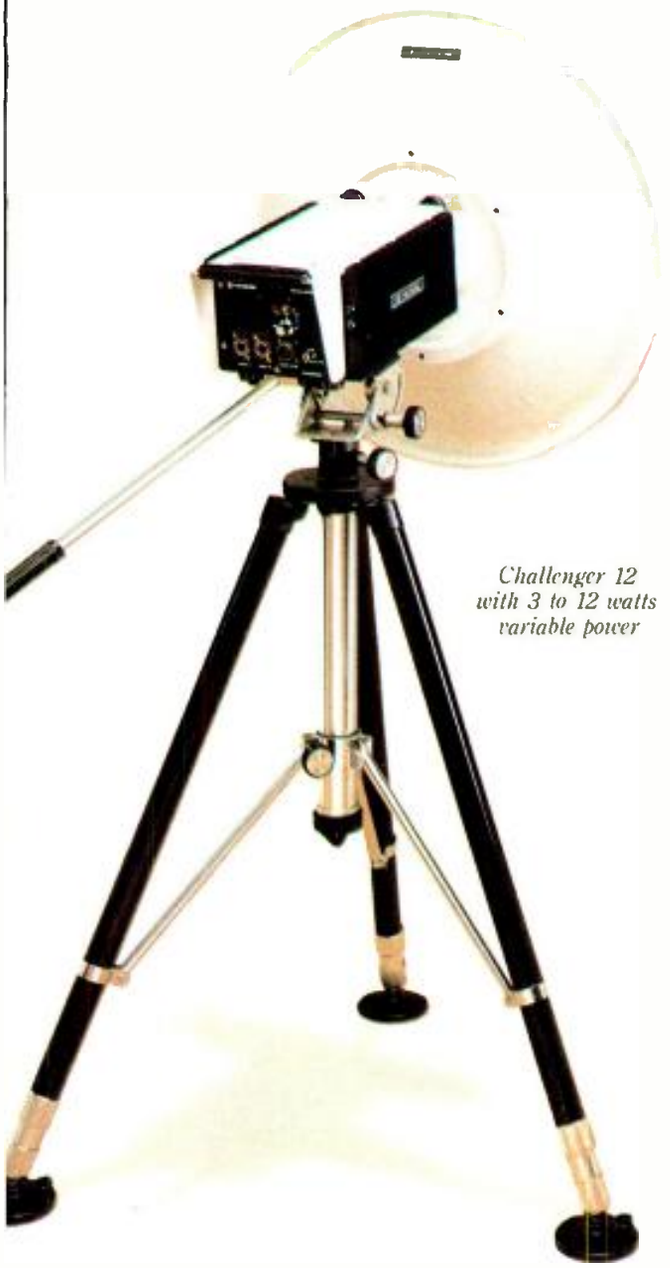
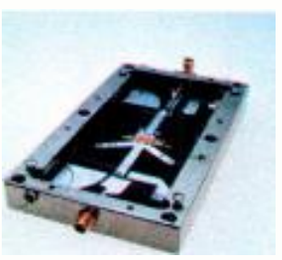
Why our new radio is heavier than you'd expect.



Challenger 12 with 3 to 12 watts variable power

When we introduce a brand new portable microwave transmitter with innovative features like continuously variable power from 3 to 12 watts and a linear GaAs FET power amp, our customers also expect it to be "bulletproof".

So, we build in modular plug-in circuit boards for quick service; multilevel RFI shielding for superior integrity, and an integral heat sink to eliminate dependence on the antenna bracket. Plus, a linear power amp eliminates spurious response to provide excellent spectral purity, while its *one* stage (versus the usual 4) reduces still further the probability of failure.



Class A Linear GaAs FET Power Amp

You see, when you buy either our *Challenger* at three watts, or the *Challenger 12* with 3 to 12 watts variable, you get unexpected state-of-the-art features. But you also get what you expect from Harris—reliability, ease-of-service, and the best product support in the business.

For information about our complete line of ENG equipment call or write, **Harris Broadcast Microwave, 967 Stierlin Road, Mountain View, CA 94043. Phone: 415-969-9100. Telex: 17-2584 HARFARVID**

Harris Broadcast Microwave, 1984

HARRIS

Circle (58) on Reply Card

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The definition of the best color camera

No matter how you define your color camera needs, you will want to be certain you have chosen the best tube for the job. And no technical appraisal can be complete without EEV Leddicons.

Highest picture quality

Lag or smearing under low-light conditions is a common effect with most tubes – but less with EEV Leddicons! Instead of the twin-light pipe used by some competitors, Leddicons incorporate a unique light bias arrangement with a 10-hole and sintered quartz diffusing disc system for minimal shading. Differential lag is minimised by balancing the response speeds of the green, red and blue channels; so a football in flight will always look like a football – not a flying saucer! Light biasing is variable on 30mm and 25mm Leddicons. On 30mm types, biasing is integral so there is no need for a clumsy adaptor.

High resolution

EEV is the only manufacturer to make three different target layers to optimise resolution for each color channel. The advantage of this unique feature can be clearly seen in the Leddicon's much better performance.

Faithful color imagery

Faithful color imagery is all about reproducing what the eye sees. And that is exactly what Leddicons do. Extended reds have a precisely-engineered response and a matched infra-red filter is incorporated to provide cut-off where you want it.

Reduced highlight image retention

Highlight image retention can be a production team's nightmare – the wrong choice of tube and highly polished orchestra instruments can end up looking like the aftermath of an aerobatics display. With EEV Leddicons, the problem is minimised by a unique target manufacturing process. The result is you can rely on Leddicons, even in the very difficult extended red channel where other tubes are simply unable to cope.

Better tube quality – plus longer life

At long last a manufacturer who is prepared to t about blemishes – but then we know Leddicons avera less spotting than other tubes! The secret lies in the fact that all Leddicons must satisfy the most exactin manufacturing, testing and quality control standards. These not only preclude loose particles from the insic of the tube but also ensure longer tube life.

Optimised geometry and registration

The optimised electron optical design of Leddico ensures the best possible geometry without distortio Registration too is equally distortion free – we can, in fact, supply computer-matched sets for all three channels.

LEDDIC

Unique anti-microphonic features

Nothing tests a tube more rigorously than the range of frequencies generated by an orchestra. With EEV's unique anti-microphonic mesh assembly, Leddicons provide the cleanest pictures – even from cameras operating in areas of high ambient acoustic noise.

FOR FURTHER INFORMATION ON LEDDICONS, CALL US TODAY.
IN USA Toll free 800 431 1230 (except for NY State).
EEV Inc Corporate Office, 7 Westchester Plaza, Elmsford, NY 10523. Tel: 914 592 6050. Telex: 6818096. **Mid. Western Sales Office,** 2073 Arleen Cou Schaumburg, IL 60194. Tel:312 843 8417. **North-Eastern Sales Office,** 250 Hami Drive, Snyder, NY 14226. Tel: 716 839 5959. **South-Western Sales Office,** 5455 Garden Grove Boulevard, Suite 420, Westminster, CA 92683. Tel: 714 895 39 **South-Eastern Sales Office,** Suite 100E, 15 Dunwoody Park, Atlanta, GA 30338. Tel: 404 394 9201.
Tri-State Sales Office, 7 Westchester Plaza, Elmsford, NY 10523. Tel: 914 592 61 **Western Sales Office,** 19001 40th Place, N E Seattle, WA 98155. Tel: 206 363 2
IN CANADA EEV Canada Ltd, 67 Westmore Drive, Rexdale Ontario M9V 3Y6. Tel: 416 745 9494. Telex: 06 989 363.
REST OF THE WORLD EEV, Waterhouse Lane, Chelmsford, Essex CM1 2QU, Engla Tel: 0245 261777. Telex: 99103.

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tubes in the world.

'irst for customer service

EEV is not only concerned with manufacturing the ›est tubes but also ensures the best delivery and ıfter-sales service. Our reputation in this respect, like hat of our Leddicons, is second to none.

To serve the needs of our broadcast customers in he USA and Canada best, we sell direct from our enters in New York and Toronto where we maintain a arge inventory as well as full test facilities.

When you add up all the facts about EEV eddicons, there is only one conclusion – namely, the lefinition of the best tubes for your camera. But don't eave it at that. Next time specify Leddicons for your ıew equipment and as replacements. Then find out vhat that definition really means in practice.

Comprehensive range

EEV Leddicons are specified throughout the world for virtually every type of studio, EFP and ENG camera. The range covers 30mm (1¼in), 25mm (1in), 18mm (⅔in) and 12mm (½in) sizes. And the comprehensive choice of front- and rear-loading types includes diode gun, low output capacitance (LOC) diode gun, triode gun and tetrode gun highlight overload protection (HOP).

EEV Leddicons are fully interchangeable in most types of camera including:

BCC10/20/21	HL79/81/83	MNC80	TC80/85
BVP300/330	HK312/322	MKVIII/IX	TK47
CEI310	KCU/KCK40	SK91/96	TK76
FOTON 1	LDK5/15/25	SK110	TTV1515/1516

ONS®

®Leddicon is the Registered Trademark of EEV Lead Oxide Camera Tubes

EEV Camera Tubes

Circle (59) on Reply Card

See Us at NAB Booth 1335

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Datatronix (1504)
Continued

318: DA with high common mode reject
PTIS: User programmable telephone interface
1604A: Stereo production/post-production console
2424: Summing crosspoint matrix, to 24x24
701A: 18W audio power amp
941: VCA automation fader

Circle (569) on Reply Card

Dataworld (315)†
See at booth

Circle (570) on Reply Card

Datum (1708)
Established products
9400-637: Source ID encoder
9200-402: Source ID reader
9520-150: Digital time display
New products
5303: SMPTE/EBU longitudinal and VITC generator/reader
9550: Multirow character generator/inserter
9241: Automatic videotape search system
9400: Multiline video data encoder
9200: Multiline video data reader

Circle (571) on Reply Card
see ad on page 318

David Green Broadcast Consultants
See Green, David

Davis & Sanford (1751)
Established products
Tripods, stands and pedestals
Tripod heads, fluid heads
Dollies
New products
Fluid heads

Circle (572) on Reply Card

Delcom (1638)†
Established products
AE-3: Auto effects interface
VO-5850D: Delcom/Sony advanced U-matic VTR
Design: Custom systems, studio or remote
Consulting: Engineering
Vans: Mobile, design/constructions
New products
Control room furnishings, consoles
Cabinetry

Circle (573) on Reply Card

Delta Electronics (105)
Established products
TCA Series: RF ammeter systems
CPB-1: Common point bridge
FMC-1: FM modulation controller
APC-1: Automatic power controller
6730E: Coaxial transfer switch
OIB-3: Operating impedance bridge
AAM-1: Antenna monitor
RCS-IV: Microprocessor-hased remote control system
New products
ASE-1: AM stereo exciter
ASM-1: AM stereo modulation monitor
RG-4: Receiver/generator
RCS-IV: ATS option for remote control system

Circle (574) on Reply Card
see ad on page 145

Desisti Americas (1131)
Established products
DLK Series: Portable lighting kits
2000/2010: HMI softlights
RC110: 1kW fiber-glass fill light
DC Series: Molded polyethylene location light cases
OCM/DeSisti: Motorized hoise rigging studio suspension system
New products
Tiziano: 200W CID Sun Gun with electronic ballast
Pilota Series: Discharge follow spotlights in 1kW and 2.5kW sizes
90.100: Brass super strong C-clamps
50.100: Junior-size stand with wheels
Americas: 200W sealed-beam hand-held HMI light and 1.2kW sealed-beam spot light
Brass scenery clamp with adapters for lights
52 series: Fresnel studio lights in 300W, 500W, 650W, 1kW and 2kW ratings

Circle (575) on Reply Card

DeWolfe Music Library (1743)
Established products
Music library
Sound effects library
Prerecorded music for use in any A/V production

Circle (60) on Reply Card

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Videomedia

THE LEADER IN POST PRODUCTION TECHNOLOGY

ANNOUNCES THE NEW ERA IN LOW COST EDITING

Breaking the price/performance barrier

Designed in the tradition of the famous Z6000 series of editors

Compare these standard features with any competitive system

STANDARD FEATURES:

- Distributed intelligence
- 250 event memory
- Animation
- Printer output
- Status display generator
- Frame accurate
- Built in sync generator
- Much more...

OPTIONS:

- List management
- Dual disk operating system
- Off line communications package (an industry first)
- A/B roll & sync roll
- General purpose interface-(for external devices)

SEE US AT NAB BOOTH 1308

FOR THE DEALER IN YOUR AREA CALL (408) 745-1700

Circle (68) on Reply Card

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DeWolfe (1743)
Continued
New products
See at booth
Circle (576) on Reply Card

Dielectric Communications (455)
Established products
Coaxial switches and patch panels
RF loads
Coaxial transmission lines
Dehydrators
New products
DCR: Circularly polarized FM ring antenna
CDP-B: FM panel antennas
Circle (577) on Reply Card

Digital Entertainment (1600)†
Established products
Digital audio recorders and accessories
SAM series of audio mixers
Portable remote broadcast audio mixers
New products
See at booth
Circle (578) on Reply Card

Digital Services (1302)
Established products
DFX2010: FlexiKey digital effects key generator
New products
16N4000: Illusion full digital effects generator
PSP100: Perspective option for illusion
PSP101: Perspective option for FlexiKey
CDN1000: Conductor-master control automation
STS100: Statistician spots/electron statistical software
Circle (579) on Reply Card

Digital Video Systems (1017)
See *Scientific-Atlanta*

DigiVision (1507)
Established products
DRGB-343: Digital video converter. Converts NTSC or RGB input video to 100-line resolution signal with noise reduction
New products
See at booth
Circle (580) on Reply Card

Dilor Industries (*)
Established products
Full range of dimmers for permanent and portable installations
LITEPAK series: Dimmer systems
New products
Memory lighting control system
Advanced direct dimmer access patching manual control system
Circle (581) on Reply Card
see ad on page 198

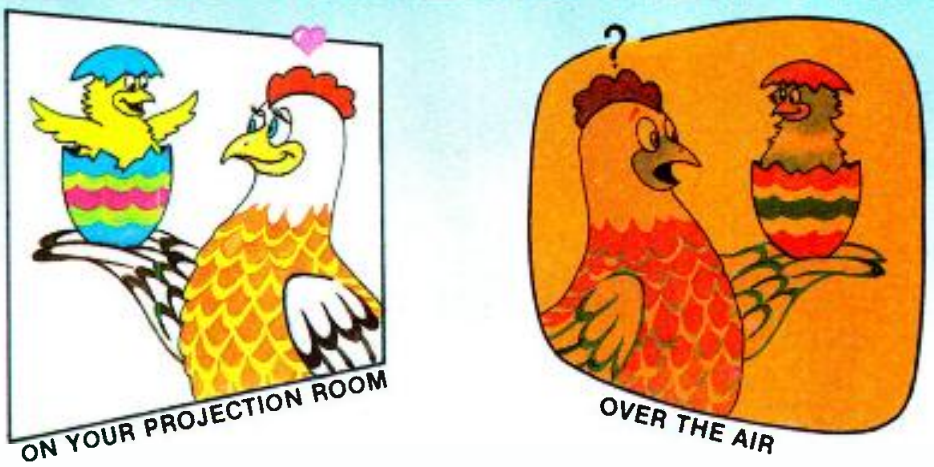
Di-Tech (1301)
Established products
5840 Series: AFV routing switchers
5800, 5500, 5400 and 5403: AFV routing switchers
110: Video DAs
150: Pulse DAs
170: Audio DAs
New products
See at booth
Circle (582) on Reply Card

Dolby Labs (1311)
Established products
226: Audio NR module for Ampex VPR-2
234: Audio NR module for Sony BVH-2000
221: Audio NR module for Sony BVH-1000/1100
360 Series: Audio NR units for outboard applications
SP Series: Audio NR system for multi-track recording
Model 372: Portable NR unit for field recording
362: 2-channel outboard NR system
New products
Model 380: Audio NR system for Ampex VPR-3 and VPR-80
Model 362: Audio NR system for applications in which two channels are required
Circle (583) on Reply Card

Dorrough Electronics (312)
Established products
610: Discriminate audio processor
40-A/40-B: Loudness meters
FM-81: FM stereo generator
New products
See at booth
Circle (584) on Reply Card

Drake-Chenault (*)
Established products

SOMETIMES EVEN A MOTHER HAS TROUBLE RECOGNIZING HER OWN CHILD



NAB BOOTH # 1161

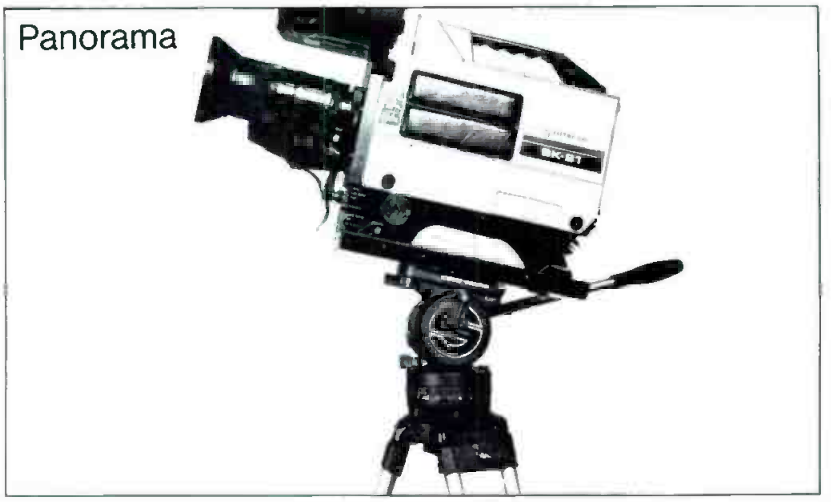
Why your Commercial doesn't look as good on the air as it did in the projection room. — There are many technical complex reasons, but the only thing you have to know is that your commercial is transferred using **THE SYSTEM 60XLB2** or **THE SYSTEM XL II** computerized scene-to-scene color correctors for **Film-to-Tape** and **Tape-to-Tape,** the *leaders and pacesetters* of "The State of the Art."

CORPORATE COMMUNICATIONS CONSULTANTS, INC.
"Manufacturers of the hassle-free line of color correctors"
4250 Veterans Memorial Highway • Holbrook, New York 11741
Tel. No. (516) 737-0903 TWX 510-228-7416

Circle (62) on Reply Card

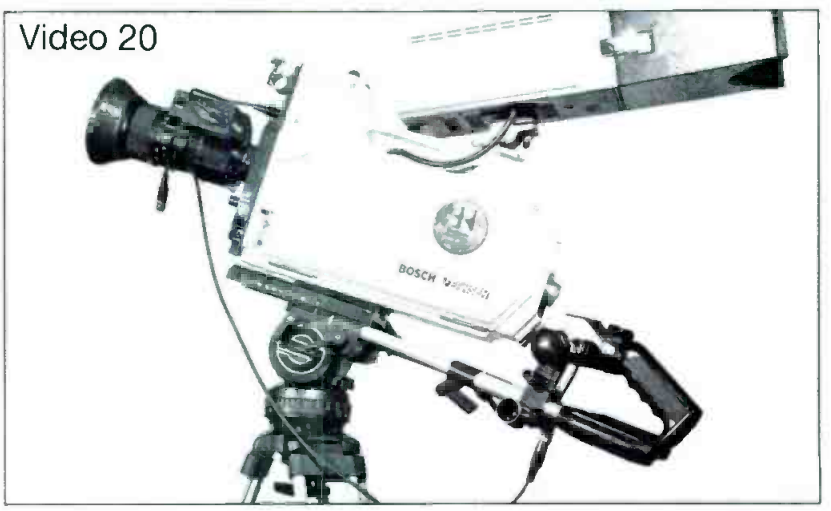
www.americanradiohistory.com

sachtler



'HE PERFECT HEADLINE

or your ENG- or EFP-camera



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subsidiary of Sachtler GmbH
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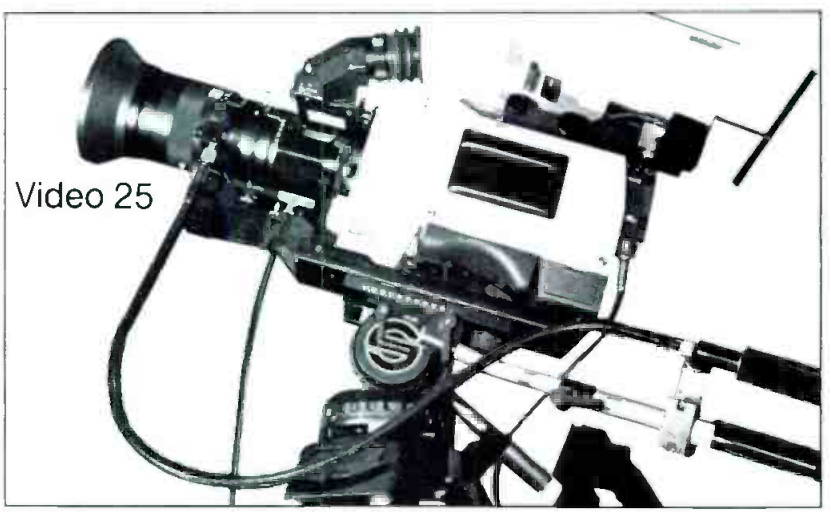
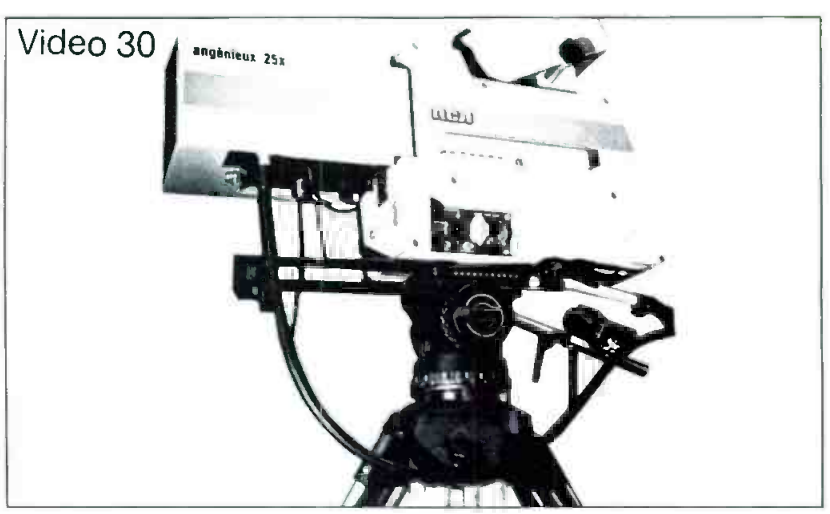
-8046 Garching/München
one (89) 3 20 40 41, Telex 5 215 340





Circle (63) on Reply Card

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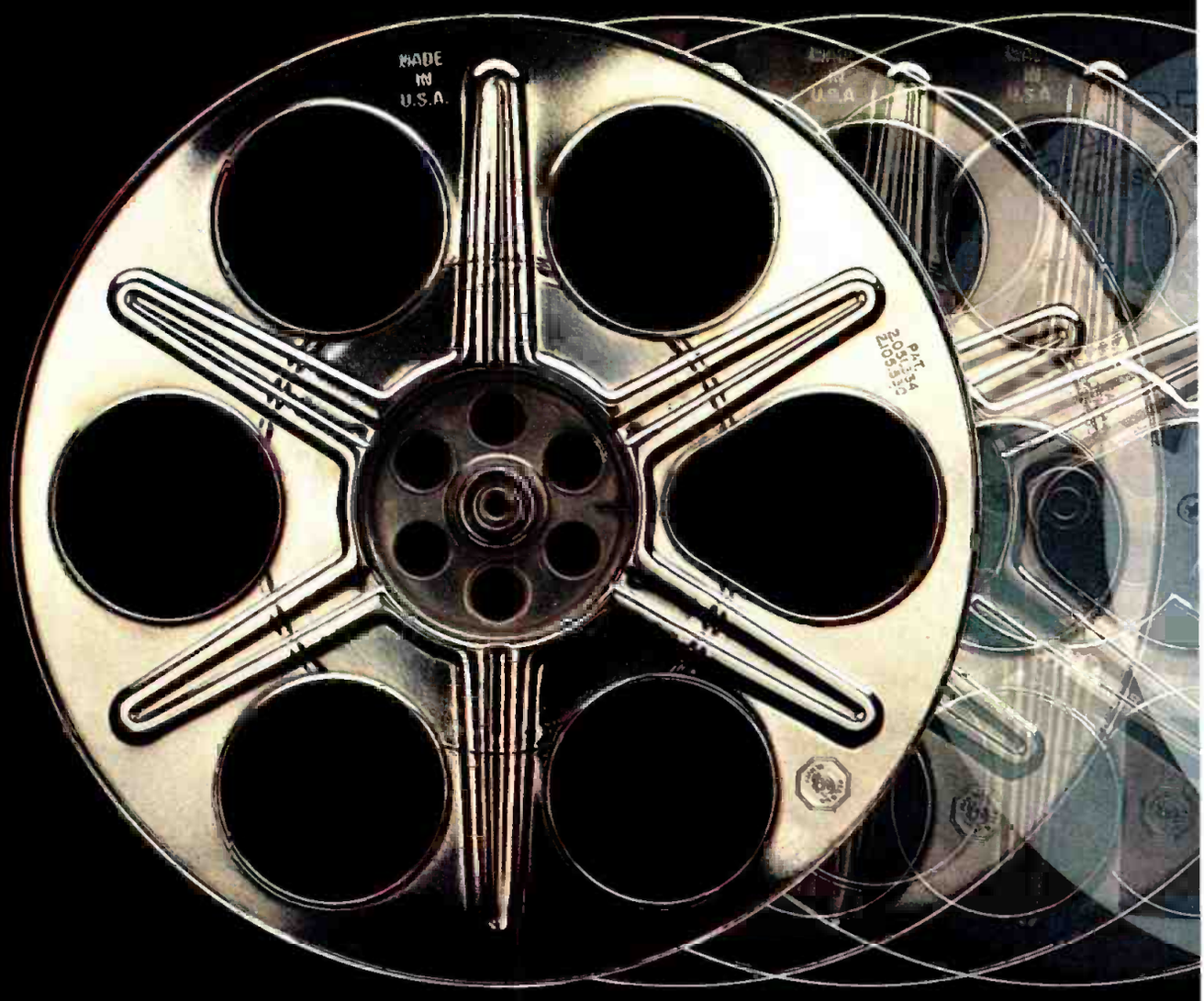
THE FIRST NAME IN FILM



Introducing video tape with the quality, dependability, consistency, and backup service you expect from Kodak.

The virtues that have made Eastman Kodak Company the first name in film are now yours in new Eastman professional video tape.

A world leader in imaging technology for more than a century brings you a brand of video tape so good that we stake our reputation on it.

So can you. Because Eastman professional video tape offers you a unique combination of benefits.

Quality. Try our video tape and experience its quality. You'll see that Eastman professional video tape meets the same stringent performance standards that characterize all Eastman products.

Dependability. Establishing a reputation for reliability takes time and commitment. Our record speaks for itself. To satisfy your need for dependability, our products are made to our own demanding specifications.

Consistency. As the world's leading manufacturer of photographic film, Kodak appreciates the critical importance of video tape product consistency. Therefore, Eastman video tape is manufactured according to our strict uniformity requirements.

Technical service. You can count on our field force of skilled sales and engineering representatives to help you get the most from Eastman video tape products.

Availability. You don't have to wait for Kodak to set up shop. We already operate a worldwide marketing network. And a dealer organization also will soon be ready to supply you with Eastman pro-

© Eastman Kodak Company, 1984

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IS THE NEW NAME IN VIDEO TAPE

fessional video tape...when and where you need it.

You have the option of professional-quality and broadcast-quality Eastman professional video cassettes in both ½-inch (VHS and Beta) and ¾-inch (U-Matic, standard and mini) cassette sizes. Broadcast-quality 1-inch tape (helical "B" and "C" format) is scheduled to be available in mid-1984. We offer an excellent selection of video cassettes and video tapes for use with NTSC as well as PAL/SECAM TV systems.

Now is the time for you to discover what the new name in professional video tape can do for you. To learn more, contact your Kodak sales and engineering representative.

ATLANTA (404) 351-6510
CHICAGO (312) 654-5300
DALLAS (214) 351-3221
HOLLYWOOD (213) 464-6131
HONOLULU (808) 833-1661
MONTREAL (514) 761-3481
NEW YORK (212) 930-7500
SAN FRANCISCO (415) 928-1300
TORONTO (416) 766-8233
VANCOUVER (604) 926-7411
WASHINGTON, DC (703) 558-9220

Overseas, call the local Kodak company.

Motion Picture and Audiovisual Markets Division, Eastman Kodak Company, 343 State Street, Rochester, NY 14650

Circle (64) on Reply Card

EASTMAN Professional Video Tapes

Kodak

www.americanradiohistory.com

Drake Chenault (*)
Continued
Syndicated music formats
Special features products
New products
History of Rock 'n Roll Series
Circle (585) on Reply Card

Dreamdata **(1728)†**
See at booth
Circle (586) on Reply Card

Dubner Computer Systems **(1630)**
Established products
CBG-2: Videographics generator
CCC-12: Color corrector computer automation for film or tape to tape transfers
New products
CBG-2: Enhancements include high resolution, more colors per image, dual keyboard operation, new 3-D software, hardware anti-aliasing and an optional third plane electronic still-store
Circle (587) on Reply Card
see ad on page 109

Dynair Electronics **(1404)**
Established products
Series 25: 20x20 AFV routing switcher
System 21: 50x10 AFV routing switcher
Series 10: 10x10 A/V routing switcher
System 23: Machine control and data switch
Series 5300: Modular DA equipment
Series 1500: DA and switching equipment
Series 1600: Switching equipment
New products
See at booth
Circle (588) on Reply Card
see ad on page 119

Dynamic Technology **(1719)**
Established products
VIMACS: Vertical interval machine control system
STATE: Source transmitter and teletext encoder
VPA2646: Video precision EQ/DA
SDA2656: Audio DAs
New products
VTR Library system
Circle (589) on Reply Card

E.A.R.
See Emergency Alert Receivers

EECO **(1314)**
Established products
EECONOLINE: Entry-level post-production time code generator, reader, character generator
MTG-550: Time code generator
PTG-560: Portable time code generator SMPTE/EBU time code source
TCR-650: Time coder reader
VCG-750: Video character generator for VITC and LTC code formats
VIG-850: VITC/LTC generator/reader
VIR-950: VITC reader
MQS-100A: Multicue synchronizer for up to three transports
IVES: Intelligent video editing system
New products
IVES enhancements: A/B capabilities and special effects control
Multimachine computer-assisted editing system with SMPTE/EBU LTC/VITC or control track control, with 9-machine capability
Circle (590) on Reply Card
see ad on page 107

EEG Enterprises **(1155)**
Established products
EN210 and EN230: Line 21 captioning encoders
DE101: Line 21 video decoder
MCZ-210: Captioning computer
EDAC-1: Line-21 text processor
New products
EN230: Dual-line encoder
DE201: VBI addressable decoder
TE-510: Teletext video data bridge
TV network alert system
TV network control system
Circle (591) on Reply Card

EEV **(1335)**
Established products
P8160/96: 1-inch DG Leddicons
P8460: ⅔-inch DG Leddicon
P8462: ⅔-inch DG LOC Leddicon
P8440: 30mm DG Leddicon
8134V1: 1-inch vidicon
P8038: 1-inch vidicon
8541A: 1-inch vidicon
4CX10,000: AM/FM transmitter power tubes
4CX15,000: AM/FM transmitter tubes →

EVERTZ closes the Time Code price / performance gap!

Model 4000
- Edit Code Master -

EVERTZ presents a new generation of LTC and VITCode products at prices comparable to traditional longitudinal only systems, but with all the advantages that vertical interval time-code offers.

We have taken a quantum leap forward in time-code technology. These products combine the best of LTC and VITC to provide the ultimate in performance, flexibility and reliability.

Model 4900
- LTC & VITC Reader -

Because longitudinal time-code remains popular as a powerful production tool we are also introducing several new LTC generators and readers combining our time tested designs with the latest advances in micro-chip technology to offer you superb edit code equipment at affordable prices.

Model 3600D
- LTC Generator / Reader -

See our comprehensive line of time-code equipment at the AMTEL booth, #1745 at N.A.B.

EVERTZ MICROSYSTEMS

Distributors and Service Worldwide
In U.S.A.: AMTEL SYSTEMS INC.
400 West Cummings Park
Woburn, MA. 01801 (617)938-8551

EVERTZ MICROSYSTEMS INC.
A Division of Dynaquip Ltd.,
3515 Mainway, Burlington,
Ontario, Canada L7M 1A9
Telex: 061-8784 Tel: (416) 335-3700

Circle (65) on Reply Card

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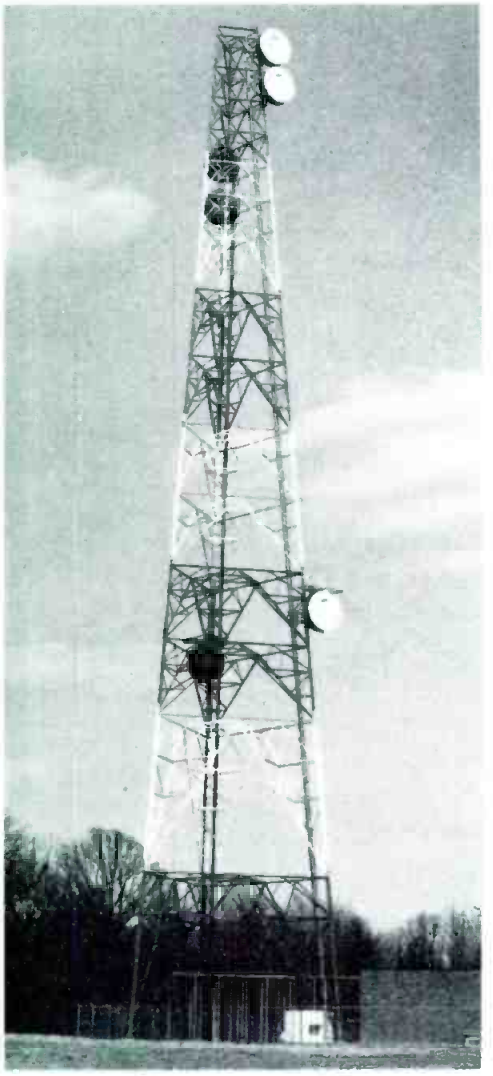
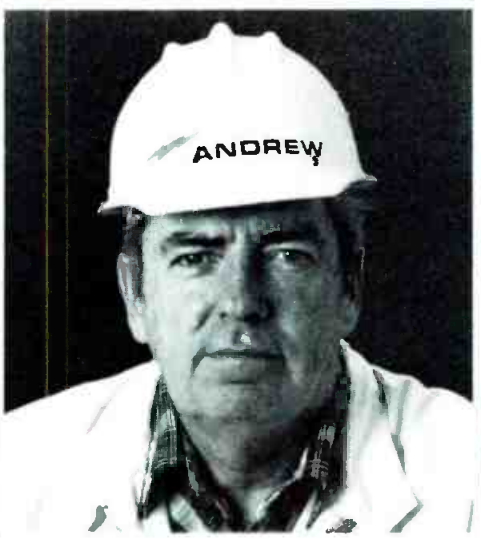
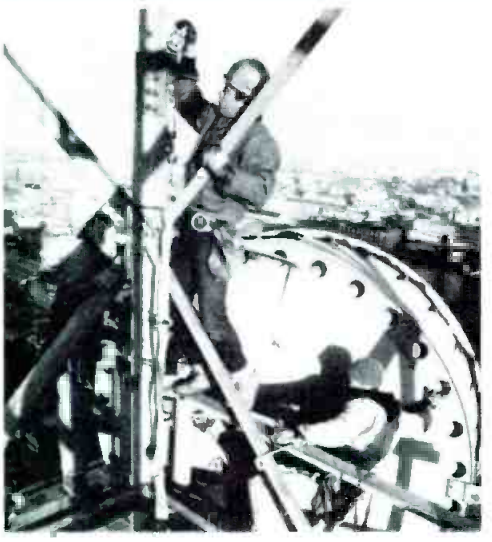


LET US DO IT ALL!





SERVICES

- Project Management
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- Electronic Systems Integration
- Delivery Service on Specialized Vehicles
- Sales and Manufacturing Support —Worldwide

PRODUCTS

- Equipment Shelters and Towers
- Broadcast Antennas and Transmission Lines
- Terrestrial Microwave Antennas
- Coaxial Cables and Elliptical Waveguides
- Earth Station Antennas

LET US DO IT ALL!

Our people in the booth wearing this button have all the answers.

Let's talk. Stop by. Visit Booth 1201A at the NAB Show.

Andrew Corporation, 10500 West 153rd Street, Orland Park, IL 60462.

ANDREW

Our concern *is* communications.

Circle (66) on Reply Card

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EEV (1335)
Continued
4CX35,000: AM/FM transmitter tubes
New products
K3372: 55kW high efficiency broadband, external cavity UHF klystron with Beam Control Device for water or vapor cooled systems
P8490: 1-inch, front-load DG Leddicon with harium aluminate cathode
P8496: 1-inch, rear-load DG Leddicon
P8442: 1-inch, rear-load DG LOC Leddicon
P8450: 30mm LOC DG Leddicon
P8452: 30mm LOC DG Leddicon with barium aluminate cathode
P4320: Electronically shuttered CCD camera
Circle (1500) on Reply Card
see ads on pages 96 and 97

EG&G **(1327)**
Established products
SS122: Tower lighting controller
SS114: Beacon power supply
SS115: Omnidirectional beacon unit
New products
SS124: Photocell to sense ambient light and control tower lighting
SS125: Flash head for strobe lighting applications
Circle (592) on Reply Card

EMCEE Broadcast Products **(1621)**
Established products
TTU1000CP: 1kW LPTV transmitter
TTU100S: 100W LPTV transmitter
TTS10SI: 10W ITFS/MDS solid-state transmitter
TTU5000: 5kW UHF TV transmitter
New products
See at booth
Circle (593) on Reply Card
see ad on page 179

E-N-G **(1022)†**
Established products
E-N-G Van
E-N-G Suburban
K-82: Backpack
E-N-G remote control unit for microwave unit
New products
See at booth
Circle (594) on Reply Card

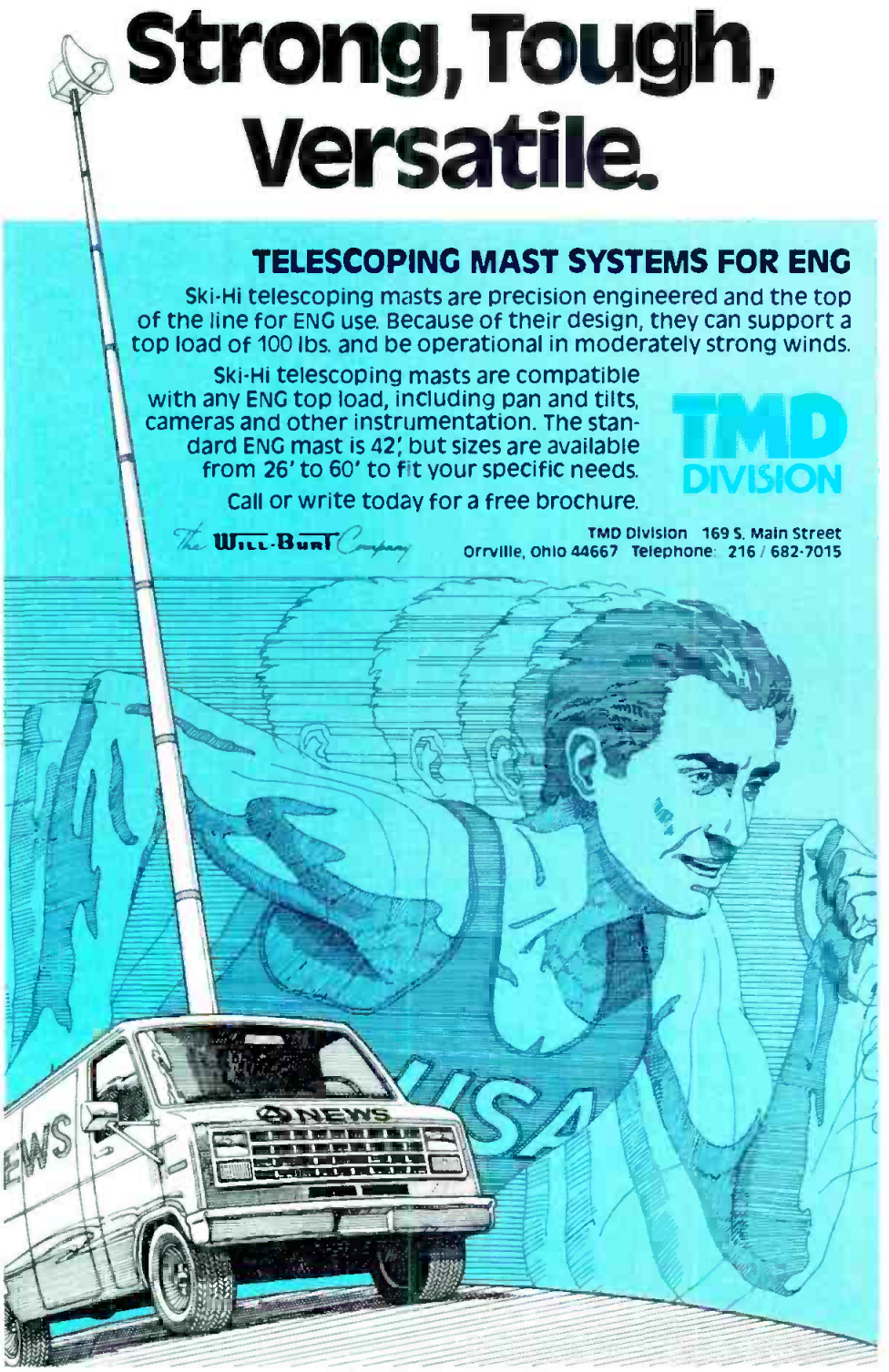
ERA **(1618)†**
See at booth
Circle (595) on Reply Card

ESE **(116, 1757)**
Established products
ES160: Master clock system
ES232: Time calculator
ES302: 100-minute up/down timer
ES790: 1000-event programmable clock
ES254/255: Multispeed, bidirectional SMPTE time code reader/video inserter
ES256: Smart SMPTE code reader
ES261: SMPTE time code generator
ES207: Video DA
New products
ES212: Phone patch telephone interface
ES257: SMPTE reader/comparator
ES258: SMPTE code comparator
Circle (596) on Reply Card
see ad on page 339

Eastman Kodak **(1214)†**
Established products
Motion picture film products especially suited to origination for television
Datakode: Magnetic Control Surface Technology
Telecine Analysis Film (TAF)
Color monitor analyzer test set
New products
See at booth
Circle (597) on Reply Card
see ads on pages 102 and 103

Echolab **(1510)**
Established products
SE/3: Microprocessor-controlled special effects generator with on-board memory and editing controller interfacing
New products
AFS: Audio switcher controlled from an edit controller, the SE/3 switcher system or from its own control panel
Circle (598) on Reply Card

Econco Broadcast Services **(1759)**
Established products
Rebuilt transmitter power tubes
New products
See at booth
Circle (599) on Reply Card



Circle (67) on Reply Card

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Q: WHAT'S THE BEST KEPT SECRET IN EDITING?

A: EECO's Pioneering Past.

—1967—EECO develops first television time code editing system, called ON-TIME™.
—1970—EECO works with the SMPTE to help establish an industry standard for longitudinal time code.
—1971—EECO is presented an Emmy Award citation for outstanding engineering achievement for the development of time code and equipment for videotape editing.
—1972—EECO pioneers first synchronizing system utilizing time code and a microprocessor to control both sprocketed and non-sprocketed transports.
—1974—EECO introduces first low power time code generator CMOS chip.
—1976—EECO, jointly with RCA, develops first microprocessor controlled videotape editing system—the RCA AE600 for the RCA TR600 VTR.
—1978—EECO receives an Academy Award citation for the application of code and control systems in motion picture production.
—1980—EECO works with the SMPTE to help establish industry standard for vertical interval time code.
—1980—EECO, jointly with RCA, develops videotape editing system incorporating longitudinal and vertical interval time code editing capabilities—the RCA AE800 for the RCA TR800 VTR.
—1982—EECO introduces IVES™ Intelligent Video Editing System, a complete post-production system for two VCR's.

A: EECO's Innovative Future.

EECO is unveiling new solutions in multi-machine editing control. Our latest innovative milestone: A computer-assisted videotape editing system, capable of multi-machine control of any mix of up to 9 professional 1/2", 3/4" and 1" VTR's or multitrack ATR's and a production switcher.

Providing ease and speed of operation, our new editing system utilizes distributed processing and multiple keyboard configurations for use by either videotape or film editors.

We've also expanded our IVES Editing System with the addition of complete A/B control of three 1/2" and/or 3/4" VCR's...the IVES A/B™ enhancement option.

EECO's forward direction in editing is backed by a history as an industry pioneer and product innovator, including a full line of longitudinal and vertical interval time code generator and reader peripherals to fit every price and capability range and a multi-cue synchronizer for enhancing audio for video.

For additional information or the name of your nearest EECO Authorized Distributor call (714) 835-6000 Ext. 419. EECO Incorporated, 1601 E. Chestnut Ave., P.O. Box 659, Santa Ana, CA 92702-0659.

EECO®

Computer Controls For Video Production

SEE EECO'S NEW SOLUTIONS FOR EDITING AT NAB BOOTH #1314

Circle (68) on Reply Card

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Circle (69) on Reply Card

Elcom-Bauer (412)
Established products
AM and FM transmitters
New products
See at booth
Circle (600) on Reply Card

Electro-Controls (1631C)
See at booth
Circle (1499) on Reply Card

Electrohome Ltd. (1744)
Established products
EVM Series: High resolution monochrome video monitors in 9-, 12-, 15-, 17- and 23-inch sizes
TV projection systems
New products
See at booth
Circle (601) on Reply Card
see ad on page 298

Electro Impulse (117)
Established products
Dry, forced-air FM dummy loads
Calorimeters
Wattmeters
Attenuators
New products
See at booth
Circle (602) on Reply Card

Electro USA (1707)†
Established products
CM22 NTSC color monitor
CM33 HRC monitor
CM51 HRC monitor
CVTM D monitor
New products
See at booth
Circle (603) on Reply Card

Electro-Voice (1159)
Established products
Sentry Series: Broadcast studio or control room monitor speaker systems
Professional microphones
New products
Sentry 100EL: Powered studio monitor speaker system
ELX-1: 4-input, 1-output mic/line mixer in portable or rack-mount unit, internal limiting, oscillator and ac/battery supply
8000 Series: Audio mixing consoles
Circle (604) on Reply Card
see ad on page 317

Electronic Research (105A)†
See at booth
Circle (605) on Reply Card

Electronic Systems Labs (406A)
Established products
200: Mixing console
EA803: Telephone hybrid
1000: Broadcast console
S20: Reportophone
2000 Series: Microphone stands
Audio cables, cable drums, cable snakes
New products
See at booth
Circle (606) on Reply Card

Emcor Products (429)†
Established products
Equipment cabinets
EMI/RFI shielding
ESQ cabinets
New products
See at booth
Circle (607) on Reply Card
see ad on page 131

Emergency Alert (508)
Established products
67kHz and 92kHz SCA receivers with various decoders
EBS receivers for homes, hospitals, industries, schools
New products
See at booth
Circle (608) on Reply Card

Environmental Satellite Data (1509A)
Established products
Dial-up weather satellite pictures from GOES East & West, with infrared and visible data and water vapor imaging
Accu-Weather feature and forecast graphics to complement ESD real time imagery
New products
PMT-100: Weather graphics production system with high resolution graphic and font generation, more than 200 frame storage, animation, frame loops, RRWDS local color displays, Doppler radar displays, automated broadcast and/or dial-up data acquisition
Circle (609) on Reply Card
see ad on page 300

Euro Equipment (1175)†
See at booth
Circle (610) on Reply Card

Eventide (323)
Established products
SP2016: Programmable effects processor and reverb system
BD955: Broadcast delay line
BD931/932: Broadcast delay lines
H949: Harmonizer for audio time compression, pitch change, delay, flanging, etc.
APX252: Real time audio spectrum analyzer software for Apple computer
Timesequeeze Jr.: Time compression system for audio film and video use
New products
New effects software for SP2016
Circle (611) on Reply Card
see ad on page 14

Excalibur Industries (1106)
Established products
Reusable shipping containers
New products
See at booth
Circle (612) on Reply Card

Farrtronics (1709)
Established products
M750 Series: Audio patch panels with prewired jacks or punch blocks
M76-DA: Distribution amplifiers
M82-P/L: 8-channel P/L system
M81: Intercom matrix
175: Intercom stations in 1.75-inch rack-mount format →

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The more you see, the more we hear

Look who's talking about Dubner now.

While we claim no responsibility for the famous line, "Build a better mousetrap and they'll beat a path to your door," we'd like to think it might have been said about the Dubner CBG-2 video graphics/animation system. In any case, we thought you might like to hear what your colleagues are saying about us:

"The CBG-2 is undeniably the most novel and flexible state-of-the-art real-time animation graphics device currently available.

– Mark Bernardo, Chief Graphics Design Engineer, Olympics
ABC Television

"We needed a machine that would allow us to compete effectively in an already competitive market. The CBG-2 gave us the capability to create weather maps and news graphics quickly, it could be operated by department personnel, and it was the best buy on the market."

– Bob Plummer, Director of Engineering, Fisher Broadcasting
KOMO (Radio & Television, Seattle)

"It's a digital computer and animation tool that allows artists to create quality animations independently. The CBG-2 is relatively inexpensive, it works fast and enhances the creative process with real-time imagery."

– Elaine Schwartz, Computer Animator
Atlantic Image (New York animation house)

"The CBG-2 is much faster and less expensive than standard film animation. The real-time animation, clean key capability, expandability and great software support make it one of the best computers around."

– Corinne Sousoulas, Art Director
Motion Picture Laboratories (Memphis post production house)

"The CBG-2 is a valuable tool due to its ability to create effective graphics quickly. It offers three dimensional animation, graphic enhancement, and character generation all in one unit. And these features are difficult to find in any one machine."

– Victoria Henigman, Electronic Graphic Designer
WPBT-TV (Miami PBS Affiliate)

"The Dubner was purchased for its advanced animation capabilities, its ability to be upgraded via software, and its cost effectiveness. We love it!"

– Dan Sokol, Vice President, Engineering
Video Post & Transfer (Dallas post production house)

With all the nice things being said about Dubner, all we can say is thank you. We plan to keep up the good work. You'll keep seeing it and we'll keep hearing about it.

For a free demonstration of the Dubner CBG-2, call (201) 592-6500, or write.

DUBNER

Dubner Computer Systems, Inc. 158 Linwood Plaza Fort Lee, New Jersey 07024

Circle (80) on Reply Card

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Farrtronics (1709)
Continued

New products
Series 525: Intercom station with or without tally system
Intercom rack equipment
New accessories
Circle (613) on Reply Card
see ad on page 316

Feldmar Watch & Clock (1777)
Established products
Condor digital clocks and timers
Gra-Lab interval timers
Digital stopwatches by Accusplit, Heuer, Cronus and Minerva
Seiko chronograph
New products
RR-01A: Seiko digital stopwatch with printer
RU-001: Seiko digital stopwatch with memory
Circle (614) on Reply Card

Fernseh
See Bosch

Ficon Broadcast (202A)†
See at booth
Circle (615) on Reply Card

Fidelipac (411)†
Established products
550: Master Cart II NAB audiotape cartridge
380: Master Cart tape cartridge
140: Model 300 tape cartridge
350: Model 350 tape cartridge
149: Model 600 tape cartridge
150: Model 1200 tape cartridge
Alignment tapes and gauges, on-air lights, bulk tape eraser
Table-top bulk tape degausser
Model 65-390: Wow/flutter meter
New products
See at booth
Circle (616) on Reply Card
see ad on pages 80 and 81

Film/Video Equipment (1153)
Established products
Wide Eye I: Wide-angle lens attachment
Wide Eye II: Wide-angle lens attachment
PEP Lead-acid battery packs and belts
PEP Solar chargers for lead-acid and nicad batteries
BP90R: Replacement battery
New products
SLA12125: PEP 12V 12.5Ah battery pack for cameras, recorders or monitors
Circle (617) on Reply Cards
see ad on page 144

Flash Technology (1619)†
Established products
ElectroFlash beacons and hardware
Electro Flash lighting controller
New products
See at booth
Circle (618) on Reply Card

FOR-A Corp. of America (1306)
Established products
VTW-210: Character generator
CI-10: Color interface background and character colorizer
TKY-4600: Title keyer
FVW-3000: Video writer
TCG-3200: Time code generator
TCR-3500: Time code reader
New products
FA-430: TBC with digital image enhancement and color correction
FA-600/690: TBC with framestore or synchronizer
FA-410: TBC with dynamic tracking for BVU-820 and NV-8950 VCRs
VTW-400: Character generator
CS-4300: Color corrector system
DEC-100: NTSC to RGB color decoder
VTG-12: Video time, date, timer
Circle (619) on Reply Card
see ad on page 299

Ford Aerospace & Comm. (1507A)†
Established products
Satellite communication equipment
New products
See at booth
Circle (620) on Reply Card

Forox (1620D)
Established products
SSV: Video animation system
VMP 800S: Video bar display on color CRT for eight to 16 tracks from audiotape
New products
See at booth
Circle (621) on Reply Card

Fortel (1409B)
Established products
CCDHP/HPS/1H: TBCs
Y-688[32]: Total error corrector
C-YIQ[32]: Component TBC
TBC[32]: TBC
DIGIBLOC Series: Including FS-1/FS-2 frame synchronizers, AS-1 audio synchronizer and RES-1 remote engineering station
Color EX: Chroma noise reducer
Record 1/2: Detail booster systems
New products
See at booth
Circle (622) on Reply Card

Fort Worth Tower (1010)
Established products
Communications equipment shelters
Towers
Tower construction and maintenance services
New products
See at booth
Circle (623) on Reply Card

Fostex (1765)
Established products
A2/A4/A8: Reel-to-reel ATRs in 2-, 4- and 8-track formats
350MB: 8-channel recording console
3030: Equalizer
250: 4-track cassette recorder
3050: Digital delay unit
3070: Limiter, compressor, expander gate
3180: Reverberation unit
6301: Minimonitors
3010: Patchbay
B-16: ½-inch, 16-track recorder
New products
See at booth
Circle (624) on Reply Card

Frank Wooley & Company
See Wooley, Frank

Frezzolini (1107)
Established products
OC1: On-camera ½-inch VHS-C VTR
BP-14: On-board battery packs
RSP2: Dual-channel 40W ac adapter/charger
RSP3: Ultra-light 50W on-board ac adapter
RBP90FC: Fast charge BP90 replacement battery
MBC2: 13-battery multibattery charger
FL650: Universal 12V-240V portable light head and kit
F30EC: Lighting power belts/packs/kits
HM90: BP90 adapter for most ENG/EFP cameras and lights
New products
MF12: Ultralight 100W minifill light head and kit
VB12V: VB series of 12V battery packs and camera adapters
BCD2: 2-channel battery charger and conditioner
FPC1: Frezzi power chargers
Circle (625) on Reply Card
see ad on page 270

Fuji Photo Film USA (1413)
Established products
H701E: 2-inch videotape
H621: 1-inch videotape
H521/H521BR: U-matic videotape cassettes
H421: VHS cassettes
H321: Beta cassettes
VHS and Beta Super HG videocassettes
Audiocassettes
Computer floppy disks
New products
H451: Super HG videocassettes in VHS T-120 type
Circle (626) on Reply Card
see ad on page 29

Fujinon (1411)
Established products
ENG/EFP camera lenses, including: A7X7RM, A12X9ERM, A12X9RM, A14X9ERM, A30X11ESM and A3.5x6.5RM
Studio zoom lenses, including: P17x16.5ESM, P28x15ESM and P44x18ESM
New products
See at booth
Circle (627) on Reply Card
see ad on page 53

GEC McMichael Ltd. (1514)
Established products
ACE: 4-field TV standards converter
GM7151/7137: 20- and 14-inch color video monitors for PAL
GM6001: Clock/logo generator
GM4001: Precision PAL comb filter decoder
Continued on page 115

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I want to hear more about Ampex Creative Command Centers.

Please have a Sales Engineer contact me.

Name _____

Organization _____

Address _____

City _____ State _____ Zip _____

Phone _____

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Where Does An Editor Go to Discover More Creative Control with Fewer Technical Constraints?

www.americanradiohistory.com

Welcome to the Ampex

Anyone who has ever integrated a complete post-production editing system knows that it's a complex, difficult and often confusing job. Products from different manufacturers don't always interface easily.

Ampex stands above the confusion by offering all the key elements of a sophisticated post-production system from one manufacturer, complete with fully integrated hardware and software. We call this the *Ampex Creative Command Center.*

This system consists of an Ampex ACE edit controller, Ampex switcher and VTRs and our Emmy-award-winning ADO digital special effects system. Since all these use SMPTE RS-422 serial communications, they are easily interfaced with each other and the peripheral equipment you need to fill out your system. No hidden costs for interface devices. Ampex products are designed from the ground up to work with each other in a fully compatible system.

This isn't exactly a new idea. Post-production facilities all over the world are discovering the business advantages of Ampex Creative Command Centers. A few of them are pictured above, and more are being installed every day.

Care-free Creative Control

More creative power and control is the name of the game with an Ampex Creative Command Center. With a system based on a sound technical groundwork, editors are free to put their full creative energy into every job, confident that they are free of technical constraints.

At the heart of the Center is the remarkable ACE editing system, fast enough and smart enough to satisfy the most creative editors in the business. Depending on individual preferences, you may choose the Touchscreen option, or either the dedicated or ASCII-style keyboards. Using the ACE joystick control, you're in command of all the other products in the system. With the optional General Purpose Interface (GPI) you can command any product activated by an electronic "trigger."

And there's more flexibility. ACE disks are interchangeable with any other ACE system of any configuration. ACE can even read and write CMX-format disks. You can schedule system time much more effectively and conveniently.

That's only part of the story. There's more creative power, control and flexibility inherent in all the Ampex products.

System Flexibility

Product quality and reliability have long been associated with the Ampex name. In our Creative Command Center, you have a wide choice of Ampex products, each unsurpassed in its price/performance category. Complementing ACE, with its various options, you have a choice of Ampex production switchers, either 4100 Series, or the microprocessor-based AVC Series. AVC switchers offer awesome creative power, yet are simple and logical to operate.

You also can choose any of the Ampex VTRs: the VPR-2B, the VPR-80, or the VPR-3 (the mainstay of Olympic Games broadcasts) with unequalled speed and tape handling ability, or our ARC-40 M-format VTRs.

The very popular ADO has become th standard in the world of creative image manipulation, with over 250 in use around the world. Its abilities are constantly being expanded by the imaginations of its many users.

Your needs and budget determine the configuration of your own Ampex Creative Command Center. No matter what shape it takes, Ampex products will perform to support your business goals.

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Creative Command Center

Can Management Love a Creative Command Center?

very Ampex Creative Command Center is, we agree, a tool to help you attain your business goals. Editors who use these systems every day find that their solid technical foundation allows more efficient use of time for creative experimentation, or to meet tight client budgets and deadlines.

All this helps keep clients happy. Not only is the Creative Command Center an impressive system to see, but its performance can help you build the kind of goodwill that pays off on the bottom line.

Captive facilities find that Creative Command Centers can be equally effective for their needs, turning out sales and training programs, internal communications and a variety of other software. One interesting application can be found at the coin-operated games division of Atari, where a complete Center has been installed to produce the very latest in laser video arcade games.

So don't be intimidated by the sophistication of these systems. They're practical first and foremost, and designed to make management smile, even the controller.

Support That Keeps You Going

Exceptional dedication to the smooth working of your Ampex Creative Command Center is a characteristic of our service and support force. This tradition is well-known and appreciated by the many users of Ampex products.

It starts with the Ampex Sales Engineer you may call to explain how a Creative Command Center can fill your individual needs. He and your Ampex Service Engineer will work with you as your system is installed and checked out. They and all the other support people at Ampex in Spares, Technical Support, Training and Technical Documentation will be there when you need them, wherever you are.

Obviously, there's much more that you need to know about an Ampex Creative Command Center than we can tell you here. Your Ampex Sales Engineer is just the person to give you that information. Ask him to tell you everything you want to know.

What Our Customers Are Saying About Us and the Creative Command Center.

- "With ACE, I can put more creative energy in my work with peace of mind. I don't have to worry about technical problems."
- "ACE is really an awesome editor. And the *system* is even more awesome than ACE alone."
- "The thing I'm most impressed with is the Ampex software and how user-friendly it is."
- "We purchased the Ampex equipment as a system, rather than stand-alone products, because we believed Ampex's innovative power can be most effectively demonstrated in the total system."
- "Interface on all equipment was a key factor in our decision to purchase a full ACE system. We wanted a single source."
- "In 20 working hours, we went from an empty room to an ACE system in full operation. That's due to the basic quality of the Ampex equipment and the use of the RS-422 buss."
- "We've gotten good support from both Ampex sales and service. They seem to be interested in what we're doing and what we think."
- "We've been with Ampex for 11 years. We're a small company; we need the support of a large manufacturer."

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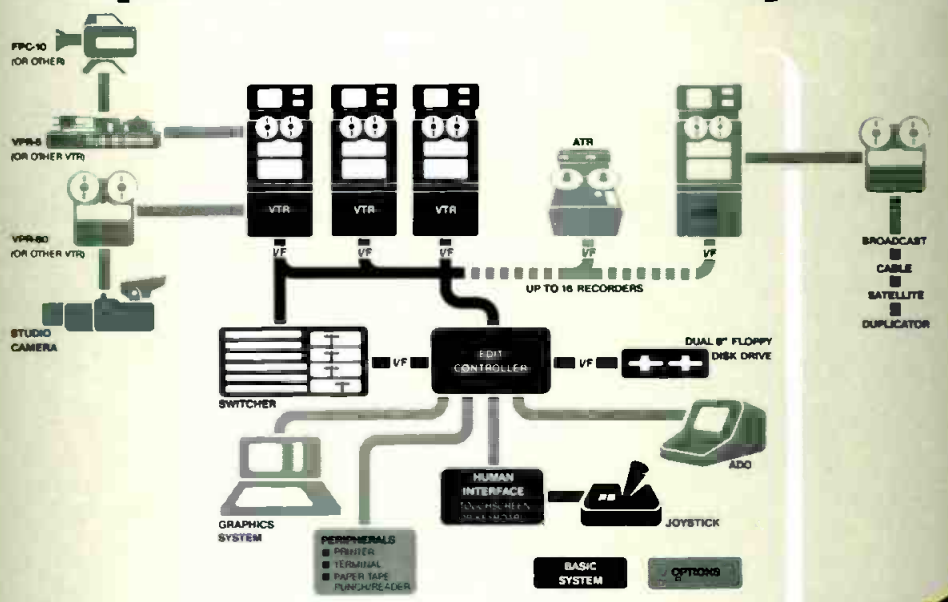
Ampex ACE Post-Production System



The Ampex "Creative Command Center" featuring ACE joystick control is a sophisticated post-production editing system offering many outstanding advantages including: hardware and software components tailored to user applications, extremely fast system speed, field-proven reliability, compatible software, easy interfacing, expandability, and single-source spares and service worldwide.

Call your nearest Ampex Regional Sales Office Today for more information about Our "Creative Command Centers."

CALIFORNIA
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Atlanta
ILLINOIS
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Arlington Heights
KENTUCKY
(502) 239-6111
Louisville

MARYLAND
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Bethesda
NEW JERSEY
(201) 825-9600
Allendale
(212) 947-8633
New York
OHIO
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TEXAS
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CYPRUS
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Frankfurt (Main)

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Kowloon
ITALY
(06) 546991
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JAPAN
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Singapore
SPAIN
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Madrid
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SWITZERLAND
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UNITED KINGDOM
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Reading Berks
VENEZUELA
782-3255
Caracas

AMPEX

Ampex Corporation · One of The Signal Companies

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GEC (1514)
Continued

New products
Transportable elliptical Ku-Band T/R satellite terminal
GM9015/A: 150° Ku-Band GaAs-FET LNA/LNC
GM9060: Satellite receiver
GM4001: Precision NTSC comb-filter decoder
GM7151/1737: 20- and 14-inch color video monitors for NTSC
GM8000: Series of monochrome monitors with 5¼- to 20-inch diagonal CRTs
Circle (628) on Reply Card

GTE Spacenet (1339)†
See at booth
Circle (629) on Reply Card

Garner Industries (1233)
Established products
70/105/144/116: Audio and computer tape erasers
270/1400: Video, audio and computer tape erasers
3056: Audiotape duplicator for ¼-inch reels
New products
1200: Video, audio and computer tape eraser
Circle (630) on Reply Card
see ad on page 100

General Electric (1007)†
Established products
FEX Quartzline lamps
FEP lamps
FKK mogul bipost lamps
Multimirror Quartzline
Comband video bandwidth compression system
Large-screen color video projectors
Consumer electronics products
New products
See at booth
Circle (632) on Reply Card

Generic Computer Systems (308)
Established products
Computer software for traffic and billing systems based on Apple IIe and IBM personal computers
New products
See at booth
Circle (631) on Reply Card

Gentner Engineering (636)
Established Products
Pre-wired patch panels
SPH-3: Broadcast telephone hybrid system
SPH-4: Broadcast telephone hybrid with *caller control* circuitry for talkshow and conferencing use
New products
TELEMIX IX: 15-line telephone interface system under microprocessor control, to mix and balance several lines simultaneously, offering remote control via RS-232 port.
Stereo program mixer
Mono program mixer
Circle (633) on Reply Card

Gerstenslager (1347)
Established products
Mobile production vans and trailers for TV
New products
See at booth
Circle (634) on Reply Card
see ad on page 267

Giese Electronic (327)†
See at booth
Circle (635) on Reply Card

Goldnugget (628)†
See at booth
Circle (636) on Reply Card

Alan Gordon (1726)†
Established products
Goldtop power supplies and batteries
Elemack cricket dolly and accessories
Pearson fluid heads
Cool-Light nine light
Zeppelin windscreen and sound accessories
Nagra soundtote
Production accessories
Mini-crab dolly and accessories
Cool-Light mini-Cool for ENG/EFP cameras

Rx for SFX

At $14,750, the totally new Chromafex 766 brings special effects within reach of every budget.

Posterize. Compress. Invert. Position. Slide. These microcomputer controlled special effects, and many more performed by the expensive image processors, can be yours in the Chromafex 766. That's right. Outstanding special effects. And for only $14,750.

There's more. The 766 also includes time base correction and frame store capabilities with infinite window performance along with freeze frame and two full fields of memory. Drop out compensation will clean up the noisiest of tapes. Perfect for remotes, it consumes only 85 watts of power.

Chroma Digital Systems has the engineering, manufacturing, marketing and service expertise, drawn from years of experience in the television equipment industry, to provide you with the support you need now and in the future.

And the Chromafex starts you with the most attractive SFX price/performance package anywhere.

If you have a problem with the high cost of SFX, we've got the solution. Chromafex 766. High priced effects. Affordably priced.

CDS
Chroma Digital Systems

Chroma Digital Systems, 2065 Martin Avenue, Suite 104, Santa Clara, California 95050 (408) 986-8270

Circle (82) on Reply Card

Circle (81) on Reply Card

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With low key lighting, differential lag can be a problem. Amperex Plumbicon tubes with built in bias light increase the speed of response of the layer, and lag is virtually eliminated.

Comet tailing and loss of detail in highlights are minimized by using the Amperex patented Diode Gun or anti-comet tail (ACT) tube. Both solve this problem by providing high beam current to stabilize highlights.

High audio levels can produce the annoying problem of microphonics. Amperex attacked this at its source, and all Amperex Plumbicon tubes have a unique mesh designed to prevent the build-up of mesh vibrations—not just to dampen them.

Six of TV's toughest shots and hov

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ıe problem of image retention. By examining layer physics and semiconictor properties Amperex developed a ew extended red layer. Now you can clude brilliant reds in your scene thout concern for image retention.

Low output capacitance Amperex Plumbicon tubes help maintain high signal to noise performance. This helps prevent loss of detail and increased video noise in low light areas of high contrast scenes.

Because of special photoconductive layers for each color and an optimized electron optics design, the Amperex Plumbicon provides the highest resolution for each image format. This resolution is measurably higher than earlier tubes.

Amperex Plumbicon® camera tubes handle them.

Ordinary pick up tubes can handle ordinary TV shots. But when you have to contend with low light levels and bright highlights...the glare of reds and the blare of trumpets...you need the extended performance of Amperex Plumbicon camera tubes.

Amperex invented and refined the pick up tube technology that makes it possible to handle the 6 toughest shots in TV. Since the original Plumbicon cameras were introduced, your business has become more competitive, more demanding. Camera designs have become more complex. That's why we continued to invest in improving the performance of the Plumbicon. That's why we offer today's range of extended performance Plumbicon tubes.

Today, virtually every TV camera system— domestic or imported—is designed to use the Plumbicon tube. And that makes the handling of the toughest shots in TV very easy. Simply specify Amperex Plumbicon pick up tubes.

For more information call or write Amperex Electronic Corporation, Slatersville Division, Slatersville, Rhode Island 02876. (401) 762-3800. Made in Rhode Island, U.S.A. Delivered to you in twenty-four hours or less.

Amperex®

WE MAKE IT HAPPEN

A NORTH AMERICAN PHILIPS COMPANY

Circle (83) on Reply Card

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Alan Gordon (1726)
Continued

Cool-Light triple twilight
Video test charts
Super Grip 2
Swintek mics
Director's viewfinders
Dollies and camera supports
New products
See at booth

Circle (637) on Reply Card

Gorman Redlich (506)
Established products
CEB EBS encoder/decoder
CE EBS stereo encoder
CD EBS decoder
CRW NOAA weather radio
CM/CMR digital antenna monitors
New products
See at booth

Circle (638) on Reply Card

Gotham Audio (509A)
Established products
Neumann Collection: Microphones, including KMR81, KMR82, KMS84, KMF4 and U89
EMT 938/948: Direct-drive turntables
EMT266: Transient limiter
EMT277: AM broadcast limiter
EMT10.02: Recording/broadcast console
Klein & Hummel self-powered broadcast monitor speakers
Colored microphone cable
10-, 19- and 27-pair snake cables
New products
3.5mm microphone cable
SYSTEX digital audio system, featuring instant access to audio information stored on 14-inch Winchester disk drives from H-P host computer
Telefunken M21: Microprocessor controlled ¼-inch analog ATR

Circle (639) on Reply Card

Graham-Patten (1227A)
Established products
1231: Downstream keyer system
612: Post-production, editor-controlled audio mixer
1200 Series: Video and audio DAs
9400 Series: Video, pulse and subcarrier DAs
New products
1203: Video DA with remote control of gain and chroma level
1213: Audio DA with remote control of gain

Circle (640) on Reply Card
see ad on page 164

Grass Valley Group (1207)
Established products
300/MKII: Video production system
1680: Video production switcher
1600-CV: Component video switcher (multiformat)
Horizon: Audio/video routing switcher
440: Audio/video routing switcher
Ten-X: Small audio/video routing system
3400: Video DA equipment
3200: Sync/video processing equipment
Wavelink: Fiber-optic transmission system
New products
See at booth

Circle (641) on Reply Card
see ads on pages 7 and 337

Gray Communications (1618A)
Established products
Distributor of video equipment for broadcast, cable and professional users
System construction and mobile production vehicle design
New products
See at booth

Circle (642) on Reply Card

Gray Engineering (1755)
Established products
DT-104F/113: SMPTE/EBU time code generators
DR-107/109/115: Readers for time code or user bit displays
VR-116: Video reticle safe position generator
VIE-224/VID-225: Translator encoder and decoder systems for LTC and VITC time code
FCM-227: Film counter converter/multiplexer to VITC and LTC code
New products
EDL-230: Automatic editing logger reads, prints log of changes in frame, reel, scene or take numbers
FCG-241: Film counter converter displays time code on video monitor
VCG-228: VITC decoder and character generator

Circle (643) on Reply Card
see ad on page 330

Great American Market (1108)
Established products
Scene Machine: Scene projector
Colormax: Computerized color changer
Stik-Up: Single-source luminaire
Projection patterns
Instaset vacuum formed scenery
Diamond lights low-voltage electric curtain and scenery
Star Strobe
New products
Lightesizer: Lighting control equipment
Blackwrap: Flexible matte black aluminum

Circle (644) on Reply Card
see ads on pages 54, 196 and 200

David Green (417)
Established products
Audicom TC-100: Telephone coupler
Rane HC-6: Headphone amp
Sennheiser and AKG headphones
New products
See at booth

Circle (645) on Reply Card

Grosh Scenic Studios (1163A)†
Established products
Lighting stands, grips, modular

WIRELESS COMMUNICATION SYSTEMS

- **Continuous hands-free communications.**
- **Full duplex operation (talk and listen simultaneously).**
- **Unlimited system configurations with easy operation.**
- **VHF/UHF high band operation for less interference and noise, more reliable operation.**
- **Safe for hazardous environments.**
- **Interfaces to wired intercom systems and TELCO lines.**
- **Meets applicable government standards—NASA proven on the space shuttle.**

The Swintek Mark 200 is the world's finest and most reliable wireless intercom system. It's simple to operate and exceptionally dependable utilizing the same technology as our systems used on the Space Shuttle. Each system is designed to meet your specific requirements using standard, fully tested, precision Swintek electronic components that are protected by rugged, industrial grade, all metal cases.

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TELECOMMUNICATIONS DIVISION
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(408) 249-5594 / TELEX 172-150 SWINTEK SUVL
CANADA Toronto, Ontario: Cinequip
Vancouver, BC: Commercial Electronic Ltd.

See Us at NAB Booth 1502

Circle (84) on Reply Card

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Presenting the Major Maintenance Tool for Dynair's Series 10 Switch

Right. A feather duster.

We first placed the Series 10 audio/video switching systems in the field four years ago. Today, most are still maintenance-free. Unless, of course, you count dusting the buttons.

Nobody's perfect. But we're close.

In fact, this solidly reliable, solid-state Series 10 switching system is virtually transparent to broadband signals. And the specifications we publish are not "typical" or best case. They are guaranteed, off-the-shelf minimums.

Study them. Then consider your installation. The Series 10 uses a single coax cable for control. That's only one economy.

Compare the cost effectiveness:

- The Series 10 switches both standard and high definition signals.
- A 72-hour battery protects the memory.
- The "in use" status of each channel is constantly displayed.
- Up to four levels of switching are available, including video and multiple video, audio and multiple audio, audio-follow-video and time code.

The Series 10 is also flexible.

Select local or remote control. Panel or desktop operation. Or both. You can start with a single level, then add levels and controls with ease.

All this, and it's almost maintenance free. Ask us for a specification booklet.

Feather duster optional.

DYNAIR

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

Circle (85) on Reply Card

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Grosh (1163A)†
Continued

studio/news sets, scenery, design/rigging
New products
See at booth
Circle (646) on Reply Card

Grumman Aerospace (1631)
Established products
Sync Proc 501: Video processing amplifier/sync generator
Machine control system with distributed microprocessor-based remote control and status monitoring
New products
Rainbow Sound places an additional audio channel into the video format, providing a full bandwidth audio path compatible with present transmitter configurations
Circle (647) on Reply Card
see ad on page 245

James Grunder & Associates (1760)†
See at booth
Circle (648) on Reply Card

H.A. Solutec
See Solutec, H.A.

HEDCO
See Hughes Electronic Devices

HM Electronics (1130)
Established products
System 58: Wireless mic with Shure SM58 element
System 85: Wireless mic with Shure SM85 element
System 82: Body-Pac wireless mic with Dynamic Expansion II
System 22RA: Body-Pac wireless mic with 90dB range and soft compressor limiter
System 25RA: Hand-held wireless mic with 90dB range and software compressor limiter
700 Series: Cabled intercoms
WL742: 2-channel, wall-mount speaker station for 700 series
IC 150 Series: Wireless intercom
New products
System 580: Hand-held SM58 wireless mic with RX752 flat-pac receiver
System 850: Hand-held SM85 wireless mic with RX752 flat-pac receiver
System 820: Body-pac wireless mic with RX752 flat-pac receiver
BH710W: Wireless/cabled intercom interface
Circle (649) on Reply Card

Hallikainen & Friends (208)
Established products
TVA132/142: Audio mixer for AFV TV applications
TEL171: Digital metering conversion kit for Moseley TRC15A
TEL172: Digital metering conversion for Moseley PBR-30A
PCC180: Transmitter control and logging computers
New products
DRC190: Digital remote control system capable of talking to 100 sites with 100 channels of control per site
Circle (650) on Reply Card

Harris Corporation (401)
(Broadcast/RF Divisions)
(Video Systems Division)
(Broadcast Microwave Division)
Established products
AM, FM and TV transmitters
FM and TV antennas
STX-1: AM stereo generator
9165: Satellite antenna control system
TC-85: Studio camera
TC-90: ENG camera
Audio consoles
Autotron Star: Business automation
9000: Program automation
9100: Intelligent remote control system
IRIS II: Digital still-store
Frame synchronizers
TBCs
Global IX: Portable microwave transmitter 2GHz, 7GHz and 13GHz transmitter and receiver systems
TV STL systems
New products
Medalist: 12-channel audio consoles
60kW UHF-TV transmitter with high efficiency klystron
30kW VHF high-band transmitter
Continued on page 124

The New Garner 1400

The high-energy tape eraser that outperforms every other eraser on the market.

The revolutionary coil design of the Garner 1400 makes it the superior high-energy 1-inch tape eraser on the market. Independent tests prove it:

Depth of Erasure:
No eraser can match the Garner 1400's minus 90 db. erasure of a heavily saturated 14-inch reel of 1-inch high coercivity tape.

Speed:
It is no contest. The 1400 erases high-energy tapes completely in less than 16 seconds. Other erasers take four times as long.

Ease of Operation:
No one beats Garner 1400's ease of operation. Just touch the "on" switch and place the tape on the conveyor. There are no drawers, no spindles, and no height adjustments.

Dependability, Guaranteed
For over 12 years, Garner has set the standard for tape erasers. Just one look at the rugged construction of the Garner 1400 shows you why. Garner is so confident of the 1400's quality that it's backed with a 2-year warranty.

The Garner 1400...designed to meet the highest standards of the industry...yours.

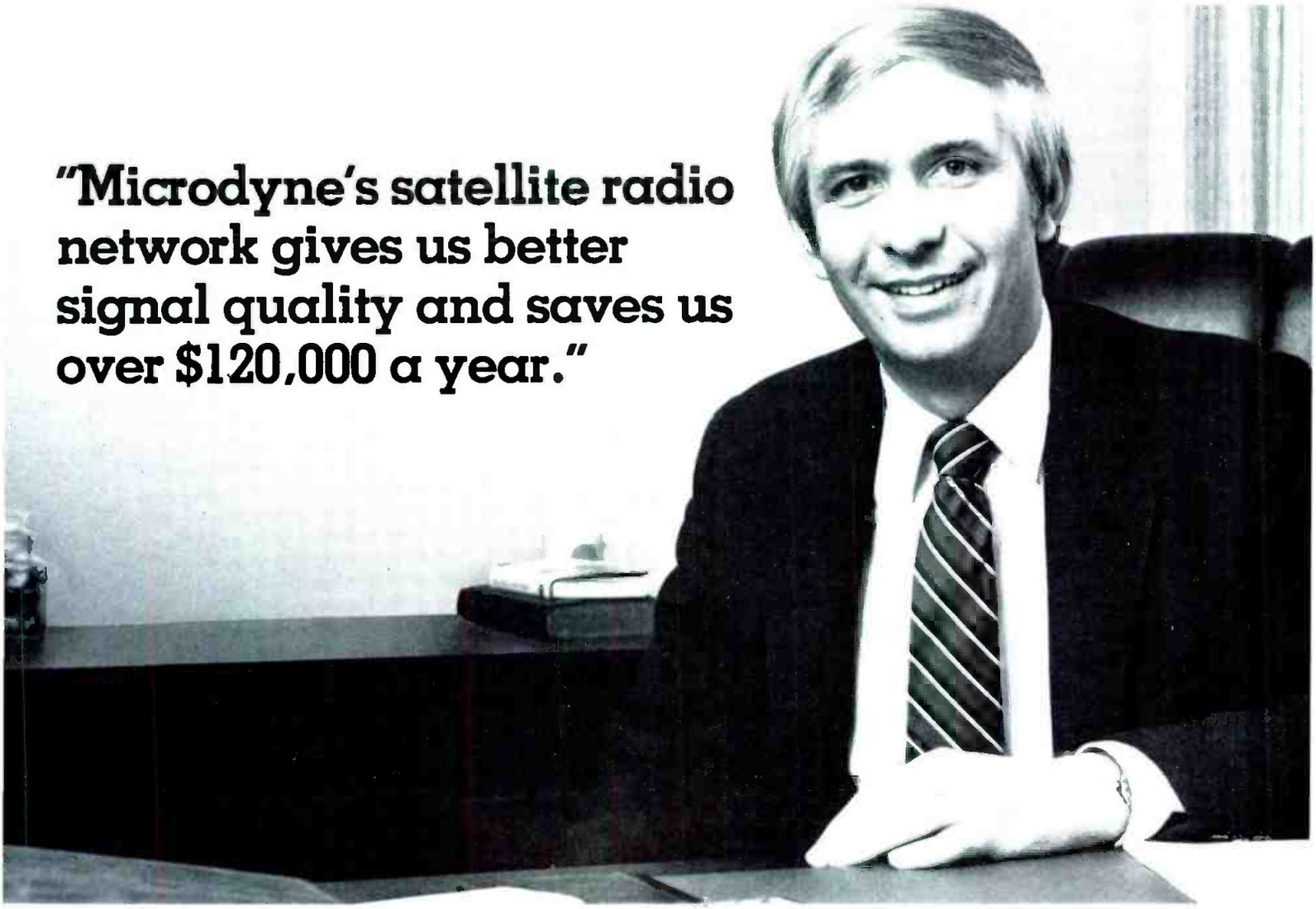
garner industries

4200 North 48th Street, Lincoln, NE 68504
(402) 464-5911/TELEX 438068

Circle (86) on Reply Card

www.americanradiohistory.com

"Microdyne's satellite radio network gives us better signal quality and saves us over $120,000 a year."



Paul Stone, General Manager, Georgia Radio News Service

educed costs – fast payback

State and regional networks eed all the money they can save. hat's why the Georgia Radio News ervice installed a Microdyne SCPC ıtellite radio network system.

They found that it reduced onthly distribution costs 80% while nproving signal quality.

t Microdyne we manufacture nearly everything in e system, from the precision-molded 5-meter olink antenna . . .

Where the network once paid 12,000 a month for land lines to feed ıeir 105 affiliates, they now lease a 0-dBw carrier on Westar IV for bout $2,000 a month. That results in savings of $120,000 a year.

"We expect a fast payback on the equipment," General Manager Paul Stone adds.

Greater programming flexibility

But lower costs and superior performance aren't the only advantages of a Microdyne radio network. Our system is frequency agile and has an optional bandwidth selection feature that lets you change formats when you change channels.

That means you can receive any of the many radio programs now being carried on a single satellite. And that gives you more programming options and greater flexibility.

Turnkey systems

At Microdyne we manufacture nearly all of the components that make up a satellite radio network, from the uplink antenna to the downlink demodulator. And we not only design and build custom systems, we can also manage the complete installation. So all you have to do is tell us what you need and when you need it.

. . . to the rack-mounted downconverter and unique bandwidth selectable, frequency-agile demodulator that lets you change formats when changing channels.

And of course all of our products are backed by our 48-hour repair or replacement policy and our 24-hour toll-free number for emergency engineering support.

Let us custom-tailor one for you

If saving thousands of dollars a month while improving performance appeals to you, call our Marketing Department at the number below. Ask for our free brochure on satellite radio systems. It could brighten your budget for years.

Microdyne Corporation

P.O. Box 7213 • Ocala, FL 32672 • (904) 687-4633 • TWX: 810-858-0307

Circle (87) on Reply Card

www.americanradiohistory.com

Introducing a high-performance mixer with a personality all your own.

The Ramsa WR-8616.

Inside every engineer is the desire for more creative control at the board.

Now there's a post-production/recording mixer designed to make your sessions sound more like you. And less like everybody else's. The Ramsa WR-8616. And its modular design is as ambitious as your needs.

You can have 16 channels of either full stereo or mono modules. Or a combination of the two.

The WR-8616 will also save you valuable time. By letting you simultaneously monitor up to 16 channels on a multi-track machine while recording.

What's more, two discrete mixes give you full monitoring capability, which can be independent from the control room's mix.

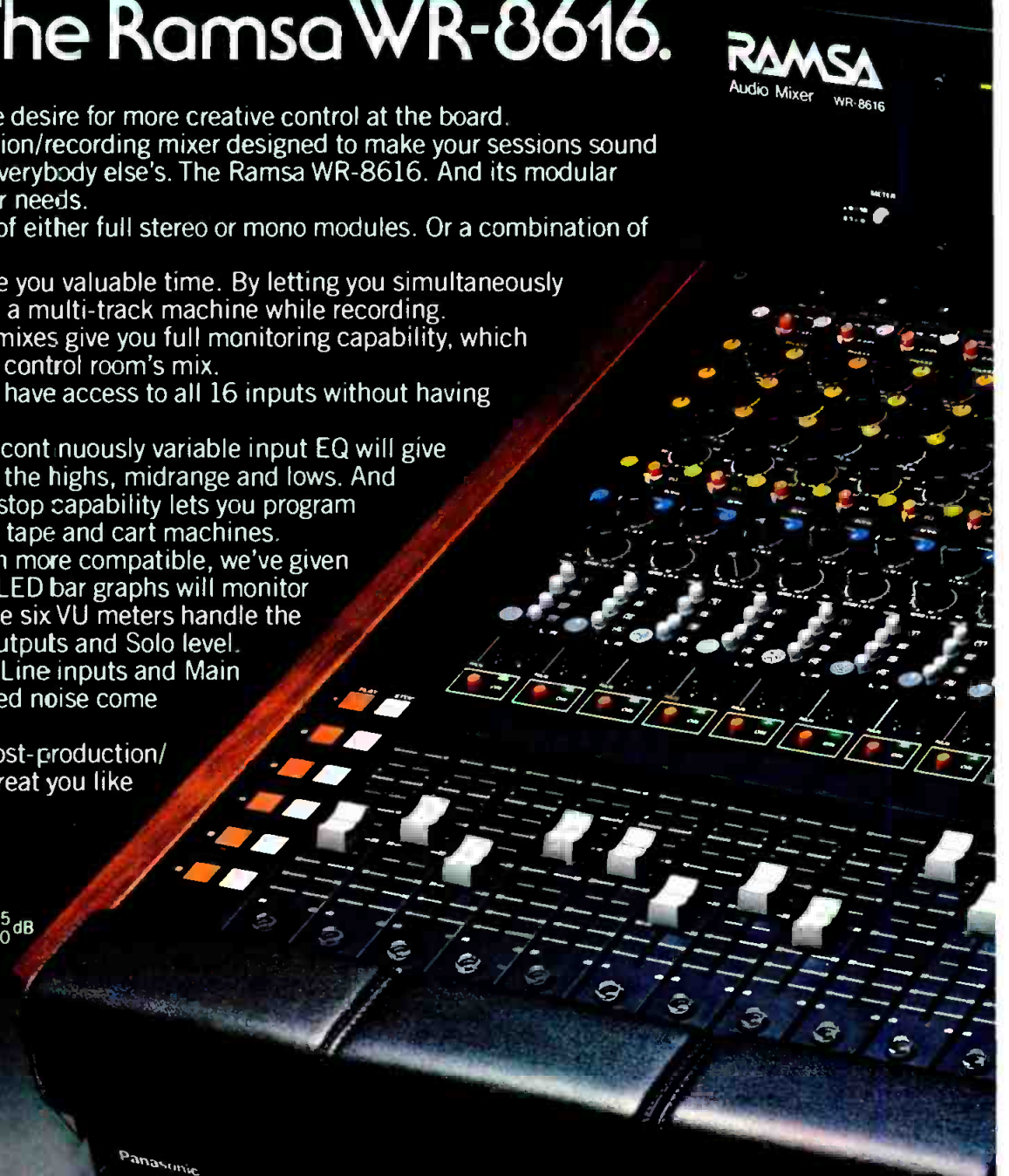
And in the mixdown, you'll have access to all 16 inputs without having to repatch or reset the board.

You'll also find the 3-band cont nuously variable input EQ will give you more precise control over the highs, midrange and lows. And the six-channel remote start/stop capability lets you program materials using turntables, or tape and cart machines.

To make the WR-8616 even more compatible, we've given it a dual set of meters. Eight LED bar graphs will monitor the 16 input signals. While the six VU meters handle the Master, Group, Send, Echo outputs and Solo level.

And the balanced Mic and Line inputs and Main outputs won't let any unwanted noise come between you and your sound.

The Ramsa WR-8616. A post-production/ recording mixer designed to treat you like an individual.



SPECIFICATIONS:

- Frequency Response: 20-20,000Hz; $^{+0.5}_{2.0}$dB
- +4dBM, 600 Ohm Line Input and Output Signal Levels
- Noise: −128dB (IHF "A" WTD, 150 Ohm)
- THD: 0.05% typical at 1kHz, +20dBM
- CMRR: Greater than 80dB typical

Please send me more information about the Ramsa WR-8616.

Name _____
PLEASE PRINT

Address _____

City _____ State _____ Zip _____

Phone ( ) _____

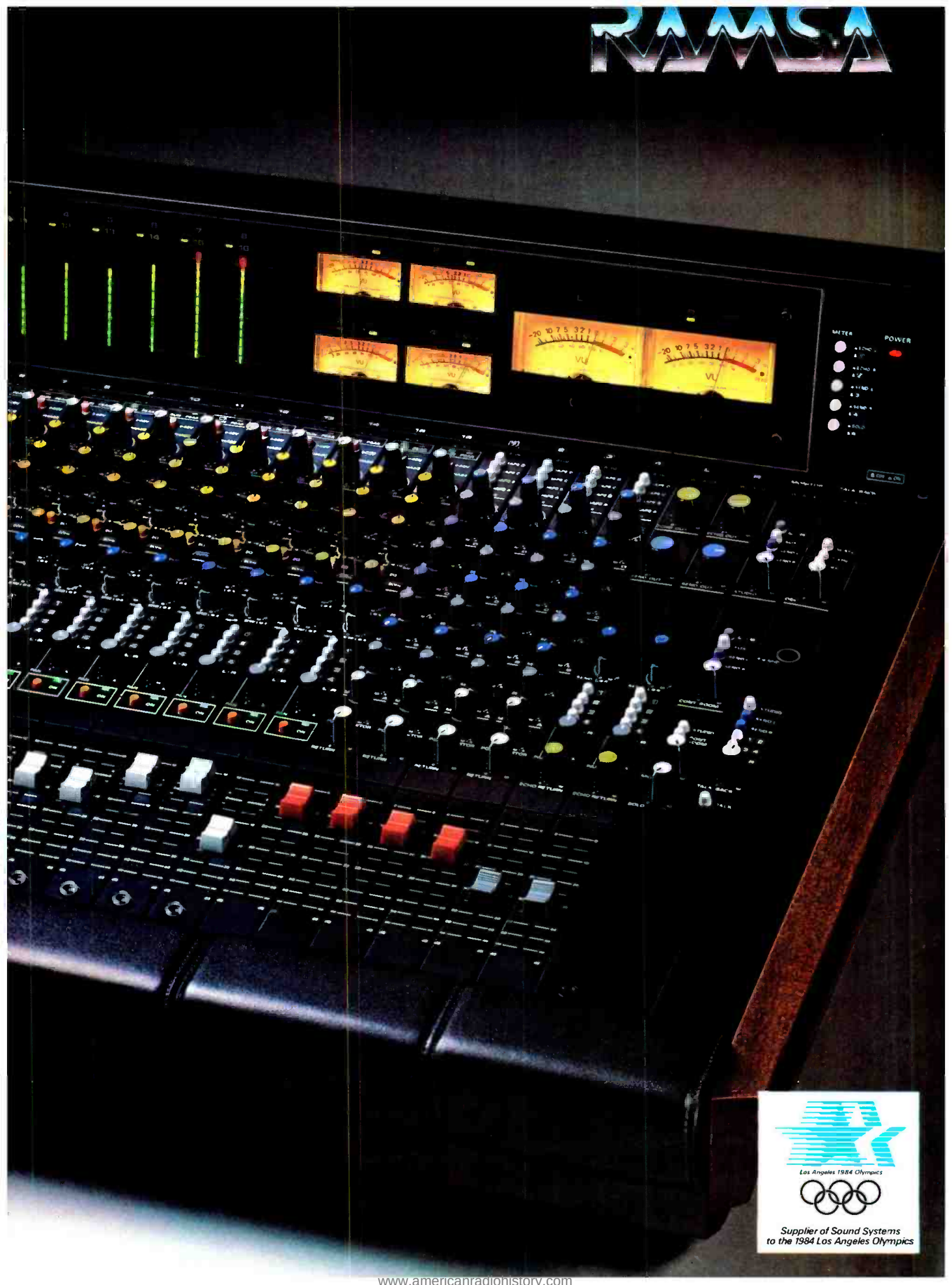
Return Coupon To: Panasonic Industrial Company, Professional Audio Systems, One Panasonic Way, Secaucus, N.J. 07094.

BE

Panasonic
PROFESSIONAL AUDIO SYSTEMS

Circle (88) on Reply Card

www.americanradiohistory.com



www.americanradiohistory.com

Harris (401)
Continued

MW-50C: 50kW medium wave transmitter
TTS-4: Teletext origination system
IRIS: Composition station
632C: Component in/out frame synchronizer with DNR, compress/position control and digital keyer
540: TBC with slow motion option for ¾-inch non-segmented video recorders accepting sync and subcarrier inputs
DVE system with bubble memory for curve and mosaic effects
Challenger: 2GHz portable transmitter, allowing optional 3W or 12W power output
2GHz and 13GHz STL systems

Circle (651) on Reply Card
see ads on pages 86, 87, 95, 132, 133, 152, 153 and 291

Harrison Systems (1324)
Established products
TV-4: Stereo production, post-production console with AFV capability
MR-4: Multitrack production, scoring console with AFV capability
TV-3: Multitrack stereo production, post-production console
MR-3: Multitrack scoring and remix console
MR-2: Dual multitrack scoring and remix consnle
PP-1: Film sound post-production console
New products
PRO-7: Stereo production console with AFV capability
AIR-7: Stereo on-air console
VSI: Video switcher interface for audio-follow-video operation

Circle (652) on Reply Card

Karl Heitz (1747)†
Established products
KINOPTIK: Lenses cine/video
GITZO: Cine/video tripods
Cnmhi tripods, tripods with counter-halanced heads, leveling balls, dollies, microphone booms, lightstands, projection stands, platforms
GITZO: Spring-balanced video heads, tripods
GITZO: Fluid heads, fluid base, tripods
GITZO: Monopods with soft grips
380: GITZO fluid head with 100% fluid front and rear tilt
385: GITZO quick-release to be mounted on any fluid head
-252: GITZO video combi tripods with spring-balanced head
Alpa Rotocamera system
New products
See at booth

Circle (653) on Reply Card

Hipotronics (1779)†
Established products
Voltage regulators
ac/dc test sets
Variable transformers
New products
See at booth

Circle (654) on Reply Card
see ad on page 62

Hitachi Denshi America (1402)
Established products
SK-110: Cnmputerized studio camera
SK-97: ⅔-inch 3-tube portable camera with on-board computer
SK-970: ⅔-inch 3-tube ENG/studio camera
SK-91DGS: ENG/EFP ⅔-inch DG Saticon camera
FP-15: Low cost ENG/EFP 3-tube camera
FP-22: ⅔-inch ENG/EFP camera
FP-50: Low cost ⅔-inch 3-tube ENG/EFP camera
HR-200/HR-211: 1-inch C VTR for post-production and broadcast applications
HR-100: 1-inch portable C VTR for ENG/EFP
New products
SR-1: Solid-state VRC camera with ¼-inch recorder
SR-3: ⅔-inch 3-tube VRC camera system with ¼-inch recorder
HR-230: 1-inch C VTR for production and broadcast
FP-7: Low-cost 1-inch trielectrode camera
ECR-5: ¼-inch playback unit

Circle (655) on Reply Card

Holaday Industries (206A)
Established products
HI-3001: Isotropic broadband exposure meter
HI-3004: Isotropic broadband field strength meter
New products
HI-3113: Fiber-optic link for HI-3000 series meters
HI-3006: Isotropic broadband magnetic field strength meter

Circle (656) on Reply Card

Holzberg (*)
Established products
Distributor for NEC, TFT, Logitek, Grumman Aerospace, HEDCO and Shively
New products
See at booth

Circle (657) on Reply Card

Hotronic (1331B)
Established products
AD-51 Series: TBC/frame synchronizer
New products
Digital dropout compensation option for the AD-51

Circle (658) on Reply Card
see ad on page 229

Howe Audio Productions (321)
Established products
7012: Rotary fader stereo audio 12-mixer console
7012A: Rotary fader console with audition and program metering
7512A: Linear fader 12-mixer stereo console, with timer and TTL logic machine control
2100: Phase Chaser phase error corrector
New products
Series of consoles using Howe VCA design in modular, expandable configurations from 6 to 24 3-input, mix-minus channels; digital machine control; spill-proof membrane switches; and various options

Circle (659) on Reply Card
see ads on pages 147, 148, 149 and 150

Hughes Electronics Devices (1225)
Established products
AVM Series: AFV monitoring switchers
Audio and video distribution and signal control modular systems
Small routing switchers
New products
IRS 24x48: Video and 3-channel audio routing switcher system
VAM-110: Video alarm module
VAF-110: Video alarm frame
SVS-401: Self-powered active 4x1 video switcher
SVD-106: Self-powered audio DA
SAS-401: Self-powered active 4x1 audio switcher
SAD-106: Self-powered audio DA

Circle (660) on Reply Card

Hungerford & Company (310)†
See at booth

Circle (661) on Reply Card

IBM (1607C)†
See at booth

Circle (662) on Reply Card

ICM Video (1766)
Established products
VE-200C: Video enhancer
VP-300C: Auto video processor
DA-5000P: Audio/video DA
SR-4600P: Satellite receiver
New products
VC-2000P: Video corrector

Circle (663) on Reply Card
see ad on page 322

IGM Communications (403)
Established products
Go-Cart 24, 42, 78 random-access cart playback equipment
Marc I: Random-access controller
BASIC broadcast automation system
New products
Instacart systems, newly redesigned for 12, 24, 36 and 48 cart-tray needs
Custom controller system for Instacart in TV production

Circle (664) on Reply Card

ITC/3M (311)
Established products
Delta series: Line of audio cartridge tape recorder/reproducer systems
Series 99B: Audio cartridge machines with ELSA
New products
Omega stereo reproducer audio cartridge machine for budget-minded stations

Circle (665) on Reply Card
see ad on page 69

Ikegami Electronics (USA) 1011/1013
Established products
TKC-970: Telecine camera system
VTN-110A: Video/pulse DAs
Series 3/8/9: High resolution video monitors
HK-322/357A: Auto setup studio-field triax cameras
HK-302: Studio camera
HL-79E: ENG/EFP camera with auto setup, triax and accessories
New products
HL-95: Camcorder system with ¼-inch

www.americanradiohistory.com

LEADERS ARE ALWAYS FOUND AT THE TOP.

AND YOU'LL FIND MARK ANTENNAS AT THE TOP OF THE WORLD.

Mark antennas are at work right now—not only throughout the world—but at the very top of it. You'll find them on the peaks of the world's highest mountain, Mount Everest. And also atop the world's tallest twin buildings, the World Trade Center.

Scaling such heights is the mark of a champion. And that's true of Mark Antennas. It took over 30 years of innovative design and engineering, careful quality control, and superior long-lasting performance —backed by reliable on-time delivery—to get them where they are. And to keep them there. On top.

MARK STEERABLE ANTENNAS

The Mark 5 meter hydraulically steerable antenna system is the only one of its kind. Covers the entire geostationary arc with no change to mount members. Meets 2 degree requirements with Scalar feed. Repositioning rate of 1 degree per second. Standard control has 20 programmable positions plus one position for manual override.

ANIXTER-MARK

MANUFACTURERS OF A FULL LINE OF POINT-TO-POINT ANTENNAS.
SATELLITE • MICROWAVE • TWO-WAY
P.O. Box 1548 • 2180 S. Wolf Road, Des Plaines, IL 60018
(312) 298-9420 • 1-800-323-5273/Telex: 282557 (Anixmark)

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Circle (89) on Reply Card

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Ikegami (1011/1013)
Continued

Lineplex and ½-inch M Format VTRs
ITC-730A: ENG/EFP camera with 300M CCU
HDTV Studio/field camera and monitors
ML-83/79: ENG microwave systems
High definition electronic cinematography camera with new lenses and accessories
Series 9: High resolution monitors with 9V PIL CRT, as well as 13V and 19V Delta-dot CRTs
TKC-990: Auto setup telecine camera system

Circle (1498) on Reply Card
see ads on pages 57, 279, 281 and 283

Image Video Ltd. **(1341)†**
Established products
8100: Automated master control
4100: Machine assignment system
7021: Status generator
7100: Universal serial data reader
4021: Machne interface
6200: Broadcast routing switcher
8105: Border generator
AJF: Prewired jackfield
M6010: 10x1 self-contained broadcast routing switcher
7105: Silence monitor
Custom-designed control panels
VMP-1: Voltage monitor panel
Broadcast routing switcher
9100: Routing switcher
8200N: Master control
7800: Routing switcher control panel
7300: Voltage monitor panel
7001: Dual video mix amplifier
7707: Status/character display
New products
See at booth

Circle (666) on Reply Card
see ad on page 293

Industrial Acoustics **(322)**
Established products
Engineered prefabricated sound studio incorporating high acoustic isolation
New products
See at booth

Circle (667) on Reply Card

Industrial Sciences **(1232)**
Established products
903/904: Video production switchers
831/899: Master control switchers
2031: Matrix wipe generator
9012: Fade to black unit
New products
5000/7000 Series: Video, audio, pulse delay and subcarrier DAs
9016: Auto transition unit
APE: Automated production effects for the 904

Circle (668) on Reply Card

Inflight Services **(1316)†**
Established products
VSTAR4: Control/projection system
New products
See at booth

Circle (669) on Reply Card

Information Transmission **(1734A)**
Established products
ITS-1: TV IF exciter-modulator
ITS-20: UHF exciter-modulator
ITS-610: MDS/ITFS 10W transmitter
New products
ITS-230: 1kW UHF transmitter
ITS-254: 50W UHF amplifier

Circle (670) on Reply Card

Innovative TV Equipment **(1215)**
Established products
T1 through T20: Tripods
D3 through D20: Dollies
P1 through P7: Studio pedestals
H1 through H100: Pan/tilt heads
New products
P2: Pneumatic pedestal
H100FD: Fluid drag cam head
D8: Dolly
T3: Tripod

Circle (671) on Reply Card

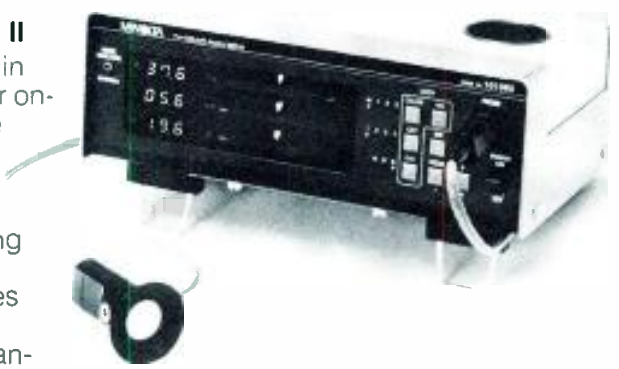
Inovonics **(304)**
Established products
201: Audio limiter
215: Multifunction audio processor
231: MAP-II multiband audio processor
250: Programmable stereo audio processor
370: Replacement audio recorder electronics
380: Magnetic recording electronics for film/tape
405: Tentrol tape recorder tension servo kit
500: Real time and reverb acoustic analyzer →

Minolta Broadcast Meters

Remarkable versatility combined with superb accuracy—
Minolta meters conform to CIE Spectral Response Standard.

MINOLTA TV COLOR ANALYZER II

Used for monitor set-up in TV control rooms and for on-line quality control in the manufacture of TV sets.
• Analyzer mode for white balance
• Chroma mode for setting white standard
• Matrix system eliminates cross-over interference
• Four white-memory channels; four CRT memory channels



NEW CHROMA METER II INCIDENT

ILLUMINANCE METER

LUMINANCE METER 1°

MINOLTA HAND-HELD INDUSTRIAL METERS ARE:
• Lightweight and compact
• Battery powered for portability
• Rugged—ideal for field use

MINOLTA

For more information, write Minolta Corporation,
Industrial Meter Div., 101 Williams Drive, Ramsey, NJ 07446
Or call 201-825-4000
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Product appearance and/or specifications subject to change without notice.

Circle (90) on Reply Card

www.americanradiohistory.com

Test & Measuring Instruments

PHILIPS

FROM THE INVENTORS OF THE PLUMBICON® TUBE

Objective Color Monitor Balance

At last, a practical solution to the age-old problem of color balancing your picture monitors—the PM5539 color analyzer.

Working directly off the screen with three color-sensitive photodiodes, the PM5539 gives you quick and easy readings of the three primary colors—separately or simultaneously—referred to a previously-set white standard.

This means that in a matter of minutes every color monitor you need to watch can be set up to have the same color temperature and intensity.

Once the PM5539 matches all your monitors, you'll see all the difference in the world. The PM5539 is the quantitative way to eliminate the qualitative "calibrated eye-ball."

For nationwide sales and service information call 800-631-7172, except in Hawaii, Alaska and New Jersey. In New Jersey call collect (201) 529-3800, or write Philips Test & Measuring Instruments, Inc., 85 McKee Drive, Mahwah, NJ 07430.

Color temperature should normally be adjusted at both high and low light levels. Balance of the three primary colors should track at the "grey" levels in between. To facilitate "grey scale tracking," the PM5539 has a wide sensitivity range (1 to 300 NIT's full scale).

For Philips rental information call 800-527-4334

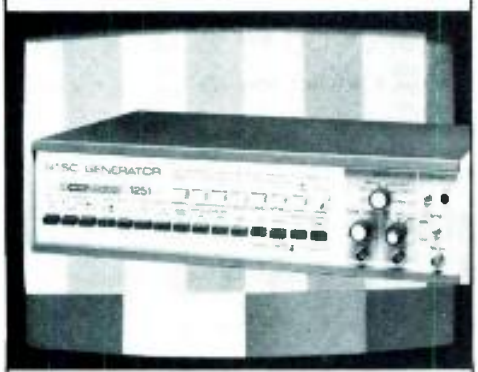
PHILIPS

Circle (91) on Reply Card

www.americanradiohistory.com

from
B & K-PRECISION

NTSC
STANDARDS
plus
MULTIBURST
for under $1,000



Model 1251 $995

- Generates standard NTSC color bars with or without -IWQ signal; five step linear staircase (with high or low chroma); dot, cross-hatch, dot-hatch, center cross and 8 raster patterns
- Multiburst—stepped, full field and variable
- External video input modulates rf or i-f carrier outputs
- Crystal controlled rf, i-f, NTSC sync
- 4.5MHz audio intercarrier modulation; selectable 1kHz, 3kHz or external

The B&K-PRECISION 1251 is a true NTSC standard generator designed for color broadcast, CATV and industrial applications. Its simple operation makes it a time-saving tool for aligning and trouble-shooting video tape recorders as well.

The quality, capability, dependability and precision of the Model 1251 equal or exceed that of much more costly generators.

Prove it for yourself.
See your local B&K-PRECISION Distributor for immediate delivery.

B&K PRECISION
DYNASCAN
CORPORATION
6460 West Cortland Street
Chicago, Illinois 60635 • 312 889-9087
International Sales: 6460 W. Cortland St., Chicago, IL 60635
Canadian Sales: Atlas Electronics, Ontario
South and Central American Sales:
Empire Exporters, Plainview, NY 11803

Circle (286) on Reply Card

Inovonics (304)
Continued

GHM PPM: Gordon Meter audio meter
New products
260: Low-cost audio processor for educational FM and LPTV
387: Multichannel magnetic reproducer amp for tape/film
Circle (672) on Reply Card
see ad on page 174

Interactive Motion Control (*)
New products
IMC 3565: Computer and modular motion control stage may be used for model or motion control photography as well as computer graphics, computer and traditional animation
R/T real time motion control system is a portable version of the 3565 motion control animation equipment
IMI-500: Interactive 3-D graphics system
Circle (673) on Reply Card
see ad on page 243

Interactive Systems (1167 & 1132)
Established products
11: Edit control with list management
21: Off-line and industrial edit controller
31: On-line, 8-port edit control system
41: Large off-line system with Jogger Motion and Programmed Motion
New products
51: High performance edit control system with VPR3 RS-422 direct control and many other features
Circle (674) on Reply Card
see ad on page 191

Interand (1016)
Established products
Telestrator 100: Electronics graphics system
New products
Telestrator 440S: Custom-designed graphics system and software to store preprogrammed charts and graphics, recalled from a stylus on a side menu panel
Circle (675) on Reply Card

Interface Electronics (1405A)
Established products
550: Broadcast audio production mixer
550-V: Video production version of 550
200: Portable ac-dc-powered stereo mixer
400: 12x4x2 recording mixer
New products
See at booth
Circle (676) on Reply Card

Itelco USA (1338)†
See at booth
Circle (677) on Reply Card

JBL (615)
Established products
4301: 2 way broadcast monitor
4401: Compact studio monitor
4312: 3-way compact studio monitor
New products
4411: Direct radiator loudspeaker system using three transducers in a cluster for sound coherency
Circle (678) on Reply Card
see ad on page 31

JVC Company (1234)
Established products
KY-950U/900U: Portable ENG/EFP cameras
KY-310U: Portable ENG/EFP cameras
ESP-7: Time code editing system for ¾-inch VTRs
ESP-4B: Basic ¾-inch editing system
VEP-1: VHS editing system
TM-R9U: 9-inch broadcast monitor
KM-2000: Special effects generator/switcher
CR-4700U: Portable ¾-inch recorder
New products
DAS-900: Digital audio mastering system
Circle (679) on Reply Card
see ad on page 199

Jefferson Data (1629)
Established products
System 90: Sales, traffic and general accounting for radio and television
Program Management System: Complete inventory and control for all syndicated program materials
Electronic News Processing (ENP): Complete newsroom computer system to handle wire services, story and script preparations, electronic teleprompter and archiving
New products
See at booth
Circle (680) on Reply Card

Jenel Consultants (*)
Established products
Monitor setup tape
Engineering consultant services
New products
See at booth
Circle (681) on Reply Card

Jensen Tools (1747B)
Established products
JTK-17: Technician's tool kit
JTK-87: Field engineer's tool kit
New products
377B145: Heavy-duty shipping container for sensitive equipment
Circle (682) on Reply Card
see ad on page 333

Jingle Machine (200A)†
See at booth
Circle (683) on Reply Card

John B. Rudy
See Rudy

J. Osawa & Company
See Osawa

Kahn Communications (625)
Established products
STR-77: AM stereo exciter
LP-2L: LINES-PLUS remote telephone pickup high and low frequency extender
Modulation processor equipment
New products
See at booth
Circle (684) on Reply Card

Kaman Sciences/KBS (1607)
Established products
Business management computer systems for broadcasters
New products
See at booth
Circle (685) on Reply Card
see ads on pages 183 and 184 →

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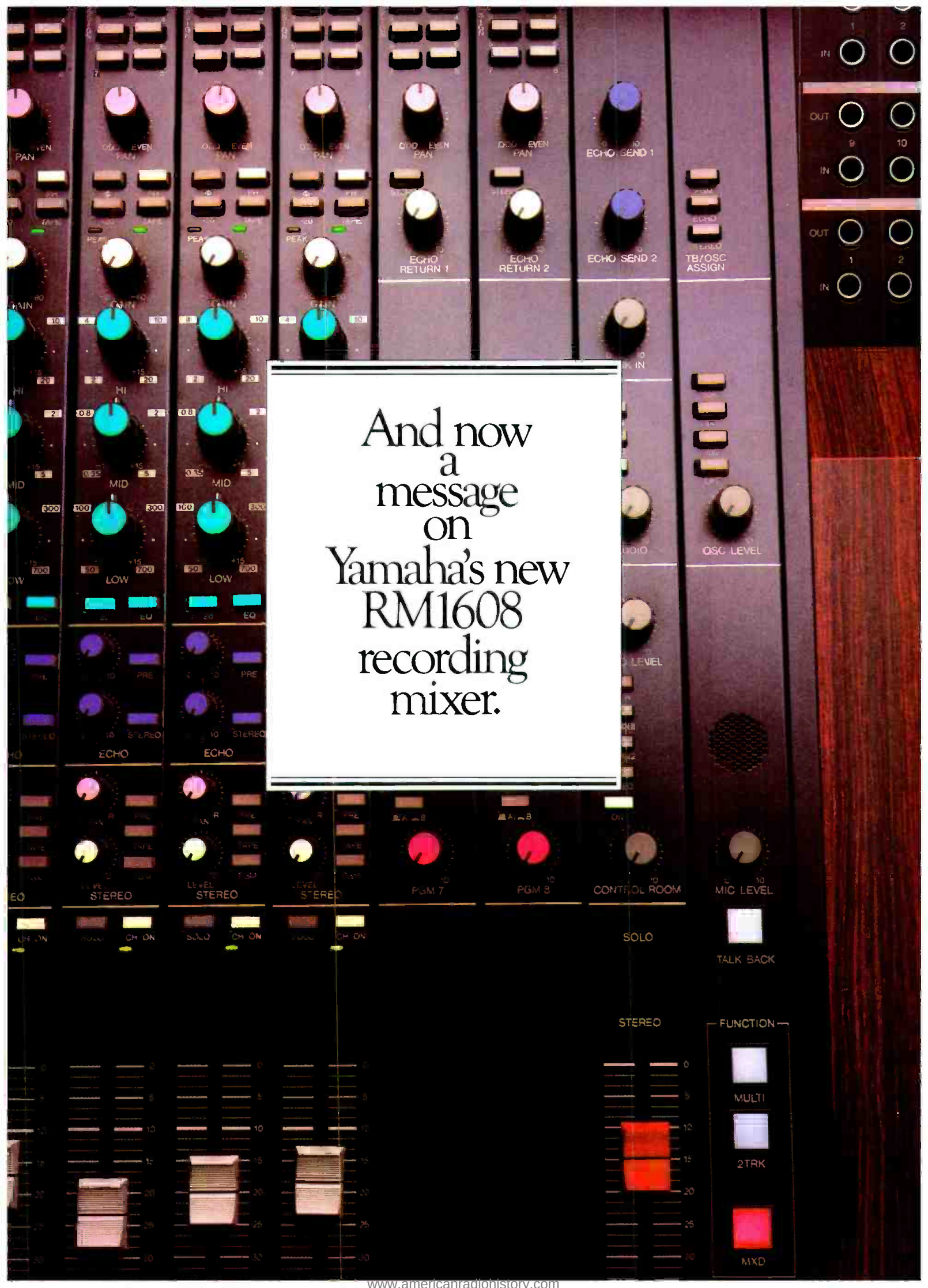

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RM1608

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.
*0dB 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 (92) on Reply Card

www.americanradiohistory.com

Kangaroo Video Products (1151)
Established products
Kangaroo Video Pack: Custom carrying cases for broadcast and industrial VCRs
Kangaroo Nagra Pack: Cases for Nagra recorders
Gripper Strap: Padded shoulder straps
Kangaroo Semi-Tough: Aluminum reinforced padded case for video cameras
New products
Kangaroo Super-tough: Top-loading camera case for video cameras and VCR combo systems, with Tri-Fast zipper opening, triple-hemmed, U-shaped aluminum frames, and closed-cell foam padding and hand/shoulder straps
Circle (686) on Reply Card

Karl Heitz
See Heitz, Karl

Kavco (1509B)
Established products
KAVCART: Broadcast video cart system with programmable microcontroller, vertical, interval switching and interfacing and separate recording console featuring label printer and Sony VO-5850 master recorder
New products
See at booth
Circle (688) on Reply Card
see ad on page 173

Kavouras (1635)
Established products
Radac color weather radar remoting equipment
Real time Atmospheric Monitoring (RAM): Meterological services and database
Triton X: Animation and GOES weather satellite image processing system
New products
Triton XL: High resolution weather graphics and animation
High resolution real time colorization system interfacing to various radar systems, including Collins Doppler radar
High speed weather data transmission via Westar III
Circle (689) on Reply Card

Kay Industries (122)
Established products
T-1300-A2: Rotary phase converter
New products
See at booth
Circle (690) on Reply Card
see ad on page 328

Keith Monks Audio (132)†
Established products
Series: Range microphone stands
RCM II: Professional record cleaning machine
RCM III: Professional record cleaning machine
LS18: Powered monitor loudspeaker
CR501/502: RCM for radio station-production
MT 2: High tripod mic stand
New products
See at booth
Circle (691) on Reply Card
see ad on page 252

Keylite Production Services (1220)
Established products
Distributor for Strand-Century Ianiro HMI lights, Modulights, Lowel Light kits.
Rosco and Lee gels and Matthews studio grip equipment
New products
Stand-up/sit-down dolly
Circle (692) on Reply Card

Kinemetrics/Truetime (115)
Established products
468-DC: Satellite synchronized clock
60-DC: WWVB synchronized clock
FTM-6: Frequency/time deviation monitor
468-FPC: Field portable satellite sync clock
WWVTR MKV: Portable WWV receiver
RD-B: Remote display
New products
Simplex Interface: For master and remote timing
Circle (693) on Reply Card

Kings Electronics (1623)
Established products
RF, coaxial and triaxial connectors
Video patch panels and cords
Field service kits
New products
See at booth
Circle (694) on Reply Card

George Kleinknecht (1769)†
See at booth
Circle (695) on Reply Card

WCCO puts its state-of-the-art equipment in Emcor's state-of-the-art enclosures.

WCCO-TV in Minneapolis/St. Paul has been a leader in broadcasting for many years and its new broadcast center is one of the finest in the industry. When it came to housing their equipment, the WCCO engineers chose Emcor enclosures.

Emcor is also a leader in its field, meeting the needs of broadcasters with high quality enclosures. Choose from six distinct product lines and more than 9,000 standard items. For those who need it fast, Instant Emcor is ready to ship in five working days. In addition to standard products, we manufacture modified designs for special needs.

Call us today with your requirements.

Crenlo, Inc.

Emcor Products
1600 Fourth Avenue N.W.
Rochester, MN 55901
(507) 289-3371

EMCOR

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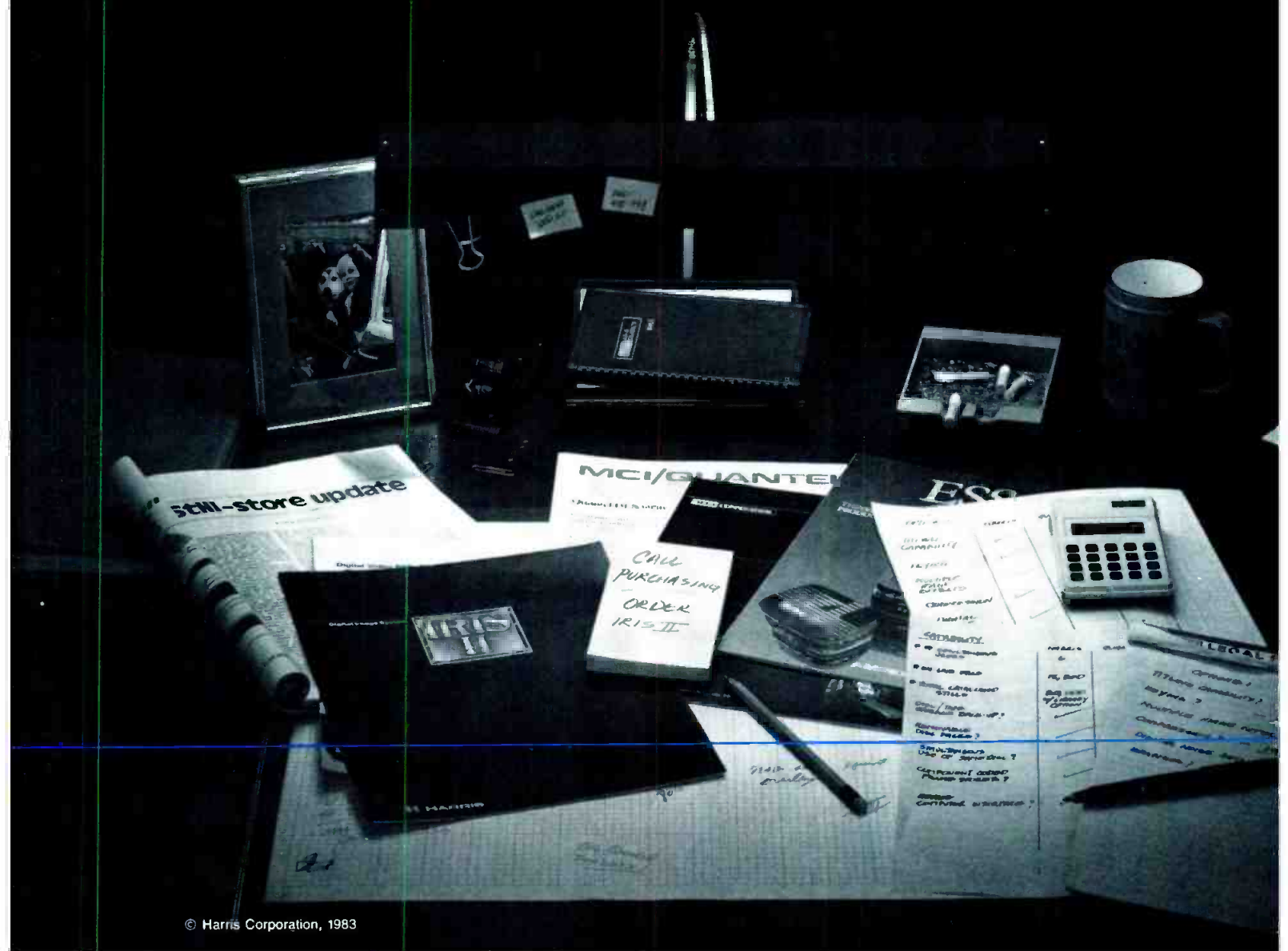
www.americanradiohistory.com

Adda, Ampex, Harris, and Quantel all make excellent Still Stores. But more and more the choice is Harris.



© Harris Corporation, 1983

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1 Harris' new IRIS Composition Station (ICS) solves your video production problems with these exclusive features:

Compression and Positioning
2X expansion
Variable size
Infinite border and background color
Soft border capability
H & V inversion
Cut-and-paste
Removable memory modules
Single joystick control

Adda doesn't. Ampex doesn't. Quantel doesn't.

The ICS is sophisticated enough to complement an artist's imagination, yet simple enough for use in the hectic pace of on-air production. And it's based on Harris' new *four frame* synchronizer, the 650.

Here's why.

2 Harris' IRIS II offers you simultaneous access by up to six users, without costly networking of separate systems.

Adda doesn't. Ampex doesn't. Quantel doesn't. Now when you want to expand, you can—cost effectively. Your system can grow just by adding inexpensive user stations.

3 IRIS II lets you title stills from each user station.

IRIS II gives you character generation with multiple fonts. It lets you title stills directly from *each* user station without tying up expensive character generation equipment.

4 IRIS II solves your still sorting and locating problems with an integral library.

In fact, IRIS II offers the most powerful search routines of *any* still store. Its library is also accessible by each user station, and has a capacity of over 80,000 stills.

5 Problems with identifying stills are eliminated.

You can get complete information on *all* the stills in your list, with full description, date, sequence, and I.D. information.

You also have the power you need to manipulate list order through addition, deletion and change of position. And, you can also link and loop your lists.

6 IRIS II gives you the storage flexibility you need for future planning.

IRIS II interfaces with the largest variety of storage drives of any still store. Several types of fixed and removable drives give you the capability of over 17,000 on-line stills. No other still store offers this flexibility. Period.

We think you get the idea. *We build the most powerful, and the most flexible, still store there is.* Whatever your business, if your problem is storing and manipulating video images, the best choice is the Harris IRIS II.

For more information about this superior solution to your video problems, call Dave Fabian, Product Manager at (408) 737-2100, or contact **Harris Studio Division, Video Systems Operation, 1255 E. Arques Avenue, Sunnyvale, CA 94086 Telex 4992172**

HARRIS

Circle (94) on Reply Card

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Kliegl Brothers (1604)
Established products
K96 SCR: Digital lighting dimmer
Performer II/III: Memory lighting control consoles
Entertainer: Manual/memory lighting consoles
Command Performance: Memory lighting control console
New products
See at booth
Circle (696) on Reply Card

Knox Video (1511)
Established products
K50: Basic titler
K128: High-resolution character generator
K500: Audio corrector
K700: Video corrector
Color Box: Dual colorizer/keyer/edger
New products
K40 Microfont: Low cost character generator
K100 Chromafont: Graphic titler
Circle (697) on Reply Card

Kobold of America (1725)†
Established products
DLF-200: HMI lighting fixture
DLF-2500: HMI lighting fixture
ST-1000: Halogen lamp lighting fixture
DLF-2000: Par 64 lighting fixture and ballast
FR-1000 and DLF-575: 1000W Halogen lamp fresnel fixture
DL-PAR: Bright beam lamp systems
DL-1200: PAR-Twin lighting system
SubLight hand-held lamp
New products
See at booth
Circle (698) on Reply Card

Kodak
See *Eastman*

LPB (405)
Established products
Signature: 5-, 8- and 10-mixer mono and stereo audio consoles
Monogram: 5- and 8-mixer audio consoles for mono and stereo uses
Citation: 8- and 10-mixer audio mixers in dual stereo configurations
New products
AM-50/150: Low power AM transmitters for PSRA, PSSA, STL and LPRTS applications
VS–TIS: High performance 15M AM antennas
Circle (699) on Reply Card

LTM of America (1518)
Established products
LUXARC: HMI Fresnel lights
AMBIARC: HMI open face lights
Soft-D-Box: HMI soft lights
MSL-250: HMI fiber-optic lighting systems
Minette: Low voltage camera and car lights
Peppers: Miniature quartz halogen lights
VARILUX: Quartz focusing open face lights
301 Series: Lightweight microphone poles and suspensions
New products
CINEPAR: HMI Par lights, from 200W-1.2kW
LUXARC 12000: 12kW HMI Fresnel unit with 24-inch lens and 110Vac ballast
Pepper Packs: Fresnel lighting kits
LT1000/LT10000: Redesigned series of incandescent Fresnel fixtures from 1-10kW in manual, pole-operated or remote-controlled configurations
A230: 6-channel sound mixer
Circle (700) on Reply Card

L-W International (1602)
Established products
4500 M: Multimedia film/video transfer system
6000: Professional 16mm telecine projector
DS 2000: 16mm film digitizer
224-A MKVII: 16mm analytic projector
New products
See at booth
Circle (701) on Reply Card
see ad on page 182

Laird Telemedia (1721)
Established products
7200: Communicator character generator
5300: Multiplexer film chain system
3300: Message generator

THE RADICAL SOLUTION

Efficient press feeds. When your facility hosts the electronic press you need the Radical solution, the M-18 press mult box.

One mic feeds entire press. The M-18 features two inputs and 18 outputs each with the option of mic or line level on either industry standard XLR or ¼" phone jacks for maximum versatility.

Clean press feeds. Each of the 18 outputs are fully transformer isolated and driven by individual buffer amps. A built-in, calibrated tone oscillator allows all outputs to be set at standard levels.

Tough, portable. A rugged, aluminum industrial case houses the M-18 assuring portability and efficient set up.

The M-18
The Radical solution to a pressing problem.

Call or write today for detailed information.

RADICAL ELECTRONICS
Manufacturer of Audio Products

Distributed exclusively by Executive Communications, 2872 Hartland Road, Falls Church, Virginia 703/573-6948.

Circle (95) on Reply Card

www.americanradiohistory.com

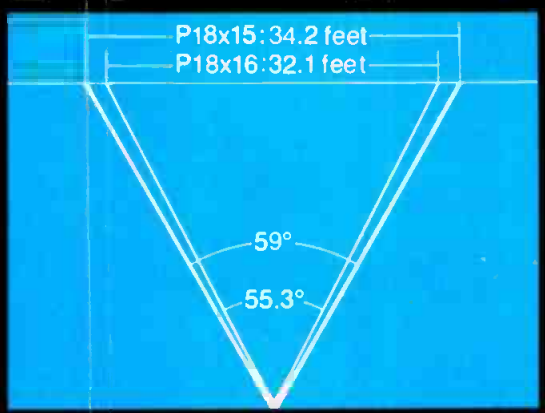
New Standards

The Widest Angle, The Highest Performance

Canon engineers have done it again, advancing the optical state-of-the-art so far forward that new standards must be considered.

The Canon P18 x 15 BIE offers the widest angle of any broadcast television zoom lens: 59°, plus incredible edge-to-edge sharpness, fidelity and sensitivity throughout its 18X range.

Every one of these superb lenses will be supplied with both 1.5X and 2X built-in extenders and a pattern projector. Options include manual, semi-servo or full servo operation.



The Canon P18 x 15 is the most versatile studio lens ever made, setting new standards for years to come.

P18 x 15 BIE F2.1 for 30mm Cameras* KEY SPECIFICATIONS

■ Focal length:	15-270mm
■ Max. Relative Aperture:	1:2.1 (15-218mm) 1:2.7 at 270mm
■ Angular Field of View:	59° x 45.8° at 15mm 3.6° x 2.7° at 270mm
■ Minimum Object Distance:	0.6 meter (2 feet)

*Also available: PV18 x 11 BIE F1.6 for 25mm Cameras

Canon Studio Standards

P18 x 16 BIE

PV12 x 14 BIE

SEE US AT NAB BOOTH 1012

Canon®

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Canon USA, Inc., Head Office: One Canon Plaza, Lake Success, N.Y. 11042 (516) 488-6700
Dallas Office: 2035 Royal Lane, Suite 290, Dallas, Texas 75229 (214) 620-2641 Chicago Office: 140 Industrial Drive, Elmhurst, Ill. 60126 (312) 833-3070
West Coast Office: 123 Paularino Avenue East, Costa Mesa, Ca. 92626 (714) 979-6000
Canon Canada, Inc., 3245 American Drive, Mississauga, Ontario L4V1B8, Canada (416) 678-2730

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Finally!
A radio automation system for under $5,000

- State-of-the-Art Ingenuity at Off-the-Shelf Prices.
- $4,900 buys everything you need to operate your present live equipment. You get a Commodore™ 64 computer with the Automate-64 operating system on a plug-in ROM cartridge, a Commodore™ Datasette recorder, a Zenith™ Data Systems monitor, a 3"-high rack-mount interface unit, interconnecting cables, plus easy to understand installation and operating manuals. Low-cost printers and disk drives are optional.
- The Automate-64 system is easy for EVERYONE in your station to learn to use because you converse with it in English.
- No compromising of your format. You can air satellite networks, syndicated programming, or locally-produced music tapes, using almost any playback equipment.

Automate 64

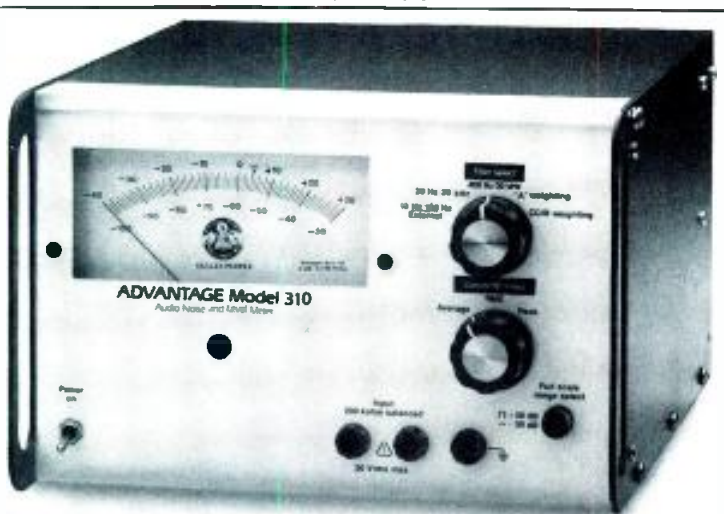
Call us, the price isn't the only good news.

Mid-Am

Commodore is a registered trademark of Commodore Business Machines, Inc. Zenith is a registered trademark of Zenith Corporation

Mid-America Automation Corporation
206 Southwind Place Manhattan, Kansas 66502
PHONE: 913-537-3289, call collect

Circle (282) on Reply Card



The true measurement of success

If your business relies on precise audio reproduction, the Advantage 310 insures your success. Our Audio and Noise Level Meter is a low cost, high quality, measurement device capable of delivering greater accuracy than that achievable with more expensive general purpose equipment.

The features of the Model 310 are tailored for audio test and troubleshooting. It offers:

- Isolated, balanced, Trans-Amp™ differential inputs
- 10 Hz to 100 kHz "wide band" filter
- 20 Hz to 20 kHz multiple pole filter
- 400 Hz to 20 kHz multiple pole filter
- "A" weighting filter
- CCIR weighting filter
- Three detector response modes: Average, Peak, RMS
- Large, easy-to-read, dual scale analog meter
- Full scale range select
- Detector output
- Preamplifier output return

Want to hear more? Put the Advantage in your corner!

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Circle (97) on Reply Card

Laird Telemedia (1721)
Continued

1040: Q board
1060: Pointer
New products
7204: Dual-channel option for 7200 Communicator

Circle (702) on Reply Card

Lake Systems (1165)
Established products
La-Kart: Matrix-10 random access video cart system
New products
La-Kart Matrix 6M: Random-access video cart system for 68K multi-event programming, including computer, floppy disk storage, three dual machine interfaces, six Type M VCRs, YIQ AFV matrix switcher, component TBC, ASACA video monitor and TEK waveform/vector monitors

Circle (703) on Reply Card

Landy Associates (1747A)
Established products
Distributor for:
Ikegami HK-79EAL camera and monitors
Anton/Bauer ProPac 14 batteries and chargers
JVC KY-310/U camera
Sachtler camera support equipment
RAMSA WR-8210/WR-130 audio mixers
CB-1: Interphase slate/border generator
S-202: Interphase 10x1 video/2- audio and tally switcher
New products
M-400: Interphase machine control system conforming to SMPTE RP-113 and using RS-422 digital bus
Arben Designs Lebenset modular set design systems
Shure FP31 field production mixer

Circle (704) on Reply Card

Lang Video Systems (1780)
Established products
VSI-820: Video source identifier
One-Shot: Switcher, mixer, identifier
Two-Shot: Integrated switcher, mixer, identifier and V/A monitoring
VAX-700: Automatic 2x1 video-audio noise switcher
New products
60825: Video recording measurements generator
4070: Microprocessor-based video test generator
VSI-821E: Digital video source identifier with memory recall

Circle (705) on Reply Card

Lansing, James B.
See *JBL*

Larcan Comm. Equipment (1626A)
Established products
TTC-30000FH: 30kW high-band VHF IF-modulated TV transmitter
New products
TEC-IV: VHF TV exciter, using SAW filtering
TTC-10000FH: 10kW high-band VHF IF-modulated TV transmitter, using

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Optimod /op'-tə-mod/

Op-ti-mod *n* [>Early Orbanian; deriv. of *optimum modulation*]

1. A broadcast audio processor built by Orban Associates to the highest standards of quality and reliability, incorporating patented circuitry to achieve a cleaner, brighter, louder airsound.

2. OPTIMOD-AM, Model 9100A; a high fidelity stereo or mono processor which achieves extraordinarily natural audio quality along with high loudness, remarkable source-to-source consistency, and FM-like brightness.

3. OPTIMOD-FM, Model 8100A/1 compressor/limiter/stereo generator; the industry's dominant choice for optimum FM processing, with or without the optional Studio Chassis and Six-Band Limiter Accessory Chassis.

4. OPTIMOD-TV, Model 8182A; a stereo processor that brings TV audio processing into the '80's by combining Orban's artifact-free multiband gated compressor with our clean "Hilbert Clipper" peak limiter and the commercial-taming CBS Loudness Controller.

5. OPTIMOD; a registered trademark.

Orban Associates Inc., 645 Bryant Street, San Francisco, CA 94107, Toll Free (800) 227-4498, In California (415) 957-1067, Telex: 17-1480.

Optimod – AM Information Circle (301) on Reply Card
Optimod – FM Information Circle (302) on Reply Card
Optimod – TV Information Circle (303) on Reply Card

orban

ORBAN PROCESSING KEEPS YOU COMPETITIVE

Hear the Optimods live in N.A.B. Booth #607

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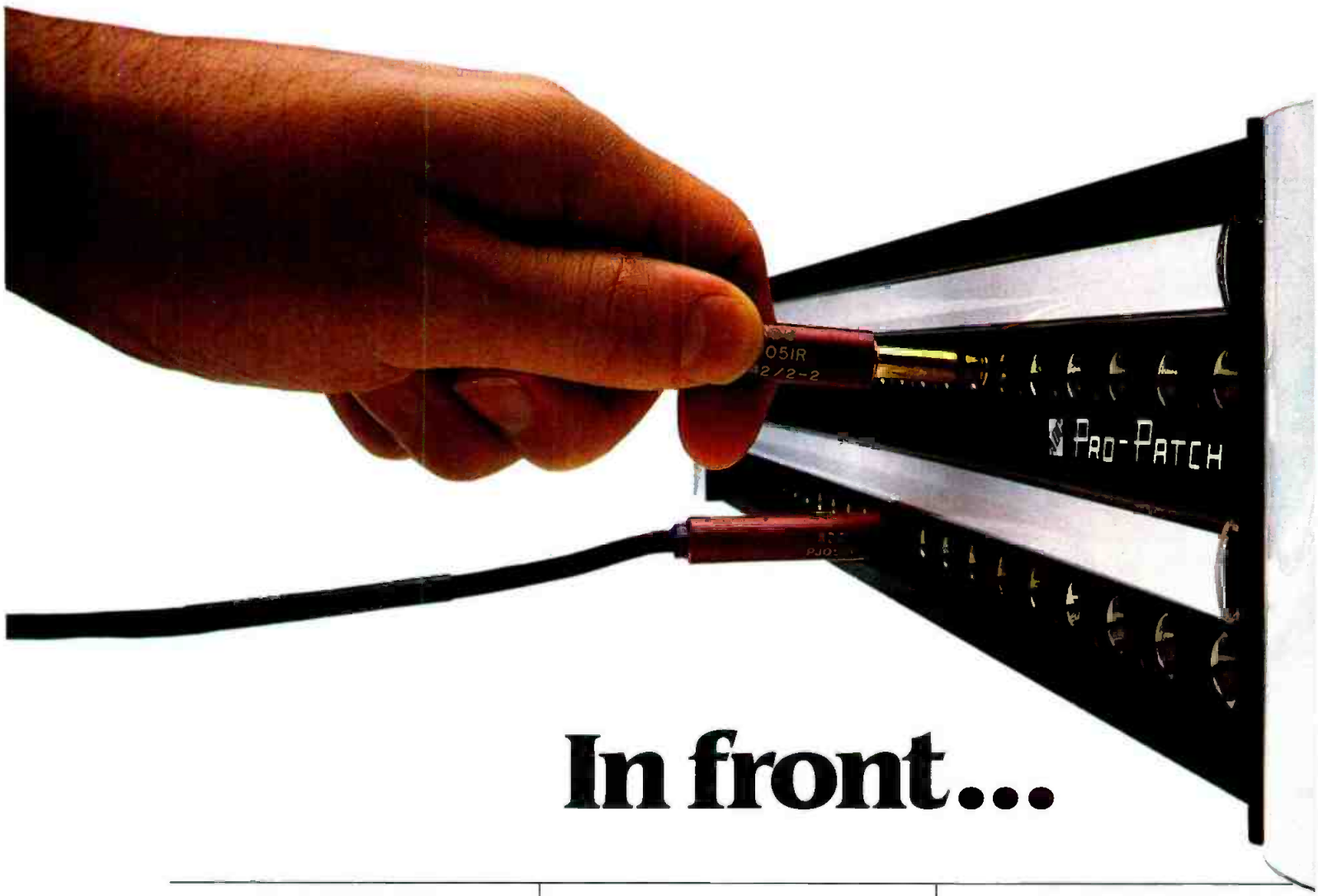
PRE-WIRED JACKFIELD



In front...

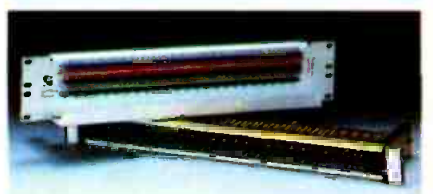
Your engineering staff has more important things to do than soldering patch panels. That's why you'll find a big advantage in ADC's 100% pre-wired Pro-Patch™ jackfields and Ultra-Patch™ panels. Featuring ADC's new split cylinder contacts, these units allow for fast, reliable, hassle-free installation.

Fully assembled, computer tested and ready to hook up, Pro-Patch and Ultra-Patch completely eliminate labor intensive soldering or crimping operations.

In fact, hooking up to the back of a Pro-Patch unit is almost as easy as plugging into the front. Just a push on a special hand tool bares a wire, locks it into a split-cylinder contact inside an insulated housing and trims off excess length.

Pro-Patch jackfields and Ultra-Patch panels cut installation time from hours to minutes and allow circuit or normalling configuration changes in seconds.

Since their introduction last April at NAB, Pro-Patch jackfields and Ultra-Patch panels have appeared in virtually every segment of the Broadcast industry.



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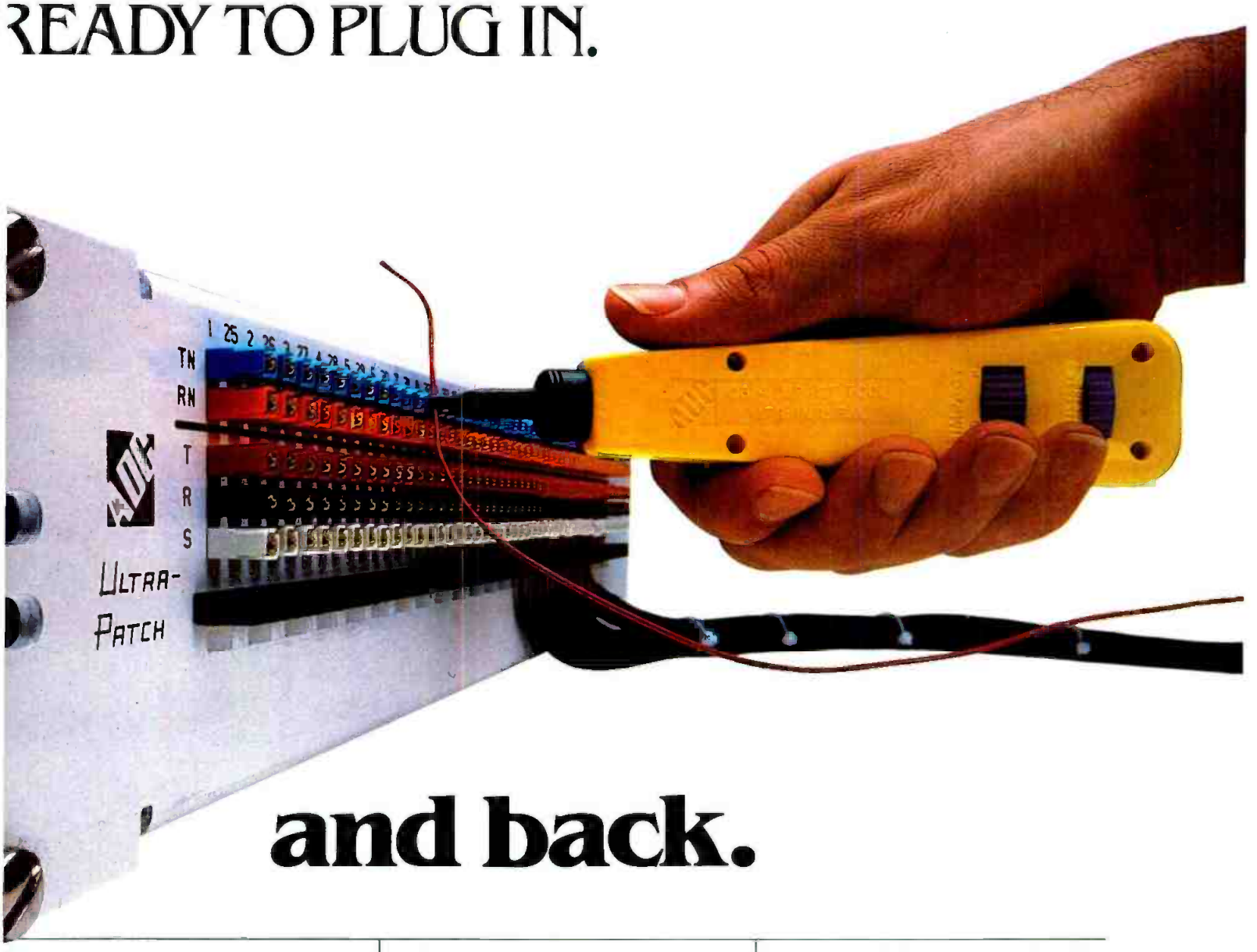
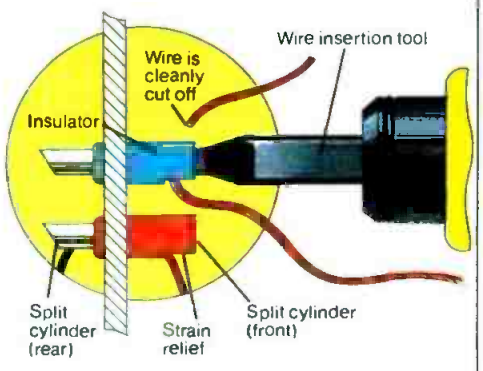
READY TO PLUG IN.



and back.



ADC's unique split-cylinder system features contacts that will accept 22.24 or 26 AWG solid or stranded wires. The cylinders are housed in plastic insulating modules and are recessed to virtually eliminate shorting at the contacts. Both sides of the contact have two-wire capability providing for four gas-tight terminations per contact. The cylinders are also rated for a minimum 100 cycles and are easily replaceable. Triple strain relieving is provided on all units.

Pro-Patch and Ultra-Patch—as well as many custom configurations incorporating the split-cylinder contacts—are fast setting the stage for a new industry standard of wire termination.

For more information on these truly state-of-the-art audio patching systems—or our over 300 other standard audio and video patching systems—write or call ADC Magnetic Controls Co., 4900 West 78th Street, Minneapolis, Minnesota 55435, (612) 893-3000.

Custom orders welcome.

ADC®

ADC Magnetic Controls Co.
4900 W. 78th St., Minneapolis, MN 55435

Be sure to visit us in Booth 1320 at the NAB show, April 29-May 2, in Las Vegas.

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Larcan (1626A)
Continued
only one tube and solid-state aural section
Circle (706) on Reply Card
see ad on page 221

Laumic (1771)
Established products
CMX Edge: Portable computer-assisted editing system
New products
Address track time code equipment for Sony VO-5850 editing recorders
Circle (707) on Reply Card

Leader Instruments (1349)
Established products
LCG-400M: Video pattern/sync generator
LCG-400S: Video generator with sweep marker unit
LVS-5850B: ½-rack vectorscope
LBO-5860A: ½-rack waveform monitor with line selector
LSG-216: Synthesized AM/FM/FM stereo signal generator
LBO-525L: 50Mz 2-channel, dual time base oscilloscope
LHC-909B/V: Video head checker
New products
LBO-5860L: ½-rack waveform monitor with expanded front panel selection of Lines 7 to 21
Circle (708) on Reply Card
see ad on page 5

LeBlanc & Dick Communications (1149)
Established products
Antenna tower construction and maintenance services
New products
See at booth
Circle (709) on Reply Card
see ad on page 263

Leitch Video (1021)
Established products
SPG-102/120: Sync generators
ACO-131: Auto sync changeover unit
660 Series: Video DAs
SCH-730: Sync/subcarrier phase monitor
IAD-750: Vertical interval adder/deleter
VIP-1101: Vertical interval processor
CBG-230: Encoded color bar generator
VPA-330: Video processing amp
DTS/DTD: Digital TV scrambler/descrambler
CSD-510: Master clock driver
CAC-511: Clock auto change
CLK: Series analog clock
UDC-508/512: Universal digital clock
DCD-520/521: Digital clock display
New products
AVS-481: Audio video switcher
CTG-240: Combination calibration test generator
DTG-1010: Digital test generator
VPA-331: Video processing amp
Frame-store synchronizer
Circle (710) on Reply Card
see ad on page 151

Lemo USA (1334)
Established products
Connectors in coaxial, triaxial and multipin configurations for audio and video applications
New products
See at booth
Circle (711) on Reply Card
see ad on page 91

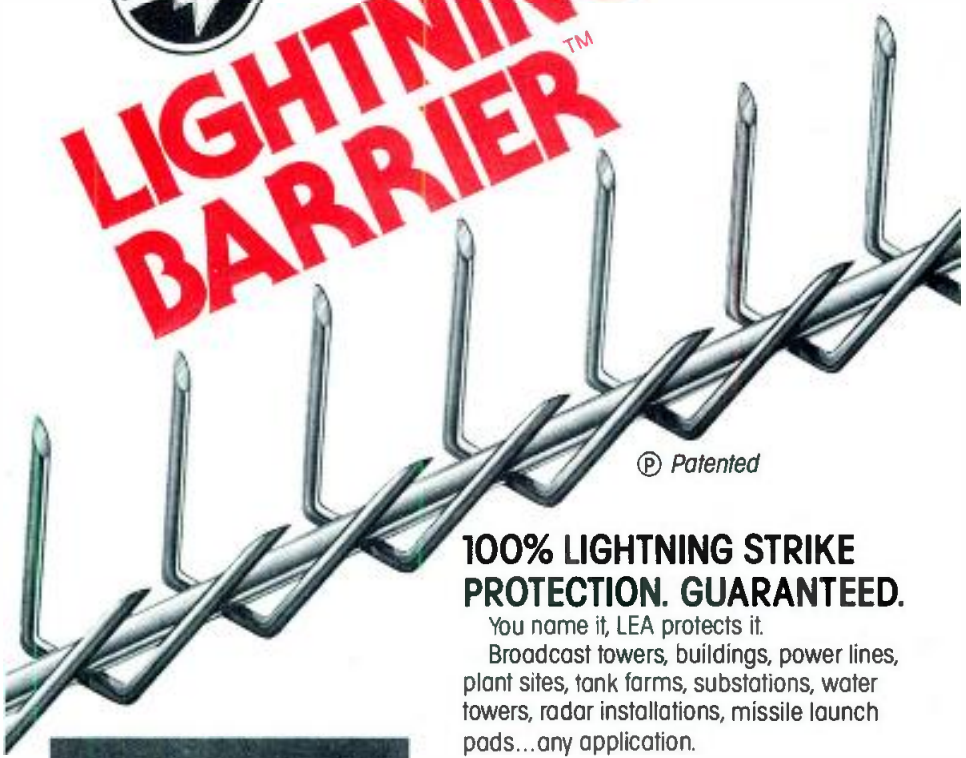
Lenco Electronic (1419)
Established products
PVS-430: Videoscope SC/H phase monitor
PMG-312: RS170A sync generator
300: Timing system
VNM-428: Video noise meter
PSW-467: Video switchers
New products
PSG-412: RS-170A sync generator
PSG-412P: PAL sync generator
PCE-466: NTSC encoder
PCE-466P: PAL encoder
PCO-418: NTSC auto sync changeover
PCO-418P: Pal auto sync changeover
Circle (712) on Reply Card

Lexicon (1139)
Established products
Model 95: Digital audio effects processor
Model 97: Programmable digital audio effects processor
Model 224XL: Digital reverb/effects processor
Model 200: Digital reverb system
New products
Model 1200C: RS-422, high resolution audio time compressor system
Model 1300S: Stereo audio/video delay compensator
Circle (713) on Reply Card
see ad on pages 65 and 71

LEA

LIGHTNING BARRIER™

See LEA at NAB in Booth #302



Ⓟ Patented

100% LIGHTNING STRIKE PROTECTION. GUARANTEED.

You name it, LEA protects it.

Broadcast towers, buildings, power lines, plant sites, tank farms, substations, water towers, radar installations, missile launch pads...any application.

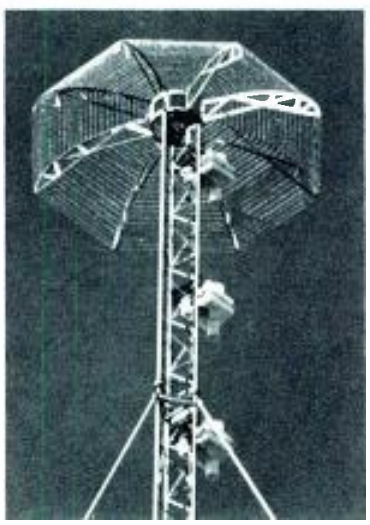
LIGHTNING BARRIER Dissipation Array Systems from LEA bleed off and control high energy electrostatic buildup between the clouds and the ground.

LIGHTNING BARRIER Dissipation Array Systems take full account of differences in structure size and height, storm patterns, altitude, and Keraunic Number.

And LIGHTNING BARRIER Dissipation Arrays are storm activated, so there is no power consumption.

No conventional lightning rod approach can possibly give you the protection that LEA'S LIGHTNING BARRIER Dissipation Array Systems provide.

So strike back at lightning. Get complete details today from LEA, Inc., a Dynatech Company, 12516 Lakeland Road, Santa Fe Springs, California, 90670 (213) 944-0916, TWX 910-586-1381.



LEA LIGHTNING BARRIER. Typical Hemispherical Dissipation Array in use at a broadcast site.

"the LEAder in pure power technology"

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BUICK IS ROLLING WITH MOTOROLA C-QUAM AM STEREO!

GM's Buick division is the first domestic automaker to offer AM Stereo radios.

Delco single-system radios, using the Motorola C-Quam® decoder integrated circuit, will be introduced in selected 1984 models.

But one of the most enthusiastic responses to this news came from a man who isn't even a Buick dealer. He's Tom Cassetty, General Manager of WSM, Nashville. "I heard the Delco playing C-Quam AM Stereo at the National Radio Broadcasters meeting in New Orleans, and I was really impressed. The sound was terrific! If they'd been playing WSM, I never would've gotten out of the car!"

If your station had the choice, wouldn't you really rather be heard in the new Buicks? You can be. Just call Dick Harasek at (312) 576-2879, or Chris Payne (202) 862-1549.

MOTOROLA AM STEREO. THE WINNING SYSTEM.

MOTOROLA

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Lightning Elimination (302)†

Established products

SE-208-400: Power line surge eliminator
MB-430/3: Power line filtering system
TETM-39-1: Transient eliminator plus RS-232 interface
CSE-HF-25K: Coaxial surge eliminator
TE(VHF)75 B: High frequency coaxial protector
Hemispherical dissipation arrays
Trapezoidal dissipation arrays
PP120-8-1: Perfect power source

New products

See at booth

Circle (714) on Reply Card

Listec (1406)

Established products

MERLIN remotely controlled crane arm
3200 Series: Tripods
Fulmar, Tern and Teal Pedestals
A-2000 Series: On-camera monitors
Avocet, Cormorant, Cygnet/Swan and Mark pan/tilt heads

New products

200 Micro Swift: Remote camera control system with shot modification, time fade, custom control panels and storage to **99** shots for single-camera pan/tilt positions, pedestal heights, zoom, focus, iris and color balance settings
A-2100 Prompter: 360 text-line memory and disk memory to 6000 lines, with variable roll speed, pause, negative/positive image and hard copy printer

Circle (715) on Reply Card

see ad on page 341

Logica (1405E)†

Established products

Teletext equipment
Video graphics generators and systems

New products

See at booth

Circle (716) on Reply Card

Logitek (613)

Established products

Audiorack: Audio mixer
MAS Series: Audio DAs
CAS Series: Audio mixers

New products

Perfectionist: 32-input mixer, featuring electronic switching, bus-swap, and pre-wired remote connection punch-block panel
PAI-4: Pro audio balance/unbalance source interface
PWR-80: Audio 80W power amp
MAS-ADJ: 1-in/6-out DA module for MAS consoles
MAS-PAI: Balance/unbalance interface module for MAS consoles
Pyramid MET-7 speakers

Circle (717) on Reply Card

see ad on page 222

Pam Lontos (120A)

Established products

Video sales training course, includes 16 videotapes
Audio sales training course, includes 24 audiotapes

New products

See at booth

Circle (718) on Reply Card

Lowel-Light (1309)†

Established products

01-10: Omni-light
D2-10: DP light
S2-10: Softlight 2
T1-10: Tota-light
Complete accessory and kit systems, Lowel reflectors and Lowel clamping, support and rigging systems

New products

See at booth

Circle (719) on Reply Card

Lyon Lamb Video (1632A)†

Established products

VAS IV: Video animation controller
VAS III: VHS video animation testing system
3300: Professional video animation stand
CCS: 4-axis motion control system
Innovator 1000: Animation control

New products

See at booth

Circle (720) on Reply Card

M/A-COM MVS (1004)

Established products

Skypod: Airborne ENG system
SuperScan/MiniScan: Auto track ENG central receive systems
2/2.5/7/13GHz: Portable ENG microwave systems
2/7/12GHz intercity microwave systems
23GHz point-to-point microwave
High gain disc array manual track ENG receiver system

New products

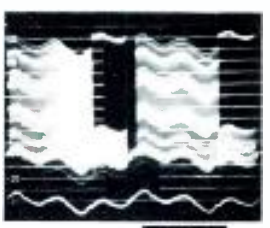
See at booth

Circle (721) on Reply Card

STOP GROUND-LOOP HUM!

VIDEO HUM STOP COIL...HSC 1

Will ELIMINATE HUM and other INTERFERENCE in Video Lines caused by differences in Ground Potential.



- For Color and Black and White.
- FLAT-DC to 6.5 MHz.
- No Low-Freq or Hi-Freq. Roll-off.
- No Differential Phase Distortion.
- No Differential Gain Distortion.
- No Envelope Delay.
- Passive Device - Failure Free-Low Price.
- Small Compact Package 4" x 4" x 2-1/4".

NEW!

$170 F.O.B. N.Y.

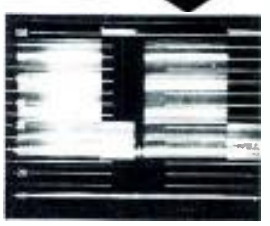
ELIMINATES HUM AND INTERFERENCE:

IN STUDIO

- Between Buildings
- On long runs in Buildings
- Between Studio and Transmitter
- On Incoming Telco circuits
- On Outgoing Telco circuits

IN FIELD

- Betw. Remote Truck and Telco
- Betw. Remote Truck and Microwave
- For Intertruck Hookup
- For VTR Units
- For Monitoring Lines



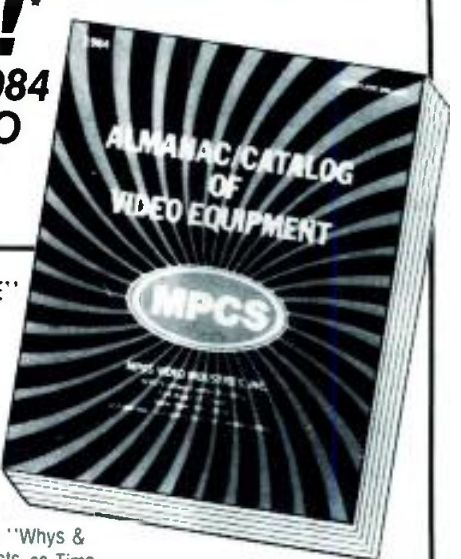
Available on 10 day free trial

AUDIO-VIDEO ENGINEERING COMPANY
65 Nancy Blvd., Merrick, N.Y. 11566
Tel. (516) 546-4239

Circle (164) on Reply Card

FREE!*

ALL NEW 1984 MPCS VIDEO ALMANAC / CATALOG



THIS "INDUSTRY BIBLE" OF OVER 300 PAGES INCLUDES:

- The latest technical specifications and information on the latest models available from more than 100 manufacturers and suppliers of video products
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- Twenty-four pages of video equipment, systems and special packages available for rental—and their rates
- Eight pages of video production, post-production and tape duplication services—and costs for such services

* To obtain your FREE copy of the 1984 MPCS Video Almanac/Catalog—a $25.00 value—send your business card, or letterhead, with a check/money order for $5.00 to cover shipping & handling costs to:

MPCS

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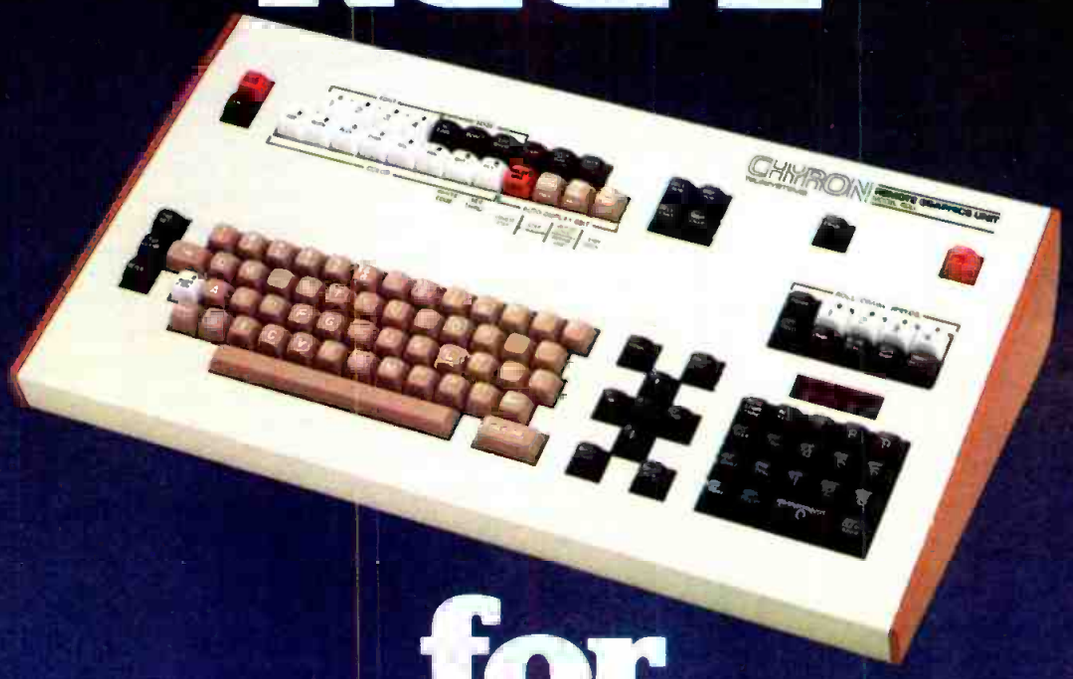
Now the CHYRON® RGU-2



for under $20,000.

Now's the time to buy a brand new, latest model CHYRON RGU-2 graphics and tilting system at a price that's hard to resist.

The high-quality RGU-2 provides many of the most-wanted features of the industry-standard CHYRON IV: unsurpassed character resolution of 27 nanoseconds...programmed graphics animation...color for background and text on a character-by-character message basis (with the optional CHYRON Color Encoder)... a versatile multi-font library... automatic color/font change...64 color choices...and much more.

With the optional Channel Control Module, mixes, wipes and fades are available at the touch of a key.

Operation is flexible and uncomplicated. Just load a software program and automatic instruction displays appear on the monitor to provide an interactive communications channel between operator and RGU-2.

So, don't delay. There may never be a better time to buy the character generator that offers most of the features found in units costing twice as much—the CHYRON RGU-2.

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CHYRON TELESYSTEMS

A DIVISION OF CHYRON CORPORATION
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• 516-249-3296 • Telex: 144522 Chyron Melv

Ampex International is exclusive distributor for Chyron Graphics Systems outside the U.S.A.

Price subject to change without notice. Circle (166) on Reply Card

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MCI/Quantel (1631)
Established products
MIRAGE: Free-form digital video manipulation system
PAINT BOX: Digital art, graphic and animation system
DLS 6030: Digital library system with production effects
DLS 6020/6010: Digital library systems
CLL: Central lending library for DLS 6000 Series and Paint Box
DPE 5000/5000SP: Digital production effects systems
DSC 4000: Family of standards converters including 6-field Silk
DFS 1750: Digital framestore, synchronizer and TBC
New products
CYPHER: Free-form character and caption generator with animation capabilities
Circle (722) on Reply Card

3M
See *"Three" M*

MPCS (1121)†
Established services
Rentals: Production equipment
Services: Post-production; modification of video cameras/monitors
Distributor: Video equipment
New services
See at booth
Circle (723) on Reply Card
see ad on page 332

MZB & Associates (1507A)†
Established products
MZB-14: Production vehicle
New products
See at booth
Circle (724) on Reply Card

Macrotel (1702)†
See at booth
Circle (725) on Reply Card

Magnasync/Moviola (1147)
Established products
V-1016/35: Videola film-to-tape transfer system
V-500/16-35: Videola film-to-tape transfer system
Edgewriter: Creates edge numbers automatically during transfer process
New products
See at booth
Circle (726) on Reply Card

Magnetic Media (1310)
Established products
Cost-effective mobile production truck
New products
See at booth
Circle (727) on Reply Card
see ad on page 142

Magnum Towers (119)
Established products
M-Series: Prewelded triangular tower sections from 18-inch to 42-inch faces
MKD-Series: Knock-down tower sections from 48-inch to 120-inch faces
New products
See at booth
Circle (728) on Reply Card

The Management (627)
Established products
Simple Log, Prolog, New Electric Log and Super Log software packages for automated broadcast stations
New products
Prolog software for the IBM-PC
Circle (729) on Reply Card

Marcom (306)
Established products
516: Marcom audio monitor/switcher
110/112: Rood BAX bandwidth extender
SC-203: Rood FM stereo generator
New products
114: Rood portable BAX bandwidth extender system
Circle (730) on Reply Card

Marconi Electronics (1609)†
Established products
MR2B: 1-inch C Format VTR
B4624: VTR monitoring unit
B3410: CCD line array telecine with color corrector computer
2019: Signal generator
2305: Modulation meter
1650: Eddystone receiver →

WITH OUR VERSATILE 'DUAL-TRUCK' VIDEO REMOTE PRODUCTION SYSTEM,

YOU CALL THE SHOTS!

Take one. Or take both. Go just about anywhere a car can go, and park with ease. Join them together in various configurations. Or split them apart. Either way, our unique dual-truck system—featuring a self-contained electronic production truck and a control room truck—is more versatile and cost-efficient than any comparable system on wheels.

Designed to suit the difficult terrain and environmental conditions of the Mountain States, our system provides the same production capabilities as much larger, conventional tractor/trailer rigs. With enough flexibility to cover anything from small, low-budget shoots to full-blown sports events and concerts.

We can supply experienced crews and customized, cost-efficient equipment packages on a step-scale basis. Choose from broadcast-quality Sony ENG/EFP cameras, recorders and monitors, to sophisticated time code and character generators, switchers, intercoms, audio mixers, etc. And for back-up, we offer our extensive inventory of video and film rental equipment: power supplies, lighting and grip equipment, camera prompters, camera support equipment (including Steadicam), etc. All serviced by our own experienced technicians.

So go ahead and rent just what you need. That's all you will be paying for.

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Be sure to visit our NAB Booth #1153

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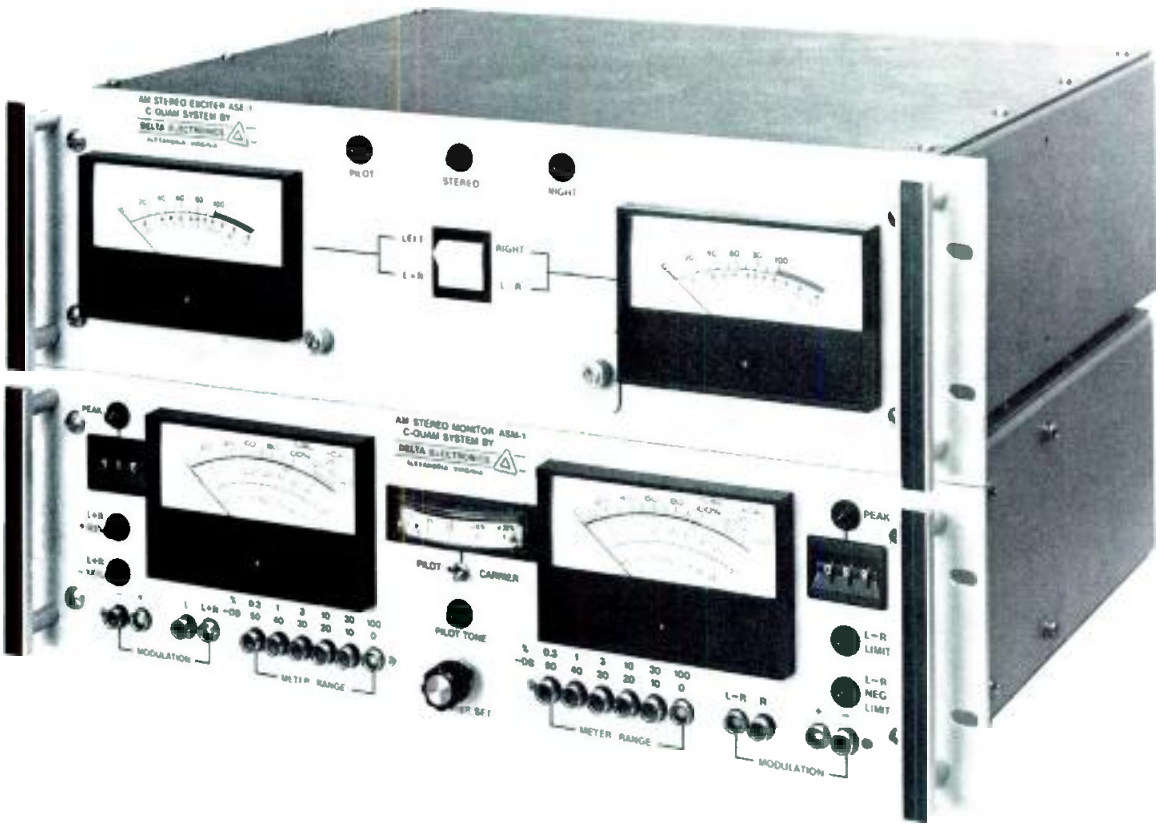
AM Stereo Without Compromise



C-QUAM® AM Stereo System by Delta Electronics, Inc.
FCC Type Accepted

Delta Electronics, Inc. introduces the ASE-1 AM Stereo Exciter and ASM-1 AM Stereo Modulation Monitor: FCC type-accepted C-Quam System transmission equipment for the AM Stereo broadcast market. C-Quam is the *Compatible* Quadrature Amplitude Modulation system developed by Motorola, Inc. C-Quam is the system of choice for more than 70 U.S. stations plus additional Canadian stations. Users range from kilowatt day-timers to full-time network flagships. These stations report enthusiastic response from listeners using multimode and full C-Quam stereo receivers as well as typical monophonic receivers. The key is compatibility without compromise. All listeners, stereo and mono, receive a clear signal with low distortion. Delta's twenty-year leadership in the field of broadcast instrumentation solidly backs this technological advance.

The proliferation of receivers from GM's Delco Electronics, Inc., MacIntosh Labs, Sherwood Electronics, Chrysler Corporation, Concord Electronics, Samsung Electronics and others not yet announced, is creating a sizeable C-Quam audience. With the outstanding performance of this equipment, you can be sure that the audience will *stay* tuned to your Delta C-Quam AM Stereo transmission system.

For additional information, contact Bob Bousman at (703) 354-3350.

C-QUAM is a registered trademark of Motorola, Inc.
Manufactured under license from Motorola, Inc.

See us at NAB Booth 105

DELTA ELECTRONICS

5730 General Washington Drive, Alexandria, Virginia 22312
Telephone: 703-354-3350 • TWX: 710-832-0273 • Telex: 90-1963

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Marconi (1609)
Continued
Cameras: Studio
Generators: Blackburst and color bar
Transmitters: AM/FM/UHF/VHF
Amps: Pulse and DAs
TBCs and color correctors
New products
See at booth
Circle (731) on Reply Card

Marconi Instruments (1615)
Established products
S1100: AWA audio transmission test system
2305: AM/FM modulation meter
2914A: Insertion signal analyzer
2920: TV interval timer
New products
6960: Automatic RF power meter
Circle (732) on Reply Card

Mark Electronics (1227)†
See at booth
Circle (1488) on Reply Card

Marshall Electronics (1331)†
Established products
Distributor of A/V products, including digital audio effects; delay, reverb; A/V sync delay; time expansion/compression
New products
See at booth
Circle (733) on Reply Card

Marti Electronics (501)
Established products
RPT2: Hand-carried RPU transmitter
RPT15: Portable aircraft/mobile RPU transmitter
RPT25/40: Portable RPU transmitters
ARS15: Automatic repeater station
STL10: Full back-up telemetry link
TSL15: Return telemetry link
RMC15: Digital remote control
ATS15: Automatic transmitter switcher
New products
See at booth
Circle (734) on Reply Card

Matthews (1209)
Established products
Aluminum and stainless stands, diffusion, lighting control hardward, grip/mounting equipment, dollies, track
Cine-Vator
Crank-O-Vator
Tulip Crane
New products
C-boom clamp, expendable reflectors and brackets, newly designed reflector braking
Stage stands, kit stands, grip heads and overhead frames
Cam-Remote system
Circle (735) on Reply Card

Maxell (1624)†
Established products
Blank audio and video recording tape; cassettes
New products
See at booth
Circle (736) on Reply Card
see ads on pages 226 and 227

McCurdy Radio (207)
Established products
AVS-100: Audio/video routing switcher
SS 8722: Audio console
SS 8670: Audio console
VDA-41: Video distribution amplifier
VDA-42: Video distribution amplifier
VDA-10: Video distribution amplifier
VLG-10: Video leader generator
8720-8: Radio and TV production console
8808: Edit booth console
8816: Air console
8824: Production/air console
CS 9000: Intercom system
ARS 5020: Audio routing switcher
CS 9400: Digitally-controlled intercom
SS 8800: Audio console
VSG-10: Video signal generator
OL1930A: Telephone hybrid
CB1950: Conference bridge
EQ 1810: Audio equalizer
EQ 1820: Telephone channel simulator
Circle (737) on Reply Card
see ad on inside back cover

McInnis-Skinner
See *Beston*

McMartin Industries (701)
Established products
1000/500 Series: 8- and 5-channel consoles
TBM Series: FM monitors
RPU Series: Remote pickup equipment
BFM-1521R: FM stereo generator
BFM-2001: SCA generator
TR Series: SCA receivers
Accu-Five: 5-channel mixer
BR-400: 4-channel remote mixer amp
New products
Comuni-quik Network: Super-S transmission system for five simultaneous sub-channels from one FM station
UDC-1: SCA data modem
TVR-2: SCA receiver for TV
PS-1K/PS-5K: Power reducers for daytime AM stations
BF-400: 400W FM transmitter
BF-30M: 30kW FM transmitter
TV stereo monitoring system
FM translator
Circle (738) on Reply Card

Meadowlands Communications (110)†
See at booth
Circle (739) on Reply Card

Media General (410)
Established products
Station IDs, audio and video
Production and sales services
Contest/promotion packages
Music formats/programming services
Custom client jingle production
Custom TV production
New products
See at booth
Circle (1485) on Reply Card

Media Service Concepts (622)†
Established products
Station automation software including Recall, Electric, Log, Electric Bill and Management
New products
See at booth
Circle (740) on Reply Card

Meret (1331A)†
See at booth
Circle (741) on Reply Card

Merlin Engineering (1023)†
Established products
258: Ultra-wide band VTR
238: Extended play kits for 1-inch type C VTRs
Service: Refurbished 2-inch quad VTRs
ME-278: Digital audio delay
ME-288: Standards converter
ME-298: VDA system
ME-408: Color film recorder
Distributor: Apert-Herzog synchronizer, TBC
New products
See at booth
Circle (742) on Reply Card

Micmix Audio (106A)
Established products
D-2B: Dynafex non-encode/decode noise reduction system
Master-Room Products:
XL-515: Multifunction reverb
XL-404: Plate synthesizer/reverb
XL-305: Acoustic chamber synthesizer
XL-210: Stereo reverb system
XL-121: Monaural reverb system
DC-2: Variable decay control for reverb systems
New products
DX-2: Dynafex noise reduction system with new exciter circuitry
Circle (743) on Reply Card

Micro Audio Products (1122C)
Established products
TX-101: Wireless mic transmitter
MR-1: Wireless mic receiver
MDS-1: Mobile diversity receiver
TRAM: Microphone systems
New products
TX-203: Hand-held wireless mic transmitter with interchangeable mic heads
MDR-3: Mobile diversity receiver
MDS-2: Modular multichannel space diversity receiver
CM-1: Camera mount attachment for MR-1 receiver
Mini-Max: Collapsible microphone booms
Circle (744) on Reply Card

Micro Communications (1014A)
Established products
High power UHF inside RF system
Circular and rectangular waveguide
LPTV UHF and VHF diplexers
MDS and ITFS diplexer
Coaxial switches
LPTV antennas
Microwave antennas
Microwave interferometer
New products
MDS/ITFS multichannel combiner
Combiner with phase shifter
Diplexer with detunable aural cavities
Circle (745) on Reply Card

Micro Control (104)
Established products
PTS-10C: Composite STL system
Continued on page 152

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Date: Today

FOR IMMEDIATE ACTION!

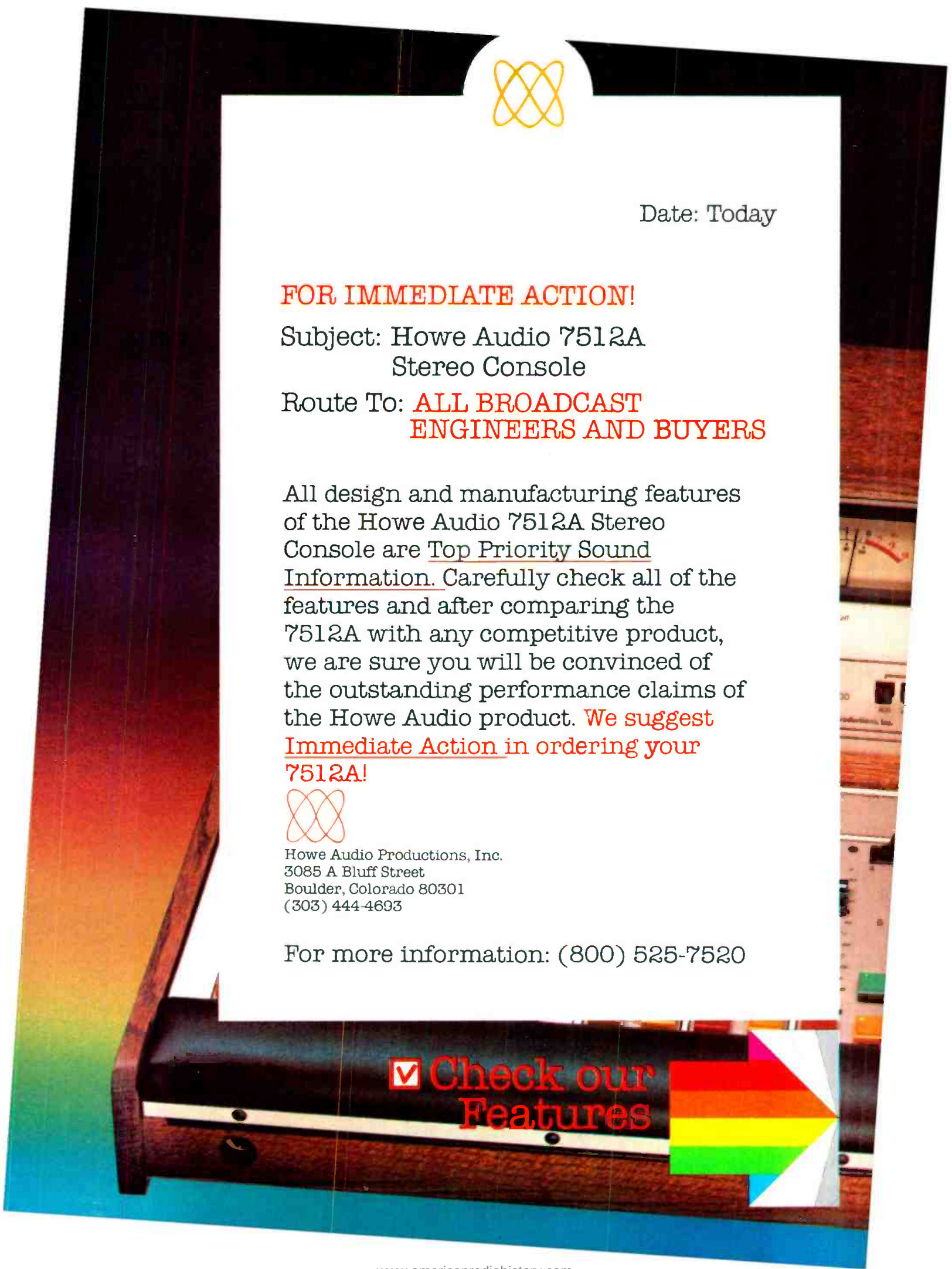
Subject: Howe Audio 7512A
Stereo Console

Route To: ALL BROADCAST
ENGINEERS AND BUYERS

All design and manufacturing features of the Howe Audio 7512A Stereo Console are Top Priority Sound Information. Carefully check all of the features and after comparing the 7512A with any competitive product, we are sure you will be convinced of the outstanding performance claims of the Howe Audio product. We suggest Immediate Action in ordering your 7512A!

Howe Audio Productions, Inc.
3085 A Bluff Street
Boulder, Colorado 80301
(303) 444-4693

For more information: (800) 525-7520



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HOWE AUDIO 7512A... The

1 **PROFESSIONAL-GRADE LINEAR SLIDE FADERS** . . . Custom made to our rigid specifications for years of reliable service.

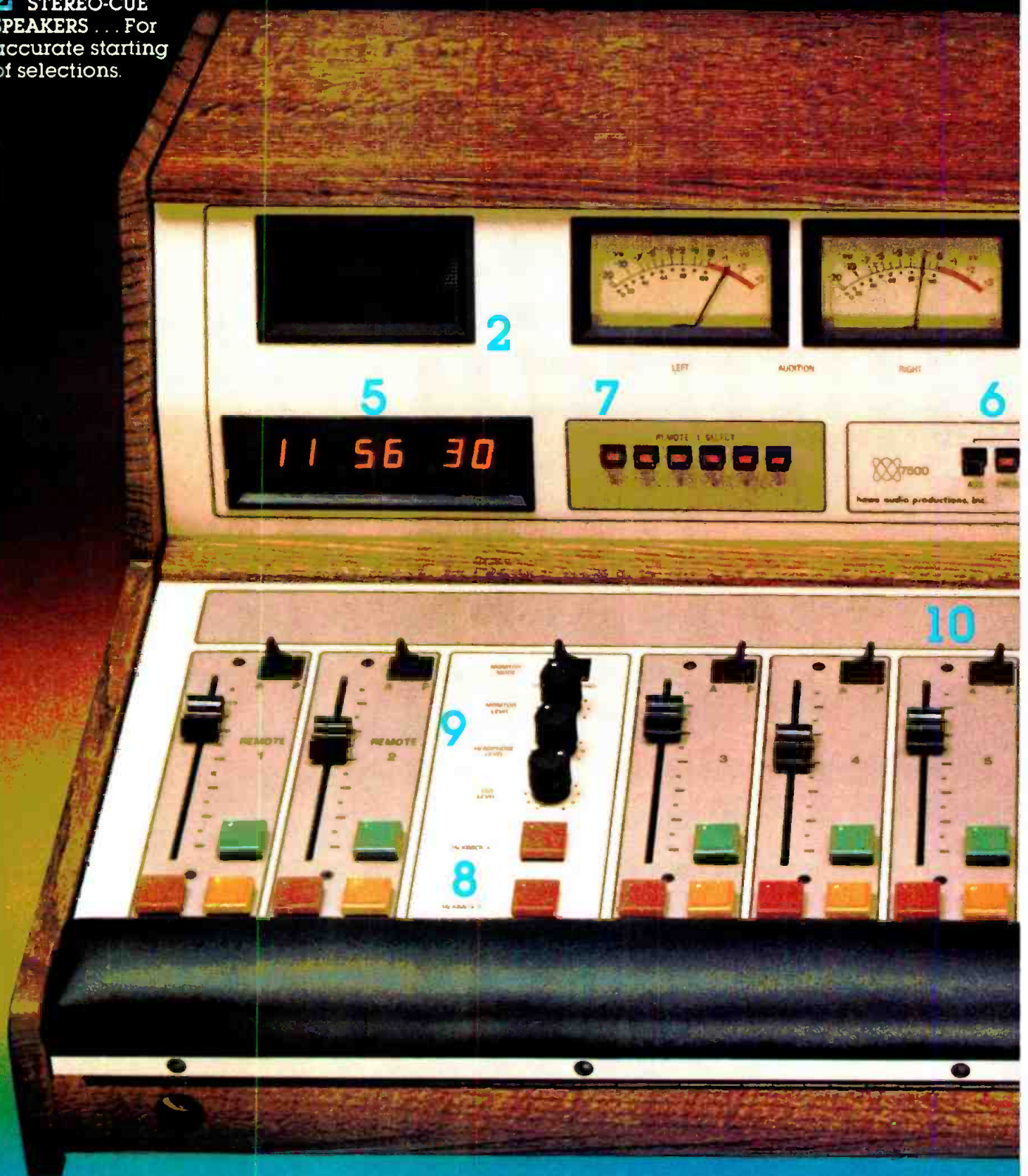
2 **STEREO-CUE SPEAKERS** . . . For accurate starting of selections.

3 **VUE-METER DISPLAYS** . . . For left and right "program" plus left and right "audition." "Air" LED meter display.

4 **"UP-COUNT" TIMER** . . . Programmable to start from the fader buttons.

5 **"REAL-TIME" CLOCK** . . . Easy access to controls.

6 **MONITOR SELECTION** . . . F "audition," "program," and "air"; with two auxiliary monit inputs and a headphone assignment control.



"I'm a Howe Audio 7512A . . . See me (plus ot

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...timate Audio Console

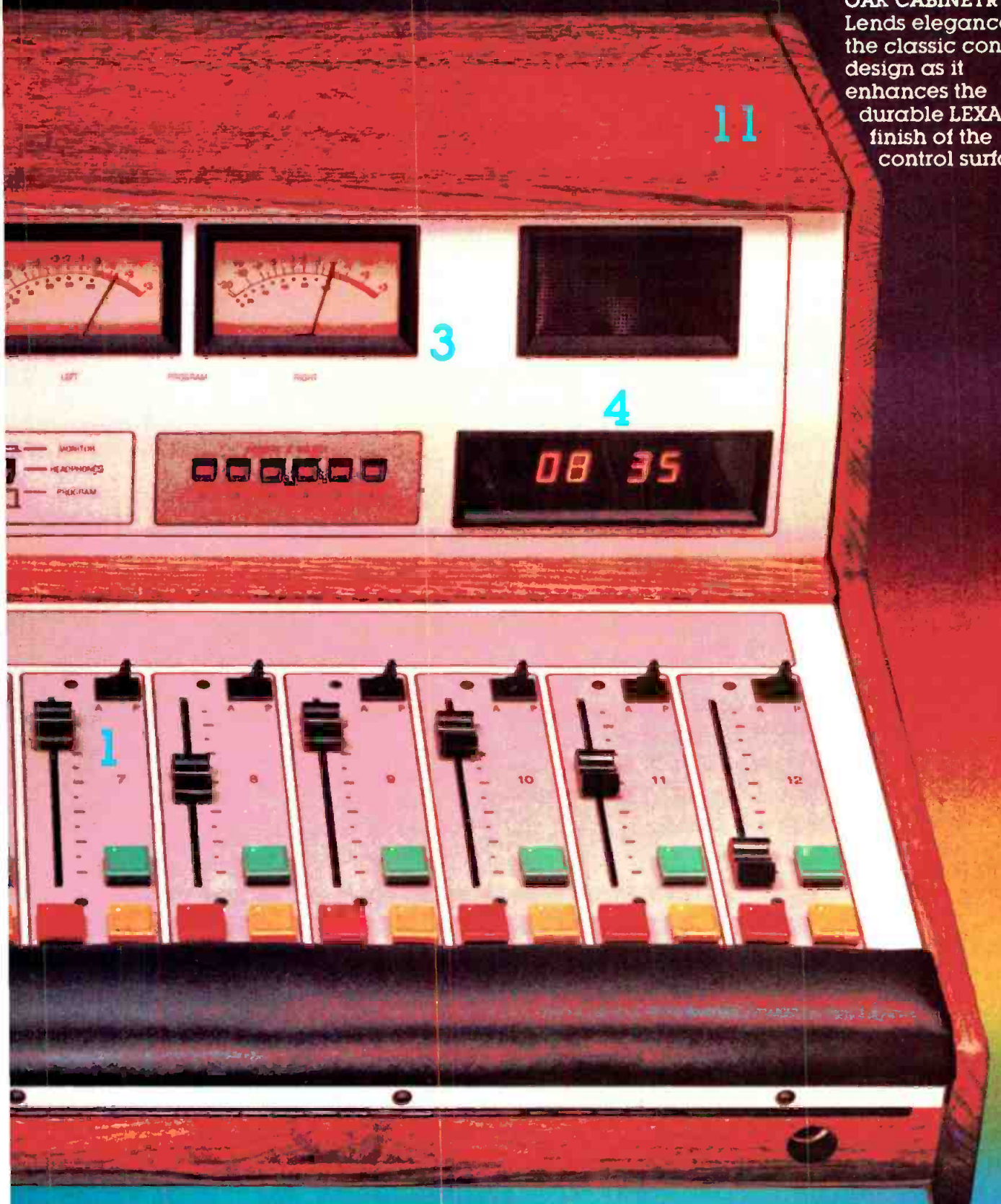
REMOTE INPUT LECTION . . . For annels One and o — six inputs r channel.

8 DIGITAL LOGIC CONTROL . . . For all channels — allowing for remote control of equipment interfaced to the console. Two "talk back" circuits are programmable for your particular needs.

9 LEVEL CONTROLS . . . For monitors, headphones, and cue circuits. Stereo/mono monitor switch also provided.

10 OPTIONAL PANEL SPACE . . . Available for customizing to your station's needs; including A/B switching, etc.

11 CLASSIC OAK CABINETRY . . . Lends elegance to the classic console design as it enhances the durable LEXAN® finish of the control surfaces.



tanding attractions) at NAB Booth 321!"

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unrivaled in quality and cost efficiency. Their sleek styling and professional design assure years of dependable operation. All Howe Audio Consoles come complete with a three-year warranty backed by 24-hour-a-day, 7-day-a-week service. Equip your facility with the best . . . the HOWE AUDIO SOUND SOLUTION!

Join the hundreds of broadcasters such as Larry Irons, K-RENO Operations/Program Director, who have found the HOWE AUDIO products to be unequalled in quality and dependability:

"We are certainly pleased with our Howe Audio 7500 Console. It's a beautiful board with all the features we need — and at a price that keeps the GM smiling. Thanks for making a quality product such a great value!"

Larry Irons,
Operations/Program Director
Station K-RENO

Howe Audio Dealers:

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  (602) 242-2211
  316 E. El Camino Dr. N.E. 85068
- **Mr. Brian Costello**
  Funke & Associates
  908 Marilyn Drive
  Campbell, CA 95008
  (408) 866-0648
- **Mr. Barrett Meyer**
  Meyer and Associates
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  Carlsbad, CA 92008
  (619) 729-4957
- **Mr. Ted Tripp**
  Marcom
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  Scotts Valley, CA 95066
  (408) 438-4273
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  Ponte Vedre Beach, FL 32082
  (904) 285-3778
- **Mr. Vern Steed**
  Steed Associates
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  Ft. Pierce, FL 33450
  (305) 466-0000
- **Mr. Larry Hall**
  Hall Electronics
  P.O. Box 5031
  Boise, ID 83705
  (208) 343-3088
- **Mr. David Burns**
  Allied Broadcast Equipment
  P.O. Box 1487
  Richmond, IN 47374
  (317) 962-8596
- **Mr. Bob Silver**
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  (617) 254-2110
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  South Glens Falls, NY 12801
  (518) 793-2181
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  Audio Associates
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  Bethlehem, PA 18018
  (215) 865-6013
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  Processing Plus
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  Allentown, PA 18103
  (215) 432-0671
- **Mr. Bernie Giesler**
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  Houston, TX 77074
  (713) 774-3314
- **Mr. Gene Randolph**
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  (214) 381-7161
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  Paris, TX 75460
  (214) 785-5764
- **Mr. Gene Sudduth Jr.**
  The Gene Sudduth Co.
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  (214) 894-6303
- **Mr. L. Clark Partridge**
  Partridge Sales
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  Salt Lake City, UT 84121
  (801) 272-3131
- **Mr. David Green**
  Broadcast Consultants Corp.
  P.O. Box 590
  Leesburg, VA 22075
  (703) 777-8660
- **Mr. Bob Gorjance**
  Enterprises Broadcast
  155 Executive Drive
  Brookfield, WI 53005
  (414) 782-7996
- **Mr. Michael Leader**
  Leader Broadcast
  Box 762
  Linwood, WA 98036
  (206) 355-8559
- **Mr. Carl Peterson**
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  Bellingham, WA 98226
  (206) 671-3970
- **Mr. Tim Schwieger**
  Broadcast Supply West
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  Tacoma, WA 94866
  (206) 565-2301
- **Mr. Michael Beebe**
  W. G. Leatham, LTD.
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  859-408
- **Mr. Wilf Rice**
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  7621 26A Street
  Calgary, Alberta, Canada
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Dealers listed alphabetically by state or country

HOWE AUDIO 7512A STEREO CONSOLES . . .

the Sound Solution

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

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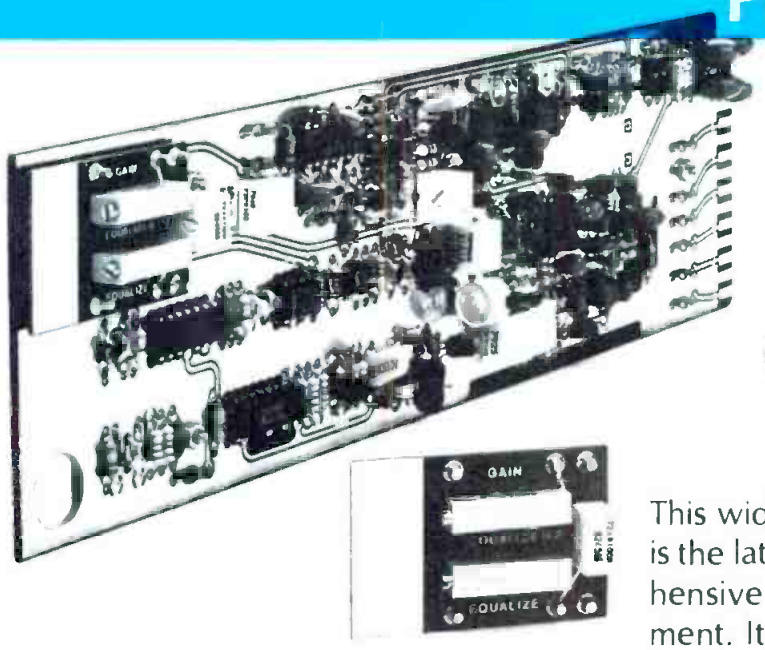
HIGH PERFORMANCE



Video Equalizing Amplifier VEA-662

$265.00

This wideband, six-output amplifier is the latest addition to our comprehensive line of distribution equipment. It features differential input, soft backporch clamping and easily set, continuously variable equalization from zero up to 300 meters (1000 feet) of Belden 8281 or equivalent coaxial cable. Delay trim and common mode hum null controls are also provided. A unique feature of this ultrastable, low power amplifier is a removable sub-module which contains the operational controls for gain and equalization. This allows instant, adjustment-free amplifier substitution.

Here are some prominent **SPECIFICATIONS**

Input

Return loss	> 54 dB to 5 MHz > 46 dB to 10 MHz
Common mode rejection	> 60 dB to 1 kHz

Outputs

Return loss	> 40 dB to 5 MHz > 36 dB to 10 MHz
Output isolation	
Signal (3.58 MHz)	> 48 dB
Load	< 0.05 dB/load at 10 MHz < 0.15°/load at 3.58 MHz
Output DC	< ±25 mV at back porch

Timing

Delay	25.4 ns (32.7° at 3.58 MHz)
Adjustment range	typically 6° at 3.58 MHz

Power Requirements

Total power dissipation	< 2 W

Performance

Frequency response	< ±0.02 dB to 5 MHz < ±0.1 dB to 10 MHz +0 -0.2 dB at 15 MHz typically -0.6 dB at 20 MHz
Differential phase	< 0.1° 10% to 90% APL
Differential gain	< 0.2% 10% to 90% APL
H tilt	< 0.25%
V tilt	< 0.25%
S/N ratio	> 70 dB to 20 MHz (rms noise/0.714 V) unweighted

Equalization

Range	0 - 300 m (0 - 1000 ft) Belden 8281, Northern Electric 728, or equivalent
Response	< ±0.05 dB to 5 MHz < ±0.15 dB to 10 MHz typically -0.2 dB at 15 MHz typically -1.0 dB at 20 MHz

Compare price and performance . . . then give us a call.

Leitch Video of America, Inc.
825k Greenbrier Circle
Chesapeake, VA 23320
Tel.: (804) 424-7920
Telex II: 710 882 4342

LEITCH

Leitch Video Limited
10 Dyas Road
Don Mills, Ontario M3B 1V5
Tel.: (416) 445-9640
Telex: 06 986 241

Circle (108) on Reply Card

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Micro Control (104)
Continued

PTS-10N: Narrowband STL link
RCR-9: Remote control with nine channels
New products
PTS-10CD: 3-channel STL for AM stereo
2002: STL Uniphase exciter
Circle (746) on Reply Card
see ad on page 108

Microdyne **(1612)**
Established products
PR 10: 3m Ku-Band antenna
PR 12: 3.7m SCPC antenna
1100BDC/DCR-12: Ku-Band video receiving system
1100TVRX-24B-2: C-Band video receiver
New products
1100 SCM: SCPC audio modulator
1100 TVE: SCPC upconverter
1100 PCDR: SCPC audio demodulator
PR-12T: Transportable SCPC uplink system
Fully redundant SCPC uplink system
Circle (747) on Reply Card
see ad on page 121

Microtime **(1230)**
Established products
T2E-120: A/B roll effects system
T-120D: TBC for dynamic tracking and digital effects
T-120: TBC for non-segmented ½-inch and U-matic VCRs
T-100: TBC
S-230: TBC/frame synchronizer
S-130: Frame synchronizer
2100: Video image processor
C-150: Commercial insertion system
Digitrol 2: VTR machine controller
New products
TSE-120: A/B roll effects system, including one T-120D TBC, one S-230D TBC/frame synchronizer and the E-120 effects processor
S2E-120: A/B roll effects system including two S-230D TBC frame synchronizer systems and the E-120 effects processor
S-230D: Infinite window TBC for ½-inch and U-matic heterodyne VTRs with or without capstan servo, as well as in-house or remote signals
Circle (748) on Reply Card
see ads on pages 168 and 169

Microwave Associates
See *M/A-COM*

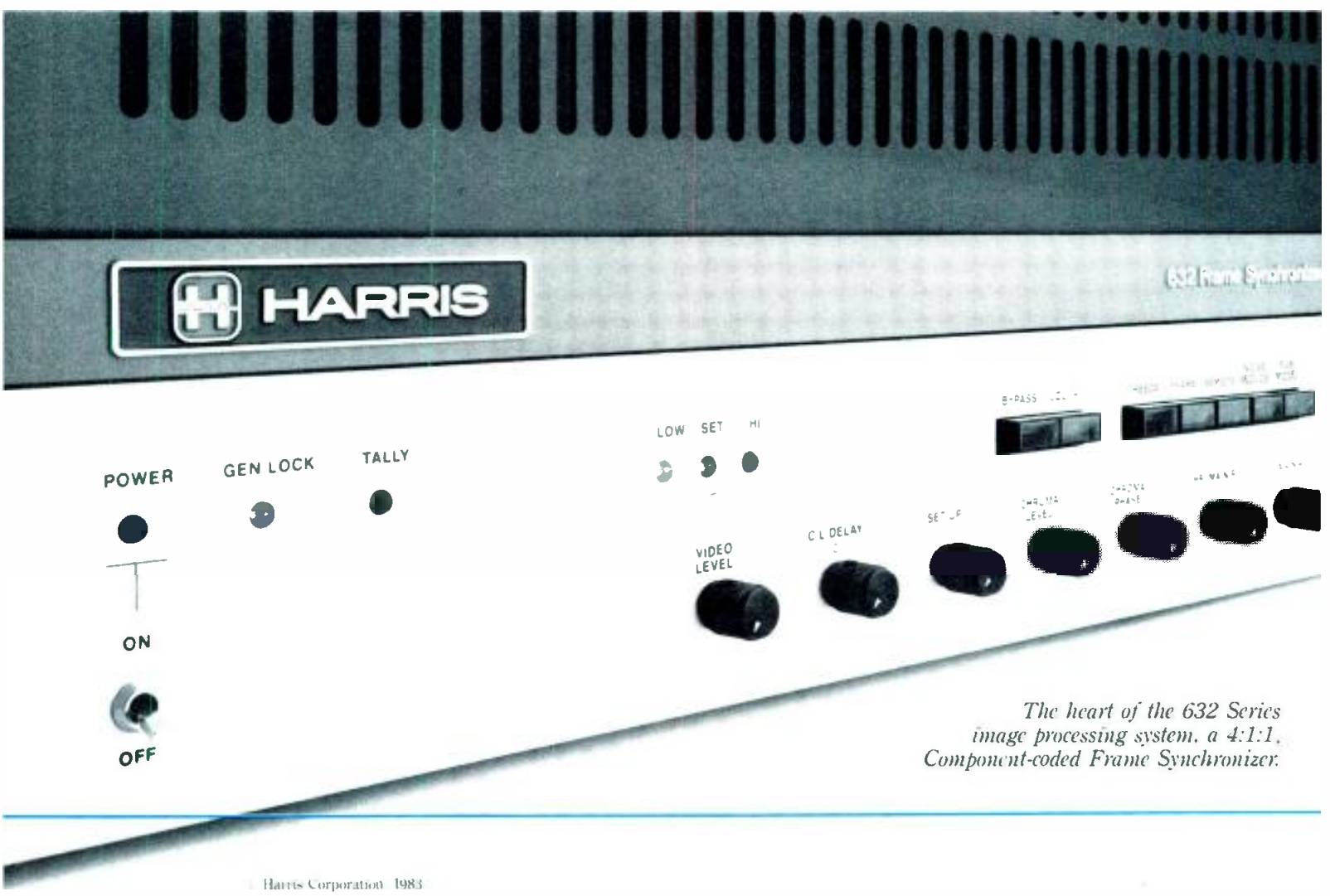
Microwave Communications **(1004)**
New products
MLV-I Series: Transportable microwave link for transmission of video and four audio program channels for outside broadcast or emergency restoration
Circle (749) on Reply Card

Midwest **(1710/1710A)**
Established products
Turnkey mobile units, broadcast facilities
New products
M40: 45-foot mobile broadcast production vehicles, fully operational with Type C and U-matic recorders with Ikegami studio and hand-held cameras with digital effects
Circle (750) on Reply Card
see ads on pages 1 8 and 9

Milab **(1018)**
New products
VIP-50: Condenser microphone with rectangular capsul, variable patterns, transformerless and switchable between mic and line levels
Circle (751) on Reply Card

Mini-TP **(1134)†**
See at booth
Circle (752) on Reply Card

Minolta **(1113)**
Established products
Color Analyzer II
Meters: Chroma II; illuminance; luminance
New products
See at booth
Circle (753) on Reply Card
see ad on page 126



The heart of the 632 Series image processing system, a 4:1:1 Component-coded Frame Synchronizer.

Harris Corporation 1983

www.americanradiohistory.com

Mitomo (1509)
Established products
MRD-100P: Random-access changer for discs
MAX-31D: Audio mixer (portable)
MAX-30: Audio mixer (portable)
MRC-45: Rapid charger
MVW-20E: Videocassette winder with eraser
New products
MRD-100P: Random-access changer for discs
MAX-31D: Portable audio mixer
MAX-30: Portable audio mixer
MRC-45: Rapid charger
MVW-20E: VHS videocassette winder with eraser
Circle (754) on Reply Card

Modular Audio Products (325)
Established products
IMPAC line of card amplifiers, including mic preamps, line amps, audio DAs, switcher cards, oscillators, noise generators and VCAs
Rack-mount audio DAs and power supplies
Panel mounted equalizers, compressor/limiters, oscillators
Racks, op-amps, transformers, accessories
New products
4824: 1x8 audio DA
4046: Line mix amplifier
2100: Power supply
7102: Stereo compressor
7301: Newsroom switcher
Circle (755) on Reply Card
see ad on page 342

Modulation Associates (1737)
Established products
R-SAT: Optimized SCPC satellite for regional radio networks
MC-SAT: Multichannel-SAT for combinations of wideband and optimized SCPC audio/data demods with multiplex and downconverter options
SU-10: 10W solid state broadcast audio and data uplink, with dual redundancy, portable and remote control options
AM-200: Audio monitor for 6 program circuits
New products
DATA-SAT: Receiver for reliable reception of 56kbit/sec data over satellite links
UC-10: Satellite uplink controller, providing remote control and monitoring
SSTS-SAT: Frequency-agile 24-channel video receiver with agile subcarrier receiver capable of selecting one of 12 frequencies
Circle (756) on Reply Card
see ad on page 161

Modulation Sciences (204B)†
Established products
CLD-2500: Composite driver/receiver
Sidekick: SCA generator
New products
See at booth
Circle (757) on Reply Card

Mole-Richardson (1006)
Established products
Solar-Arc Solarspot fixtures
Molepar fixtures
Molepole Solarspot fixtures
Softlite fixtures
Molite and Molekits
Molequartz Molelipso fixtures
Molefar Super Quartz Cyc-Strips
Quartz scoops, broads, Nooklites
Molefay and Molecool fixtures
Hanger, adapter and grip equipment
New products
Molelectronic dimmer: 12kW ac/dc dimmer units
Molescent light: 160W 4-tube fluorescent fixture
Mole Solar-Arc Solarspot: 6kW 14-inch HMI light
PAR36 Molepar: 200W HMI light
Junior Moleremote Solarspot: 2kW 8-inch wireless light
Circle (758) on Reply Card

Monks, Keith
See Keith Monks Audio ——→

If you're a Decision Maker, here's an easy one:

REQUIREMENTS	YOU COULD PAY	HARRIS 632
Digital noise reduction	$ 9,000	Included
Digital keying	7,500	"
Picture compression/position	18,000	"
Frame synchronization	12,000	"
Time base correction	10,000	"
Remote control	5,000	"
	$61,500	$27,990

OK, what will it take to get the job done?

The Harris 632 Series image processing system. It gives you a combination of signal processing capabilities and features that will add versatility to your studio, and imagination to your productions.

And at less than half what you could spend on separate pieces of equipment.

So, if you're trying to get a job done and stay within a budget, the *component-coded* 632 *(for NTSC)* or 631 *(for PAL)* may just be the right answer.

Try a 632. Then try to be without it.

For information contact: **Harris Studio Division, Video Systems Operation, 1255 E. Arques Avenue Sunnyvale, CA 94086 (408) 737-2100 Telex 4992172**

Harris Studio Division

HARRIS

Circle (109) on Reply Card

www.americanradiohistory.com

Montage Computer (1775)
New products
Montage 5000: Digital picture processor
Circle (759) on Reply Card

Moseley Associates (301)
Established products
MRC-1/MRC-2/MRC-1600: Microprocessor-based remote control systems
PCL-505/PCL-606: STLs
RPL-4B: Remote pickup link
TRL-1: Telemetry return link
SCG-9/SCD-9: Stereo generator/demodulator
SCG-8/SCD-8: Subcarrier generator/demodulator
TFL-280B: Audio limiter
New products
CRT and auto logging options for the MRC-1600 remote control system
PCL-606/C: STL system for 1.7GHz
Circle (760) on Reply Card

Motorola (309)
Established products
AM stereo exciter
AM stereo modulation monitor
Communications products
Mobile telephone equipment
New products
See at booth
Circle (761) on Reply Card
see ad on page 141

Multi-Track Magnetics (1712)†
Established products
108DCS: Servo drives/torque motors
TD-106/DCS: Reproducers, motor drives
New products
See at booth
Circle (762) on Reply Card

Music Director Programming (709)
Established products
Music library for pop and country formats
Weekly music supply service for adult-contemporary and country format stations
New products
Music research service, based on nationwide listener tests, 300 oldies for adult-contemporary and CHR/Top 40 stations
Circle (763) on Reply Card

The Musicworks (209)
Established products
Radio programming formats to give owner/managers control of station image and music content
Country Alive format
Country 80 format
Casual Country format
Pop Adult Lifestyle format
New products
Feature shows, including Ralph Emery Show, Jim Reeves Radio Special
Seasonal specials including Country Christmas Music Service
Circle (764) on Reply Card

Mycro-Tek (1752)†
Established products
Character generators
New products
See at booth
Circle (765) on Reply Card

NEC America (1415)
Established products
E-FLEX DVE: Video effects with perspective and rotation
SP-3: 3-chip CCD camera
FS-18: Frame synchronizer with TBC option
TVL-800: 7GHz microwave system
Series: UHF/VHF TV transmitters
Series: FM transmitters and exciters
New products
FBN-9000: FM transmitter
AS-18: Audio synchronizer
Circle (766) on Reply Card
see ads on pages 66 and 155

NTI America (1014D)
Established products
525A12: Signal generator
New products
MEK-1000: Multi-effect keyer
DSS-11: Frame-store/still-store
Circle (767) on Reply Card
see ad on page 178

Nady Systems (1133)
Established products
700/900/mic: VHF wireless mic systems
Nady 49: 49MHz wireless mic system
HM I & II: Nady Headmics →

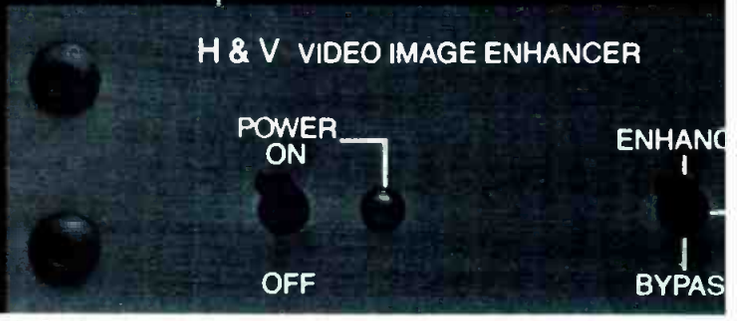
OUR ENHANCER DOES MORE THAN YOU THINK

Before you judge our horizontal and vertical image enhancer solely by its moderate price, consider its features... some of them unusual:

- 4.5 MHz bandwidth, 2H-type vertical enhancement, plus horizontal aperture correction and detail enhancement, optimized for ½" & ¾" formats
- Adjustable coring to suppress overall enhancement noise
- Adjustable enhancement-suppression to reduce noise in dark areas
- Split-screen mode allows side-by-side comparison of enhanced and unenhanced video.
- Loop-through video input with switchable 75 ohm termination
- Four video outputs
- Unique one line vertical chroma registration switch
- Enhancement signal gating and white/black level clippers to prevent picture tearing or recording level shifts caused by over-enhancement
- Special video output consisting of enhancement signal with 50% setup and sync
- Price: $1295

Also note that the Vidicraft H & V image enhancer is constructed for stand-alone or 1¾" rack-mount use. It is available in 120V or 220V, NTSC or PAL (4.43 MHz)/SECAM versions. For complete information or to order call 800-547-1491.

vidicraft®



TWX: 910-464-5156 • (503) 223-4884 • 0704 S.W. Bancroft Street • Portland, Oregon 97201

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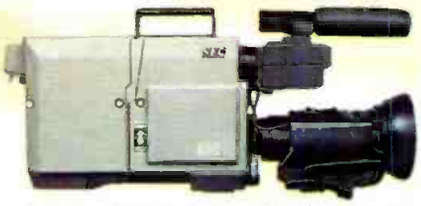
EVEN THE HAIRIEST SITUATION CAN'T SHAKE UP THE FIRST 3-CHIP CAMERA.



Some gripping news from NEC: the ENG camera has come of age. Our new SP3 packs so many features into 7.3 lbs., it's a small wonder.

With three CCD chips instead of tubes, the SP3 can take all the abuse your crew dishes out, and never needs registering. It produces broadcast quality pictures with over 500 lines of resolution. And better still, you can use it with any format — VHS, Beta,™ or ¾ inch.

To find out more about the SP3, the most newsworthy camera around, call NEC at 1-800-323-6656. In Illinois, call 312-640-3792.

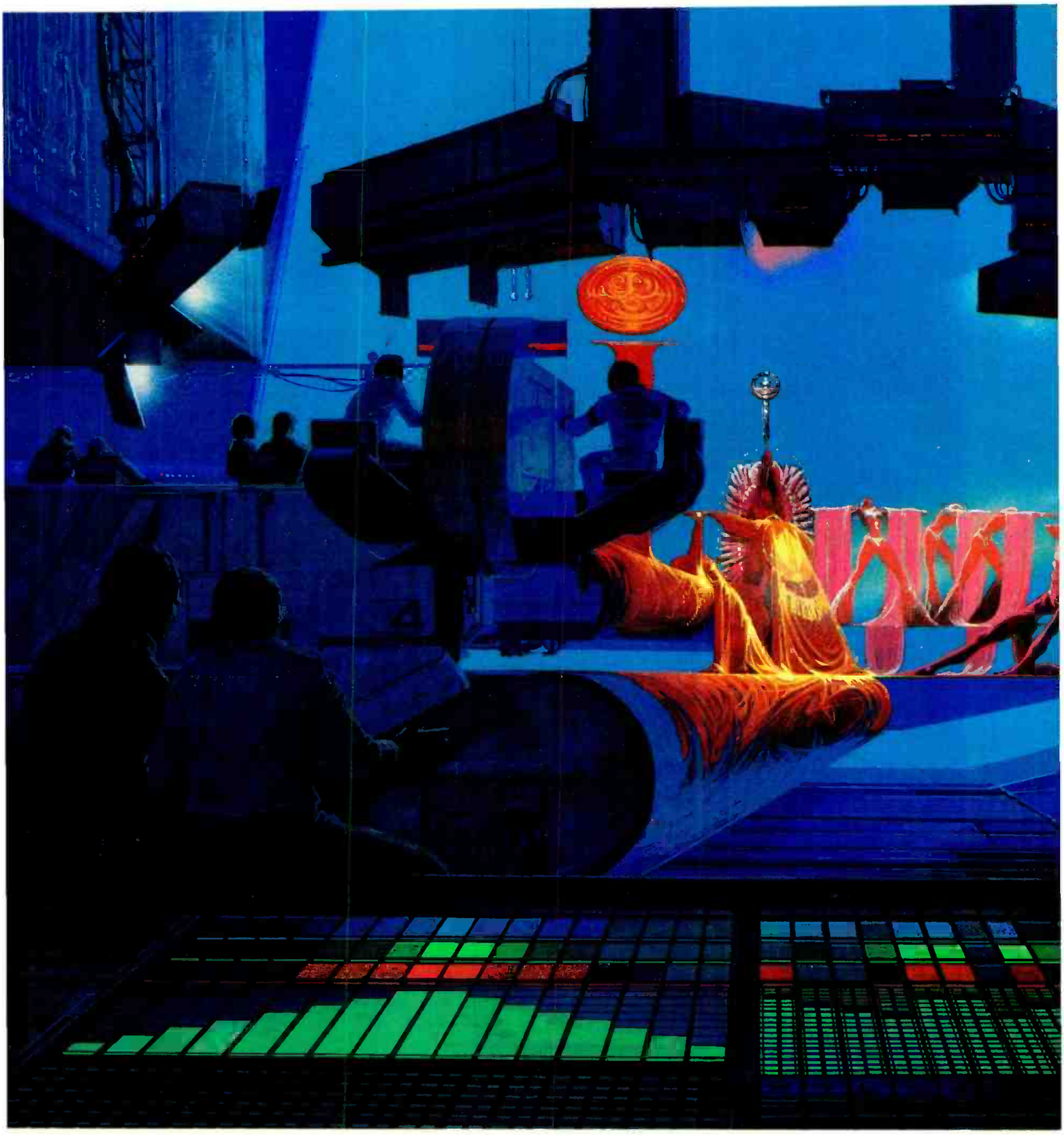
NEC

IMAGINE WHAT WE'LL DO NEXT

NEC America, Inc., Broadcast Equipment Division
130 Martin Lane, Elk Grove Village, Illinois 60007

Circle (11) on Reply Card

www.americanradiohistory.com



ONE NEW MONITOR FOR BOTH

CONRAC

Your choice of input displays (A, B, Test or RGB) is only one of many advanced features in the new Conrac 6200 master video monitor. A simple front panel switch lets you use the same monitor to display computer graphic images or live action shots.

The Conrac 6200 is the first in-line monitor with full broadcast features that meets the demanding requirements of Class 1 performance levels. That includes Conrac's best-yet white field and brightness uniformities, consistent Colormatch™ phosphors, switchable comb filter and notch filter chroma separators and status indicator lights that reduce trouble-shooting time to almost nothing.

CONRAC DIVISION, CONRAC CORPORATION, 600 N. RIMSDALE AVE. COVINA, CA 91722 • OFFICES: WEST (213) 966-3511 • N. CALIFORNIA (408) 727-14

www.americanradiohistory.com

KINDS OF ACTION.

IMAGE FROM DUBNER COMPUTER

And all this at prices under $5000 list for a full 19-inch cabinet model, $4675 list for 13-inch CRT models.

With the introduction of the 6200, Conrac continues its 37 year commitment to providing the highest quality professional monitors for technical and artistic evaluation of broadcast picture quality.

For Conrac 6200 Technical Specifications, use the Reader Service number or call Conrac Marketing Communications at (213) 966-3511.

Contact Conrac Division for a full color reproduction of this illustration which is suitable for framing.

Circle (113) on Reply Card

MIDWEST (312) 833-3310 • EAST (203) 348-2100 • NEW ENGLAND/CANADA (617)485-7910 • SOUTH CENTRAL (214) 235-8933 • EUROPE (49)0 79 34/70 71

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Otari (601)
Established products
MX-5050-BII/BQII: ¼-inch open-reel ATRs
MARK III Series: ATRs in ¼-inch and ½-inch, 2-, 4- and 8-channel formats
MTR-10/12: ¼-inch and ½-inch ATRs
MTR-90: ATRs in 8-, 16- and 24-track formats
DP-4050-C1: 1-master/1-slave stereo cassette duplicator
DP-4050-OM: Open reel master tape duplicator for use with C1 system
VL-Series: Videotape loaders for VHS, Beta, U-matic and 8mm cassettes
New products
EC-400: Tape speed resolvers
DP-80: High speed duplication system
Prototype ATRs in 1-inch, 8- and 16-channel formats

Circle (785) on Reply Card

see ad on page 340

Otis Conner (414)†
Established products
Services: Production, ID, radio/TV
Library: Music
New products
See at booth

Circle (786) on Reply Card

Pacific Recorders & Engineering (113)
Established products
TOMCAT: Cartridge tape recorder/player
BMX Series: On-air consoles
SDA-8: Stereo audio DA
LSM-10: Line selection module for audio selection and editing
Furniture systems for combo, production and newsroom
New products
ABX-18/26/34: Audio production consoles featuring multitrack production facilities

Circle (787) on Reply Card

see ad on page 93

Paltex Ltd. (1005)
(formerly Datatron)
Established products
Vanguard videotape editing system
New products
Edit-Star videotape editing system
New generation of digital video equipment including dual and single TBC/field stores with multiple inputs per channel, digital mixing/effects, digital picture processing and enhancement

Circle (788) on Reply Card

see ad on page 295

Panasonic Industrial (1019)
(Broadcast Systems)
Established products
AU-300A: M Format studio VCR and editing system
B-100: M Format camera VCR
MVP-100: Multifunction video player
WJ-5600B: 1-piece special effects generator
TU-200X: Professional NABTS teletext decoder
WV-555/WV-888: 3-tube ENG/EFP prism-optics cameras
AG Series: ½-inch VHS VCRs
High performance video monitors
New products
See at booth

Circle (789) on Reply Card

see ads on pages 24, 25, 32 and 33-40

Panavision
See *CEI/Panavision*

Patch Bay Designation (1773)
Established products
Preprinted labeling strips for use on patch panels
New products
Label products for use with illuminated switches

Circle (790) on Reply Card

Peerless Sales (1618B)
Established products
4005: Camera arm
Desk-, wall- and ceiling-mount security brackets
Single-arm design wall bracket
Yoke design wall bracket
New products
See at booth

Circle (791) on Reply Card

Penny & Giles (*)
Established products
Linear faders using conductive plastic, series 1100, 1500, 1900 and 3000
Rotary faders, mono and stereo, linear and audio tapers, with or without cue detent →

Clear-Com Gives You...

...a Choice!

In this demanding industry so abundant with incompatible formats, Clear-Com presents TWO barrier-breakers: a 2-channel belt-pack that works on standard mic cable and a Clear-Com-to-RTS System Interface!

Our CP-300 Two-Channel Belt-Pack is not only a high-intelligibility Clear-Com Remote Station, but it also provides the same pin-to-pin connections as RTS-type intercoms with *better performance.*

Ergonomically, the tough, lightweight CP-300 has been designed for camera operators and production people. Dynamic or carbon headset-compatible, it features rocker switches that place Clear-Com's popular features at your fingertips. Three-pin XLR input and output connectors allow simple, quick set-up.

The CP-300 works with any Clear-Com or RTS System. You decide: do you want one channel or two? Finally, you can enjoy two channels of communication in an RTS-type OR Clear-Com-type* intercom system.

The choice is yours!

*two channels when used with Clear-Com TW-12 two-wire interface

For more information, call or write:

Clear-Com® intercom systems
1111 17th St. / San Francisco, CA 94107
415-861-6666 / TWX:910-372-1087
EXPORT DIV.: Box 302
Walnut Creek, CA 94596 / 415-932-8134
Telex: 176340 CLEAR-COM WNCK

Come See and Hear for Yourself at NAB Booth #1502

Circle (114) on Reply Card

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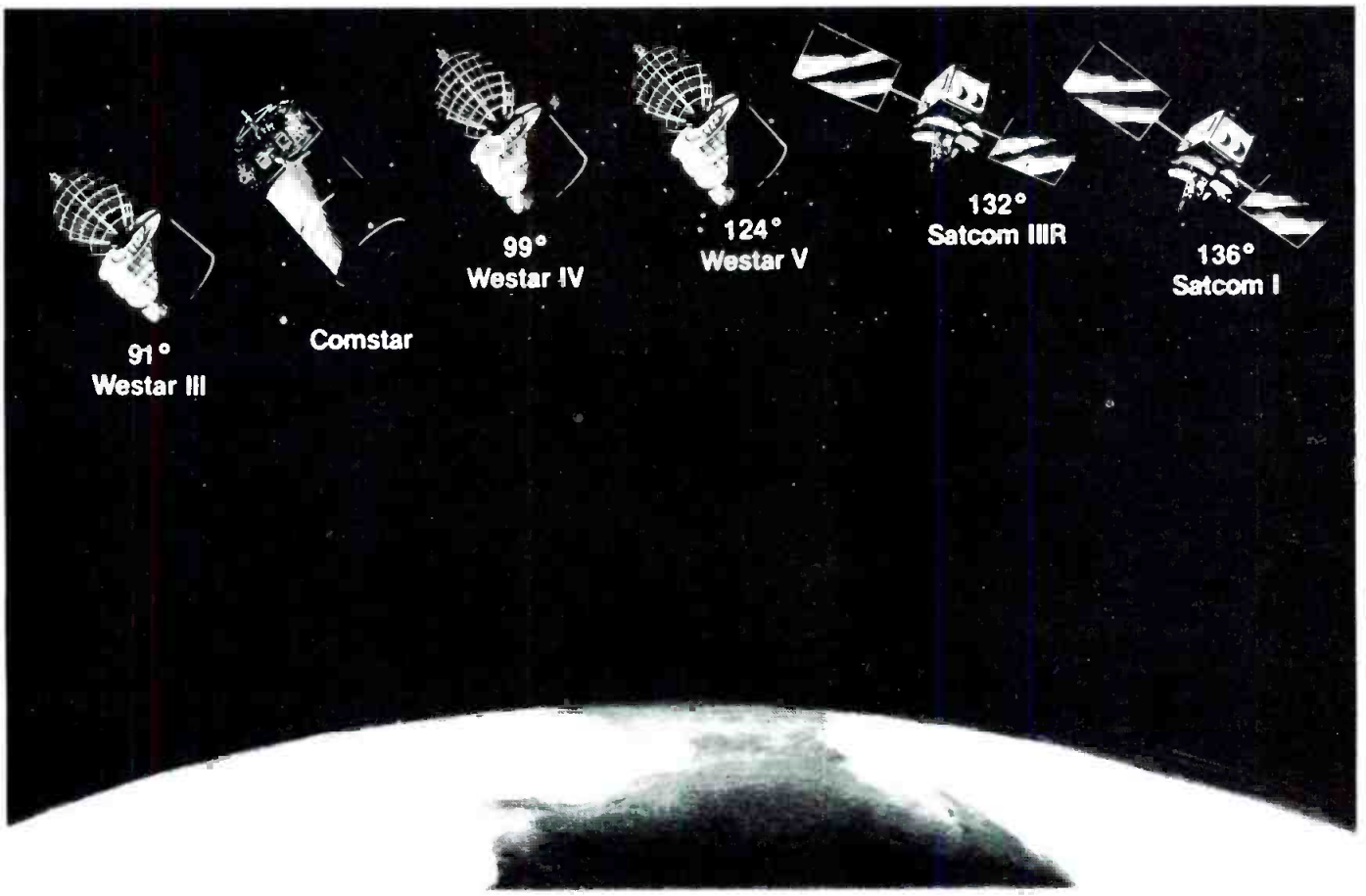
IN SATELLITE RADIO EQUIPMENT . . .
MODULATION ASSOCIATES IS THE LEADER



- The *SU 10* is the first completely portable SCPC solid state satellite uplink. It allows any earth terminal in a network to become a transmitting station for news collection, for regional program uplinking to the network, or for data transmission.
- The *R SAT* is the first optimized SCPC satellite receiver specifically designed for state and regional networks. There are more R-SAT's in operation in regional networks than any other system.
- The *DATA SAT* is the first receiver designed for reliable, low cost point-to-multipoint reception of 56 kbs data over satellite links. It allows affordable high speed data reception of weather, financial, commodity, and other broadcast data information to multiple users from a common originating uplink.
- The *MC-SAT* (Multichannel) can accommodate any combination of wideband or optimized SCPC audio and/or data demodulators along with an extensive line of multiplex and downconverter options. Its expansion capabilities make the MC-SAT the affordable choice of many networks.

MODULATION ASSOCIATES is the pioneer and leader in state-of-the-art satellite technology. Let the satellite network experts help you with your complete satellite package, including:

- Hardware
- Space Segment
- FCC Licensing
- Installation

SU-10

Contact Terry Sheffield
Executive Vice President
(415) 962-8000

Modulation Associates
897 Independence Avenue
Mountain View, CA 94043
(415) 962-8000

Circle (115) on Reply Card

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Penny & Giles (*)
Continued

Joystick quad pan potentiometers in X, XY or XYZ movement
New products
See at booth
Circle (792) on Reply Card
see ad on page 220

PEP **(1408)**
Established products
PEP ENG Power Plus: Batteries and chargers
Portable 12Vdc and 30Vdc lighting equipment
PEP On-Cam ½-inch VCR
New products
PEP XL Super Charge: A new generation of nicad batteries
PEP DAC2: ENG battery conditioner, featuring 2-channel analyzer and charger
PEP ES800: Alternate edit source, allowing direct interface of ½-inch VHS-C On-Cam VCRs to BVU800 editing control system
Circle (793) on Reply Card

Peter W. Dahl Company
See Dahl, Peter W.

Perrott Engineering **(1729)**
Established products
MP Series: Silver-zinc battery packs
PE Series: Nicad battery packs
Minichargers: Fast, medium-fast and overnight minichargers for nicad and silver-zinc batteries
New products
PE8204-2: Universal-universal multiple fast charger
PE136D: Cellmate discharger/analyzer
Circle (794) on Reply Card
see ad on page 332

Philadelphia Resins **(126)**
Established products
Phillystrand HPTG tower guy material for high power operation
New products
See at booth
Circle (795) on Reply Card
see ad on page 68

Philips TV Systems **(1500A)**
Established products
LDH 6200: Color monitor
LDK-6: Computerized TV camera
LDK-14/44: TV cameras
TV transmitters
FM transmitters
Pro digital compact audio disc systems
New products
LDK-614: Portable computerized camera, companion to the LDK-6
LDK-26: Midstudio camera using ⅔-inch tubes, computer control, triax and LDK-6 compatible
LDK-54: Video recording camera, using ¼-inch Lineplex tape format with playback and post-production systems
LDK-14RGB: Lightweight production camera
LDH 6220: 20-inch color monitor
LDM 1208: 55kW TV transmitter
FM transmitters from 100W-20kW with modular drive and comprehensive monitoring and control logic
HDTV demonstration
Optical disk mastering demonstration
Circle (798) on Reply Card
see ads on pages 232 and 233

Philips Test & Meas. Instr. **(1408A)†**
Established products
PM5565: Waveform monitor
PM5567: Vectorscope
PM5539: Color analyzer
PM5533: Color signal generator
PM5560: TV demodulator
PM5570: Video test signal generator
PM5580: IF modulator
PM5581/5582: VHF/UHF converter
PM5583: Converter base unit
PM3263X: 100MHz oscilloscope with TV trigger
New products
PM5630: Color generator
PM5631: Multipattern color generator
PM5632: SECAM color generator
PM5645: Teletext test generator
PM5634: Sync/test generator
PM5651: Studio VITS generator
PM5669: TV test modulator
PM5671: TV modulator
PM5672/73: TV modulator with dual sound for CATV
Circle (799) on Reply Card
see ad on page 127

Phoebus **(1331C)**
Established products
UA120RH/LT: Ultra Arc long-throw follow-spot
UA120RH/ST: Ultra Arc short-throw follow-spot
UQ120/82: Ultra Quartz fixture
New products
Ultra Arc series II fixtures
Circle (800) on Reply Card

Phoenix Systems **(609)†**
Established products
Automation: Station business, music format and word processing
New products
See at booth
Circle (801) on Reply Card

Picture Element **(1517B)†**
See at booth
Circle (802) on Reply Card

Piher Electronic **(1409A)**
Established products
PM-4600 Series: Color monitors
PM-3600 Series: B/W monitors
IM-4300 Series: Color monitors
HR-3600 Series: B/W monitors
TP-4696B: Color video titler
TR-4700 Series: VHF/UHF transmitters up to 5kW
TT-4700 Series: VHF/UHF transmitters, up to 5kW
New products
CG-4721: Character generator
AC4-4700: RF automatic control/switcher
Circle (803) on Reply Card

Pinzone **(1615A)**
Established products
RCD-100: Diagnostic system for the RCA TCR-100 videotape cart
8250: Satellite receiver
Complete uplink and downlink satellite system
New products
RCD-100P: Computer printer option to diagnostic system
Circle (804) on Reply Card

Polar Research **(511)†**
Established products
Lil Slipper: Communications/monitoring antenna mounts, UHF/VHF
New products
See at booth
Circle (805) on Reply Card

Porta-Brace/K&H Products **(1746)**
Established products
Recorder transportation cases for Sony BVU50, BVU110, VO-4800 and JVC CR4700
Camera cases for Ikegami HL79, JVC KY310, Sony DX3M3 and Sharp XC-800
New products
CC Beta P: Camera case for Sony Betacam system
CC B100 P: Camera case for Panasonic RECAM system
Circle (806) on Reply Card

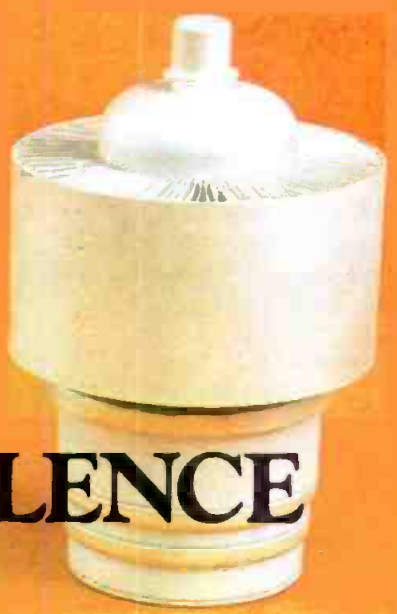
Porta-Pattern **(1427)**
Established products
001 Series: TV test charts/systems
002 Series: Telecine test slides
005 Series: Telecine test films
006 Series: 8x10 test transparencies
010 Series: Spherical transparency illuminators
020 Series: DuoChart test charts systems
New products
001-45: Zone plate chart for 525-line use
001-46: Zone plate chart for 625-line use
001-41A: Depth of modulation chart (upgraded)
030 Series: Large studio test charts
Circle (807) on Reply Card

Potomac Instruments **(100)**
Established products
AT-51: Audio test system
FIM-41: AM field strength meter
FIM-71: FM-TV field strength meter
SD-31: Synthesized detector
AM-19: Antenna monitors
SMR-11: AM monitor receiver
DAP-11: Data acquisition/logging system
ATS-11: Automatic transmission system
New products
RC-16+: Automatic remote control system
MPC-11: Automatic modulation and power controller for AM
FIM-72: UHF field strength meter
Circle (808) on Reply Card
see ad on page 64

Precision Echo **(1617)**
Established products

www.americanradiohistory.com

50 YEARS Eimac® EXCELLENCE



EIMAC 1934–1984 Supporting Broadcasting for 50 years

50 years of quality and dependability from Varian EIMAC.

EIMAC's tradition of high quality and dependability was firmly established in 1934 and continues on in 1984. Stringent manufacturing standards and controls, plus EIMAC's exclusive, long-term warranty reduces transmitter downtime and eliminates excessive operating overhead.

EIMAC backs its quality products with the industry's most comprehensive warranty program:

Warranty time for each EIMAC tube type is specified in writing and runs from the industry standard of 1,000 hours or 12 months to as high as 10,000 hours and 24 months.

Specific warranties for some popular tube types are:

4CX5000A	10,000 hours/24 months
4CX10,000D	10,000 hours/24 months
4CX15,000A	10,000 hours/24 months
4CX35,000C	10,000 hours/24 months
3CX2500A3	5,000 hours/12 months
4CX1500A	5,000 hours/12 months
5CX3000A	5,000 hours/12 months

Fourteen other EIMAC types have these extended use-time warranties. Specific warranties for each tube type are available from the Varian EIMAC worldwide sales organizations.

In all cases, EIMAC tubes are 100% warranted to be free of manufacturing defects. And, don't forget, EIMAC has a "carcass credit" return program for real savings on replacement tubes.

Compare EIMAC's 50-year record of outstanding performance. We guarantee EIMAC products will be here tomorrow for today's applications.

More information is available on EIMAC tubes and warranty program from Varian EIMAC, or any Electron Device Group worldwide sales organization. See your distributor or contact Varian EIMAC today.

Varian EIMAC
301 Industrial Way
San Carlos, California 94070
Telephone: 415•592-1221

Varian EIMAC
1678 S. Pioneer Road
Salt Lake City, Utah 84104
Telephone: 801•972-5000

varian

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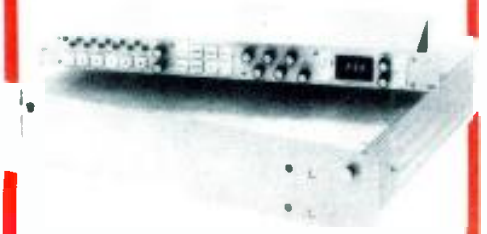
If You Are Involved in Post Production You Should Visit Us at NAB

Our 1231 Downstream Keyer can give your video switcher all the keying capability you need for today's complex video editing.

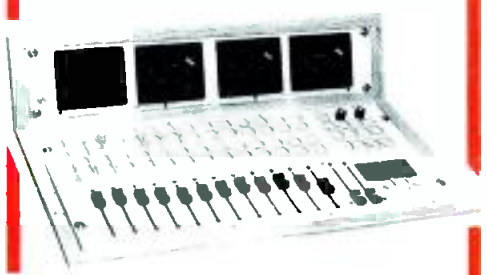
4 units are now being used by ABC-TV for their 1984 Olympic coverage



- Up to 6 Simultaneous Keys
- Post Production Editor Interface
- Analog Type Key Bordering
- Key Masking
- Key Mix In and Out
- Program Fade to Black

Our 612 Post Production Audio Mixer will give you all the capability and flexibility you need to edit audio the same way you now edit video. And in stereo too!

10 units are now being used by ABC-TV for their 1984 Olympic coverage



- Post Production Editor Interface
- AFV Capability
- 12 Inputs
- Auto Transitions
- Dual Channel

NAB Booth 1227A

GPS **GRAHAM-PATTEN SYSTEMS, INC.**

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(916) 273-8412

Circle (117) on Reply Card

Precision Echo (1617)
Continued

EFS-2: Slide Stor/animator
Squeezer: Low cost video image compression system
New products
Video Store: Video frame recorder capable of 400 still frames on a magnetic disc

Circle (809) on Reply Card
see ad on page 181

PrismaGraphics (110A)
Established products
Manufacturer of presentation folders and media kits, including various styles and sizes, using offset, gold stamping, embossing and laminations
New products
Media kit folders with cassette holder affixed to the pocket

Circle (810) on Reply Card

Procart (112)
Established products
Procart audiotape cartridges featuring phase stability from cart to cart
New products
See at booth

Circle (811) on Reply Card

Procommotion (434)†
See at booth

Circle (812) on Reply Card

Products Int'l. (1125)
Established products
Desoldering: Pace Equipment
Test: Huntron equipment
PCB: Pace repair equipment
Production: 3M static control work station
New products
Equipment: Field portable electronic repair tool kit work station

Circle (813) on Reply Card

QEI (307)
Established products
691: FM modulation monitor
695T1kW: 1kW FM solid-state transmitter
695T3.5kW: 3.5kW FM single-tube transmitter
ARC-27: Automatic remote control system
New products
695T25kW: 25kW FM single-tube transmitter
695: FM exciter

Circle (814) on Reply Card
see ad on page 235

QSC Audio Products (626)†
Established products
Series one amplifiers: Audio. 200W/channel
Series three amplifiers: Audio. 110-285 W/channel
New products
See at booth

Circle (815) on Reply Card

QSI Systems (1325)
Established products
CB9000/V: SMPTE color bar generators with 8-character ID
CB9105-V8/80: Color bar generator with 80 character ID and 8-character vertical ID
VSID-822/103: 24-character video source identifier
BG208: Full field color bar generator with 8-character ID
Demod 400. Off-air demod/tuner
Demod 150: 105 channel varacter tuner
VT-7: Countdown generator
Tally-1D: Routing switcher input identifier
New products
AF1000 Phase III: Blackburst generator with individual control of phase for each of the three outputs

Circle (816) on Reply Card

Q-TV (1401D)
Established products
VPS-100: Console transport prompting system
VPS-300: Conveyor transport prompting system
Mini-Q: Prompter system
New products
VPS-500: Computer prompting system

Circle (817) on Reply Card

Quad-Eight/Westrex (1636)
Established products
Audio mixing systems for portable studio and music applications
248: Component audio mixing console
System 5LC: Digitally controlled reverb processor
New products
Westar I: Music recording/TV post-production console for 24-track automatable applications

Circle (818) on Reply Card
see ad on page 231

Quanta (1432)
Established products
Q8: Face-loadable teleproduction graphic titling system
Quanta News: Broadcast newsroom computer system.
Select 7: Teleproduction graphic titler
Microgen: Teleproduction graphic titler
New products
See at booth

Circle (819) on Reply Card
see ads on pages 210 and 211

Quante (1216A)†
See at booth

Circle (820) on Reply Card
see ad on page 185

Quantel
See MCI Quantel

Quantum Audio Labs (509A)
Established products
Series 22: Modular broadcast and production audio consoles
New products
See at booth

Circle (821) on Reply Card

Quickscan Systems (1405B)
Established products
Electronic publishing: NTSC/PAL/SECAM data transmission

www.americanradiohistory.com

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Negotiate your best deal for RCA or EIMAC tubes with any of their authorized dealers in the U.S.A. and if we can't beat their price we'll pay you $25.00!

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2. The tubes offered must be factory new 1983 or 1984, late coded, made by RCA or Eimac.

3. The quote must be verifiable and at our option may require a copy of dealer's invoice showing Part Number, date of shipment, date codes, serial number and brand.

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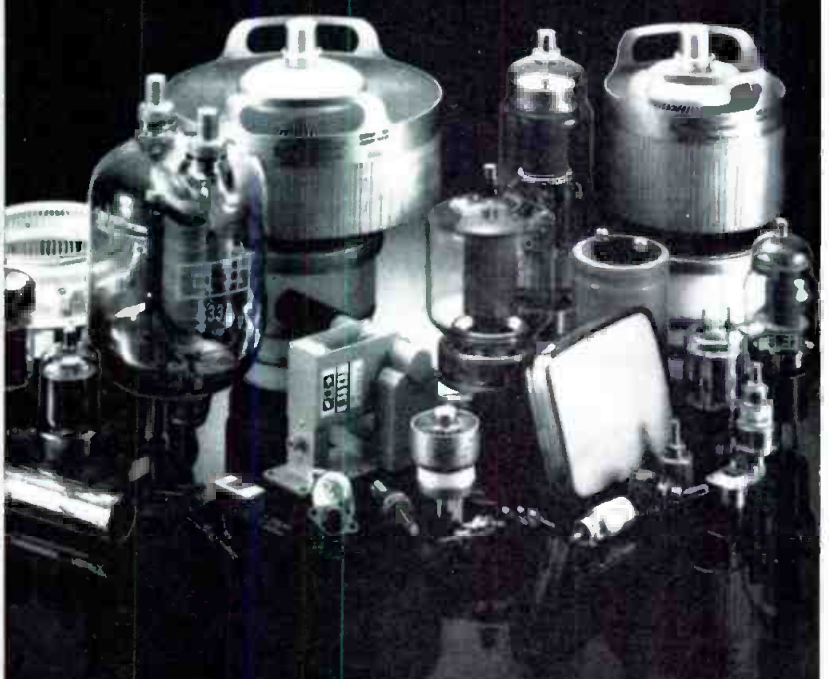

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ASSOCIATE MEMBER

484

Circle (318) on Reply Card

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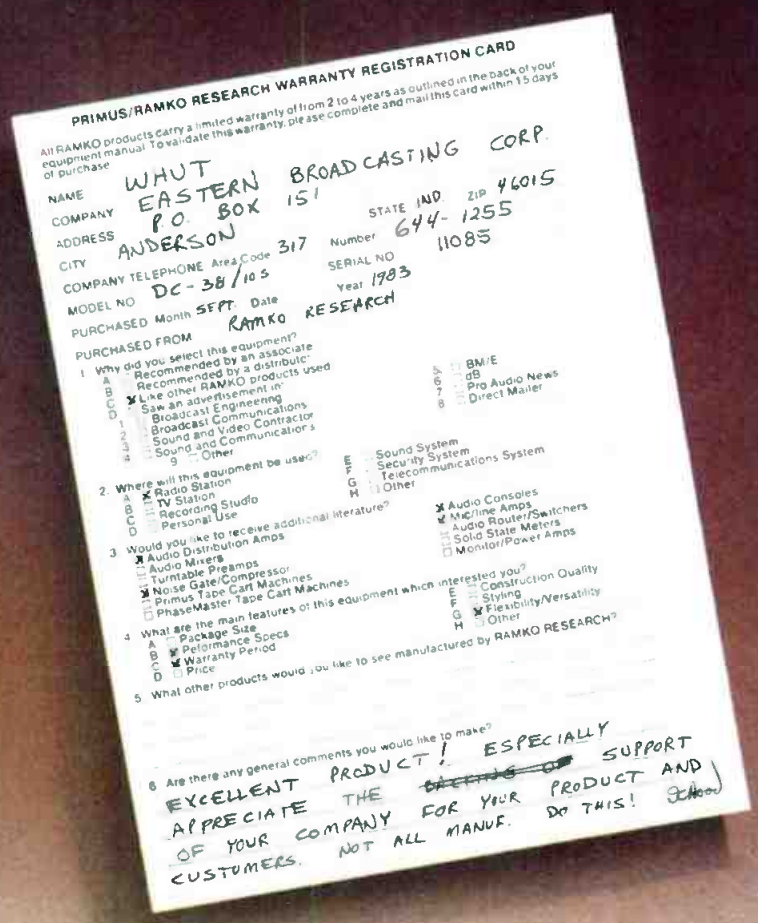
Let WHUT radio help you pick the right Audio Console... The first time.



PRIMUS/RAMKO RESEARCH WARRANTY REGISTRATION CARD

All RAMKO products carry a limited warranty of from 2 to 4 years as outlined in the back of your equipment manual. To validate this warranty, please complete and mail this card within 15 days of purchase.

NAME WHUT
COMPANY EASTERN BROADCASTING CORP.
ADDRESS P.O. BOX 151
CITY ANDERSON STATE IND. ZIP 46015
COMPANY TELEPHONE Area Code 317 Number 644-1255
MODEL NO DC-38/10S SERIAL NO 11085
PURCHASED Month SEPT. Date Year 1983
PURCHASED FROM RAMKO RESEARCH

1 Why did you select this equipment?
A ☐ Recommended by an associate
B ☐ Recommended by a distributor
C ☒ Like other RAMKO products used
D ☐ Saw an advertisement in:
1 ☐ Broadcast Engineering
2 ☐ Broadcast Communications
3 ☐ Sound and Video Contractor
4 ☐ Sound and Communications
9 ☐ Other
5 ☐ BM/E
6 ☐ dB
7 ☐ Pro Audio News
8 ☐ Direct Mailer

2 Where will this equipment be used?
A ☒ Radio Station
B ☐ TV Station
C ☐ Recording Studio
D ☐ Personal Use
E ☐ Sound System
F ☐ Security System
G ☐ Telecommunications System
H ☐ Other

3 Would you like to receive additional literature?
☒ Audio Distribution Amps
☐ Audio Mixers
☐ Turntable Preamps
☒ Noise Gate/Compressor
☐ Primus Tape Cart Machines
☐ PhaseMaster Tape Cart Machines
☒ Audio Consoles
☒ Mic/line Amps
☐ Audio Router/Switchers
☐ Solid State Meters
☐ Monitor/Power Amps

4 What are the main features of this equipment which interested you?
A ☐ Package Size
B ☒ Performance Specs
C ☒ Warranty Period
D ☐ Price
E ☐ Construction Quality
F ☐ Styling
G ☒ Flexibility/Versatility
H ☐ Other

5 What other products would you like to see manufactured by RAMKO RESEARCH?

6 Are there any general comments you would like to make?
EXCELLENT PRODUCT! ESPECIALLY APPRECIATE THE ~~OFFERING OF~~ SUPPORT OF YOUR COMPANY FOR YOUR PRODUCT AND CUSTOMERS. NOT ALL MANUF. DO THIS! Thanks

The DC-38 series of Audio consoles — the fourth for WHUT/WLHN-FM.

Although Mr. Hood's comments indicate what you can expect with a RAMKO console, there is a lot more to the story. Features, for example, that in many cases can only be found in these truly superb consoles. Here's a short sampling; Mono or stereo — 5, 8 and 10 mixer, dual channel — four inputs per mixer — each input gain selectable — mono mix/phase meter on stereo units — DC control via dbx® voltage controlled amplifiers — all solid state switching — multiswitch programmable CUE, MUTE and on air relay — optional digital clock/production timer — optional plug in remote equipment start/stop — and much, much more. *All this and our exclusive 4 year parts and labor warranty.*

For the whole story, contact your nearest rep or dealer today, or call RAMKO RESEARCH toll free, (800) 821-2545, for your full color, descriptive brochure. Let us help you do it right the first time.

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(916) 635-3600

Circle (119) on Reply Card

Quickscan (1405B)
Continued

New products
See at booth
Circle (822) on Reply Card

Quickset **(1105)**
Established products
Complete line of camera support equipment, including tripods, pedestals, dollies, fluid heads, cam heads
Video switchers, CCTV equipment
Microwave antenna and dish control positioners
Remote control studio camera positioners
New products
Modular tripods for studio and remote
Fluid heads for 10- to 60-pound cameras
Fluid-damped cam head
Remote controlled positioners with telephone or audio signal control
Modified tracking devices
Microprocessor-based control and data feedback for microwave
Circle (823) on Reply Card

RCA Broadcast Systems **(1000)**
Established products
TK-47B: Automatic studio camera
TR-800: 1-inch Type C VTR
TH-400: Low cost 1-inch Type C VTR
TK-29: Broadcast telecine, multiplexer, film and slide projector
TK-290: Broadcast telecine using TK-47 automatics
Hawkeye VRC with portable VTR, studio VTR, edit controller and accessories
Antennas for VHF and UHF TV
Transmitters and filter equipment for VHF and UHF TV
New products
TH-900: Full-feature 1-inch VTR
TKS-100: Solid-state telecine
CCD camera, production model of camera demonstrated in 1983
Circle (824) on Reply Card

R-Columbia Products **(1111)**
Established products
TR-50: Wireless intercom headphones
T4/1C: Self-powered wired intercom headphones
TP/1C: Remote powered wired intercom headphones
52/TA: Camera operator headphones
SB/2: Sports broadcaster headphones
System 50: Wired-to-wireless intercom interface
System 10: Wired intercom with remote power supply source
CC/1C: Headphones for use with ClearCom, RTS, Telex and other intercom systems
New products
UL-85: Ultralight headphone/mic
UL-85/2: Ultralight stereo headphone
CC/1C-85: Ultralight replacement unit, as CC/1C headphones
658T: Compact telephone for IFB and ENG applications
Circle (825) on Reply Card
see ad on page 244

ROH **(1634)†**
Established products
Model 190: Switcher/line monitor →

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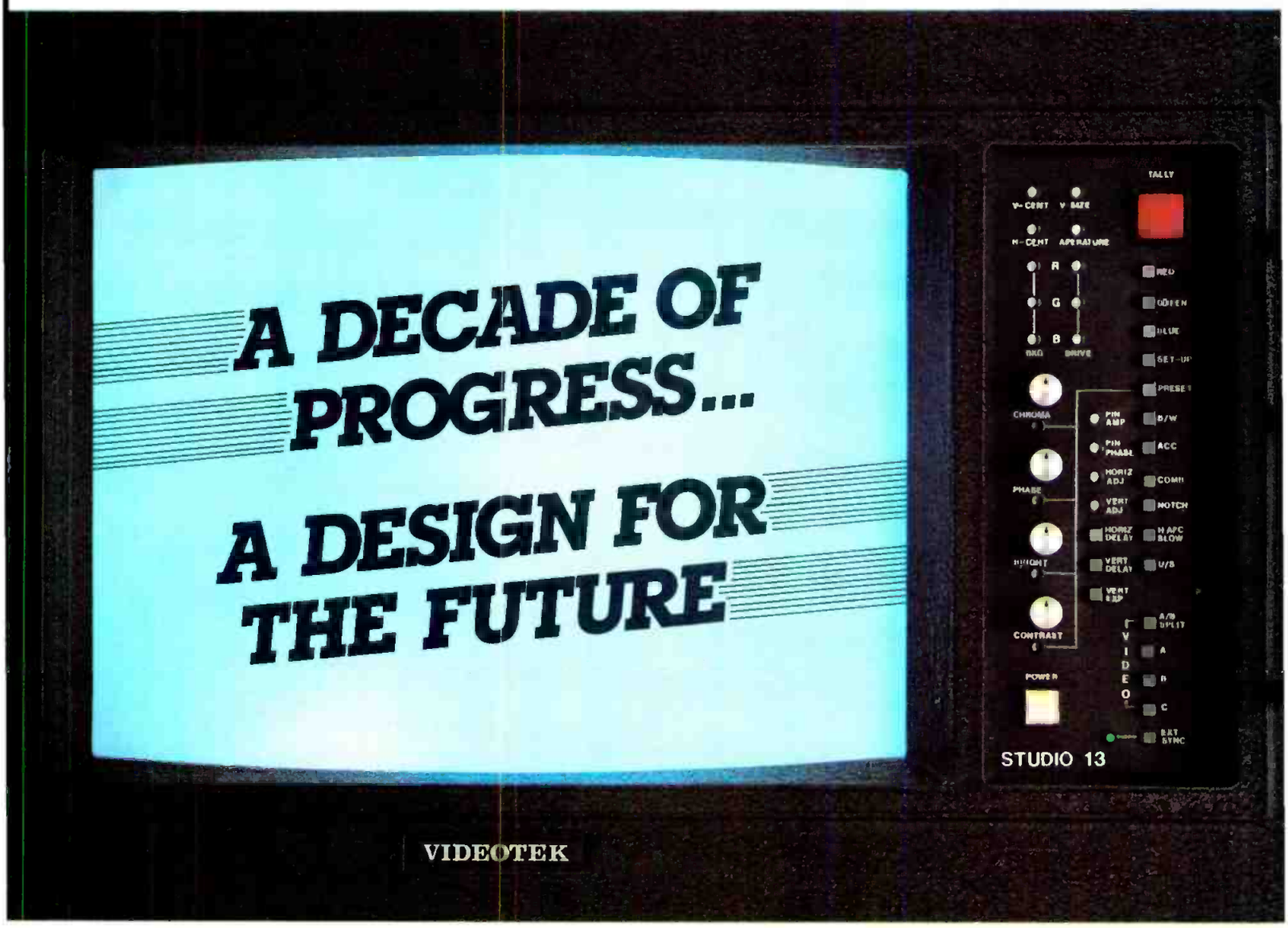


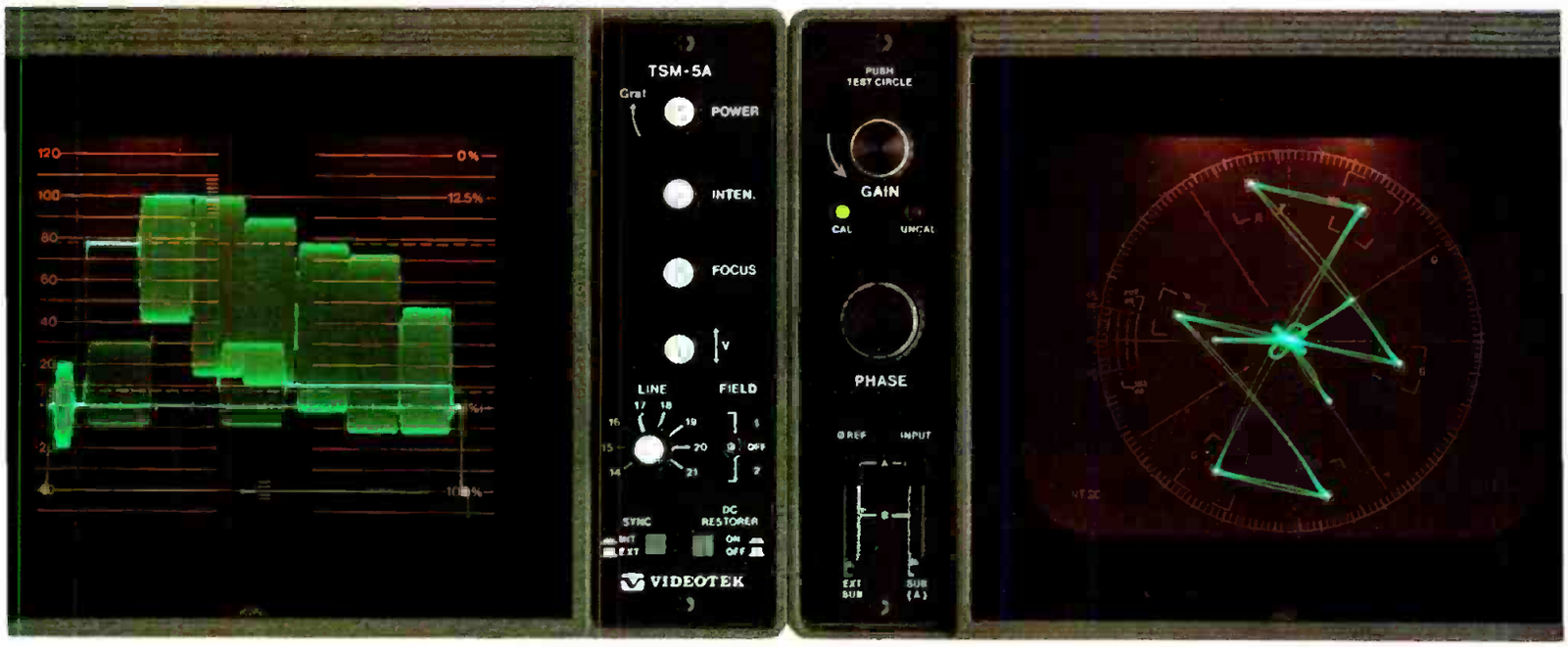
Videotek, in only 10 years, has emerged as an industry leader on the strength of quality products, competitive pricing, and an unprecedented record of delivery and customer service.

The Studio 13 is the latest example of this Progress by Design, incorporating more features and a higher level of quality than any color monitor in its class.

Line Select and 1H/2H Mode highlight the 1984 refinements to the ever-popular TSM-5A Waveform Monitor and VSM-5A Vectorscope.

As we enter our second decade, our commitment to offer the best products, prices, delivery, and service remains an uncompromised goal.

VIDEOTEK INC



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See Us at NAB Booth 1633

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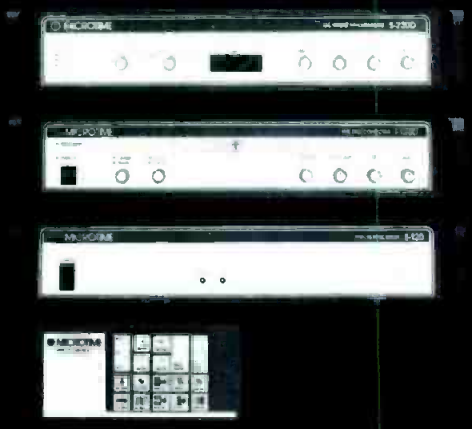
The new S-230D easily interfaces with new or existing Microtime T²E-120 A/B Roll Effects Systems to provide the ultimate in input signal flexibility and freeze effects capability.



The S-230D allows inputs such as in-house camera signals, external ENG, microwave, satellite, network and remote studio feeds, as well as ½" and ¾" heterodyne VTR formats with or *without* capstan servos. You also have the choice of operating in either standalone heterodyne *or* 3.58 MHz subcarrier feedback modes. And by using the S-230D on one or both channels of the E-120 A/B Roll Effects System, you get the additional "effect" of manual or automatic freeze.

Now there are three E-120 A/B Roll Effects configurations:

T²E-120. This established configuration consists of two T-120D TBCs capable of DYNAMIC TRACKING* operation with a SONY* BVU-820 U-MATIC* VTR.

TSE-120. This new configuration consists of:

☐ one T-120D TBC capable of DYNAMIC TRACKING* operation with a SONY* BVU-820 U-MATIC* VTR and

☐ one S-230D TBC/Synchronizer with freeze and auto mode switching.

S²E-120. This new configuration consists of two S-230D TBC/Synchronizers with freeze and auto mode switching for maximum flexibility in both channels.

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Flexibility is on a roll.

E-120 A/B Roll Effects System.

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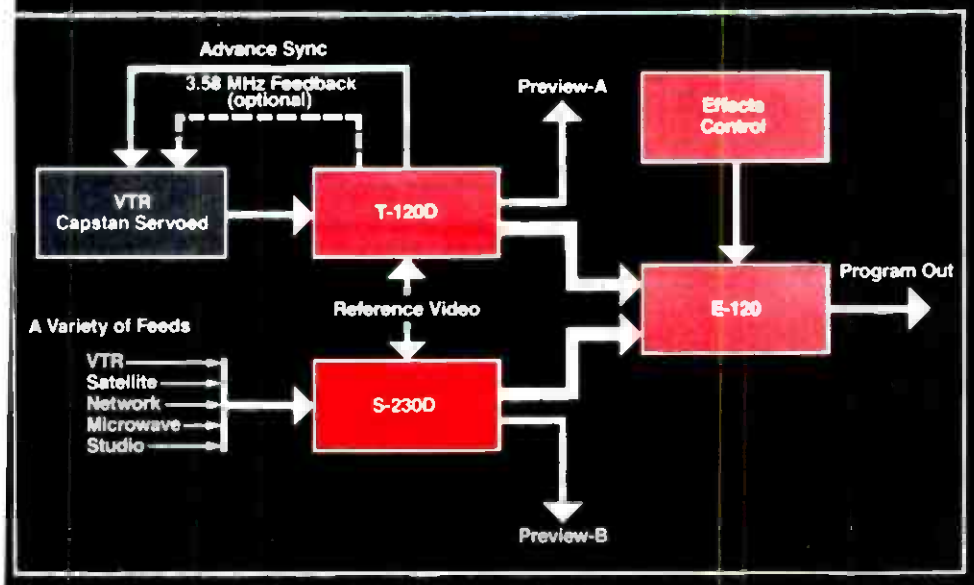
TSE-120 System
Typical A/B Roll Applications with Effects



DT* operation is possible with the T-120D with a single cable interface to the SONY* BVU-820 U-MATIC* VTR.

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from the systems for standalone operation.

Each E-120 System includes the E-120 A/B Roll Effects Processor and Effects Control with a 75′ cable. Each features an 8 bit 4x subcarrier design for high reliability and transparent performance and is controllable by VTR editor for preview and record. Each contains a RS-170A gen-lock sync generator to assure precise output timing. Each is made in the U.S.A., rigorously tested throughout the manufacturing process, and comes with a full one-year warranty on all parts and labor.

Microtime is on a roll. Contact us today. MICROTIME, INC., 1280 Blue Hills Ave., Bloomfield, CT 06002. (203) 242-4242. TWX 710-425-1165.

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Circle (121) on Reply Card

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ROH (1634)
Continued
Series 180: Audio routing switchers
Series 300: Intercom systems
Series 211: Audio distribution amplifiers
Series 200: Modular packaging system
Series 120: Audio distribution amplifiers
New products
See at booth
Circle (826) on Reply Card

R/Scan (1740)†
Established products
LPATS: Lighting detedim system
New products
See at booth
Circle (827) on Reply Card

RTNDA (1501)
Association
Professional association exclusively for broadcast journalists
Circle (828) on Reply Card

RTS Systems (1142)
Established products
Series 800: Microprocessor-assisted intercom master station
Series 4000: IFB system
Series 400: Pro audio amplifiers
HPM41 mixer: 4x1 mic/line mixer
TW Intercom system
New products
Series 17: Conference line intercom system for single-channel permanent or portable applications
System 2500: Amplifier system with 1x6 audio DA, 1x6 stereo DA, quad stereo buffer amp, quad line amp with VCAs and tone signal generator
Circle (829) on Reply Card
see ad on page 301

Radio Arts (418)†
Established products
Syndicated program, radio
New products
See at booth
Circle (830) on Reply Card

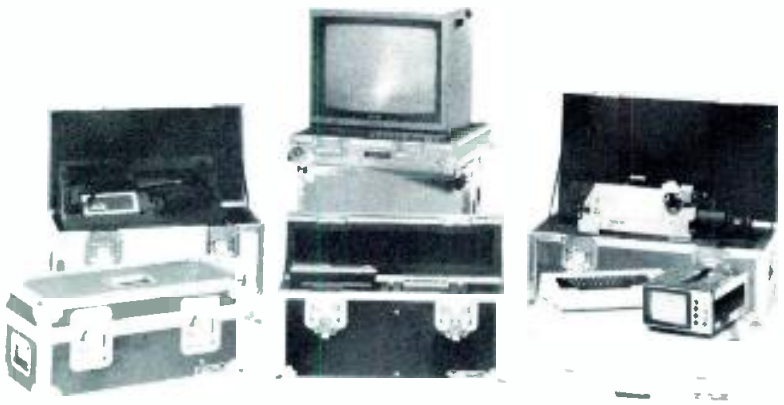
Radio Systems (213)
Established products
PA-1: Audio Metrics stereo phono preamp
DA-8/DA-16: Audio DAs
TM-1: Audio Metrics studio timer
TR-20: Phase II 20W post-sunset transmitter
PP-10: Pre-wire patch panel
New products
ESA-10: Audio Metrics broadcast console
TR-70: Phase II 70W post-sunset transmitter
Circle (831) on Reply Card
see ad on page 275

Radio-TV News Directors Association
See *RTNDA*

Ram Broadcast/Wheatstone (121)†
See at booth
Circle (832) on Reply Card

Ramko Research (415)
Established products
DC38-10S: 10-mixer, audio console
PhaseMaster: Record/play and play phase correcting stereo cart machines
RP-1S/P-1S: Primus stereo cart machines
P-3S/6M: 1x3 stereo or 1x6 mono audio DA
P-8S/16M: 1x8 stereo or 1x16 mono audio DA
P-VG1: Primus single-channel compressor with noise gate
P-93S: Lab standard turntable preamp
P-21/P-42MX: Mic/line amps, mixers
New products
P-4M: Primus 4-channel mixer with metering
P-4M Portable: Primus 4-channel mixer with intercom and slate cueing
P-5MX: 5-channel mic/line mixer with send receive
P-1612: Audio router, modular expandable system
P-2080: Primus modular 20x80 DA with provisions to mix other audio modules into the same frame
Circle (833) on Reply Card
see ad on page 166

RAMSA/Panasonic (437)
Established products
WR-130: Portable 8x2 mixer
WR-500: Remote 8x2 mixer for dc/ac operation
WR-8112/8118: 12 or 18x4x2x1 mixer for remote and recording applications
WR-8210A: 10x4 recording mixer →



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ANVIL® produces literally thousands of case designs for the audio/visual, television, and broadcast industries. Whether your professional needs call for a totally operational video system that is permanently installed in an ANVIL® CASE, or a simple transit case to insure against shipping damage, ANVIL® can meet the test. ANVIL® has been assuring safe transit for video producers, sound teams, and engineers for over 30 years.

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The machinery used to manufacture ANVIL® CASES is the finest in the travel case industry. Only the most advanced pneumatically operated tools are used. Precision foam slicing and sculpting is facilitated by high speed, accurate electronic cutting devices. The result is a case that stands up to the bumps and grinds of life on the road-so your delicate instruments don't have to.

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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.

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Telex: 533356

Circle (123) on Reply Card

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RAMSA (437)
Continued

WP-9120: Dual-channel 200W power amp
SP-10MKII/SP-15: Direct-drive phono turntables (Technics)
New products
WR-8616: Post-production and recording mixing console, 16x4x2x1

Circle (834) on Reply Card
see ads on pages 122, 123 and 223

Rank Cintel Ltd. (1219)
Established products
MK IIIC: Film-to-tape transfer telecine
Amigo: Software-based control system for Mk IIIC
FeRRIT: Separate magnetic sound follower for audio record/replay on 16mm, 17.5mm and 35mm magnetic film
New products
ADS 1: 16/35mm solid-state telecine for broadcasting from film, including dirt/scratch concealment, multiplexing of 3 dual-gauge transport mechanisms from one control unit, variable speed and negative/positive operation

Circle (835) on Reply Card

Reach (341)
Established products
Nationwide message/data distribution service, based on FM subcarrier transmissions
New products
See at booth

Circle (836) on Reply Card

Real World Technologies (1520)
Established products
V-01-/P-02: uniVUer analog VU or PPM bargraph keyed over video on picture monitor
Custom ballistic configurations of uniVUer, compatible with EBU standards
Broadcast facility/systems design and construction
Remote truck design/construction
New products
uniMonSter: uniVUer option for mono-stereo coherency evaluation
MonSter: Stand-alone mono-stereo coherency evaluator

Circle (837) on Reply Card
see ad on page 290

Recortec (1416)†
Established products
VTE-210: 2- and 1-inch combination video tape evaluator/cleaner
VTE-101: Low cost 1-inch videotape evaluator/cleaner
VTT-211: Replacement electronic videotape timer for Ampex 2-inch VTRs
VTT-212: Replacement electronic videotape timer for RCA TR70
VTT-221: Replacement electronic videotape timer for RCA TR60
RMOD: Automated reel servo modification for Ampex and RCA 2-inch VTRs
HBU: High band U-matic VTR
DTG-100: Low cost video date/time character generator
FRU-750: Fast rewinder for ¾-inch U-format cassettes
VCE-500: Measures dropouts and tape quality on ½-inch VTRs tape
New products
See at booth

Circle (838) on Reply Card

Rees Associates (1727)†
Established services
Consultants specializing in planning, architectural design and engineering services. Facilities renovation and LPTV packages are specialties
New services
See at booth

Circle (839) on Reply Card

Register Data (128)†
Established products
RDS-III-HD: Broadcast computer system
RDS-5000: Hard disc computer system
RDS-8000: Business system
New products
See at booth

Circle (840) on Reply Card

Research Technology (1626)†
Established products
TV-120: The total film care system
Data-Film: Computerized timing/reporting system
Cinescan: High-speed 16mm film viewer
¾-inch videocassette evaluator/cleaner
10512: CineScan high speed 16mm film viewer/previewer
TV-2000: Complete film editing system
Data-Film 820: Computerized information reporting system
VT3100: Professional videotape evaluator/cleaner for U-matic
Retec-410: Self drive liquid film cleaner/conditioner
CF series film cleaners
Film storage cans
New products
See at booth

Circle (841) on Reply Card
see ad on page 52

Restoration/Sprague Magnetics (705)
Established products
Replacement tape heads for reel-to-reel, cart, duplicator, film and R/V recorders
Refurbishment of all magnetic tape heads
Alignment tapes
Recorder care products
New products
Replacement heads for MCI ¼-inch and ½-inch 2- to 24-track recorders
Replacement heads for Mincom M-79 recorder
Replacement heads for high-speed duplicators
Replacement audio for video heads

Circle (842) on Reply Card

Richardson Electronics (212)
Established products
Camera and transmitting tubes
RF power amplifiers
RF power transistors
New products
See at booth

Circle (843) on Reply Card

Riviera Broadcast (1784)†
Established products
Services: equipment leasing
New products
See at booth

Circle (844) on Reply Card

Rockwell Int'l. (1767)†
Established products
Microwave video radio: STL for TV
MVR: Systems for common carrier, CARS and government
New products
See at booth

Circle (845) on Reply Card

Rohde & Schwarz (1203)
Established products
UPSF2: Video noise meter
EKF2D: Demodulator
EKF2K: Relay receiver
DZF: TV data distortion meter
LFM2: Group delay measuring set
MUF2: TV transcope
SPF2: Digital video signal generator
SBTF/SBUF: Test transmitter
UPF: Auto video analyzer
New products
See at booth

Circle (846) on Reply Card

ROHN (1605B)
Established products
Rohn towers
Equipment shelters
Antenna supports for cable and STV
Tower obstruction lighting
New products
See at booth

Circle (847) on Reply Card

Rosco Laboratories (1235)
Established products
Color and diffusion filters for lighting
Gobo patterns
Specialized paints and scenic materials for TV
New products
Precision chroma-key and Ultimatte Paints for coloring muslin for video requirements

Circle (848) on Reply Card

Roscor (1181)†
Established products
Rental equipment
Post-production equipment
Engineering/sales
Elite Fleet vehicles
New products
See at booth

Circle (849) on Reply Card

Ross American Logic (1332)†
See at booth

Circle (850) on Reply Card

Ross Video (1110)
Established products
RVS 524: Video production switcher
RVS 508: Video production switcher
New products
Memory system for storing all crosspoint and analog data about a multilevel →

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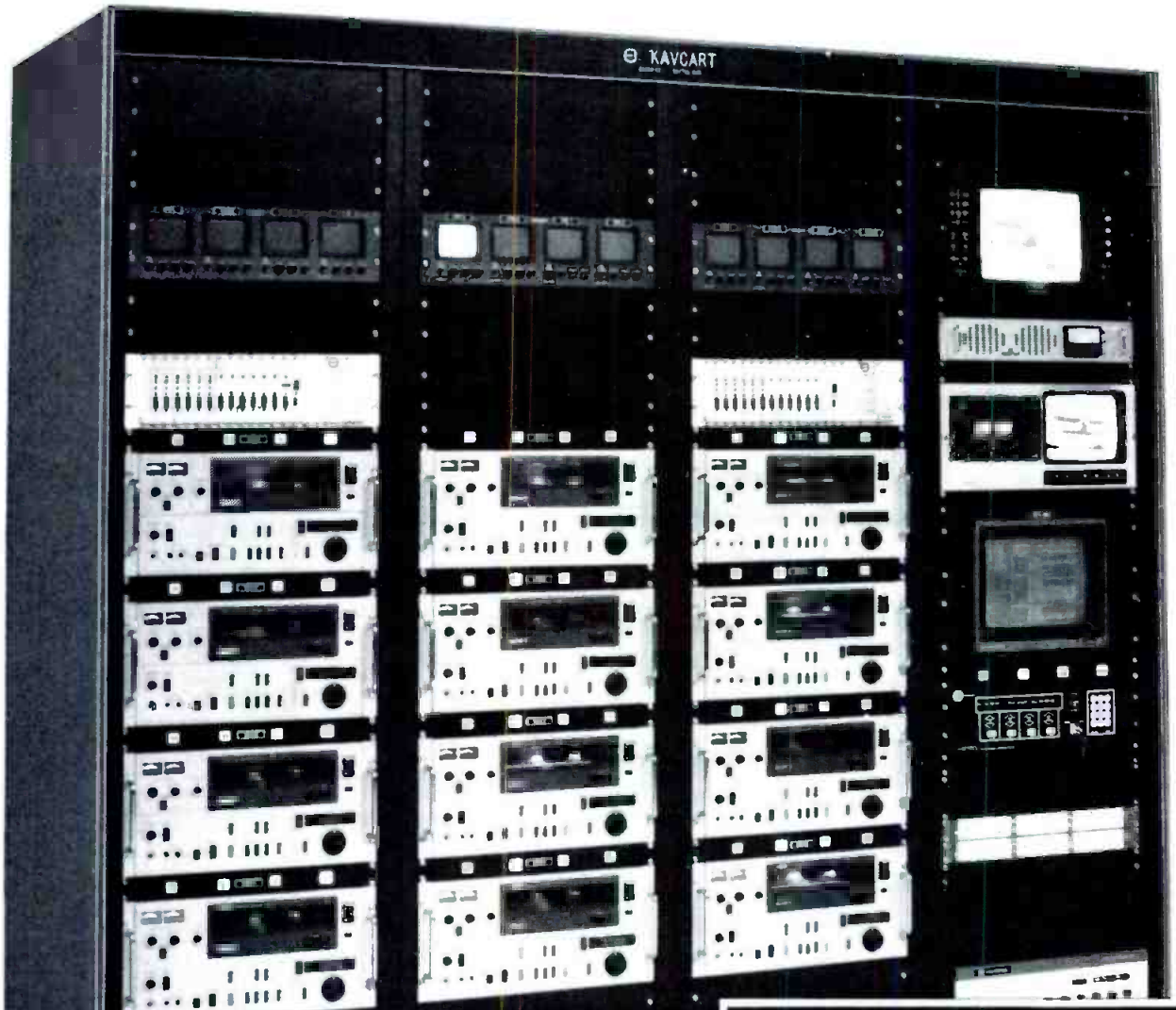
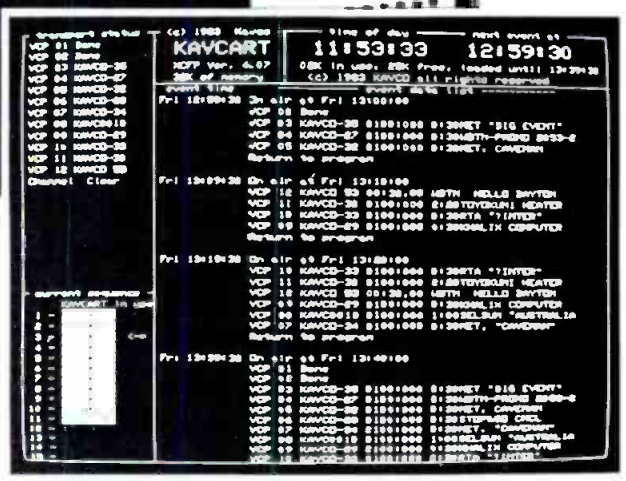


KAVCART

THE Broadcast Video Cart System



The heart of KAVCART is our own programmable microcontroller, field proven over five years. KAVCO's "Smart Frame" modules provide machine control interfacing, vertical interval switching, data sensing, etc. These products are designed, manufactured and software-programmed in our own facilities.

All KAVCART systems include a separate recording console including cassette label printer, full monitoring and a Sony VO-5850 master recorder.

FEATURES

- Simple operator entries
- Random access
- Manual or realtime start
- Will sequence three-second spots
- Vertical interval switching
- Automatic cue-up and re-cue
- Runs program-length tapes with automatic break insertions
- Runs back-up spots concurrently
- Uses Sony Type V U-Matic VCR's, the industry standard
- Includes simple-to-use separate tape identification preparation console
- Modular . . . plug-in boards . . . expandable
- Includes printer with complete program log

SONY type V

KAVCO INCORPORATED

3931 Image Drive, Dayton, Ohio 45414 • 800-221-1879
(800-221-0449 in Ohio)

See us at NAB Booth 1509B

Circle (124) on Reply Card

KAVCO

KAVCO • KAVCO • KAVCO •

Ross Video (1110)
Continued
effects unit with serial interface
Circle (851) on Reply Card
see ad on page 89

John B. Rudy (1776)†
Established products
Distributor of audio and video wiring/cabling, microphones, connectors and custom cables.
New products
See at booth
Circle (852) on Reply Card

Rupert Neve
See Neve

Russco Electronics (413)†
Established products
Cue-Master: 3-speed broadcast turntable
Studio Pro: Deluxe 2-speed broadcast turntable
Mark V: Electronic speed control—deluxe 2-speed turntable
RTA-12: Broadcast tonearm
Phono-Mate Series: Phono preamps
Fidelity-Pro Series: Phono preamps
505 Series: Audio consoles
RTQ-7: Turntable
New products
See at booth
Circle (853) on Reply Card

SMPTE (*)
Established products
Test materials
Publications
Technical standards
New products
See at booth
Circle (854) on Reply Card

SWR (1644)†
Established products
Coaxial transmission line
Transmission line components
New products
See at booth
Circle (855) on Reply Card

Sachtler (1648)
Established products
Panorama 7+7: Lightweight fluid head for ENG
Video 20: Fluid head
Video 25: Medium-sized fluid head for ENG and field production
Video 30: Medium-sized fluid head for field production and studio production with dynamic counterbalancing
New products
Video 14: Lightweight fluid head pedestal optimized for the single tube camera or non-broadcast pro-camera with all typical features
Circle (856) on Reply Card
see ad on page 101

Saki Magnetics (416)
Established products
Long-life hot-pressed glass-bonded ferrite heads for Ampex, Mincom, Otari, Revox, Scully, Studer and Technics
New products
Long-life metal cartridge heads, constructed of long-wearing core materials
Circle (857) on Reply Card

Sansui Electronics (130)†
Established products
Receivers: AM stereo
PC-X1: Digital audio processor
B-2301: Audio power amplifier
New products
See at booth
Circle (858) on Reply Card

Schneider (1403)
Established products
TV44: 14x9mm zoom lens with 2x extender for standard ⅔-inch ENG/EFP cameras and VRC systems
TV54: 14x6.5mm ENG/EFP zoom lens for ½-inch cameras
TV39: 30x26mm zoom lens system for ½-inch and ⅔-inch ENG/EFP cameras
New products
TV53/63: 15X studio lens with integral diascope and 2X extender for auto-setup cameras with 1-inch and 1¼-inch formats
Circle (859) on Reply Card
see ad on page 274

Scientific-Atlanta (1017)
Established products
Model 7500: Video receiver
Model 7620: Receiver protection switch
Model 7630A: LNA protection switch
Model 7550: Video exciter →

What is this man doing?

...he is readjusting his audio processing!

You no longer need to compromise your station's audio quality. Format changes, audience profile variations and cut-to-cut music inconsistencies present problems that no ordinary processor can hope to deal with. That's why Inovonics developed the *Programmable* Processor.

Our Model 250 behaves just like five independent audio processing chains. The AGC action, compression, equalization and overall limiting of each of these chains can be custom-tailored to any specific audio feed or to any station format. This gives precisely the proper processing to make any program source or format sound its very best. No compromise!

Controlled by station automation, a time clock, or simple manual selection, the 250 provides processing which can change with your station throughout the broadcast day. What's more, our RS-232 Interface Option puts the 250 under continuous computer control with almost endless processing possibilities.

The 250 is a fully L/R correllated stereo unit with slow, gain-riding AGC, a five band compressor, five band equalizer and either a split-spectrum peak limiter for FM or a true matrix, phase-following AM peak limiter. Each of the five preset groups is remotely selected by simple contact closures to ground.

Is the Inovonics 250 ahead of its time, or aren't *you* keeping up?

Inovonics 250 *audio processor*

INOVONICS, INC.
503-B Vandell Way, Campbell, CA 95008
(408) 374-8300

Circle (125) on Reply Card

www.americanradiohistory.com

The best equalizer is no equalizer.

It's Belden fiber optic cable.

Now a video signal can go two miles on a Belden optical cable with 60dB SNR and no hint of high frequency roll-off. That means a cleaner picture without equalizers, and less maintenance than alternative transmission systems—coax or microwave.

For tower installations, Belden's high-strength, all-dielectric optical cable design doesn't have the problems generally associated with coax, such as ground loops, lightning and other E.M.I. problems. Plus, it's rated for full performance from −40°C to +60°C.

Belden optical fiber cable is also thinner and up to 30% lighter than conventional cable. That makes it easier to install on transmission towers, or through underground ducts. A recent installation of Belden cable on a 1500 ft. vertical tower was accomplished in less than one day.

For remote applications, Belden optical cable is much easier to carry around the golf course, or the metropolitan sports arena. Its toughness has been proven in rapid deployment cables designed by Belden for military applications in desert terrain.

Put Belden optical fiber cables and experience to work for you. They'll put you ahead with cleaner signals, better reliability and total system economy. For information on our fiber optic line and application reports or system design guide, contact your local Belden distributor or write: Belden, Fiber Optics, 2000 S. Batavia Ave., Geneva, IL 60134. Phone: 312-232-8900.

Circle (126) on Reply Card

COOPER INDUSTRIES

BELDEN

FO-3-2A

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Scientific-Atlanta (1017)
Continued
Model 7640: Uplink protection switch
Model 7600: Remote control system
Model 8010C: 7m antenna
Model 8840A: Antenna control system
Model 8251: 11m transportable earth station
Satellite TV products
TBC and frame synchronizers
New products
Model 7555: Ku-Band video exciter
Model 8252: Transportable TV earth station
Model 7622: RF matrix switch
Circle (860) on Reply Card

Scribe Recorders (214)
New products
Scribe NewsCorder: Newsgathering machine includes custom-designed cassette tape recorder for audio news operation in the field with talk-over capability
Circle (861) on Reply Card

Sennheiser Electronic (1137)
Established products
Professional microphones and headphones
New products
New line of broadcast microphones, including hand-held and body pack units
HME41: Headset/mic combo using lightweight headphone and Sennheiser MKE-2 ultra-miniature mic
Circle (862) on Reply Card
see ad on page 236

Sescom (1616)
Established products
ADA-1/ADA-2: Audio DAs
MB-1: Newsbridge
IC-100/IC-300: Intercom systems
MLD-1/2/3: Mic-line drivers
Mic splitters
Field mixers
Various transformers and audio modules
New products
SAT-1: Audio levelers for satellite receivers
MLD-5: 2-channel mic/line driver
TST-1: Field tester
Circle (863) on Reply Card

Sharp Electronics (1102)
Established products
XC-900D: Diode-gun plumbicon TV camera
XC-800: 3-tube Saticon II camera
XC-803TX: Triax camera system
New products
XM-1300: High resolution 13-inch broadcast color monitor
Circle (864) on Reply Card

Shintron (1417)
Established products
375: Super switcher
374: Super 80 switcher
372: Special effects generator
505: Character generator
641: SMPTE time code generator
644: SMPTE time code reader
350: Encoded chroma-keyer
316: Audio distribution amplifier
336: Video distribution amplifier
515: Character generator
508: Subtitler
Series: Modular distribution amplifiers
390: YIQ switcher
646: Time code reader
647: Time code generator
200 Series: Distribution amplifiers
400: Computer/NTSC interface
New products
See at booth
Circle (865) on Reply Card
see ad on page 70

Shively Labs (623)
Established products
6814: Super power FM CP antenna
6810: High power FM CP antenna
6813: Medium power FM CP antenna
6811: Low power FM CP antenna
6811NP: Low power, non-pressurized CP FM antenna
6010: Broadband CP FM panel antenna
CMM-03: 1⅝-inch 4-port rotary switch
UTV-01: Broadband UHF panel antenna
Rigid coax line
New products
2120: AM/UHF and AM/VHF isolation couplers
4420: Reflectometer display and protection system
6813NP: Medium power non-pressurized CP FM antenna
Circle (866) on Reply Card
see ad on page 323

Shook Electronics (1310)
Established products
14-22/E: Mobile TV production system with equipment from Magnetic Media
45-60: Full feature network production trailer
18-27: Full feature mobile TV production system with equipment from Magnetic Media
New products
See at booth
Circle (867) on Reply Card

Shure Brothers (1401A)
Established products
M267: Microphone mixer
SM632: Omnidirectional dynamic mic
SM82: Line-level condenser mic
SM57: Unidirectional dynamic mic
New products
SM83-CN: Lavalier mic
FP31: Compact microphone mixer for ENG/EFP applications
Circle (1496) on Reply Card
see ad on page 61

Sigma Electronics (1333)
Established products
CSG-365A: Color sync generator
BBG-144: System timing module
System 500: Modular DA equipment
Series 100: Self-contained DA equipment
New products
GLC-100: Gen-locking computer, character generator and graphics system
VPA-380: Video processing amplifier
Circle (868) on Reply Card

Singer Broadcast (101A)
Established products
1kW AM transmitter
FM exciter with phase-locked loop synthesizer, broadband RF amplifier, 30W output
25kW FM transmitter
3kW FM transmitter
5kW AM transmitter
ST30F: Stereo generator
SC30F: SCA generator
New products
See at booth
Circle (869) on Reply Card

Skotel (1126)
Established products
PTC-100: Portable time code reader/generator with jam/slave and time of day
New products
TCG-80N: Time code generator with jam/slave on time and/or user data
TCR-80: Time code reader with dub output
DM-1000: Digital metronome with 0.001 frames/beat setting for film and video
Circle (1495) on Reply Card

Warren R. Smith (1717)†
Established products
Leases: Telecine and snorkel
Stands: Animation
Positioners: Slide/title
New products
See at booth
Circle (870) on Reply Card

Society of Motion Picture & Television Engineers
See SMPTE

Solid State Logic (1723)
Established products
SL6000E Series: Live and post-production audio console
SL4000E Series: Multitrack recording and OB console
Primary studio computer-mixing automation and audio edit controller
Total Recall: Retains details of console setups
Events Controller: 16 multirepeatable contact closures activated by SMPTE protocol
New products
SL688V: Mix and machine matrix for SL6000E systems
Programmable equalizer with time code control of 3-band parametric EQ
Synchronizer controller for multiple machine control via SSL computer
Circle (871) on Reply Card
see ads on pages 192 and 193

H.A. Solutec (1517)†
Established products
SOL 6800: Automated broadcasting system
SOL 8200: Co-channel filter
New products
See at booth
Circle (872) on Reply Card

Sono-Mag (707)
Established products
MSP: Automation programmer →

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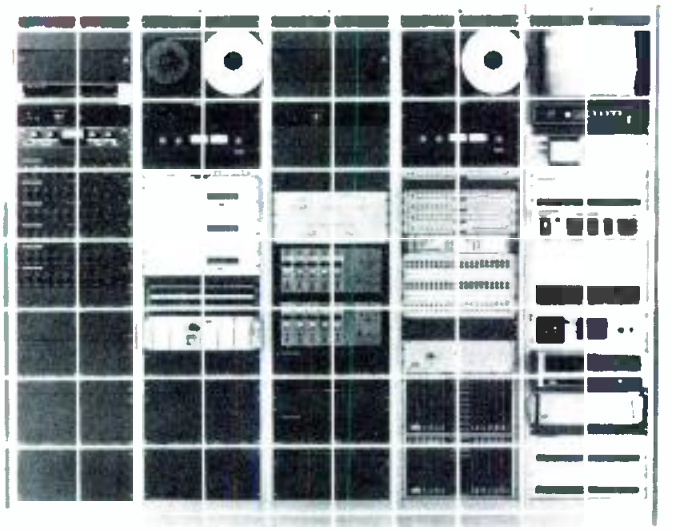
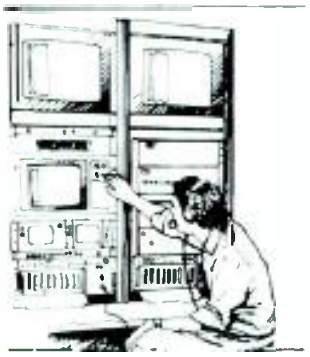
To Totally Appreciate A Video, Audio/Visual or Teleconferencing Communications System Created By Avtec, You Have To Take It Apart.



Whether it's a conference room, a training center, a video studio or an audio/visual center, to fully appreciate the thought and care that went into a total communications system created by Avtec, you have to take it apart. And when you do, you'll begin to appreciate why Avtec has been acknowledged as a worldwide leader in total communications systems.



Design

Avtec designers begin a system at the very beginning. They will work with you, your architect and/or your communications consultant during initial planning. They'll study your requirements and provide all of those little details that ultimately lead to a system's successful operation.

Engineering

Avtec's engineering department is comprised of dedicated, talented professionals. Together, they control every facet of every system designed by Avtec. They'll consider the designer's concepts and translate those concepts into the technology a system specifically calls for.

Procurement

Avtec considers every communications system individually. We realize each has a specific purpose. We keep in mind the client's specific requirements, so we select and procure all system components on the basis of the best available technology and technical compatability.

Fabrication

Avtec procured equipment is tested individually as well as a total system and retested to make certain it meets our client's requirements and Avtec's demanding standards. Enclosures, consoles and alike are fabricated and finished and the system's components are assembled and shipped to the installation site.

Once the system is on site, Avtec personnel test every function. When we're absolutely certain the system is performing as it should, only then will we approve it for operation.

Documentation And Training

We don't consider our job to be over until our clients fully understand how to operate their systems. So we document every piece of hardware and software. Avtec engineers will remain at the installation as long as necessary to train all client personnel and we'll return to the site to repeat training sessions on an as needed basis.

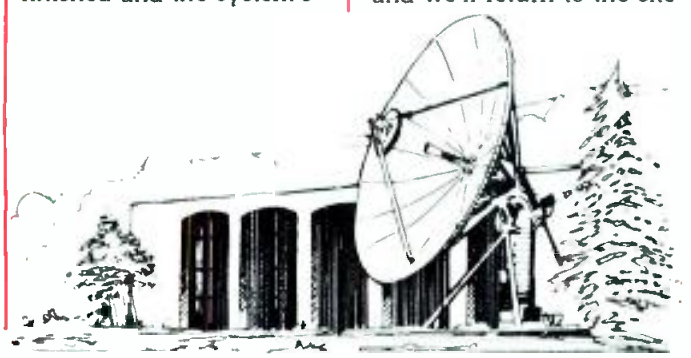
Maintenance

If you appreciate the fact that during the life of any communications system problems sometimes arise, you'll appreciate Avtec service. Avtec's service group is available virtually anytime, anywhere in the world to solve problems quickly, efficiently and professionally.

AVTEC In Total

Each individual part of any Avtec communications system can be considered a specialty. The fact that Avtec can and does have proven expertise in each of these specialties, has established Avtec as a premier company in video, audio/visual and teleconferencing communications systems.

So if you are considering creating parts of a communications system or a total system, consider Avtec—the total company for total communications systems.



avtec INDUSTRIES, INC.

5 Audrey Place, Fairfield, NJ 07006
(201) 882-9460 • Telex: 134421 AVTEC FFLD
Regional Offices: Orlando, Florida; Riyadh, Kingdom of Saudi Arabia

Circle (127) on Reply Card

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Sono-Mag (707)
Continued
New products
ESP-2: Automation programmer
Circle (873) on Reply Card

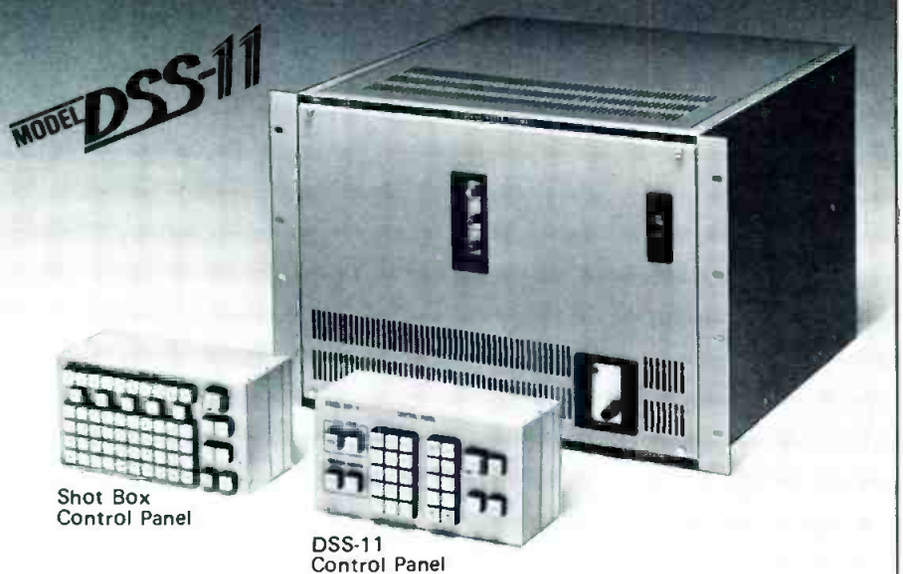
Sony Corporation (1200)
(Sony Video Communications)
(Sony Broadcast Products)
Established products
VO-5800 Series: U-matic VCRs
RM-440: Video editing controller
DXCM3: 3-tube MF Saticon camera
SEG-2000A: Special effects generator
WEX, CRK: Chroma-keyer
LPP-1000A: Videodisc players, digitizers and graphics tablet
PVM/CVM/KX/VPH: Color monitors and TV projectors
SL/SLO Series: Betamax players and recorders
BVH-2500: 1-inch C VTR with animation capabilities
Digital video multiprocessing equipment
ENG/EFP cameras
Betacam VRC with playback and editing equipment
Computerized editing controllers
TBCs
Time code reader/generators
New products
DXC1820: SMF Trinicon color camera with 10:1 zoom lens, 1.5-inch viewfinder, auto white balance and preset ABO system, featuring versatile interfacing
SMC-70G: Microcomputer titler, featuring gen-lock, sync mode select, loop-through BNC connectors, NTSC output, RGB superimpose and 3.5-inch micro floppy disk memory
IF-500: Intelligent remote control interface box, allowing interconnection of institutional and broadcast equipment
Beta-format multicassette system
HDTV video production system
Circle (874) on Reply Card
see ads on pages 44, 45, 73, 74, 75, 76 and 77

Sony Professional Audio (605,1200)
Established products
DASH: Digital audio/video post production system
Portable and ENG/EFP mixers
UHF wireless mic systems
Wired mics
Broadcast audio production system
Audio lay-back recorder
Audio consoles
Audiotape recorders
New products
WRT/WRR-200: VHF wireless system with frequency synthesis
AVS/AVP-500: Syncmaster SMPTE/EBU synchronizer for audio, video and film special effects
JH800/Opt23: Video editor interface allowing control of the audio console
CDP/CDS-300: 2-player compact disc control system for radio broadcasting, allowing precise index search and programming capability
Circle (875) on Reply Card

Soper Sound Music Library (1620B)
Established products
Music library
MusicSelector software for Apple II
New products
Series IX: 2-album series of nine themes and 54 cuts in contemporary upbeat tempo
Series X: 2-album series of 10 themes and 59 cuts, covering various orchestrations of a medium tempo
Series XI: 3-album series including 12 themes and 60 cuts of electronically synthesized music beds, all up-tempo, progressive in nature and New Wave in style
MusicSelect software: For Apple II, II+ and IIe computer for simplified location of selections in Soper library
Circle (876) on Reply Card

Soundcraft Electronics (219)
Established products
200: 8-, 16- and 24-channel stereo mixing consoles
400B: 16- or 24-channel mixing console
1600: Recording mixer
SCM 760: Multichannel audiotape recorder
New products
SAC-2: Stereo on-air broadcast console
Series 20: 2-channel master recorder
Circle (877) on Reply Card →

The Only Digital Still Store for Less than $40,000



The DSS-11 is the world's only digital still store with the quality and resolution required for broadcasting applications priced under $40,000. Although the DSS-11's compact modular design is ideal for OB vans, an on-board Winchester disk drive provides 160 megabytes of storage for up to 1,000 fields. It can also be simultaneously interfaced with up to seven additional disk drives. Superb stills reproduction is guaranteed by the CC-SPF system. And the fast access time of 0.35 sec even for frames makes the DSS-11 perfect for either studio or OB applications. Call NTI America for a free demonstration. The DSS-11: the most cost-effective digital still storage on the market.

NTIA
NTI America, Inc.
1680 North Vine Street, Los Angeles, California 90028
® Phone: (213) 462-8945 Telex: 215468

SEE US AT NAB BOOTH #1014D

Circle (128) on Reply Card

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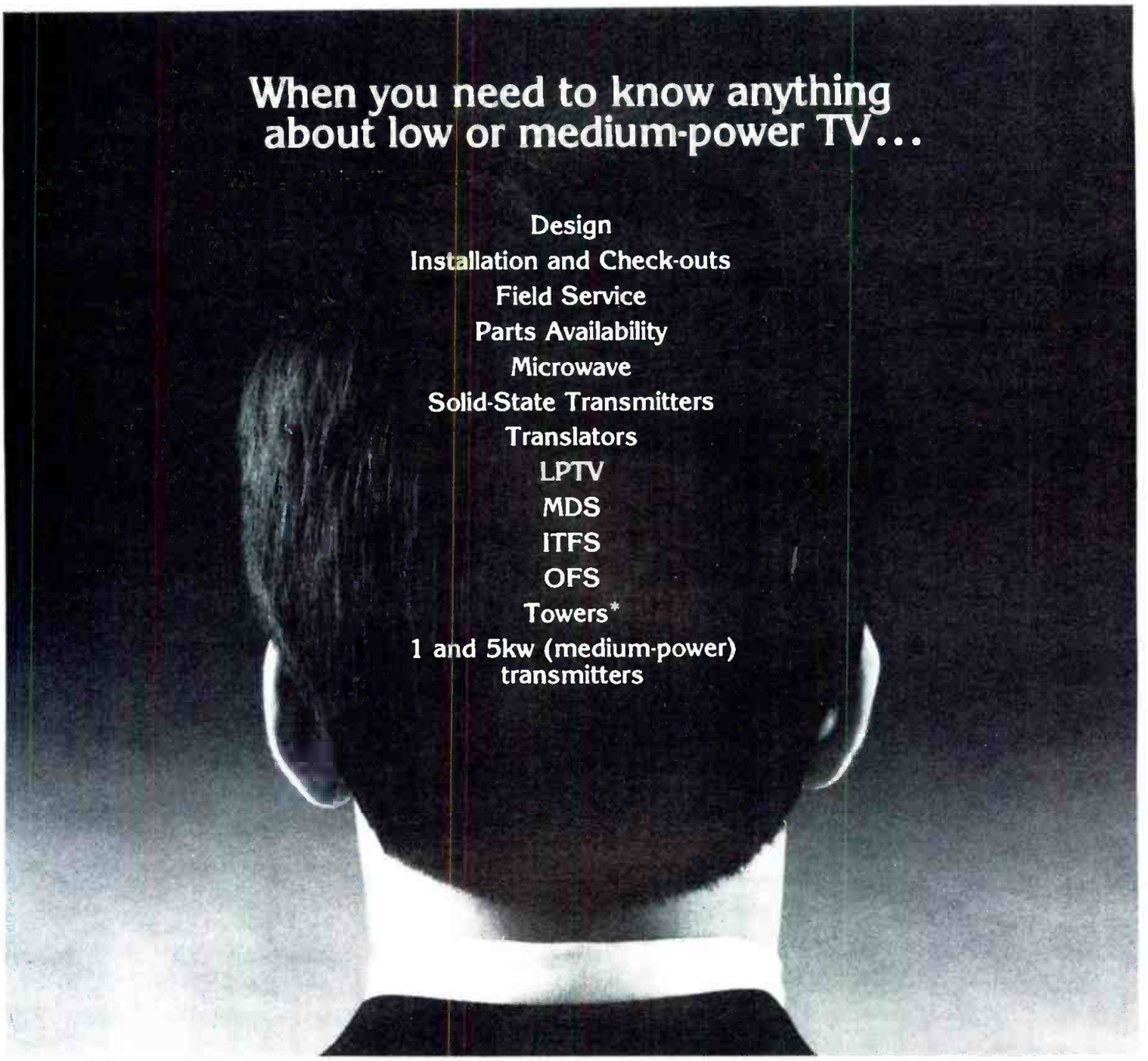

EMCEE has been accumulating knowledge and experience for over two decades. Along the way, we've recorded a number of singular accomplishments. Like putting the first LPTV station on the air in 1981. And being chosen over all others for the Salt Lake City multi-channel experiment in MDS in 1982.
At the same time, we've earned a reputation for quick response to any customer need.

You need to know us.

Try us. All it takes is a toll-free phone call to 1-800-233-6193 (in Pennsylvania, call 717-443-9575). If it has to do with low or medium-power TV, EMCEE has already done it. And we'll be happy to put our unparalleled knowledge and experience to work for you.

Visit our booth, #1621 at NAB convention.

*Through Del's Tower Service, a wholly-owned subsidiary

EMCEE®

EMCEE BROADCAST PRODUCTS a division of ELECTRONICS, MISSILES & COMMUNICATIONS, INC.
White Haven, PA 18661 717-443-9575 • 800-233-6193 • TWX: 510-655-7088

Circle (129) on Reply Card

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Sound Ideas (1620C)
Established products
Sound Effects library with more than 3000 stereo effects and more than 30 hours of recorded sounds
New products
See at booth
Circle (878) on Reply Card

Soundolier (1704)†
See at booth
Circle (879) on Reply Card

Sound Technology (500)
Established products
1510A: Tape recorder/audio test system
1710A: Distortion analyzer
1020A: AM/FM stereo generator
New products
170: Precision audio filter set
Circle (880) on Reply Card
see ad on page 188

Spectrum Planning (510)
Established products
Engineering services
New products
See at booth
Circle (881) on Reply Card

Spencer Broadcast (406)
Established products
Distributor for Howe Audio 7512 console and Phase Chaser, Audio-Path Associates audio power amplifiers
EFI electrical filters
New products
DA-1: Digital audio recorder
Circle (882) on Reply Card

Stage Lighting (1128)†
Established products
Lightning products: Lycian line
New products
See at booth
Circle (883) on Reply Card

Stainless (1315)
Established products
Towers for FM and TV broadcast to 2000 feet
AM towers for single and array applications
Microwave towers for stringent deflection specs and environmental conditions
New products
VERDA lightning deterrent unit for protection of any structure from damage
Circle (884) on Reply Card
see ad on page 289

Stanton Magnetics (102)
Established products
Standard phono cartridges, plug-in cartridges and replacement styli
Stereo headphones, announcer earphones
Phono preamps
Equalizers
Record card products
New products
Stereowafer 80: Open audio design with samarium cobalt driver
Stereowafer 45: Lightweight headphone
Dynaphase 60A: Open audio headphone with samarium cobalt high-velocity drivers
SP-98: Headphone amp for signals delivered from low impedance moving magnet cartridges
ARC-5: Antistatic carbon brush employs aerospace quality carbon fiber to clean records
Circle (885) on Reply Card

Stantron (1123)
Established products
VCRK6331: Mobile VTR/VCR racks
VCAS5020: Sloping front consoles
VCAS5025: Wedge organ-style console
VCDR21/31: ½- and ¾-inch VCR racks
VCMB9000: VTR monitor bridge consoles
VCKD70-2: Knock down vertical cabinets
VC800-L: Editing consoles
VCSD4267-MB: Sloping desk with monitor bridge
VCAS70-1: Vertical cabinet assemblies
New products
See at booth
Circle (886) on Reply Card

Steenbeck (1424)
Established products
ST1B: Film-to-video transfer unit with counter loop programming and interlock
New products
ST941V: Video-sound editing table, contains U-matic videocassette machine mechanically locked with two or three 16mm or 17.5/35mm magnetic film transports and time code accessories
Circle (887) on Reply Card

Storeel (1008)
Established products
Setup trucks
Storage racks for film and tape containers
New products
See at booth
Circle (888) on Reply Card →

Circle (321) on Reply Card

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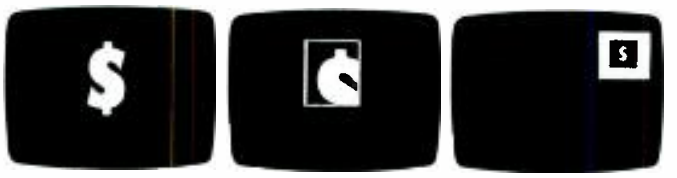
The Squeezer

Precision Echo Presents The Video Compression System With One Feature All Others Lack: Affordability.

Everyone today is facing the budget squeeze one way or another. Networks, affiliates and independents. Cable companies. Production and post production houses. One curious thing about budget squeezes is that they have a way of making equipment purchase decisions both easier and harder. Easier when it's clear that a particular item costs too much for the times. But harder when you are looking at equipment you know you need, but can't find the bucks for.

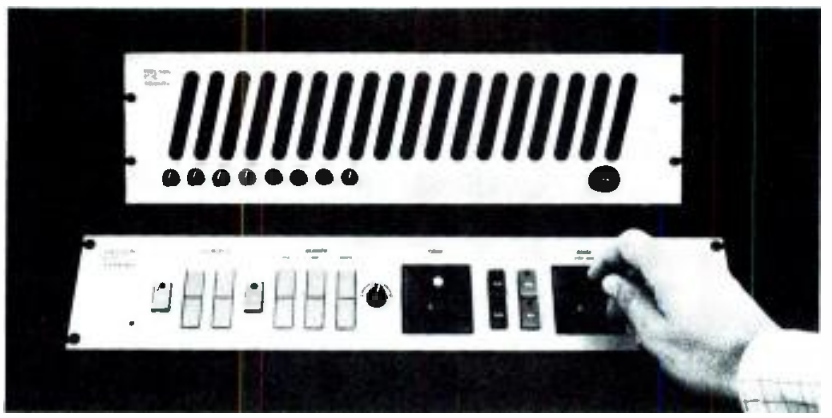


The Squeezer: Meeting Your Needs With A Unique Set of Special Effects Features.

The Squeezer, from Precision Echo, is a programmable video compression and positioning system that compresses an image down to four selectable sizes, places that image anywhere within the screen on command, crops any part of it to any size, and puts a variable-sized border of any color around it on request. It can even flip the image horizontally or freeze the action. Exclusive dual joy stick controls make image manipulation simple. And the utility of its design makes The Squeezer a versatile tool whether rack mounted in a production facility or used in mobile applications.

The Squeezer: An Affordable Alternative.

There's very little that you'll find on The Squeezer that you couldn't find on an ADDA, Vital, or a Quantel system. Except the price tag. Those other systems cost anywhere from $40,000 to $200,000. The Squeezer costs under $20,000. For broadcast programming, news and sports production, cable TV, educational and industrial applications, nothing comes close to the cost efficiency of The Squeezer.



The Squeezer from Precision Echo. High on quality and cost efficiency.

PRECISION ECHO

A Name Worth Repeating

3105 Patrick Henry Drive
Santa Clara, CA 95054 (408) 988-0516, TWX: 910/338-2328

Circle (130) on Reply Card

www.americanradiohistory.com

athena
4500
"The" cost-effective
film-to-tape transport

See us
at NAB,
booth 1602

- Phase-locks to NTSC, PAL or SECAM
- Constant T-V pull-down time at all frame rates.
- 1-2-4-6-8-12-24 FPS stop and single frame
- Capable of computer or programmable control
- Two-year warranty
- Modular design

For more information contact:
L-W INTERNATIONAL
6416 Variel Ave.
Woodland Hills,
California 91367 U.S.A.
Telephone: (818) 348-8614

Circle (131) on Reply Card

MX-84
BROADCAST
REMOTE
MIXER

- 8X4 Portable Mixer
- Strictly Professional Specs.
- IFB for Studio Communications
- Headphone Monitor Feeds for Talent and Producer
- AC/Battery Automatic Silent Switchover
- Built-In Charger
- Expandable Intercom System

RCI ENGINEERED AUDIO SYSTEMS
8550 Second Avenue
Silver Spring, MD 20910
(301) 587-1800

Circle (132) on Reply Card

Strand Century (1418)
Established products
Light Palette: TV lighting control system
MiniLight Palette: Lighting control system
Mantrix Memory
Mantrix 25
CD80: Portable dimmer packs
Ianiro portable lighting kits
Ianiro studio lighting fixtures
Ianiro remote and HMI lighting equipment
New products
Solid-state ballast for 575W and 1.2kW
PARLITE: HMI PAR fixture, customer selectable between 575W and 1.2kW
Circle (889) on Reply Card

Studer Revox (201)
Established products
A800: Microprocessor-controlled multitrack recorder
A810: 2-track recorder with center-track SMPTE code
A710/B710MKII: Professional cassette deck
900: Broadcast audio consoles
169/269: Portable audio consoles
TLS2000: SMPTE synchronizer
A80 VU: Multitrack recorders
2706: Studio monitor
A68: Monitor amplifier
B67: 2-track recorder
B77SLS: Broadcast logger
PR99RO: Automation logger
Telephone audio system and hybrid
New products
PR99MKII: Compact pro recorder with real time counter
TLS4000: Modular SMPTE synchronizing system
A726: FM monitor tuner
New input module options for 900 series consoles
Circle (890) on Reply Card
see ad on page 255

Swintek Enterprises (1503)
Established products
Hand-held radio microphones
VHF/UHF wireless headsets
RF switching diversity antenna systems
Lavalier VHF/UHF wireless microphones
MARK Q: Series of wireless mic operating with all video cameras
New products
See at booth
Circle (891) on Reply Card
see ad on page 118

Switchcraft (427)
Established products
Switches and indicator lamps
Connectors
New products
See at booth
Circle (892) on Reply Card
see ad on page 313

Sylvania GTE (1401B)
Established products
T-H Lamps for studio, theater, TV and video in 5kW and 10kW ratings
Brite Arc/Brite Beam HMI lamps
New products
BB200 200W PAR36: Brite Beam metal halide lamp for ENG
Ruggedized versions of T-H lamps
DNV/DNT: T-H versions of incandescent models
Rim-mount lamps for video camera lighting
Design 50: 5000k fluorescent lamp for studio, printing and lithography lighting
Lighting Handbook: 7th edition
Circle (893) on Reply Card

Symetrix (616)
Established products
T1-101: Telephone interface
511: Single-ended audio noise reduction system
501: Peak-RMS compressor/limiter
CL-150: Fast-RMS compressor/limiter
A-220: Stereo amplifier
SE-400: Stereo parametric equalizer
DCS-16: Remote control system
522: Compressor/limiter/expander with gate and ducker
New products
See at booth
Circle (894) on Reply Card
see ad on page 220

Symtec (1522)
New products
PGSIV: Text and graphics generator combination, featuring RS-170A signal output with animation capability, 22 fonts, cut/paste, scaling/rotation, gen-lock, A/D conversion, slide/print production of graphics and RGB outputs
Circle (895) on Reply Card

System Associates (1331E)
Established products
Distributor for a wide variety of equipment for the radio and TV broadcast industry
New products
See at booth
Circle (896) on Reply Card

TFT (109)
Established products
8300: Studio transmitter link
701: TV monitor
753/754: AM monitor
763/764/724A/730: FM monitors
7900 Series: Microprocessor remote control system
8100: Transmitter studio link
760: Emergency broadcast system equipment
8020/8010: AM/FM E-alert equipment
New products
840/841: AM stereo exciter/monitor
830: SCA generator for voice and data
Circle (897) on Reply Card
see ad on page 269

TV Equipment Associates (1216)
Established products
Matthey delay lines and low pass video filters
RACAL headsets for broadcast and intercoms
Elcon videotape cleaner profiler for 2-, 1- and ¾-inch formats
VG Zone plate generator

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HERE'S WHY THE KAMAN BROADCAST MANAGEMENT SYSTEM IS THE CHOICE OF THE INDUSTRY.

The KAMAN Broadcast Systems are designed to be the most comprehensive and advanced in the industry. They are truly state of the art.

The Kaman Broadcast Systems are a "Station Operations" solution designed for today and the future. The interactive data base ties together all the various departments within your station. Information can be put in the systems anywhere . . . is immediately part of the systems everywhere. Speed is one of its greatest attributes!

The Kaman Broadcast Systems are totally "in-house," and are available at all times, unlike other systems which have operating hours and days. Timely, decision-producing information is now available at your fingertips anytime. Your sales staff can log spots immediately when a buy is made and avails will be updated. Information ripples through the entire system: to traffic, billing, and even production. The Kaman Systems are designed for your station's future needs: to produce information, data, and reports in an ever-changing industry.

Broadcast Systems Division

KAMAN SCIENCES CORPORATION

a Kaman Company

1500 Garden of the Gods Rd • Tel. 303 599-1500 • Telex 452412
Mailing Address: P.O. Box 7463 • Colorado Springs, CO 80933-7463

The Kaman Broadcast Systems are designed exclusively for the IBM System/38 which can provide uninterrupted, multiterminal access for your entire station. The System/38 has outstanding capacity for data and is backed by IBM's reputation for superior service.

The Broadcast Management System reflects Kaman's in-depth broadcasting background . . . a background unique among broadcast computing companies. Kaman has a strong commitment to the broadcasting industry and it shows through a solid reputation for service and reliability of its products.

At Kaman, today's quality is tomorrow's reputation.

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KAMAN BROADCAST SYSTEMS
A TOTAL SOLUTION FROM A SINGLE SOURCE

REPORTS TO INCREASE PRODUCTIVITY

AVAILS:
- Multiple formats
- 365 days
- Budgets
- Average pricing
- Constant updating

PROJECTIONS:
- 9 different calendars
- By salesperson, agency or advertiser
- Budgets
- History
- Pace

LOGS:
- Complete pre-logs, engineers logs, final logs

CONTRACT/CONFIRMATIONS

PSA/PROMO LISTS AND AFFIDAVITS

DAILY LOG VALVE

FCC LOG ANALYSIS

COMPLETE PREEMPT/MAKEGOOD HANDLING

TAPE CARTRIDGES:
- Automatic allocation
- Inventory control
- Dub lists
- Cartridge labels

BILLING:
- Invoices – airtime/production
- Statements
- Accounts receivable
- Cash receipts
- Co-op reports
- Salesperson journal
- Rep report
- Revenue analysis by: Time, Show, Salesperson, Agency, Advertiser, Product, All with history

Standard reports are formatted but may be changed, and other reports can be tailored by the user through the use of the IBM System/38 "Query" function.

FLEXIBILITY

The Broadcast Management System is completely interactive and geared to maximize sales. As a contract is being input, it immediately checks the avails and places every spot according to the station's priorities; i.e., highest rate, client preference, length of unit, national or local, rate section, personal preference, length of contract. The priorities are set by the station to their sales philosophy. Each time a spot is ordered, the spot is placed according to these steps and according to space availabilities on the log or avails. If space is not available but can be acquired by moving or juggling spots, the system will maximize the area by the station's logging priorities. The system logs and avails spots automatically in horizontal and vertical rotations following sports programs, specials, etc.

THE IBM SYSTEM/38

The IBM System/38 is engineered to grow as your station work load and business requirements change and grow. It is a system that can adapt easily to the addition of a work station in one of your satellite offices or the addition of a new disk file . . . all without major programming changes. The System/38 has integrated many large system features into a single system design . . . at an affordable price.

For various station departments, it can provide accurate, timely information where it is needed, when it is needed, and in the desired form, without support from data processing personnel.

The IBM System/38 lends itself to networking with other IBM Systems and multistation operation from a single site. Our programs incorporate the ability for corporate reporting and electronic mail.

Security is also built into its operation . . . users enter their assigned password, and the system determines the information they can use. Your employee files, for example, can be restricted to a select few.

OTHER KAMAN BROADCASTING PRODUCTS

Autoswitching Interface System: passes the log directly to engineering and retrieves following airing for automatic billing.

Accounting: includes capabilities for General Ledger, Payroll, Fixed Assets and Accounts Payables.

Film System: inventories feature and syndicated films. Amortizes as you prefer. Includes payables to vendors. The system is unique in that it is designed to forecast for your station . . . what you have contracted for the future, costs versus cash flow so you know what you can afford to bid. This system is scheduled for release in late 1984.

Interface your Broadcast Management System with your National Reps. Your Reps will be able to have access to whatever you want them to have (and no more) to help them close sales on your hot avails. Currently under research and design.

All new Kaman Systems software modules can be interfaced with all other Kaman Broadcast Systems software, even if added at a later date.

THE KAMAN DIFFERENCE

We pride ourselves on the fact that our training, installation and customer services people are broadcasters. Our systems are designed from the user point of view and in broadcast language. All Systems are easy to learn, operate, and bring up. Our program consists of station personnel being in Colorado Springs for advanced training, and our installation team being at the station for instruction and live conversion. We have Customer Service personnel available thereafter.

At Kaman, today's quality is tomorrow's reputation.

Broadcast Systems Division

KAMAN SCIENCES CORPORATION

a Kaman Company

1500 Garden of the Gods Rd • Tel 303 599 1500 • Telex 452412
Mailing Address P O Box 7463 • Colorado Springs, CO 80933 7463

Let us show you more about how the Kaman Broadcast Systems can provide you with present and long-term solutions to your problems now. Developing software for broadcasters is our business. Call us at 303-599-1470.

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TV Equipment Associates (1216)
Continued

Link audio and video DAs
IRT color monitor comparitor, dc-powered
MATEL auto multiplex phone/intercom
New products
RACAL Suregard headset for noise exclusion with noise canceling electret microphone
RACAL emergency field phone for party line operation

Circle (898) on Reply Card

Taber **(711)**
Established products
409: Tabererase, manual
Audio head replacements
New products
1500 Taberaser, automatic

Circle (899) on Reply Card

Tamron Company **(1640)**
Established products
265H 10X: Zoom lens
665H 10X: Zoom lens
466H 14X: Zoom lens
181H 10X: Zoom lens
81H 10X: Zoom lens
466HB 14X: Zoom lens
New products
See at booth

Circle (900) on Reply Card

Tandberg of America **(614)**
Established products
TDC-910: Cassette recorder
TD-20L: Logging recorder
TDC-621: Duplicator machine
TES: Telephone enhancement system
TD20A-SE: Recorder
New products
See at booth

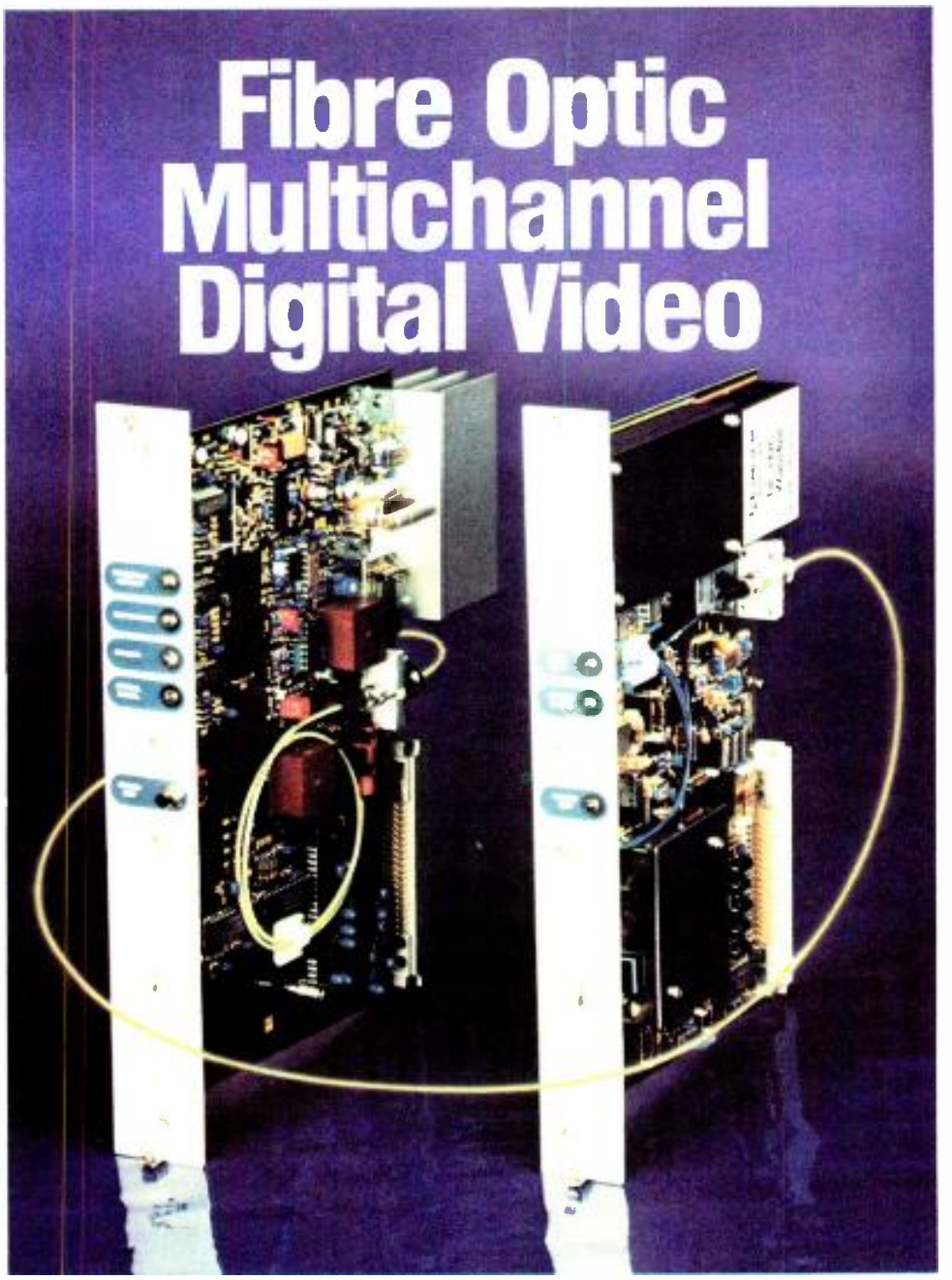
Circle (901) on Reply Card

Tapscan **(106)†**
See at booth

Circle (902) on Reply Card

TASCAM **(1304)**
Established products
M16: 24-input, 16-channel mixer
M30/M35: 8-track mixers
Series 22: Audio recorders
Series 30: 2-, 4- and 8-track recorders
85-16B: 16-track audio recorder
Portastudio 244: 4-track mixer with integral 4-track audiocassette recorder
122: Stereo cassette recorder
133: 3-channel cassette recorder
Line amps, equalizers, mics
New products
Series 40: +4dBm balanced, 2-, 4- and 8-track audio recorders
Series 50: +4dBm balanced, 2- and 8-track recorders
M-520: 20x8x16 modular-construction studio or production mixing console, featuring one clean feed, four side chain systems for processing, prefader listen cue and stereo solo in place
122B: Balanced input/output stereo cassette recorder
133B: Balanced input/output 3- →

Circle (145) on Reply Card



MULTISTANDARD TRANSMISSION OF COMPONENT OR COMPOSITE VIDEO

Component Video
Multistandard sources
Multiple video feeds
All create challenges for the Video Transmission Engineer

Quante's QLT 1000 Series Digital Fiber Optic Transmission System provides four transparent channels per fiber, ensuring maximum flexibility to meet new standards as they evolve.

- Single fiber for 4 video and up to 56 digital audio channels
- Multistandard transmission with any mix of component or composite channels
- Fully bi-directional
- Reach 11 to 50km with choice of wavelengths
- RS 250 B performance

See us at NAB '84-booth 1216A

Quante CORPORATION

3350 Scott Boulevard
Building 15
Santa Clara, CA 95051
(408) 727-2077

Norkshäuschen 25
D-5600 Wuppertal 1 (West Germany)
Tel. (0202) 704001-03
Tx. 8591542

Circle (133) on Reply Card

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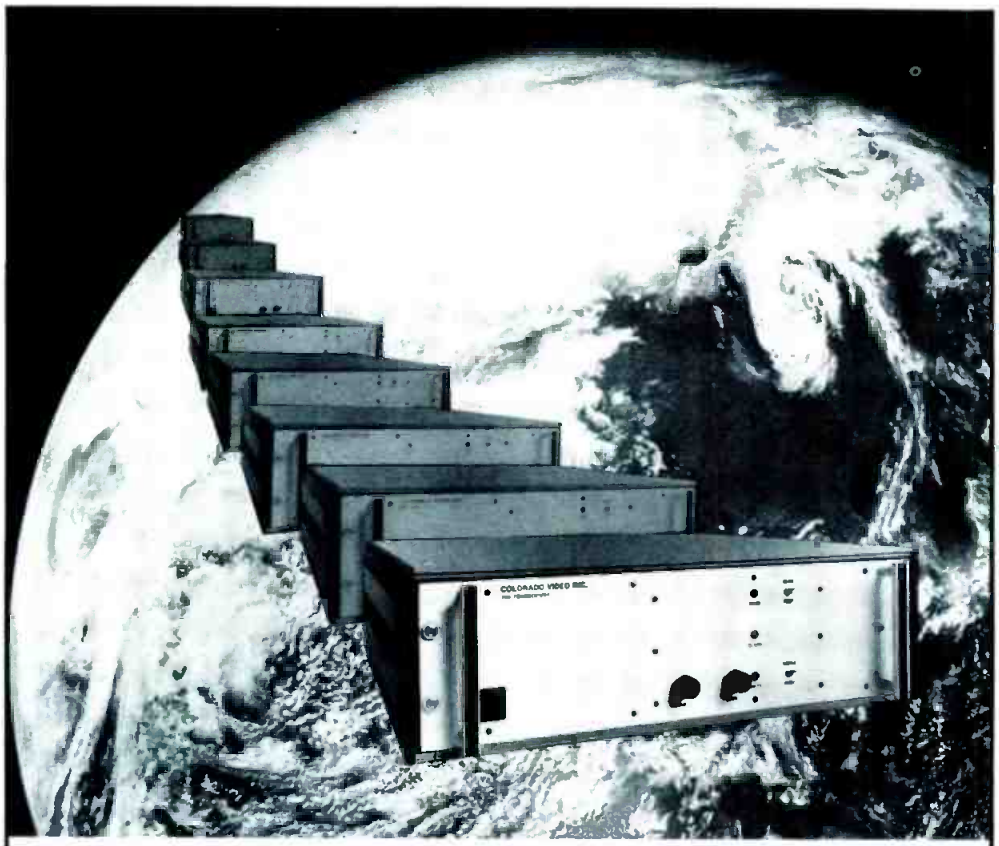
TASCAM (1304)
Continued
channel cassette recorder
234: Multichannel production cassette recorder
Series: Patch bays
2-piece ¼-inch ½-track transport in floor-standing console with optional broadcast/monitor editing system
Circle (903) on Reply Card
see ads on pages 27 and 315

Teatronics (1786)†
Established products
Genesis 2400: Dimmer systems
Marathon 1200: Dimmer systems
New products
See at booth
Circle (904) on Reply Card

Tektronix (1601)
Established products
110-S: 10-bit frame synchronizer
1910: Digital signal generator/inserter
1980A: Option 04 NTSC video monitoring software
690SR: Color video monitor
2445: Portable 150MHz oscilloscope with TV option
AA501: Audio analyzer with support equipment
380: Test monitor, combining waveform, vector and oscilloscope functions
New products
1740 Series: Waveform/vector monitor for NTSC, PAL and PAL-M with portable battery pack capabilities
1750 Series: Waveform/vector monitor with SC/H-phase capability in NTSC, PAL and PAL-M formats
494: Spectrum analyzer with 'HELP' mode for 10kHz-325GHz measurements
118-AS: Digital audio synchronizer, complementing the 110-S, to compensate audio-to-video delay differentials incurred when video passes through cascaded and/or extended memory (4-field) video synchronizers
Circle (905) on Reply Card
see ads on pages 17, 18, 19, 20 and 21



REACH THE WORLD WITH SSTV

High quality programming can be provided to a national audience using Slow-Scan television (SSTV). Both the digital Model 285C and analog Model 290C transmit still video color images over the subcarrier of a satellite transponder—at a fraction of the cost of full-motion satellite delivery.

With the addition of inexpensive earth stations, SSTV can be used to reach specialized audiences, like academic institutions, religious groups, or professional associations.

Slow-Scan television offers rapid "slide-show" programming. Use it for topics such as news, travel, weather, finance, art, real estate or geography.

COLORADO VIDEO

To learn how specialized programming becomes affordable with SSTV, contact Colorado Video, Inc. Box 928, Boulder, CO 80306 303/444-3972.

See Us at NAB in Booth #1222
Circle (288) on Reply Card

For simplified phasing

Certifying the SC/H-phasing in a TV facility is not that difficult, but even for an engineer or knowledgeable technician, the process *does* take time. More than a glance at the waveform monitor or CRT display is needed to set the phase adjustments correctly. For less well-trained personnel, the process could be a major undertaking. As an answer to the task of SC/H phasing the facility, Tektronix will introduce its 1750 series at NAB-'84/Las Vegas.

Closely paralleling the design of the TEK 1740, the 1750 waveform monitor/vectorscope includes the capability for measuring and monitoring subcarrier-to-horizontal (SC/H) sync phase. The instrument allows quick determination of proper composition of individual signals and their compliance with NTSC RS-170A, as well as relative color framing of two signals. The phasing display is available at the touch of a front-panel mode select button.

Easily understood front-panel controls allow normal waveform and vector displays, as well as R–Y differential phase and new SC/H mode. Sweeps allow 1H, 2H, 1-field and 2-field displays, along with a magnification mode. Dc restore is switched and vertical filtering provides for flat, IRE and chroma selections, just as on the 1480 waveform monitor. Also, line selections from Fields 1 or 3 and Fields 2 or 4 may be made, allowing VIRS, VITS and other vertical interval signals, such as teletext, to be monitored.

In the SC/H-phase monitor mode, the 1750 uses the vectorscope graticule, with the subcarrier reference burst indicated as on a vector display. When controls are properly set, the phase error is determined by the position of a spot lying on the outer circle of the vector display. The number

→

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FM BROADCASTERS, IS YOUR SIGNAL REALLY ON TARGET?

You know your market numbers, and the demographics that tell you where you should have your best signal coverage.

That's good, because your competition knows them too.

But, are you certain that you're delivering every watt into those numbers? Do your field-strength numbers raise a few doubts? And, what about the quality of your station's sound? You've spent all that money on the studio equipment. You've fine-tuned your transmitter. Great. But those improvements really don't count for much if your programming is hitting the open pastures while your competition is zeroing-in on the key demo sectors. This is where a CETEC FM Antenna comes in.

INTRODUCING OUR "HAVE IT YOUR WAY" PROGRAM FOR FM BROADCASTERS

Because your market has changed since your antenna was first put into service, or it's come time to directionalize, it makes good sense to look into the benefits of upgrading with CETEC ANTENNAS. Here's three different ways:

1. Our Pattern Optimization Service;
2. Directionalization on any of our standard antennas;
3. Upgrading to our patented Series JSCP antennas.

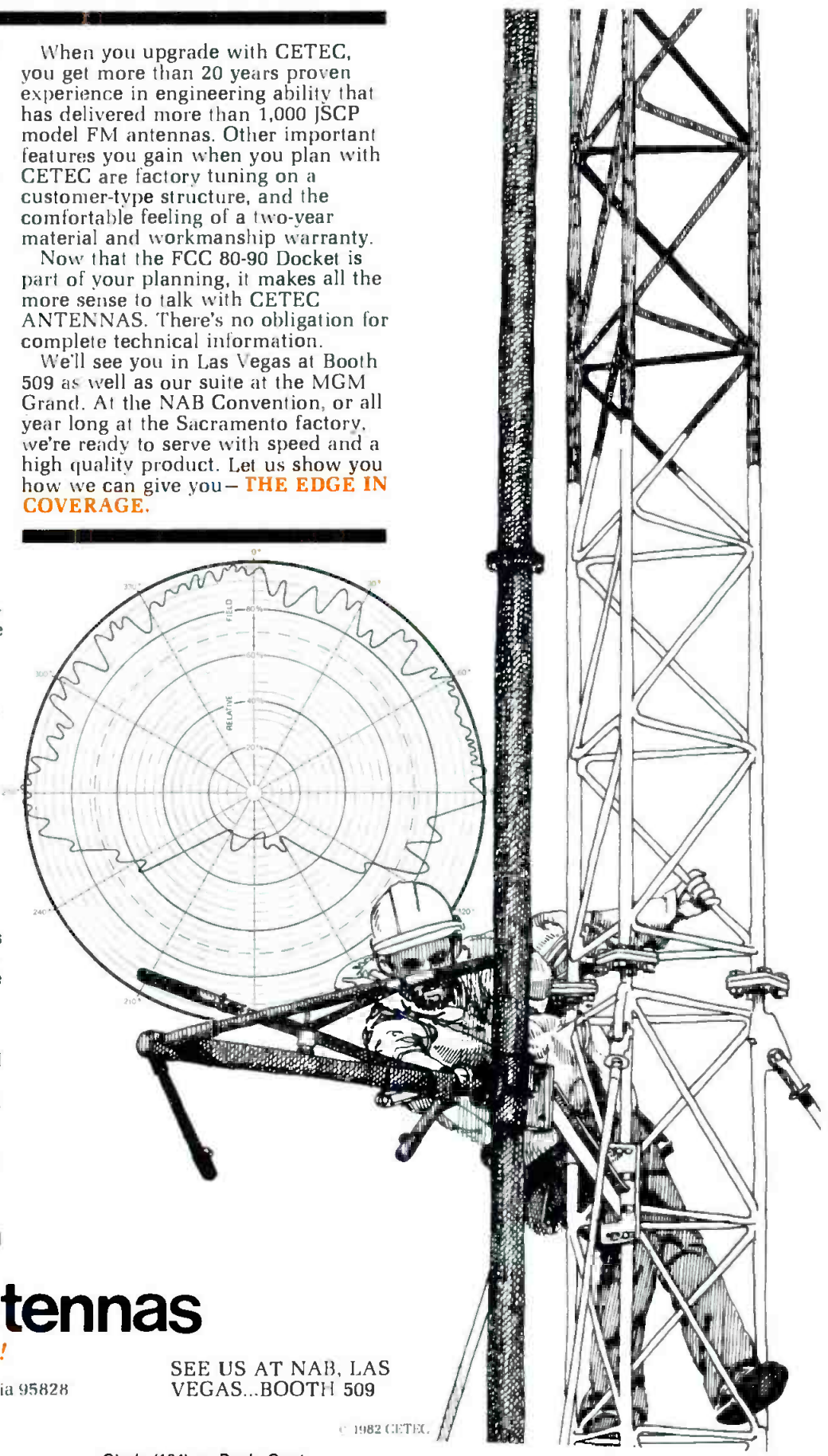
With pattern optimization, we can give you more uniform coverage and better signal quality. Typical nulls and peaks can be virtually eliminated. All of our work is done fullscale to eliminate errors too. Parasitic elements are precisely determined on a custom basis for your particular site. When you optimize your signal our way, you optimize your market reach and penetration—your way.

Cetec Antennas meet FCC requirements for directionalizing. With us, FM antennas aren't a sideline. All of our FM's are CP and can be directionalized. From 4KW to 360KW, one bay to large, multiple bay systems, we're one of the largest suppliers to the industry. With a CETEC directional, we can place your signal right where you want it.

When you upgrade with CETEC, you get more than 20 years proven experience in engineering ability that has delivered more than 1,000 JSCP model FM antennas. Other important features you gain when you plan with CETEC are factory tuning on a customer-type structure, and the comfortable feeling of a two-year material and workmanship warranty.

Now that the FCC 80-90 Docket is part of your planning, it makes all the more sense to talk with CETEC ANTENNAS. There's no obligation for complete technical information.

We'll see you in Las Vegas at Booth 509 as well as our suite at the MGM Grand. At the NAB Convention, or all year long at the Sacramento factory, we're ready to serve with speed and a high quality product. Let us show you how we can give you— **THE EDGE IN COVERAGE.**



Cetec Antennas

The Edge In Coverage!

6939 Power Inn Road, Sacramento, California 95828
(916) 383-1177 Telex: 377321

SEE US AT NAB, LAS VEGAS...BOOTH 509

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Circle (134) on Reply Card

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of degrees of error are read from graticule marks.

Intended for rack-mount or bench use, the new instrument is sized similar to the 1740 and 528A waveform monitors or 1420 vectorscope. The half-rack-width monitor is 18.13 inches deep, weighs 16 pounds and is operable only on ac power. It will sell for approximately $5600 in NTSC. A 1751 PAL version and a PAL-M model, 1752, will follow the NAB introduction. In each case, the cost is slightly more than the combined cost of a 528A/1420 set, or PAL equivalent, in half the space.

Circle (400) on Reply Card

Telemet (1202)

Established products

7934: A/V routing switcher with computer control option
3710: Broadcast demodulator with tester and synchronous detector
3706: TV sideband analyzer
4501: Precision demod
4503: Demod tester
4504: Synchronous detector
4500: Off-air demodulator
4400: Modulator
4210: Fiber-optic system
4600: Video signal conditioner
3538: Multifunction test set
5300: Isolation amplifier

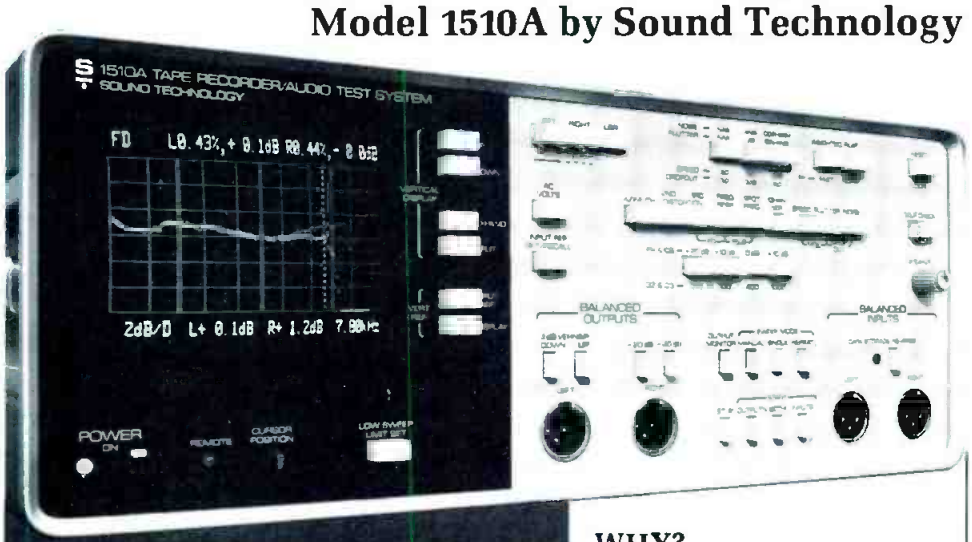
New products

See at booth

Circle (906) on Reply Card

see ad on page 194

The All-in-One Audio Test System—
Model 1510A by Sound Technology



IF. . .

. . .you're involved with production or post-production of audio for video, or on-location taping for television or CATV

. . .your equipment maintenance is an on-going, in-house responsibility

. . .your firm is ultimately concerned with the *audio quality* of your projects. . .

Then the 1510A Audio Test System belongs in your facility!

WHY?
Sound Technology's 1510A tells you EVERYTHING YOU NEED TO KNOW ABOUT YOUR AUDIO. It insures delivery of a sound product each & every time!

DESIGNED TO GIVE YOU THE COMPLETE PICTURE
The 1510A quickly and precisely evaluates and analyzes audio quality for VTRs. Microprocessor control, differential inputs, electronically-balanced outputs with a clean, low-distortion signal source (typically .005%) from +30 to −70 dBm. . .all contribute to the 1510A's ability to fulfill ALL your audio requirements.

MORE FOR LESS
Why invest $17K in a collection of test gear when the 1510A can do it all? Call Sound Technology to find out more about THE ONLY ALL-INCLUSIVE, TWO-CHANNEL TEST INSTRUMENT in today's market!

Leaders in Test and Measurement for over a Decade

SOUND TECHNOLOGY
1400 Dell Avenue, Campbell, CA 95008
(408) 378-6540 Telex: 357445
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Circle (135) on Reply Card

Telescript (1407)

Established products

MPS-1000: Monitor prompting system Telecue and Telescriptor transports

New products

DIGIS: Digital prompting system using current manufacture personal- and briefcase-type computers

Circle (907) on Reply Card

Telesource (1607B)

Established products

In-station election reporting system with vote computation and on-air display with unlimited number of races

New products

BUZ Series 2000: Comprehensive TV and radio newsroom management/editing system, featuring a local area network, redundant processors and terminal work stations

Circle (908) on Reply Card

Television Engineering (1700)

Established products

TV remote vehicle, equipped with state-of-the-art equipment
Professionally designed TV systems
Individual production items

New products

New design in remote vehicles, planned and designed to save on replacement cost

Circle (909) on Reply Card

Television Information Office (806)†

See at booth

Circle (910) on Reply Card

Telex Communications (600/1605A)

Established products

Wireless mic systems
Microphones
Closed circuit intercom systems
Headsets
Open reel and cassette ATRs and loggers
Tape duplicators
A/V projection film equipment including front and rear screen combinations with cassette audio and dissolve control

New products

See at booth

Circle (911) on Reply Card

Tennaplex (1127)

Established products

Kathrein broadband dipole panels for FM and TV antennas
Hybrid combiner modules

New products

Kathrein broadband dipole panels suited for arrays of three panels per bay on triangular masts

Circle (912) on Reply Card

Tentel (1613)

Established products

Tentelometers: Tape tension gauges for C, U-matic, Beta, VHS, M-format and quad VTRs and reel-to-reel audiotape
TUSH: Spindle height gauges for VHS, Beta and U-matic formats

New products

T2-H18-CBD: Tentelometer for Sony and

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DID YOU KNOW CHESTER CABLE MAKES AUDIO AND VIDEO CABLE?

Many people don't.

But that's changing. We've committed ourselves to the broadcast industry by offering a full line of custom-designed and standard audio and video cables. We didn't just get started either. We've been manufacturing wire and cable for over 40 years. Today, Chester products are carrying critical signals in network broadcast studios and for field broadcast coverage. They've been used to cover the Olympic Games, the U.S. Open in golf and in numerous everyday news and sports coverages.

We gained our knowledge and experience by designing quality wire for use in atomic submarines, jet aircraft and life support systems and diagnostic equipment in the medical field to name just a few. Of more importance to you, we build coaxial and triaxial video cables, shielded multi-pair audio cables and multi-conductor control cables. But, we don't stop there. We will design a cable for you as well, for that special application that needs something more than the standard designs. So, you can design a cable to fit your project rather than design your project to fit a cable. We also don't go into slow motion when the word "special" comes up. We understand the needs of the broadcast industry and are ready to react to your timetable demands. So when your next cable requirement comes up, think of Chester. We've got what you're looking for.

CHESTER CABLE

P.O. Drawer D, Chester, New York 10918
(914) 469-2141
A unit of Chester Cablewave Systems Corporation.

Proven reliability.

Circle (136) on Reply Card

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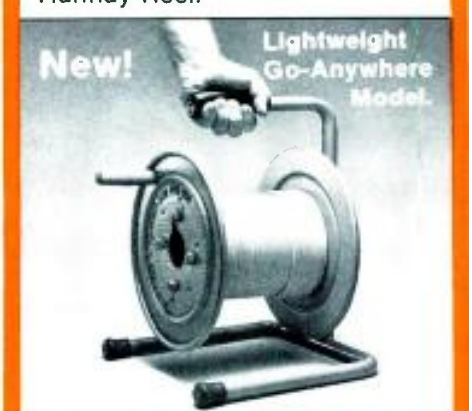
HANNAY REELS GET YOU IN AND OUT FAST.

Save precious seconds in set-up, tear-down time. Just pick up the durable, lightweight Hannay Portable Cable Reel, and go. When the story's in the can, direct rewind makes pick-up easy. And the Portable Cable Reel is compact to take up minimal storage space.

It's the newest addition to our complete line of cable reels, for an even bigger selection of unlimited sizes, shapes and capacities to choose from.

When it comes to getting in and out fast, no other reel is "remotely" as efficient as a Hannay Reel!



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CLIFFORD B. HANNAY & SON, INC., 600 EAST MAIN STREET
WESTERLO, NEW YORK 12193 • TELEPHONE (518) 797-3791

Circle (137) on Reply Card

Tentel (1613)
Continued

Ampex 1-inch C VTRs
T2-H7-UMS: Tentelometer for Sony Betacam
HPG-1: Universal head protrusion and drum eccentricity gauge for Beta, VHS and U-matic systems
WS120: Field calibration weight set for field checking of Tentelometer accuracy

Circle (913) on Reply Card
see ad on page 240

Theatre Service /Supply (1513)
Established products
Cyclorama backdrop curtains and cyc track systems
Overhead track systems for light fixture support and electrical power distribution
New products
See at booth

Circle (914) on Reply Card

Thermodyne (1637)†
Established products
Shok-Stop: Shipping and storage cases
Rack-Pack: Shipping storage and operating cases
Rack-Pack: With new 3-tiered sliders
New products
See at booth

Circle (915) on Reply Card

Thomson-CSF Broadcast (1001)
Established products
4101/4111: FM Volumax peak controllers
4300: AM Volumax peak controller
4440A: Audimax level controller
1602: Dual audio DA
5500B: NTSC color corrector
8010: Image enhancer
9010NM/9020NM: Videoplex encoder/decoder
TTV-2705: Color slide scanner
MC-613: 3-tube Betacam with ½-inch VTR
Vidifont V: Character generator and graphics system
NABTS teletext system
UHF and VHF TV transmitters
4-program TVRO system
New products
TTV-1525C: Color studio camera
TTV-1623: Automatic 3-tube Betacam Editing suite
TTV-4400: Auto contrast corrector
TTV-5305: Special effects image processor
TTV-8400: Thom. C.A.T. computer-aided test instrumentation
TTV-7650/7660: D/A and A/D converters
2kW VHF TV transmitter
200W, 1kW and 2.5kW FM transmitters

Circle (916) on Reply Card
see ad on page 251

Thomson-CSF Components (1003)
Established products
Klystrons
TH-3591B and TH-3640 TWT amplifier systems for satellite communications
Tetrode for UHF and VHF applications
New products
TH-2417C: 24-channel 3.35kW C-Band klystron for satellite uplinking stations
TH-2426: 2kW Ku-Band klystron for uplink ground stations
TH-2445: DBS klystron for transmitter amplifiers in the DBS satellite services in the 17.3GHz to 18.1GHz spectrum
TH-547: 1kW UHF tetrode for LPTV service
TH-582: 20kW UHF tetrode, using the Pyrobloc grid structure
TH-371: 20kW VHF tetrode with Pyrobloc grid structure

Circle (917) on Reply Card

Thorn EMI (1331D)†
Established products
Lamps: For studio use
Lamps: hand-held fixtures
New products
See at booth

Circle (918) on Reply Card

3M Company (1002)
(3M Magnetic Audio/Video Products)
(3M Broadcasting and Related Products)
(3M Optical Recording Project)
Established products
250/226: Audio mastering tape
Cinetrak: Tape cycling
Anti-static treatment of cassettes
Custom mastering/replication of laser videodiscs from 1-inch and U-matic videotape
New products
480: Master broadcast videotape
D-1000/D-5000: Character generator systems
BFA: Video graphics paint system
210: Sync generator
Additional models of H-Hybrid routing switcher series
EECO converter to provide 150 hours of audio programming from optical video discs

Circle (919) on Reply Card
see ad on page 311

Tiffin (1422)
Established products
Complete line of special effects and standard filters for video and film cameras
New products
See at booth

Circle (920) on Reply Card

Toby Arnold & Associates (107)
Established products
Music program syndication service
New products
See at booth

Circle (921) on Reply Card

Toshiba (1631A)
Established products
PK-41: Computer-controlled camera
PK-60: ENG/EFP TV camera
WG-V: Wipe pattern generator
CKG: Soft chromakey signal generator
New products
PK-70: Color camera with VTR
PK-61: Portable color TV camera
D-VSW 1000: Digital video switcher
Power amplifiers for transmitters

Circle (922) on Reply Card
see ad on page 239

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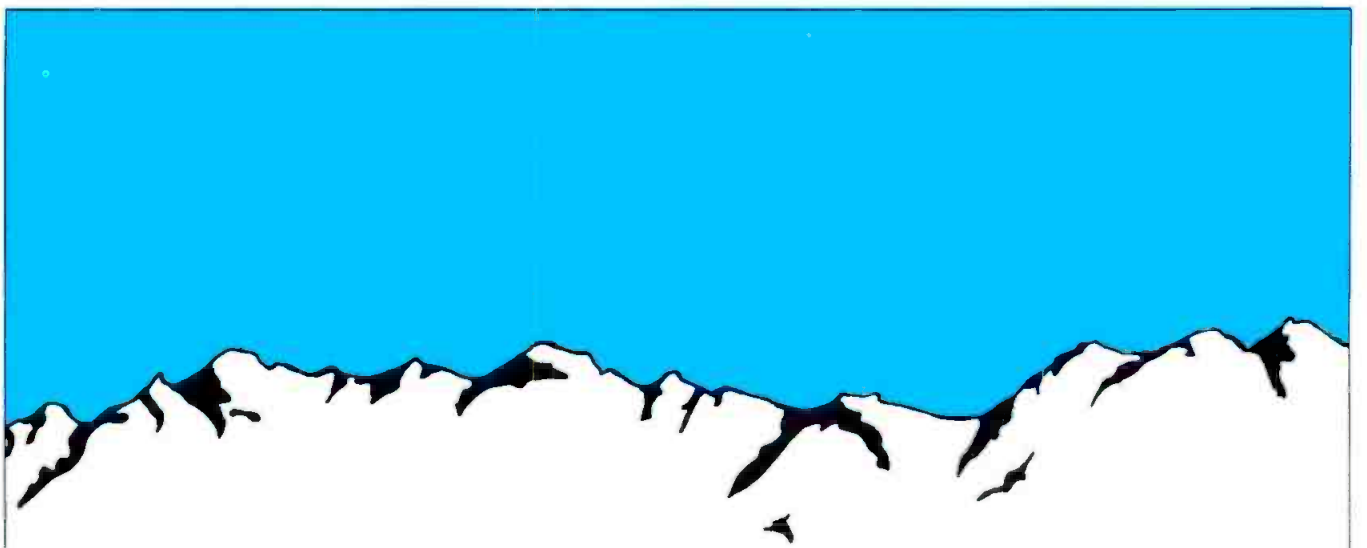
ONE OF THE INDUSTRY'S BEST KEPT SECRETS . . .

ISC EDITING SYSTEMS ARE CONTROLLING MORE VPR-3'S THAN ALL OF OUR COMPETITORS COMBINED.

SURPRISED?



THEN YOU SHOULD GET TO KNOW US BETTER.

ISC is the only company that can control both the newest Ampex and Sony's VTR's through RS422 Direct Control protocol, and simultaneously control a host of other equipment through Calaway and CMX RS232 interfaces.

Visit us at NAB. We will demonstrate the industry's most flexible interfacing and most sophisticated VTR and switcher control. ISC provides precise, easy to use control permitting you to expand your creativity.

ANOTHER BEST KEPT SECRET. . .

In fact, our new model 51 is still a secret . . . until NAB.

See it at NAB booth No. 1167

ISC—the strong, quiet company setting the pace.

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5601 N. BROADWAY, BOULDER, CO 80302 (303) 447-2013
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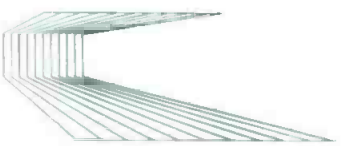

Ad Dated: February 8, 1984.

Circle (138) on Reply Card

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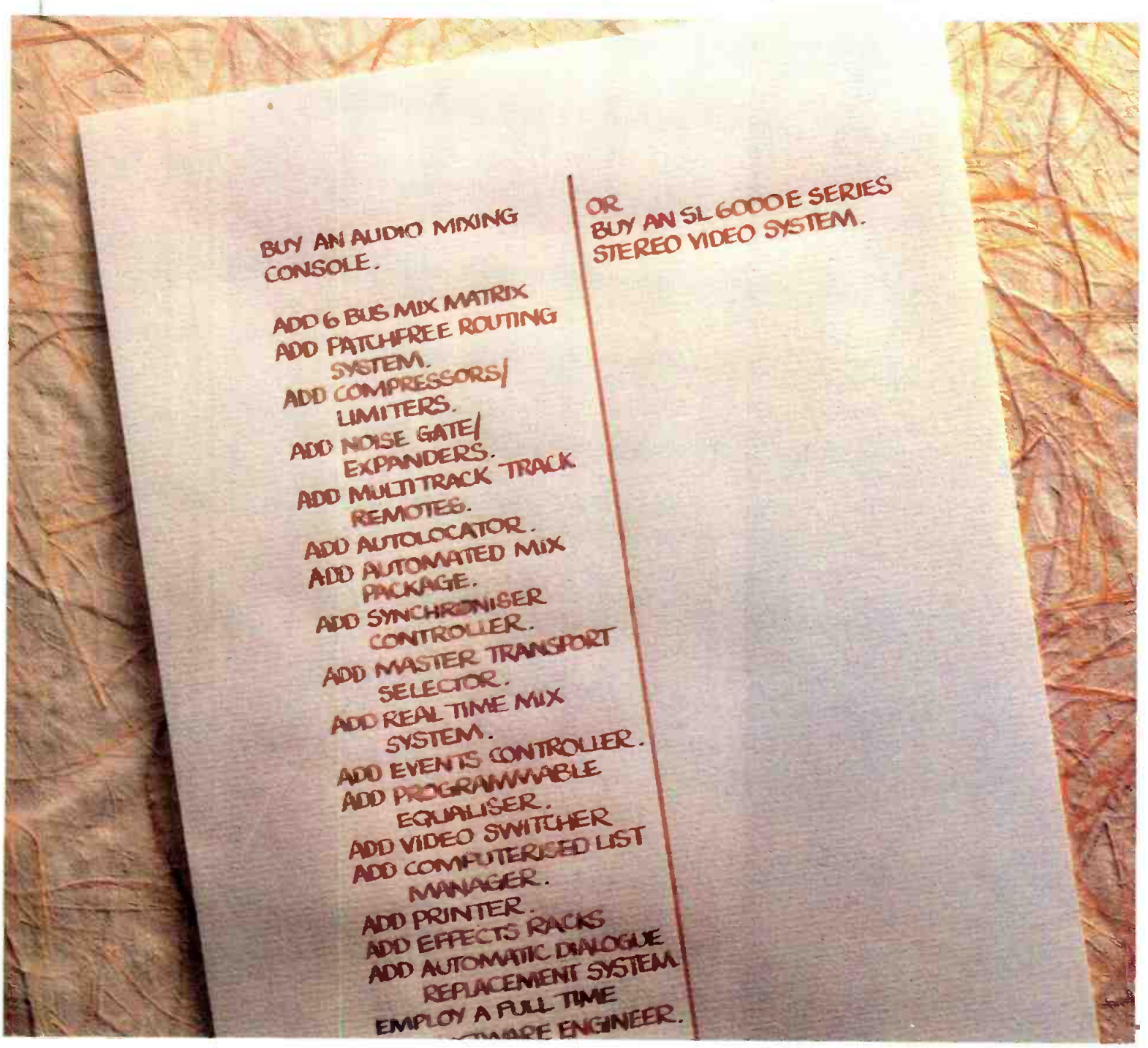
Buying an audio post-production system. The long and the short of it.



www.americanradiohistory.com

In the competitive world of eo production, providing the it facilities is one of the first uirements for success.

Getting it right can prove icult, however. Especially in area of audio post- duction.

For people expect the same histicated standards of sound t they hear from the recording ustry. But they usually expect a fraction of the time.

Which means a post-production studio, if it is to et these demands, must not only give first-rate stereo ind, it must be streamlined to give it as quickly and ciently as possible.

Unfortunately, because the video business is still ing, much of the equipment on offer is new and proven. With different suppliers working differing standards.

And even if you choose the individual nponents of your system wisely, they 't work together with maximum ciency. Because they weren't designed do so.

So, at best, assembling your audio ilities will be complicated, time suming and not entirely satisfactory. the worst, it will be very costly and tentially catastrophic.

Unless of course you choose the Solid te Logic SL 6000 E Stereo Video System. e world's first fully integrated audio post- duction system.

Designed in consultation with several leading post- duction houses and broadcasters, the SL 6000 E ies provides outstanding audio quality. Combined h systematic design and practical innovation, aimed cifically at the needs of the video and broadcasting lustries.

The Stereo Mix Matrix, for example, contains three reo mix buses. Allowing the simultaneous creation of arate music, effects and dialogue mixes, and giving the atest possible flexibility for both stereo and mono st-production.

Master Logic Control enables the console to be reconfigured instantly for track laying, overdubbing or remixing. Ingenious switching on each input/output module gives easy patchfree routing and sub-grouping.

The SSL Primary Studio Computer handles automated mixing, autolocation, and list management. It interfaces with the remarkable Total Recall system and links with the Synchroniser Controller to provide direct control of the entire system via its keyboard and in-built TV monitor.

As a result, an enormous amount of time (and money) is saved. Giving the engineer a new freedom to concentrate on the more creative aspects of his work.

These features, incorporated into the SL 6000 E's cohesive and comprehensive design, are of great benefit to post-production and broadcast studios alike.

And because of the system's modular nature, it can be built up from the basic mainframe as your needs and budget dictate. Making it an affordable proposition for any size of studio.

So if you're in the market for an audio post-production system, you can fall into the trap of trying to assemble one piece by piece.

Or you can drop a line or call Antony David in the UK or Piers Plaskitt in the USA, and find out more about SSL's Stereo Video System.

Solid State Logic

Please send me further information on the SL 6000 E Series Stereo Video System.

Name_____

Position_____

Company_____

Address_____

Solid State Logic, Churchfields, Stonesfield, Oxford OX7 2PQ, England
Tel: (099) 389 8282. Telex: 837400 SSL OX G. Facsimile: (099) 389 8227.

Solid State Logic, 228 East Main, Milan, Michigan 48160, USA.
Tel: (313) 439 8866. Telex: 230504 SSL MILAN. Facsimile: (313) 439 8516.

Circle (139) on Reply Card

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Townsend (1420)†
Established products
Phaestar: 100W low-power UHF transmitter-antenna system. Plug-in vacuum contactor for klystron beam voltage power supplies.
TMP-3-10: All solid-state mod anode pulser for UHF klystron transmitters.
TA-10NTH: 10kW high-band UHF transmitter
PE-250: Perveac klystron beam voltage control system
TMP-2-10: Solid-state pulser
TMC-10-XT: 10W MDS/ITFS transmitter
TA-55TE: 55kW UHF TV transmitter
TA-10ATH: 10kW VHF TV transmitter
TA-100ASU: 100W UHF TV transmitter
TMD-100XT: 100W solid-state MDS/ITFS transmitter
TC-800: 800A vacuum contacter
TA-5ATU-M: 5kW UHF TV transmitter
IR-500: Impedance plotter
New products
See at booth
Circle (923) on Reply Card
see ad on page 257

Transimage Int'l. (1512)†
See at booth
Circle (924) on Reply Card

Trident (333)†
Established products
Series 80: Production/recording console
Trimix: Expandable portable/studio console system
Limiter/compressor: 2-channel limiter/compressor
Parametric equalizer: 3-band fully parametric equalizer
Trimix: Expandable portable/studio console system
Series 70: Audio consoles
VFM: Audio consoles
New products
See at booth
Circle (925) on Reply Card

Trompeter (1211)†
Established products
Series: Patching and patching accessories, coax, twinax and triax BNC-type connectors
J-18: Miniature 70Ω jacks
TRS: Connector systems
New products
See at booth
Circle (926) on Reply Card

Turner Broadcasting (621)†
See at booth
Circle (927) on Reply Card

Tweed Audio (313)†
Established products
Service: Specialize in custom-designed systems for radio and TV broadcasting studios
New products
See at booth
Circle (928) on Reply Card

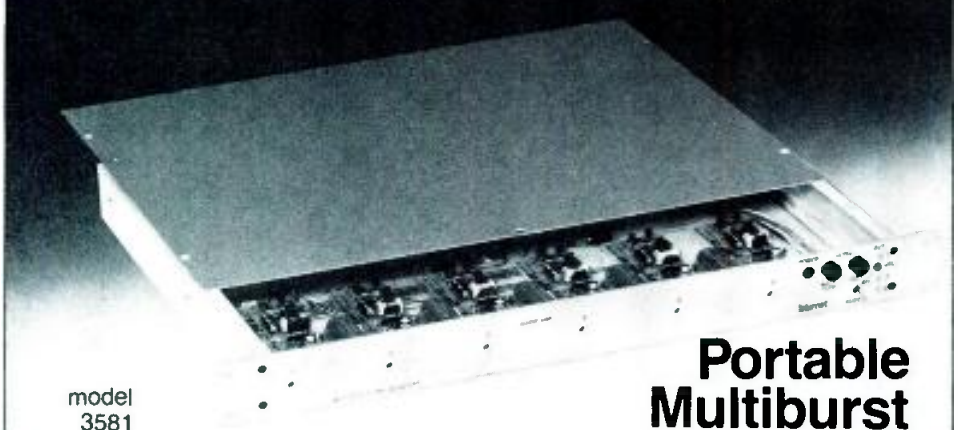
UMC Electronics (114)
Established products
Type 100: A/AA size audio cart machines
Type 200: Audio cart machines
Type 300: Triple-deck audio cart machine
SFE-100: Splice finder with or without eraser
BC-16: Stereo on-air console
Beaucart II: Economy line cart machine
System 8: Operator-assist automatic news recording system
New products
Type 200MA: Motorized azimuth cart machine with built-in white noise generator
Circle (929) on Reply Card
see ad on page 327

UREI
See United Recording Electronics

US Tape & Label (602)
Established products
Pressure sensitive products for broadcast industry promotional use: bumper strips, window labels and concert patches
New products
See at booth
Circle (930) on Reply Card

Ultimatte (1642)
Established products
Ultimatte-4: Video compositing device
Newsmatte: Video compositing system for live broadcast

Think Telemet
for Test & Measurement Equipment



model 3581

Portable Multiburst Generator

And, we mean PORTABLE!
This rugged, solid state Multiburst Generator is designed to go where you go.
It's a self contained test package which allows you to check your frequency response—anywhere!

It has 75Ω unbalanced output and 124Ω balanced.
The frequency bursts are from 0.5 to 4.2 MHz.
Internal sync, blanking and white bar are sine-square filtered to avoid overshoots.

It even has its own rough, tough carrying case for added protection.

This is just one of over 175 products that we make.

Free catalogs are available upon request. Please call or write...

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A Geotel Company
185 Dixon Avenue, Amityville, L.I., New York 11701
(516) 842-2300 TWX 510-227-9850
Eastern Area Office—(914) 279-3231

At Booth #1202 we have a free "Test Manual" for you
Circle (140) on Reply Card

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When you'd give an arm and a leg for an extra foot...

A-T gives you a hand!

The new AT835.

Now there's a new way to reach out and hear. The Audio-Technica AT835 Condenser Line + Gradient Microphone. It's barely longer than a legal pad, but it zeroes in on the sound you want to hear, while blocking out noise from the sides and rear.

Baby Brother

The new AT835 is 4 inches shorter than our famed AT815a and its remote-powered brother, the AT815R. Yet its performance in the field is remarkably close. The major difference is a slightly wider (60°) acceptance angle at higher frequencies. Credit a sophisticated "Fixed-Charge" element for the truly impressive sound and excellent directional control. The AT835 short "shotgun" fits in whether you are recording "actualities" for the evening news, picking up dialogue for film or A/V, or eavesdropping from the sidelines.

With Guts

Our FET impedance converter is super quiet, and runs for months on a single "AA" flashlight cell. The balanced, phased output matches any remote or studio input from 150 to 1000 Ohms without problems. And the AT835, like all A-T condensers, is built to take real punishment. Even so, it weighs just 7½ ounces for easy fishpoling or extended hand-held use.

If your goal is better control of your sound at moderate cost, your Audio-Technica sound specialist has a brand new answer. The AT835.

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AUDIO-TECHNICA U.S., INC., 1221 Commerce Dr., Stow, OH 44224 • 216/686-2600

Circle (141) on Reply Card

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YOUR RECORDS ARE STILL DIRTY!

The only professionally accepted method of record cleaning employs a powerful fluid, a special brush, and a 100% effective vacuum. Nitty Gritty now offers such a system that is designed to meet the demands of your radio station.

The Nitty Gritty PRO is the only available professional record cleaner that simultaneously washes and vacuums dry both sides of a record. It takes just 60 seconds per disc. $599 each.

SEE US AT NAB!

NITTY GRITTY
RECORD CARE PRODUCTS, INC.

4650 ARROW HWY - F4
MONTCLAIR, CA 91763
714/625-5525

Circle (314) on Reply Card

UNIVERSAL SURGE PROTECTOR FOR ALL LINE VOLTAGES!

Never obsolete! Unique resettable strapping protects on all power systems—even 3-phase—if you should change line voltage. "On" all the time, to protect constantly. Immediate shipment. Quantity discounts. Money back guarantee. Order today.

CALL BILL JOHNSON
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EAGLE HILL ELECTRONICS, INC.
41 Linden Avenue Rutledge, PA 19070

Circle (209) on Reply Card

	UMATIC	VHS & BETA
20 MINUTE RELOAD (tape only)	$3.30	55¢
LOAD (tape & housing)	$7.85	1.70

Your typical costs when you load yourself with our Video Tape Loader/Reloader/Rewinder. When reloading old tape is removed without taking the housings apart.

SEE OUR SYSTEM AT	BOOTH
NAB/LAS VEGAS	1343
L.A. VIDEOSHOW (May 22-24)	638

Audico, Inc. 219 Crossen, Elk Grove, IL 60007
Phone 312/640-1030 Telex 4992690 AUDCO UI

Circle (210) on Reply Card

FREE 32pg Catalog & 50 Audio/Video Applic.

OPAMP LABS INC (213) 934-3566
1033 N Sycamore Av LOS ANGELES CA, 90038

Circle (211) on Reply Card

CASES
FOR DELICATE EQUIPMENT
PRICE LIST ON REQUEST
818/899-2547
EXCALIBUR INDUSTRIES
12427 Foothill Blvd Lake View Terrace, CA 91342

Circle (212) on Reply Card

Want more information on advertised products? Use the Reader Service Card.

Ultimatte (1642)
Continued

New products
Ultimatte-5: Video compositing system with additional features
Newsmatte-2: Newsmatte system with digital memory

Circle (931) on Reply Card

Union Connector (1783)
Established products
20PS/60PS: 20A and 60A outlet panels and boxes
2P&G Series: 20A, 30A, 60A, 100A 3-wire plugs/connectors, UL-listed, with pin and sleeve
60-620L: 7.2kW portable distribution box
G4100: 4-pole, 5-wire grounding 100A, plug, connector, receptables, inlets, UL-listed
New products
SU-I: Dimmer at the light source, rated 2.4kW, modular, silent without RF interference or control cables
DIGI-I: Digital remote controller for SU-I, allows switcher/dimmer control through ac circuitry for up to 256-dimmer capability in a hand-held model

Circle (932) on Reply Card
see ad on page 287

Uni-Set (1236)
Established products
Uni-Set modular studio staging system, providing a variety of settings from cycloramas, risers, etc
New products
See at booth

Circle (933) on Reply Card

United Media (1300)
Established products
Commander II: Computer-assisted multisource SMPTE/EBU editing system
The Director: Auto dialog replacement controller with cueing for six actors
205: Time code generator/character generator
210: Time code generator
215: Time code character generator
305: Time code reader/character generator
310: Time code reader
425: 8-crosspoint audio router and dissolver interfaceable to Commander II
New products
Minicomm: Compact computer-assisted 2- or 3-machine editing system with time code or control track timing, expandable to Commander II.
500: Sequencer, providing contact closure for 16 devices, programmable from Commander II or front panel, with RS-232 port

Circle (934) on Reply Card

United Press Int'l (430)
Established products
UPI custom news
UPI radio network
New products
UPI broadcast computer system

Circle (935) on Reply Card

United Research (604)
Established products
Auto-Tec: Reel-to-reel recorder
D-75: Crown power amplifier
Nortronics recorder care products
3001: ASC cassette deck
ML-6: Coated pinch rollers
MC-II: Telex broadcast cart machines
Ampex replacement parts, video and audiotape
3M broadcast cartridges
New products
See at booth

Circle (936) on Reply Card

Ursa Major (512)
Established products
SST-282: Reverb, delay and effects system
8x32: Reverberation system
New products
StarGate 323: High quality, low priced digital reverberation system

Circle (937) on Reply Card

Utah Scientific (1114)†
Established products
AVS-1: Switching system and various party line control panels.
PLMC-1: Machine control system.
New line of software
MC-502 panel provides three buses while MC-501 provides preset and program buses only.
Station automation system with master control switchers
High performance 8-output video and and audio distribution amplifiers
ADA-8: Audio distribution amplifier
VDA-8: Video distribution amplifier
New products
See at booth

Circle (1494) on Reply Card
see ad on page 67

Utility Tower (703)
Established products
18-inch to 4-foot face tower products for AM, FM, TV, microwave, CATV and LPTV installations
Tower lighting equipment
Base insulators
New products
See at booth

Circle (1492) on Reply Card

Valentino (1231)
Established products
Production music library
Sound effects library
New products
See at booth

Circle (938) on Reply Card

Valley People (318)
Established products
810 Kepex II: Keyable program expander/noise gate
811 Gain Brain II: Compressor/limiter and voice-over device
812 Maxi-Q: 3-band parametric equalizer with tune mode
813 QLZ: Low impedance transformerless →

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BOOTH 507

See us at the NAB Show

We are looking forward to seeing our old friends and making new. Don't miss the unveiling of our new product line. See you April 29th.

CSI ELECTRONICS INC.

18248 EAST ROGERS CIRCLE
BOCA RATON, FLORIDA 33431
PHONE (305) 994-6511 TWX 510-953-7603

Circle (142) on Reply Card

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Valley People (318)
Continued

quad mic preamp
430 Dyna-Mite: Multifunction dynamics processor
432 Dyna-Mic: Dual transformerless preamp/mixer
610: Dual compressor/expander
HH2X2: Level matching interface
New products
310 Advantage: Audio noise and level meter for verification and specification of audio spectrum data
HH2X2B: Balanced level matching interface

Circle (939) on Reply Card
see ad on page 136

Varian Associates (1605)
(Microwave Tube Division)
(EIMAC/Salt Lake City)
(EIMAC/San Carlos)
(Microwave Equipment Division)
Established products
VCP-7858: Variable visual coupler
VA-890: 30kW UHF TV klystron
4KM150: LAH external cavity UHF TV klystron
VKU-7791J: 2kW Ku-Band klystron
Y834/Y831: Tubes for LPTV transmitters
Y730/Y570: Tubes for LPTV transmitters
3CX800A7: HF 800W power triode
3CX800U7: VHF 800W power triode
8973: Megawatt power tetrode
8974: Megawatt power tetrode
4CW300,000G: 300kW power tetrode
VAW-6700: Klystron test set
VZU-2701G: GEN II klystron high power amplifier
VZJ-2700G: GEN II klystron high power amplifier
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VZV-6995A2: 14-14.5Ghz, 500W power combined TWT HPA
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VKP-7853: 100kW UHF TV klystron
VKC-7980B12: 3kW C-Band broadband klystron
2CX1200A7: Small ceramic triode for FSB, AM and amateur radio
4-500B: Economical version of 4-500A
4CX3500A: 3.5kW power tetrode
4CX7500A: 7.5kW power tetrode
4CM25,000G: 25kW multiphase power tetrode
4CM100,000G: 100kW multiphase power tetrode
4CM400,000A: 400kW multiphase power tetrode
4CM40,000G: 40kW power tetrode
Klystrode: VHF power amplifier
Cavities: Six new VHF cavity amplifiers

Circle (940) on Reply Card
see ads on pages 47, 163 and 237

Circle (143) on Reply Card

Video Associates Labs (1303)
Established products
Apple computer based products, including:
MicroKey system computer graphics
New products
IBM-PC MicroKey applications for shape manipulation, weather graphics and title generation

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Video Composition (1775)†
See at booth

Circle (942) on Reply Card

Video Data Systems (*)
Established products
MPC-II/MPC-2500: Multichannel character generator with file management, 512-page memory and VCR control
New products
VID-STAR: Broadcast-quality display channel

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Video Int'l. (1524)
Established products
STC-2003: PAL/SECAM/NTSC standards converter
New products
STC-1003: PAL/SECAM/NTSC standards converter

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Videomagnetics (1109)
Established products
Quad video head refurbishing services
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4809B	695.00 ea
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8572V4	590.00 ea
ENG Cameras	
XQ1427 series	call for price
XQ1428 series	call for price
STUDIO Cameras	
XQ1070 series	call for price
XQ1075 series	call for price
XQ1020 series	call for price
XQ1025 series	call for price

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NAB-'84/Las Vegas

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广播工程
VIDEO SYSTEMS
S&VC sound & video contractor

Convention exhibitor guide

This removable *Exhibitor Guide* form has been designed to help you organize your plans for NAB-'84/Las Vegas. The exhibitors have been located on the Convention Center floor plan by an abbreviated name and booth number. Handy alphabetical listings give quick references to exhibitors' booths.

This special section will prove valuable in planning your convention coverage—a convention that promises to be exceptional in terms of exhibits, attendance and sessions showing trends in broadcasting, especially in digital technology.

An attempt has been made at the Las Vegas Convention Center to maintain a consistency in organization of the exhibits by rows and aisles, using a crosshatch pattern. Aisles are easily identified.

Show aids

To locate a specific exhibitor, look it up on the alphabetical listings on the map to get the booth number. Then just "walk" through the map to find it. It's that simple. (Advertisers in this issue are identified in red ink; you can find their ads in the *Advertisers' Index* near the back of this issue to obtain further details of what they are showing.)

To ascertain what *all* exhibitors are showing, study the *Exhibitor Roundup* section elsewhere in this issue. (In that section, Reader Service Numbers are provided and advertisers' positions are designated.)

To make sure that you have thoroughly covered a *product line* of interest at the convention, use the *Product Directory* section that collects exhibitors and their booth numbers under selected product categories. If you wish, circle these booths on your map to be sure you don't miss an exhibitor important to your purpose of attending NAB-'84.

Final notes

The exhibitor lists given here are up-to-date as of press time, but daily changes are still being made at NAB headquarters. Consequently, **BE** will print a map update to be distributed at the show that will contain all the latest changes. After you've registered, pick up your copy and also check NAB's notices for any late bulletins and/or revisions.

Map out your plan of attack for NAB-'84 now and fine tune it after registration to optimize your time.

Whether you attend NAB-'84/Las Vegas or not, look for our June issue for a *Convention Wrap-up* with its emphasis on new equipment and technology. Our July issue will carry highlights of the technical radio and TV sessions.

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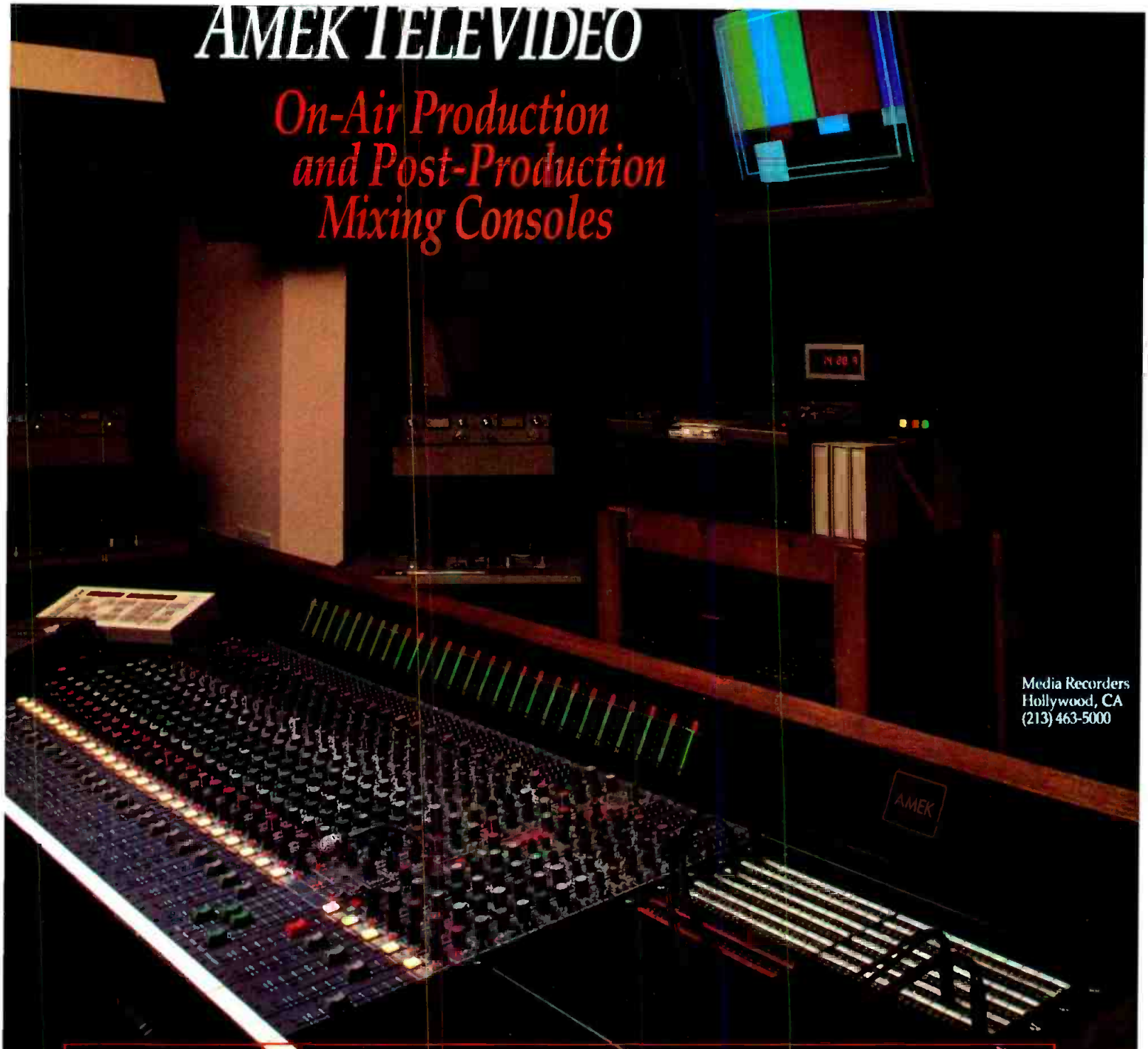

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• BC-01	Portable DC Powered Field/ENG Mixer 4 Buss, 8-16 Inputs
• M-1000	8 Buss, 8, 16, or 24 Monitor 8 to 32 Inputs
• M-1000A	24 Buss, 24 or 48 Monitor 16 to 56 Inputs, opt. VCA Automation
• M-2500TV	24 Buss, 24 or 48 Monitor 24 to 56 Inputs, VCA Automation
• M-3500TV	24 or 48 Buss, 24 or 48 Monitor 24 to 120 Inputs, VCA or optional Motorized Fader Automation
• M-5000AIR	24 or 48 Buss, 24 or 48 Monitor 36 to 120 Inputs, VCA or optional Motorized Fader Automation

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NAB-'84/Las Vegas

Conference personal agenda

Saturday April 28 Registration: 9-5 Exhibits Closed	Sunday April 29 Registration: 8-5 Exhibits: 9-6	Monday April 30 Registration: 8-5 Exhibits: 9-6	Tuesday May 1 Registration: 9-5 Exhibits: 9-6	Wednesday May 2 Registration: 9-Noon Exhibits: 9-2
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9
10	10	10	10	10
11	11	11	11	11
12	12	12	12	12
1	1	1	1	1
2	2	2	2	2 (Exhibits Close)
3	3:00 Opening Ceremonies	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

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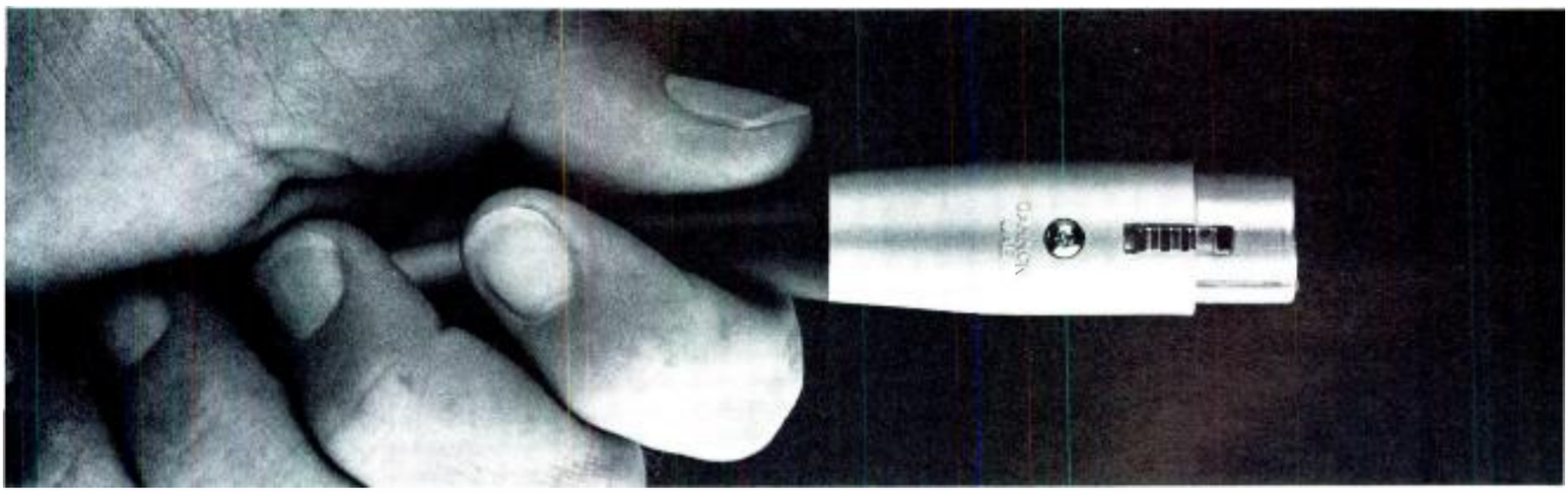
Protect your investment with a cannon.



An audio connector by any other name is simply not an ITT Cannon audio connector. Which is precisely why so many audio engineers continue to specify Cannon® connectors for use with their audio equipment.

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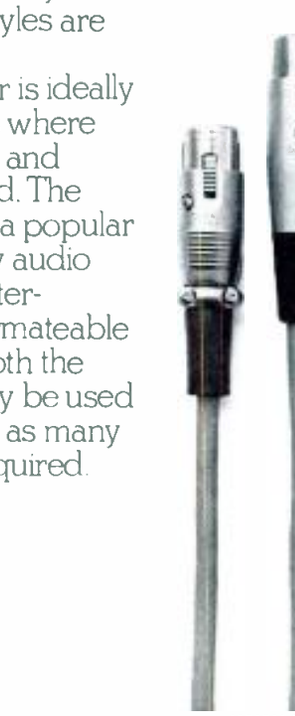

The AP LNE and AX LNE are specifically designed to handle the special needs of mains and other power supply applications.

For more information, please contact Commercial/Industrial Products Marketing Manager, ITT Cannon, a Division of ITT Corporation, 10550 Talbert Avenue, Fountain Valley, CA 92708, (714) 964-7400. For the sales office nearest you, call toll-free (800) 845-7000.

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Videomagnetics (1109)
Continued from page 198
for Sony U-matic format
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Videomedia (1308)
Established products
Z6000A-E: Video editing systems
Eagle 1-3: Video editing systems
Q-Star: Sequencer-station automation system
VMC-200: Total automation control
New products
Version 2 software for DOS systems
Circle (946) on Reply Card
see ad on page 99

VideoStar Connections (1122)
New products
Ku-Band transportable uplink and downlink equipment
Satellite networking services
Circle (947) on Reply Card

Videotek (1633)
Established products
VM-13 PRO: 13-inch rack-mount color monitor
Delphi I: dc-powered digital waveform monitor
VSM-5A: Vectorscope
RS-10A: 10x1 AFV routing switcher with two audio channels and breakaway
RS-12: 12x1 video routing switcher
RM-8A: 8-inch ac/dc portable color monitor
Audio, video, pulse and subcarrier DAs
Audio program monitors
Demodulators
New products
Studio-13: 13-inch rack-mount color monitor
TSM-5A: Waveform monitor with switchable line select
VSG-100: Sync generator with helical scan gen-lock and color bar output
APM-2RA: Dual input audio program monitor with simultaneous monitoring
Circle (948) on Reply Card
see ad on page 167

Viking Cases (1731)
Established products
Heavy-duty shipping cases
Light-duty carrying cases
Molded cases
Rack-mount cases
Custom cases
New products
See at booth
Circle (949) on Reply Card

Vital Industries (1212)†
Established products
SqueeZoom: Digital effects
VIX-114-4A1: Production switcher
VIX-114-2A1: Production switcher
VIX-114-10A: Production switcher
VIX-114-16A: Production switcher
VIX-115: On-air switcher
250P/N: Production switcher
SAM: Station Automation System
SANDI: Serial Access Network Data Information
PSAS: Production Switcher Automation System
New products
See at booth
Circle (950) on Reply Card

WSI Corporation (1104)
Established products
Weather graphics/weather-sports data
SuperSat GOES satellite imagery
Superadar
SuperSports scores and standings
New products
Meteosat European weather satellite imagery
New weather graphics software
Circle (951) on Reply Card

Ward-Beck Systems (1224)†
Established products
T1202: Transportable audio console
M1204B: Production audio console
M2484B: Broadcast/multi-track audio console
L2042: TV audio console
R1200: Radio audio console
MicroCOM: Microprocessor-controlled communications systems
R1000: Radio audio console
R2000: Radio audio console →

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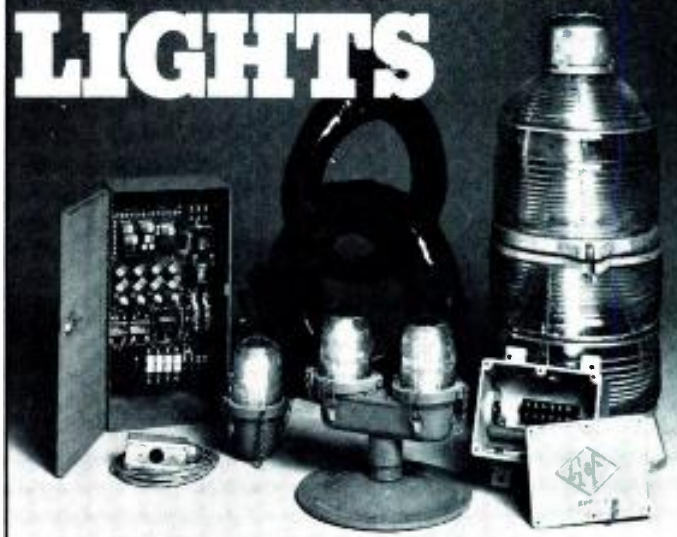
TOWER WARNING LIGHTS



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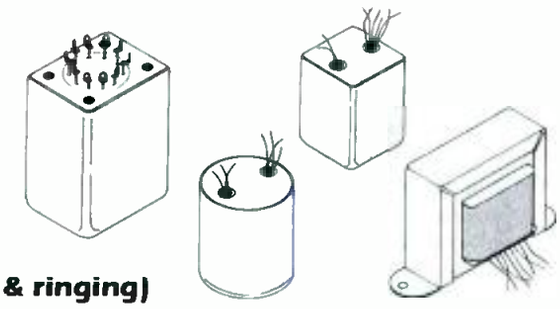

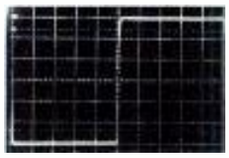

JE-16A
2 kHz Square Wave

INPUT TRANSFORMERS AND SPECIAL TYPES

Model	Application	Impedance Ratio Pri-Sec	Turns Ratio Pri:Sec	20 Hz Max Input Level[1] (dBu)	Typical THD Below Saturation (%) 20Hz / 1kHz	Frequency Response (dB ref. 1 kHz) 20Hz / 20kHz	Band-Width[2] –3dB @(kHz)	20 kHz Phase Response (degrees)	Over-Shoot (%)	Noise Figure (dB)	Magnetic Shield[4] (dB)	Number of Faraday[4] Shields	Package[5]	PRICES 1-19	100-249	1000
MICROPHONE INPUT																
JE-16-A JE-16-B	Mic in for 990 opamp	150-600	1:2	+8	0.036 / 0.003	–0.08 / –0.05	170	–10	<1.75	1.7	–30	1	A = 1 B = 2	63.61 68 25	42.49 45.60	29.32 31.46
JE-13K7-A JE-13K7-B	Mic in for 990 or I.C.	150-3750	1:5	+8	0.036 / 0.003	–0.10 / –0.22	85	–20	<3	2.3	–30	1	A = 1 B = 2	63.61 68.25	42.49 45.60	29.32 31.46
JE-115K-E	Mic in for I.C opamp	150-15K	1:10	–6	0.170 / 0 010	–0.50 / +0.10	115	5	<7	1.5	–30	1	3	41.48	27.72	21.65
LINE INPUT																
JE-11P-9	Line in	15K-15K	1:1	+26	0.025 / 0.003	–0.03 / –0.30	52	–28	<3		–30	1	1	102.86	68.72	47.42
JE-11P-1	Line in	15K-15K	1:1	+17	0.045 / 0.003	–0.03 / 0.25	85	–23	<1		–30	1	3	39.53	26.41	20.62
JE-6110K-B JE-6110K-BB	Line in bridging	30K-1800 (10K-600)	4:1	+24	0.005 / 0.002	–0.10 / –0.30	75	–15	<1		–30	1	B = 1 BB = 2	62.31 70 95	41.63 47.38	30.56 32.70
JE-10KB-C	Line in bridging	30K-1800 (10K-600)	4:1	+19	0.033 / 0.003	–0.11 / –0.08	160	–9	<2		–30	1	3	40.98	27.37	18.89
JE-11SSP-8M	Line in / repeat coil	600 / 150-600 / 150	1:1 split	+22	0.035 / 0.003	–0.03 / 0.00	120	9	<3.5		–30	1	4	151.90	101.47	70.01
JE-11SSP-6M	Line in / repeat coil	600 / 150-600 / 150	1:1 split	+17	0.035 / 0.003	–0.25 / –0.00	160	–5	<3		–30	1	5	78 62	52.52	36.24
SPECIAL TYPES																
JE-MB-C	2-way[3] mic split	150-150	1:1	–2	0.180 / 0.005	–0.25 / –0.20	88	–15	<1		–30	2	3	34 08	22.78	17.78
JE-MB-D	3-way[3] mic split	150-150-150	1:1:1	–2	0.180 / 0.005	–0.25 / –0.16	100	12	<1		–30	3	3	59.57	39.80	31.08
JE-MB-E	4-way[3] mic split	150-150-150-150	1:1:1:1	+10	0.050 / 0.002	–0.10 / –1.00	40	–18	<1		–30	4	1	96.29	64.32	44.38
JE-DB-E	Direct box for guitar	20K-150	12:1	+19	0.096 / 0.005	–0.20 / –0.20	80	–18	<1		–30	2	6	43.04	28.76	22.46

1. Max input level – 1% THD; dBu = dBv ref. 0.775 V
2. With recommended secondary termination
3. Specifications shown are for max. number of secondaries terminated in 1000 ohm (typical mic preamp)
4. Separate lead supplied for case and for each faraday shield
5. Except as noted. above transformers are cased in 80% nickel mu-metal cans with wire leads.

PACKAGE DIMENSIONS:

	W	L	H
1 =	1 5/16" Diam.		× 1 9/16"
2 =	1 3/16" ×	1 3/16"	× 1 5/8"
3 =	1 1/8" Diam.		× 1 1/16"
4 =	1 1/2" ×	1 3/4"	2 1/2" w / solder terminals
5 =	1 5/8" Diam.		× 1 3/4"
6 =	1 1/8" Diam.		× 15/16"

NICKEL CORE OUTPUT TRANSFORMERS[6]

Model	Construction	Nominal Impedance Ratio Pri-Sec	Turns Ratio Pri:Sec	20Hz Max Output Level[7] (dBu)	across (n) windings	600Ω Termi-nation Loss (dB)	DC Resistance per Winding (Ohm)	Typical THD Below Saturation (%) 20Hz / 1kHz	Frequency Response (dB ref. 1kHz) 20Hz / 20kHz	Band-Width –3dB @ (kHz)	20 kHz Phase Response (degrees)	Over-Shoot[8] (%)	Package[9]	PRICES 1-19	100-249	1000
JE-123-BMCF	Quadfilar 80% nickel	600-600 150-600	1:1 1:2	+28	2	–1.1	20	0.002 / 0.002	–0.02 / –0.02	>450 158	–2.1 –4.1	<1	7	87.41	44.17	30.47
JE-123-DMCF	Quadfilar 80% nickel	600-600 150-600	1:1 1:2	+21	2	–1.0	19	0.004 / 0.002	–0.02 / –0.00	>450 230	–1.2 –2.5	<1	8	50.71	33.88	23.38
JE-123-BLCF	Quadfilar	600-600 150-600	1:1 1:2	+32	2	–1 1	20	0.041 / 0.003	–0.02 / –0.01	>450 168	–1.9 –4.0	<1	7	61.30	35.79	24.70
JE-123-DLCF	Quadfilar	600-600 150-600	1:1 1:2	+27	2	–1.0	19	0.065 / 0.003	0.02 / –0.01	>450 245	–1.2 –2.5	<1	8	39.61	26.45	19.42
JE-123-SLCF	Quadfilar	600-600 150-600	1:1 1:2	+23.5	2	–1.1	20	0.088 / 0.003	0.03 / –0.01	>450 245	–1.2 –2.8	<1	9	33.48	22.35	15.43
JE-112-LCF	Quadfilar	600-600 150-600	1:1 1:2	+20.4	2	–1.6	29	0.114 0.003	0.03 / 0.01	>450 205	–1.2 –3.2	<1	10	25.48	17.01	12.49
JE-123-ALCF	Quadfilar	66.7-600	1:3	+26.5	3	–1.3	8	0.125 / 0.003	0.04 / +0.06	190	–4.6	<6	8	42.14	28.15	19.42
JE-11S-LCF	Bifilar w / split pri.	600-600 150-600	1:1 1:2	+30	1 (sec)	–1.7	63	0.058 / 0.002	0.02 / +0.01 0.02 / –0.05	>10MHz 155	+1.1 –4.1	<1	8	42.14	28.15	19.42

6. Multifilar construction has no faraday shield. All specifications are for 0Ω source, 600Ω load.
7. Max output level – 1% THD; dBu = dBv ref. 0.775 V
8. Source amplifier –3dB @ 100kHz
9. Output transformers are horizontal channel frame type with wire leads, vertical channel frames available.

PACKAGE DIMENSIONS:

	W	L	H	Mounting Centers
7 =	1 1/2" ×	2 5/16" ×	1 15/16"	2 13/16"
8 =	1 5/16" ×	1 15/16" ×	1 5/8"	2 3/8"
9 =	1 1/8" ×	1 11/16" ×	1 3/8"	2"
10 =	1 1/16" ×	1 7/16" ×	1 3/16"	1 3/4"

These charts include the most popular types which are usually available from stock. Many other types are available from stock or custom designs for OEM orders of 100 pieces or more can be made to order. Certified computer testing is available for OEM orders. Call or write for applications assistance and/or detailed data sheets on individual models.

Prices shown are effective 2/1/84 and are subject to change without notice.

jensen transformers
By REICHENBACH ENGINEERING

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(213) 876-0059 *Closed Fridays, visitors by appointment only.*

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Ward-Beck (1224)
Continued

L3242: TV audio console
Custom designed audio consoles
New products
See at booth
Circle (952) on Reply Card
see ad on back cover

Wavetek (1782)†
Established products
1880: CATV system analyzer
5120A/5130A: Frequency synthesizers
New products
See at booth
Circle (953) on Reply Card

Wegener Communications (515)
Established products
Satellite audio transmission products for subcarrier, SCPC and band-edge SCPC applications
Panda II: Noise reduction system
Multiple audio transmission systems for international satellite circuits
SCPC and subcarrier data transmission systems to 220kbits/sec
Vertical interval data transmission systems for data insertion, bridging, deletion and reception applications
New products
See at booth
Circle (954) on Reply Card

Want More information on advertised products?

Just refer to the reader service # beneath each ad. Circle the appropriate number on the Reader Service Card in the back of this issue. Complete the remaining information and mail!

BROADCAST engineering
P.O. Box 12901, Overland Park, KS 66212
U.S.A.

Whirlwind (329)
Established products
Audio and video cabling for industrial systems and portable equipment
Bulk connectors, bulk wire, transformer devices, interface panels and services
New products
See at booth
Circle (955) on Reply Card

White Instruments (1318A)
Established products
Audio equalizers
Real time audio analyzers
Pink noise generators
New products
See at booth
Circle (956) on Reply Card

Wilkinson Electric (305)†
See at booth
Circle (957) on Reply Card

Wilk Power & Video (1229)
Established products
CG-3350: Character generator and production titler
CG-3300: Character generator and production titler
CG-3330: Production titler
CG-3540: Character generator
CG-3550: Computer-controlled character generator
VAR-15X10: Audio-follow-video switcher
VAR 1201: Audio-follow-video switcher
VAR 0601: Audio-follow-video switcher
VAR 0602: Audio-follow-video switcher
New products
Routing switcher: 10x10 expandable
Character generator: With full color graphics
Circle (958) on Reply Card

William Bal Corporation
See *Bal, William*

Winsted (1238)
Established products
E9303: Mobile editing console
D4502: Editing rack
V8501: 70-inch vertical rack
U5000: Tape truck for videotape or film
System/85: Editing/production consoles
Super density storage cabinets
New products
H8520: Oak-trimmed editing console
System/85: 30-inch-wide consoles for large top loading VTRs
High capacity tape and film storage cabinets
Circle (959) on Reply Card
see ad on page 214

Wireworks (1014C)
Established products
MS/MR Series: Multibox and multirack input units
MSB/MSR Series: Tranformer-isolated mic splitters
MK Series: Main and extension cables
MT Series: Multitails interface components
MC Series: Chassis-mount multipin connector interfaces
New products
MSJ/MSC Series: Multipin input mic splitters
MPS Series: Phantom power supply components
MYJ/MYC Series: Prism components, allowing six, nine, 27 or 36 channels as inputs or outputs to be integrated into one system
Circle (960) on Reply Card

Wold Communications (1515)
Established products
Wold Satellite TV Network
News and sports basic delivery services
Mobile microwave and uplink services
SSTS system for radio play-by-play
Production services
Videoconferencing
New products
Syndicated programs, including 28 recurring weekly series and news services, motion pictures for TV and 1-time ad-hoc network TV specials
Circle (961) on Reply Card

Wolf Coach (1317)
Established products
S-102: Suburban ENG vehicle
New products
B-103: Wolf Coach B-series ENG vehicle
Circle (962) on Reply Card

Frank Woolley & Company (1405C)
Established products
113-16: Motionmaster video animation system, using polarized light for motion illusion
Animation system training
New products
See at booth
Circle (963) on Reply Card

World Tower (519)
Established products
Towers for TV, AM, FM, CATV, microwave, LPTV and 2-way communications
New products
See at booth
Circle (1490) on Reply Card

Yamaha Int'l. (1340)
Established products
PC Series: Power amplifiers
RM Series: Recording mixers
PM2000: Audio console
M1500: Audio console
M Series: Audio consoles
Producer Series: Audio components with 4-track cassette sytem
MQ Series: Audio consoles
EMX Series: Powered mixers
New products
REV-1: Digital reverberator
YDD2600: 8-tap digital delay
R1000: Preset digital reverberator
Circle (1491) on Reply Card
see ads on pages 129 and 130

www.americanradiohistory.com

One of the world's smallest digital still stores is also one of the largest.

Introducing "Snapshot" from MCI/Quantel. Only 12¼ inches high by 19 inches—including removable cartridge Winchester disk drive!

Snapshot is not only the smallest of MCI/Quantel's DLS 6000 series units—it's one of the smallest digital still stores in the world.

Snapshot lets you capture pictures from live asynchronous feeds, store up to 400 of them with titles, and replay them on demand. You can prepare and edit sequences or stacks of sequences. And you can search by title.

Need more? You can increase Snapshot's storage to 1,600 pictures. Or you can upgrade it to a DLS 6020 with on-air cuts and dissolves. Or upgrade it further to a DLS 6030, the most powerful still store available with production effects that bring an exciting look to your stills.

If that's not enough, you can integrate up to seven Snapshots—or other DLS 6000 series units—as workstations into our Central Lending Library (CLL). Now you can store over 10,000 stills at each workstation and have simultaneous access to 100,000 more from the CLL. Plus unlimited off-line storage on disc cartridges or videotape.

You can even include MCI/Quantel's Paint Box as one of the workstations. So you can create the finest electronic graphics ever seen in television and have them instantly available for on-air use as well as library storage.

So whether you want a small system or a big system, Snapshot is the place to start.

Call your local MCI/Quantel office for more details. Or get in touch with us directly at 415/856-6226. Micro Consultants, Inc., P.O. Box 50810, Palo Alto, California 94303.

MCI/QUANTEL

The digital video people.

MCI Quantel and "Snapshot" are trademarks of Micro Consultants, Inc

Circle (152) on Reply Card

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NAB-'84/Las Vegas

Product directory

This special section provides a directory to the NAB-'84/Las Vegas exhibitor products. Each exhibitor was asked to complete a comprehensive checklist of products to be shown. The following section is a compilation of that data. It shows major equipment headings followed by the exhibitor name and booth number (when provided before deadline).

This special section will be an aid in finding equipment of special interest at the show. But a word of caution: As **BE** goes to press, there are still changes being made daily in the exhibitor sign-ups, equipment being displayed and booth assignments. So, although every attempt has been made for accuracy in this section, double-check the final program at NAB-'84 to organize your show coverage and visits.

For those not attending NAB-'84/Las Vegas, the June issue of **BE** will provide a wrap-up of equipment trends at the show and the July issue will carry highlights of the technical radio and TV sessions.

ACOUSTICAL MATERIAL
AVC Systems (331)
Alpha Audio (210)
Broadcast Supply West (112A)
Centro Corporation (1101)
Industrial Acoustics (322)

AMPLIFIERS, PREAMP, POWER, DA (AUDIO)
ADM Technology (1223)
AVC Systems (331)
Allied Broadcast (639, 641)
Amtel Systems (1745)
Aphex Systems (513)
Arrakis (211)
Audio + Design/Calrec (402)
Auditronics (505)
BSM (637)
Robert Bosch (1603)
Broadcast Audio (319)
Broadcast Supply West (112A)
Broadcast Technology (1701)
Bryston Ltd. (517)
Camera Mart (1018)
Circuit Research (300)
Clyde Electronics (204A)
Connectronics (608)
Crown (428)
Datatek (1428)
Datatronix (1504)
Dynair (1404)
ESE (116, 1757)
Electronic Systems (406A)
Electro-Voice (1159)
Farrtronics (1709)
Fostex (1765)
Graham-Patten (1227A)
David Green (417)
Harris (401)
HEDCO (1225)
Holzberg (*)
Howe Audio (321)
ISI (1232)
Image Video (1341)
JBL (615)
LPB (405)
Laumic (1771)
Lenco (1419)
Logitek (613)
McCurdy (207)
McMartin (701)
Modular Audio (325)
Neve (1410)
Omicron (1748)
Pacific Recorders (113)
RAMSA/Panasonic (437, 1019)
RTS Systems (1626)
Radio Systems (213)
Ramko (415)
Sescom (1616)
Shure Brothers (1401A)
Sigma Electronics (1333)
Sony (605, 1200)
Spencer Broadcast (406)
Stanton Magnetics (102)
Symetrix (616)
Telemet (1202)
Television Equipment (1216)
Telex (600, 1605A)
Thomson-CSF (1001)
UREI (615)
United Research (604)
Valley People (318)
Videotek (1633)
Ward-Beck (1224)
Yamaha (1340)

AMPLIFIERS, PREAMP, POWER (RF)
Robert Bosch (1603)
Broadcast Microwave Services (1749)
Broadcast Supply West (112A)
Comark (1217)
Continental Electronics (101)
Elcom-Bauer (412)
Gray Communications (1618A)
Harris (401)
Information Transmission Systems (1734A)
McMartin (701)
Modular Audio Products (325)
Modulation Associates (1757)
Nurad (1426)
Ramko (415)
Richardson Electronics (212)
Scientific-Atlanta (1017)
System Associates (1331E)
Sony (605, 1200)
Townsend Associates (1420)
Varian Associates (1605)

AMPLIFIERS, PROCESSING, DA (VIDEO)
Amtel Systems (1745)
Apert-Herzog (1703)
Broadcast Video Systems (1326)
Robert Bosch (1603)
Datatek (1428)
Di-Tech (1301)
Dynair (1404)
Dynamic Technology (1719)
ESE (116, 1757)
FOR-A (1306)
GEC McMichael (1514)
Graham-Patten (1227A)
Grass Valley Group (1207)
David Green (417)
Grumman Aerospace (1631B)
Harris (401)
HEDCO (1225)
Holzberg(*)
ICM Video (1766)
ISI (1232)
Ikegami (1011, 1013)
Landy Associates (1747A)
Laumic (1771)
Leitch Video (1021)
Lenco (1419)
Marconi Electronics (1609, 1615)
Midwest (1710)
Montage Computer (1131)
NTI America (1014D)
Omicron (1748)
QSI Systems (1325)
Shintron
Sigma Electronics (1333)
Symetrix (616)
Sony (1200, 605)
TEA (1216)
Telemet (1202)
3M Company (1002)
Ultimatte (1642)
Valley People (318)
Videotek (1633)

ANALYZERS, AUDIO & VIDEO
Amber Electro (422)
Asaca (1226)
B & K Instruments (511A)
Eastman Kodak (1214)
Electronic Systems Labs (406A)
Eventide (323)
Fidelipac (411)
Inovonics (304)
L-W International (1602)
Laumic (1771)

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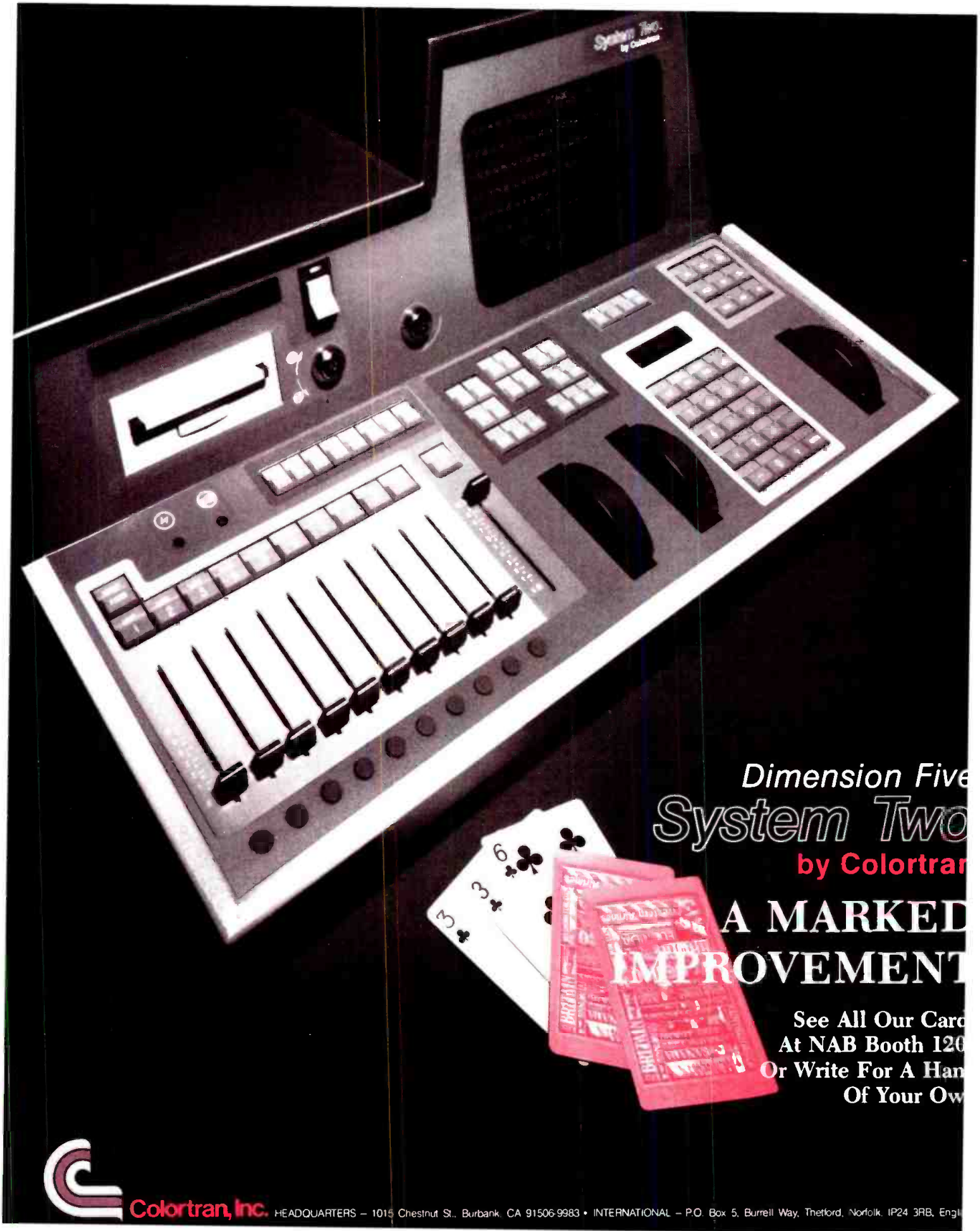

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NOW!

The Penny & Giles Feel in a Rotary Fader.

from Penny & Giles continue a tradition of incomparable performance, matchless quality, total reliability. They'll give you the same level of excellence you've come to expect with Penny & Giles' linear faders.

Discover a new standard of rotary action.

Nothing approaches the technology of Penny & Giles' new rotary faders:

- Ultra-smooth rotary action
- Mono or stereo (optional)
- Maintenance-free
- Fully sealed construction
- Up to eight outputs per fader
- Audio, linear or pan pot taper
- Detents and switches (optional)

For the complete story on Penny & Giles' new rotary fader, call or write:

As seen at NAB, Las Vegas.

Compare and there's no comparison.

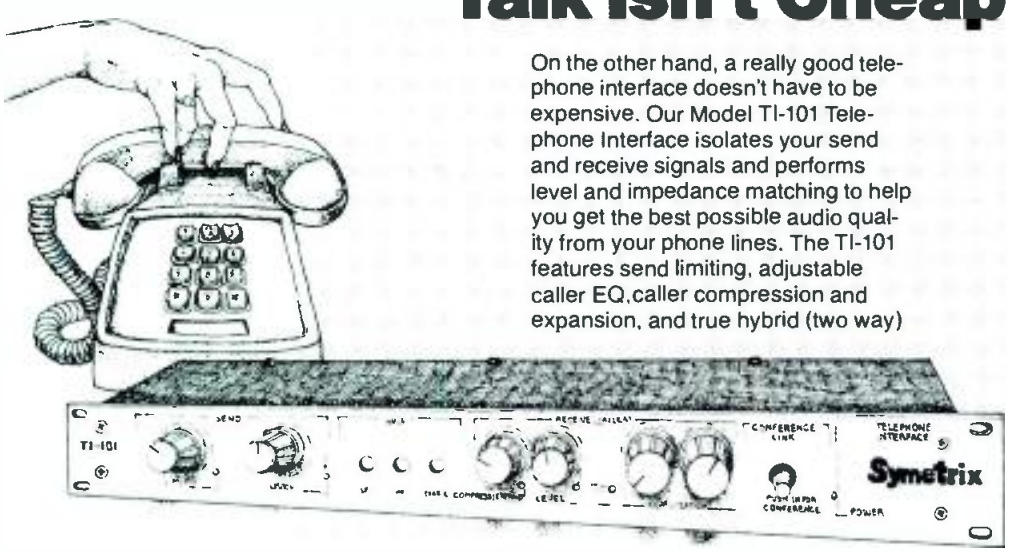
Nothing compares with Penny & Giles' world-famous smooth-as-glass feel. These totally new rotary faders

Penny & Giles

1640 Fifth Street, Santa Monica, CA 90401 · Phone: (213) 393-0014 · Telex: 652337

Circle (154) on Reply Card

Talk Isn't Cheap



On the other hand, a really good telephone interface doesn't have to be expensive. Our Model TI-101 Telephone Interface isolates your send and receive signals and performs level and impedance matching to help you get the best possible audio quality from your phone lines. The TI-101 features send limiting, adjustable caller EQ, caller compression and expansion, and true hybrid (two way) operation. If telephones are an important part of your operation then you know talk isn't cheap. So don't let yourself down. Call Symetrix or your favorite broadcast equipment supplier to get complete details and specifications on the Model TI-101 Telephone Interface.

Symetrix

Symetrix, Inc.
109 Bell Street
Seattle, WA. 98121. USA
Telephone: (206) 624-5012
Telex: 32-0281 GLOBECEN SEA

Circle (155) on Reply Card

Analyzers, audio & video
Continued

Leader Instruments (1349)
Marconi Instruments (1615)
Minolta (1113)
Philips Test (1408A)
Potomac Instruments (100)
Rohde & Schwarz (1203)
Sound Technology (500)
System Associates (1331E)
Tektronix (1601)
Thomson-CSF (1001)
UREI/JBL (615)
White Instruments (1318A)

ANIMATION/ELECTRONIC GRAPHICS

Accu-Weather (1134C)
Alden Electronics (1336)
Aurora Systems (1312)
Beston/McInnis-Skinner (1020)
Robert Bosch (1603)
Chyron (1610)
Colorgraphics Systems (1116)
Computer Graphics Lab (1143)
Convergence (1430)
Dubner Computer Systems (1630)
Forox (1620D)
GEC McMichael (1514)
Interactive Motion Control
Interand (1016)
Logica (1405E)
Lyon Lamb (1632A)
MCI/Quantel (1631)
Precision Echo (1617)
Sony (1200)
System Asociates (1331E)
Thomson-CSF (1001)
Video Associates Labs (1303)
Frank Woolley (1405C)

ANTENNAS

AVC Systems (331)
Aries Antenna Services (1770)
Antenna Technology (1737)
Andrew (1201A)
Bogner Broadcast Equipment (1319)
Broadcast Microwave Services (1749)
Broadcast Supply West (112A)
CSI (507)
Cablewave Systems (108)
Celwave RF (202)
Cetec Antennas (509)
Comark Comm (1217)
Continental Electronics (101)
Dielectric Communications (455)
Fort Worth Tower (1010)
GEC McMichael Ltd. (1514)
Harris (401)
Holzberg (*)
Lang Video Systems (1780)
Larcan (1626A)
LeBlanc & Dick (1149)
Marconi (1609)
Marti (501)
M/A-COM (1004)
Microdyne (1612)
Micro Communications Inc. (1014)
Nurad (1426)
RCA (1000)
Scientific-Atlanta (1017)
Shively (623)
Tennaplex (1127)
Townsend Assoc. (1420)
Wilkinson Electric/TTC (305)

ATTENUATORS

ADM (1223)
Aphex Systems (513)

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How Boston took advantage of us.

Boston is the home of a wealth of history: Paul Revere, the Boston Tea Party, and Harvard University. But respect for all that tradition didn't stop WNEV-TV from seeking equipment from other than the traditional suppliers.

After a thorough examination of the transmitters available today by the station's Engineering group led by Karl Renwanz, Vice President of Engineering and Operations, WNEV-TV decided to take advantage of the sophisticated simplicity of Larcan's Model "F" transmitter. They chose a pair of 30 kW TTC30000FH transmitters in parallel, backed up by a single TTC30000FH.

In today's competitive environment, a station such as WNEV-TV needs the performance and reliability that is designed into every Larcan transmitter. It also needs the back up and commitment to the business which Larcan, a company that specializes in RF, can provide.

Increasingly broadcasters in large and small markets are joining the new tradition by taking advantage of Larcan's Model "F" transmitters.

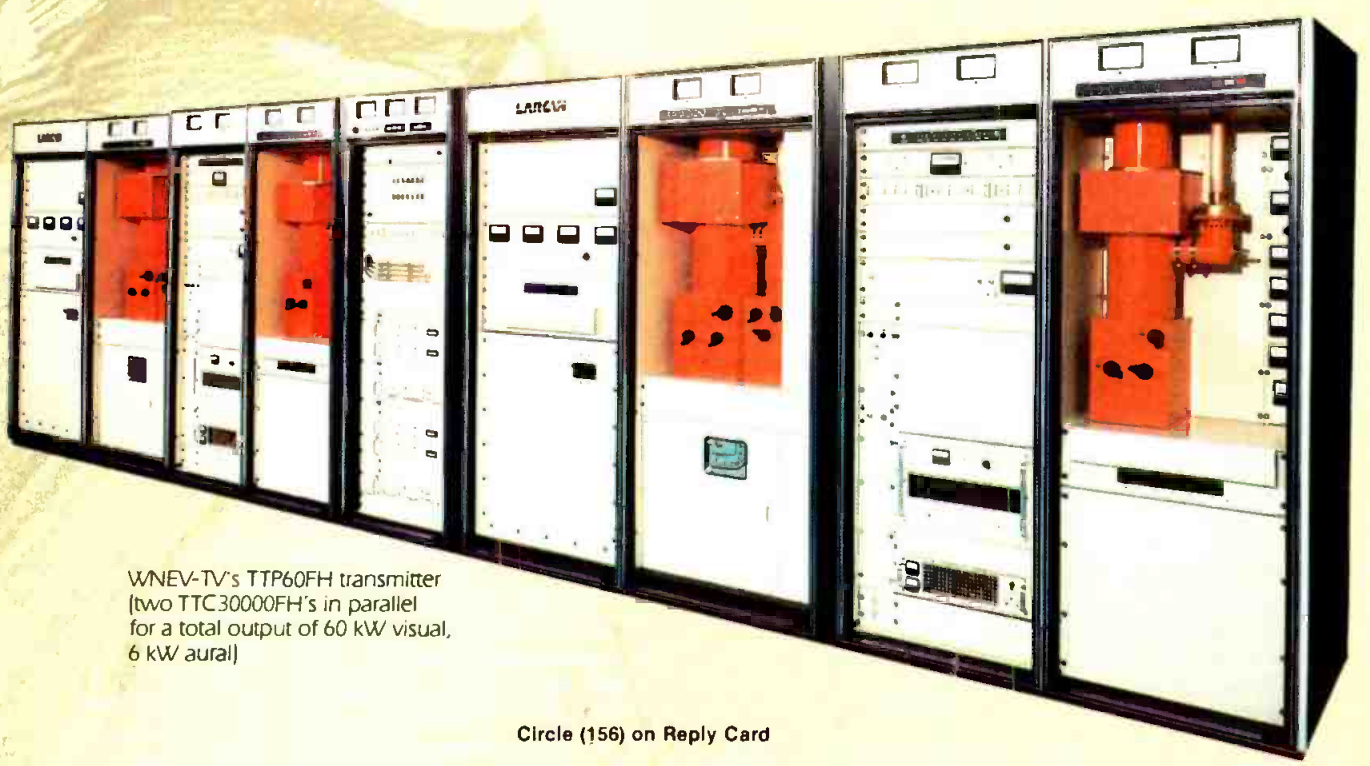
Find out what it can do for you by contacting:

LARCAN COMMUNICATIONS EQUIPMENT INC.
6520 Northam Drive
Mississauga, Ontario
Canada L4V 1H9
Telephone (416) 678-9970
Telex 06-968055

In the USA:
Lewis F. Page
14440 Cherry Lane Court
Suite 201
Laurel, Maryland 20707
Telephone (301) 490-6800

LARCAN

See us at the NAB Convention, Booth 1626-A



WNEV-TV's TTP60FH transmitter (two TTC30000FH's in parallel for a total output of 60 kW visual, 6 kW aural)

Circle (156) on Reply Card

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Attenuators
Continued

Bird Electronic (1625)
Datatronix (1504)
Electro Impulse (117)
Electro-Voice (1159)
HEDCO (1225)
Omicron (1748)
Penny & Giles (*)
Sescom (1616)
Shure (1401A)
Valley People (318)

ATS & EQUIPMENT
Camera Mart (1018)
Continental Electronics (101)
Delta Electronics (105)
Hallikainen & Friends (208)
Moseley (301)
Potomac (100)
QEI (307)
TFT (109)

AUDIO BANDWIDTH EXTENSION EQUIPMENT
Comrex (400)
Kahn Communications (625)
Marcom (306)
McCurdy (207)
Spencer Broadcast (406)
Valley People (318)
Ward-Beck (1224)

AUDIO CONSOLES
ADM Technology (1223)
AMEK (1620)
AVC Systems (331)
Allied Broadcast (639, 641)
Arrakis Systems (211)
Audio Developments (1743)
Audio + Design (402)
Audio-Technica (1141)
Auditronics (505)
Autogram (120)
Broadcast Audio (319)
Broadcast Electronics (303)
Broadcast Supply West (112A)
Broadcast Technology (1701)
Camera Mart (1018)
Clyde Electronics (204)
Comprehensive Video Supply (1145)
Comrex (400)
Connectronics (608)
Continental Electronics (101)
Datatronix (1504)
Elcom Bauer (412)
Electro-Voice (1159)
Electronic Systems Labs (406-A)
Fostex (1765)
Gotham Audio (509A)
Graham-Patten (1227A)
Gray Communications (1618A)
David Green (417)
Hallikainen & Friends (208)
Harris (401)
Harrison Systems (1324)
Holzberg (*)
Howe Audio Productions (321)
Interactive Systems (1167/1132)
Interface Electronics (1405-A)
LPB (405)
LTM (1518)
Laumic (1771)
Logitek (613)
McCurdy Radio (207)
McMartin Industries (701)
Microtime (1230)
Micro Trak (*)
Neve (1410)
Pacific Recorders (113)
Quad-Eight/Westrex (1630)
Quantum Audio Labs (509A)
RTS Systems (1142)
Radio Systems (213)
Ramko Research (415)
RAMSA/Panasonic (437)
SESCOM (1616)
Solid State Logic (1723)
Sony (1200, 605)
Soundcraft Electronics (219)
Spencer Broadcast (406)
Studer/Revox (201)
TASCAM (1304)
UMC Electronics (114)
UREI (615)
Valley People (318)
Ward-Beck (1224A)
Yamaha International (1340)

AUDIO LEVEL INDICATORS
AMEK (1620)
ATI (420)
Auditronics (505)
AVC Systems (331)
BSM (637)
Broadcast Supply West (112A)
Broadcast Technology (1701)
Clyde Electronics (204A)
Camera Mart (1018)
Dorrough Electronics (312)
ESE (116, 1757)
Gotham Audio (509A)
Harrison (1324)
Holzberg (*)
Inovonics (304)

NEW

Better than BMX! Ahead of Auditronics! Astounding Price!

TO BE UNVEILED AT NAB

The Logitek PERFECTIONIST
Broadcast Studio Console

	PERFECTIONIST	Audi. 200	BMX
Max THD	<.1%	<.15%	<.3%
Inputs/ mix channel	4	2	2
Fader Type	rotary or slide	slide only	slide only
Connectors	remote punch blocks	internal plugs	rear panel Molex
Switches	hall-effect	hall-effect	mechanical
Warranty	5 years	1 year	not listed
Price	<$10,000	much more	even higher

SEE US AT NAB BOOTH 613
OR CALL 800-231-5870
(Texas, Alaska, Hawaii call 713-782-4592 collect)
for full information and the name of your Logitek *Instant Action* Dealer.

Logitek Electronic Systems, Inc.

Circle (157) on Reply Card

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Let a leader in sound technology lead you through the commercial sound barrier. Introducing Panasonic Commercial Sound Systems.

For more than 40 years, the parent company of Panasonic, Matsushita Electric, has supplied the international commercial sound market with products. Dependable, quality products that are the result of the engineering expertise, sophisticated testing and rigorous quality-control standards of Matsushita—one of the largest and most innovative electronics companies in the world.

And now, Panasonic is introducing a line of quality compact sound amplification/paging units that offer some of the most advanced features available today.

Our 30, 60 and 120 watt 5-input Mixer Power Amps (Models WA-735P, WA-745P, WA-755P respectively) feature a built-in AM/FM tuner, three low impedance microphone inputs, a transformer balanced auxiliary input for telephone paging, a voice-activated priority circuit and a tone generator for sound level setting. Plus a two-tone calling chime for paging.

Many of these features are offered without an AM/FM tuner in our other 60 and 120 watt 5-input Mixer Power Amps (Models WA-740P, WA-750P).

Our 15 and 30 watt 4-input Mixer Power Amps (Models WA-300P, WA-320P) feature two low impedance microphone inputs and a transformer balanced auxiliary input for telephone paging. And both can be powered by a DC 13.2 volt source for portable operation.

Remember: Panasonic is a leading name in advanced sound technology. So, if you're looking for Commercial Sound System equipment, follow a leader: Panasonic.

For more information on Panasonic Commercial Sound Systems, please contact: Commercial Sound Systems Department, Audio-Video Systems Division, Panasonic Industrial Company, One Panasonic Way, Secaucus, NJ 07094.

Panasonic
Industrial Company

Circle (312) on Reply Card

www.americanradiohistory.com

Audio level indicators
Continued
Marcom (306)
McCurdy (207)
McMartin (701)
Microtime (1230)
Pacific Recorders (113)
Ramko (415)
Real World Technologies (1520)
Sescom (1616)
Sony (1200. 605)
Sound Technology (500)
Thomson-CSF (1001)
Videotek (1633)
White Instruments (1318A)

AUDIO PROCESSORS & EFFECTS
ADM Technology (1223)
AMEK (1620)
AVC Systems (331)
Advanced Music Systems (1330)
Aphex Systems (513)
Audio + Design (402)
Audio Technologies (420)
Broadcast Supply West (112A)
CRL (300)
Camera Mart (1018)
Continental Electronics (101)
Connectronics (608)
dbx (107A)
Dorrough (312)
Electronic Systems (406A)
Electro-Voice (1159)
Eventide (323)
Fostex (1765)
Gotham Audio (509A)
Harris (401)
Holzberg (*)
Inovonics (304)
Kahn Communications (625)
Knox Video (1511)
Lexicon (1139)
Marti Electronics (501)
McMartin (701)
Micmix (106A)
Modulation Associates (1737)
Moseley (301)
Orban (607)
Ramko (415)
Sescom (1616)
Sony (605. 1200)
Spencer (406)
Symetrix (616)
TASCAM (1304)
Thomson-CSF (1001)
UREI (615)
URSA Major (512)
Valley People (318)
Wegener Communications (1782)
White Instruments (1318A)
Yamaha International (1340)

AUTOMATION EQUIPMENT (AUDIO)
AVC Systems (331)
Adams-Smith (1724)
AMEK (1620)
Barrett Associates (103)
BTX (1124)
Beston/McInnis (1020)
Robert Bosch (1603)
Broadcast Electronics (303)
Century 21 (204)
Data Communications (1014)
Digital Services (1302)
Datatronix (1504)
Gotham Audio (509A)
Harris (401)
Harrison Systems (1324)
IGM Communications (403)
Microtime (1230)
Quad-Eight/Westrex (1636)
Solid State Logic (1723)
Sono-Mag (SMC) (707)
Studer Revox (201)
UMC Electronics (114)
Valley People (318)

AUTOMATION (BUSINESS)
AF Associates (1611)
Basys (1129)
Broadcast Electronics (303)
Columbine Systems (1323. 118)
Computer Concepts (404)
Data Communications (1014)
Dynamic Technology (1719)
Harris (401)
IBM (1607C)
Kaman Sciences (1607)

AUTOMATION (NEWSROOM)
AF Associates (1611)
Colorgraphics Systems (1116)
Data Communications (1014)
Dynamic Technology (1719)
Harris (401)
Quanta (1432)
UMC Electronics (114)
Video Magnetics (1109)

AUTOMATION (VIDEO)
AF Associates (1611)

Continued on page 228

HOW DO YOU IMPROVE ON A GOOD THING?

Peter Lisand follows a tough act . . .

Peter-Lisand has learned from its successes. Proof of this can be seen in our two new camera support systems. Our heavy-duty camera head has a 30-50 pound capacity, while the light-duty style holds 15-30 pounds. Here are a few reasons both heads deserve your attention:

- True fluid action maintains a smooth regulated motion by a sensitive system without brake shoes, bands, or other mechanical parts to interfere with its operation. Separate positive locks and drag are featured on the pan and tilt. Tilt achieves a full 90° vertical position.
- Sealed leak-proof chamber assures long-lasting, problem-free operation.
- Adjustable quick-release will counterbalance camera and lens requirements. (optional)
- Versatile control—use right, left or dual handles.
- New reversible foot, rubber-tipped for interiors and standard metal points for outside use, can be ordered with either of the JRA tripods. (optional)
- Tripods come with various top castings to accommodate existing systems.
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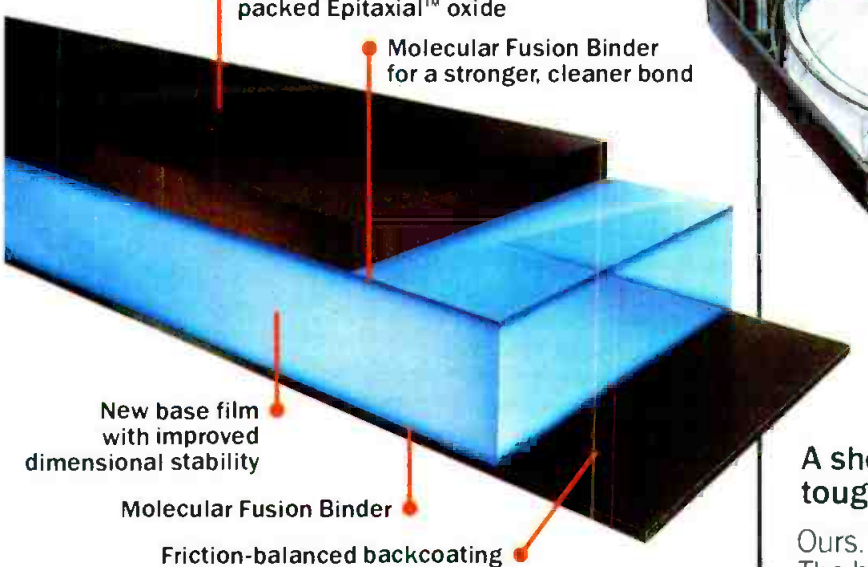

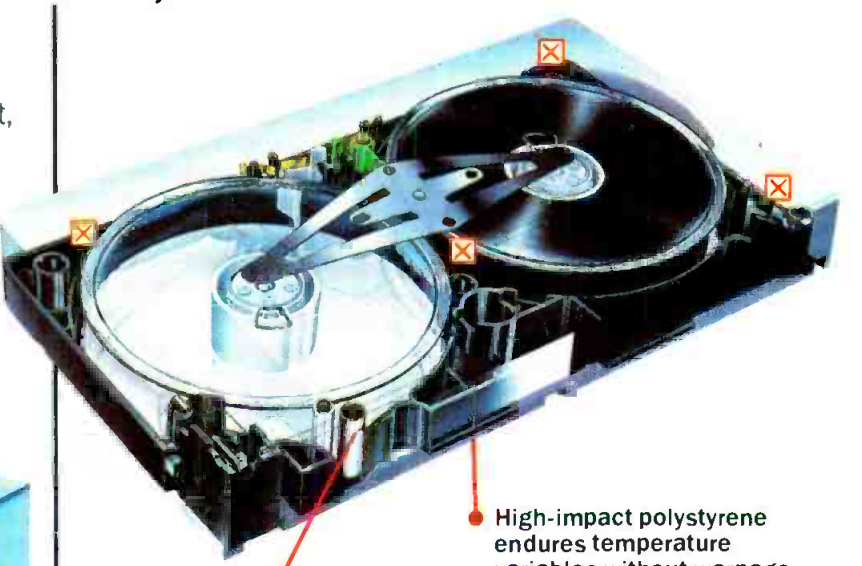

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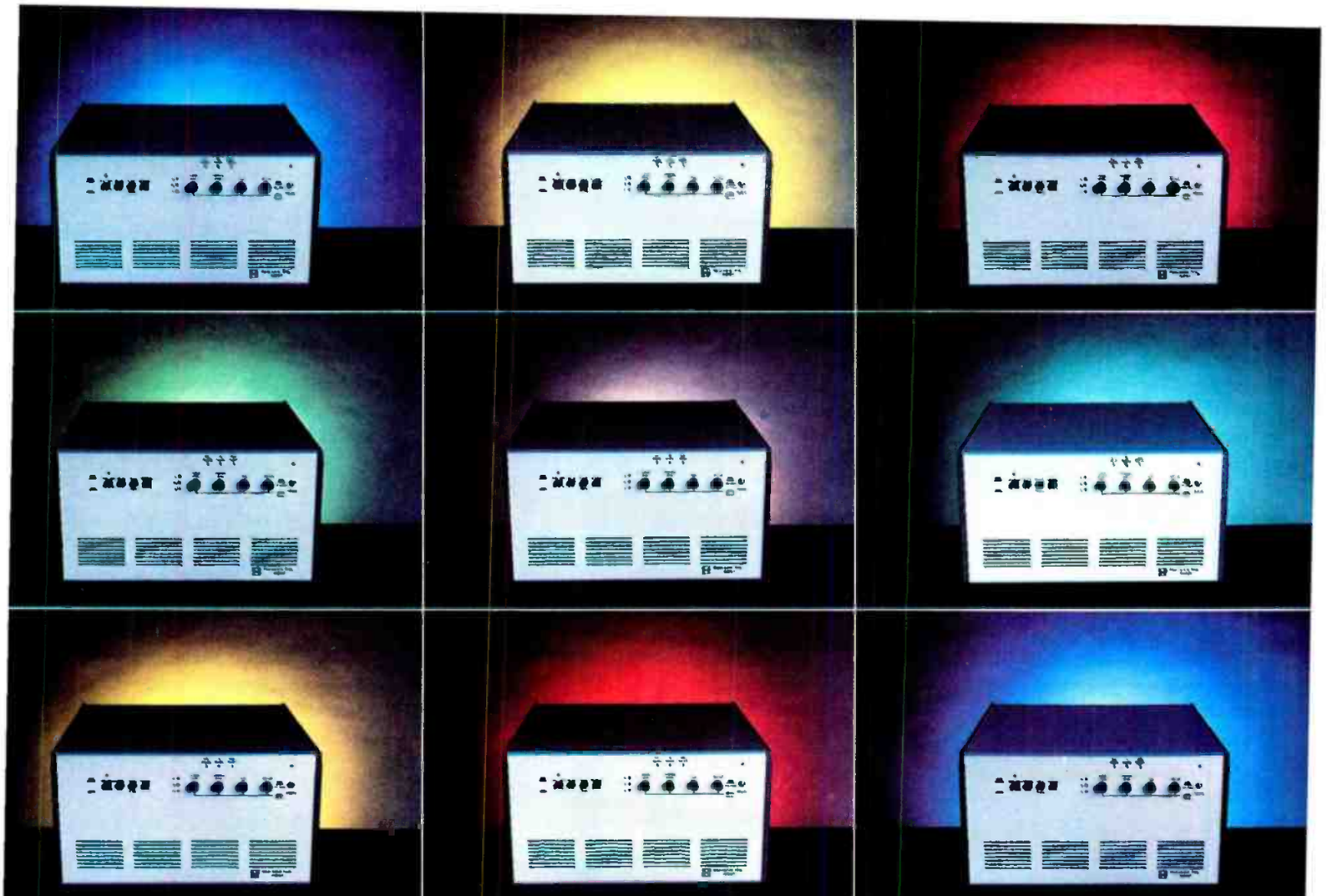

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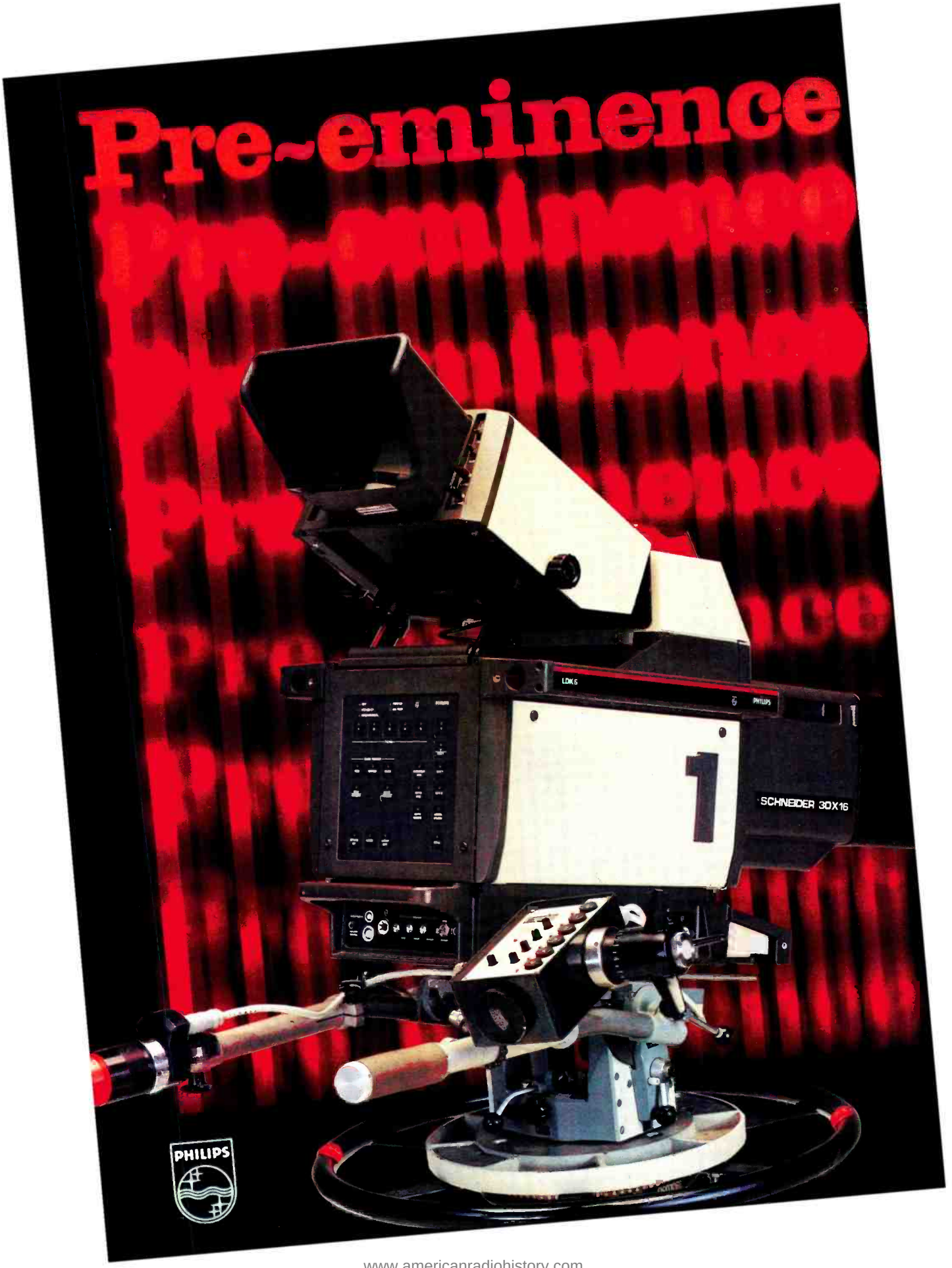

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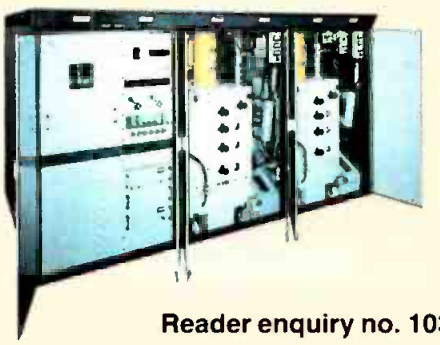

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Videotek (1633)
Vital (1212)

GENERATORS (VIDEO SPECIAL EFFECTS)
ADDA (1100)
Ampex (1400)
Aurora Systems (1312)
Robert Bosch (1603)
Camera Mart (1018)
Chroma Digital Systems (*)
Chyron (1610)
Colorado Video (1222)
Comprehensive Video Service (1145)
Digital Services (1302)
EchoLab (1510)
FOR-A (1306)
Graham-Patten (1227A)
Grass Valley Group (1207)
Gray Communications (1618A)
Harris (401)
ISI (1232)
Interactive Systems (1132/1167)
Interand (1016)
JVC (1234)
Knox Video (1511)
Laird Telemedia (1721)
Laumic (1771)
Leader Instruments (1349)
MCI/Quantel (1631)
NEC (1415)
NTI (1014D)
Omnicron Video (1748)
Paltex (1005)
Panasonic (1019)
Precision Echo (1617)
Sony (1200)
Symtec (1522)
System Associates (1331E)
Thomson-CSF (1001)
3M Broadcast (1002)
Toshiba (1631A)
Vital (1212)

HEAD & REFURBISHING SERVICES
Ampex (1400)
CMC Technologies (1425)
Gray Communications (1618A)
Restoration/Sprague Magnetics (705)
Saki Magnetics (416)
System Associates (1331E)
Taber (711)
United Research Labs (604)
Videomagnetics (1109)

HEADPHONES
AVC Systems (331)
Advanced Video (*)
Audio-Technica (1141)
Beyer Dynamics (426)
Broadcast Supply West (112A)
Camera Mart (1018)
Continental Electronics (101)
Fostex (1765)
Gray Communications (1618A)
Midwest (1710)
Nalpak Video Sales (1722)
R-Columbia (1111)
Sennheiser (1137)
Sony (605, 1200)
Stanton Magnetics (102)
Telex (600/1605A)
TV Equipment (1216)

HELICOPTER, SALES & RENTAL
Broadcast Microwave (1749)

INTERCOMS, WIRED
AVC Systems (331)
Anchor Systems (1618C)
Camera Mart (1018)
Clear-Com Systems (1502)
Datatronix (1504)
Farrtronics (1709)
Gray Communications (1618A)
HM Electronics (1130)
McCurdy Radio (207)
Midwest (1710)
Nalpak Video Sales (1722)
Neve (1410)
Olesen (1307)
Pacific Recorders (113)
R-Columbia (1111)
RTS Systems (1142)
Swintek (1503)
Telex (600/1605A)
Theatre Services & Supply (1513)
Ward-Beck (1224)

LIGHTING DIMMERS & CONTROLLERS
B-W Lighting (1753)
Camera Mart (1018)
Colortran (1205)
Comprehensive Video (1145)
Desisti Americas (1131)
Dilor Industries Ltd. (*)
Dynamic Technology (1719)

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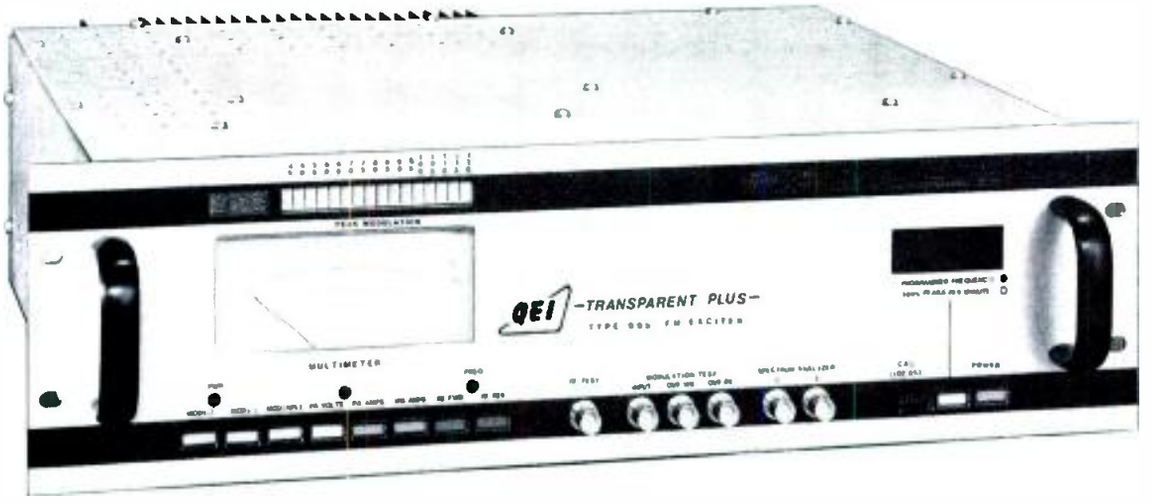

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• Jampro-Cetec • JBL • Leader
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Lighting dimmers
Continued

Electro Controls (1631C)
Electronic Systems Labs (406A)
Gray Communications (1618A)
Great American Market (1108)
Keylite Production (1220)
Mole-Richardson (1006)
Olesen (1307)
Strand-Century (1418)
Theatre Service & Supply (1513)
Union Connector (1783)

LIGHTING GELS, FILTERS, GOBOS, EFFECTS
Camera Mart (1018)
Cinemills (1140)
Colortran (1205)
Desisti Americas (1131)
Great American Market (1108)
Keylite Production Services (1220)
Mole Richardson (1006)
Olesen (1307)
Rosco Laboratories (1235)
Theatre Service & Supply (1513)
Tiffin (1422)

LIGHTS, PORTABLE & STUDIO
Anton/Bauer (1337)
Arriflex (1421)
B-W Lighting (1753)
Bogen Photo (1705)
Broadcast Supply West (112A)
Camera Mart (1018)
Cine 60 (1423)
Cinema Products (1221)
CineMills (1140)
Colortran (1205)
Comprehensive Video (1145)
Cool Light (1329)
Desisti Americas (1131)
Electro Control (1631C)
Frezzolini (1107)
General Electric (1007)
Gray Communications (1618A)
Great American Market (1108)
Keylite Production (1220)
Kliegl Brothers (1604)
LTM (1518)
Mole-Richardson (1006)
Olesen (1307)
Perrott (1729)
Phoebus (1331C)
Strand-Century (1418)
Sylvania GTE (1401B)
Theatre Supply & Services (1513)

LIGHTNING PROTECTION/POWER CONDITIONING
Peter Dahl (612)
Gray Communications (1618A)
Lightning Elimination (302)
Mole-Richardson (1006)

MACHINE SYNCHRONIZERS (ATR & VTR)
AVC Systems (331)
Adams-Smith (1724)
Audio Kinetics (1173)
BTX (1124)
Robert Bosch (1603)
Interactive Systems (1132/1167)
Omicron (1748)
Sony (605, 1200)
System Associates (1331E)

METERS (ALL TYPES)
Audio Technologies (420)
Bird Electronic (1625)
Camera Mart (1018)

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Meters (All types)
Continued

CineMills (1140)
dbx (107A)
Gotham Audio Corp (509A)
Harrison Systems (1324)
Inovonics (304)
Keylite Production Services (1220)
Pacific Recorders (113)
Radio Systems (213)
Ramko Research (415)
Real World Technologies (1520)
Rohde & Schwarz (1203)
Tentel (1613)

MICROPHONES, MIXERS, ACCESSORIES
AVC Systems (331)
Accurate Sound(*)
Allied Broadcast Equipment (639, 641)
Anchor Systems (1618C)
Audio + Design (402)
Audio-Technica (1141)
Beyer Dynamics (426)
Broadcast Supply West (112A)
Camera Mart (1018)
Comprehensive Video Service (1145)
Continental Electronics Mfg. (101)
Countryman Associates (1720)
Electro-Voice (1159)
Electronic Systems Labs (406A)
Fostex (1765)
Gotham Audio (509A)
Gray Communications (1618A)
David Green (417)
Harris (401)
Holzberg (*)
LTM (1518)
Marti Electronics (501)
Micron Audio (1122C)
Midwest (1710)
Milab (Camera Mart) (1018)
Nady Systems (1133)
Nalpak Video Sales (1722)
Sennheiser Electronic (1137)
Shure Brothers (1401A)
Sony (1200, 605)
Spencer Broadcast (406)
Swintek (1503)
Telex (600/1605A)
Valley People (318)

MICROWAVE SYSTEMS (MDS, ITFS)
Andrew (1201A)
Broadcast Microwave Service (1749)
GEC-McMichael (1514)
Harris (401)
Information Trans. Systems (1734A)
Lang Video Systems (1780)
M/A-COM (1004)
Micro Communications (1014)
Micro Controls (104)
System Associates (1331E)
Varian Associates (1605)

MONITORS (AUDIO)
AVC Systems (331)
Asaca (1226)
Allied Broadcast Equipment (639, 641)
Anchor Systems (1618C)
Audio Technologies (420)
Broadcast Supply West (112A)
Broadcast Technology (1701)
Camera Mart (1018)
Continental Electronics (101)
Electro-Voice (1159)
Fostex (1765)
Gray Communications (1618A)
David Green (417)
Harris (401)
Holzberg (*)
Interactive Systems (1132/1167)
JBL (615)
Laumic (1771)
Logitek (613)
Marcom (306)
McMartin Industries (701)
Midwest Corporation (1710)
Modular Audio Products (325)
Ramko Research (415)
Sescom (1616)
Sony (1200, 605)
Spencer Broadcast (406)
Studer Revox America (201)
TFT (109)
Telemet (1202)
UMC Electronics (114)
Videotek (1633)
Yamaha International (1340)

MONITOR (TEST EQUIPMENT/ METERS)
Bird Electronics (1625)
Broadcast Video Systems (1326)
Camera Mart (1018)
CeCo (1010A)
Delta Electronics (105)
Gray Communications (1618A)
Laumic (1771)
Leader Instruments (1349)
M/A-COM (1004)
McMartin Industries (701)
Midwest (1710)
Motorola (309)
Rohde & Schwarz (1203)
System Associates (1331E)
TV Engineering (1700)
TV Equipment (1216)
Valley People (318)
Videotek (1633)

MONITORS (VIDEO/PICTURE)
Asaca (1226)
Robert Bosch (1603)
Broadcast Systems (1500)
Camera Mart (1018)
CeCo (1010A)
Conrac (1401)
Elector/Band (*)
Electrohome Limited (1744)
GEC McMichael (1514)
Gray Communications (1618A)
Harris (401)
Ikegami (1011/1013)
Interactive Systems (1167/1132)
JVC (1234)
Landy Associates (1747A)
Laumic (1771)
Lenco (1419)
Midwest (1710)
Panasonic (1019)
Philips/Test (1408A)
Rohde & Schwarz (1203)
Sharp (1102)
Sony (1200)
System Associates (1331E)
Tektronix (1601)
TV Equipment (1216)
Videotek (1633)

MULTIPLEXING SYSTEMS, AUDIO/VIDEO
BTX (1124)
Bayly (124)
Camera Mart (1018)
Datatronix (1504)
Gray Communications (1618A)
L-W International (1602)
McMartin (701)
NEC (1415)
Sescom (1616)
Spencer Broadcast (406)
System Associates (1331E)
Thomson-CSF (1001)
Wegener Communications (1782)
Whirlwind (329)

MUSIC LIBRARIES, SOUND EFFECTS
Comprehensive Video Supply (1145)
DeWolfe (1743)
Drake Chenault (2875)
Media General (410)
Music Director (709)
Music Works (209)
Network Productions Music (1138)
Soper Sound (1620B)
Sound Ideas (1620C)
Valentino (1231)

NOISE REDUCTION SYSTEMS (AUDIO)
Audio + Design (402)
Broadcast Supply West (112A)
Camera Mart (1018)
Connectronics (608)
dbx (107A)
Dolby Laboratories (1311)
Fostex (1765)
Gotham Audio (509A)
Gray Communications (1618A)
Inovonics (304)
McMartin (701)
Micmix (106A)
Midwest (1710)
Ramko (415)
Symetrix (616)
Valley People (318)
Wegener Communications (1782)

NOISE REDUCTION SYSTEMS (VIDEO)
Camera Mart (1018)
Digivision (1507)
Fortel (1409B)
Gray Communications (1618A)
Harris (401)
ICM Video (1766)
Midwest (1710)
Philips TV Systems (1500A)
Sony (1200)
Thomson-CSF (1001)

PATCH PANELS, JACKS, PLUGS
ADC Magnetic Controls (1320)
ADM Technology (1223)
AF Associates (1611)
B-W Lighting (1753)
Broadcast Systems (1500)
Broadcast Supply West (112A)
Celwave RF (202)
Comark (1217)
Comprehensive Video Supply (1145)
Connectronics (608)
Electronic Systems Labs (406A)
Farrtronics (1709)
Fostex (1765)
Gentner Engineering (636)
Gray Communications (1618A)
Harris (401)
Kings Electronics (1623)
Kliegl Brothers (1604)
Lemo (1334)
Micro Communications (1014A)
Mole Richardson (1006)
Oleson (1307)
Patch Bay Designation (1773)
Potomac Instruments (100)

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Patch panels
Continued

Radio Systems (213)
Sescom (1616)
Shively (623)
TASCAM (1304)
Union Connector (1783)
Whirlwind (329)

POWER SUPPLIES
Anton Bauer (1337)
Robert Bosch (1603)
Broadcast Microwave Services (1749)
Camera Mart (1018)
Peter Dahl (612)
Frezzolini (1107)
Gray Communications (1618A)
Kay Industries (122)
Modular Audio Products (325)
Mole Richardson (1006)
Perrott Engineering (1729)

PROGRAM SERVICES
BPI (200)
Byline Magazine (CBS) (606)
Century 21 (204)
Concept Productions (423)
Drake Chenault (2875)
Media General (410)
Music Director (709)
Music Works (209)
UPI (430)

PROJECTIONS (TV LARGE-SCREEN)
Camera Mart (1018)
Cinema Products (1221)
Electrohome (1744)
General Electric (1007)
Gray Communications (1618A)
JVC (1234)
Listec (1406)
Panasonic (1019)
RCA (1000)
Sony Video (1200)

PROJECTORS (TELECINE & ACCESSORIES)
Camera Mart (1018)
Gray Communications (1618A)
L-W International (1602)
Laird Telemedia (1721)
System Associates (1331E)
Telex (600/1605)
Thomson-CSF (1001)

PROMOTIONAL
Communication Graphics (630)
Concept Productions (423)
Media General (410)
Prismagraphics (110A)
US Tape and Label (602)
Wold Communications (1515)

PROMPTING SYSTEMS
Beston/McInnis (1020)
Cinema Products (1221)
Colorgraphics Systems (1116)
Dream Data (1728)
Gray Communications (1618A)
Laird Telemedia (1721)
Listec (1406)
Q/TV (1401D)
Telescript (1407)

RECEIVERS (ALL TYPES)
Broadcast Microwave Services (1749)
Broadcast Supply West (112A)
Comrex Corporation (400)
Emergency Alert Receivers (508)
GEC-McMichael (1514)
Gorman Redlich (506)
Gray Communications (1618A)
JVC (1234)
M/A-COM (1004)
Marti Electronics (501)
McMartin (701)
Microdyne (1612)
Midwest (1710)
Modulation Associates (1737)
Motorola (309)
Panasonic (437, 1019)
Pinzone (1615A)
Potomac (100)
Sansui (130)
Scientific-Atlanta (1017)
Sescom (1616)
Sharp (1102)
Sony (1200)
Studer Revox (201)

RECORD CARE PRODUCTS
Allsop (1177)
Audio-Technica (1141)
Broadcast Supply West (112A)
Camera Mart (1018)
Restoration/Sprague Magnetics (705)
Stanton (1123)

RECORDER/CAMERA COMBINED SYSTEMS
Ampex (1400)
Robert Bosch (1603)
Camera Mart (1018)
Frezzolini (1107)
Gray Communications (1618A)
Hitachi Denshi (1402)
Holzberg (*)
Ikegami (1011/1013)
JVC (1234)
NEC (1415)
PEP (1408)
Panasonic (1019)
RCA (1000)
Sony (1200)
System Associates (1331E)
TEC (1700)
Thomson-CSF (1001)
Toshiba (1631A)

RECORDER CARE PRODUCTS
Allsop (1177)
Broadcast Supply West (112A)
Camera Mart (1018)
Comprehensive Video Supply (1145)
Restoration/Sprague Magnetics (705)
United Research Lab (604)

RECORDERS (AUDIO, REEL CARTRIDGE, CASSETTE)
AVC Systems (331)

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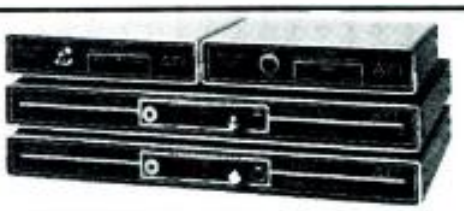
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Recorders (audio)
Continued

Allied Broadcast (639, 641)
Accurate Sound (*)
Audi-Cord (123)
Broadcast Electronics (303)
Broadcast Supply West (112A)
Camera Mart (1018)
Continental Electronics (101)
Fostex (1765)
Gotham Audio Corp (509A)
Gray Communications (1618A)
David Green (417)
Harris (401)
Interactive Systems (1167/1132)
ITC/3M (311)
Midwest (1710)
Nagra (1213)
Otari (601)
Pacific Recorders (113)
Ramko (415)
Scribe Recorders (214)
Sonomag—SMC (707)
Soundcraft (219)
Sony (605, 1200)
Spencer (406)
TASCAM (1304)
Telex (600)
UMC Electronics (114)
United Research (604)

RECORDER (DIGITAL AUDIO)
AVC Systems (331)
Broadcast Supply West (112A)
dbx (107A)
JVC (1234)
Sony (1200, 605)
Spencer Broadcast (406)
Studer (201)

RECORDERS (VIDEODISC, SLOW MOTION REPLAY)
Camera Mart (1018)
Forox (1620D)
Gray Communications (1618A)
Midwest (1710)
Panasonic (1019)
System Associates (1331E)
3M Optical (1002)

RECORDER (VIDEOTAPE)
AF Associates (1611)
Ampex (1400)
Robert Bosch (1603)
Camera Mart (1018)
Forox (1620D)
Frezzolini (1107)
Gray Communications (1618A)
ISC (1132/1167)
Ikegami (1011/1013)
Hitachi Denshi (1402)
JVC (1234)
Lake Systems (1165)
Laumic (1771)
Midwest Corporation (1710)
NEC (1415)
PEP (1408)
Panasonic (1019)
RCA (1000)
Sony (1200)
System Associates (1331E)
3M (1002)
Thomson-CSF (1001)

REMOTE-CONTROL SYSTEMS
Andrew (1201A)
Anton/Bauer (1337)
BTX (1124)
Robert Bosch (1603)
Bowen Broadcast (1770)
Broadcast Supply West (112A)
CAT Systems (1014B)
Camera Mart (1018)
Continental Electronics (101)
Delta Electronics (105)
Dynair (1404)
Graham-Patten (1227A)
David Green (417)
Grumman (1631B)
Harris (401)
Holzberg (*)
Hallikainen & Friends (208)
IGM (403)
Listec (1406)
McMartin (701)
Marti (501)
Micro Control (104)
Moseley (301)
Neve (1410)
Potomac (100)
Scientific-Atlanta (1017)
Swintek (1503)
Symetrix (616)
TFT (109)
UMC Electronics (114)

SATELLITE COMMUNICATIONS (EARTH STATIONS AND ANTENNAS)
Andrew (1201A)
Antenna Technology (1737)
Avantek (1742)
Broadcast Microwave Services (1749)
GEC McMichael (1514)
Harris (401)
Lang Video Systems (1780)
M/A-COM (1004)
Microdyne (1612)
Midwest (1710)
Modulation Associates (1737)
Pinzone (1615A)
Scientific-Atlanta (1017)
Sescom (1616)
Spectrum Planning (510)
UMC Electronics (114)
VideoStar Connections (1122)
Wegener Communications (1782)
Wold Communications (1515)
Varian Associates (1605)

SECURITY SYSTEMS
CAT Systems (1014B)
FOR-A (1306)
Gray Communications (1618A)
Lang Video Systems (1780)
M/A-COM (1004)
Panasonic (1019)
Peerless Sales (1618B)

SEQUENCE CONTROLLERS
AVC Systems (331)
BTX Corp (1124)
Harris (401)
United Media (1300)
Videomedia (1308)

SETS & BACKDROPS
Desisti Americas (1131)
Great American Market (1108)
Olesen (1307)
Theatre Services & Supply (1513)
Uni-Set (1236)

SOUND SYSTEMS
Anchor Systems (1618C)
Electro-Voice (1159)
Fostex (1765)
JBL (615)
Sescom (1616)
Spencer Broadcast (406)
UMC Electronics (114)
Wireworks (1014C)
Yamaha (1340)

SPEAKERS & ENCLOSURES
AVC Systems (331)
Anchor Systems (1618C)
Broadcast Supply West (112A)
Continental Electronics (101)
Electro-Voice (1159)
Fostex (1765)
Gotham Audio (509A)
David Green (417)
Holzberg (*)
JBL (615)
Logitek (613)
Midwest (1710)
Studer Revox (201)
United Research Labs (604)
Yamaha International (1340)

STL EQUIPMENT
AVC Systems (331)
Andrew (1201A)
Broadcast Microwave Services (1749)
Continental Electronics (101)
Cablewave (108)
David Green (417)
Harris (401)
Holzberg (*)
Lang Video Systems (1780)
M/A-COM (1004)
Marti Electronics (501)
Micro Communications (1014A)
Micro Control (104)
Modulation Associates (1737)
NEC (1415)
Spencer Broadcast (406)
System Associates (1331E)
TFT (109)
Thomson-CSF (1001)

STANDARDS CONVERTERS
AF Associates (1611)
GEC McMichael Ltd. (1514)
MCI/Quantel (1631)
Marconi (1609)
OKI Electric (1505)
System Associates (1331E)
Video International (1524)

STILL/FRAME STORE EQUIPMENT
Abekas Video Systems (1620A)
ADDA (1100)
Ampex (1400)
Robert Bosch (1603)
Camera Mart (1018)
Colorado Video (1222)
Colorgraphics (1116)
Dubner (1630)
FOR-A (1306)
Fortel (1409B)
Harris (401)
MCI/Quantel (1631)
Midwest (1710)
NTI (1102A)
Precision Echo (1617)
System Associates (1331E)
Video International (1524)

STUDIO FIXTURES
B-W Lighting (1753)
CineMills (1140)
Desisti Americas (1131)
Keylite Production Services (1220)
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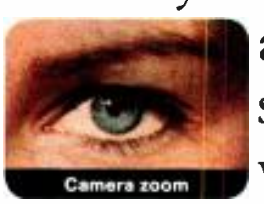

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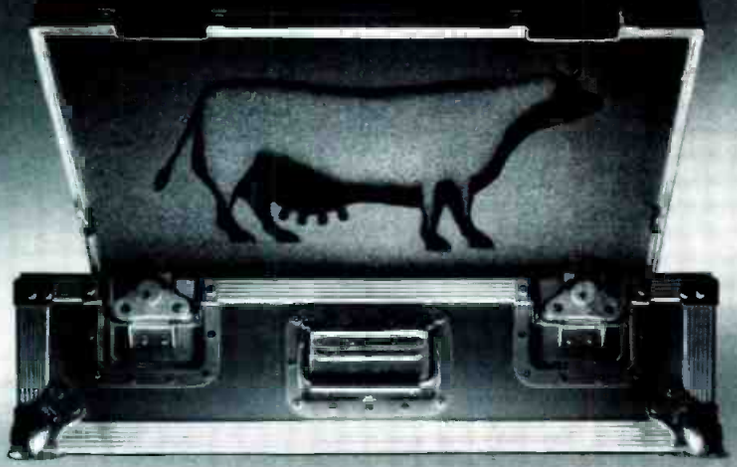

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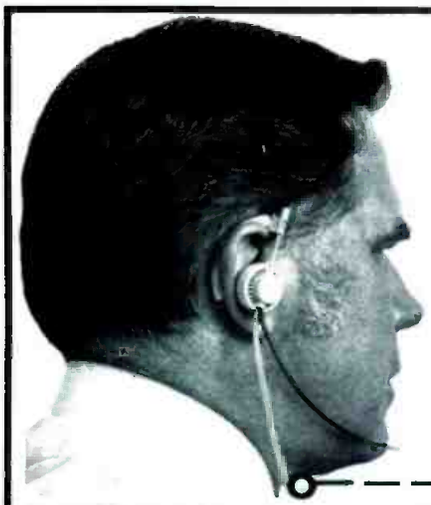

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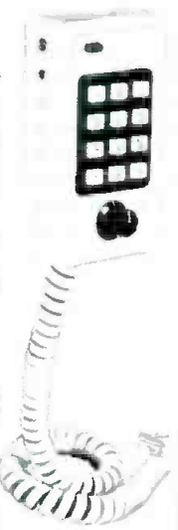
TELEPHONE
for
"HANDS-FREE"
COMMUNICATION



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BSM (637)
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Broadcast Supply West (112A)
Datatek (1428)
Datatronix (1504)
Di-Tech (1301)
Dynair (1404)
Electronic Systems Labs (406A)
Farrtronics (1709)
Gentner Engineering (636)
Grass Valley Group (1207)
Gray Communications (1618A)
HEDCO (1225)
Holzberg (*)
ISI (1132, 1167)
Lang Video (1780)
Laumic (1771)
Leitch (1021)
Logitek (613)
Marcom (306)
Midwest (1710)
NTI (1014D)
Neve (1410)
Panasonic (1019)
Patch Bay (1773)
QuickSet (1105)
Ramko Research (415)
Scientific-Atlanta (1017)
System Associates (1331E)
3M Broadcast (1002)
Telemet (1202)
United Media (1300)
Utah Scientific (1114)
Videotek (1633)

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ADDA (1100)
Ampex (1400)
Apert-Herzog (1703)
Digital Video Systems (1017)
FOR-A (1306)
Fortel (1409B)
GEC McMichael (1514)
Gray Communications (1618A)
Harris (401)
Holzberg (*)
Hotronics (1331B)
Laumic (1771)
MCI/Quantel (1631)
Microtime (1230)
Midwest (1710)
NEC (1415)
Nova Systems (1345)
Paltex (1005)
Sony (1200)
System Associates (1331E)
Video International (1524)

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Accurate Sound (*)
Garner Industries (1233)
Inovonics (304)
Otari (601)
Sony (1200)
System Associates (1331E)
Telex (600/1605)
United Research Labs (604)

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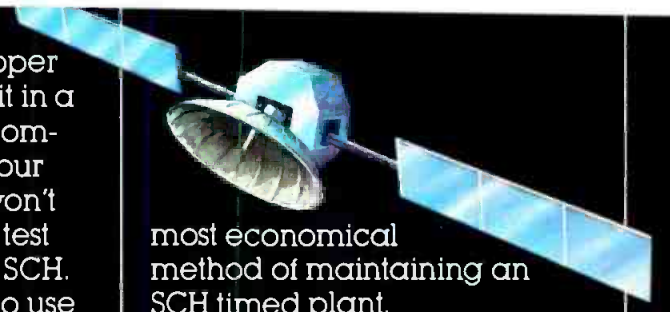

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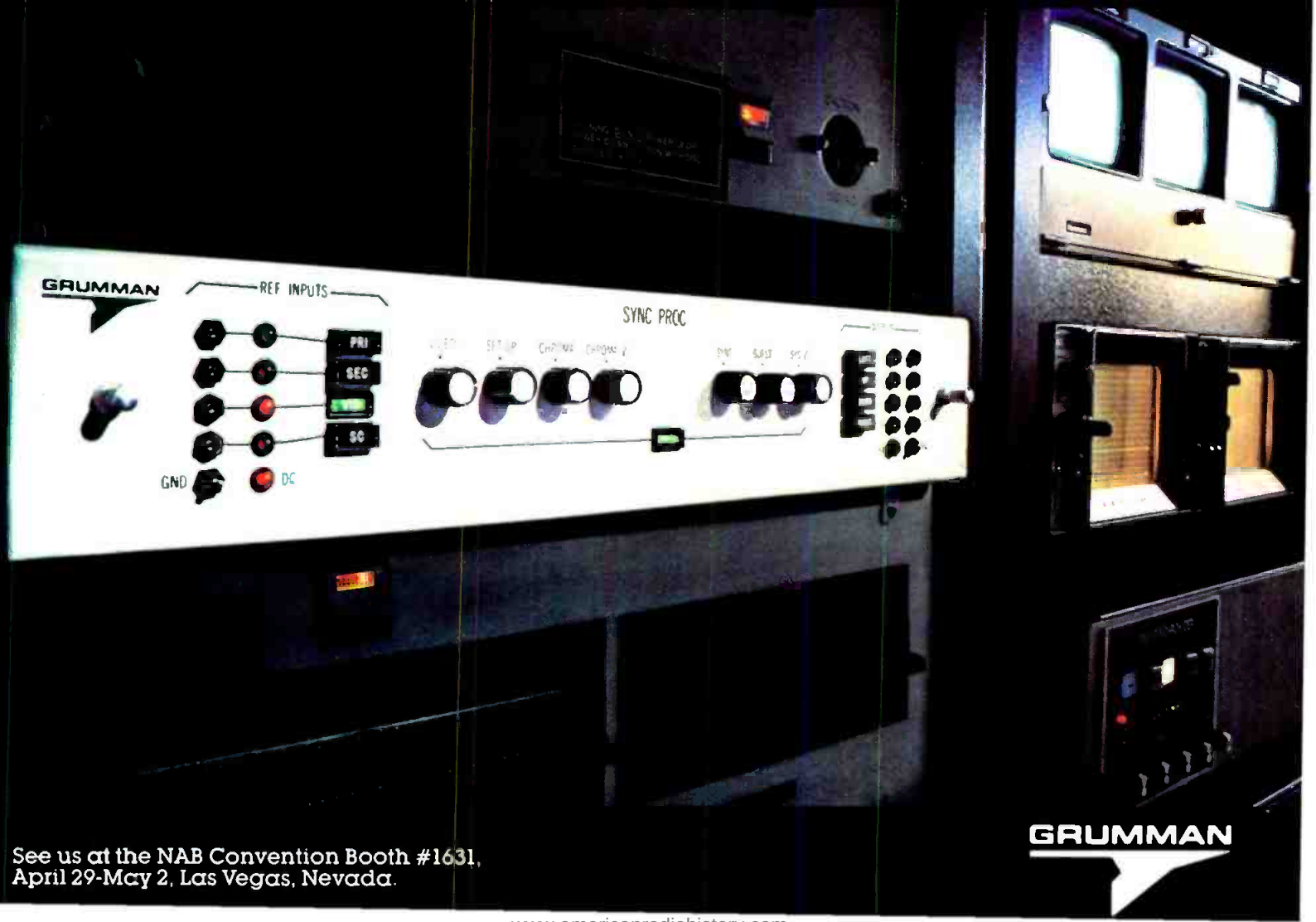

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GRUMMAN

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Tape erasers
Continued

Continental Electronics (101)
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Gray Communications (1618A)
David Green (417)
Restoration/Sprague Magnetics (705)
Spencer Broadcast (406)
System Associates (1331E)
Taber (711)
UMC Electronics (114)
United Research Labs (604)

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Gray Communications (1618A)
RTI (1626)
System Associates (1331E)
TV Equipment (1216)
Tentel (1613)

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AGFA (1608)
AVC Systems (331)
Ampex (1400)
Broadcast Cartridge Service (611)
Broadcast Supply West (112A)
Camera Mart (1018)
Continental Electronics (101)
Fidelipac (411)
Fostex (1765)
Gray Communications (1618A)
David Green (417)
IGM Communications (403)
Inovonics (304)
Pam Lontos (120A)
Maxell (1624)
Midwest (1710)
Nagra (1213)
Restoration/Sprague Magnetics (705)
Sescom (1616)
Sony (1200, 605)
Spencer Broadcast (406)
3M Magnetic (1002)
UMC Electronics (114)
United Research Labs (604)

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Ampex (1400)
AGFA (1608)
BASF
Camera Mart (1018)
Fuji (1413)
GEC-McMichael Ltd. (1514)
Gray Communications (1618A)
JVC (1234)
Pam Lontos (120A)
Maxell (1624)
Midwest (1710)
Panasonic (1019)
Restoration/Sprague Magnetics (705)
Sony (1200)
Spencer Broadcast (406)
System Associates (1331E)
3M Magnetic (1002)
United Research Lab (604)

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Broadcast Technologies (1701)
Comrex (400)
Datatronix (1504)
ESE (116, 1757)
Electronic Systems Labs (406A)
Gentner Engineering (636)
David Green (417)
RTS Systems (1142)
Spencer Broadcast (406)
Studer (201)

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Datum (1708)
Hallikainen (208)
Marti (501)
Spencer Broadcast (406)

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Beston/McInnis-Skinner (1020)
Datum (1708)
EEG (1155)
Harris (401)
Logica (1405E)
Thomson-CSF (1001)
Wegener Communications (1782)

TEST PATTERNS, CHARTS
Camera Mart (1018)
Gray Communications (1618A)
Nalpak Video Sales (1722)
Porta-Pattern (1427)
SMPTE (1632)
Sigma Electronics (1333)

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Asaca (1226)
Amber Electro (422)
Broadcast Cartridge Service (611)
Broadcast Supply West (112A)
Camera Mart (1018)
Continental Electronics (101)
Electronic Systems Labs (406A)
Electro-Voice (1159)
Eventide (323)
Inovonics (304)
Marcom (306)
Marconi Instruments (1615)
McMartin (701)
Potomac Instruments (100)
Real World Technologies Group (1520)
Sescom (1616)
Shively (623)
Sound Technology (500)
Tektronix (1601)
Tentel (1613)
Valley People (318)
Videotek (1633)
White Instruments (1318A)

TEST EQUIPMENT, MONITORS & METERS (VIDEO)
Anchor Systems (1618C)
Anton/Bauer (1337)
Asaca (1226)
Audio Technologies (420)
Broadcast Video Systems (1326)
Camera Mart (1018)
EEV (1335)
Gray Communications (1618A)
HEDCO (1225)
Hitachi (1402)
Inovonics (304)
Lang Video Systems (1780)
Laumic (1771)
Leader Instruments (1349)
Marconi Instruments (1615)
Midwest (1710/1710A)
Philips/Test (1408A)
Rohde & Schwarz (1203)
Tektronix (1601)
Telemet (1202)
TV Equipment (1216)
TFT (109)
Tentel (1613)
Valley People (318)
Videotek (1633)

TEST EQUIPMENT (RF)
Asaca (1226)
Bird Electronic (1625)
Broadcast Supply West (112A)
Camera Mart (1018)
Comark (1217)
Continental Electronics (101)
Delta Electronics (105)
Electro Impulse (117)
Gray Communications (1618A)
Holaday Industries (206A)
Marconi Instruments (1615)
Potomac Instruments (100)
Rohde & Schwarz (1203)
Shively (623)
Sound Technology (500)
System Associates (1331E)
Tektronix (1601)
Telemet (1202)

TIME CODE EQUIPMENT
AVC Systems (331)
Adams-Smith (1724)
Amtel Systems (1745)
Arriflex (1421)
Audio + Design (402)
BTX (1124)
Robert Bosch (1603)
Camera Mart (1018)
Control Video (1157)
Datum (1708)
ESE (116, 1757)
Evertz (1945)
For-A (1306)
Gray Engineering (1755)
Gray Communications (1618A)
Interactive Systems (1167/1132)
JVC (1234)
Kinemetrics (115)
Laumic (1771)
Paltex (1005)
QSI Systems (1325)
Skotel (1126)
Sony (1200)
System Associates (1331E)
United Media (1300)

TIMERS & CLOCKS (PROGRAM)
AVC Systems (331)
Amtel Systems (1745)
Broadcast Supply West (112A)
Camera Mart (1018)
Continental Electronics (101)
Datum (1708)
ESE (116, 1757)
Feldmar Watch (1777)
FOR-A (1306)
GEC-McMichael (1514)
Gray Communications (1618A)
David Green (417)
Kinemetrics/Truetime (115)
Leitch Video Systems (1021)
Midwest (1710)
Pacific Recorders (113)
Radio Systems (213)
Spencer Broadcast (406)

TOOLS
Broadcast Supply West (112A)
Jensen Tools (1747B)
Tentel (1613)

Continued on page 250

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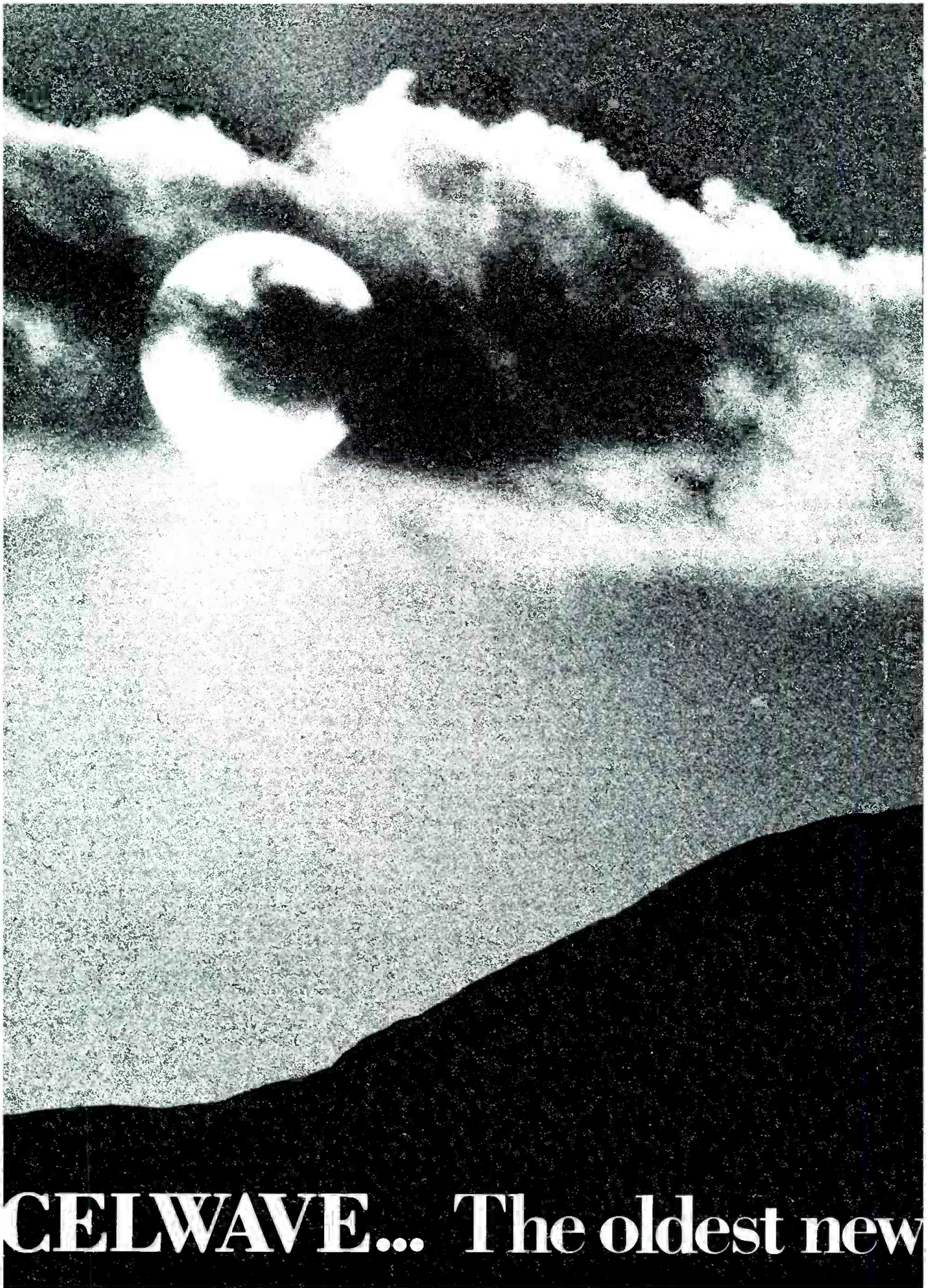

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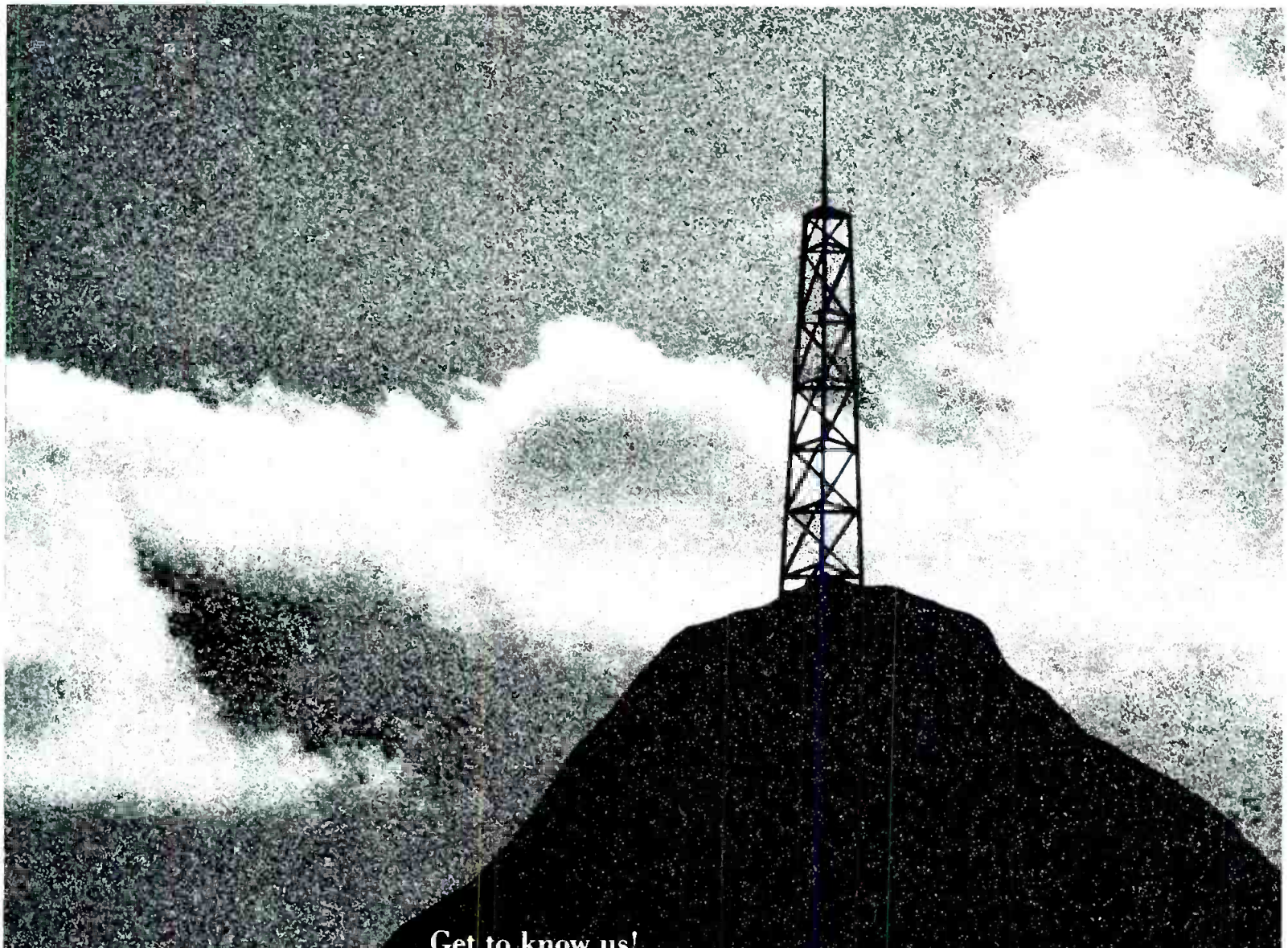

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Aries Tower Services (1770)
Cetec Antennas (509)
Comark (1217)
Continental Electronics (101)
EG & G (1327)
Fort Worth Tower (1010)
Harris (401)
Magnum Towers (119)
Philadelphia Resins (126)
Rohn Towers (1605B)
Stainless (1315)
Utility Tower (703)
World Towers (519)

TRANSFORMERS (ALL TYPES)
Calvert Electronics (125)
Peter Dahl Company (612)
Fostex (1765)
Gotham Audio (509A)
Mole Richardson (1006)

TRANSISTORS, ICs, SOLID-STATE DEVICES
Calvert Electronics (125)
CeCo Electronics (1010A)
Gray Communications (1618A)
Valley People (318)

TRANSMISSION LINE PRESSURIZATION EQUIPMENT
Andrew Corporation (1201A)
Cablewave (108)
Celwave RF (202)
Cetec Antennas (509)
Continental Electronics (101)
Dielectric (455)
David Green (417)
Harris (401)
Micro Communications (1014)
Microdyne (1612)

TRANSMISSION LINE, WAVEGUIDE, COAXIAL SWITCHES
AVC Systems (331)
Andrew Corporation (1201A)
Bird Electronic (1625)
Cablewave (108)
Celwave RF (202)
Cetec Antennas (509)
Comark (1217)
Continental Electronics (101)
Dielectric (455)
David Green (417)
Harris (401)
Marti Electronics (501)
Micro Communications (1014)
Microdyne (1612)
Pinzone Communications (1615A)
Scientific-Atlanta (1017)
Shively (623)
Sigma (1333)

TRANSMITTERS (AM & FM)
AVC Systems (331)
Bayly (124)
Broadcast Electronics (303)
Continental Electronics (101)
Elcom-Bauer (412)
David Green (417)
Harris (401)
Holzberg (*)
LPB (405)
Larcan Communications (1626A)
McMartin (701)
NEC (1415)
QEI (307)
RCA (1000)
Radio Systems (213)
Rohde & Schwarz (1203)
Spencer Broadcast (406)
Thomson-CSF (1001)
Wilkinson-TTC (305)

TRANSMITTER (TV & TRANSLATOR)
Acrodyne (1228)
Comark (1217)
EMCEE (1621)
Gray Communications (1618A)
Harris (401)
Information Transmission Systems (1734A)
Larcan Communications (1626A)
M/A-COM (1004)
McMartin (701)
NEC (1415)
RCA (1000)
Rohde & Schwarz (1203)
Thomson-CSF (1001)

TURNTABLES, TONEARMS & PHONO CARTRIDGES
AVC Systems (331)
Audio-Technica (1141)
Broadcast Electronics (303)
Broadcast Supply West (112A)
Continental Electronics (101)
Gotham Audio (509A)
David Green (417)
Harris (401)
LPB (405)
Ramko Research (415)
RAMSA (437)
Spencer Broadcast (406)
Stanton (102)

VACUUM TUBES (CRTs, RECEIVING)
Calvert (125)
CeCo (1010A)
EEV (1335)
Gray Communications (1618A)
Richardson Electronics (212)
Thomson-CSF Tubes (1003)
Varian Associates (1605)

VACUUM TUBES (CAMERA)
Amperex (1412)
Calvert (125)
CeCo (1010A)
EEV (1335)
Gray Communications (1618A)
Hitachi (1402)
RCA (1000)
Richardson Electronics (212)
Thomson-CSF (1003)

VACUUM TUBES (TRANSMITTING AND CAVITIES)
Amperex (1412)
Calvert (125)
Camera Mart (1018)
CeCo (1010A)
Comark (1217)
Continental Electronics (101)
EEV (1335)
Econco Broadcast Service (1759)
Richardson Electronics (212)
Thomson-CSF (1003)
Varian Associates (1605)

VANS & ACCESSORIES
AF Associates (1611)
Camera Mart (1018)
Centro Corporation (1101)
GEC McMichael (1514)
Gerstenslager (1347)
Gray Communications (1618A)
Magnetic Media/Shook (1310)
Midwest Corporation (1710)
Mole Richardson (1006)
Shook Electronic Enterprises (1310)
System Associates (1331E)
Television Equipment (1216)
Whirlwind (329)
Wolf Coach (1317)

VIDEO SWITCHERS, PRODUCTION
American Data (1409)
Ampex Corporation (1400)
Asaca (1226)
Beaveronics (1313)
Robert Bosch (1603)
CeCo (1010A)
Camera Mart (1018)
Comprehensive Video (1145)
Crosspoint Latch (1321)
Echolab (1510)
Gray Communications (1618A)
Grass Valley Group (1207)
ISI (1232)
ISC (1167/1132)
JVC (1234)
Laumic (1771)
NTI (1014D)
Panasonic (1019)
Ross Video (1110)
Sony (1200)
System Associates (1331E)
Toshiba (1631A)
TV Equipment (1216)

WEATHER SYSTEMS
Alden Electronics (1336)
Beston/McInnis Sckinner (1020)
Broadcast Supply West (112A)
Colorgraphics Systems (1116)
Dubner Computer Systems (1630)
Environmental Satellite Data (1509A)
Kavouras (1635)
Thomson-CSF (1001)
Video Assoc Labs (1303)
WSI (1104)

WIRELESS MICROPHONES, INTERCOMS, REMOTE PICKUP SYSTEMS
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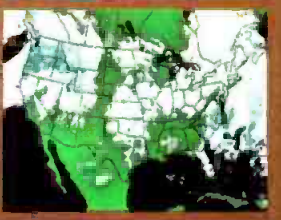

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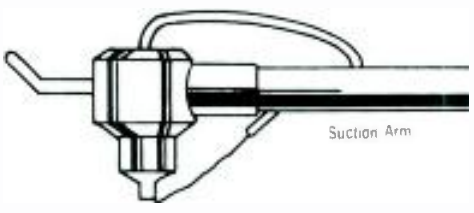

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AM stereo

Continued from page 14

and, therefore, be suitable for station give-away promotions. The company said orders placed to date for the Kahn adapter have been contingent on sales of minimum quantities of *Motorola-only* car receivers in each station's market.

The decoding of all the systems except Motorola is automatic on the converter. When the listener wants to hear a C-QUAM signal, a button must be pushed. Kahn Communications president Leonard Kahn said the switching arrangement was not designed to embarrass Motorola, but instead had a good engineering basis.

Group W selects Motorola

Westinghouse Broadcasting has selected the Motorola AM stereo system for use at its AM music stations. According to Harrison Klein, Group W director of radio engineering, the selection follows more than a year of tests of various AM stereo systems at WBZ, the company's AM radio outlet in Boston. The Motorola C-QUAM equipment currently is installed at WBZ and will be installed in the near future at KDKA, Pittsburgh. All other AM stations in the Group W chain use news/talk formats, and will not be converted to stereo operation at this time.

Klein said he thinks the emergence of a single AM stereo system would best serve the long-term interests of the industry. However, he said he has no objections at this point to the multimode receiver concept. "The more AM stereo receivers (single- or multimode) we get out in the field, the better," he said. |:-)))|

Satellite update

Continued from page 16

works that will transmit two or three TV channels per transponder, reducing the network's annual transmission costs significantly. For example, a 6-channel hotel network would reduce its transponder lease costs by $5 million to $6 million a year if two TV channels were transmitted per transponder instead of the normal single channel. The savings over an 8-year period would be far greater than the total added cost of larger receiving antennas.

The next decade in satellite TV broadcasting promises to bring a wide variety of transmission techniques, a far different scenario than has been the case to this point. |:-)))|

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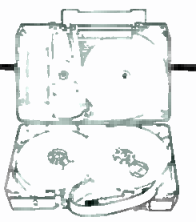

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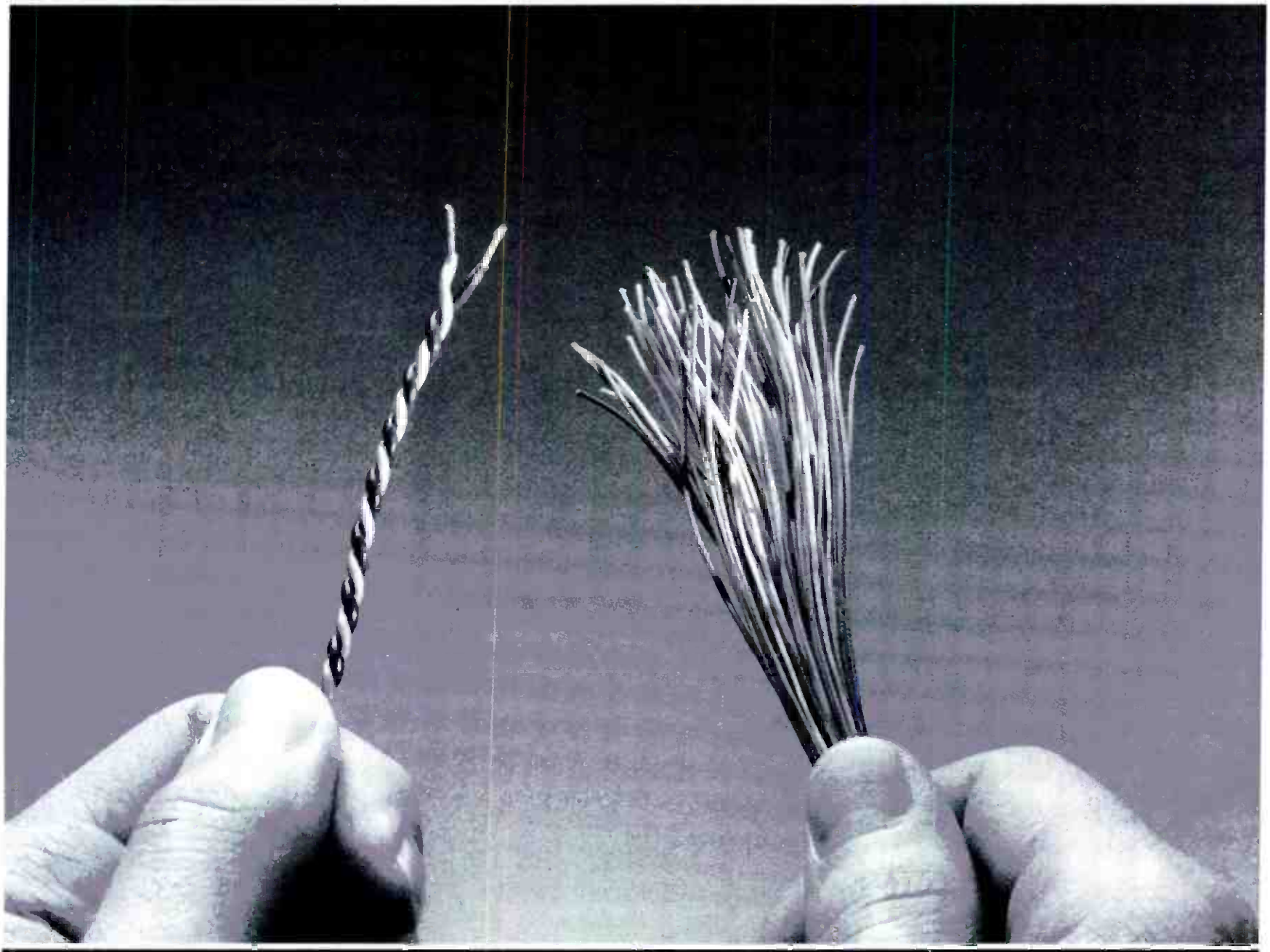

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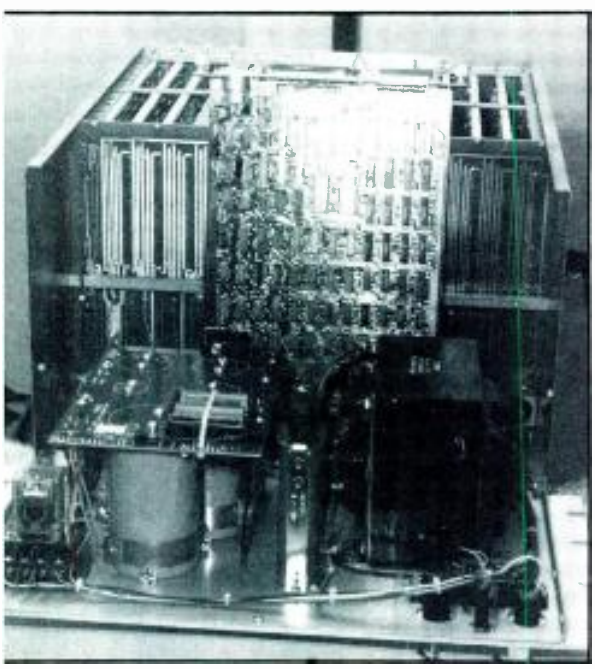
One of a new wave of high technology manufacturing plants, the United Media facilities in Anaheim, CA, are designed conservatively to handle R&D and manufacturing needs.

Conversations

An interview with Bob Ricci of United Media



The modular design of the Commander II edit controller adds flexibility to the total system.

After the 1983 fall SMPTE meeting in Los Angeles, Carl Bentz, **BE** television editor, toured the United Media facilities in Anaheim, CA, and interviewed president Bob Ricci. The discussion focused on trends in videotape editing, Ricci's corporate philosophy and his plans for NAB-'84/Las Vegas. This report, which combines elements of the interview and plant tour, results from that meeting.

Q: How old is United Media?
A: I founded the company in 1976 to be a systems house. People could come in and state their needs, and we would develop a system to meet those requirements. I handled several lines of products from which the systems would be built.

Q: What was your background for such work?
A: Before forming United Media, I worked for Datatron. There I gained a good understanding of what was required in a reliable editing system. I also was involved in developing the Tempo system, which the company manufactured.

Q: When did United Media become a manufacturer, rather than a systems assembler?
A: Our first product, the Commander I, went on the market in 1979, and the first unit was sold in June.

Q: Do you remember the first sale?
A: Very well. The contract, from a Canadian post-production house, included a clause requiring the system to pass certain engineering tests before it would be accepted. Needless to say, I was pleased when, within three days of the equipment's arrival, the editing controller had passed acceptance and payment was on its way.

Q: Was the Commander I a successful product?
A: Yes. Its shortcoming was that it was not an upgradable system, as is the Commander II. There are a number of them still in the field and in use in facilities that do 2-machine editing jobs.

Q: What about the Commander II?
A: We introduced the Commander II at NAB '80/Las Vegas. From the beginning, it was conceived as modular. The system could be configured in various ways, from a 2-machine system up to an 8-VTR operation, with integrated time code readers and generators. Any combination of VTR formats, quad, 1-inch or U-matic were possible, along with a switcher interface.

We stressed the upgradability factor at NAB-'82/Dallas. The buyer could

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start with the basic 2-machine system and build up to the full 8-machine configuration. From basic to expanded, the Commander II included almost every editing feature that the industry has requested. Obsolescence was avoided.

Q: How well was the second generation system accepted?
A: There are more than 100 Commander II systems installed in facilities around the world. They involve various grades of expansion, and have proved to be quite reliable.

Q: In talking with people experienced with United Media systems, each has stressed reliability. Why?
A: When an editor sits down to do a project, he has enough things to think about besides his equipment. The design should include every possible way to reduce failures. But electronic equipment *will* fail. So in major sections such as the power supply, for example, we use heavier duty components than normally needed. In case of a power outage, batteries protect the 500-event internal memory.

Q: I have also been told that your systems generally are lower priced than equivalent ones. How do you keep the price down?
A: Our products, which all are editing-related, use several basic common modules so that we can save on design costs, and, for product support, on the cost of storing an inventory of spares.

Q: What products are included in the line now?
A: All our products are involved in editing. Besides edit controllers, we have time code systems, an audio router/dissolver and automatic dialogue replacement equipment.

Q: When I talk to people in the industry, many are not acquainted with United Media. Why?
A: Our marketing efforts have been at a rather low-profile level to date. In fact, our best promotion has been word-of-mouth. It's slower, perhaps, than splashy advertisements, but effective.

Q: Will you be showing new items at NAB-'84?
A: The major new product will be the new Mini-Comm edit controller. It is a compact A/B roll, full-featured system for up to three VTRs or ATRs. It is upgradable with SMPTE time code, list management and switcher interfacing.

We also will show a model 500 sequencer, or digital electronic programmer, and a user-definable key enhancement for the Commander II. Each of two keys may recall a sequence of 120 keyboard entries for often-used routines.

Q: What about the redefinable keys others are stressing? Why haven't you gone to that concept?
A: I do not think that redefining or reassigning keys gains anything. Once an operator is oriented to a particular system, why would he want or need to change it, to have to reorient himself? There are arguments that reassignment is of value for right- or left-handed and multiple operator situations, but I have not been convinced.

The same situation is true of other features that have been introduced in the last couple of years. For example, the touch-sensitive screen concept is interesting, but, in my opinion, somewhat of a restraint to the user. I find the *touch* screen approach to be slower, because it requires me to reorient myself all of the time.

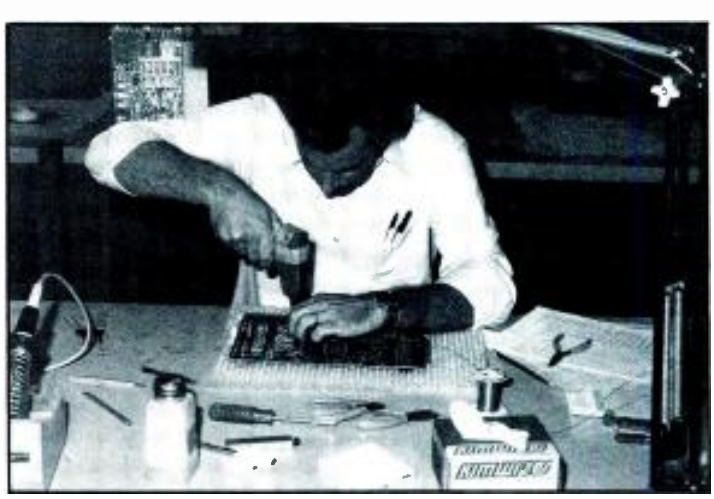
Q: What about voice actuation and recognition systems?
A: They also are interesting. We looked at that approach several years ago. At the present time, I don't think that it is practical.

Q: How practical are large editing systems, such as your Commander II, fully implemented with the maximum number of VTRs, switcher and mixer interfacing, etc.?
A: In the editing business, time is money. Let's suppose that you purchase eight 1-inch VTRs to go with your edit controller, each with a TBC, for an investment of approximately $800,000. The majority of editing projects will only involve one or two source machines at a time with one recording VTR. In addition, the editing systems usually are limited to a single mix/effects amp control. With that in mind, most large systems simply are not cost-effective.

Q: Could you state your concept of the ideal editor control system?
A: I instruct my design group to think in terms of the complete system. The purchaser should be able to take the equipment out of the box, plug it in, connect the various record and source units to the assigned plugs and jacks, turn the equipment on and begin editing. As such, the controller should be a black box, designed and constructed in a manner that leaves the operator's concern to focus on the editing task. His technical staff should only need to worry about the sources, the recorders and other equipment attached to the black box.

Then, with the system operating, product support becomes important. We have developed a system, for example, in which users that call for help before 3 p.m. and need replacement parts to get their systems operating will have the parts on their way by 10 a.m. the next day.

It is my opinion that systems design, backed by a good customer service program, is what has made United Media successful.



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Plant tour:

Cetec Antennas

By Jerry Whitaker, radio editor

The Antenna Division of Cetec Corporation, with sales and manufacturing facilities located in Sacramento, CA, specializes in transmitting antennas for TV and FM broadcasting. The company is one of 11 divisions of Cetec, based in El Monte, CA.

Cetec Antennas has a long and distinguished record of accomplishments in FM and TV antenna technology. The company began more than 25 years ago as the Jampro Antenna Company, manufacturing a line of FM and TV transmitting antennas. The company introduced its patented JSCP Penetrator series of FM circularly polarized (CP) antennas in 1967. The design has served broadcasters around the world, with more than 1000 sold to date. The company began testing CPTV antennas in 1974 and, once authorized by the FCC, began selling its patented spiral antenna in 1977.

Cetec's spiral CPTV antenna is lowered into position on top of the Sears Tower in Chicago. The antenna was manufactured for WLS-TV.

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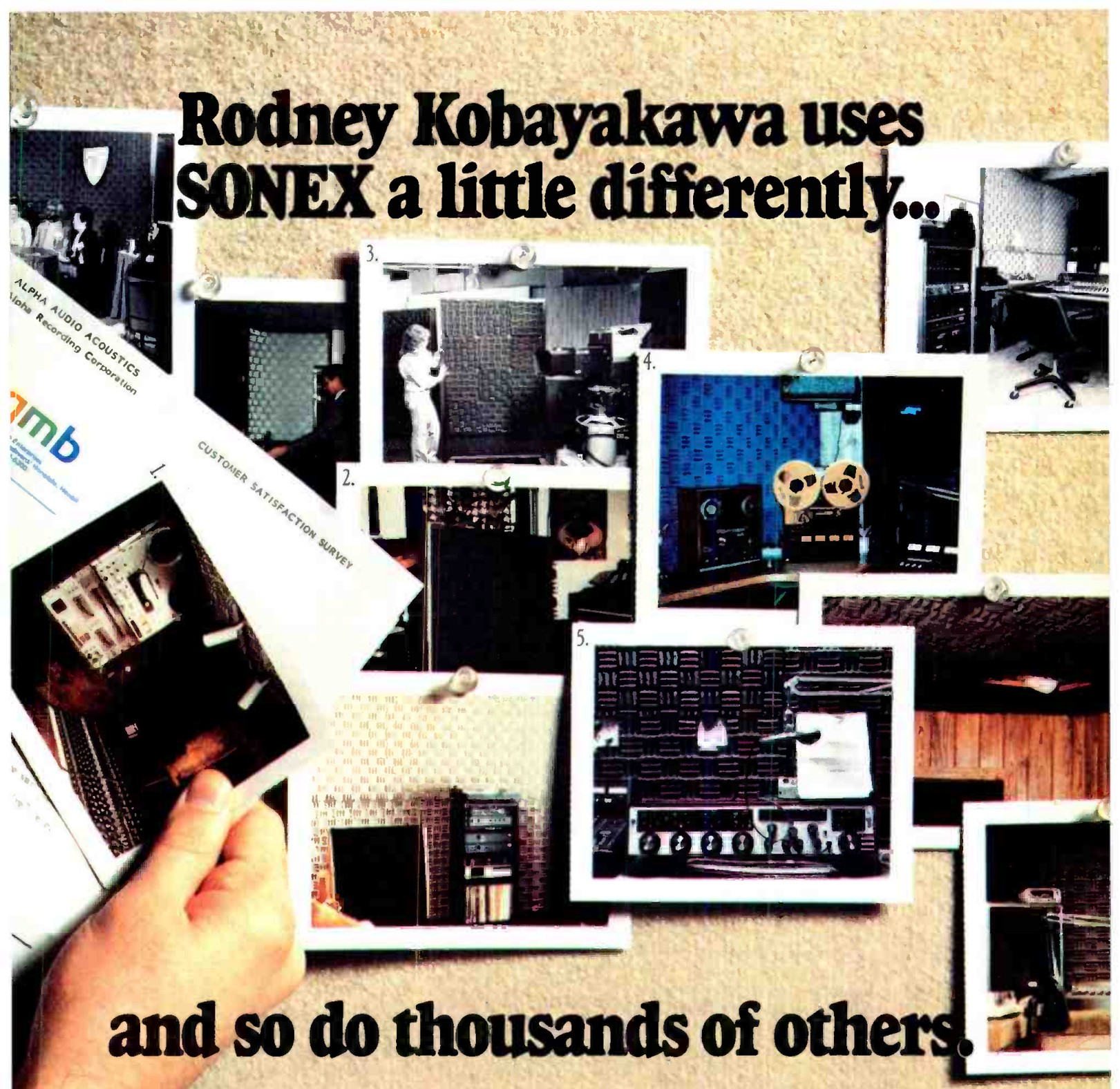
Rodney Kobayakawa uses SONEX a little differently...



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2. "Musicians are always impressed by your SONEX products." Dennis Scott of Chelsea Entertainment Organization, who won a Grammy in 1981 for **Sesame Country,** an album featuring Crystal Gayle, Loretta Lynn, Glen Campbell and the Muppets.

3. "Takes the 'ping' out of hard walls." Don Bachmeier, KFYR-TV, Bismarck, N.D. uses SONEX on wheeled, portable panels to kill voices on adjoining news sets.

4. "Delighted with SONEX's effectiveness...pleasing aesthetics... audio professionals notice reduced standing waves...increased sound-proofing." Sherrie Thomas, Producer, recording studio for the General Conference of Seventh-Day Adventists, Washington, D.C.

5. "Good!...in radio station's master control and production room." Craig Falkenstine, WJCF, Morgantown, W.V.

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The Cetec facility is impressive to the visitor in that virtually all machining and manufacturing work necessary to construct an antenna is done on-site. Raw stock goes in one side of the building and finished antennas come out the other side. Some specialized procedures, such as galvanizing and custom-order Teflon coating, are done by an outside company under contract to Cetec.

An important part of the company's 17-acre manufacturing facility is a sophisticated turntable measurement assembly used to conduct performance tests on antennas of various designs. The assembly allows engineers to check the radiation patterns and VSWR performance of full-scale production antennas with great accuracy.

The company currently is concentrating its efforts on multistation (or *community*) FM transmission systems and CPTV antennas. Cetec has installed spiral CPTV antennas at stations in several major cities in the United States. The spiral design gives viewers better reception, including reduced ghosting and less critical front-end tuning.

The FCC's 80-90 decision has forced many FM stations to consider improving their facilities to avoid reclassification at a lower level. The requirement for minimum height above average terrain often can be met by a community arrangement in which a single broadband transmitting antenna, located on a tall tower, is shared by several stations. Such cooperation results in better coverage for all stations participating in the project, and helps defer the costs of constructing the new facilities. Cetec offers several products aimed at meeting this need.

Building an antenna

Although each antenna manufactured at the Sacramento facility is unique, all follow a similar route through the construction process, as follows.

The company maintains a large supply of copper, brass and Teflon stock. As needed, the hardware is cut and machined into components that make up an antenna. The parts store also contains cast mechanical components, O-rings, brackets of various sizes, deicing elements and stainless steel hardware.

Machining is a critical stage in constructing an antenna. It is often necessary for parts to be cut to tight tolerances for low VSWR, as well as a proper fit. Some components machined at this stage carry the entire power load for portions of an antenna system.

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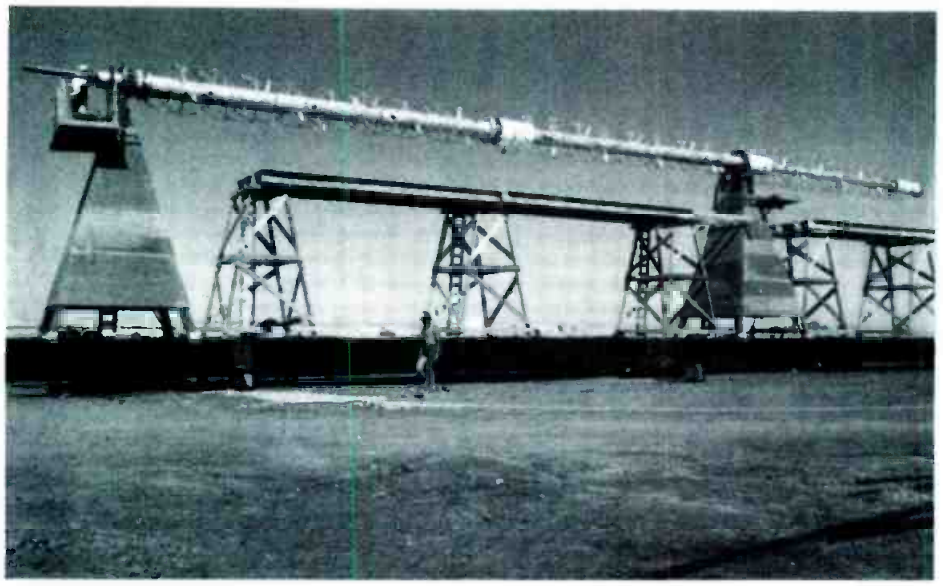
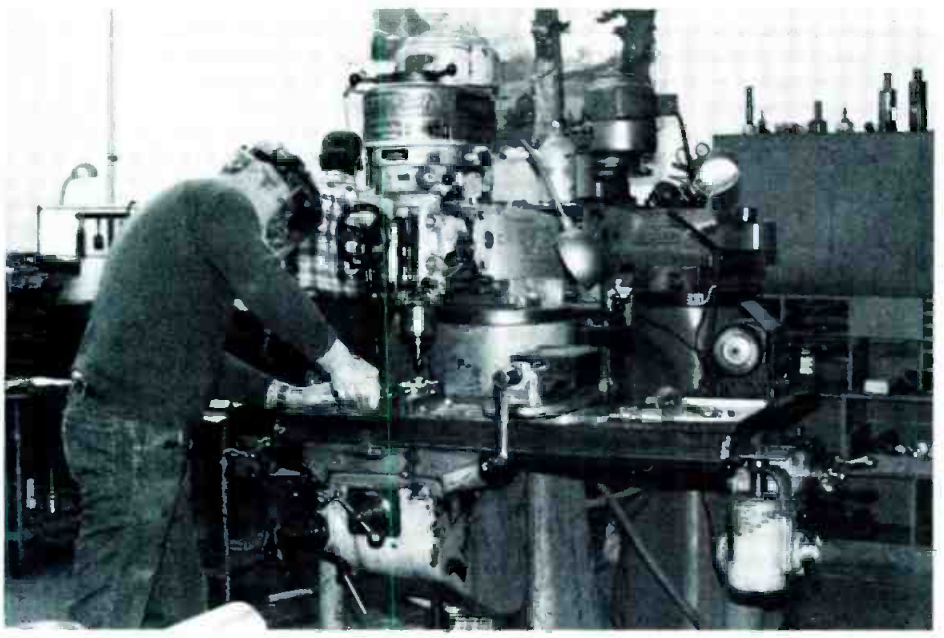


A spiral CPTV antenna, similar to the antenna installed on the Sears Tower, is checked at the field measurement test site.

Shown is part of the supply of raw stock used in constructing an antenna.



The machine shop at the Sacramento plant is shown here.

The antenna begins to take shape in the plant's welding area. The radiating elements and line sections are cut to size and formed in this stage. The tungsten inert gas (TIG) process, also known as *heliarc*, is used to give a good electrical and mechanical bond to the members. All welders are state-certified, an important factor in assuring mechanical quality.

Radiating elements for FM antennas are assembled in individual bays, while the transmission line used for support and power distribution is constructed in another area of the plant. The inside surfaces of all power-carrying members are polished during production to assure maximum efficiency. Power loss can result from contaminants on the inside surfaces of antenna elements and power-carrying hardware.

TV antennas are built in sections of varying lengths, depending on the gain required and the frequency of operation.

Once assembled, the antenna elements are hot-dip galvanized to protect against corrosion.

If requested, Cetec will supply FM antennas with a baked-on Teflon coating, as an alternative to deicing elements or radomes. Field reports indicate that Teflon-coated elements shed ice more rapidly than those with the conventional finish.

Once the antenna has been built, one or more elements is fine-tuned on a support tower identical to the tower used by the station placing the order. Any antenna irregularities then can be tuned out, and adjustments made for minimum VSWR. Directional antennas, when desired by the station, are created by adding parasitic elements. Cetec produces a large number of directional FM antennas each year. Pattern measurements required for FCC approval are done on the company's test range.

Pattern optimization work also is done on the Cetec test range. Often, simply changing the antenna mounting slightly will benefit the pattern requirements. Parasitic elements sometimes are added to correct radiation pattern problems. This service does not directionalize an antenna, but seeks to optimize radiation in a desired direction by removing any nulls found in the pattern.

Shipping containers are constructed at the Sacramento facility and all FM antennas are shipped disassembled (unless specially ordered), because of the finished product's large size. A complete set of drawings and instruc-

Continued on page 266

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From roots that stretch sky high we have pulled together the resources of LeBlanc & Royle and Alan Dick to form LeBlanc & Dick Communications Inc., based near Washington, D.C.

By drawing upon the expertise of these two world class companies we are able to bring broadcasters the team that provided antennas for the world's tallest building, the Sears Tower in Chicago, and the world's tallest free-standing structure, the CN Tower in Toronto.

While our main activities include the design and construction of communications towers and antenna systems for broadcasters all over the world, our unique reputation has been built on mastering the really big challenges.

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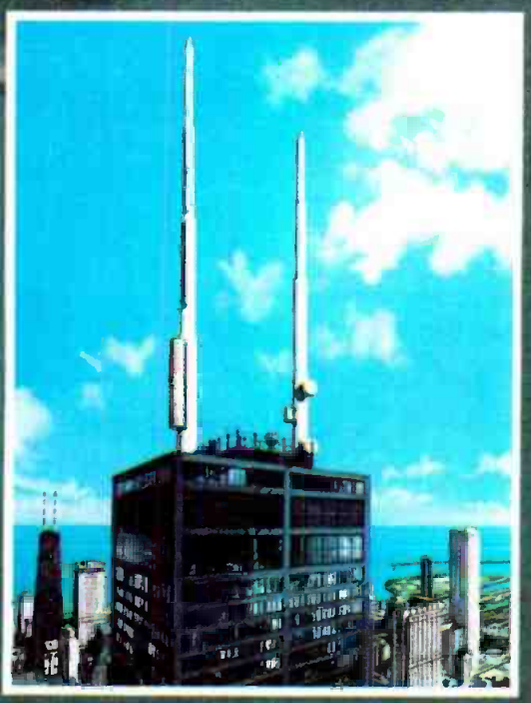

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The Beyer MCM Condenser System's comprehensive selection of interchangeable mic capsules means total applications versatility in the most logical and cost-effective format. A choice of mics with cardioid, lobe, omni or figure-8 patterns and the option of integral shock-mounting is instantly available for use in the studio *and* out in the field.

New Super High Performance Mics

The ongoing technical evolution of Beyer condensers has produced several newly designed mics offering matchless performance and long-term reliability. The new MC 737 long shotgun (lobe pattern) and MC 736 short shotgun (cardioid/lobe) utilize a built-in switchable bass rolloff to effectively suppress low end noise and rumble below 200 Hz and provide increased intelligibility for optimum speech and music recording. A 12 dB attenuator prevents high sound pressure levels from overloading the mic's internal electronics without coloration. These mics also feature an extended frequency

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vithout typical condenser sound.

response of 40 Hz to 20 kHz (± 2.5 dB) and an excellent signal-to-noise ratio of 74 dB.

The new MC 734 is the only "studio" condenser mic that delivers the highest standards of performance in *any* recording or live concert situation. An extremely flat frequency response from 20 Hz to 18 kHz (± 2.5 dB) insures total accuracy while a 3-step filter compensates for proximity effect in close-miking situations. To maximize the MC 734's performance onstage, a unique stage resonance filter which reduces rumble and extraneous noise is combined with the mic's ability to withstand sound pressure levels of 138 dB (1 kHz ≦ 0.5% THD).

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For added back-up flexibility, the Beyer Condenser System includes a full complement of accessories including windscreens, power supplies, pistol grips, suspension mounts and our one-of-a-kind MZA 716 telescoping "fishpole" boom with an adjustable tilt variable from 0 to 360°.

Beyer Dynamic has firmly established itself as a leading force in moving-coil and ribbon microphone technology, but don't let our name mislead you. Instead, consider the uniquely natural sound, applications versatility and wide variety of accessories that make up the Beyer Condenser System.

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Continued from page 262

A welding turntable is used when working with line sections to ensure an even bond.

A production run of JSCP model FM antennas is readied for final assembly and testing.

tions is provided for the tower crew at the transmitting site.

TV antennas are shipped fully or partially assembled, so the units can be lifted directly onto the supporting tower. A flat-bed trailer transports these sectionalized antennas.

In addition to building new antennas, Cetec regularly receives FM transmitting antennas for refurbishment and repair. Sometimes the antenna has been damaged by lightning or vandalism, and requires repair that is not practical in the field. Other times, a station wants to change frequency and needs the main antenna retuned, while operating on a standby system.

A number of items are taken into consideration in the process of repairing an antenna. A visual inspection of the condition of the elements, feed line and mounting hardware reveals the more obvious problems. Elements, and sometimes entire bays, are replaced as needed and all internal power-carrying components are cleaned thoroughly. Deicer elements are checked for proper operation and the system's electrical cabling is inspected.

Antenna system maintenance

Cetec estimates that a well-built antenna will provide about 20 years of service, if properly maintained. The company recommends the following measures to guarantee long life:

- The transmission line and antenna should be pressurized with nitrogen gas. Not only will pressurization keep contaminants out of the system, but also will provide a means to monitor the integrity of the line and antenna. Pressure loss should be charted, and any increase in loss values should be investigated.
- The antenna system's VSWR should be measured regularly and charted to determine whether any long-term changes are occurring in the system. Likewise, the *incidental* AM (also known as *synchronous* AM) should be measured regularly and charted. An increase in either of these two parameters may indicate antenna or transmission line problems.
- A visual inspection should be made every year by an experienced tower worker of the transmission line and antenna system. Deicer cables should be checked and a determination made that each heater element is working properly. Particular attention should be given to the individual antenna bays. Any bent elements or other physical damage should be repaired as soon as possible. Assembly

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A JSCP FM antenna undergoes final testing and adjustment at the field measurement range.

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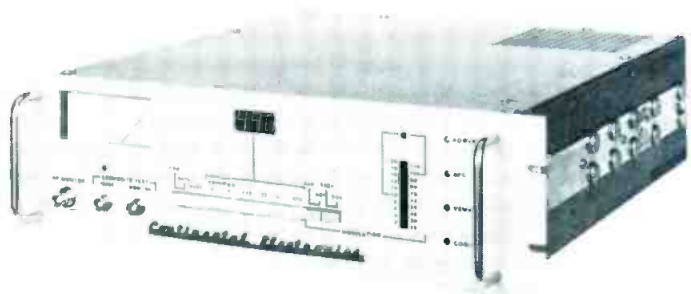

Continental's Type 802A solid-state FM Exciter offers broadcasters unmatched performance.

Modulation performance of this new exciter exceeds all currently known or marketed FM exciters.

No tuning adjustments are required other than selecting the operating frequency.

Power output is 50 watts into a 50 ohm load at all FM frequencies.

The exciter may be used as a low power transmitter.

Special circuits protect amplifier from mismatched loads. Automatic power control maintains output at preset levels from 5 watts up to the maximum level.

The Type 802A FM Exciter accepts composite baseband signal from a stereo generator, STL system or monaural and SCA programming.

A digitally-programmed, dual-speed, phase-locked frequency synthesis system generates exciter frequency.

Case design is very clean: front panel analog or digital meters and LED readouts give clear, accurate indications of system status and performance. A digital LED display shows true peak level of modulating signal in 5% increments with an accuracy of better than ±2%.

Modular subassemblies may be removed from the exciter without removing the exciter from the transmitter. The exciter moves on slides for easy access from front of transmitter.

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TFT 8300 STL

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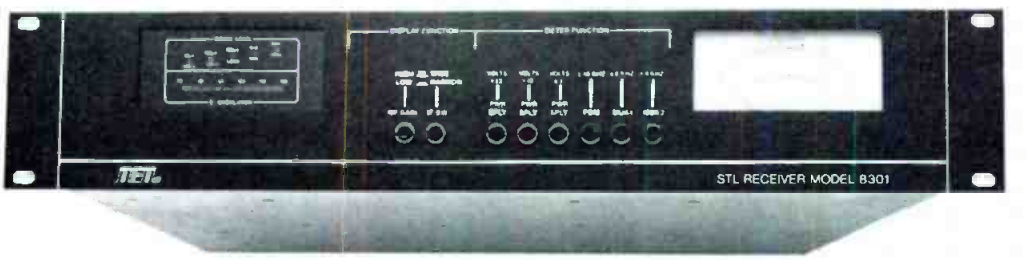
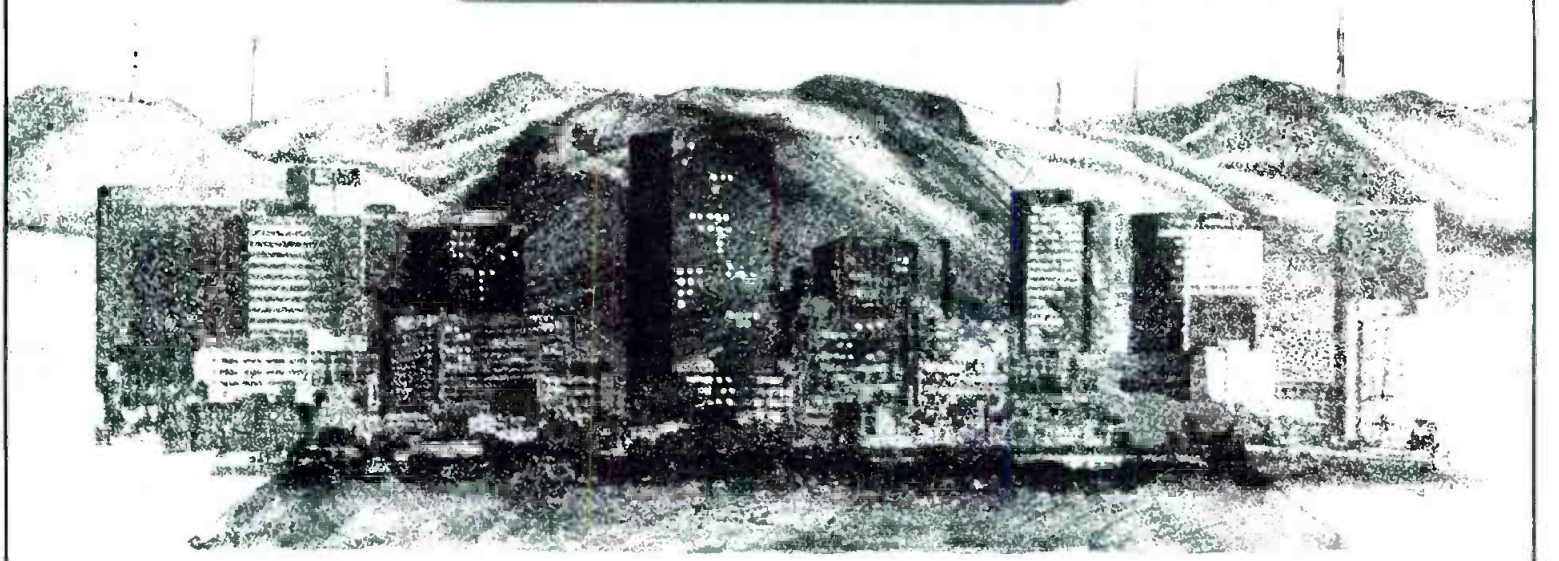
In Price and Performance





The 8300 STL outperforms *any* other STL, even in the densest RF environment. Yet, it's priced way below the nearest competitor.

The 8300's superiority is clear in its overall performance. Like a 75 db SNR and stereo separation of 50 db, or better.

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In the receiver, too, the TFT 8300 stands above the rest, with a sensitivity of 30 μv or less for a 60 db SNR; front panel selection of wide or narrow I.F. bandwidth; and a Surface Acoustics Wave (SAW) filter to ensure outstanding selectivity.

Additionally, the 8300 receiver features continuous, independent display of signal strength and a bargraph display of modulation.

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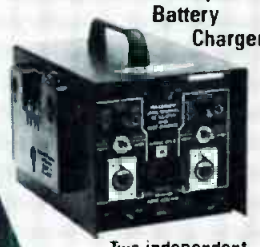

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and support hardware also should be inspected for missing or loose bolts.

- Lightning protection of the antenna and tower is essential. A lightning rod (or group of rods) should extend from the top of the supporting structure at least 3-4 feet. The tower and all guy wires also must be well-grounded, with at least one ground rod at each guy wire point and several ground rods spaced evenly around the tower base to form a circle. A good rule of thumb for ground rod placement is to make the distance between adjacent rods equal to the length of each rod. If a ground screen or radial system has been installed, so much the better.
- All ground rods should be bonded together with 2-inch copper straps or heavy gauge wire and then bonded to the tower structure. The transmission line should also be grounded to the tower at the point where it leaves the tower and begins its horizontal run into the equipment building. The line should be grounded with a separate ground rod at the point where it enters the building.

A batwing-style TV antenna takes shape as the mounting brackets and radiating elements are secured to the mast.

New products

Cetec currently is working on several new antenna designs, including a spiral FM panel radiator. The antenna is a broadband CP design intended for multistation use. It will handle about 30kW per panel, and mounts on each face of the support tower. (See Figure 1.)

Dr. Ray DuHamel, a consultant to the company on antenna design, is directing research and development on the project. DuHamel also designed Cetec's spiral CPTV broadcast antenna.

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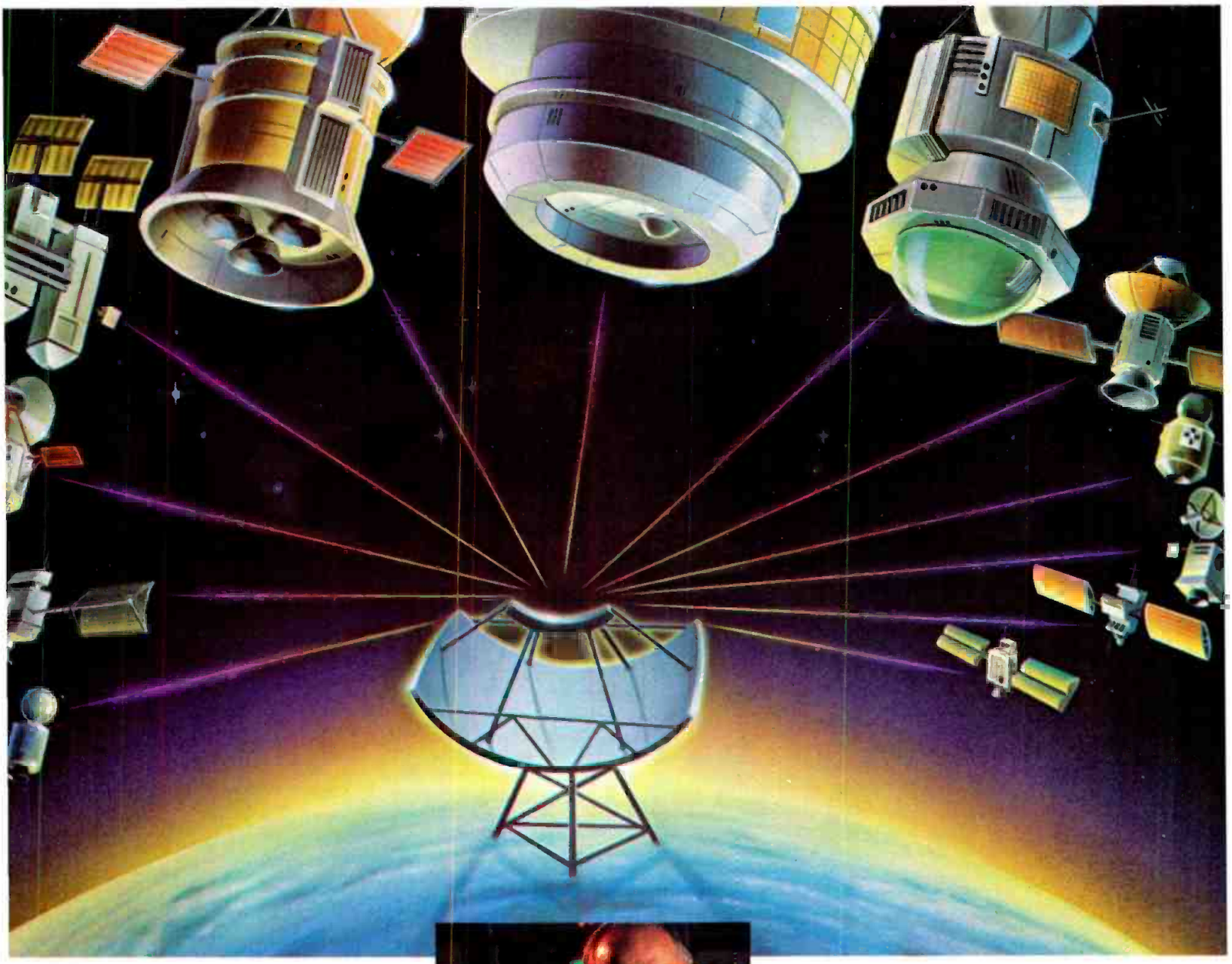
"WITH SIMULSAT, WE CAN PICK UP 5 SATELLITES AT ONCE."



SIMULSAT, the multi-beam antenna from Antenna Technology Corporation, that can simultaneously see all domestic satellites at once with consistent broadcast quality performance. It is being heralded as a major breakthrough by broadcast and cable operators everywhere.

Listen to what Chief Engineer Gerald Dreger of KTVO, one of SIMULSAT's more than 200 nationwide customers has to say:

"We purchased SIMULSAT 8 months ago. We're very pleased with it. SIMULSAT does everything I was told it would do and more. We now pick up 5 satellites simultaneously, and also run our low power station K40AI off SIMULSAT, which, before was impossible. On top of that, it has the capabilities to help us expand even more. We could reach 13 (domestic) satellites at once. SIMULSAT will pay for itself over and over again."

Mr. Gerald Dreger
Chief Engineer
KTVO, (ABC affiliate)
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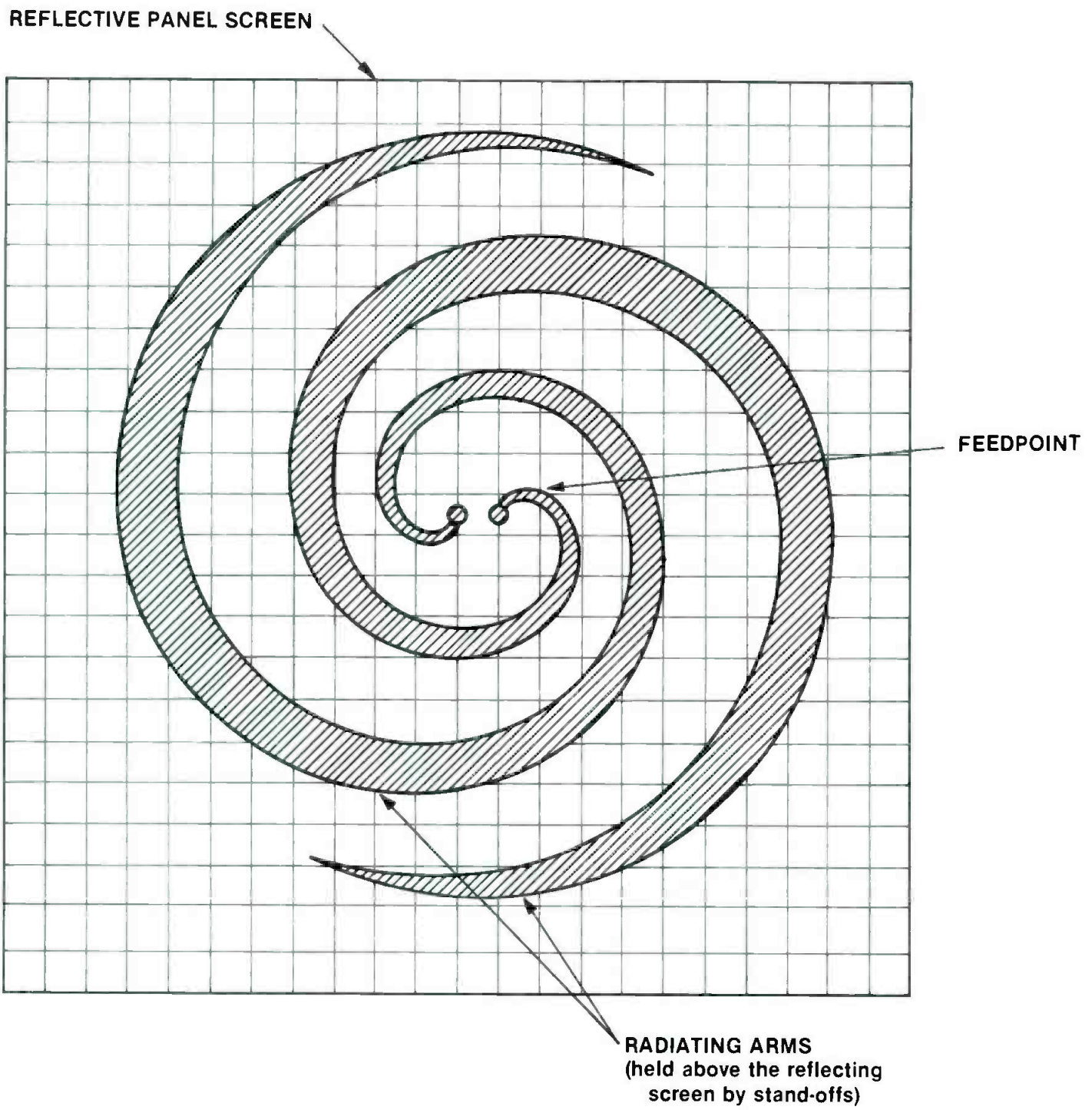

Figure 1. The design of Cetec's new FM CP spiral panel antenna, which is being developed at the Sacramento plant. The spiral arms form the radiating elements, which sit in front of a reflector screen.

The carpentry shop is where shipping containers are made for the antennas and other Cetec products.

The main benefits of the new design are its true circular polarization and mechanical simplicity. The reduced number of machined parts and feed lines should make the new spiral FM CP antenna more reliable in the field and less expensive to manufacture. Tests to date on the antenna show that it has outstanding broadband characteristics, easily covering the FM broadcast band.

In addition to FM and TV antennas, Cetec also manufactures transmitter combiners and notch filters of various designs.

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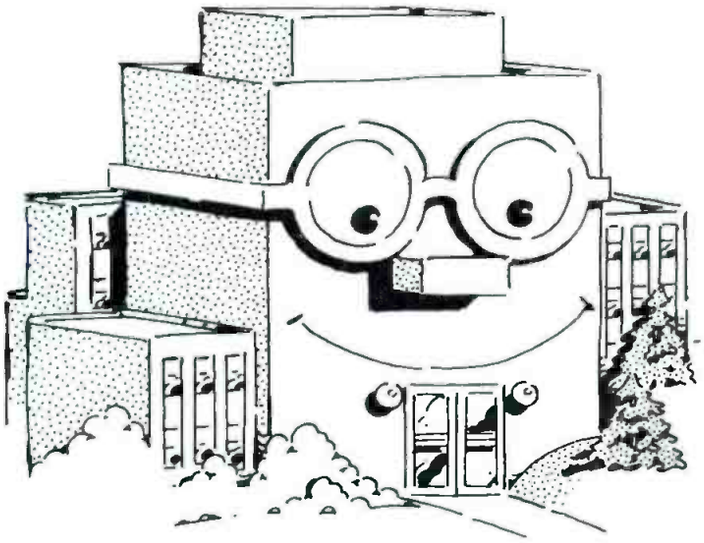

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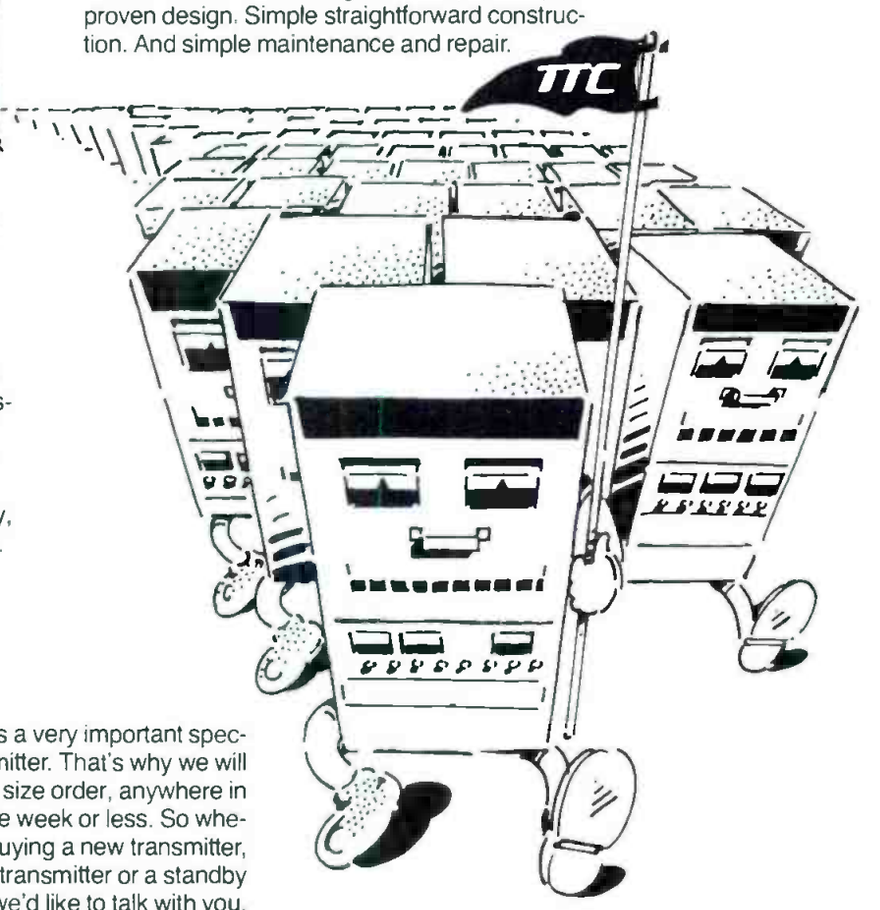

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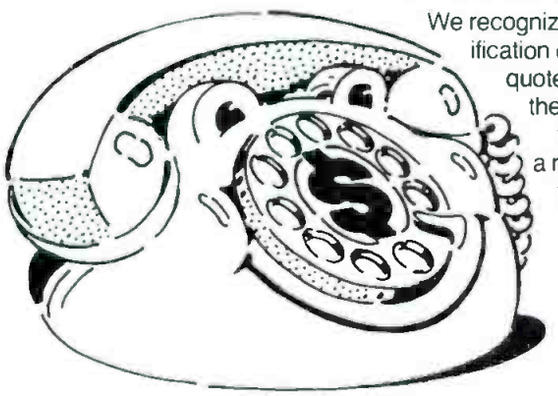

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Corrections

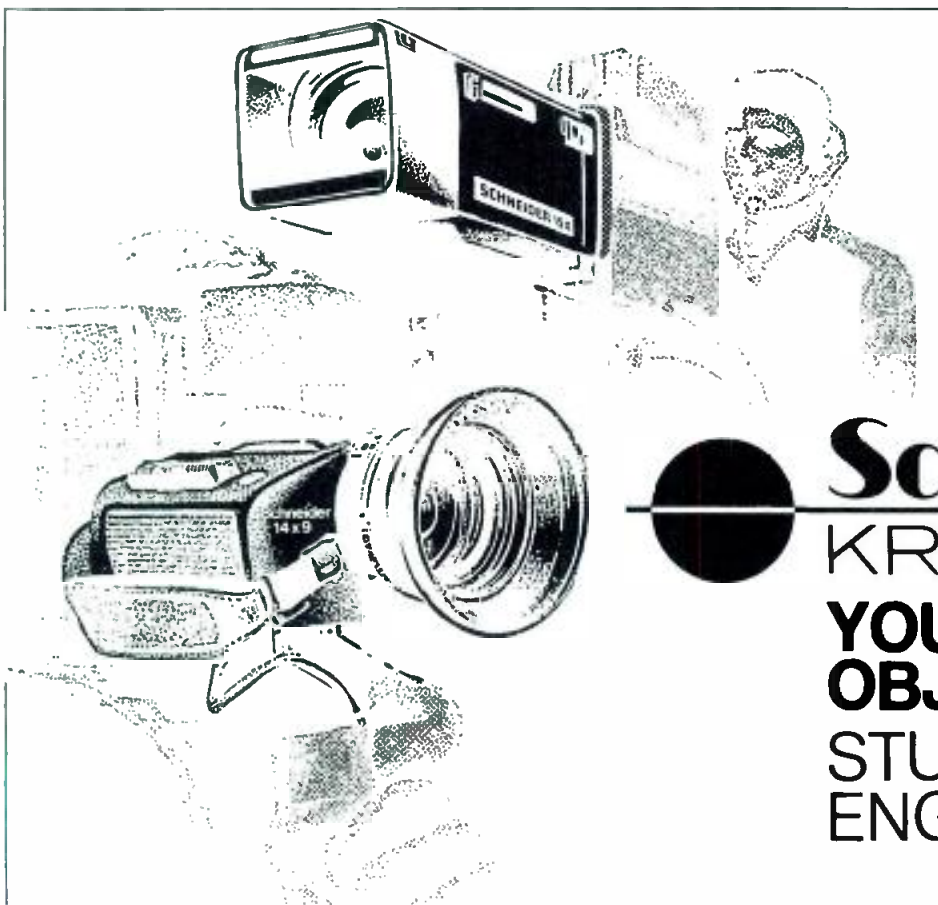
• *In the February 1984 issue of* ***BE****, clarification should be made on a few points in the article, "Stages of SCA." Under the subheading "SCA for Data Transmission" (page 68), it is said that error rates for SCA delivery of data can be as much as five orders of magnitude* **higher** *than standard telephone data lines. This should be corrected to state that SCA delivery provides data error rates* **less** *(that is to say,* **better***) than telco circuits. A similar discrepancy occurs at the bottom of page 70. The corrected paragraph should read as follows:*

"Error rates (for SCA data transmission) are **less** *than one in 10 million (1:10^7), as opposed to the telephone company typical figure of one in 100,000 (1:10^5), or* **higher** *in some cases."*

• *Environmental Satellite Data (ESD) was not included in "Electronic Videographics Systems: An Update" (February 1984* ***BE****). ESD provides the PMT-100 Professional Model Terminal for access, storage, analysis and display of color weather information via the GOES East and West weather satellites. Sixteen-bit computer technology includes 128kbyte RAM, 10Mbyte hard disk and floppy disk storage with RS-232C interfacing, repeating image loop sequences and a graphics tablet for the artist's input. CP/M-86 allows data processing and business applications of the system as well. For more information, circle (1497) on the Reply Card.*

• *The manufacturer name for the Emph-a-sizer audio processor on page 27 of the 1983* ***Spec Book*** *issue should have read ATI/Audio Technologies Inc. For those having used Reader Service Numbers, your requests have been properly directed to the Horsham, PA, company.*

BE *staff*



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RADIO SYSTEMS ESA-10	**Yes**	**3**	**6**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes (pgm. & aud.)**	**Yes**	**Yes**	**Yes**	**Yes**	**$ 8,950**
Pacific Recorders BMX-10	No	2	2 (3 op)	Yes	Yes	No	Yes	No	Op	Op	No	No	Yes	No	$13,250
Auditronics 212	Yes	2	3	Yes	Yes	No	Yes	Op	Op	1	No	No	Yes	No	$12,389
LPB Citation C-10SL	No	3	2 (5 op)	Yes	No	Yes	Yes	Op	Op	Op	Yes	Yes	Yes	Cp	$10,205
Broadcast Audio System 12	No	3	5	Yes	Yes	Yes	No	No	No	1	No	Yes	Yes	No	$ 9,600
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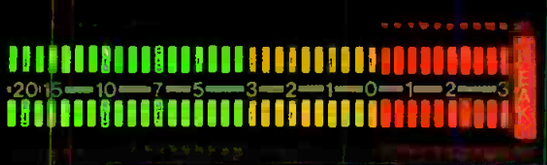

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Continued from page 42

ferent in appearance. We thought of a *space-station* that invited people to come off the wide aisles and experience the Sony family of broadcast products that were currently available and those high technology items coming in the near future.

After visiting with us, many people said it was like visiting the World's Fair. You could wander around and interact with the equipment, experience it and ultimately leave the area satisfied that you were able to see everything from a highly complex editing suite and a demonstration of the Betacam ½-inch camera/recorder system to a professional audio production studio designed for broadcast applications. It was a revolutionary concept, and much of the credit should go to Sony Broadcast president Neil Vander Dussen, who had the foresight to support the idea, and the company's management people who made the ideas into reality.*

Usually the gestation period for an NAB exhibit of this size is six months; our 1983 booth was created in four. Management gave us the go-ahead in late December 1982, and, in the next 12 weeks, the space center was designed, produced, shipped, erected and then stocked with 250,000 pounds of equipment. It was a remarkable feat accomplished thanks to the hard work of many dedicated people at Sony and Lynch Exhibits (Pensauken, NJ).

*In July 1983, Vander Dussen was appointed president of Sony Consumer Products company. William G. Connolly currently is president of Sony Broadcast Products Company.

The larger space center was 58 feet in diameter, and included a complete BVE-5000 editing suite (shown here). Note the tape machines behind the glass doors to the right.

Q: Can you discuss the design of the Sony exhibit in detail?

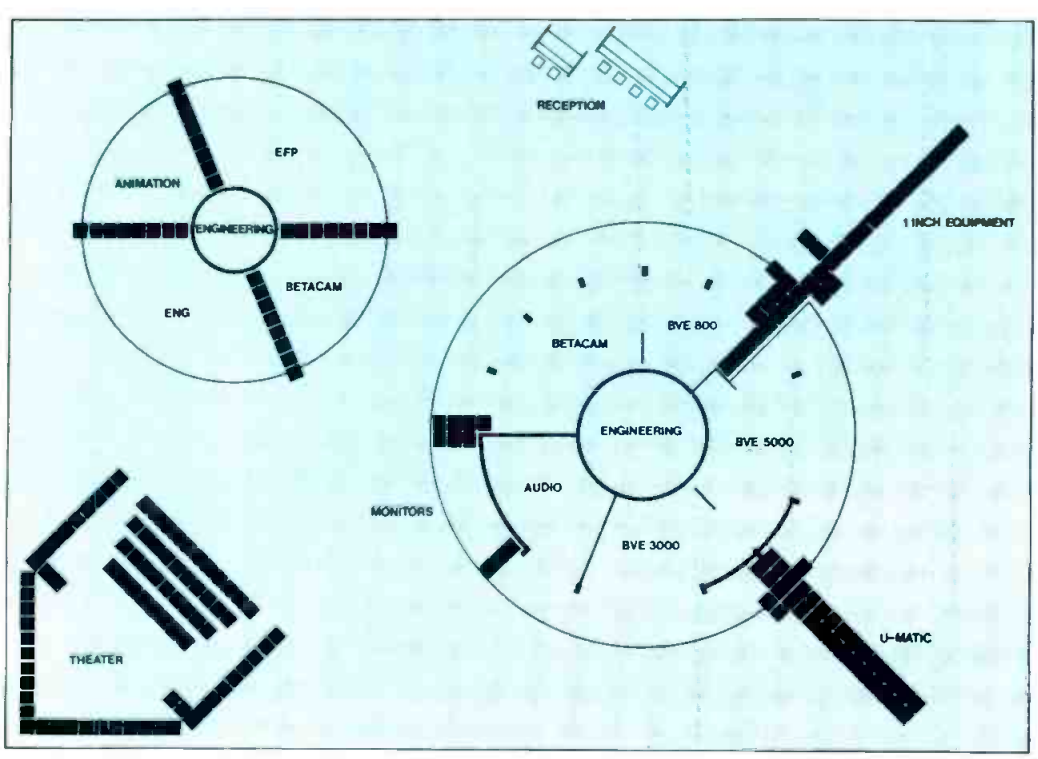
A: We received several competitive submissions by exhibit houses and selected the one by Lynch Exhibits to create a unique triad complex comprised of two circular space stations and the Sony Vision Theater, covering one-third of an acre.

We also designed a different treatment for housing equipment on the floor. We call it *space frames*. It makes the equipment seem to just be there without the customary walls and counters.

The larger space unit was 58 feet in diameter with an 18-foot engineering core at its center. Like slices of a large pie, five interlocking areas around the central hub offered displays of the Betacam ½-inch camera/recorder system, including the BVW-40 recorder/editor, the BVW-20 portable field player and all accessories for the BVP-3 Betacam recording system; three editing suites (which combined 1-inch U-matic VTR and Beta); and a complete MCI/Sony multi-track studio. A combination of TV monitors, overhead projectors and a small sound system enabled people on the periphery of the editing suites to observe the activities without obstruction. Editing generally is a one-on-one type of demonstration.

Completing the configuration of the larger space center, two finger-like space frames extended from the sides of the structure: one displayed 1-inch equipment arranged in ascending levels of sophistication; and the second *finger* was devoted to U-matic hardware.

The sister space unit, the smaller of the two, was 42 feet in diameter, divided into four sections, with a 10-foot engineering core at its center. One section displayed additional Betacam accessories; two sections were camera stages for ENG and EFP operations and applications; and the fourth module introduced our new BHV-2500 animation machine. The



Shown is the floor plan of Sony's 1983 NAB booth. The complex included a reception area, theater center and two circular space stations built around their own engineering core.

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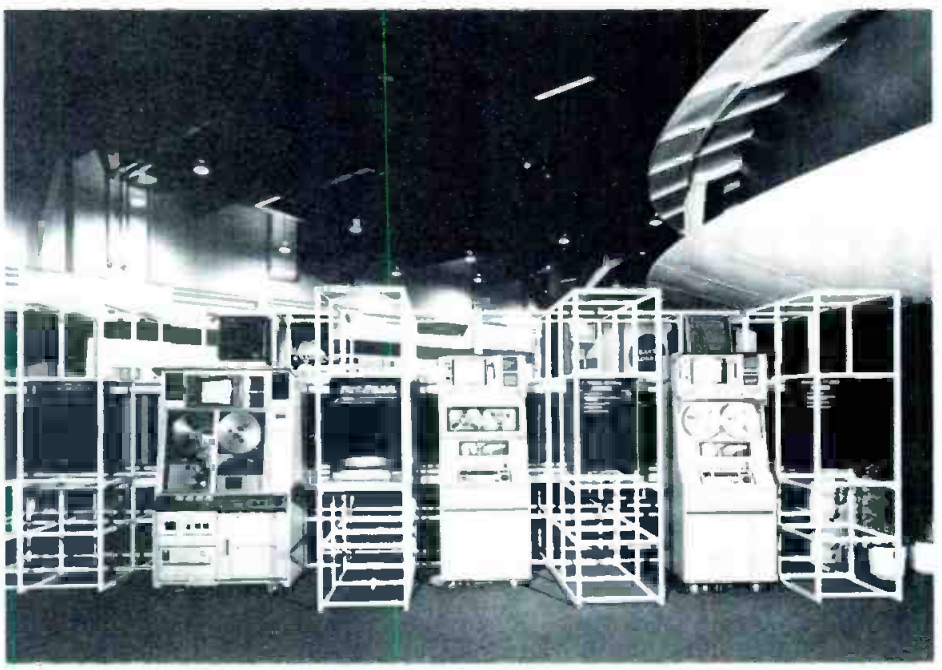
entire exhibit had a staff of sales engineers on hand to interact with visitors and explain special features and operation of all equipment.

The third part of the exhibit was the Sony Vision Theater, a separate entity from the two space stations. Traditionally, we have an audio-visual presentation that gives a brief overview of our entire product line. In 1983, the show included an on-stage performer and video segment, and was capped by a dramatic demonstration of HDTV. People cued up for tickets and even returned for performances later in the day. Showings were continuous from 9:30 a.m.-5:30 p.m.; 3800 NAB attendees saw the show.

Q: Mounting such an ambitious exhibit must have required a tremendous amount of coordination.
A: Pre-show activity always involves a great deal of pressure. Traditionally, NAB opens on a Sunday. However, Sony has a special preview of the exhibit a day before for the press and members of International Sony Broadcast Companies (Canada, England, Japan, Australia and South America), cutting our time by one-half day to prepare. We also use this time to familiarize our own personnel who run the show with the intricacies of the exhibit.

The structure was so complex that, until the actual setup date, we never knew how long it would take to assemble. Working with teams of 10-16 people, it took approximately 1800 man-hours to erect it. We began construction a full 1½ weeks before NAB opened. Working 24 hours a day in two shifts, it took four days to prepare the exhibit for the arrival of more than $6 million worth of equipment. We ran about 35 miles of cable. Last-minute problems were worked out and we counted down to the opening.

As a sidenote, our assembly procedure was so well-coordinated that we actually were ahead of schedule. More than once we completed a section and had to wait for the next truck to unload. We only had to redrill one hole in our entire steel structure.



Extending from the larger space station were two finger like corridors (above), one of which displayed 1-inch tape equipment arranged in ascending levels of sophistication. Note the uncluttered open-space design of the exhibit layout.

The smaller space station included the company's new BVH-2500 model (below), a SMPTE Type C 1-inch machine that features still-frame recording and playback without pre-roll. The BVH-2500 is designed for animation applications.

Q: Were there any unexpected problems?
A: Of course. Our one shortcoming was that we did not adequately design the reception/check-out area to handle the large numbers of people. It was an unanticipated bottleneck. Another thing we learned, once the exhibit opened, was that the traffic patterns of booth visitors were far greater than anticipated, and created some minor traffic jams. At one point, we estimated that more than 2000 people were in the booth at the show's peak.

Q: Was Sony pleased with the results?
A: Everyone was extremely pleased. Our goal was to emphasize the company's position as a leader in the industry by showcasing our line of products and future technology in the most efficient and original way possible for our customers to learn the most about our products. Lynch Exhibits helped us dramatically demonstrate how an innovative display can serve those ends. We expect that our space center will influence the design of major exhibitors at NAB and other shows for many years to come.

Q: How do you top such an exhibit?
A: We hope you'll come to NAB-'84 and see!

Editor's note:
This is how Sony prepared for its NAB-'83/Las Vegas convention spectacular. But remember, many exhibitors can relate similar stories. This year, when you see something you like at the convention in Las Vegas, let the exhibitor know. Much effort has gone into making *your* show the best in the world, and your words of acknowledgement will be appreciated.
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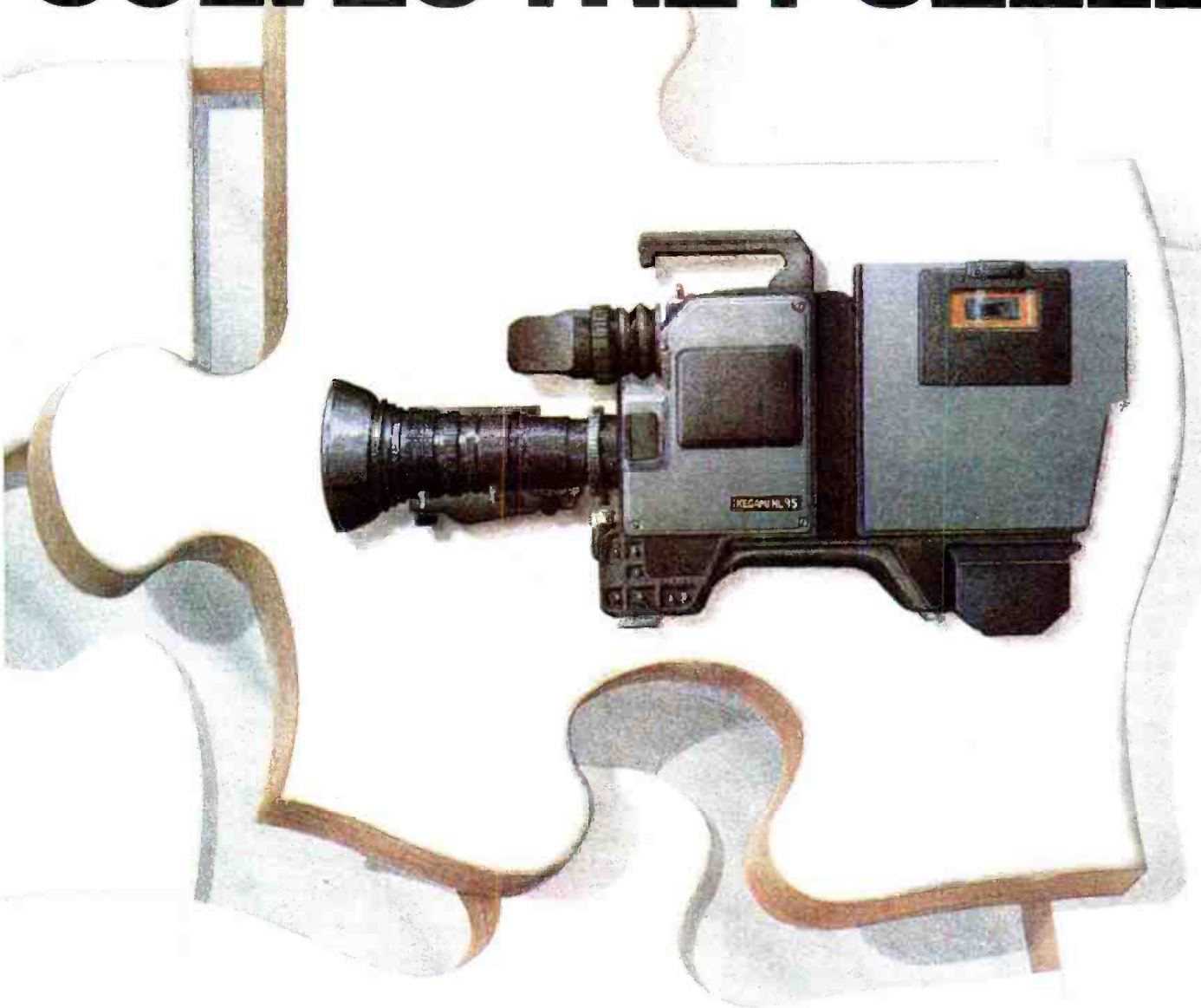

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The videodisc revolution

By Arthur Schneider, A.C.E., post-production consultant, Agoura, CA

This year at the NAB convention in Las Vegas, several editing systems manufacturers may show videodisc-based editing systems. However, based on my research, the big splash for disc-based systems will occur at next year's NAB show.

Without a doubt, the most time-consuming part of videotape editing is finding and locating material. Many ¾-inch VTRs used in editing take more than 12 minutes to go from one end of a 1-hour tape to the other. Even the most sophisticated of these machines will take more than two minutes to perform the same task.

Currently, 1-inch broadcast VTRs will search at speeds of 50X play speed or greater, but the majority of editing time still is devoted to threading VTRs or searching back and forth until the desired material is located. Even at 50X play speed, it takes more than a minute to go from one end of a 1-inch tape to the other.

If one were to analyze the various functions of the editing process, locating the material to edit takes most of the time and making decisions takes the rest of the time. Finding the right reel or cassette, winding down to the desired material and rewinding each reel consume much time during the so-called *creative* period of editing.

Most decision-making occurs or should occur during the work-print stage, using low cost editing controllers and VTRs. For obvious reasons, the cost of off-line or work-print editing generally is about one-quarter that of mastering or on-line editing.

What if you were to dramatically reduce the editing time by virtually eliminating search time? This presumes that adequate notes would be taken during production to allow production people to tell the editor to go to a specific take based on time code information or slate identification.

Let's assume that a point of reference has been selected. If a mass storage medium such as an optical laser videodisc were interfaced with the appropriate edit controller, access to this spot would take only a fraction of a second, instead of more than a minute with today's fastest VTR. Wouldn't it be great to be able to access material 60-600 times faster than with present-day VTRs? Think of the time and money saved in editing.

You can quickly see the tremendous advantages of such a system. Decision-making will be improved immeasurably, and I predict an immediate improvement in the aesthetic quality of the product because the creative juices would not he lost waiting for tape machines to find the material.

Science fiction you say? That is not so. Believe it or not, in 1971 CMX announced such a system, the CMX-600. Although its specifications were not quite what I have described, it did work and was in a class by itself. In fact, it could locate any frame of information within its videodisc storage hanks in one-seventieth of a second (twice as fast as the human eye blinks).

For all practical purposes, it allowed instananeous retrieval of picture and sound information. You may ask why it is no longer around. There are a numher of reasons. First, its initial price tag was close to $500,000. Second, its high maintenance costs limited its sale to only a few facilities that had the resources to keep it running. Third, the 600 only produced pictures in black-and-white. And, finally, it had a capacity of only about 27 minutes, limiting the amount of raw material the editor had to work with. This meant that you had to carefully select only the takes with which you planned to work.

The CMX-600 was designed for one particular purpose: to edit commercials and other short segments. It was an amazing device, but producers, seeing the potential for editing programs, wanted to use it for more sophisticated editing.

I was pleased to be among the first users of this system. Once I had learned to operate the system, I was able to edit the first cut of a 1-hour program in one 8-hour day. It took me only another four hours to refine it. Today, that same process takes about five days to complete. Although no longer in production, there is one CMX-600 disc system still operating at One Pass Video in San Francisco.

CMX plans to show additional videodisc interfaces to its 3400 editing system at NAB-'84. Last year, CMX was the first to introduce a videodisc interface for its editing system.

Because of the tremendous technological advances in electronics and related fields, mass storage, quality and capacity have been improved greatly. To date, there are 17 announced manufacturers of videodiscs and related components. Not all of them, however, are building videodisc units for editing systems. Some of them are for industrial use in interactive applications and others are strictly consumer-oriented.

Some features that I as a film and tape editor would like to see included in a videodisc-based editor are light pen control with plain English editing commands, no visible time code so that the user may call up material by scene or take number, and the capability for editing at 24fps, allowing conversion back to film edge numbers.

Features needed for video editing applications include a videodisc player that has a minimum capacity of 30 minutes per side, preferably 2-sided. The capability for scanning the video and audio at any rate selected by the user; for freezing a clean usable field or frame indefinitely; and for making edits from disc to disc or within the same disc in real time are some other features required by such an editing system. Another required feature is instant random access of any material recorded on any disc within the system. It also must be easy to use and reliable. The industry does not need another piece of hardware that takes a staff of engineers to maintain it.

Thirteen years ago, when the CMX-600 was introduced, the picture quality was mediocre, black-and-white and of limited capacity. Today the laser disc has come into its own. For example, disc storage now is up to an hour per side. Color with resolution of 4.5MHz or more is available. Disc players are less complex than a VTR. Even the slowest disc access time now is only a few seconds.

There are some limitations to the current crop of videodisc units. The most obvious one is the inability to get a videodisc made within a short time, such as overnight. You cannot use a videodisc as a source in post-production if the turnaround time is not within the constraints of the show's time schedule. Access time is the second limitation. The 70ms access time of the CMX-600 is not yet available for the video laser disc, although I am sure that eventually will be achieved. A third problem is that of cost. Some disc mastering costs more than $2000 per disc, out of the range of most TV editing budgets.

During my recent research on this subject, I contacted a number of com-

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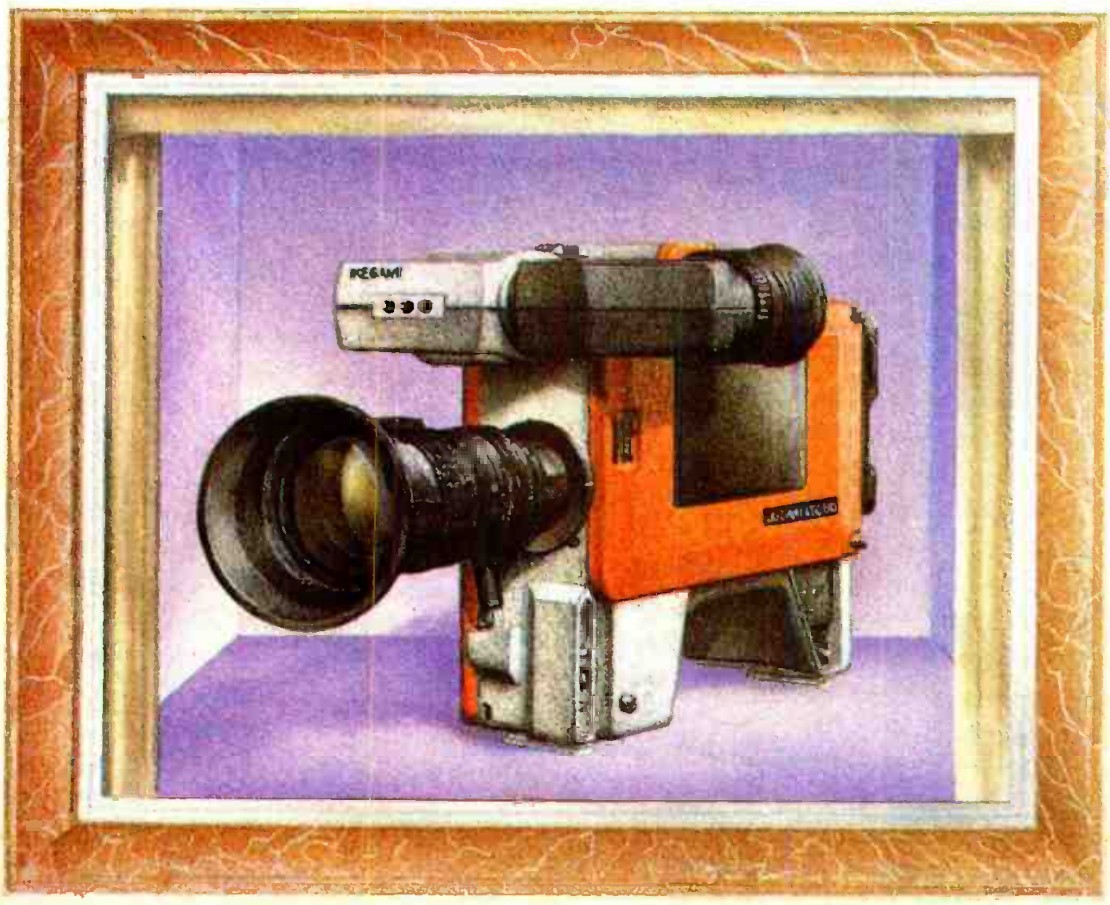

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panies designing and building videodisc interfaces for their editing controllers. As of this writing, the following provides information on companies, many of whom will be at NAB-'84/Las Vegas, that are building systems.

One of the companies working on a videodisc editing system is Spectra Image. Gary Matz, executive vice president, said that the company is building an interactive and catalog-type disc-based system. This will include equipment to provide motion control and capability for handling up to 30,000 individual slides. Another service to be offered will be disc-based presentations. The company is building videodisc-based editing systems that will be leased to users. Input from industry film and tape editors helped this company develop a user-friendly system. According to Spectra Image, the TV industry is moving so fast that the company periodically will have to update its systems to be competitive.

Spectra Image plans to provide mastering to videodisc on a 1-shot basis with overnight turnaround for a cost per half-hour disc of $150. By 1985, it expects to lower that price to $100. According to Matz, Spectra Image may show its system at NAB'-84.

One of the most well-kept secrets in this industry to be unveiled at this year's NAB show is the Edroid videodisc-based editing system. This joint venture between LucasFilm and Convergence, if nothing else, should have people lined up at the booth to get a look. I have asked for information describing the system, but Convergence, as well as all other editing systems manufacturers, is not furnishing it.

According to Deborah Harter of Convergence, the Edroid editing system will be manufactured and distributed by Convergence. The system has been designed by George Lucas and his engineers and is aimed primarily at the film editor. There is no keyboard or light pen for input to the system. However, Harter said that the input device is mechanical. The number of disc players seems to be virtually unlimited. The system also will interface with existing VTRs. Although the Edroid seems to be designed for film editors, it also will be compatible with SMPTE time code and will allow the editing of TV programs on videotape.

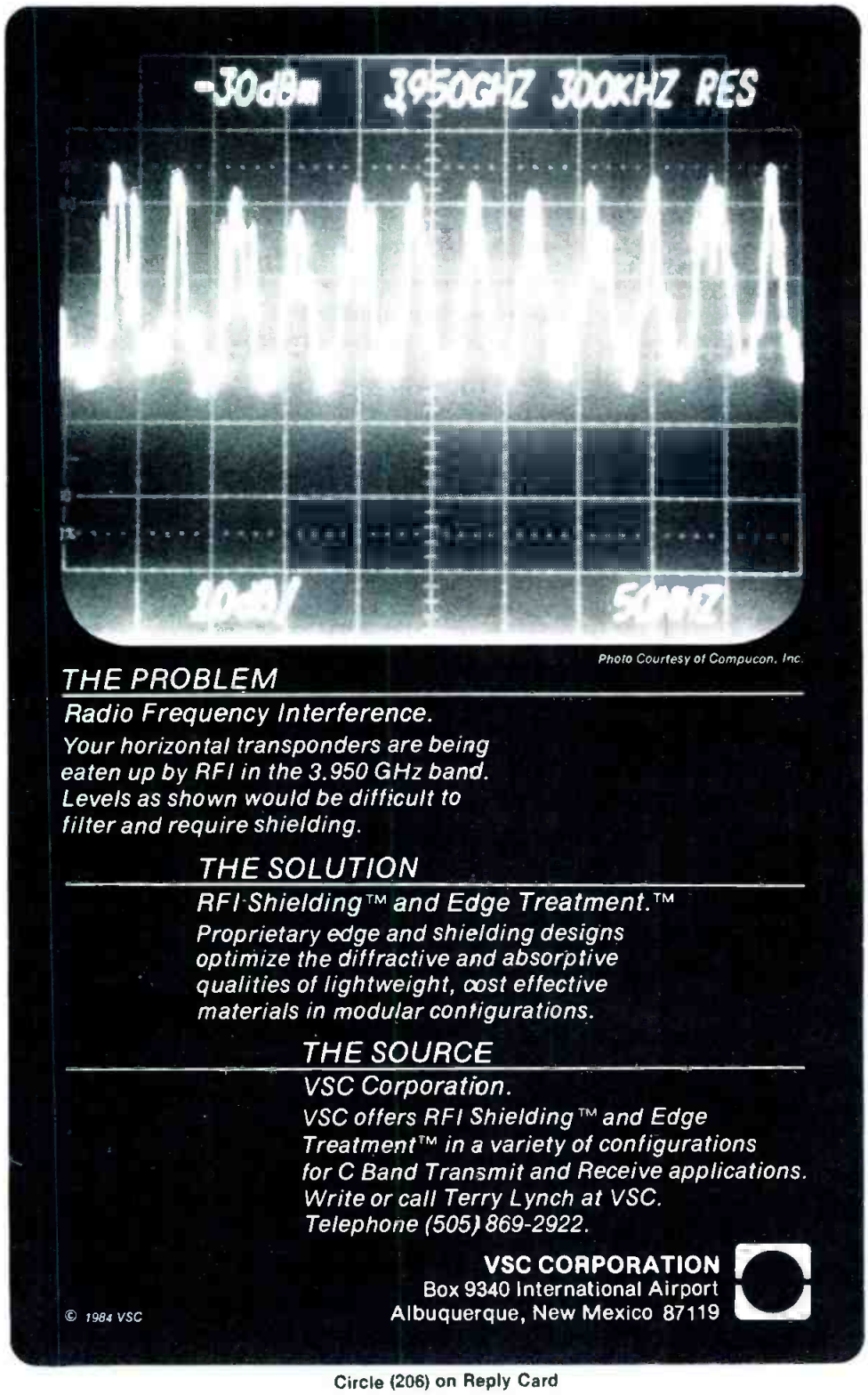
The Control Video Corporation (CVC) has announced that it will introduce a new disc-based editing system, the Competitor. It is a high level editing system with the capability for interfacing up to 30 videodisc players, using an enhanced CVC editing controller.

At this time, CVC is interfacing to the Panasonic direct read after write (DRAW) videodisc recorder/player, which has a capacity of 13.8 minutes of material in real time. Some of the announced features include an interface to four videodisc players, real time playback, multiple record capability and variable speed playback in either direction. It also will allow film-to-video-to-film editing with the 24- to 30-frame conversion software included in the base price of the system, which is expected to be from $50,000 to $55,000. Another feature will be the transfer function, allowing auto duping of material to another disc for dissolves or for editing between disc players in real time.

The CVC Competitor also includes complete edit list management capabilities. This includes finding an edit by anything stored in the list from edit number to names stored as a note. Data is put into the system by the Lightfinger screen or an optional keyboard.

NAB-'84 promises to unveil some of the most interesting and innovative post-production tools broadcasters have ever seen.

|:-)))|



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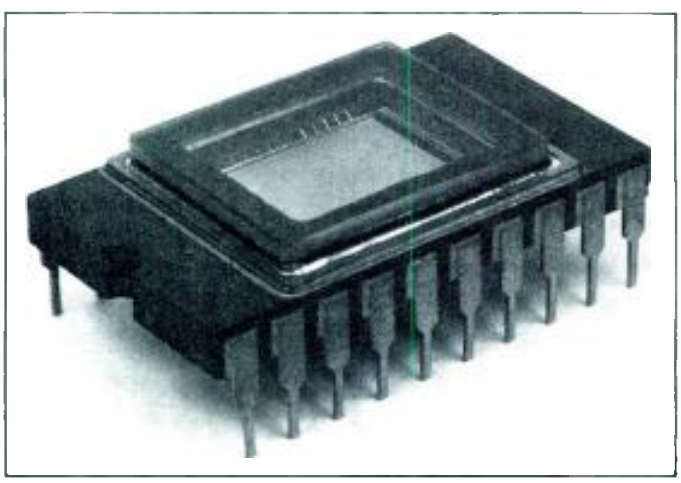
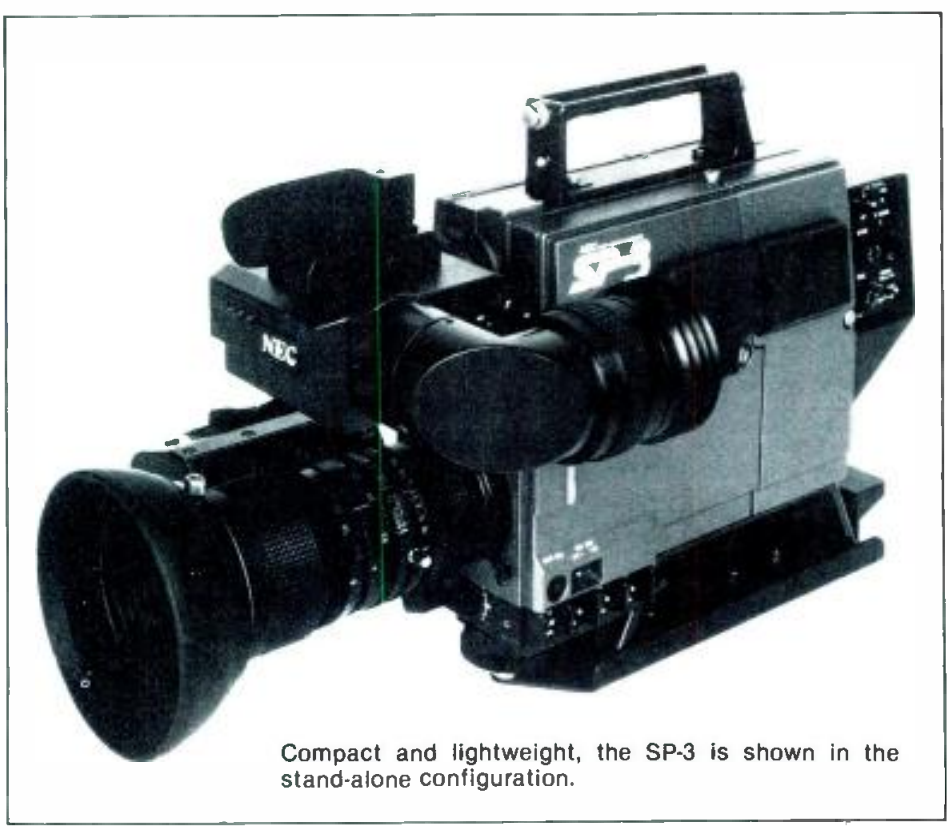
NEC's new 3-chip CCD color camera

By Masao Mitsui, director of engineering, NEC America, Elk Grove Village, IL



Shown is one of the new NEC interline CCD chips used in the SP-3 video color camera. The registration of the three CCD imaging chips is permanently set in the factory.



Compact and lightweight, the SP-3 is shown in the stand-alone configuration.

Since they were introduced in the late 1970s, video cameras using solid-state charge-coupled device (CCD) image sensors have generated a great deal of excitement in the broadcast industry. With their mechanically locked registration, CCD cameras seemed particularly suitable for electronic newsgathering, in which camera operators often are required to carry out tough ENG assignments in difficult circumstances with little or no time to set up.

Furthermore, CCD cameras promised to be considerably more rugged and reliable in operation, as well as lighter in weight and lower in power consumption, effectively easing the load of equipment ENG camera operators need carry with them.

Video cameras using solid-state CCD image sensors were expected to provide performance superior to that available from most conventional ⅔-inch pickup tubes. However, until recently, their use was confined mostly to industrial applications because their resolution was still inferior to that of Vidicon-type pickup tubes. One of the problems that needed an immediate solution was the *blooming* phenomenon. The application of an overflow drain and barrier positioned beside the photosensitive area has made it possible to suppress the blooming phenomenon in CCD image sensors. However, this method was found to sacrifice photosensitivity and dynamic range.

To produce its first broadcast-quality CCD color camera, the SP-3, NEC has developed a totally new interline CCD chip, in which the contents of the multiple solid-state data registers are read out during the video picture's vertical interval. The NEC interline CCD chip features a *vertical*

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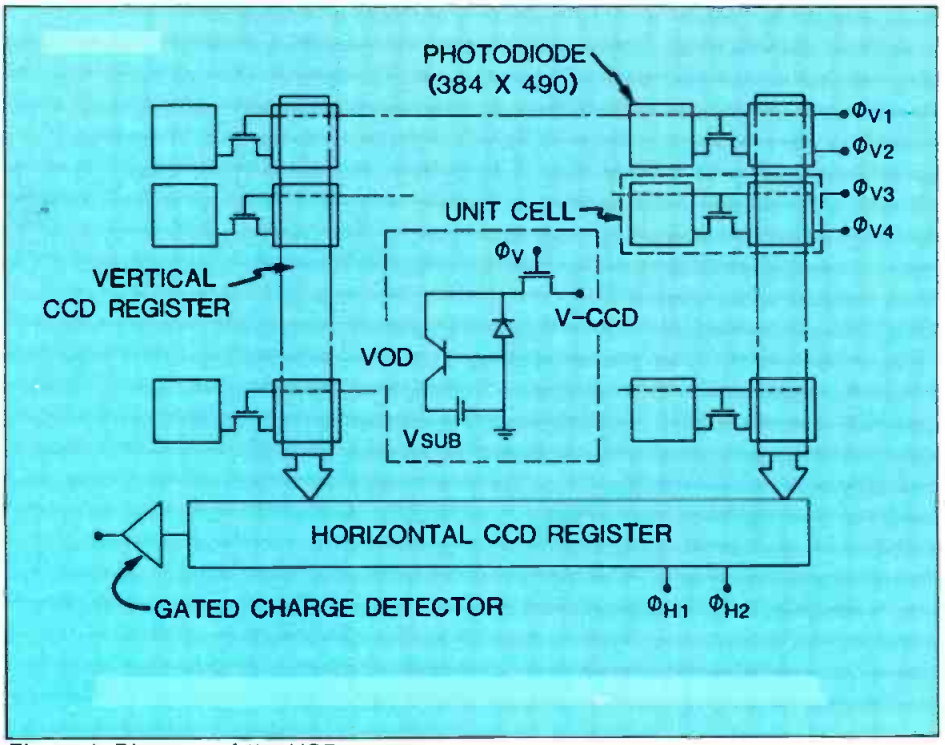

Figure 1. Diagram of the VOD sensor.

overflow drain (VOD) positioned under, rather than beside, the photo diode, thus effectively increasing the cell area that can be used for photo electron generation and storage. Three of these interline VOD CCD image sensors are used in the SP-3 ENG color camera: two for the green channel alone, and one for the combined red/blue (RB) channels. This dual green system, which can only be realized with a mechanically locked registration system, provides much higher resolution and sensitivity than can be obtained from a conventionally structured RGB system.

The CCD image sensor

Figure 1 shows the basic composition of the new interline CCD image sensor used in the SP-3 camera.

The sensor features a photoelectronic conversion system that consists of an array of 490(V) x 384(H) photo diodes, a transfer gate region (TG) controlled with a vertical transfer pulse, a buried channel vertical register (V-CCD), a horizontal register (H-CCD) and a gated charge detector for the output signal.

The photogenerated signal charges are transferred to the corresponding V-CCD through the TG region during the vertical blanking period. There are two ways to accomplish the transfer: One is the *field* mode, which transfers all photogenerated signal charges at the field rate; and the second is the *frame* mode, which transfers half of the photogenerated signal charges during the first field period and the remaining half of the signal charges during the second field period. The signal charges transferred to the V-CCD register subsequently are transferred to the horizontal register at the horizontal line rate and sent out to the output stage at the clock rate of the horizontal register.

A unit cell (indicated by the dotted line) consists of a photo diode, a half-stage V-CCD register and a VOD in which all of the photogenerated excess charges are drained into the substrate without flowing into the V-CCD. By means of the vertical overflow drain, the cell area can now be used effectively for photo electron generation and storage, and increased photosensitivity and dynamic range can be maintained. In effect, this technique eliminates the blooming phenomenon.

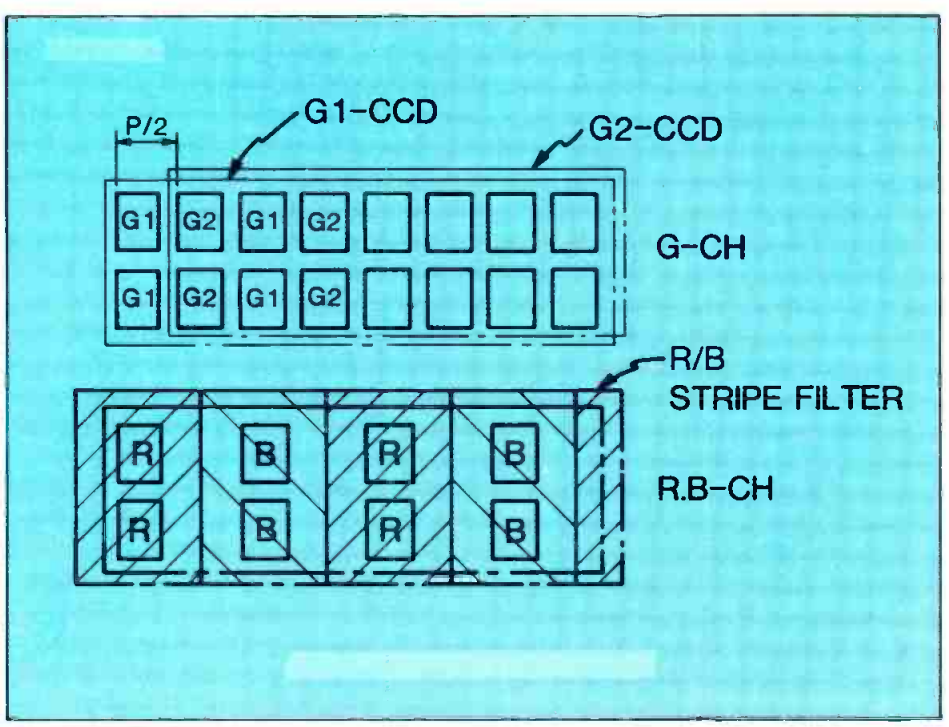

Figure 2. Pixel arrangement.

A dual green image pickup system

In a conventional 3-tube elements camera, each of the elements is assigned to the RGB channels respectively. However, this method of one channel/element assignment is not effective if applied to the 3-chip CCD camera, yielding resolution problems, as well as signal aliasing problems, which are created by the use of solid-state chips as the image pickup elements. Aliasing occurs in the CCD image sensor when the spatial fre-

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Designed as a broadcast-quality stand-alone ENG camera, the SP-3 (shown here with Sony Betacam ½-inch recorder) offers universal interface to all videotape formats: ½-inch Beta or VHS, ¾-inch U-matic, as well as ¼-inch VCRs. Solid-state operational characteristics feature accurate and permanent registration that is free from geometric distortion.

ne author (right), demonstrates the P-3 at the 1983 SMPTE Convention in os Angeles.

iency of the image projected on the iage sensor in a given plane exceeds lf the photo diode spacing in the im-ge sensor on that plane.

To overcome these problems and to ovide the best balanced perform-ice that can be achieved with cur-nt CCD chip pixel capacity [490(V) x 4(H)], a dual green system was veloped as the image pickup system r the SP-3 CCD camera.

As shown in Figure 2, two of the ree CCD chips have been assigned the green channel, which requires a eater amount of light and a wider ndwidth, by means of a compen-ting arrangement of horizontal pixel terpolation. The remaining chip was signed to the red/blue channels by means of a time sharing multiple process with an RB vertical strip filter.

The dual green system attempts to approximate the performance of the human eye as it perceives color, taking into account the following: The light value ratio of green to red/blue is approximately 1.5:2; and in the NTSC color system, the bandwidth ratio of the luminance channel to the chrominance channels is about 4:1. Conse-

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quently, in spite of the limitations inherent in having only 384 pixels for the horizontal picture elements (per CCD chip), with the dual green system it was possible to obtain a horizontal resolution of more than 500 TV lines.

The optical system

Refer to Figure 3 for the composition of the optical system employed to split the incoming light beam by prism. In front of the prism there is a series of filters: an ND filter (to help increase the camera's dynamic range), an IR cut filter and an optical low-pass filter (LPF).

The optical low-pass filter is used to minimize the aliasing problem, which is mainly caused by green light. In effect, the optical low-pass filter suppresses the spatial frequency of the image that causes aliasing on the CCD image sensor.

Because the dual green system is employed, the SP-3 camera uses a unique prism-optics block to split the incoming light beam into three beams: two greens for the G1 and G2 CCD image sensors and one magenta for the RB CCD image sensor. One-half of all incoming green light is reflected at the first dichroic surface, and the remaining one-half of the green light is reflected at the second dichroic surface. Only magenta light passes straight through the prism without any reflection. In this system, two green lights are reflected to precisely opposite directions against the light axis, thus minimizing achromatic effects that may occur when the image is out of focus and the iris is wide open.

Past the prism, another low-pass filter is inserted in the red/blue optical path to prevent aliasing and ghosting from the RB CCD image sensor. This is done because the bandwidth of the red or blue channel is effectively only one-quarter of the green channel bandwidth.

The CCD imaging chips are mounted directly on the optical assembly. The registration of the imaging chips is permanently set in the factory. No adjustment is ever needed.

Signal processing circuits

• **Combining the G signals and splitting the RB signal**—Refer to Figure 3 for a block diagram of the SP-3 camera. Because the horizontal shift registers of the CCD image sensors for G1 and G2 are driven by the two clock pulses (7.16MHz) with 180° phase shift, a 1H delayed signal and a 2H delayed signal for G1 and G2 can be obtained just through two 1H CCD-type delay lines without requiring a special delay line for phase matching respectively.

The non-delayed original signal, the 1H delayed signal and the 2H delayed signal for G1 and G2 are all combined, respectively, by three sample-and-hold (S.H) blocks, each consisting of two sample circuits and one hold circuit. Therefore, the data rate of the output signal from each of the sample-and-hold blocks is twice the rate of the output signal from each of the green CCD image sensors.

On the other hand, because the output signal from the red/blue CCD image sensor consists of alternating red and blue pictures at a rate of 7.16MHz, the red and blue signals can be easily split by using two sampling

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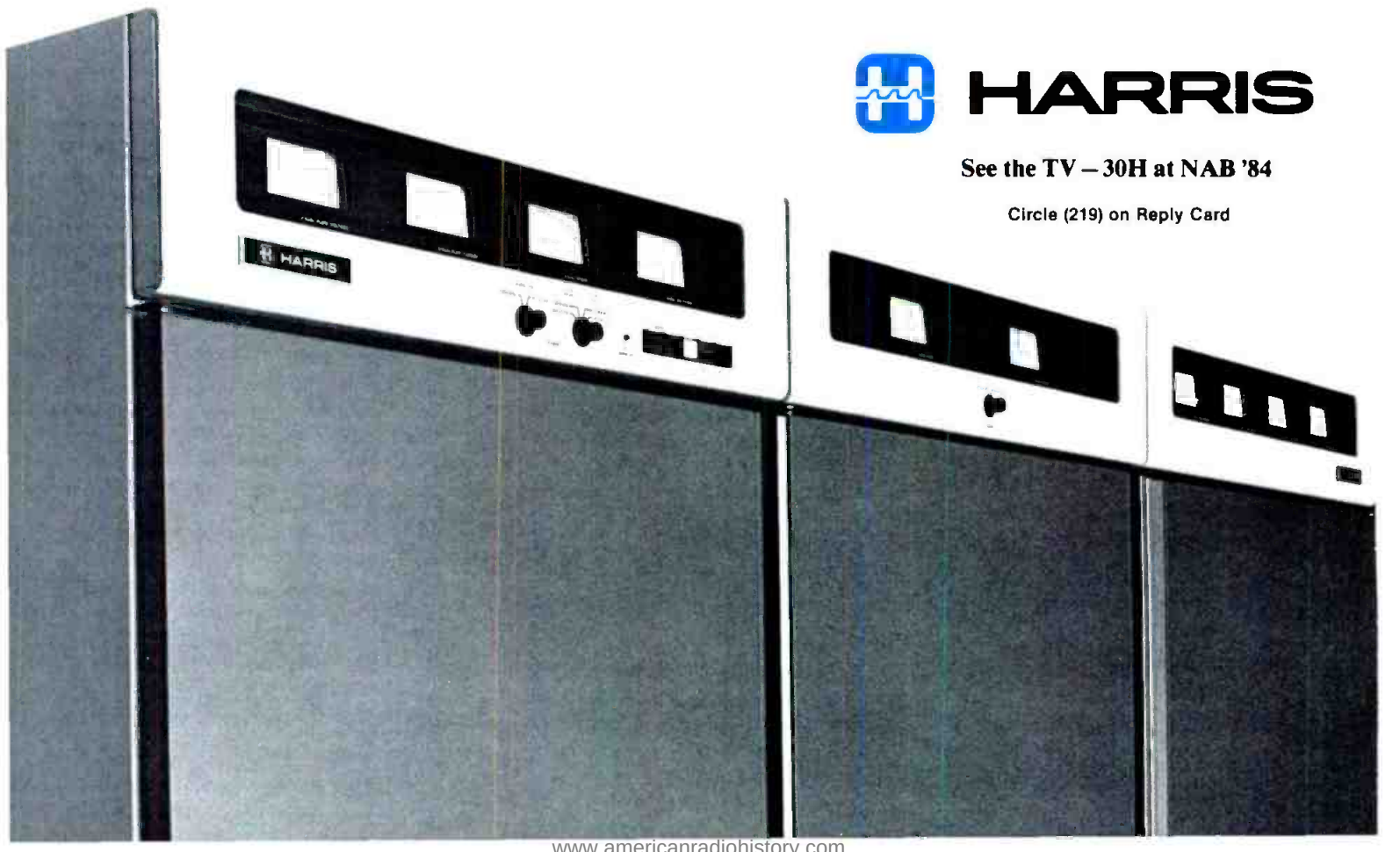

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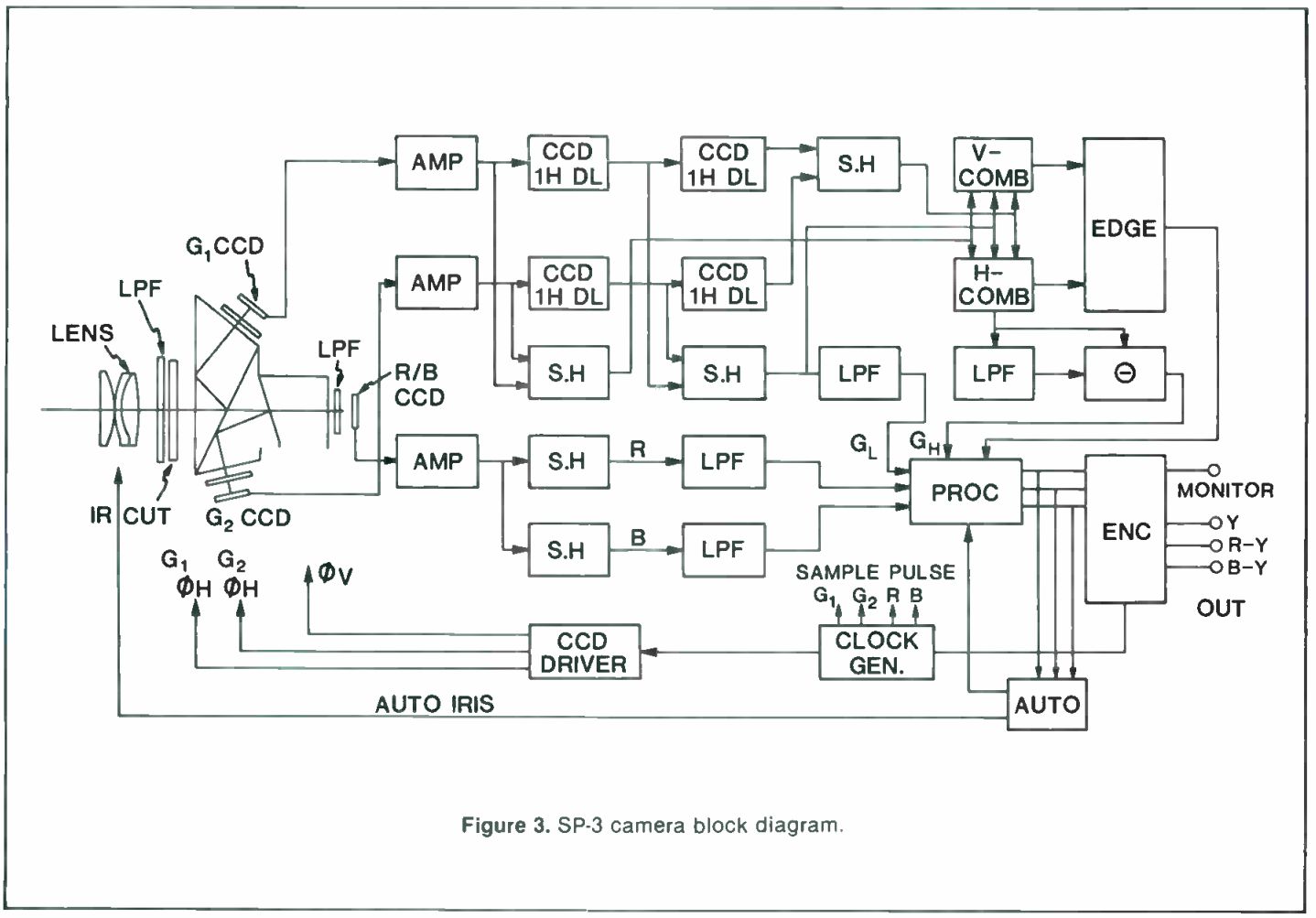

Figure 3. SP-3 camera block diagram.

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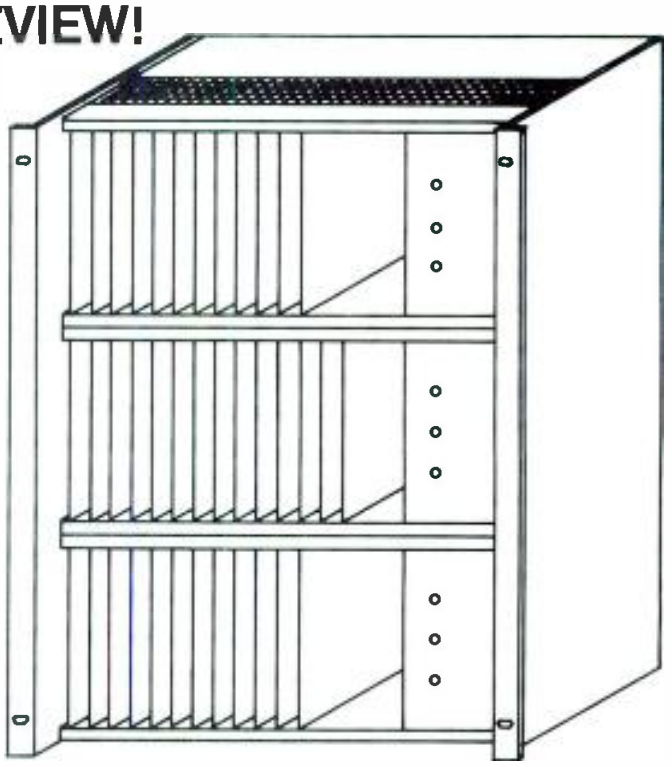

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SP-3 Performance Specifications

Color System	NTSC Color Signal
Pickup Image Devices	CCD Solid-State Image Sensors μPD 3511 Green Channel μPD 3512 Red/Blue Channel
Optical System	F1.4 Prism Optics
Signal-to-Noise Ratio	More than 55 dB
Sensitivity	f/5.0 2000 Lux, 3200°K, 89.9% Reflectance
Resolution	Horizontal — More than 500 Lines Vertical — More than 350 Lines
Operating Temperature Range	−20°C to +45°C
Power Consumption	Approx. 12W
Dimensions (Camera Only)	90mm (W) × 178mm (H) × 155mm (D)
Weight (Camera Only, with Viewfinder, less Lens)	Approx. 2.7kg (5.9 lbs.)

pulses (3.58MHz) with a 180° phase shift.

• **Image sharpener circuit**—The camera features a 2H-line type image sharpener by means of a high performance CCD delay line (DL) which has a 400% dynamic range and a 62dB signal-to-noise ratio.

The CCD delay line and the green image sensors are driven in parallel with the same clock signal to maintain proper timing between the signal coming from the green CCD image sensors and the delayed signal through the CCD delay lines. The output of the three sets of sample-and-hold blocks (non-delayed, 1H delayed and 2H delayed video) is then fed to a comb filter and image sharpener to peak the high frequency components of the green channel signal and to generate edge component signals. In this system, the high frequency component of the green channel is also used to feed the red and blue channel signals to enhance their frequency content.

• **Output signals**—The camera provides the following output signals:

- Y, R − Y and B − Y signal for component VTR;
- composite video signal with SP-1AD adapter; and
- direct RGB output signal with SP-2AD adapter.

An NTSC composite signal is also available as monitor for the built-in VTR system in camera/recorder combinations.

Camera functions

The SP-3 camera incorporates auto and preset white balance, auto black balance, black stretch and auto iris.

The camera system

The CCD color camera is designed to be used as a broadcast-quality ENG stand-alone camera, as well as in camera/recorder combined systems using on-board component VTRs for ENG applications.

Enhancing the versatility of the camera, available camera adapter attachments interface to external conventional portable VTRs, as well as to RGB image processing systems as a special application.

The SP-1AD camera adapter attachment is used to generate composite video signal output for conventional VTR recording. The SP-2AD camera adapter provides direct RGB output for use as a document camera or for image processing applications.

Because the SP-1AD camera adapter contains gen-lock and I/Q type encoder modules, it will generate a burst signal and a color frame pulse that will meet the RS-170A standard, as well as NTSC color signal requirements.

Remote-control functions are available for gain, pedestal, iris, SC and horizontal phase control, etc.

Features

Compared with conventional 3-tube video cameras, the CCD camera offers several distinct advantages:

• Solid-state operational characteristics feature accurate and permanent registration that is totally free from geometric distortion. In normal operation, no CCD chip ever requires replacement or adjustment.[1]

• Disturbances such as electrical circuit deviations or the earth's magnetism that can affect registration and cause geometric distortion in conventional magnetically deflected cameras are totally ignored by the SP-3 camera.

• Furthermore, the CCD camera is completely free from burn-in, sticking and comet-tail that may occur in conventional pickup tube cameras when high intensity objects are viewed. Even if you were to shoot directly at the sun, no damage would be incurred to the elements.[2]

The SP-3 offers a complete freedom of choice in videotape interface. Its compact size, light weight, and outstanding resistance to shock and vibration make it an extremely durable and versatile system that can be employed effectively in ENG applications as well as other applications where conventional 3-tube video cameras cannot perform adequately.

With its high resolution and quality color reproduction, NEC's new CCD camera represents a big step forward in available broadcast-quality cameras, and points the way for the next generation of broadcast camera technology.

[1]As noted, under normal operation, the CCD chips of the SP-3 camera should never need replacement. If, for any reason, such replacement should ever become necessary, the camera should be returned to NEC for inspection and service. Although such service seems unlikely, **BE** explored the possibilities with NEC. The company said that individual chip replacement is possible. If the camera has been seriously mistreated, the entire optical block and all its CCDs can be replaced. In this worst-case situation, the cost would be approximately what you would expect for replacing the optics in a traditional tube-type camera. In any event, if your camera has been extensively damaged, you would probably want to replace it rather than service it.

[2]Aiming your expensive video camera at the sun, or at its reflection from a shiny surface, is not a recommended practice. However, according to NEC experts, such action, accidental or deliberate, does not have any apparent adverse effect on the immediate or long-term performance of the SP-3 camera. It is our understanding that NHK in Japan set up a CCD camera to tape an eclipse of the sun. A segment of the resulting tape was subsequently broadcast so that the public could view the event. **BE** is researching this work and will report details when they become available.

Editor's note:
This article on the SP-3 CCD camera was provided courtesy of NEC America and excerpted from the NEC *Synchronizer*, Volume 2, No. 1, Winter 1984. A production version of the SP-3 camera was introduced at the SMPTE-'83/Los Angeles Convention, Oct. 30-Nov. 4, 1983. The camera is available now from NEC, essentially from stock, for approximately $19,000 (without lens). For a quotation, contact the Broadcast Equipment Division, NEC America, 130 Martin Lane, Elk Grove Village, IL 60007. |:-)))|

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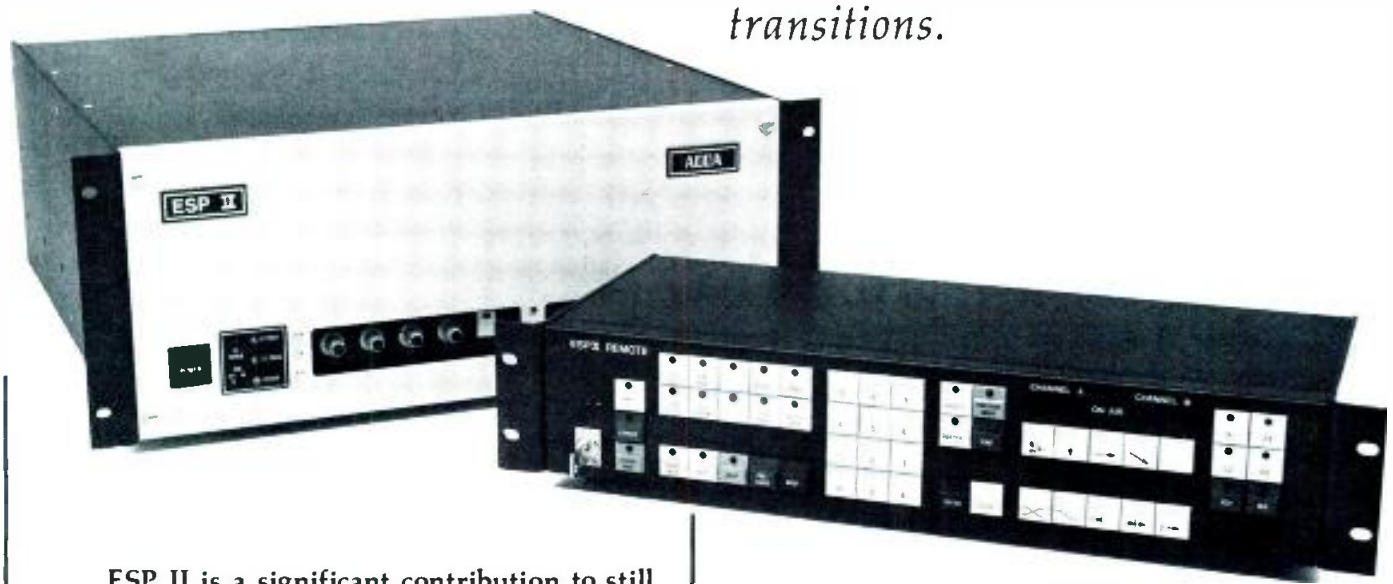

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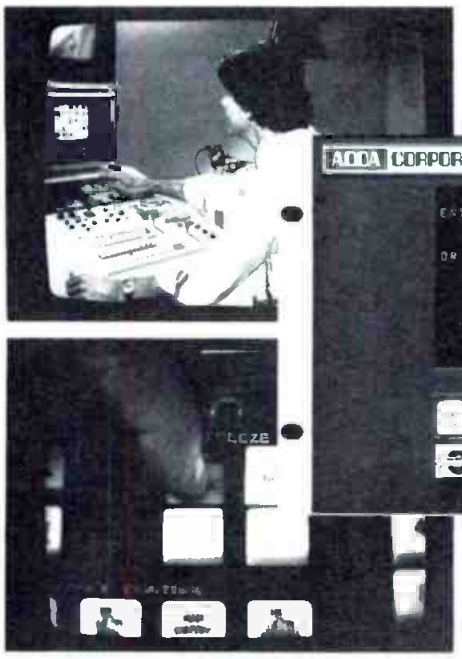

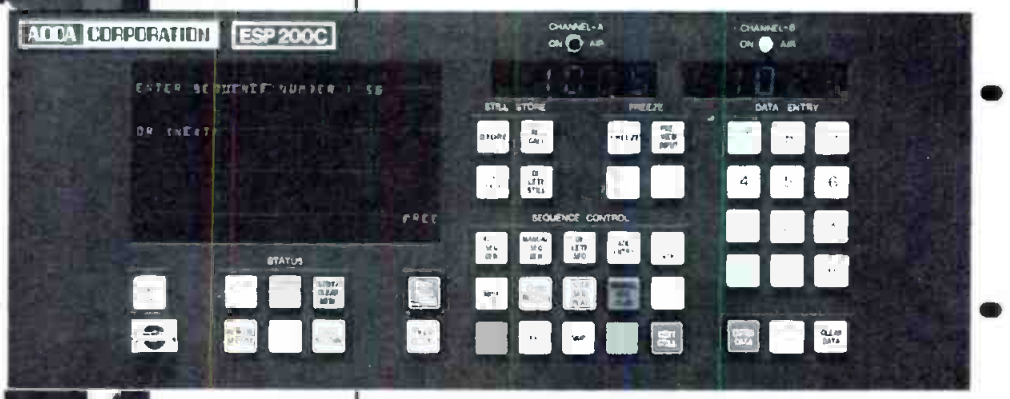

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Audio crosspoint switching:
A design example

By Bob Zavrel, applications engineer, Siliconix, Santa Clara, CA

The audio crosspoint switching system described here can be used not only for recording studio and broadcast mixer applications, but also in a diverse range of circuits requiring low switch cost and small size. Such applications include audio-follow switches for video systems, audio synthesizers, high quality multiplexers and home entertainment systems.

Recent advances in analog switch integrated circuits have resulted in devices that can deliver superior audio performance for the most demanding applications. A high quality audio frequency switch should have a reasonable cost, unity or variable gain, low harmonic distortion (less than 0.01%) and flat response (from dc

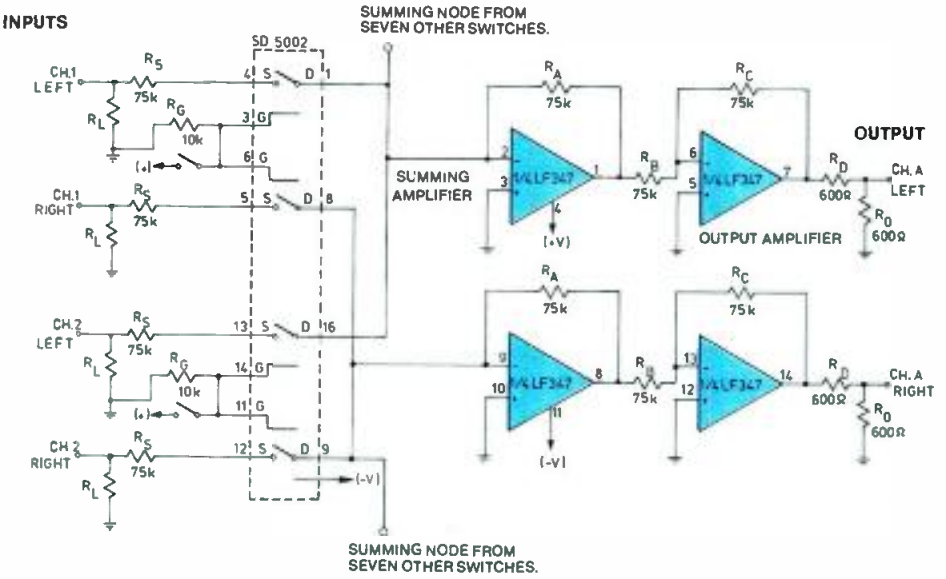

Figure 1. Basic analog switch design for the 8x2 stereo crosspoint matrix. Circuit input impedance is determined by R_L and output impedance is determined by R_D.

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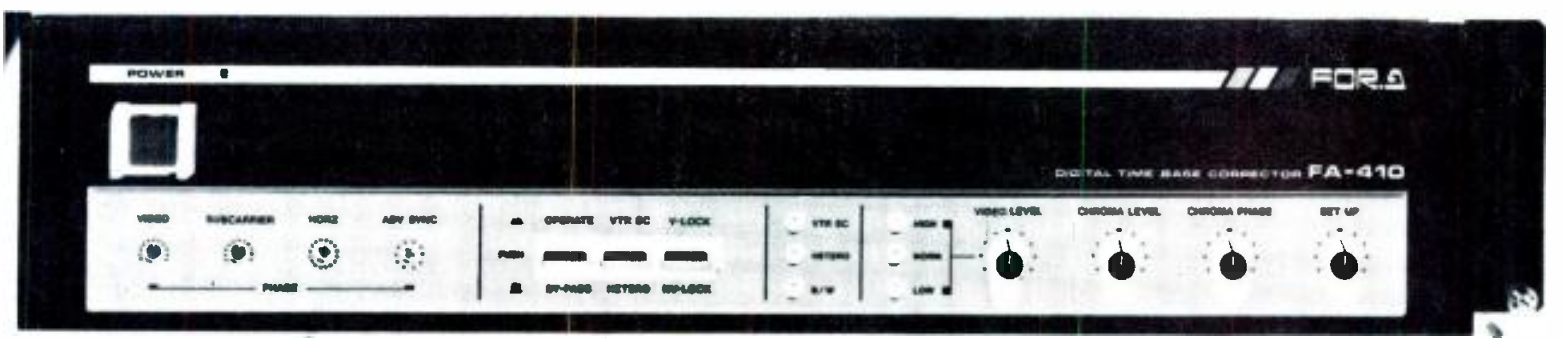

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[1]Dynamic Tracking and U-Matic are trade names of Sony Corporation.
[2]The Panasonic VHS NV-8950 is V-locked with modification by FOR-A Corporation. Contact FOR-A Sales Department for complete information.

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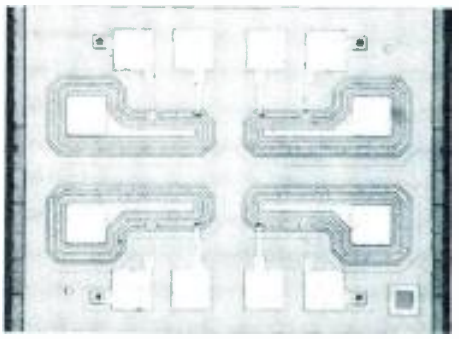

A magnified view of the circuit pattern for the SD5002 quad analog switch chip.

to greater than 1MHz). Low cross-talk, high off-state isolation, excellent phase linearity and high switching speed (less than 1ns) also are desirable characteristics. Finally, the switch should be free of *popping*, directly controllable by digital gates and use dc coupling only.

The size of a complex audio switching array can be reduced greatly by using integrated circuit (IC) technology. The analog array described here is an 8x2 stereo crosspoint switch mounted on a 4"x7" printed circuit board (PCB). Other switch configurations may be fabricated with little effect on the switch characteristics. This single board can replace a score of rotary switches and the bundles of audio cables often found in audio mixers. Furthermore, eliminating long cable runs often will reduce ground-loop problems.

The switching system

SD5002 switching elements are used in this application because of their low on-resistance, low switch capacitance and fast switching characteristics. The LF-347 quad op-amp is used as a buffer and output amplifier.

Figure 1 shows how a single SD5002 is configured as a 2x1 stereo switch. The LF-347 functions as a summing and output amplifier for each stage. The analog switches are held *normally* open by biasing the control gates to ground potential through 10kΩ resistors. For any configuration, the appropriate switches are closed by biasing their gates to the positive voltage supply.

In this circuit, pairs of switches are operated together to control the left and right channels of a stereo input simultaneously. This is accomplished by tying the applicable switch gates together and using a common bias resistor. The capability for directly interfacing the SD5002 gates to digital integrated circuits presents multiple design options for switch control.

Figure 2 shows how the basic circuit

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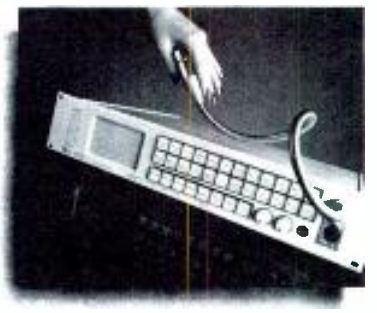

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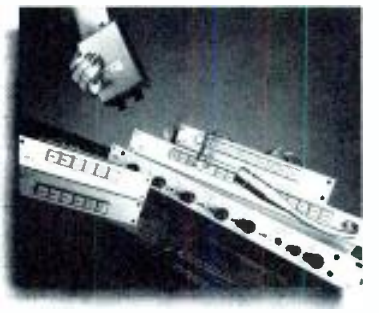

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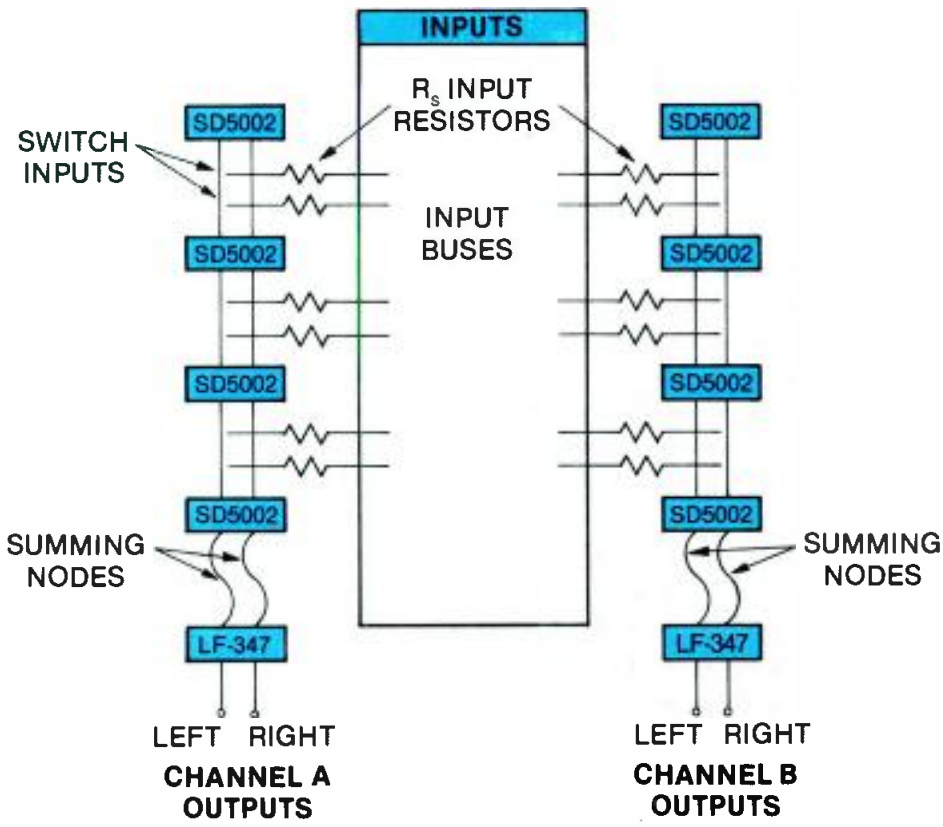

Figure 2. Block diagram of an 8x2 stereo matrix array using the basic design shown in Figure 1.

Table I.
The measured performance of the 8x2 stereo audio crosspoint switching system. Note that cross-talk and off-state isolation are down a minimum of 62dB within the audio frequency band.

Frequency(Hz)	Cross-talk(dB)	Off-isolation(dB)	%THD
50	−74	−75	0.006
100	−74	−75	0.005
200	−74	−75	0.004
500	−74	−75	0.003
1k	−74	−75	0.003
2k	−73	−74	0.003
5k	−70	−71	0.003
10k	−67	−68	0.004
20k	−62	−62	0.006
50k	−55	−55	0.020
100k	−50	−49	0.045

Signal voltages: 3Vp-p
Supply voltages: +12V; −12V
Input impedance: 10kΩ

can be expanded into a switch matrix. Eight SD5002s are required to construct the 8x2 stereo matrix array.

How it works

Each channel input requires resistor R_L for termination and a second resistor (R_s) to feed the signal from the inputs to the various switches. The junction of these resistors forms an input bus.

The SD5002 drains are connected to the summing nodes located at the inverting inputs of the summing amplifiers. As array size increases, system performance normally would suffer from longer lead lengths and increased circuit capacitance. However, the SD5002 allows large matrices to be designed with little performance compromise because of the low switch capacitance.

The value of R_L, which should reflect the value of the source impedance, influences cross-talk and off-state isolation between channels. Both specifications improve with lower values of R_L. The feedback resistor for the output amplifier stage, R_c, can be adjusted to give a wide range of system gain values. Unity gain is achieved when R_c is equal to 150kΩ. Resistor R_o in the output circuit determines the value of the output impedance. If the switch feeds a high impedance load, R_o is necessary to maintain good system performance.

Electrolytic and mica capacitors are suggested for use on the circuit board to provide power supply bypassing functions. This reduces low frequency and supersonic noise, and helps to stabilize the system. The entire circuit should be well-shielded, particularly if it is exposed to strong RF or power-line fields. Conductors carrying high currents should be isolated from the card, and a double-sided PC board should be used to create a ground plane on the component side for added protection.

Table I shows the measured switch performance of the 8x2 crosspoint configuration. For test purposes, the value of R_L was 10kΩ, matching the high impedance to the test oscillator output. Regulated power supply voltages of ±9-15V may be used with this design. Peak-to-peak signal voltages at the input should be less than 3.5V for optimum switch performance.

A variety of other switching arrangements can be devised for the SD5002. This example can serve as a circuit guideline for other requirements a station might have.

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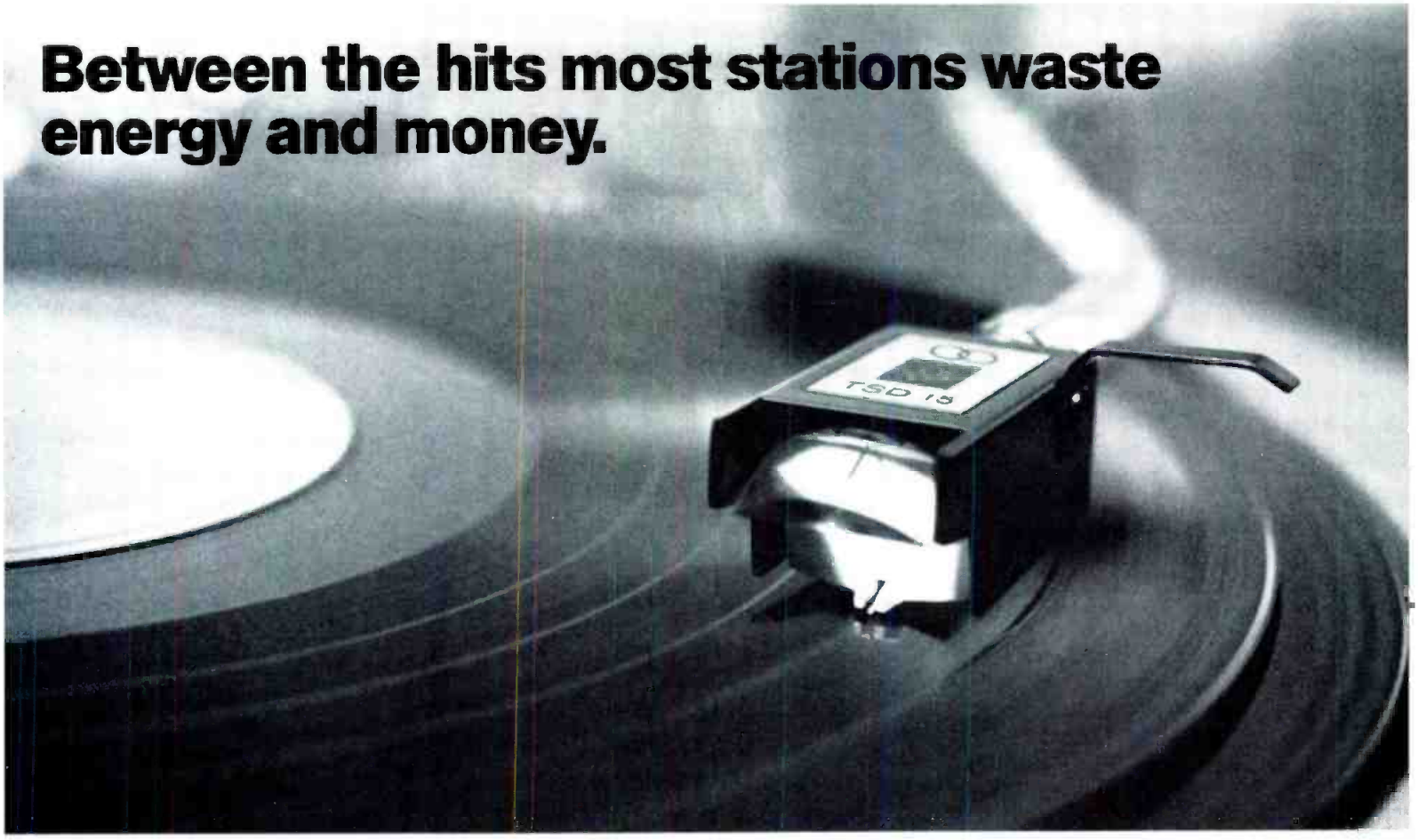
Between the hits most stations waste energy and money.



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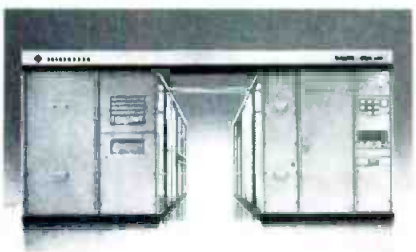

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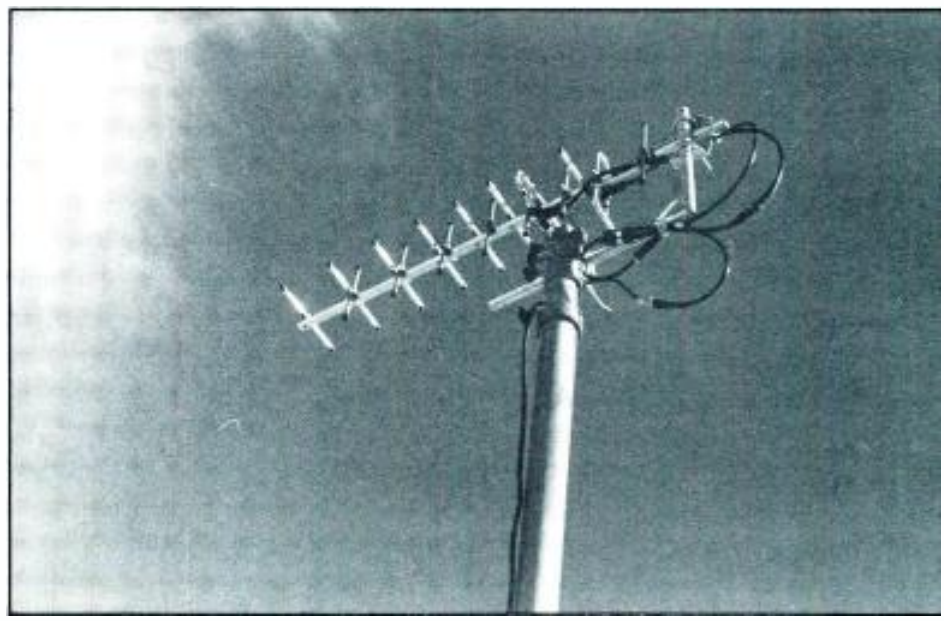
Frequency coordination put to the test

By Richard Rudman, **BE** spectrum management consultant, and chief engineer, KFWB Radio, Los Angeles, CA

In 1984, frequency coordination will play a key role in three US events that will receive worldwide attention. Never before have this many events of global interest, so dependent on backstage Part 74 2-way and microwave transmission, taken place. New ideas, along with methods used since the dawn of ENG interference, will be tested literally before the eyes of the world.



The upcoming Olympics in Los Angeles and the political conventions in San Francisco and Dallas/Fort Worth will be supreme tests of the capability of frequency coordination for squeezing 10 pounds of RF into a 5-pound bag. This complicated coordination of transmission equipment of all types involves not only the networks and local stations, but also out-of-town and foreign broadcasters.

The 1984 Olympics

Olympic coverage and frequency coordination for the event are the responsibility of the American Broadcasting Companies (ABC), which bought exclusive broadcast rights. Along with the responsibility of getting the Olympics on the air from Los Angeles (the country's RF congestion capital), ABC will host broadcasters from the rest of the world who will provide electronic coverage for their respective countries. The word has gone out that anyone planning to bring wireless broadcast equipment into Los Angeles, even so much as a hand-held transceiver, must contact ABC's Olympics RF coordinator, Michael LoCollo.

LoCollo has been busy for more than a year planning ABC's Part 74 coverage. Because the Olympics will take place in the backyard of the Southern California Frequency Coordinating Committee (SCFCC), he has worked closely with that organization at key stages in the planning process. A prerequisite for the coordination planning was that Olympic coverage should have minimal impact on day-to-day operations in the Southern California area.

With more than 14 regular users of the 10 2GHz channels in the Los Angeles region, and more than 70 licensees in the two 1MHz slices of the 450MHz remote pickup unit (RPU) bands, you must resort to special measures to accommodate Olympian needs. With this in mind, the FCC has granted a special temporary authority (STA) to ABC for temporary use of frequencies not included in the Part 74 channels. The STA allows ABC to use a vacant UHF TV channel for voice communications related to its broadcast coverage. Protection for licensees in the 2GHz, 7GHz and 13GHz bands will be provided by close coordination with Los Angeles area TV licensees and other non-broadcast microwave users.

The FCC has formally recognized ABC as the principal coordinating body for Olympic activity by announcing that it will waive the 30-*Day Rule* (Part 74.24). This means that any broadcaster from outside the Los Angeles area will be required to perform prior coordination with ABC. The SCFCC will support this waiver fully. ABC has worked closely with the regional coordinating body to guarantee that coverage of the Olympics will mesh smoothly with local broadcast activity, and ABC will continue to do so. LoCollo, a member of the Society of Broadcast Engineers' National Frequency Coordinating Committee (NFCC), has worked closely with the SBE group on coordination planning.

The political conventions

The three networks traditionally have shared the frequency coordinating chairmanship for political conventions, since the need for prior planning was recognized some years ago. This year, Richard Harvey of CBS has an immense task, Olympian in its own right. Harvey will be responsible for making sure that coverage in two different cities, each experiencing RF saturation, goes off without a hitch.

Both Dallas/Fort Worth, scene of the Republican convention, and San Francisco, where the Democrats will meet, have local frequency coordinating committees. Gerry Dalton of KKDA-FM has organized the Dallas/Fort Worth database, which makes coordination information available from any computer terminal equipped with the proper modem. Joe Berrini of KRON-TV in San Francisco is the Northern California Frequency Coordinating Committee chairman. These local organization efforts are important to the upcoming political convention activity. They have proved that local broadcasters in both regions can work together.

Harvey has held meetings of his National Political Frequency Coordinating Committee (NPFCC) in both convention cities. He has reassured local broadcasters that his group's coordination plan will affect daily operations as little as possible. STAs for unused UHF TV channels have

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been approved by the FCC for both convention cities. The NPFCC will be responsible for coordination of these STAs. Unlike the STA that ABC obtained for the Olympics, the San Francisco and Dallas/Fort Worth STAs stipulate that all broadcasters needing extra channels for their coverage are eligible.

The 30-Day Rule also will be waived during the conventions in Dallas/Fort Worth and San Francisco, making the NPFCC the official coordinating body for these two events in the eyes of the FCC.

Sharing the spectrum

There is growing recognition that frequency coordination's time has come. The First Report and Order on Docket 82-334, which, at SBE urging, protected 2GHz and 7GHz microwave users from potentially disasterous requirements to share their channels with other users, is a milestone. Another milestone is FCC approval of a 450MHz channel split plan administered by the SCFCC that increased the number of users that could be accommodated in the UHF RPU band. An indication of the commission's interest in and support of industry-run frequency coordination efforts came at a January meeting of the NPFCC. Among the persons attending was Jim Durst, broadcast analyst for the FCC. He was there at the direction of James McKinney, chief of the commission's Mass Media Bureau.

Notice to the industry

Any organization that intends to cover the 1984 political conventions in Dallas/Fort Worth or San Francisco using RF transmitters or wireless microphones of any type, power or frequency, should contact Richard Harvey, chairman of the National Political Frequency Coordinating Committee, at CBS, 555 W. 57th St., New York, NY 10019.

Any group that plans to cover the Los Angeles Olympics using RF transmission gear should contact Michael LoCollo, chairman of the World Broadcasters RF Committee, at ABC-TV, 1313 N. Vine St., Hollywood, CA 90028.

Harvey has developed a set of guidelines for operation during the two conventions. Carrying the blessings of the SBE's NFCC, these guidelines incorporate many ideas that all Part 74 licensees should take to heart. A complete list of these guidelines is available. Requirements of special interest include a power restriction that all parties must observe within the convention centers, and a promise that everyone operating a microwave link outside the halls will use a visual identifier when the link is up but programming is not being transmitted.

Although prior coordination has been used on major events in the past, never have such events taken place where the level of radio and TV ENG activity, plus satellite transmission, will be as high as we will see later this year. It will be a test of the technical competence of all broadcasters involved, the patience of the frequency coordinators and the trust of local broadcasters who are working closely with frequency coordinators for the events.

With hard work, good will and the proven elements of regional coordination, all participants in the sporting and political dramas of 1984 should see their efforts on the air with a minimum of problems—to themselves and others.

Editor's note:
The author is chairman of the National Frequency Coordinating Committee, under the auspices of the Society of Broadcast Engineers. He also has joined the BE masthead as spectrum management consultant.

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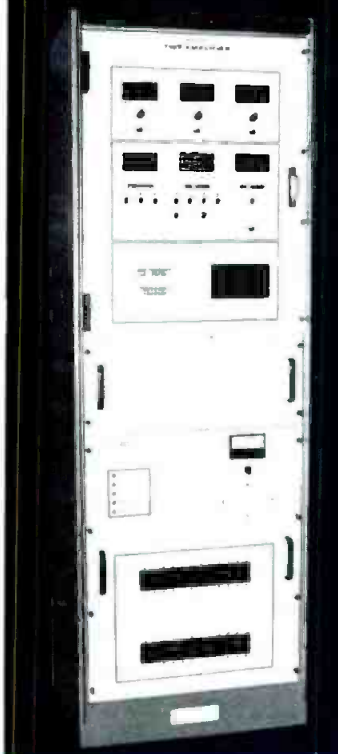

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The Klystrode:

An old idea with new applications

By Merrald B. Shrader and Donald H. Priest, Varian Associates, EIMAC Division, Palo Alto, CA

Today's increasing cost of energy has forced power tube designers to incorporate energy-saving features into their newest designs and re-evaluate the merits of older models. In their search for a way to improve UHF TV transmitting tubes, the authors—without knowing it—resurrected an idea that had remained dormant for more than 40 years. Called the Klystrode,* the result of their efforts is seen as a promising source of energy-efficient power that already has generated more than 30kW (CW) at 775MHz, and conceivably could deliver hundreds of kilowatts in the UHF range.

The Klystrode, which combines the features of a tetrode and a klystron, consists of a magnetically focused electron beam bunched by an RF cavity-driven grid, an output cavity and a collector.

The device can be operated as a Class B linear amplifier, similar to a tetrode, but with the reliability and high power-handling capability of a klystron. Power gain is in the range of 18-25dB, depending on the input RF circuitry, and efficiency at full drive power is in the range of 50% to 63%.

For example, at an operating frequency of 775MHz and an RF drive power of 150W, the new tube delivers an RF output power of 30kW. This represents a power gain of 23dB. The conversion efficiency is 58% minimum. In pulsed operation, output power has been measured at 45kW, with a peak RF drive power of 225W, representing a power gain of 23dB. Conversion efficiency is 60%.

Best of both worlds

Recent testing of the Klystrode has indicated that it is well-suited to UHF TV service as an aural or visual channel amplifier. In *aural* FM service, the high power gain and efficiency, as well as long life expectancy, make it especially attractive. The fact that the tube operates with a high voltage (HV) power supply having the positive end grounded makes it particularly suitable for use with a klystron visual amplifier, which uses a similar positive-ground configuration. The Klystrode can operate at the same beam voltage as the associated visual klystron, thus a common beam power supply may be used, further reducing cost.

In *visual* service, the Klystrode offers the possibility of greater overall efficiency than conventional tetrodes or even the most advanced klystrons. Compared with the tetrode, its efficiency and power gain at all signal levels and peak of sync is measurably higher. Because of its lower emission density (resulting from high voltage/low current operation), and the absence of a heavily stressed screen grid and anode (caused by high dissipation of energy due to current interception), the Klystrode also is expected to have a much longer life expectancy, and may prove to be as durable as the klystron.

Compared with a klystron, which has an input beam current that stays constant and high at all picture levels, the Klystrode—like the tetrode—has a dc power input that varies with the level of the video signal (lower at white, higher at black). Thus, even though the klystron has much higher power gain, long life expectancy, more-than-sufficient bandwidth and far more power output than necessary for today's TV needs, its operating cost is increased drastically by its relatively low average picture efficiency.

Initially, the Klystrode's cost seems to fall somewhere between the less-expensive tetrode and the more-expensive klystron. The Klystrode also is shorter than a klystron, an advantage in some applications.

The Klystrode amplifier tube offers UHF TV users greater efficiency than the klystron or conventional tetrode. Long life also is expected from the Klystrode.

*The Klystrode is a trademark of Varian's EIMAC Division.

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With the growing interest in the potentially lucrative UHF TV market, there is a realization that any source of high power must be efficient, therefore cost-effective, to be a viable competitor with the firmly established VHF TV base. The broadcasting industry may have found such a contender in the Klystrode.

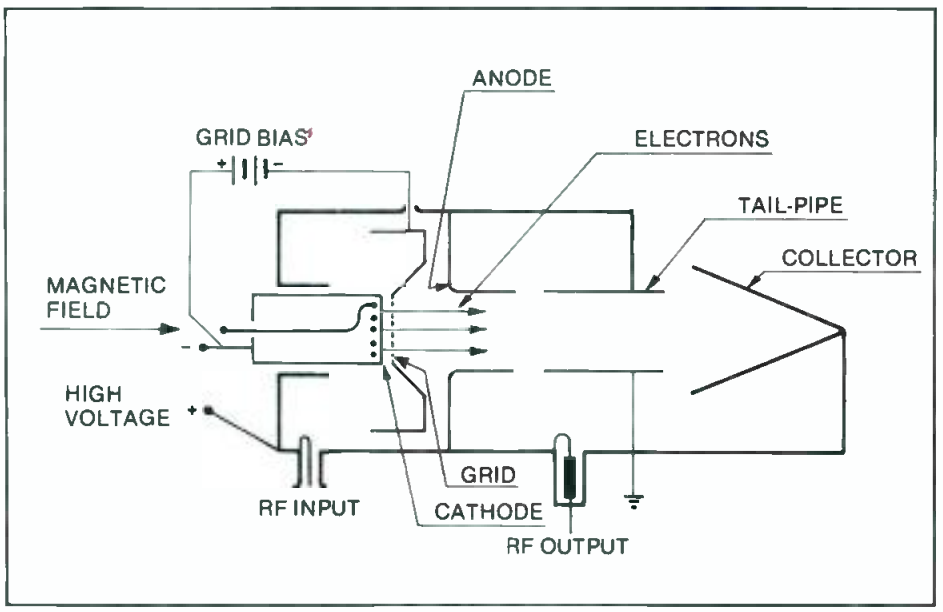
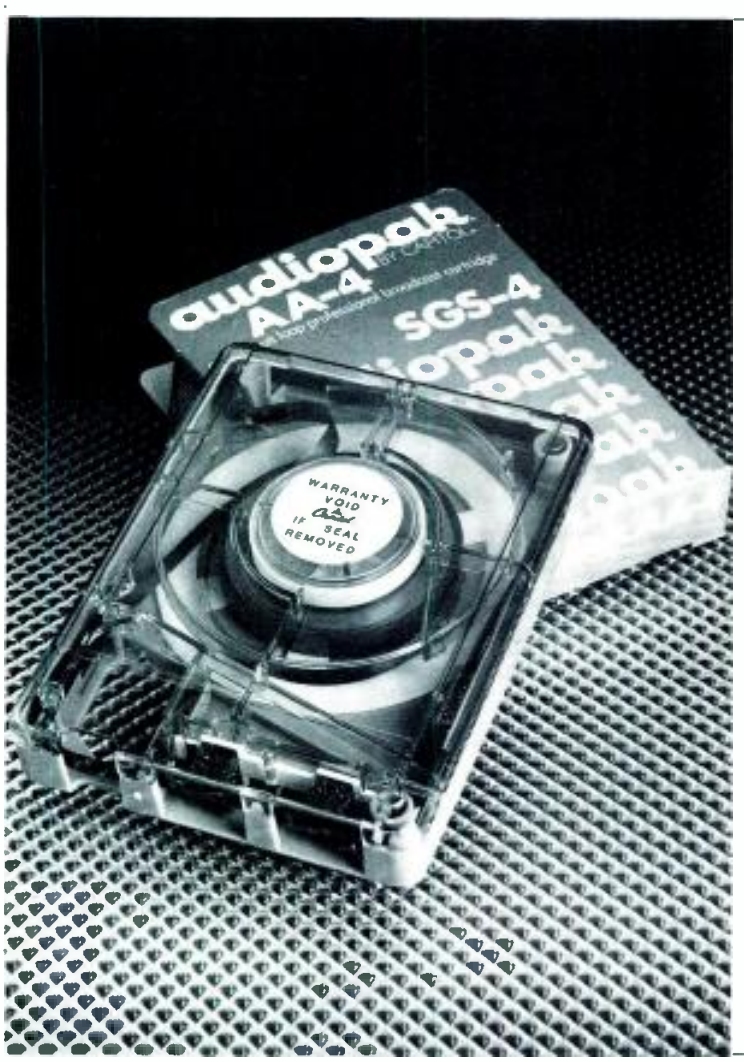


Figure 1. The structure of the Klystrode, which combines the features of a klystron and a tetrode.

How it works

Developed by Varian Associates' EIMAC Division, the Klystrode actually is a pentode (five elements) that has a round-disc cathode, planar grid and apertured anode. (See Figure 1.) A re-entrant cavity has been placed between the anode and the next electrode, called the tail pipe. Insulated from this is the final electrode or collector. A solenoid or permanent magnet then is used to immerse the tube in a uniform magnetic field. At first glance, then, the tube is similar to a conventional tetrode, except the spent electrons are dissipated separately from the output resonant circuit.

In operation, an alternating RF voltage is applied between the cathode and grid, using one of several possible circuit arrangements. The resulting bunched, or density-modulated, electron beam then is accelerated toward the apertured anode at high potential, passing through it without being intercepted. Continuing through a field-free region at constant velocity, the beam next passes through an output gap in the resonant cavity as the electric field induced by its passing is decelerating.



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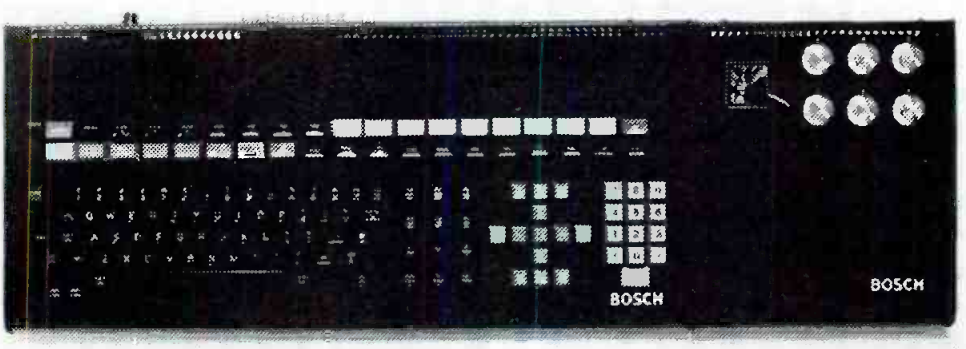

84' NAB Highlights

In addition to the now existing 2-Dimensional Editor, Real-Time Text Editor, Off-Line Text Editor, and Animation Editor, Bosch will highlight at the 1984 NAB:

3-Dimensional Editor: This editor gives complete freedom in the generation of true 3-D objects. With the extruder, the operator can take any 2-D ohject and make it thick.WithROB (Read Object), the operator can type in X, Y, and Z coordinates and produce any 3-D object, or 3-D objects can be produced via surfaces of revolution or by redefining objects by gluing existing 2-D and 3-D objects together.

HQAS: High Quality Animation System gives the operator tools for enhancing previously created animations by adding glows, sparkling effects and streaking capabilities. Also, texture mapping and multiple, moveable light sources will be included.

Paint: Also available at this year's NAB is a *Basic* paint system. By using the stylus and the system's tablet, the operator may paint with all the FGS-4000's 16 million colors, change brush size or shape, air brush or blend. This is an expandable package with more features to be introduced.

Single Framing Editor: Single frame machine control allows automatic control of VTR's via the FGS-4000. This gives the operator the ability to record frame-by-frame and then play them back in real time.

Things You Should Know

Ease of operation: Bosch enlisted the talents of professional graphic artists to help design the operational functions of the FGS-4000, thus making this graphic system as easy to operate as a pencil and paper.

Image quality: Images of the FGS-4000 are indistinguishable from actual video. No aliasing, stair stepping, breaking up or tearing of edges when scaling, positioning, or rotating objects.

Animation: The FGS-4000 allows the artist to create, animate and display 2- or 3-dimensional objects together or independently, as well as automatically assigning special effects such as transparency, light source and perspective.

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The history of the Klystrode

During the 1930s, the state of the art in transmitting and receiving tubes had attained a maturity and cost-effectiveness that served most needs of contemporary radio communications. At that time, attention began to turn to higher frequencies, which offered advantages that later culminated in the development of such now-commonplace industries as television and radar.

As frequencies became higher, conventional transmitting tubes became necessarily smaller, with resulting lower power outputs. Some designers began to look for newer approaches, turning away from the classical gridded density-modulated tube. Two innovators who continued to do research on gridded tubes, however, were A.V. Haeff and L. Nergaard, who then were working for RCA in Harrison, NJ.

What they discovered was that a major output limitation involved wasted power dissipation by the grids and anodes of then present-day tubes. They perceived that if non-intercepting electrodes (apertures, for example) could replace wire grids, and the electron beam could be contained by a coaxial magnetic field, more-efficient, higher level power could be produced.

Similar to the developers of the klystron, they saw that power could be removed from a bunched electron beam by passing it through a resonant cavity in which the kinetic energy of the high velocity electron beam could be transformed to electromagnetic energy, without having to collect the electrons on the walls of the cavity.

Invented by Haeff, the inductive output tube (IOT)—precursor of the Klystrode—was first described by him in 1939 (*Electronics*) and again, with Nergaard, in 1940 (*Proceedings IRE*). When built, the tube delivered 100W (CW) at 450MHz, with a 10dB power gain and 35% efficiency, remarkable performance for its time.

Unfortunately for the IOT, during World War II, VHF triodes and microwave cavity magnetrons became popular, followed by increasing interest in velocity-modulation (V-M) tubes. The IOT remained forgotten until Shrader and Priest, searching for new ways to improve UHF TV transmission, independently resurrected the tube. It was only after reading Haeff's published papers that they realized their creation (the Klystrode) was none other than the basic IOT embellished by more-sophisticated tube and materials technology.

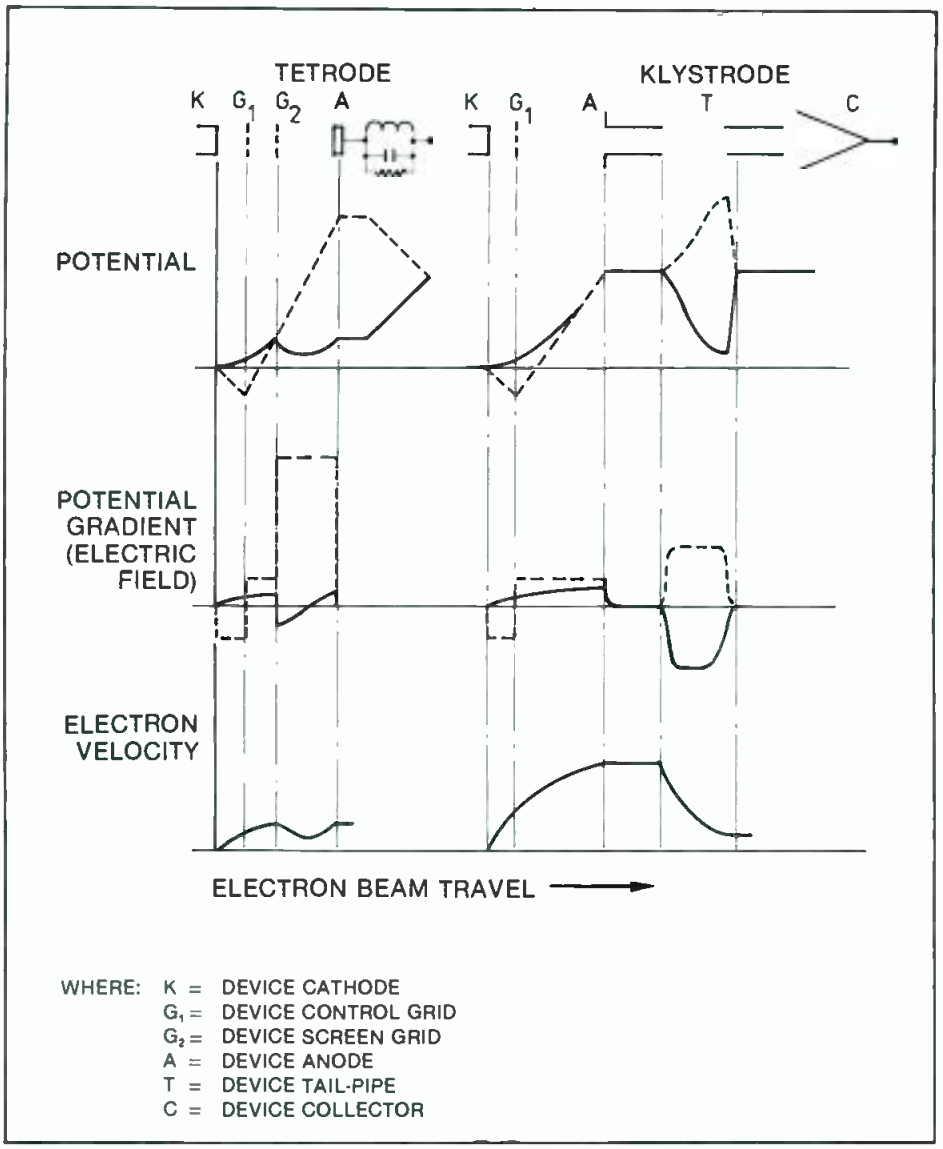

Figure 2. The potential, potential gradient and electron velocity vs. beam distance, for a tetrode and a Klystrode. In the top two drawings, the solid line indicates the tube characteristics at minimum conduction and the broken line shows the tube at maximum conduction.

Finally, the beam passes through a second field-free region (the tail pipe), again with minimal interception, and then crosses the gap between tail pipe and collector.

The differences between the Klystrode and a conventional tetrode can be demonstrated graphically in a comparison of their potential, electric field and electron velocity. (See Figure 2.) Observe that the Klystrode acts similar to a klystron between the anode and collector, but closely resembles a tetrode between the cathode and anode. Six important differences should be elaborated on:

- The Klystrode's anode potential is higher than the tetrode's screen grid potential.
- There is a strong decelerating field in the output gap of the Klystrode compared with an almost zero field associated with the tetrode at the time of maximum current flow.

These different profiles for the potential and field (potential gradient) reveal fundamental differences in operation. Think of the tetrode as a switch that closes every half cycle, allowing current to flow from the power supply through the resonant load. By taking advantage of the energy storage properties of the resonant circuit, the dc energy is converted to RF energy in the circuit.

In contrast, the Klystrode (and the klystron) changes the kinetic energy of the high velocity electrons directly to electromagnetic energy in the output gap. Also, although the tetrode conversion efficiency is maximized at low frequencies, efficiency is decreased markedly at higher frequencies, when the screen-grid voltage must be made high enough to supply sufficient electron beam velocity.

An important result of the different potential profiles is the Klystrode's much larger average electron velocity, which makes the use of a relatively long beam possible.

- Another difference between the two devices is the presence of the field-free regions before and after the

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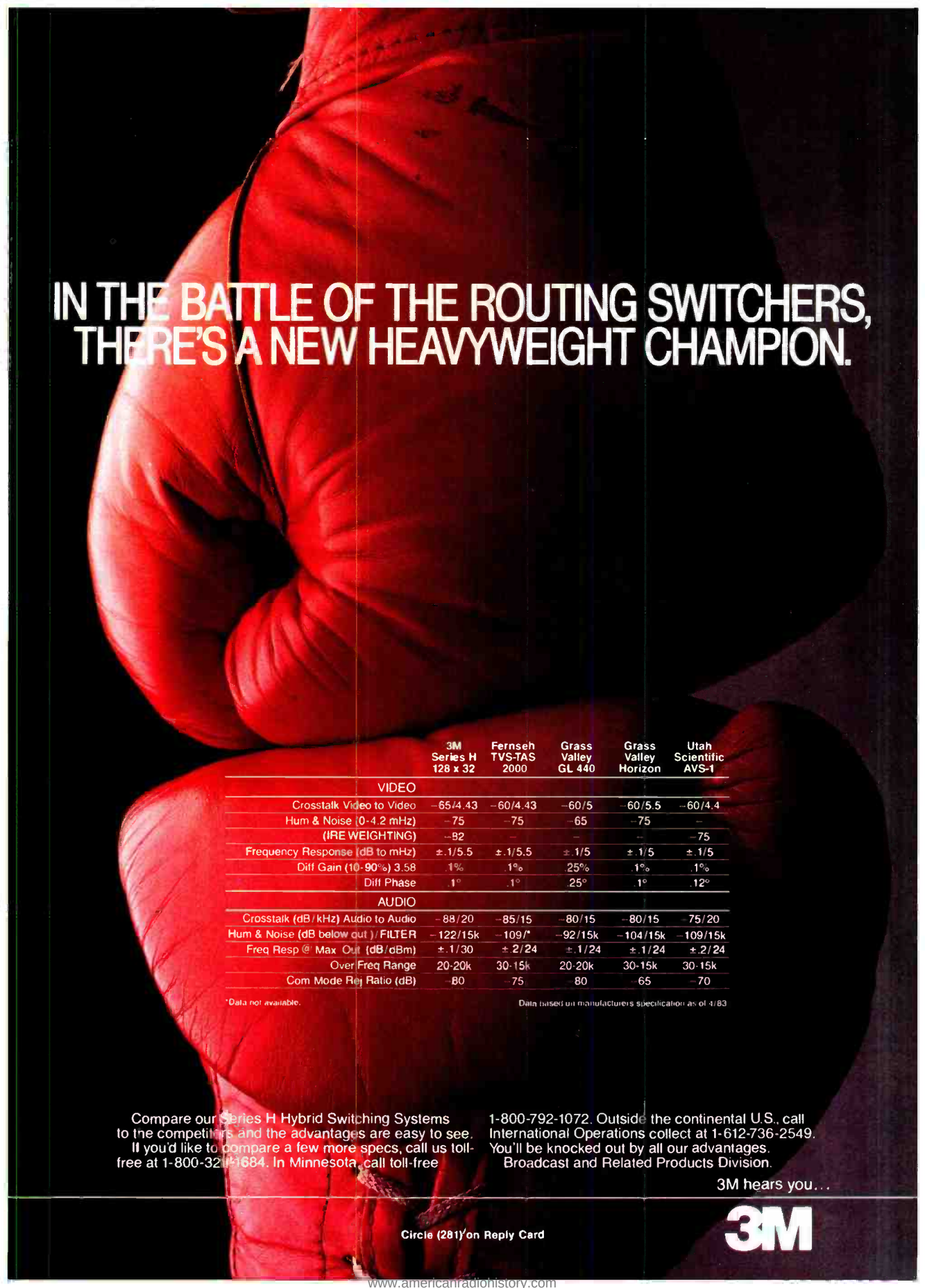

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Diff Phase	.1°	.1°	.25°	.1°	.12°
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Freq Resp @ Max Out (dB/dBm)	±.1/30	±.2/24	±.1/24	±.1/24	±.2/24
Over Freq Range	20-20k	30-15k	20-20k	30-15k	30-15k
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VRM1275	0-1275	5.0	Slide Switch	*3.00	.4	33
VRM2270	0-2270	10.0	Slide Switch	*3.00	.5	40
VRS0317	0-317.5	2.5	Strap	.40	.5	26
VRS0635	0-635	5.0	Strap	.75	.5	35
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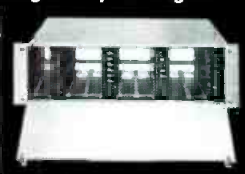

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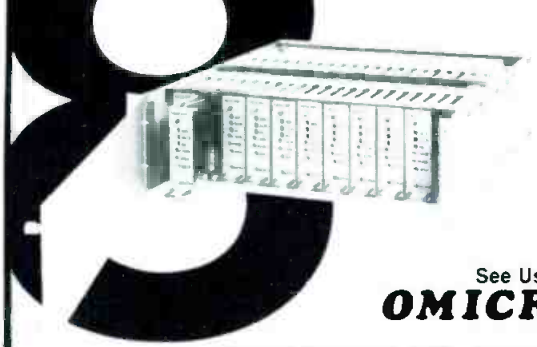

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Klystrode output gap. These ensure that the output interaction space is isolated from the input space (grid-anode), as well as the collector. In practice, this isolation is important because, without it, input circuit conditions could be affected adversely by variations in tuning or loading of the output circuit.

- The Klystrode tail pipe essentially is non-intercepting as compared with the tetrode's anode, which also functions as a collector. It becomes obvious, then, that the Klystrode's collector can be made large (unlike the anode of the tetrode) and, therefore, can operate at lower power density and greater power output.
- With the Klystrode, there is no need for a blocking or bypass capacitor, because there is no dc voltage across the output gap. The fact that the high voltage dc and RF fields are separated means that the gradient in each gap is about half the gradient in the output space of a conventional tetrode. This, coupled with the fact that no blocking capacitor is needed to carry the RF circulating current in the output cavity (which can be at ground potential), is an advantageous operational feature of the Klystrode.
- Unlike the tetrode, the Klystrode uses a magnetic field. Although the Klystrode would perform well without such a field (look at the electrostatically focused klystron, for example), the advantages of a magnetic field are considerable.

For one, the natural tendency of the beam to spread is curtailed, especially in the output gap, where the exit electron velocity is low and the space-charge forces are high. Without such focusing, the tail pipe would have to be much larger in diameter to avoid its interception with the beam, which could generate secondary electrons that would cross the gap in a direction opposite that of the main beam, thus tapping energy from the main load. The larger tail pipe also would increase the output gap capacitance and decrease bandwidth. Finally, the beam-to-gap-coupling coefficient between the beam and cavity fields would be reduced, decreasing conversion efficiency.

A bright future

Experimental results conducted at Varian EIMAC have proved the viability of the Klystrode tube as an excellent source of high power and efficiency for the broadcast industry, especially UHF TV. With the development of more powerful units, there is reason to expect that other applications requiring the performance and efficiency capabilities of this high frequency power source will emerge.

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Updating FM facilities

Photo: James Hoff

By Jerry Whitaker, radio editor

New technology and tougher-than-ever competition are causing station managers and engineers to look closely at their technical plants for ways to improve the performance and reliability of their systems. With the FCC's Docket 80-90 decision and the expected increase in subsidiary communication authorizations (SCAs), FM transmission systems that were acceptable in the past may no longer be adequate.

One of the potential bottlenecks to high quality, wideband transmission overlooked many times is the antenna. Unless presented with a serious an-

Constructing an FM transmitting facility is an expensive project that should be carefully planned for maximum service area coverage and long-term reliability. Shown is the construction of the transmitting tower and antenna for KPDJ-FM, Eureka, CA. The station's transmitting facility, located atop Kneeland Mountain, CA, operates with 100kW ERP from 2600 feet. A 10-bay circularly polarized antenna is used in the installation.

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tenna or transmission line problem, the performance of "outside" equipment often is ignored.

A wide variety of antennas is available for use in the FM broadcast band. Although these antennas differ from one manufacturer to another, some generalizations can be made that apply to any FM antenna.

Circular polarization (CP) of the transmitted signal almost universally is employed for FM broadcasting. CP results from equal electric fields in the vertical and horizontal planes of radiation that are out-of-phase by 90° and rotating a full 360° in one wavelength of the operating frequency. The rotation can be clockwise or counterclockwise, depending on the antenna system design. This continuously rotating field gives the CP signal good penetration capabilities, because it can be received by an antenna of any random orientation.

Propagation of RF energy in the FM band is governed by many different factors, such as free-space loss, vegetation, soil conductivity, the Brewster angle and Fresnel zone, multipath and type of terrain. These concerns must be considered when choosing a transmitting site or antenna type.

The need for careful planning of an FM transmitting facility cannot be overstated. Mistakes in site selection or antenna gain design can be costly to correct after construction has been completed. This word of caution applies especially to stations trying to increase their antenna height or effective radiated power (ERP) to avoid classification at a B1, C1 or C2 level, because of the FCC's 80-90 ruling.

The solution to a low ERP is not necessarily additional bays on the transmitting antenna. Likewise, the solution to a low height above average terrain (HAAT) is not necessarily additional sections on the present tower. Although these two actions may avoid classification of the station at a lower level, the end result may be disappointing (or even disastrous) when coverage patterns are considered. Safety factors also must be taken into account, such as the capability of the present tower for supporting additional antenna bays. Extending the height of an existing tower is a project that should not be entered into lightly. Unless the structure was designed for

Table I.
Various combinations of transmitter power and antenna gain to achieve 100kW ERP.

# Bays	Antenna gain	Transmitter power*
3	1.5888	66.3kW
4	2.1332	49.3kW
5	2.7154	38.8kW
6	3.3028	31.8kW
7	3.8935	27.0kW
8	4.4872	23.5kW
10	5.6800	18.5kW
12	6.8781	15.3kW

*Transmitter power based on 95% line efficiency.

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additional height, a careful engineering study should be conducted to determine how much higher the tower can go, and what reinforcing would be needed to preserve the present mechanical strength.

Antenna gain

The ideal combination of antenna gain and transmitter power for a particular installation is something few engineers or consultants ever agree on. A variety of different pairings can be made, and predicting which one would be best is a difficult proposition. Because the trial-and-error method is expensive in this case, broadcasters must make an educated guess on the right combination, based on the recommendation of a qualified consultant and the present coverage patterns of other broadcasters in the same market (preferably transmitting from the same general area).

If the presence of the ground could be disregarded, there would be virtually no difference between any combination of antenna gain and transmitter power that yielded the same effective radiated power. This, however, is not the case.

Often it is suggested that the best coverage patterns result from the highest reasonable transmitter power

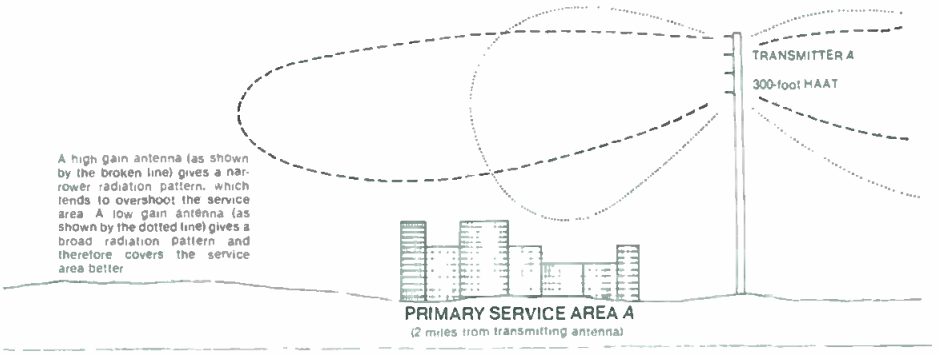

Figure 1(a). The effects of antenna gain on flatland service area coverage. In this application, a low gain antenna with beam tilt should be used. The scale is exaggerated to illustrate the principle involved.

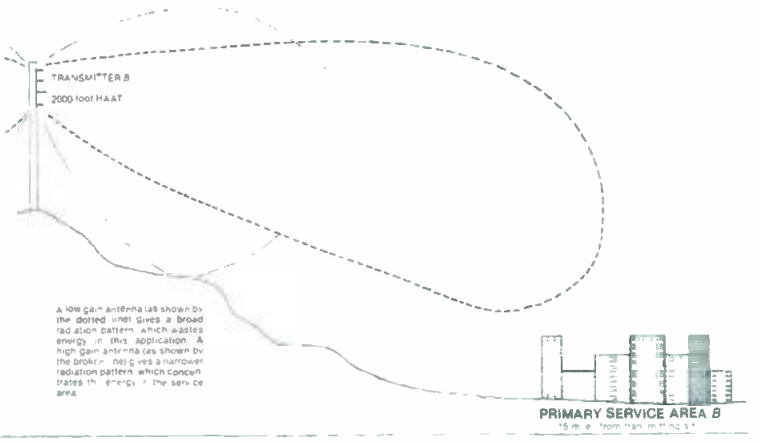

Figure 1(b). The effects of antenna gain when applied to a mountainous region. A high gain antenna with beam tilt should be used in this application. The scale is exaggerated to illustrate the principle involved.

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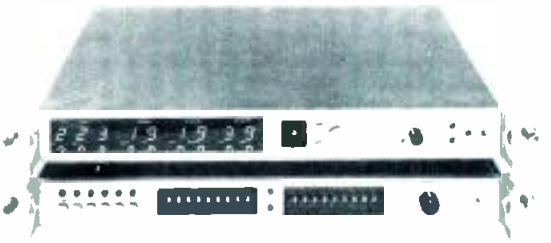

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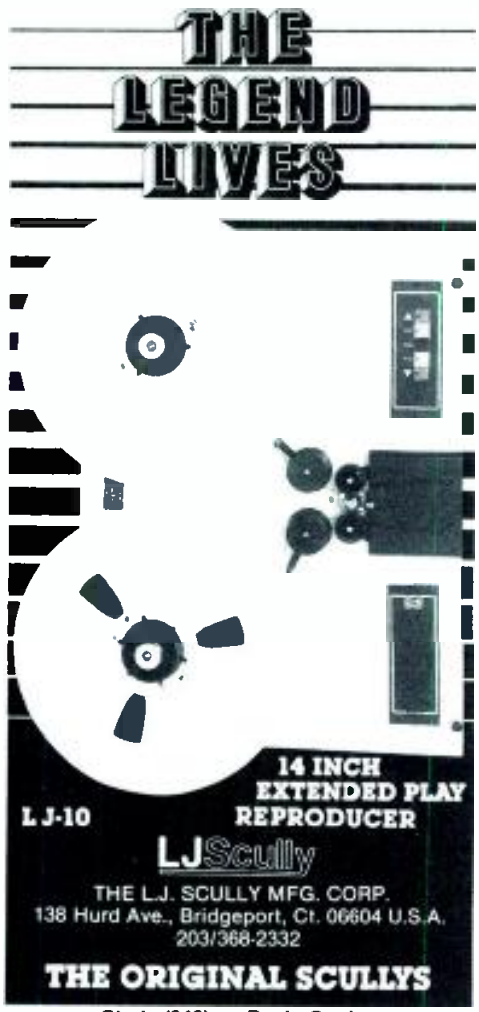

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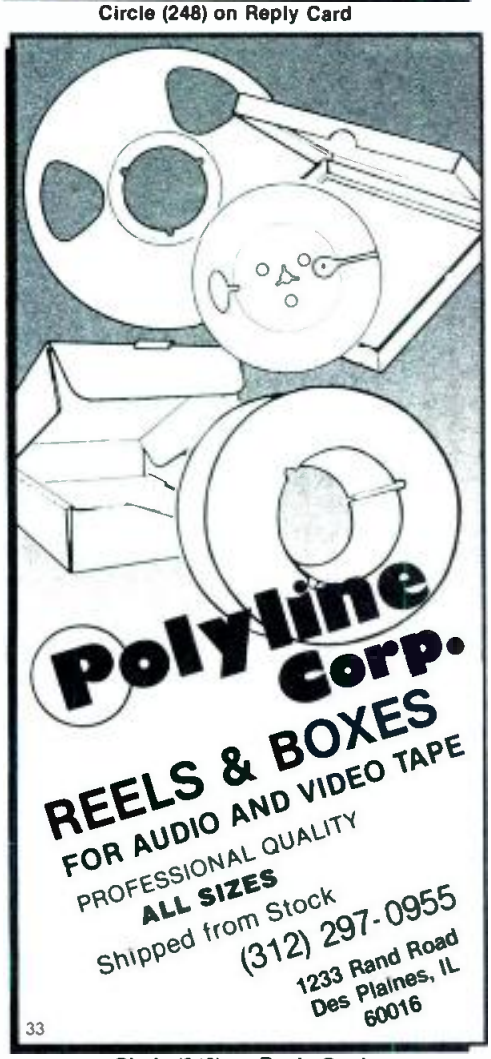

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FM classifications simplified

By Bob Weirather, Harris Corporation, Quincy, IL

FCC Docket 80-90 has caused much confusion among FM operators regarding new station class designations. The commission's order requires FM stations to meet certain minimum antenna height and effective radiated power (ERP) requirements or be permanently declassified at a lower level. Stations have, in the past, had the option of beginning operation with facilities below the full licensed power and height allowed by FCC rules and, when economics permitted, improving their plant to the licensed level. Docket 80-90, however, places a time limit on updating facilities for stations currently operating at less than full capacity.

Docket 80-90 gave FM broadcasting three new classifications: B1, C1 and C2. Figure 1 and Figure 2 graphically show the new divisions. (For a more complete understanding of the implications and requirements of 80-90, see the docket itself.)

CLASS	HAAT		ERP (KW)	
	MIN.	MAX.	MIN.	MAX.
A	0	100M (328FT)	0.1	3
B1	0	100M (328FT)	3	25
B	0	150M (492FT)	25	50

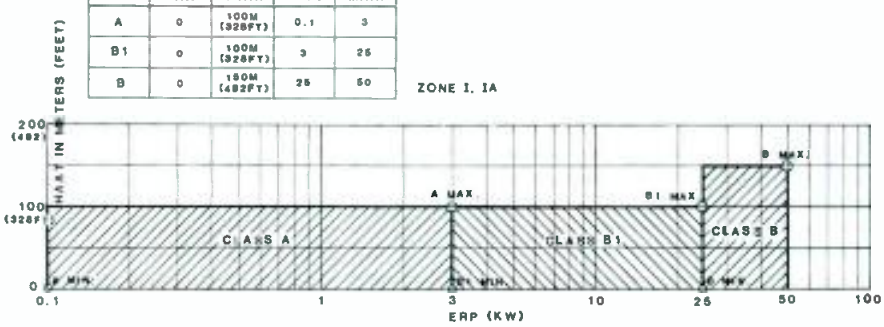
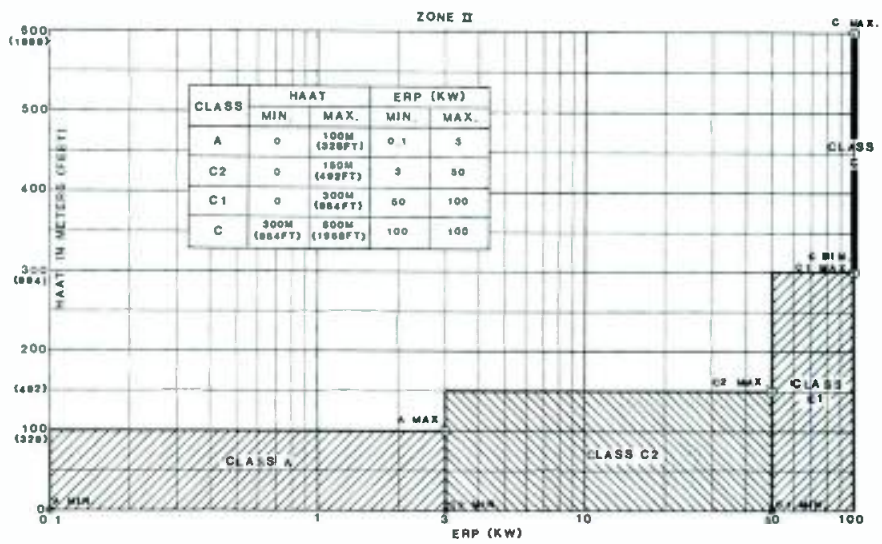


Figure 1. The Docket 80-90 classifications for Zone 1 and Zone 1A stations.



CLASS	HAAT		ERP (KW)	
	MIN	MAX.	MIN	MAX.
A	0	100M (328FT)	0.1	3
C2	0	150M (492FT)	3	50
C1	0	300M (984FT)	50	100
C	300M (984FT)	600M (1968FT)	100	100

Figure 2. The Docket 80-90 classifications for Zone 2 stations.

Reading the charts

Stations located in Zone 1 and Zone 1A should use Figure 1, and Zone 2 stations should use Figure 2. The respective charts show the minimum and maximum facilities for each classification. Mark your antenna height above average terrain (HAAT) on the vertical axis and ERP on the horizontal axis of the proper zone chart. Plot the intersect point and read your current classification. Further examination of the chart will show the minimum facilities that must be met to avoid being permanently placed in the lower position.

Note that to be a Class C station, you must have 100kW ERP from an elevation of at least 300 meters (984 feet).

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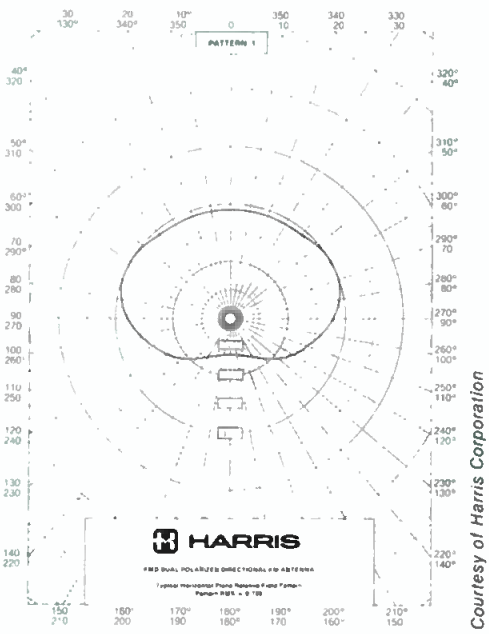
and the lowest antenna gain needed to give the licensed ERP. This is not necessarily true, however, as demonstrated in Figure 1(a) and Figure 1(b).

The lower the antenna gain, the broader the radiation pattern. This is a requirement for the situation shown in Figure 1(a), but it is a waste of money and power for the example shown in Figure 1(b). A good share of the energy from the transmitter to city *B* would be radiated above the horizon if a low gain antenna were used. A high gain antenna, which will narrow the beam, should instead be paired with the transmitter serving city *B*. If the same high gain antenna were used at location *A*, however, the chances are fairly good that acceptable performance would not be available to the city of license because the majority of the transmitter energy would skim over the top of the city.

For greatest efficiency, electrical beam tilt can be designed into a high gain antenna. A standard antenna radiates more than half its energy above the horizon, thus losing it for practical purposes. Electrical beam tilt, caused by delaying the current to the lower elements of the antenna, can be used to provide more useful power to the service area.

Mechanical beam tilt sometimes is used by a station in a particularly difficult mountainous location. In this arrangement, the antenna itself is mounted at an angle from the tower. Any attempt at substantial mechanical beam tilt should be closely examined by a structural engineer.

Another method used occasionally to increase the field strength over the primary service area is to employ a directional antenna with a radiation pattern specifically designed for the particular location. This is accomplished by special construction of the antenna using radiating and reflecting parasitic elements. Figure 2 shows a typical directional pattern available from one antenna supplier, Harris Corporation. The antenna consists of two driven horizontal elements, one horizonal parasitic reflector and one driven vertical element. In certain applications, vertical parasitic elements can be added to further shape the vertically polarized component.



Courtesy of Harris Corporation

Figure 2. A typical radiation pattern (horizontal plane) for a Harris directional antenna.

Pattern correction

Another method to maximize radiation to the service area is pattern optimization. The characteristics of the transmitting antenna are affected, sometimes greatly, by the presence of the tower, if side-mounted, or by nearby tall obstructions (such as another transmitting tower) if top-mounted. Unless the antenna was tuned at the factory on a tower identical to the one it finally would be mounted on, the presence of the supporting structure can severely distort the radiation pattern. The tower causes reflections of

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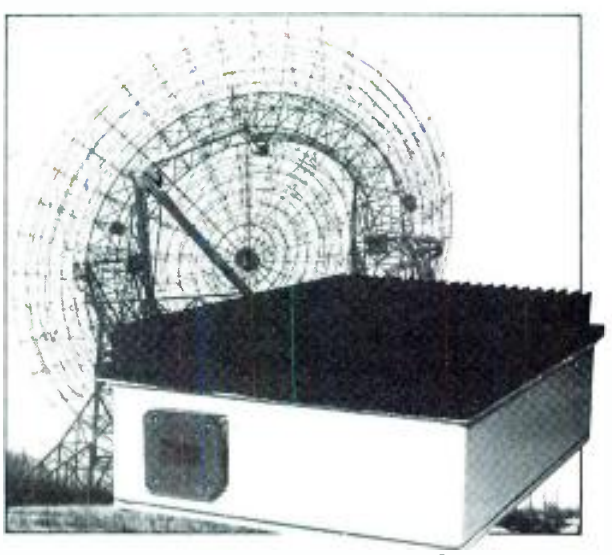

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the transmitted wave and, in the case of circular polarization, opposite sense rotation, which further distorts the pattern.

Antenna manufacturers that offer a pattern optimization service use various methods to tune out pattern distortions. These methods generally involve changing the orientation of the radiators with respect to the test tower, and adding parasitic elements. Figure 3 shows a typical pattern before and after correction.

Such pattern correction techniques also may be used to develop directional antennas without the complexity of phased elements and multiple-feed systems.

Some antennas have provisions for fine tuning once the unit is mounted in its operating position. Generally, however, this is unnecessary if the transmitting tower was duplicated accurately by the manufacturer during factory pattern optimization. Spacing of the radiating elements from the tower face is important for proper operation, so tower riggers should be sure to mount the antenna according to the manufacturer's recommendations.

Community antennas

One of the effects of the commission's 80-90 decision has been to make the concept of community, or shared, transmitting antennas more appealing. In many areas of the country, high elevation transmitting sites are difficult (if not impossible) to find. The only alternative, then, is a tall tower, which is expensive to construct. Adding to the cost of such a project are difficulties that may arise when trying to clear local zoning requirements and FAA flight path restrictions.

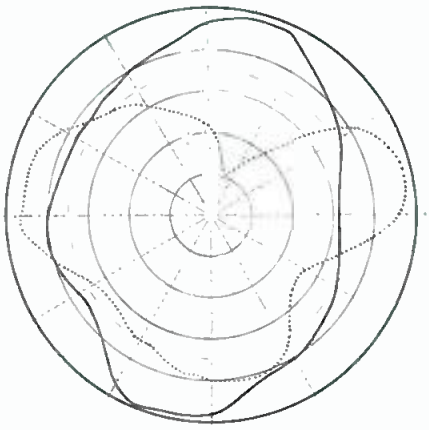

Figure 3. An example of pattern optimization of an FM antenna. The dotted line is before correction (±6.58dB) from the desired, near-circular pattern. The solid line is after correction (±2.08dB) from the same coverage pattern.

If, on the other hand, a number of stations in a particular market join to construct a tower and mount a broadband transmitting antenna used (through combiner equipment) by all participating FM stations, the project may become feasible. The cost of such an effort can be substantial, but in many markets there is no other way to achieve the desired performance.

Small-scale community transmitting towers (2-3 stations or less) probably are best served by individual antennas on the common structure. Larger facilities most likely will find the shared antenna system to be the more cost-effective approach. These estimates take into account costs for transmission system hardware, not the tower structure. Special considerations at a particular site may make the *break-even* point for a shared antenna slightly different than that presented here.

Editor's note:

For more information on items presented in this article, refer to the following literature:

[1] *NAB Engineering Handbook*, sixth edition.

[2] "FM Facility Improvements," Elton Chick, Harris Corporation engineering paper.

[3] *The Complete Broadcast Antenna Handbook*. John Cunningham. TAB Books.

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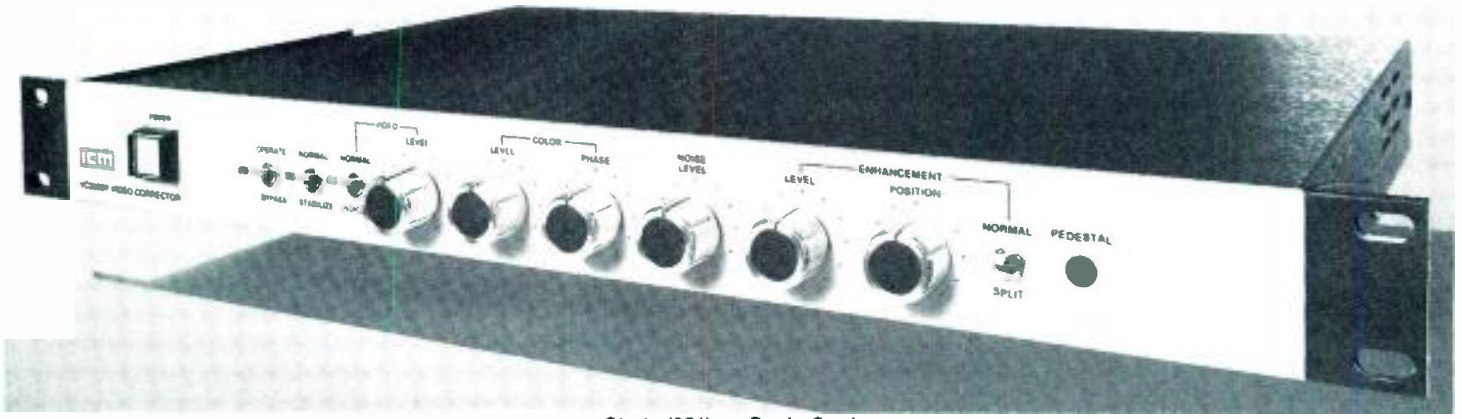

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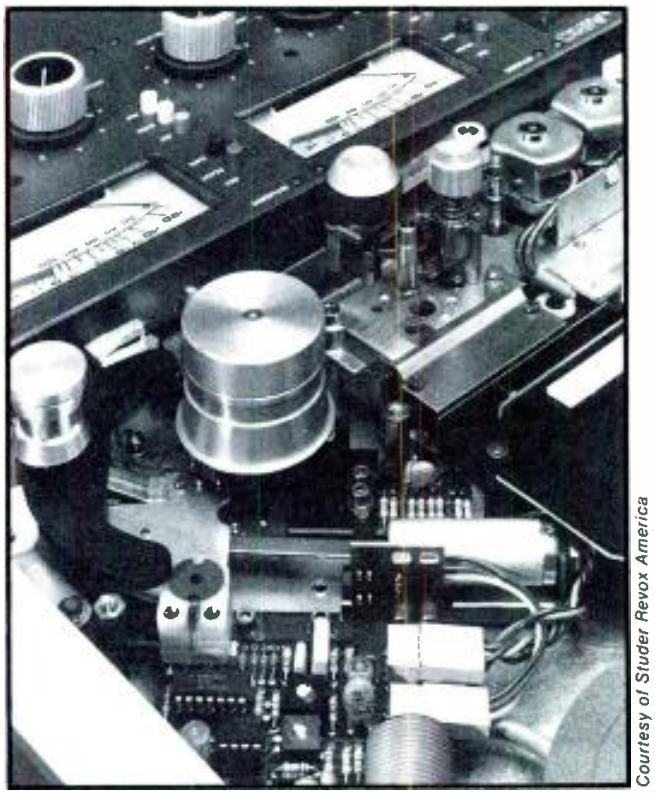

Courtesy of Studer Revox America

Shown are one of the A-810 tape tension sensor elements and its associated electronics circuit card (in the foreground). The deck headblock assembly also can be seen. Note the shielding used on the playback head audio cable.

Studer A-810 tape recorder

By David Smith, chief project engineer, audio, Editel, New York, NY

The audio post-production room at Editel is an audio-for-video facility based on Studer tape machines, so it came as no surprise when Studer Revox America offered our company an in-house demonstration of Studer's new 2-track unit, the A-810. I had heard repeatedly that although this new machine's transport was microprocessor-controlled (as in previous Studer models), the audio setup also was under the supervision of the microprocessor. In other words, there were no screwdriver adjustments. I have been carrying a *tweaker* around for some 11 years, and I am a great believer in techniques such as nonstandard equalizations, underbiasing and generally playing the tape deck as a musical instrument. The idea of a self-aligning machine left me skeptical and somewhat apprehensive.

The day the A-810 arrived, I saw it aligned for record and playback with the push of several buttons. The alignment procedure demonstrated a heretofore unseen synthesis of tape recorder and computer that was fully programmed to converse with inhabitants of the real world, human and electronic. The level of software development immediately quashed my fears about automated alignment. The machine is managed entirely by microcomputer, including the establishment of audio parameters. Operational settings are dictated by the user. The computer's primary purpose is to execute instructions and store them in memory for later access.

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SMPTE time code feature

The main reason for demonstrating the A-810 at Editel was to spotlight an optional feature of the unit that uniquely suits it to video post-production, where SMPTE time code is employed universally for synchronization. This is the first production machine that uses biphase recording to place time code signals between stereo audio tracks on ¼-inch tape. The technique allows the code to be recorded without the cross-talk usually associated with time code. So successful was the A-810 in this respect that within two weeks of installing the demonstration model, the machine had become indispensable.

The Studer system records the SMPTE time code on a center track 0.33mm wide, using specially designed combination heads placed on either side of the audio record and reproduce heads. As shown in Figure 1, the combi-head to the left side of the headblock (when facing the recorder) performs the time code reproduce and audio erase functions. The combi-head on the right side functions as the time code erase and subsequent record device. It also performs code reading functions when the transport is in the shuttle mode, allowing rapid access to a particular section of tape. Because the time code and audio

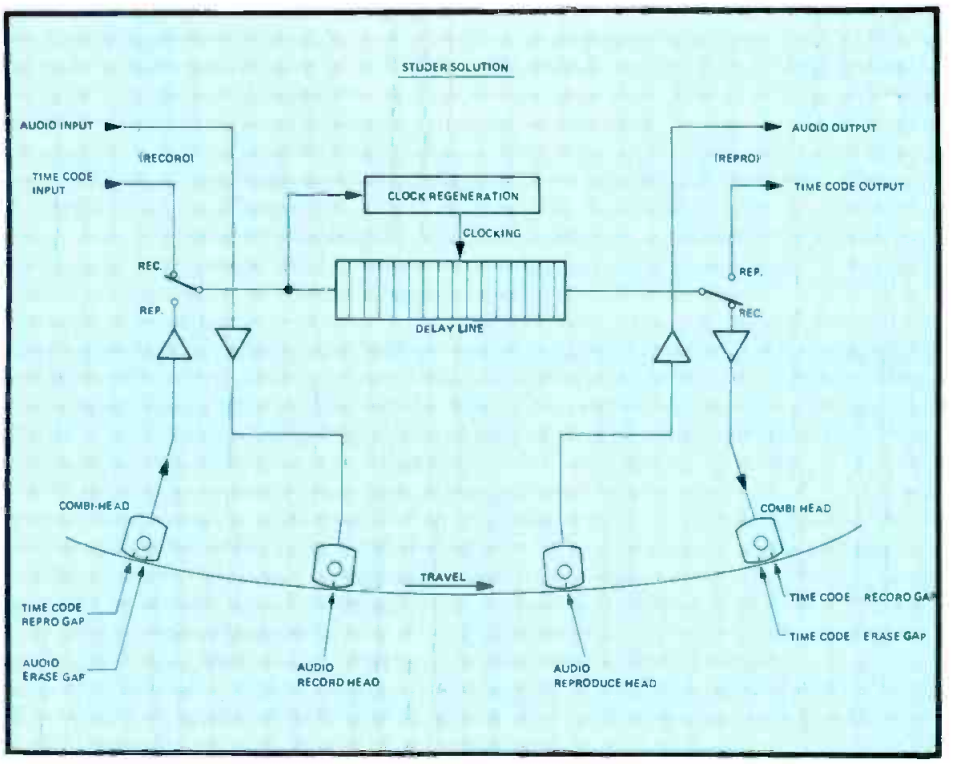

Figure 1. The Studer *time coincident center channel* SMPTE code system used in the A-810 tape recorder. According to the company, this arrangement keeps code-channel-to-audio-channel cross-talk at less than 90dB.

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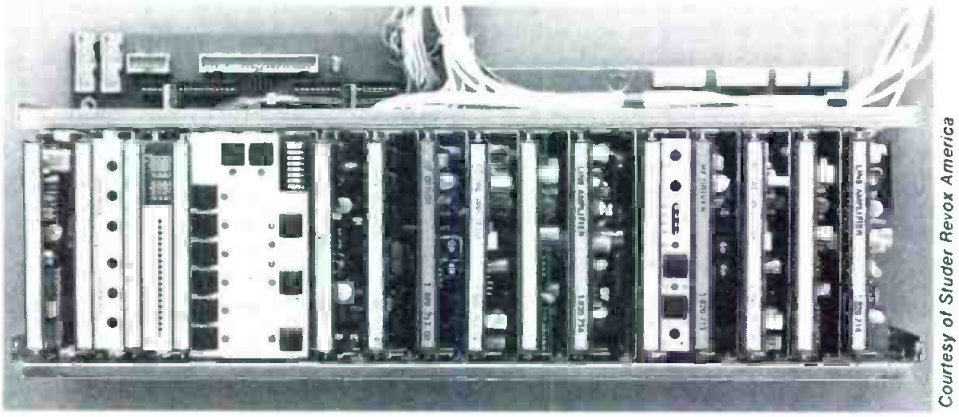
heads are separate, the Studer system is capable of maintaining cross-talk rejection (between audio channels and the time code channel) greater than 90dB, according to company specifications.

Figure 1 also shows the delay line system used to compensate for the tape travel time between the audio and time code heads. This compensation is automatic at all speeds, even in the variable speed mode. The time code system used in the A-810 also allows tape splicing in the normal manner without fear of cutting off the corresponding time code information.



Courtesy of Studer Revox America

The electronics chassis for the A-810 is shown here. Plug-in circuit boards, accessible from the front of the unit, are used for easy field service.

Machine design

The A-810 is a compact, rack-mountable tape machine constructed around a light alloy transport casting that holds three motors, a precision-machined mount for interchangeable head blocks, a tape-tension servo system, stabilizer and tachometer rollers, and various power supplies. The capstan operates at all four professional tape speeds (3.75ips, 7.5ips, 15ips and 30ips) and is servo-controlled by a phase-locked loop (PLL) with a natural frequency of 9.6kHz. The spooling motors form servo loops with their associated tension arms. Supply and takeup reel motor torque are controlled by individual switching power supplies (a first for Studer), allowing more precise tension adjustment and reduced heat dissipation. An air-damped pinch roller gives the tape deck the silent start feature required in on-air control rooms.

Attached to the transport casting is a card cage of motherboard-backplane construction containing all analog and digital electronics. This assembly is protected by a hinged cover, which also contains the transport operating keys and various displays. Large backlit VU meters are standard on the A-810, and their ballistics can be switched electronically to European Broadcasting Union (EBU) peak program characteristics, if desired.

The machine can be ordered as a free-standing portable, console or rack-mounted unit. The console configuration has lockable casters and an adjustable deck position feature, which allows the transport to be operated within a 90° arc from full horizontal to full vertical. The console model includes an overhead meter bridge that holds the audio controls at a fixed operating angle independent of the transport. All models of the A-810 include a switchable amplifier and loudspeaker, allowing local moni-

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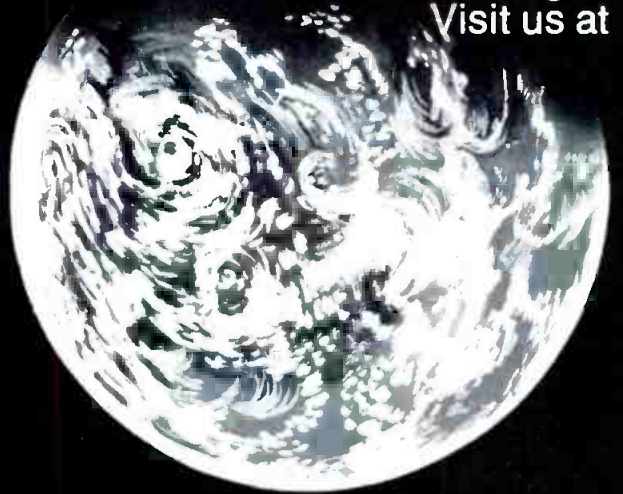

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toring and cueing in the record or playback mode.

A variable speed control is available as an option on the tape deck. It can be mounted in the overbridge assembly on the console version of the A-810, or adjacent to the speed selector switch in other configurations.

The microcomputer system

The brain of the A-810 is a Motorola 6803 8-bit microcomputer operating on three levels simultaneously. It monitors the operational status of all controls and systems, runs all transport tape handling functions and keeps track of all audio parameters. (See Figure 2.) When the machine is switched on, the microcomputer begins a self-test of all circuits to determine any problems. This routine includes checks of all indicator lamps, push-buttons, random access memory (RAM), power supplies, audio channels and erasable-programmable read-only memory (EPROM) chips. Once these tests are passed, the microcomputer sets all machine controls to their last memorized positions.

In the event that a power supply rail or the spooling motor power controller has failed, the machine is rendered inoperative. Other problems can be handled by the computer under de-rated (limited mode) operating conditions. In such cases, the computer indicates the location of the problem to the operator via an electronic error (EE) visual message and disables that section of the system. Functions not affected by the failure continue uninterrupted.

The microcomputer has full control of the transport, in that the functions of certain control keys are programmable (or soft) and can be changed. The machine contains a 4-memory autolocator, and the last three autolocate position keys can be reprogrammed to perform tape-dump, remote-control, fader-start, pause and code-channel-ready functions. Certain combinations of buttons read out the elapsed time of the capstan motor and power supplies in hours. When not being used for special functions, the liquid crystal display (LCD) indicates tape position.

A universal serial interface port is optional on the A-810. The port is compatible with RS-232, RS-422 and RS-422 modified. The interface permits external computer control of all transport functions, audio switching and electronic alignment parameters. The serial port also can be used for comprehensive monitoring and testing of all recorder functions.

In the A-810, the typical potentiometers used to set audio parameters have been replaced by 8-bit digital-to-analog converter (DAC) chips. These integrated circuits function as precision 256-step attenuators and give the system microcomputer control over what once was a manual adjustment. Eliminating the alignment pots removes one of the last vestiges of

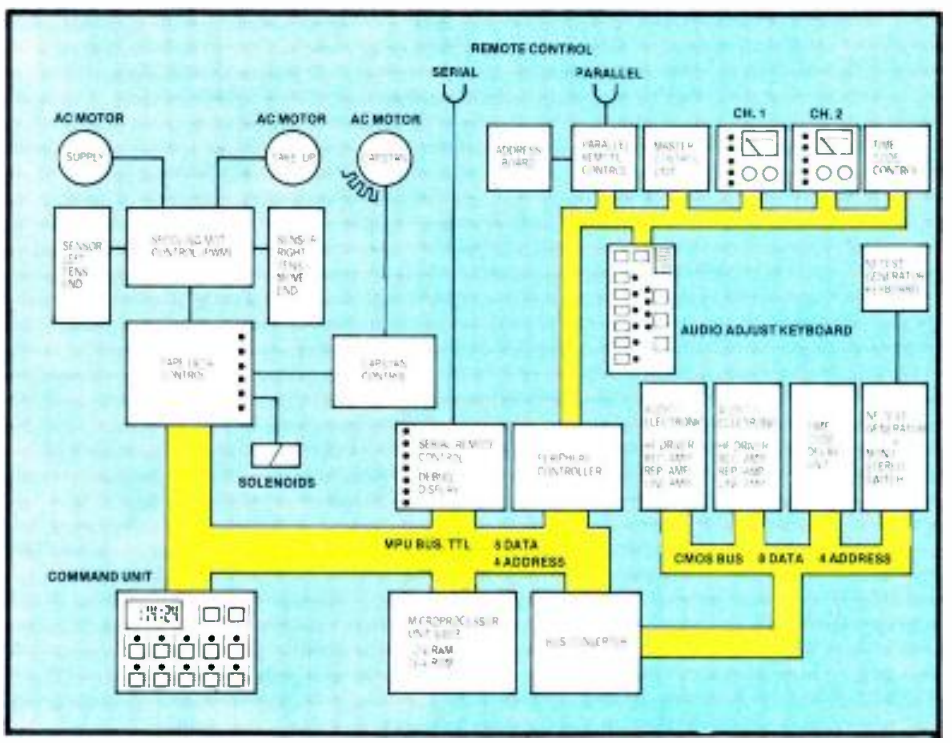

Figure 2. The block diagram of the microprocessor-controlled functions of the Studer tape transport and audio electronics. Note the use of data bus connections between the various circuit cards.

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electronic drift, rendering this machine more stable and resettable than any other I have dealt with. Record and playback level, equalization and bias are set by pressing raise or lower buttons corresponding to the chosen parameter. These settings then are stored in non-volatile memory for later recall.

While electrical adjustments are being made, the LCD display reads out the setting values, allowing the user to compile a handwritten log that can be used to re-align manually the tape deck without having to put tape on it. The A-810 stores parameters for two types of tape at all four speeds with NAB equalization and also for two types of tape with CCIR equalization at 7.5ips and 15ips, giving a total of 12 alignment registers. In the event that the deck's registers contain no settings (due to failure of the operator or the machine), the factory has placed a full set of Agfa PER-525 parameters into the operating program. These values automatically will be downloaded into the alignment registers at powerup.

An optional 5-frequency (60Hz, 125Hz, 1kHz, 10kHz and 16kHz) tone generator is available for audio system alignment and routine performance tests. A special feature automatically adjusts the generator output and playback amplifier gain for operation with increased electronics and tape headroom, if desired.

The audio system

The audio circuits in the A-810 are analog, and have been perfected to give superb sonic performance. Specifications for major parameters are shown in a sidebar. Tests conducted at Editel indicate that the A-810 easily meets its published specifications. I found the head assembly to be stable and not subject to loss of alignment caused by vibration encountered in normal use. I also have found that there is ample headroom in the electronics portion of the playback system. Levels normally used with the machine leave 18dB or more headroom in the output section. Gain control of the amplifiers contained in the A-810 is accomplished through use of a variable element in the feedback loop of the particular stage, rather than a passive attenuator network. This arrangement preserves maximum headroom throughout the amplifier chains. All electronic circuits in the A-810 are phase-compensated. Gapless timed recording in and out can be programmed by the computer, further increasing the system's flexibility.

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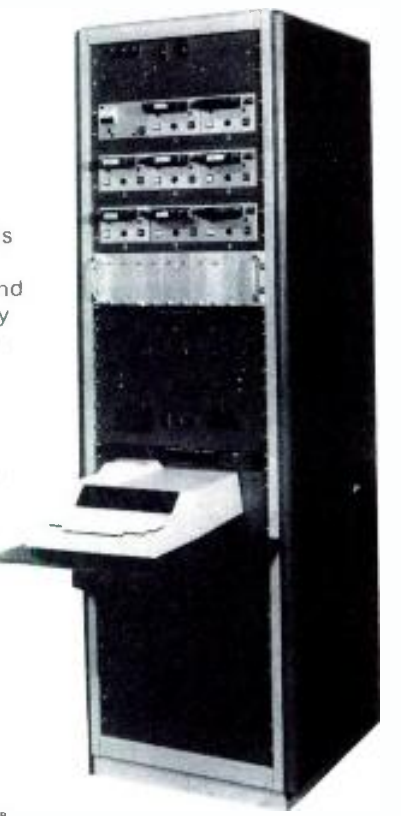

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Manufacturer's specifications:

Studer A-810

Tape speeds:	crystal controlled ± 0.2% 3.75,7.5,15, 30 ips			
Reel type:	DIN, CINE, NAB, up to 11.1" (282 mm) diameter			
Tape slip:	0.1% max.			
Tape width:	¼" (6.3 mm)			
Wow & flutter: **Peak weighted according to DIN 45507**	30ips .03%	15ips .04%	7.5ips .06%	3.75ips .12%
Tape timer:	± 0.5% indicating hours, minutes and seconds real time for all speeds			
Rewind time:	approx. 100 seconds for 2500 ft reel			
Stopping time:	less than 2 seconds			
Line inputs:	balanced and floating; optional: transformer or transformerless			
Line outputs:	balanced and floating; optional: transformer or transformerless			
Output level:	max. undistorted output level + 28dBm into 600 ohms			
Equalization:	NAB or CCIR switchable; special (non standard) time constants can be programmed			
Equalization Time Constants:	30ips	15ips	7.5ips	3.75ips
CCIR:	17.5/∞ µs	35 µs	70 µs	90/3180 µs
NAB:	17.5/∞ µs	50/3180 µs	50 3180 µs	90/3180 µs
Frequency response: **(record–reproduce)**	30ips	15ips	7.5ips	3.75ips
±2dB	30Hz-33kHz	20Hz-30kHz	10Hz-23kHz	10Hz-16kHz
±1dB	35Hz-31kHz	30Hz-28kHz	20Hz-21kHz	10Hz-12kHz
Signal to Noise Ratio: **RMS record-reproduce (referred to 6dB above operating level of 510 nWb) unweighted according to NAB standard two track; 2mm track width**	30ips 72dB	15ips 72dB	7.5ips 72dB	3.75ips 68dB
Distortion: at 1kHz **(3rd Harmonic)** **NAB equalization at operating level**	30ips 1%	15ips 1%	7.5ips 1%	3.75ips 1.5%
Crosstalk rejection: (stereo)	70 dB or greater at 1kHz			
Erase efficiency: (15ips)	82dB at 1kHz			
Erase and Bias Frequency:	153.6kHz			

For broadcast applications in which RF is present, I recommend using transformers on the inputs and outputs to minimize interface problems and ground loop possibilities. For most other applications, I suggest using the active-balanced configuration, which gives slightly better sonic performance.

Maintenance considerations

This tape machine seems to be easy to service, with all electronic assemblies on plug-in cards using plug-in integrated circuits (ICs). As of this writing, I have not received a complete instruction and maintenance manual, but I am told one is forthcoming. A detailed set of operational instructions was supplied with the deck. However, schematic diagrams for the system and troubleshooting procedures had not been completed.

Most electronic parts used in the A-810 appear to be common types that can be obtained from local supply houses. Some of the ICs are somewhat specialized, though, and would have to be ordered from a major semiconductor distributor. Most mechanical parts and transformers used in the machine must be obtained from Studer. Troubleshooting the microcomputer system in the field is not practical because of the system's com-

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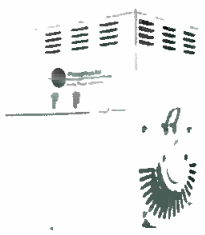

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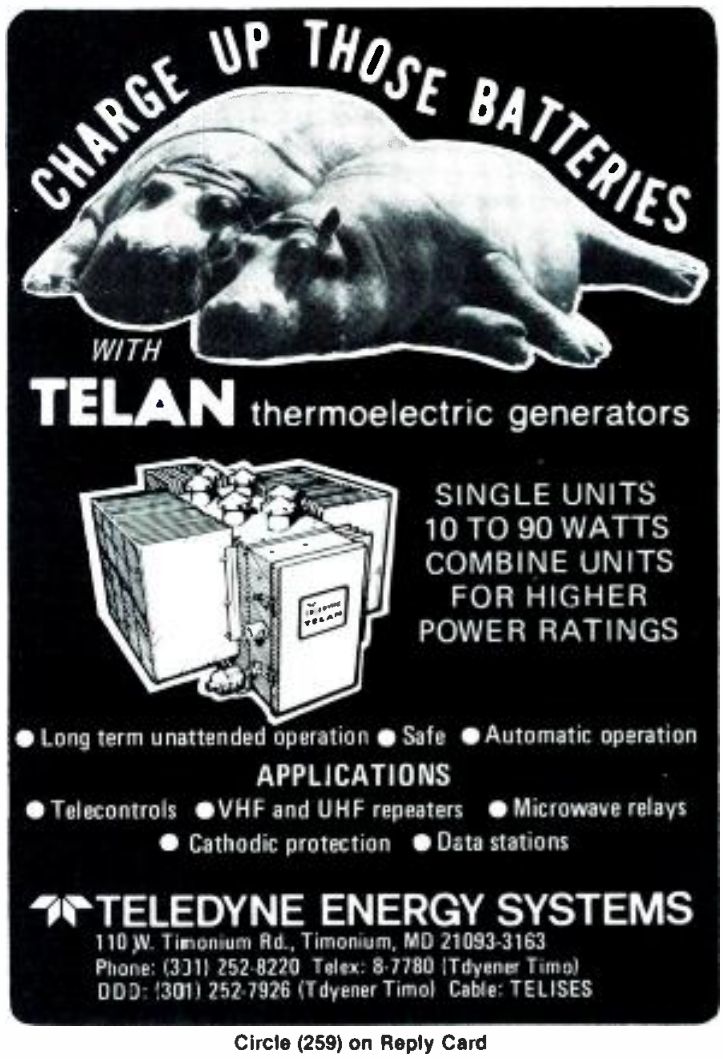

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Courtesy of Studer Revox America

The control panel of the A-810 is shown in the portable configuration. Some of the transport buttons are *soft* and can be programmed to perform various functions.

plexity. Repair of that section is a replace-the-card proposition.

The keyboard command switches are non-contacting Hall elements for long life and reliable performance. They appear to be relatively *coffee-proof*. However, I am somewhat concerned that the electronics bay (which sits below the command buttons) could be subject to damage from coffee spills when the machine is ordered in the console configuration. Operators of this deck should put their coffee cup somewhere else.

The A-810 contains a large amount of electronic hardware, and the heat generation from the system is substantial for a 2-track deck. The company has assured me that this is normal. It does seem somewhat unusual, however.

Editing

Editing is an important subject for broadcasters and production facility personnel, and the Studer A-810 offers an array of features to ease the burden of an editor working with time code or razor blades.

Spooling through a section of tape can be done in either direction at any of four speeds (10m/s, 7m/s, 4m/s and 1m/s). With practice, tape can be moved along one word at a time with the toggled spooling feature, a microprocessor routine that exerts precise control over the reel motors. Tape lifters prevent excessive wear of the heads while the machine is in the shuttle mode. The lifters can be defeated for cueing purposes, if desired. A 4-position autolocator system helps the operator find fixed points in the tape reel.

The tape deck comes with a splicing block. However, the position leaves something to be desired.

Limitations

Although the A-810 is an excellent machine, it is not without its limitations. The transport will not handle 14-inch-diameter reels, making it difficult to produce long music shows recorded at high tape speeds. Also, at this time no pilot tone 60Hz synchronizer is available for the machine, requiring the use of an alternate deck for this task. TV facilities increasingly are subject to film-type synchronization procedures, as film-to-tape transfers proliferate. Other problems with the tape machine include the LCD readout, which is not illuminated and therefore cannot be read in low light environments. An extra in-

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dicator lamp also would be helpful to indicate the presence of a time code signal.

There has been much discussion at Editel regarding the *soft key* arrangement. Broadcasters might prefer a simpler arrangement with fewer keys, whereas video and recording houses might want all functions *soft*. Studer could address this problem by offering different optional control panels (or additional control panels) that would be fitted into the blank areas of the electronics cover when the machine is ordered in the console form.

Overall impression

In conclusion, the Studer A-810 is a machine that is unparalleled in performance and versatility. I think that the unit's innovative design points the way to the future for audio recording.

The A-810 shown is installed in one of Editel's studios. The machine (here in the console configuration) also is available in portable and rack-mount models.

Editor's note:

The field report is an exclusive **BE** feature for broadcasters. Each will be prepared by the staff of a broadcast station, production facility or consulting firm. The intent is to have the equipment tested on-site. The author is at liberty to discuss his research with industry leaders and to visit other broadcasters and/or the manufacturer to track down pertinent facts.

In each field report, the author will discuss the full applicability of the equipment to broadcasting, including personal opinions on good features and serious limitations – if any.

In essence, these field reports are prepared *by* the industry and *for* the industry. Manufacturer's support will be limited to providing loan equipment and to aiding the author if support is requested in some area.

It is the responsibility of **Broadcast Engineering** to publish the results of any piece tested, whether positive or negative. No report should be considered an endorsement by **Broadcast Engineering** for or against a product.

The tape deck reviewed in this report was purchased by Editel for use in its New York City facilities. After this field report was completed, Studer Revox answered two questions brought out in the author's examination of the A-810. Thomas Mintner, director of Studer products in the United States, says an optional LED will be available in the near future to indicate the presence of time code signals. He also saic that the digital readout display will be available soon in an LED format, instead of the present LCD, if desired.

For more information on the Studer A-810 tape recorder, contact: Studer Revox America, 1425 Elm Hill Pike, Nashville, TN 37210.

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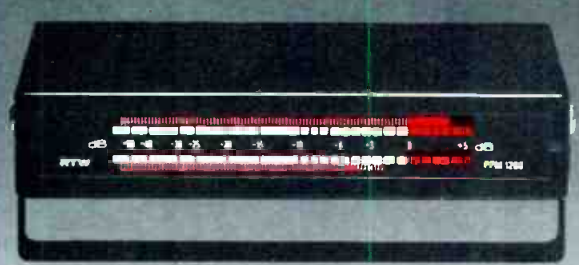

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station-to-station

Adding blue-gun-only capability to the Sony PVM-1900

Carl Armon
Technician
WNEV-TV
Boston, MA

Being able to display only the blue channel has advantages in setting up videotape equipment. Blue, being most susceptible to noise, simplifies optimizing adjustments of the VTR, particularly in matching head settings of quadruplex machines. Unfortunately, the *blue-gun-only* mode is not available in many monitors that otherwise are well-suited to many areas of a TV facility.

A simple modification may be made to the Sony PVM-1900. The components are inexpensive (about $35), and the procedure requires less than an hour to complete. The result allows a PVM-1900 or CVM-1900 with tuner to be used in the studio with a blue-gun-only display mode.

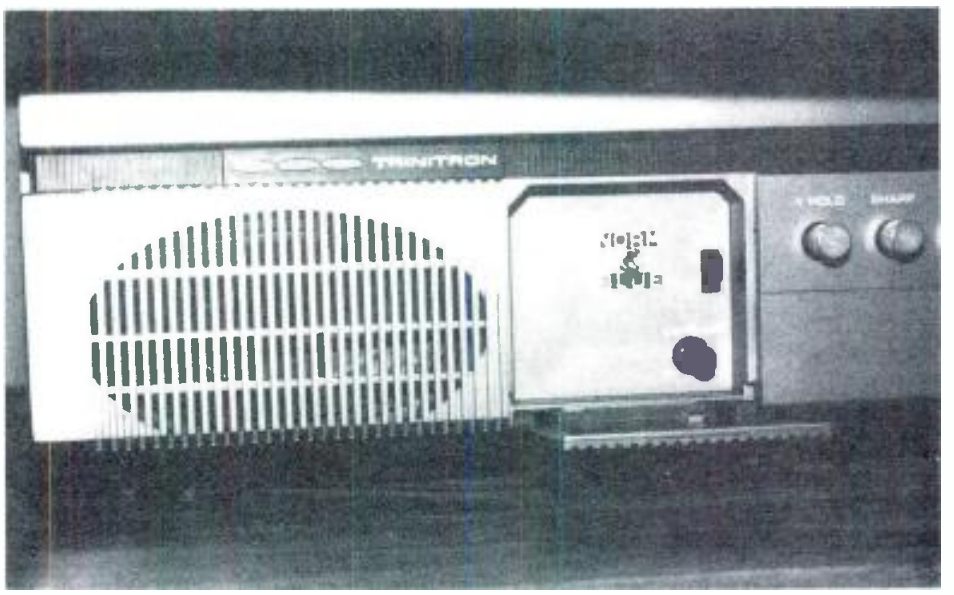
The added circuitry removes the red and green signals from the CRT by breaking the circuit paths and inserting equivalent circuit conditions in place of the signals. This leaves only the blue signal to reach the CRT screen.

Only one component, a diode found on the main printed circuit board (PCB) of the monitor, is replaced in the modification. Of the additional parts, the most expensive are two relays. Potter and Brumfield HP11D relays were chosen at $16 each, because their small size allows easy attachment to the CRT PCB.

The modification has been made on seven PVM-1900 monitors at WNEV-TV. These monitors, used in the ½-inch YIQ format edit suites, have been in continuous 24-hour operation for more than six months. To date they have been trouble-free.

Modification procedures are performed as follows:

•Remove the back cover (five screws). Two screws at the rear of the chassis must also be removed to allow the chassis to slide out of the cabinet. Sufficient slack is provided in chassis cabling to allow the chassis to be



PVM-1900 monitor with blue-gun-only switch.

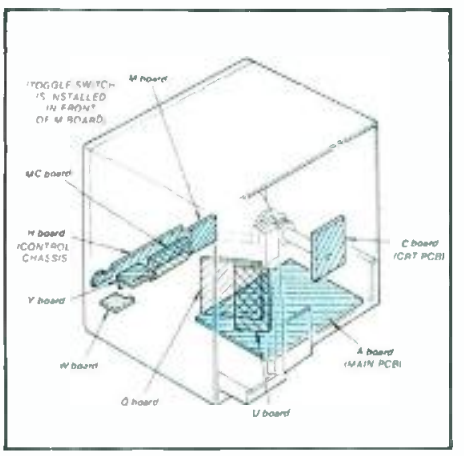


Figure 1. PCB location guide. Control switch mounts in front of the M board. Relays and components mount on the C board.

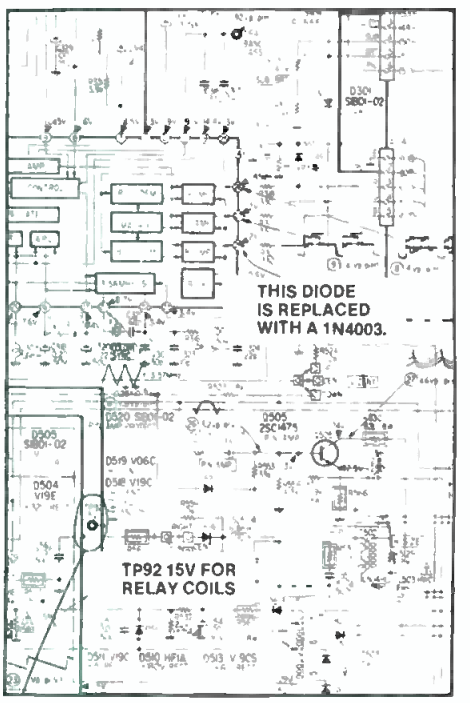


Figure 2. Partial schematic of the main (A) PCB. TP92 and the location of D349 are shown.

Editor's note:
The interior of a video monitor contains a high vacuum CRT and the ever-present possibility of stored, residual high voltages. Use care when working inside the unit. Also, this modification may void a warranty on the equipment.

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pulled out far enough to perform the modification.

•Disconnect a black ground wire between the chassis and CRT housing at the CRT end.

•Release the following cables from their plastic guides: a red high voltage cable leaving the flyback transformer (two guides); all wires going from the main PCB to the CRT yoke and to the CRT socket PCB (three guides); and all cables running along the bottom of the CRT housing (five guides).

•Lift the plastic chassis locking tab at the right of the chassis and carefully slide the chassis out of the cabinet about 10 inches.

•Remove six control knobs from the front of the set (*V Hold, Sharp, Hue, Color, Bright, Picture*); then completely loosen the five screws that hold the control chassis to the front of the set. (See Figure 1.) The screws are captive to the circuit board. The board may be carefully pulled back, with the right end being moved out of the way to expose the portion of the case where the blue-gun-only switch will be mounted.

•Drill a ½-inch hole about three-quarters of an inch above the center of the panel. Viewed from the front, it will be to the left of the *Auto color* switch and at about an 11 o'clock position from the *Subvolume* control. Viewed from inside the set, the position is at the center of a ⅜-inch circle that appears slightly indented into the plastic. Alternative to drilling, a round-tipped soldering iron may be used to melt a hole through the plastic, working from the inside. Remove any burrs from around the hole.

•Solder a 30-inch and an 18-inch length of wire to the toggle switch that

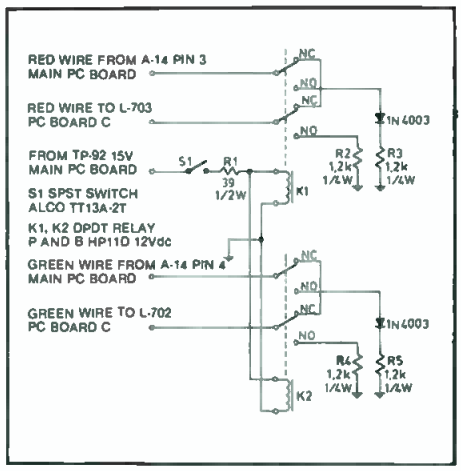

Figure 3. Schematic for the blue-gun-only modification addition to the CRT (C) PCB. Dotted lines indicate where components attach to relay coils for a ground connection.

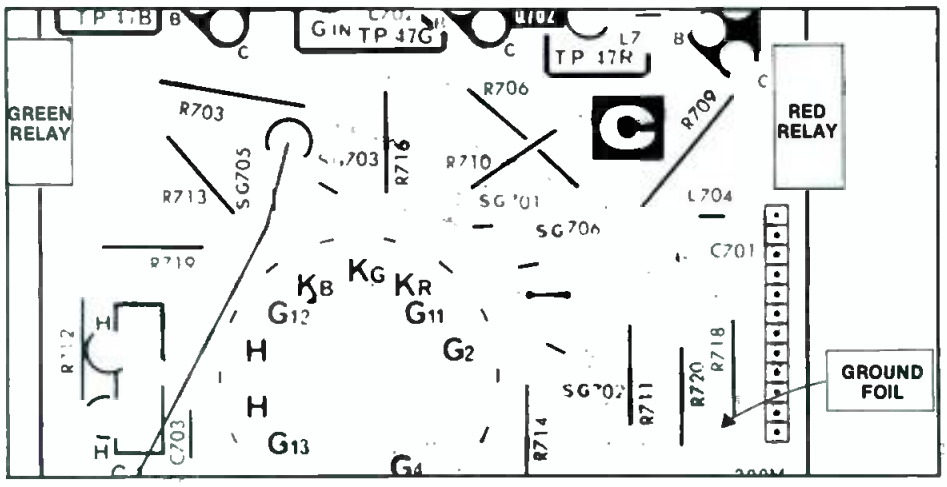

Figure 4. Layout of the C PCB, showing placement of the relays and ground foil.

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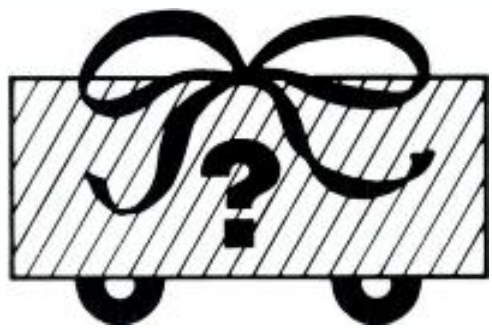

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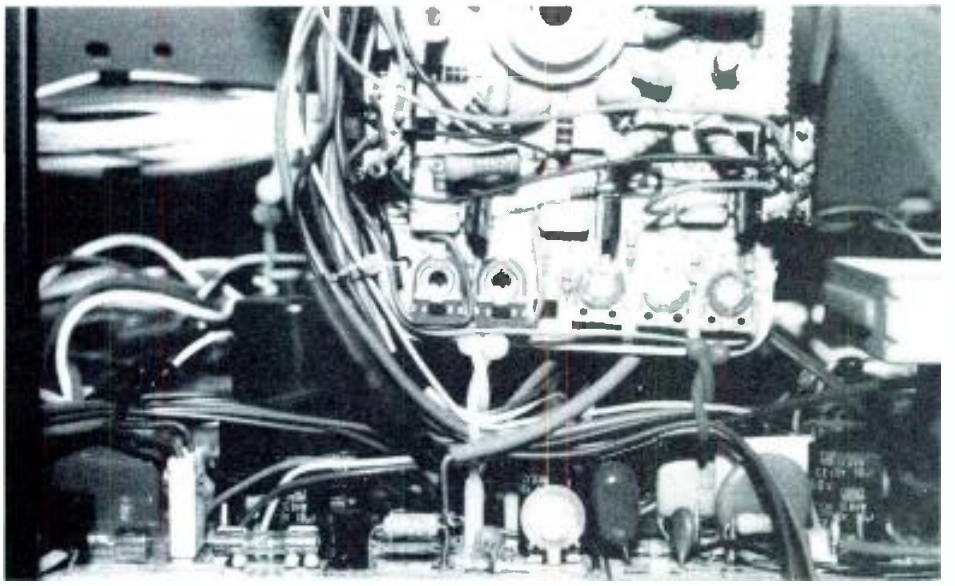

The completed blue-gun-only circuit mounted on the CRT PCB.

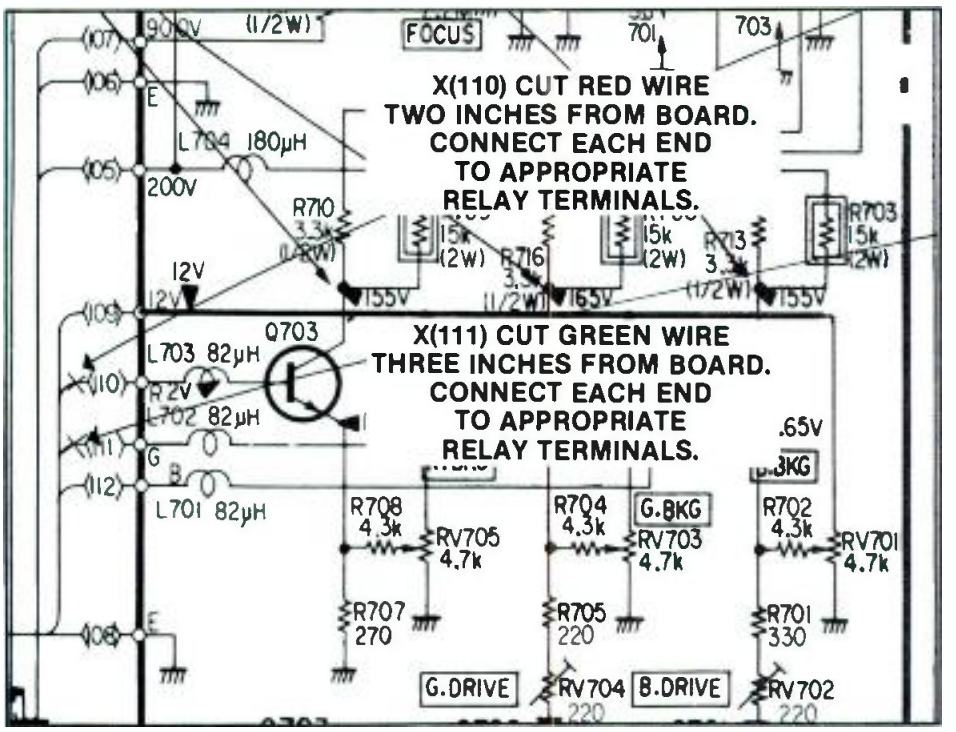

Figure 5. Partial schematic of the CRT (C) PCB indicates where the red and green signal wires are severed for attachment to added relays.

will be installed in the hole. Loosely twist the wires together before mounting the switch in the hole.

•Remount the front-control-panel PCB and tighten all five screws. Replace the control knobs.

•Replace diode D349 on the main PCB with a 1N4003, keeping the same polarity. (See Figure 2).

•Slide the main chassis toward the front of the set, leaving it out about three inches to give working room. Reinsert the cables from the bottom of the CRT housing into their respective cable guides and tighten the guides.

•Solder the free end of the 18-inch wire to TP92, and 15Vdc source on the main PCB. (See Figure 2).

•Cut the 30-inch wire near the TP92 location. Slide a short section of heat-shrink tubing over one end and attach the cut ends of the wire to the ends of a 39Ω, ½W resistor. Solder the connections and shrink the tubing over the resistor and wire junctions.

CRT PCB preparation and wiring

•Install a 1N4003 diode and 1.2kΩ resistor (in series) from one normally open (NO) terminal of each of the relays. (Note the polarity of the diode in Figure 3.) Install a 1.2kΩ resistor from the other NO terminal of each relay. Use one of the relay-coil terminals as the ground connections for the components.

•Use a short section of insulated wire to connect the normally closed (NC) terminals on each relay, as indicated in Figure 3.

•With 5-minute epoxy or a super

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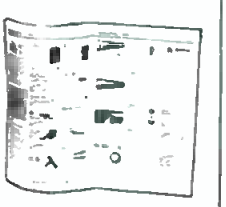

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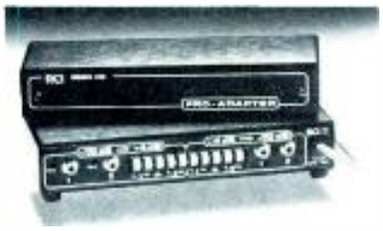

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glue, attach the relays to appropriate areas of the CRT PCB, as shown in Figure 4. Allow the adhesive to set.

•Attach the remaining end of the 30-inch wire to the *hot* ends of the relay coils.

•Connect a wire between the ground ends of each relay coil (the common point to which the components were previously attached) and to the ground foil of the CRT PCB. A black wire from the main PCB attaches to that foil to aid in the point identification.

•Cut the green wire that connects to the CRT PCB at three inches from the board, then solder the ends of the green wires to the common (CO) terminals of the relay closest to them. (See Figure 5).

•Cut the red wire that connects to the CRT PCB at two inches from the board and solder the ends of the red wires to the CO terminals of the second relay. (See Figure 5).

•Carefully plug the CRT PCB onto the CRT.

•Place all cables removed from cable guides at the beginning back into the guides and secure them.

•Slide the chassis back into the monitor cabinet and secure with the two screws. Then, replace the back cover.

Simple remote-control tally drivers

Robert Ramsaur
Engineer
KBYU-TV
Provo, UT

Most modern-day broadcasting equipment is designed to be remote controlled. You usually can find a connector on the rear panel labeled *Remote*. If your equipment has this feature, you should be able to connect switches to the appropriate pins and operate the device from some distant location. If you are fortunate, the remote connector also will provide tally information to indicate what operation the machine currently is performing.

Unfortunately, not all equipment you wish to control will have fully remoted control and tally lines. To add remote control to a particular device, you may only need to add a remote switch that parallels a local switch. If, however, that switch does not cause a tally lamp to light, you have no ready source for a remote tally.

We encountered this problem and designed a $5 circuit to solve it. Figure 1 shows a basic circuit for latching command information and driving tally lamps. If we push the *Play* pushbutton (S1), the flip-flop is set, and **Q** goes high turning Q1 on, lighting the *Play* lamp. If the *Stop* button (S2) is pushed, the flip-flop is reset and **Q** goes low, which turns off Q1 and the *Play* lamp goes out. At the same time, **Q** goes high, turning on Q2 and lighting the *Stop* lamp. Resistors R1 and R2 limit the base-to-emitter current. This basic circuit can be adapted to many remote-control applications.

In the case of our Sony 2800/2850 VCRs, the remote connector had full remote-control lines and partial tallies. Tallies for *Play*, Stop and *Rewind* were missing. The machines were easy to remote control because the VCR used momentary switches for all commands. We connected the remote switches directly to the remote

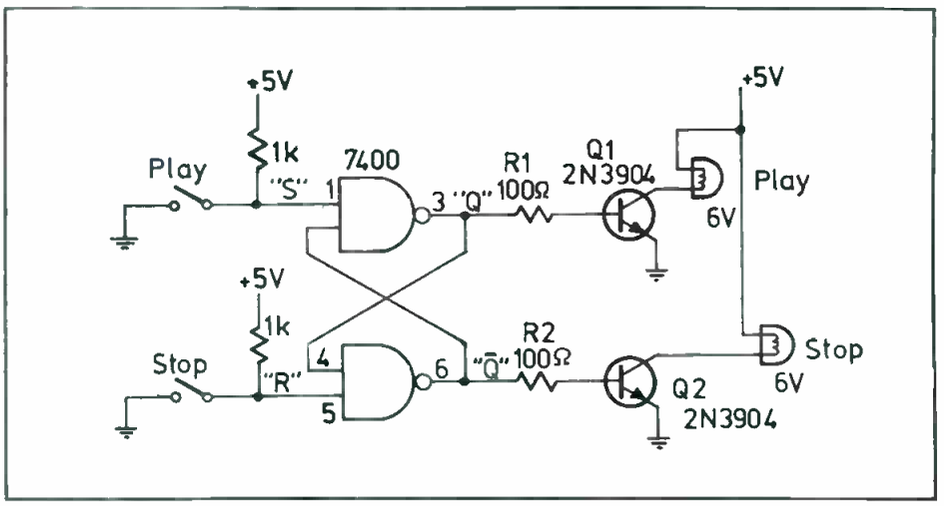

Figure 1. Basic RS flip-flop latch and lamp driver circuit.

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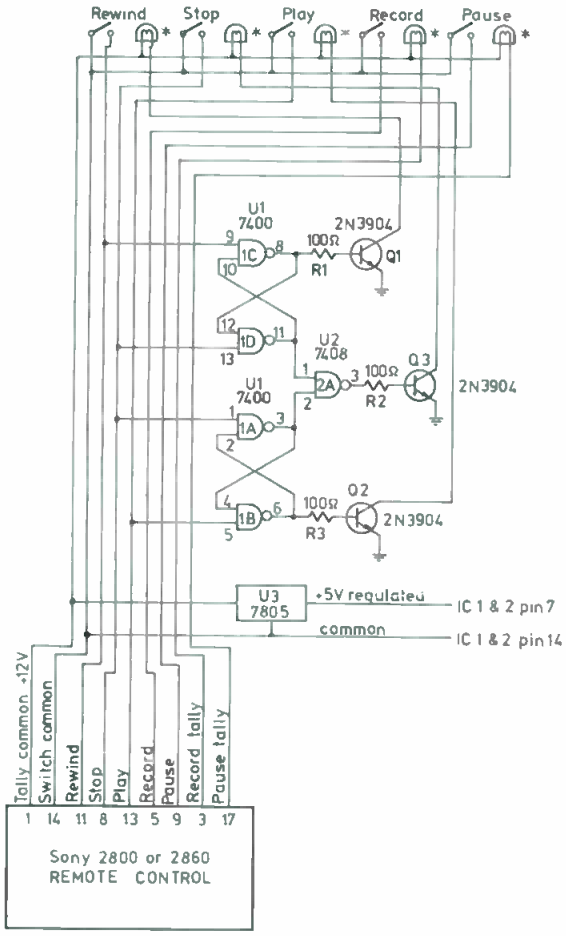
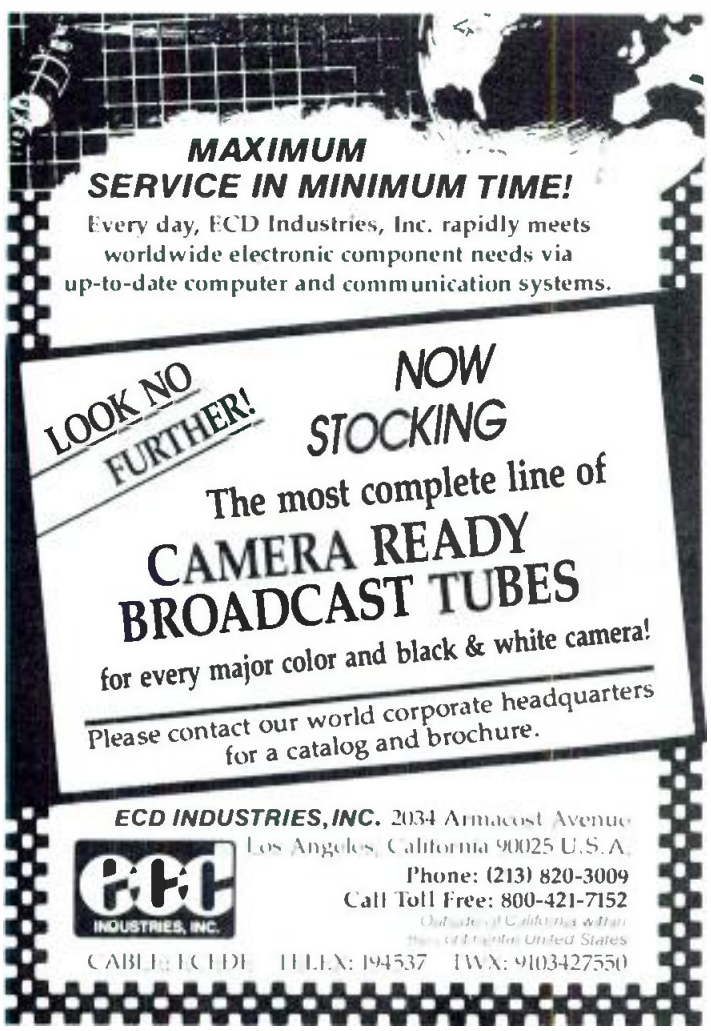


Figure 2. Remote control and tally for Sony 2800/2850.

connector, placing them in parallel with the command switches on the VCR itself. The remote connector on the VCR provided 6V power and *Record* and *Pause* tallies. We needed a way to remember which command had been issued and to tally *Stop*, *Play* and *Rewind*.

Figure 2 shows the basic flip-flop and driver circuit modified to serve the VCR's remote-control needs. IC-1 forms two flip-flops, one for *Play/stop* and one for *Rewind/stop*. Q1-Q3 are used to drive the *Stop*, *Play* and *Rewind* lamps. IC-2 sets the circuit logic so that it follows the VCR's logic. If you are in *Play*, you must push *Stop* before you can go to *Rewind*. The tally circuit indicates what mode the VCR is in, whether the command was issued at the machine or at the remote-control location. This happens because the remote switches parallel the local control switches and either can set or reset the flip-flops.

The basic circuit shown in Figure 1 can be used to generate tally logic and lamp drivers for many remote-control applications found in broadcasting. The circuits are simple to construct and easily can be modified for special applications. They draw little energy and usually can be powered from the equipment they are tallying.



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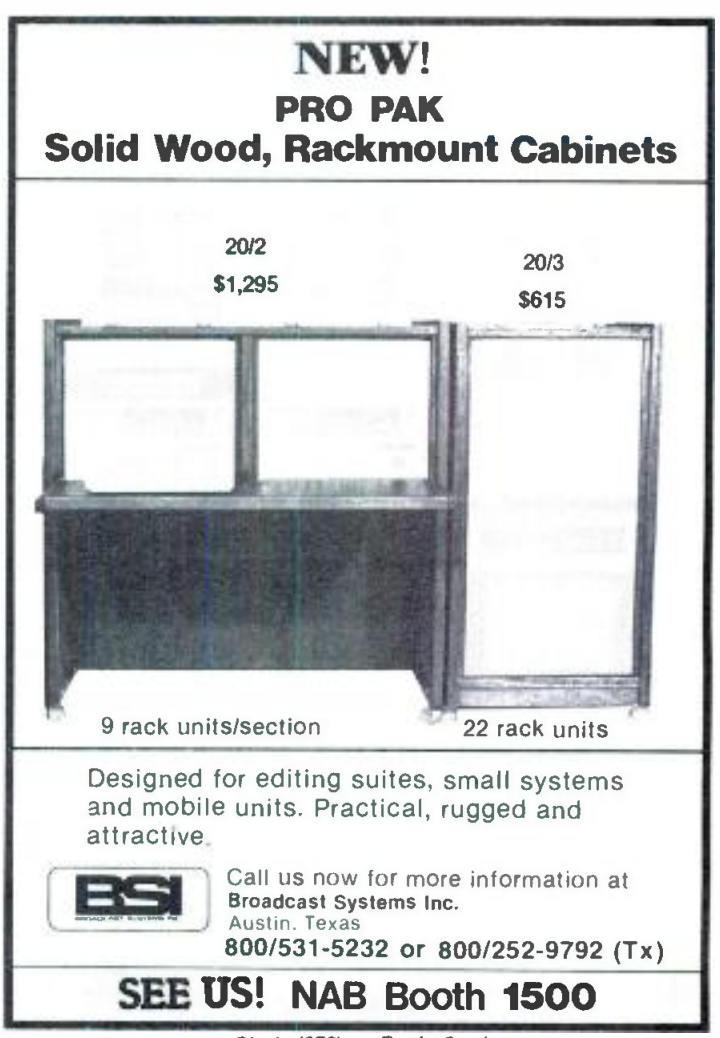

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CORPORATE DATA

Audio & Design Recording Ltd. and **Calrec Audio Ltd.** have concluded an agreement in which Calrec acquired a substantial stake in the US subsidiary **Audio + Design Recording,** based in Seattle. Nigel Branwell, formerly vice president of the US corporation, becomes president. To reflect the Calrec involvement, the name has changed to **Audio + Design Calrec.**

A new company, **Knudson & Benson Associates,** specializing in the design and specification of TV studios, performing arts facilities and places of public assembly, has been formed. Knudson, a registered architect, was formerly the associate director of plant facilities planning for CBS Television Network in New York, and is a graduate of the Yale University Theater Engineering Program. Benson is a professional lighting designer, author and teacher, with 20 years' experience in studio lighting control system design and specification. He was president of Skirpan Lighting Systems before establishing this practice with Knudson. The company is located at 3002 89th Place SE, Mercer Island, WA 98040; telephone 206-232-2273.

A special license from the US Department of Treasury enabled **Wold Communications** to proceed with live telecasts from Reno, NV, to Emtelcuba, Cuba's international telecommunications carrier. Boxing matches between amateur teams of the United States and Cuba were featured in the 4-hour telecast from Lawler Event Center in Reno. The transmission plan used a domestic satellite (Telstar 301) from the West Coast to Miami, then terrestrial microwave for the 90-mile Caribbean Sea link to Havana. Normally, TV from the United States to Cuba is routed through international satellite, but Intelsat was unable to provide the four hours required by Emtelcuba.

RCA's Broadcast Systems Division and **Rank Cintel Ltd.** have announced an agreement that gives RCA's Broadcast Systems Division non-exclusive rights to market NTSC, PAL and SECAM versions of Rank Cintel's solid-state broadcast telecine worldwide as the RCA TKS-100. RCA will sell the unit through its sales representatives and will then provide warranty coverage, installation, servicing, spare parts and training. Rank Cintel also will market the telecine as the ADS 1 through its own outlets worldwide, including Rank Precision Industries in the United States.

Innovative Concepts Int'l. has been appointed to represent **EECO** time code products in the 13 Western states. ICI also represents Anton/Bauer, Audiotronics, Video Aids of Colorado, Knox Video Products, Nova Systems and Zie-Mark.

ADDA Corporation has agreed in principle to acquire **Control Video Corporation,** Campbell, CA. Control Video will continue to operate under the direction of Wayne J. Lee, president, and founder Larry Seehorn, as vice president.

RCA and **Ampex** have announced an OEM agreement that will allow RCA to begin worldwide marketing of the Ampex VPR-80 1-inch helical-scan videotape recorder. **RCA's Broadcast Systems Division** also will provide servicing, warranty coverage, installation assistance, training and spare parts for the recorder, which RCA will market as the TH-400. The TH-400 will be available in NTSC, PAL and SECAM standards.

EQUIPMENT SALES

Under an agreement announced by CBS, **Scientific-Atlanta** will provide satellite earth stations to CBS and some of its affiliated stations. The earth stations will be installed at various CBS locations and at CBS Television Network affiliated stations across the country as part of a plan to convert the network distribution system from the existing terrestrial network to a satellite-based system. The network conversion plan was initiated in the fall of 1983 and will continue with a roll-out plan that will be completed in 1986. A number of stations in strategic locations across the country also will be equipped with occasional transmission capability. The first 10 installations in the United States were scheduled to be completed and operational early this year, and other installations will proceed at the rate of about 20 per quarter.

Spar Aerospace Ltd. of Ste. Anne de Bellevue, Quebec and Toronto, has reached agreements worth more than $20 million for the sale of 26 satellite earth stations and the transfer of related technology to the People's Republic of China. The earth stations will form a major part of China's planned satellite communications system.

Comtech Antenna Corporation of St. Cloud, FL, has delivered 3.8m and 5m transportable audio uplink antenna systems to the IDB Communications Group of Los Angeles, CA. Both transportable systems were used to uplink SCPC audio for a number of the major college bowl football games this past season.

Microdyne has announced a $300,000 order from Anixter UK Ltd. for satellite TV receiving equipment to be used in Great Britain. Anixter UK was to take delivery of 70 1100BDC-12 block downconverters and 90 1100DCR-12 receivers in the first months of this year. The equipment ultimately will be used in Britain for distributing TV programming via Intelsat V and ECS satellites.

Comark Communications, of Southwick, MA, and Colmar, PA, has announced the receipt of a major contract award from JP Communications for the manufacture and installation of a 30kW UHF TV transmitting facility to serve KPOL-TV/Channel 40 in Tucson, AZ.

Arch Communications Corporation, Hartford, CT, has placed an order valued at more than $3 million for UHF TV transmission and control equipment with the **Broadcast Transmission Division of Harris Corporation.** The equipment will be used at Arch's new TV station, WETG-TV/Channel 61, Hartford. The equipment package includes the first two omnidirectional pattern Wavestar antennas. Also included in the order are a Harris 220kW UHF TV transmitter, which is equipped with multichannel (stereo) sound capabilities; a Harris 9100 facilities control system for intelligent remote control of the transmitter; and a Harris fully protected hot standby STL/TSL microwave system. Harris will install all the equipment except the antennas.

Recent orders of **Bogner** high power TV broadcast antennas include: Channel 23, Decatur, IL; Channel 51, Ocala,

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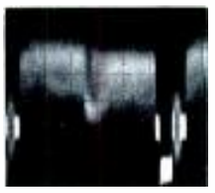
THE AGONY AND THE ECSTASY



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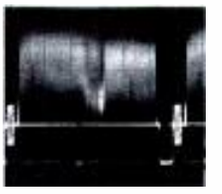

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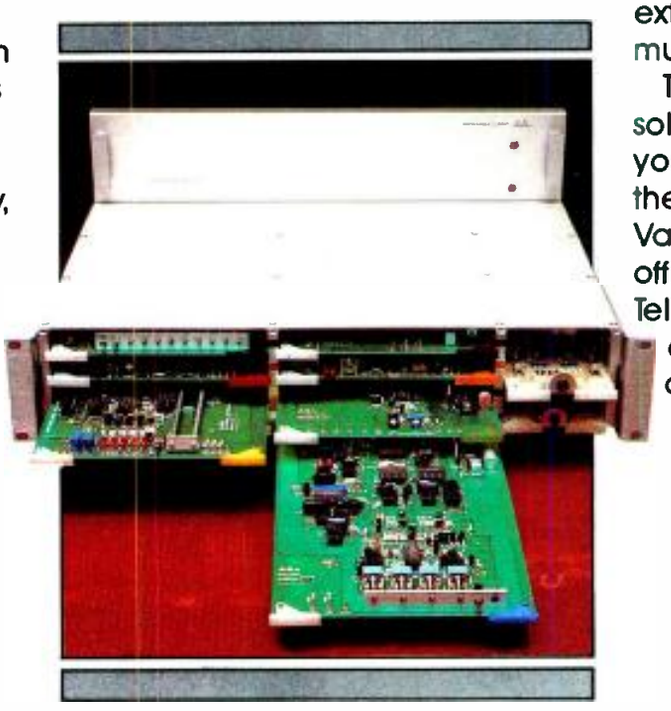

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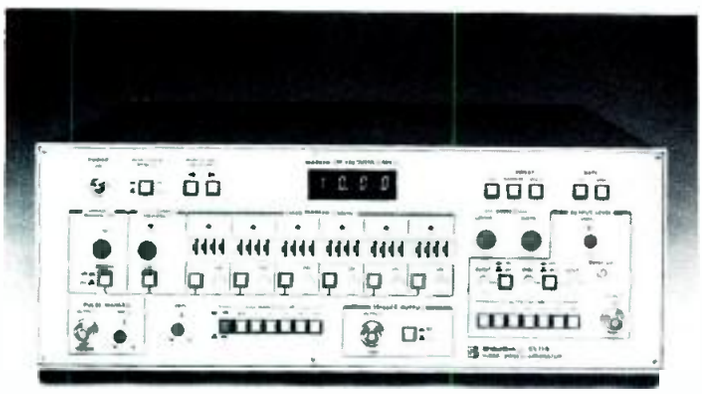

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FL; Channel 28, Columbus, OH; Channel 28, Corkville, TN; Channel 43, Bridgeport, CT; and Channel 52, Oklahoma City.

Microdyne has announced an agreement to supply a new $1 million, 2-channel satellite radio distribution system for Florida Network. The initial agreement calls for a permanent single-channel-per-carrier (SCPC) uplink to be installed at WKIS in Orlando, FL, and for approximately 50 downlinks to be installed statewide at the network's various affiliates. Microdyne also will supply a transportable audio-only uplink for the network's second channel.

Toyo Recording Company Ltd. in Tokyo has installed a complete **Ampex** post-production system valued at more than $1.1 million in its new editing suite. The suite features five Ampex VPR-3 1-inch helical-scan videotape recorders, a 2-channel Ampex Digital Optics (ADO) system, an ACE computerized editing system, an AVC-33 production switcher and ATR-102/ATR-104 and MM-1200 audio recorders.

NEW ADDRESSES, DIVISIONS

Atlanta-based **VideoStar Connections** has expanded its staff and opened a Midwest regional office just outside of Chicago. Johan Praats, VideoStar's Midwest region sales manager, will be in charge of the new office. The new address is Suite 400, 999 Plaza Drive, Schaumburg, IL 60195. Telephone number is 312-843-7323.

Comprehensive Video Supply Corporation has opened a West Coast distribution center. The new facility is located at 14731 Franklin Ave., Tustin, CA 92680; 714-669-1138.

Fortel has moved to a new, larger facility at 2985 Gateway Drive, Norcross, GA 30071. The phone number is 404-449-4343. The new facility has more than twice the floor space than the old location.

Digital Entertainment Corporation has announced the opening of its latest sales and service facility located at 2200 Hillsboro Road, Nashville, TN 37212. The phone number is 615-298-6613.

News

Continued from page 4

ITFS to see increased activity

Agreements between Microband Corporation of America and a number of educational institutions soon may result in additional TV programming for US viewers. Following regulatory changes in the Instructional Television Fixed Service (ITFS) allowing ITFS licensees to lease their excess channel capabilities to other organizations, Microband already has made arrangements with institutions in at least 24 US cities to transmit the new signals before the end of this year.

The ITFS spectrum, authorized by the FCC in 1963, set 2500-2690MHz aside as a supplemental band for educational TV broadcasting services. License holders have been limited to educational, institutional, governmental and non-profit organizations, and programming has been held to instructional and cultural materials. The new regulations and arrangements will allow Microband's Urbanet, a wireless CATV service, to transmit "the Pay TV programs consumers want, as well as the instructional programming America needs," according to Mark Foster,

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Microband board chairman.

The program fare to be provided by Urbanet will be a combination of satellite-relayed premium programming and instructional material produced by the institutions to which the licenses are assigned. Because each licensee holds more than one 6MHz channel, simultaneous multichannel operation is possible, with as many as 12-18 specialized program services being provided to a community.

Working with Microband in the venture are such educational institutions as the Network of Instructional Television (NITV), Harvard University, the University of California, the Pennsylvania Hospital Television Network, the Hispanic Information and Telecommunications Network, and a number of public schools and community colleges. Some of the cooperating organizations previously have operated limited power ITFS systems during the 20 years of the service's existence.

The 1983 re-regulation of the ITFS concept by the commission may bring to an end a running battle that has waged between Microband and other multipoint distribution service (MDS) operators and ITFS proponents. Not only has MDS been given eight of the originally available 31 channels in the 2GHz band, but now the commercial operation will use from 1-4 additional channels of what was strictly non-commercial spectra.

Waivers also have been given to ITFS operators to use non-standard transmission modes on the channels. These include a SECAM/60 color system in the Anaheim City School District of the Los Angeles area, and non-NTSC-compatible formats for specialized needs in transmission of medical programs. In the commission's re-regulation of ITFS, a relaxation of technical standards allows licensees the choice of standards and corresponding equipment appropriate to individual instructional goals involved.

Because the service operates between 2.5-2.69GHz, special receiving equipment is needed. Subscribers to the service must use a special microwave receiving antenna that generally will be roof-mounted to receive the strictly line-of-sight signals. A downconverter will change the signals to an unused VHF channel and feed a set-top converter. Through a 2-way telephone link, pay-per-view and other transactional programs may be delivered live or to a subscriber's VCR for delayed use.

Downtown teleport to be built

The world's first *downtown* satellite communications teleport—to be constructed on top of the National Press Building in Washington, DC—was announced recently in a news conference at the National Press Club.

The new satellite communications complex, called The National Teleport, will provide direct access to US and Canadian satellites from the heart of the nation's capital. For the first time, domestic and international broadcasters, news organizations, corporations, associations and government agencies will have a convenient and low cost means to transmit video, voice and data to and from Washington.

The National Teleport will be the first teleport located in a downtown area. Such facilities usually are situated in outlying, suburban locations to escape other telecommunications interference. But, because The National Teleport will use state-of-the-art Ku-Band technology, its satellite earth stations can operate in a congested metropolitan area interference-free.

Initial plans call for installing two 5m Ku-Band transmit/receive earth stations with multiple interconnections via fiber-optics, coaxial cables and microwave to locations throughout the greater Washington area. There will be expansion space for as many as six additional earth stations.

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Associations

Continued from page 12

randomly selected radio stations will be contacted.

No previous studies have sought to measure comprehensively the amount and manner of use stations make of technologies that support routine program and signal transmission essential to providing service. The use of spectrum and non-spectrum-based applications will be measured. Spectrum applications refer to telecommunications that occur in an open system and make use of the electromagnetic spectrum, such as the broadcast auxiliary services and satellites. Non-spectrum applications include telephone, fiber-optics and coaxial cable.

Applications relating primarily to broadcast signals to the public, as well as those of secondary uses such as data communication, energy management and other new services, will be measured. In each area, present and planned usage levels, satisfaction with technical quality and cost variables will be considered.

SMPTE

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Scarsdale, NY 10583
914-472-6606

Component analog tests conducted

Tests of a new time division multiplexed component analog video signal were conducted by the Working Group on Component Analog Video Standards of the SMPTE. The tests were held in a studio of the Canadian Broadcasting Corporation in Montreal during the week preceding the 18th SMPTE Television Conference.

The working group is developing a series of interface standards for parallel and serial interconnections at the studio level and for parallel interconnections of cameras and recorders in the field. The tests were designed to validate choices the group has recommended regarding the form of the signal to be used for single-cable, serial interconnections in the studio, and the waveform to be used to carry that signal.

A special, parallel-component system was assembled to support the tests of the serial component analog video (CAV) signal and waveform. Incorporated were several picture sources, including two cameras, a slide scanner, a character generator and two small format videotape machines for playback of pre-recorded tapes with live action. Also available were a number of test signal generators, including zone plate, a component production switcher and a color matting device.

A specially built multiplexer and demultiplexer were used to convert the parallel component signals to a serial Y, C_B, C_R signal having an 11MHz bandwidth. The resulting CAV signal then was passed through an environment that included reduced bandwidths (using filters with various corner frequencies and shapes), severe amplitude and phase non-linearities, and a variety of interferences such as hum, noise, line and field rate tilt.

Regarding the test results, Weiss said, "A majority of observers was startled by the robustness of the signal, even under severe distortions in the CAV environment. Distortions which would have destroyed NTSC signals had very little effect upon the CAV signal, aside from the expected reduction in resolution when the bandwidth was reduced."

The group will next proceed to tests of the stability of

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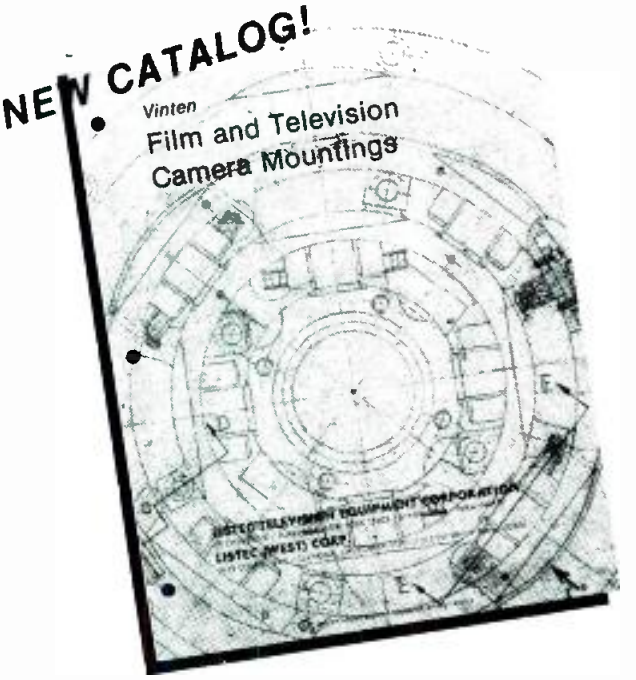

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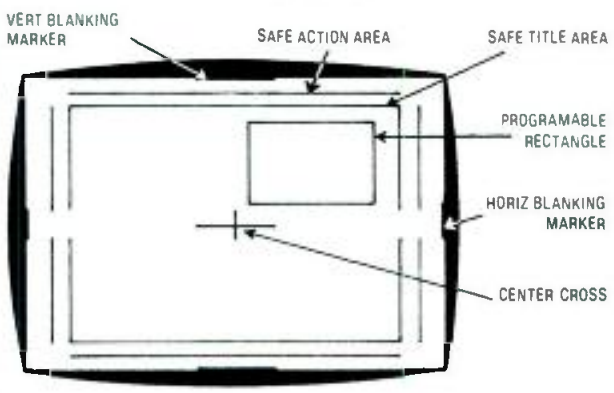

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the synchronizing waveform proposed to carry the CAV signal. The tests will include compatibility with existing TV facilities.

NRBA
National Radio Broadcasters' Association
2033 M St., NW, Suite 506
Washington, DC 20036
202-466-2030

Inclusion of NAB Programming Conference with NRBA Convention approved

"In recognition of the fact that NRBA has always supported any move that solidifies and unifies the radio industry, the NRBA board of directors invites the NAB's Radio Programming Conference to stage a joint all-radio convention at the NRBA's previously scheduled convention in Los Angeles, with instructions to our Executive Committee to negotiate any agreement which is sensitive to the financial needs of NRBA."

So read the NRBA board of director's resolution unanimously approving the joint effort, at the board's semiannual meeting in February. The board empowered president Bernie Mann and the NRBA staff to work out details with NAB on the matter. The music industry also will be invited to participate in the convention, according to another resolution.

Radio sales university to be created

NRBA will work to establish a radio sales university in a first-ever program of its kind to train those interested in radio sales. "This will be a sales university on a professional level taught by professionals in the industry," according to the NRBA board of directors.

Specific points remain to be developed for the program. It is expected that the university courses will be taught on a regional basis on college and university campuses within each region.

Translator action sought

NRBA has petitioned the FCC to begin a rulemaking proceeding to prohibit the assignment of FM translator facilities to communities that already receive primary service from two or more commercial FM stations and to clarify commission rules on the non-commercial nature of FM translators to make it clear that the use of such facilities for commercial profit is prohibited.

In light of the deluge of FM translator applications—650 in October and November—many for markets well-served by full-service stations, NRBA said it believes that without action by the FCC, a new low power FM broadcast service will develop and that the effects of the service could be harmful to the radio broadcasting industry.

NRBA also has asked the FCC to look at some 400 applications that have been filed by one entity using three applicant names.

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people

Chuck Pope has been named product manager, ½-inch videotape, by Ampex Corporation. In his new position, Pope will be responsible for the VHS and Beta product lines.

Daniel Antonellis has joined Videotek as national sales manager. He will direct all sales efforts for Videotek's color monitor, test equipment and terminal equipment product lines. Also, Antonellis will work directly with Videotek's dealers in metropolitan New York, New Jersey, Eastern Pennsylvania, Maryland and Washington, DC.

Ronald L. Arendall has been named president of Dynavid Corporation, Indianapolis, IN. Arendall will be responsible for system design, application engineering, marketing and sales for the Broadcast and Industrial Divisions of DVC. Arendall, a registered professional engineer, had been director of engineering at WTHR-TV, Indianapolis, since 1976. He is immediate past president of the Society of Broadcast Engineers.

Joseph C. Volpe has been appointed division vice president and general manager of the RCA Broadcast Systems Division. Volpe succeeds **Joseph B. Howe,** who has been named staff vice president and chief engineer on RCA group vice president John D. Rittenhouse's staff. Volpe had been division vice president, operations, Broadcast Systems Division, since October 1983. Before heading the Broadcast Systems Division, Howe served as division vice president and general manager of the RCA Commercial Communications Systems Division since 1981.

Sony Broadcast Ltd. has announced the appointment of **Jeff Meadows** as managing director designate. Early in 1977, Meadows joined NBC News and, based in London, was in charge of its operations throughout Europe, Africa and the Middle East. Returning to New York in 1979 to manage all ENG operations for NBC News, he was appointed managing director of news operations in 1980, with additional responsibilities for studio operations, graphics and news archives. During 1982, he became vice president of engineering and technical services, responsible for development, design and installation of technical facilities for the NBC network generally and the electronic maintenance of its New York facilities. He vacated this post to join Sony Broadcast.

ADM Technology has promoted **Murray Shields** to the new position of vice president of corporate sales. Shields has been with ADM for 11 years and most recently was vice president of sales. **Larry Mandziuk,** who has been with ADM eight years, has been promoted to the new position of staff vice president of advanced programs. Mandziuk was formerly manager of systems engineering. **William Keely** has joined ADM in the new position of vice president of engineering. Most recently, he held several engineering management positions in the electronics group of the Advanced Development Center of National Water Lift in Kalamazoo, MI.

New Media Graphics Corporation has announced the appointment of **James A. Frantzreb** as Northeast sales manager. Before joining the company, Frantzreb held senior sales management positions with Pioneer Video, Unicom, MP Video and Crimson.

The appointment of **Stuart Rauch** as national sales

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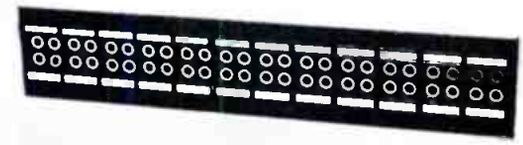

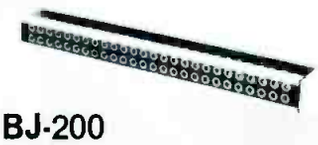

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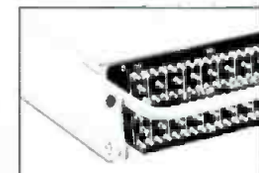

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manager for broadcast and color CCTV dealers for Ikegami Electronics (USA) has been announced.

Beverly McGill and **Stephen Dunwoody** have joined Mycro-Tek as representatives for the company's Mycro-Vision video display information system. McGill will be based in Dallas. Her sales territory includes Texas, Arkansas, Oklahoma and New Mexico. Dunwoody will be based in Indianapolis and will cover Indiana, Michigan, Ohio, Kentucky, Tennessee and the metropolitan Chicago area.

Jon Bart, national marketing manager of Listec TV Equipment Corporation, Plainview, NY, will join the broadcast equipment staff at Listec (West) Corporation, Glendale, CA. Bart will be responsible for consulting and sales for Vinten camera mounting equipment and Listec visual prompting systems.

EECO has announced the appointment of **Eloy Chairez** to product specialist, video products marketing, Video Products Division. Chairez's primary responsibilities involve new product planning, market research/analysis, and sales and technical support. Before joining EECO, Chairez was associated with Fernseh.

Joseph M. Bradley has been appointed vice president of marketing for Varian Associates' Electron Device Group (EDG). Bradley will manage the EDG central marketing organization, which includes a network of field marketing and sales offices in the United States and Europe. He also will be responsible for coordinating divisional marketing activities among the nine operating divisions of the group.

Acrodyne Industries has appointed **Stephen Wozniak** as electrical design supervisor. Wozniak will be responsible for the design of Acrodyne's low power and medium power TV broadcast equipment.

Harris Corporation, Broadcast Group, has announced the appointment of **John F. Delissio** as vice president of systems and service operation. In his new position, Delissio will have general management responsibilities for the operation. Delissio comes to Harris after serving 18 months as vice president/general manager of the Broadcast Division of M/A-COM Video Systems.

Attila C. Bitto has been appointed editing products manager for Sony Broadcast Products Company. Bitto's responsibilities will include management of Sony's broadcast editing system, time code products and broadcast audio products. **Jerry Cohen** has been named product manager for cameras by the company. Cohen will be responsible for all marketing aspects of cameras, from interfacing with development and design engineers to supporting the activities of Sony sales engineers.

Ampex Corporation has announced the appointment of **Morgan Rees** as product manager of ¾-inch videotape. His promotion follows three years of service with Ampex as sales representative for magnetic tape in Florida.

Leitch Video of America has announced the appointment of **Gary Becknell** to the position of marketing manager for the United States. Becknell brings with him 10 years of experience in all phases of TV broadcast engineering.

Glenn P. Wolk has been named national sales manager of the Visual Products Division, Hitachi Denshi America Ltd. Wolk joined the company more than a year ago as Eastern regional sales manager for the Visual Products Division.

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OPERATING ENGINEERS wanted for fast growing 37th Market NBC Affiliate. Good benefits plus excellent southern location. Beach or mountains just two hours drive. 1-2 years experience as Tape Operator or Master Control Operator with General Class Lincense. Send resume and salary requirements to Director of Engineering, Durham Life Broadcasting Inc., P.O. Box 1511, Raleigh, NC 27602. 4-84-2t

CHIEF ENGINEER. Small market VHF station on the northern coast of California needs strong self starter, experienced in transmitter and studio maintenance and operation. Mild climate, pleasant living in small town atmosphere. Year-round hunting, fishing, camping, hiking. Salary range commensurate with experience and market size. Send resume to Dept. 606, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 4-84-1t

SAN FRANCISCO BASED Audio/Video facility seeks experienced Video Engineer for maintenance and troubleshooting of cameras, VTR's, editing systems, and other production equipment. Many varied responsibilities and occasional travel. Send resume to Dennis Minnick, McCune Audio/Visual, 951 Howard Street, San Francisco, CA 94103. 4-84-1t

ASSISTANT CHIEF ENGINEER for second shift at around the clock post-production/production house to do hands on maintenance of two CMX editing suites, EFP gear, etc. Provide engineering support for nighttime editing staff, but no operations work. Should have two to three years experience in post-production facilities, and knowledge of Sony 1" and BVU, Grass Valley switchers, ENG cameras, etc. Send resume to Videosmith Inc., 2006 Chancellor St., Philadelphia, PA 19103, c/o Steve Beuret, (215) 864-0658. 4-84-1t

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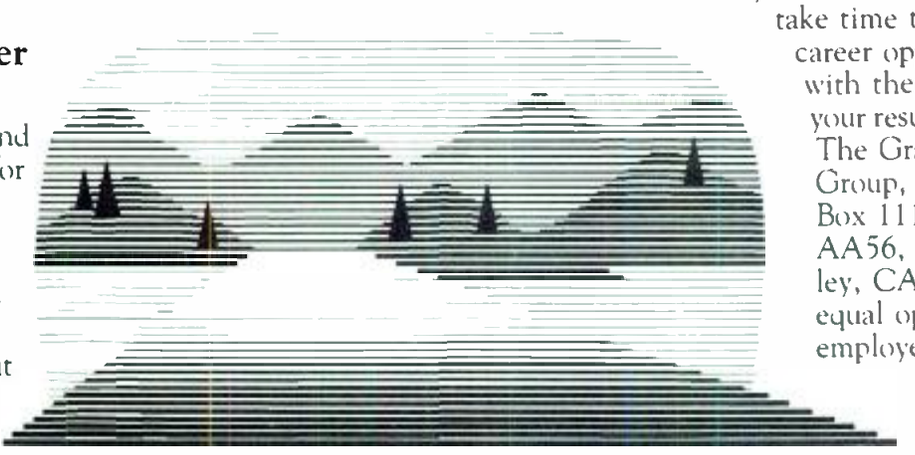

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U.S. INFORMATION AGENCY, WASHINGTON D.C. TV BROADCAST TECHNICIANS—HELP US BUILD A WORLDWIDE TELEVISION SATELLITE NETWORK. Apply now for an opportunity to work in international television broadcasting. If you are a technician with experience in computerized videotape editing, you may be eligible to work at the USIA's broadcast TV production facility in Washington D.C. Six years experience in broadcasting or at a broadcast quality production facility required. Work hours 8:45 a.m. to 5:30 p.m. with periodic overtime. Starting salary: $30,402. Indicate announcement PDP-293-83. Interested applicants are requested to send a standard U.S. Government application form SF-171 to USIA, Attn.: M/PDP, Room 518, 301 4th Street, S.W., Washington, D.C. 20547. Moving expenses to Washington, D.C. must be provided by selected applicant. USIA is an Equal Opportunity Employer. 4-84-1t

MAINTENANCE TECHNICIAN Knowledgeable with analog and digital circuiting. Maintenance experience with all tape formats, switchers and cameras. UHF transmitter experience and FCC license preferred. Contact Director of Engineering, KSEE TV, P.O. Box 24000. Fresno, CA 93779, (209) 237-2424, EOE. M/F. 4-84-1t

POST-PRODUCTION MAINTENANCE ENGINEER. Established NYC facility seeks responsible individual preferably familiar with Sony 1" VTRs, CDL Switchers, CMX, Chyron, Quantel, and ADO. Excellent salary and benefits. Reply to Dept. 607, Broadcast Engineering, P.O. Box 12901. Overland Park, KS 66212. 4-84-1t

EXPERIENCED TRANSMITTER SUPERVISOR: Transmitter supervisor for VHF Television Transmitter. First or General Class FCC License required. Experience in tuning TV Transmitters is essential. Top 100 Station. Mitchell/Sioux Falls, South Dakota. Contact Donald Sturzenbecher at (605) 996-7501. E.E.O. 4-84-1t

SR. CMX EDITOR—For Commercial Production House. Experience required. Southern Productions, Inc., P.O. Box 121583, Nashville, TN 37212. (615) 248-1978. 4-81-1t

VIDEO TAPE ASSOCIATES AND VTA TECHNOLOGIES—Video Tape Associates with television production facilities in Atlanta, Georgia and Hollywood, Florida and VTA Technologies a research, development, and manufacturing firm in Hollywood, Florida, are accelerating their expansion plans and therefore have the following openings: VTA TECHNOLOGIES, HOLLYWOOD, FLORIDA—DIGITAL DESIGN ENGINEERS, Challenging opportunity for engineers with a television engineering background and the ability to apply advanced technologies to new areas of teleproduction equipment needs. If you are not satisfied with today's methods and equipment help us develop tomorrow's. SOFTWARE ENGINEERS—Join the software development team responsible for real time control and manipulation of television signals and equipment. Must be familiar with 68000, 6502 assembly language. ANALOG ENGINEERS—Experience with operational amplifiers, linear and non-linear circuits and video signal processing. VIDEO TAPE ASSOCIATES—ENGINEER IN CHARGE OF REMOTE OPERATIONS, HOLLYWOOD, FLORIDA. Management position for maintenance engineer with good knowledge of all areas of teleproduction. Only moderate travel required. The position involves the management of remote engineers and teleproduciton trucks. Good client relation skills necessary. MAINTENANCE ENGINEERS, ATLANTA, GEORGIA; HOLLYWOOD, FLORIDA. Experience and current digital skills necessary. Work with the latest equipment, from computer graphics and ADOS, to Betacams with wireless time code. TELECINE COLORIST, HOLLYWOOD, FLORIDA. Film knowledge and experience as well as a strong television background are needed for this position. Work with the Bosch FDL 60 and scene-by-scene computer assisted color correctors. If you are still excited about your profession, and would enjoy working for a company that rewards self-motivation, creativity and innovation contact Michael Orsburn, 2040 Sherman Street. Hollywood, Florida 33020, Phone 305-920-0800. 2-84-3t

TV MAINTENANCE ENGINEER—Requires experience with Sony ¾" tape and Ikegami cameras. RF, 1" and microwave experience preferred. Requires FCC General License. Send resume to Marty Peshka, WTNH-TV, Box 1859, New Haven, CT 06508. Equal Opportunity Employer. 4-84-1t

TRANSMITTER MAINTENANCE ENGINEER—KRIV-TV, Metromedia Houston, Texas has an immediate opening for a conscientious individual. Must have strong UHF background and the desire to advance to supervisory position. New facility with modern equipment. Apply to Wendell R. Wyborny V.P./C.E., KRIV-TV Metromedia, Inc., P.O. Box 22810, Houston, TX 77227, (713) 626-2610. EOE.

MAINTENANCE SUPERVISOR FOR UHF STATION in northeastern Ohio. Must have FCC first or general class license and minimum of four years experience in TV broadcasting, with emphasis on transmitter and telecine maintenance. No studio or ENG maintenance necessary. Competitive salary with extraordinary benefits, including university tuition for dependents. Send resume to: John Cervone, WNEO-TV, 275 Martinel Drive, Kent, Ohio 44240. An affirmative action/equal opportunity employer. 4-84-1t

ENGINEER FOR MODERN UNIVERSITY TEMECOMMUNICATIONS center/Public television joint facility. Responsibilities include maintenance and limited operations. Facility includes FM, UHF TV, ITFS, CCTV and production studios. BS in related field and demonstrated technical expertise required. Competitive salary plus university fringe benefits. Apply to: John V. Kuderka, Chief Engineer, Bradley University, WTVP-TV, Peoria, IL 61625, (309) 676-7611 X235. An Affirmative Action/Equal Opportunity Employer. 4-8-1t

POSITION WANTED

VIDEO MAINTENANCE ENGINEER, editor, cameraman seeks freelance news or production work overseas. Peter White, 610 Waller St., San Francisco, CA 94117, (415) 552-3780. 4-84-1t

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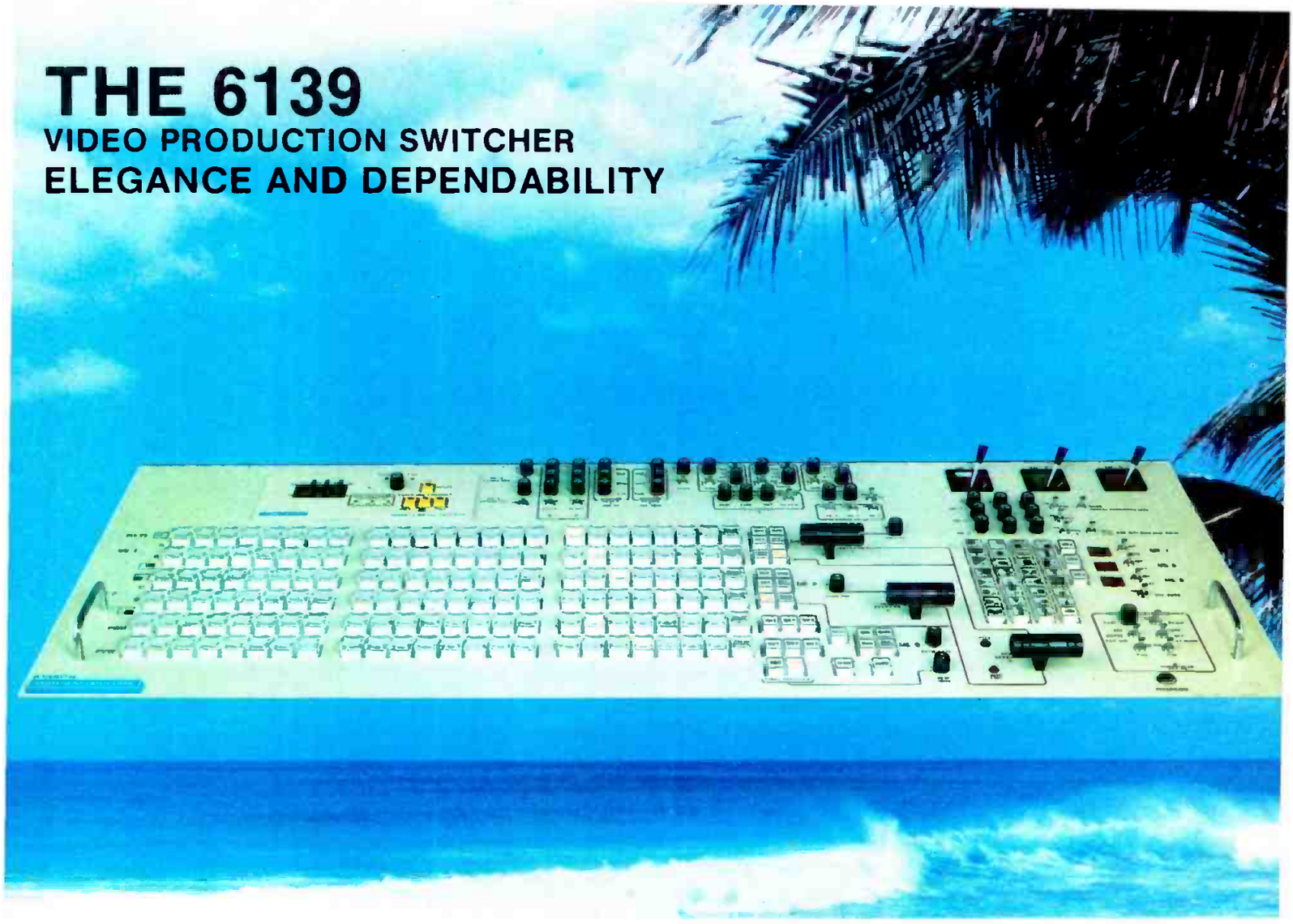

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