

SEPTEMBER 1974

BMME

BROADCAST MANAGEMENT/ENGINEERING

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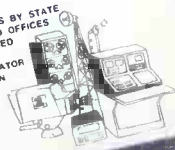


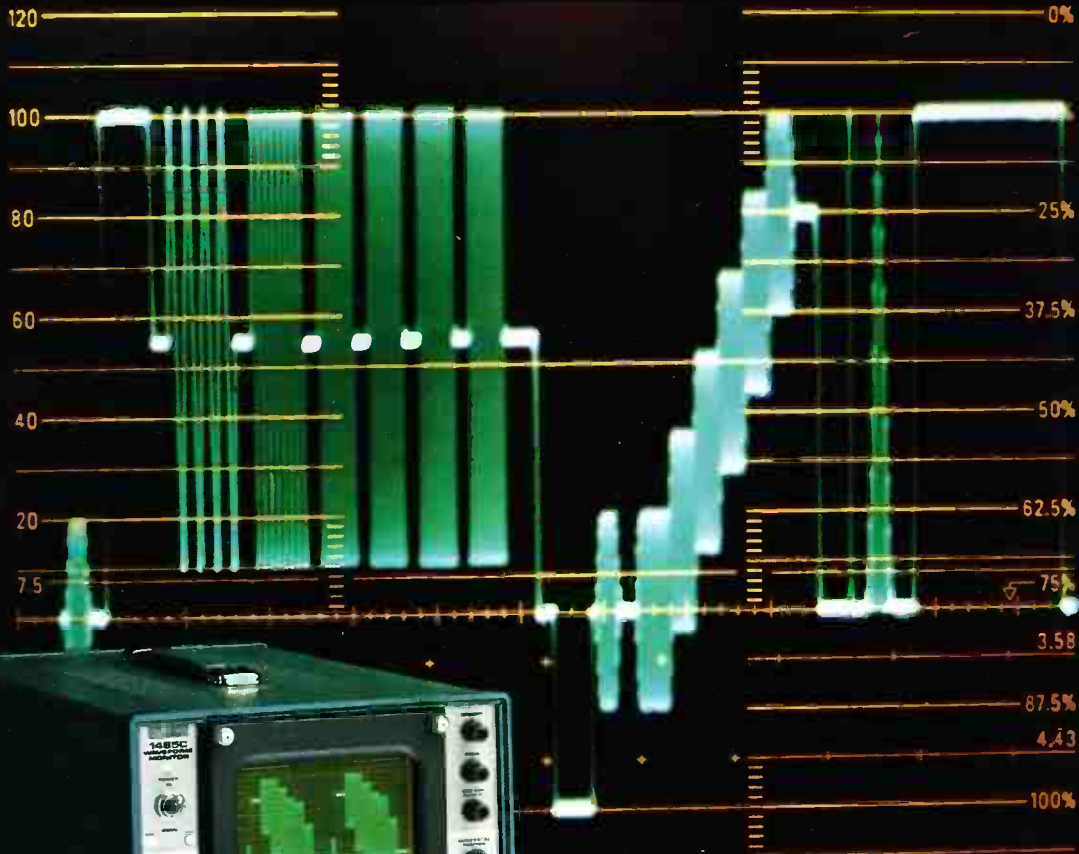
representing the source '74: is verified.

The Source '74.

The industry's only
verified guide of broadcast
equipment manufacturers

- REPS AND DISTRIBUTORS BY STATE
- MANUFACTURER'S FIELD OFFICES
- PRODUCT LINES HANDLED
- PHONE NUMBERS
- INSTANT SOURCE LOCATOR
- VERIFIED INFORMATION





EXCEPTIONAL ACCURACY EXCEPTIONAL BRIGHTNESS EXCEPTIONAL WAVEFORM MONITORING

There is a 1480 Series Waveform Monitor for every application and every television standard . . . and they all are exceptionally bright, bright enough to display VIT Signals in a well lighted facility. They all have exceptional amplitude measuring

accuracy achieved by comparing your signal to an internal standard with 0.2% tolerance. They all include a variety of new features such as trace overlay, digital line selection, fast and slow DC restoration, and direct sync recognition or AFC operation.

prepared to demonstrate and deliver an exceptional waveform monitor.

To learn more about these new Tektronix waveform monitors call your Tektronix people now. They are

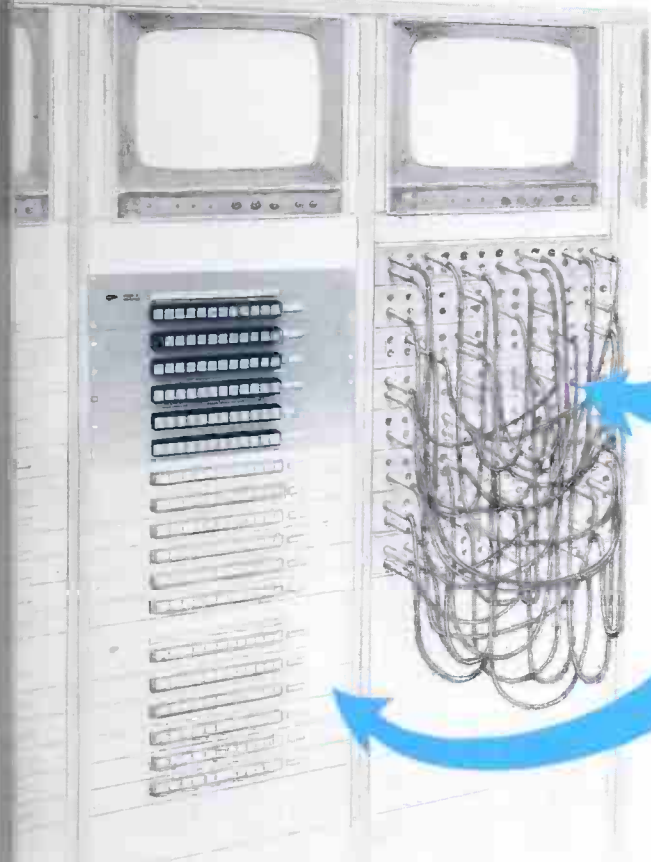


Tektronix, Inc., Box 500, Beaverton, OR 97077

Circle 100 on Reader Service Card;
For demonstration, Circle 101

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EXPANDABLE AUDIO/VIDEO SWITCHER ELIMINATES PATCH CABLES



DYNAIR'S SERIES-X SWITCHERS ARE TOTALLY MODULAR WITH FIELD EXPANSION CAPABILITY

That's right. Now you can replace your video/audio patch panel with a routing switcher made up of off-the-shelf modules. You get the versatility of a custom system with the price and reliability of volume-produced electronics. It makes your signal routing easier and your system looks better too.

Messy, tangled patch cables are a thing of the past. The confusion of patching is being replaced with the simplicity and professionalism of pushbutton selection... a more reliable, more compact and — in many cases — less expensive approach.

You receive a lot of other extras when you go the Series-X route. Like illuminating pushbuttons, which give you an instantaneous indication of signal routing. And... each pushbutton can be easily labeled in the field to indicate the signal it controls.

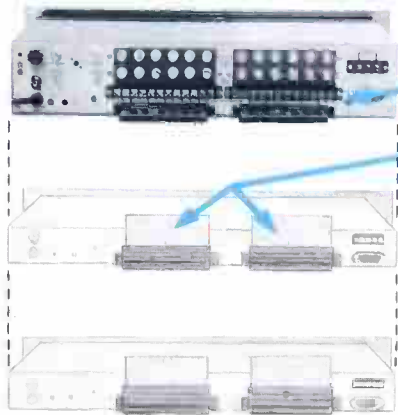
Expansion is easy too... you simply add input or output expansion modules as required. Up to 36 inputs and 120 outputs without adding external DA's. Inputs are added in increments of six or twelve, and outputs are added in increments of one.

Unlike many other switchers of this type, the Series-X is a broadcast quality unit. Worst case crosstalk isolation: 50 dB at 3.58 MHz. Frequency response: 12 MHz, ±0.5 dB. Differential gain: less than 0.5%. Differential phase: less than 0.5°. State-of-the-art integrated circuit design.



Plug-in modular construction simplifies servicing and allows various options to be added in field. Liberal use of integrated circuitry.

Precisely regulated power supply designed for continuous-duty applications.



Master 12 x 1 switcher supplies power for up to eleven output expansion units. Unique 3-way connector for signal and power bridging.

Etched circuit interconnect.

Output expansion units provide one additional output each. Receive power and signals automatically when plugged into switcher. Switchers of almost any input-output configuration can be easily assembled from off-the-shelf modules; inputs or outputs can be added in the field.

The new Series-X provides exceptional performance prices which are, in most cases, much less than competitive versions. For reference, a 12-input, 12-output audio-follow-video Series-X occupies only 22% of standard rack space and costs only \$4495. Wouldn't a Series-X switcher solve some of your distribution problems?

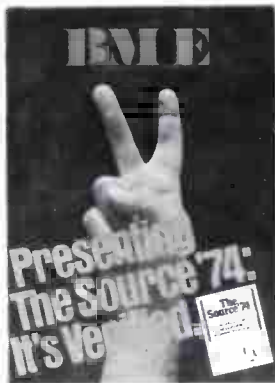
DYNAIR ELECTRONICS, INC.
6360 FEDERAL BLVD, SAN DIEGO, CALIF. 92114
TELEPHONE: 714-582-9211



Circle 102 on Reader Service Card

BM/E

BROADCAST MANAGEMENT/ENGINEERING



The "V" salute on this month's cover is to the verified listings in the 1974 Source directory—an industry first. Companies in the manufacturer's section are bonafide producers of the equipment listed.

**BROADBAND
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SEPTEMBER 1974/VOLUME 10/NUMBER 9

- 8 Broadcast Industry News**
Remote control computer by IBM runs transmitter
- 20 Interpreting the FCC Rules & Regulations**
Election '74 permissible charges for political use of broadcast and cablecast facilities
- 24 The Great Idea Contest**
Ideas resume this month—10 more
- 40 How an Architect Takes the Trouble Out of Station Building**
- 38 It's The Year of Automation**
- 39 Packaged Program Sources**
- 48 Stereo Tape Phase Alignment**

The Source 1974

- 55 Instant Source Locator**
 - 60 Broadcast Equipment Manufacturers**
Including manufacturer's of Cable TV equipment
 - 85 Independent Broadcast Reps/Distributors**
-
- 101 Broadcast Equipment**
New and significant products for broadcasters
 - 107 New Literature**
Useful reading materials

**CM/E: A supplement for those with cable interests
following page 100**



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APC-2000 AUTOMATION SYSTEMS

Grass Valley Group television automation systems employ a building-block concept. This approach enables a broadcaster to begin automated operation on a modest scale and expand the system as requirements change.

The basic system provides on-air switching, storage for 16 events, automatic logging, and complete control of telecine and VTR machines. Larger systems accommodate up to 2,000 or more events. A wide variety of both hardware and software options is available to meet individual needs.

APC-2000 systems can also be interfaced with other computer systems. By combining these systems, a user can achieve a completely automated facility which encompasses on-air, traffic, sales, and billing/accounting operations as well as management information services. Consult GVG for further information.



THE GRASS VALLEY GROUP, INC. 
A TEKTRONIX COMPANY

Station Plaza East
GREAT NECK, NY 11021
(516) 487-1311

4419 Van Nuys Blvd, Ste 307
SHERMAN OAKS, CA 91403
(213) 990-6172

1644 Tullie Cir, NE
ATLANTA, GA 30329
(404) 634-0521

P.O. Box 482
MABANK, TX 75147
(214) 887-1181

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IL 60005
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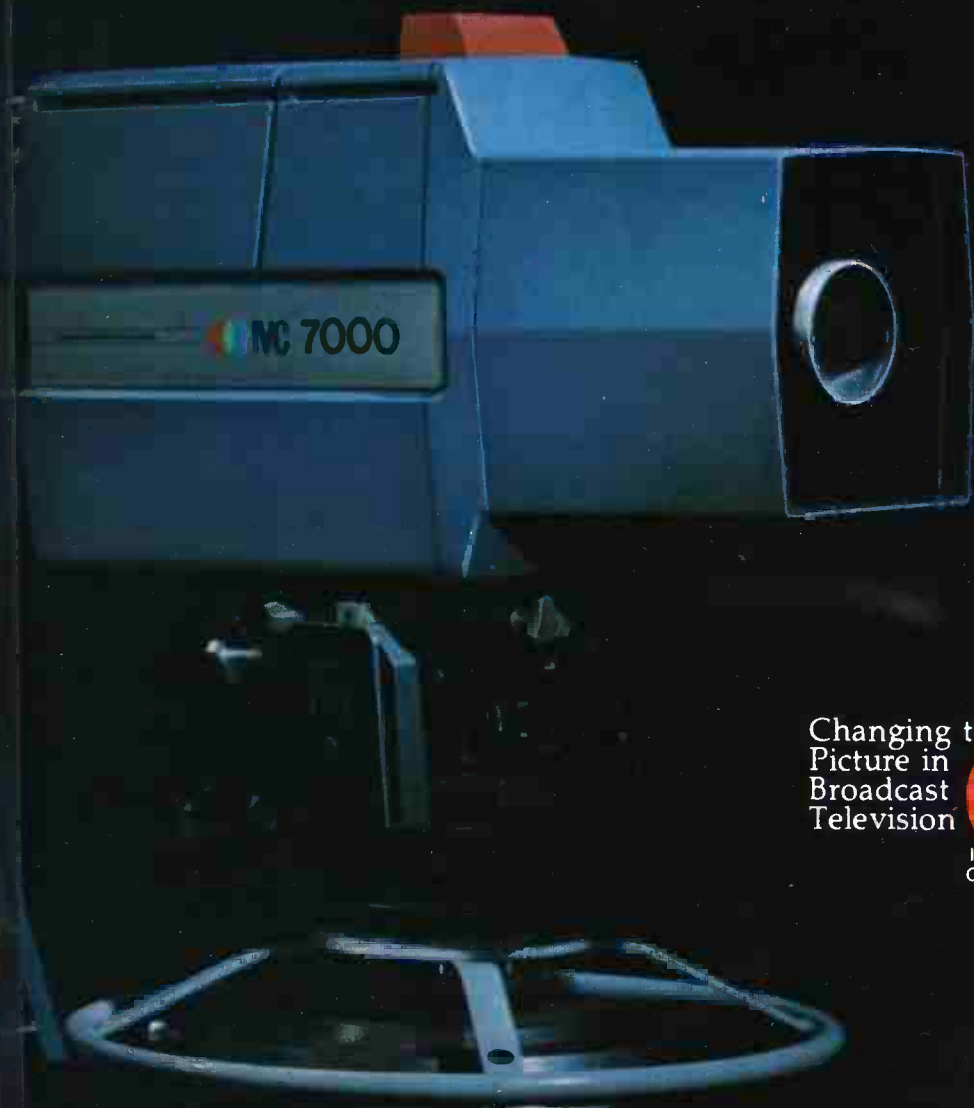


INTRODUCING THE NEW ECONOMICS OF BROADCAST TELEVISION... AND A PRODUCT LINE THAT BREAKS WITH TRADITION

Here are two important new broadcast television products that make sense for today and the years ahead. They are the result of fresh creative thinking and the belief that today's broadcast environment demands a substantial reduction in equipment operating costs, lower initial purchase price—*plus* performance that exceeds the best the industry has known. The IVC-9000

Broadcast Videotape Recorder accomplishes these goals by challenging and surpassing existing quad concepts. The IVC-7000 Camera offers performance that equals or exceeds that of the best cameras now in use yet at a mid-range camera price.

That's what we mean by "the new economics." Let us help you break with tradition.



Changing the
Picture in
Broadcast
Television



International Video Corporation
Circle 103 on Reader Service Card

BROADCAST INDUSTRY NEWS

"More Profits" Theme For NAFMB Broadcaster Meet

The 14th annual meeting of the National Association of FM Broadcasters, the first to which all broadcasters, FM and AM, have been invited, now appears certain to exceed all earlier NAFMB meetings in size and interest.

Set for October 10th thru 13th at the Fairmont Hotel in New Orleans, the "Conference and Exposition" is also the first to include an exhibit of broadcast equipment.

Upwards of 1000 registrants are expected, and more than 50 equipment makers had signed up for exhibit space early in August.

NAFMB has chosen the theme, "Make Your Station More Profitable," and some of the planned session topics in this area are: "Sales

Promotion on a Budget"; "Motivating Salesmen"; "Management Profit-Building Techniques," and many more.

The sessions will also cover the latest engineering developments; use of syndication and automation; news gathering and programming; license renewal; and other major aspects of station operation. John Richer, president of NAFMB, said that the sessions "... will be the traditional NAFMB shirtsleeve workshops ... the broadcasters attending will go home better equipped to make their stations more profitable and their wives will enjoy the famous New Orleans shopping and night life too."

A Dozen Communities Get Their First FM Channels

The Federal Communications Com-

mission has amended the FM Table of Assignments to give channels to a dozen communities that previously had no FM channels. Each of the new assignments, says the FCC, is free of any damaging effect on existing channels and is consistent with the mileage separation rules. Only two or three of the assignments stirred up any objections from present licensees when proposed, and the FCC found the objections to be invalid in each case.

The new channels are going to: Glennville, Ga.; Pinceyville, Ill.; Boyne City, Mich.; Johnstown, Ohio; Huntington, Tenn.; Graham, Texas; Kilmarnock, Va.; St. Helena, Calif.; Lehigh Acres, Fla.; Rockwell City, Iowa; Millinocket, Me.; and Aguada, P.R.

CTIC Asks For Closer Control of Cable Transfers

Four staff members of the Cable Television Information Center have filed with the FCC recommendations that transfers of cable franchises be prohibited when constructions has not begun, and that close control of all transfers be exercised by the local franchise body. W. Bowman Cutter, the executive director, and members E. A. Deagle, Jr., V. A. Figures, and J. C. McGuire told the FCC that the selling of franchises subverts the whole franchise selection process, enabling losers in the contest, rejected by the community, to get the franchise by an "end run." They called for careful definition of transfer of control, to eliminate the disguise of transfers by keeping a name unchanged.

NAB Approves Cuts in Ads for Kid Programs

Recommendations by the NAB TV Code Review Board for additional cuts in advertising time on children's programs were approved by the National Association of Broadcasters Board of Directors at a July meeting, by an 8 to 4 vote. The new Code regulations reduce "non-program" time on Saturday and Sunday by

continued on page 1

Computer Remote Control Runs TV Transmitter

Said to be the first remote control of a TV transmitter by computer, a system recently put on line at WLOX-TV, Biloxi, Mississippi, bridges a studio-transmitter gap of about 25 miles. The computer is by IBM; the link to the transmitter uses both microwave and telephone company lines. The latter, originally intended to be the back-up, are now used by the station management as the primary link with the microwave system as backup.

Every 15 seconds the computer reads 14 parameters at the transmitter, gives warning if any are outside the assigned tolerances. Every 30 minutes a summary reading goes into the computer memory, and is available for hard-copy printout. The FCC gave special approval for the use of the system.



Hard copy printout is examined (above) by WLOX-TV chief engineer, T. B. Majure, left, and his assistant, James S. Fleming.

So simple. So reliable. So effective. So successful. Sony.

The simplicity, reliability, and effectiveness of the Sony U-matic Videocassette System are what have made it so successful.

So successful, in fact, that an independent survey* shows that 3 out of every 4 purchasers of video recording/playback equipment in 1974 will buy the U format Videocassette System.

So successful in use that the U. S. Army has publicly stated that their 3/4" U-matic equipment is "99.9% reliable."

And the 3/4" U format is Sony's format. Originated and engineered by Sony. Perfected by Sony. And proven effective to thousands of users in Business and Industry: from the Fortune 500 to smaller regional companies. In Education: from Universities to Public School Systems. In Medicine, in Cable TV, Government.

Wherever people must interchange information.

It's the new concept in communication. With all the impact that you know television has. Simple to use, ideal for training, teaching, product demonstrations, messages from management.

Here are some special features of the Sony 3/4" U-matic format:

Delivers a picture that's superior in resolution, color fidelity, and stability.

2-track sound for bilingual or technical and non-technical presentations.

Playing time of up to 60 minutes, twice that of some other systems.

Push-button controls. Pause, automatic rewind and shut-off.

A book-sized cassette that can be mailed inexpensively anywhere in the U.S. or the world.

And everything the Sony name stands for in quality, reliability, and nationwide service.

It's Sony's easy and effective way for you to move into a new world of communications. Find out how easy. Write today.

Sony. The proven one!



Sony Corporation of America
Video Products Dept. BME-094
9 West 57th Street, N. Y., N. Y. 10019

SN-182

- Send me more information about the Sony Videocassette System.
 Have a representative contact me for a demonstration.

NAME _____

TITLE _____

ORGANIZATION _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

PHONE (AREA CODE) _____

TYPE OF BUSINESS _____

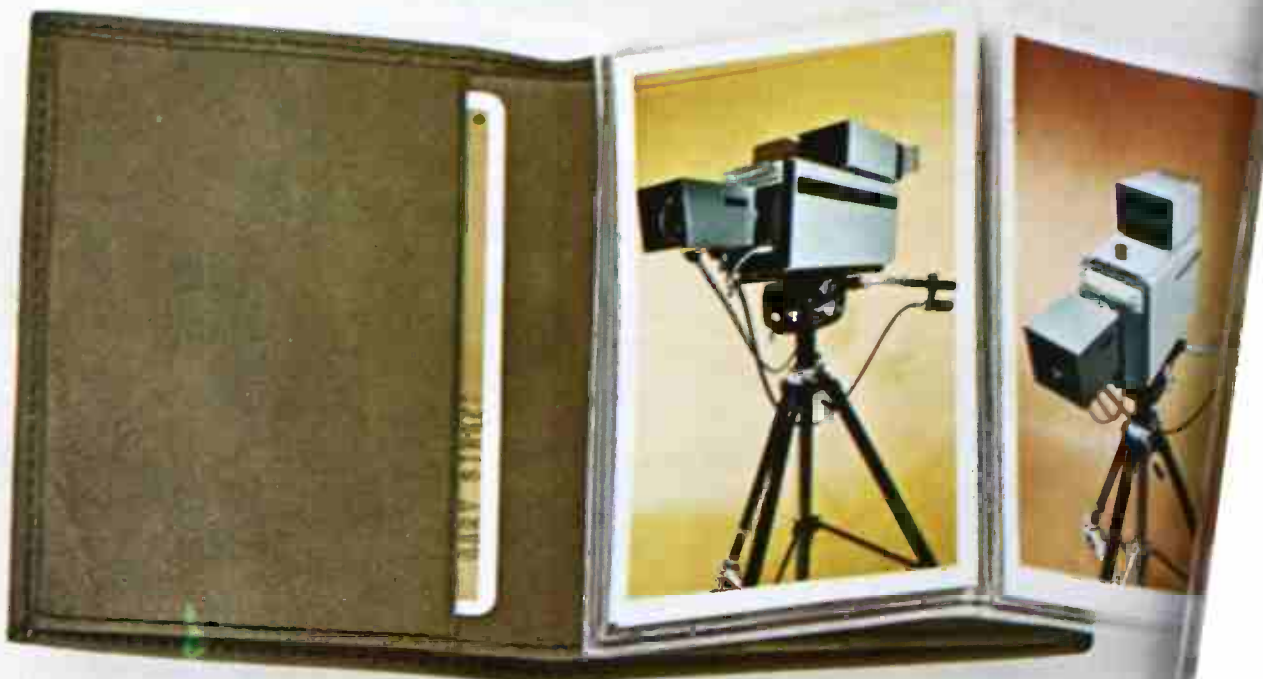
Sony U-matic Color Videocassette System

* Educational & Industrial Television, February 1974
All TV reception simulated

Circle 222 on Reader Service Card for a demonstration
Circle 223 on Reader Service Card for literature



showing of



We're proud to show off our family of professional color video products. Each is an excellent example of the latest video state-of-the-art. And each offers superb picture quality and fine craftsmanship. Look over our family. See why Hitachi-Shibaden — with 25 years of professional broadcast experience — is called "The Image Makers".



HITACHI SHIBADEN
Corporation of America

Exec. Off: 58-25 Brooklyn-Queens Exp'y,
Woodside, N.Y. 11377 Phone 212-898-1261
Offices in Chicago, Los Angeles, Dallas, Toronto

FP1212

Professional three tube 1" Plumbicon* color camera. High quality, advanced technology. Bias light for low-light conditions, FET pre-amplifiers offering a 46dB S/N ratio (luminance channel), I&Q broadcast encoder with color bar generator, and many more features found in much higher priced cameras. Camera head with 3 industrial grade Plumbicons (extended red optional) 5" viewfinder, 10:1 zoom lens, CCU and 50' cable. **\$18,655.**

FPC1000B

Superb quality camera using 2/3" Vidicons PC boards and solid-state c (except Vid Camera head 5" viewfinder zoom lens and 50' ca (Chalnic optional)

*TM N.V. Philips

the family



1100S2
 Superior color at moderate cost. Light weight (under 7 lbs.). Three 2/3" halnicons (no burn, reduced lag tubes). Excellent for remote operation and microscope application. "C" mount camera head, CCU and 45' cable. **\$12,333.**

HSPC
 Color Teleproduction System. Self contained portable color studio for business, industry and medicine. Consists of two single-tube color cameras with viewfinder, headset, and 5:1 zoom lens on tripod/dolly. Consoles incorporate preview monitors, color bar generators, audio mixers, special effects amplifier, sync generator and head set. **\$15,280.**

HV1100
 Three 2/3" Vidicon non-viewfinder color camera. Low silhouette. Registration and set-up functions remotely operated from CCU. Accepts all "C" mount lenses. Camera head, CCU, 45' cable. **\$9,450.**

CM181
 Professional 17" R.G.B. color monitor. Outstanding features. **\$1,690.**

SV530
 1/2" EIAJ color video cartridge recorder/player. Trouble-free features in superbly crafted cabinet. Auto-threading and keyboard operation. **\$1,285.**

CA520M
 High-quality 15" color receiver/monitor. Excellent complement for Hitachi-Shibaden VTRs. All Solid-State (except picture tube). **\$650.**

FP1214X
 Broadcast quality sports camera. All features of FP1212 but modified to accept the ultra-fast Fujinon F/1.8, 14:1 29.5mm-415mm focal length zoom lens with electron-beam coated optics. Produces full NTSC color down to 10 foot candles. Includes FP1212 features, 1 1/2 X range extender, extended red tube, CCU and 50' cable. **\$32,700.**

All prices subject to change without notice.

EECO's new low priced modules provide fast electronic indexing/editing of video and audio tapes...

A pair of these versatile, solid-state instruments offer you the advantages of efficient, accurate electronic indexing and editing — at a cost that's tailored to tight budgets! They're compact (about the size of a large card file box) and easy to use. They can be placed on a table, bench or rack-mounted side-by-side. Whatever your video tape editing needs — commercial, closed-circuit, cable or educational TV — it'll pay you to check into the economies afforded by EECO's new "Mini-Modules"!

BE 520 EDIT CODE GENERATOR is used to record real or elapsed time on video or audio tape in standard SMPTE edit code format. Although the code is normally recorded while scenes are actually being shot, it can also be added to pre-recorded tapes. Simple to operate, yet versatile, this low-cost instrument provides accurate scene indexing for rapid retrieval.



BE 420 EDIT CODE READER detects the SMPTE edit code from any source (video/audio tape or BE 520 Edit Code Generator) and displays it as real or elapsed time in hours, minutes, seconds and frames. Scenes on quadruplex or helical tapes can be quickly located. Program sequence logs can be quickly developed to drastically reduce subsequent editing time and cost. Supplemental outputs are provided for double system synchronization.



BE 400 VIDEO CHARACTER GENERATOR converts any number of monitors into time-code displays. It's flexible and easy to use. For example, it can display time and frame on studio monitors without affecting video signals being broadcast or being transferred to another tape ... or ... it can add a visual time display to live or taped scenes being broadcast or duplicated.



... and they're made by the same company that supplies complete electronic editing systems for use with RCA and AMPEX Video Recorders.

E E C O

1441 East Chestnut Avenue • Santa Ana, California 92701
Phone (714) 835-6000 • TWX 910-595-1550 • Telex 67-8420

SEND FOR
COMPLETE INFORMATION

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NEWS

about 16% by December 31, 1974 and by 25% by December 31, 1975. This is in addition to the 25% reduction in effect January 1, 1973.

Also voted were the first time standards for Monday through Friday children's programs—a reduction of 25% in the present 16 minutes per hour of nonprogram time.

FCC Starts Inquiry Into Cable Carriage of Yankees

The FCC has instituted an inquiry into the carriage by Home Box Office, New York pay-cable operator of certain New York Yankee baseball games. Chairman R. E. Wiley responding to a letter of complaint on the subject from the NAB Committee on Pay Television, said that the staff had been instructed to investigate the matter thoroughly, including getting from Home Box Office a statement as to why the Yankee coverage was not in violation of the anti-siphoning rules.

NCTA Hires Consultants To Aid in Pay Cable Fight

Meanwhile, on the other side of the pay-cable battle line, the National Cable Television Association announced the hiring of the firm of Michael W. Moynihan, Public Affairs Consultants, to help in developing pro-pay-cable programs. The NCTA effort will be directed to "inform the public, elected officials, and other about the important public policy considerations in the pay cable issue."

Gibson Forms Cable Service Company

C. Rod Gibson, with more than 20 years experience in sales and management in broadcasting and cable announced the establishment of Gibson Cable Services, New York City and Stamford, Conn. The new company, Mr. Gibson said, will offer industry-wide cable personnel recruitment, franchise acquisition assistance, and training of CATV time salesmen in securing national advertising.

Dept. Of Commerce To Run Mexico Broadcast Exhibit

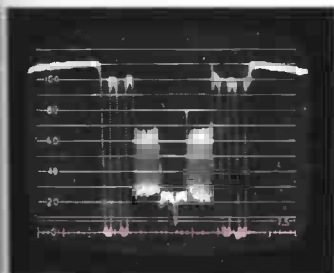
An exhibit of audio, video and broadcast equipment will run October 1 to 4th, 1974 at the U.S. Trad Center in Mexico City, sponsored by the U.S. Department of Commerce. The Department recently announced

continued on page 1

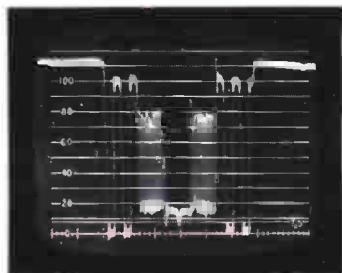
Amperex announces a new high resolution Plumbicon* tube that increases the modulation depth in your Green Channel by 50%†

In the ten years since we introduced the Plumbicon TV camera tube, we have worked continuously to "improve the breed." The first improvement was the development of the separate-mesh Plumbicon . . . then, the XQ1025R, an extended red response version that doubled red-channel sensitivity with color response paralleling that of the human eye.

Now we've made still another advance in Plumbicon technology: a green channel version of the XQ1025. With the new XQ1025G, you can expect an improvement in green channel performance that will be instantly apparent to your viewers . . . and to your advertisers.



Our standard XQ1020G offers 40% modulation depth in the green channel.



Modulation depth under same test conditions is 60% with the new XQ1025G, an improvement of 50%.

As the photographs show, the XQ1025G provides a 50% increase in green channel modulation depth as compared to the XQ1020G you're now using. This increase in modulation depth makes possible a significant improvement in resolution and also greatly reduces the need for electronic signal enhancement in the green channel. The resulting improvement in overall system signal-to-noise ratio now allows the camera to be operated at lower light levels.

The new XQ1025G is physically and electrically interchangeable with the standard XQ1020G. Since it is based on the same design and construction principles as the earlier Plumbicon tubes, it offers the equivalent reliability and long life as the standard versions.

We have prepared a short report on the characteristics of the new tube and on what it means insofar as improvements you can expect from it for your camera. For your free copy, contact: Amperex Electronic Corporation, Electro-Optical Devices Division, Waterville, Rhode Island 02876. Telephone: 401-762-3800.

Registered trademark N.V. Philips of the Netherlands.

† Typical measurement: 50%; Range: 40% to 70%



Amperex[®]

TOMORROW'S THINKING IN TODAY'S PRODUCTS

Sold through
North American Philips Electronic Component Corporation

Circle 107 on Reader Service Card

www.americanradiohistory.com

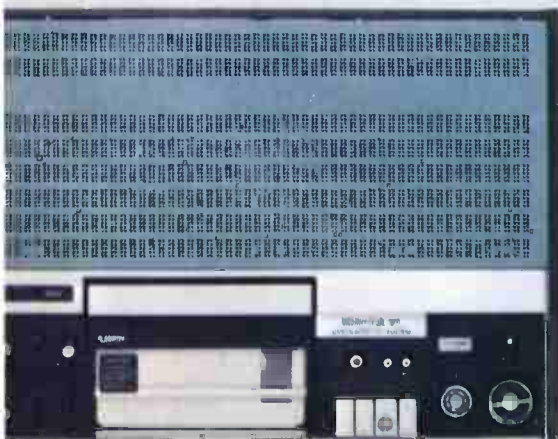


**If you didn't wait for our color videotape system...
we'll provide a portable color camera to improve yours!**

AKAI's fantastic 5.76-pound lightweight has all the ambitions of a professional heavyweight! Two vidicon tubes for ultra sensitivity—servo controlled iris—built-in microphone—wide angle to telephoto 6X zoom lens—300 line resolution—three-adjustment sensitivity selector—white balance switch for perfect color—electronic viewfinder/instant replay monitor—plus complete compatibility with any VTR system you might have on hand. There's still more. A slight modification, and you have RS-170 and external drive. Another allows you to use a 12-volt battery. All the versatility to improve any VTR system, AC or DC. We modestly think our CCS-150S is the best portable color camera in the world. That's why we use it in our own system. If you want to be convinced, see your local AKAI video dealer; or write AKAI America Ltd., 2139 East Del Amo Boulevard, Compton, California 90220. Telephone (213) 537-3880. Video Department.

Circle 108 on Reader Service Card

From
AKAITM
The Innovators





If you waited for a portable color videotape dream machine...

Here it is! The incredible AKAI VTS-150 color videotape system — only 22 pounds light, yet featuring automatic editing that smacks of magic! Start with our 5.76 pound camera with built-in everything — servo controlled iris, automatic/manual aperture, built-in microphone, wide angle to telephoto 6X zoom lens (F2 to closed), 300 line resolution, white balance switch, electronic viewfinder/playback monitor, and two vidicon tubes for ultra sensitivity. Add our truly portable, battery powered videotape recorder/playback with automatic editing, stop motion, and sound dubbing. Throw in a reel of inexpensive 1/4" full-color tape and you're ready to roll. Ordinary playback on TV monitor or regular color TV set — with a time base corrector, commercial telecasts from field to air with incredible speed, and no processing along the way. Put it all together, and you have a color videotape system that lets you tell it like it is, *whoever* you may be. News, sports, medicine, communications. Now that you know, don't keep it under your hat. Find your nearest AKAI video dealer, or write AKAI America, Ltd., 2139 East Del Amo Boulevard, Compton, California 90220. Phone (213) 537-3880. Video Department.

Circle 117 on Reader Service Card

From
AKAITM
 The Innovators

NEWS

Exhibitors, will get substantial aid from the Department of Commerce in reaching their objectives in Mexico. This will include full information on markets there, identification of or introduction to relevant Mexican businessmen, journalists, and public officials, advice on promotion and sales. For entry data, manufacturers should write the Office of International Marketing, Dept. of Commerce, Washington, D.C. 20230.

CCTA Praises Quello Appointment to FCC

The appointment of James Quello to be a Commissioner of the FCC, recently completed by Senate confirmation and Mr. Quello's swearing in, got a strong endorsement from the California Community Television Association. The CCTA resolution, the first word from the cable industry on the hotly contested Quello appointment, noted Mr. Quello's "distinguished record of over

twenty-five years of public and community service." The CCTA announcement also pointed to Mr. Quello's selection of Alan Corden, former assistant chief of the FCC cable bureau, as evidence that Mr. Quello intended to be fair to the cable industry.

Ad Misleading, Says NARB; Advertiser Will Not Use

Industry self-regulation of advertising to eliminate misleading statements was exemplified by a recent action of the National Advertising Review Board, which judged an ad of the Carte Blanche Corp. to be out of line. The ad in question said, in effect, that "lots" of businesses no signed up with American Express would, on the other hand, honor the Carte Blanche card. Investigation said the NARB, showed that the implication of "lots," meaning "many" or at least a substantial faction, was not correct. Carte Blanche has accepted the decision, saying that the ad, in fact, has not been used for a year and will not be revived.

CTAC Has Collected \$100K; Will Ask More

The Cable Television Technical Advisory Committee, preparing detailed recommendations to the FCC through the work of 150 industry professionals on nine panels, announced the collection of about \$100 thousand in contributions, which will carry the work through 1974. However, since the work must continue until sometime in 1975, additional letters of solicitation are being issued; anyone wanting to contribute can reach CTAC at 1629 K St. N.W. Washington, D.C.

TPT Consents to SEC Ruling, Denies Any Illegality

Teleprompter Corp. has announced consent to the issuance of an injunction, forbidding certain practices, in a case brought the same day against the company by the Securities and Exchange Commission. TPT, however, strongly denies that it has violated the law in any respect, but says it agreed to the injunction solely to save the time, and money that fighting the case would cost. As to two of the principal SEC demands, the disclosure of construction-related expenses that were capitalized, and the use of internal budget forecasts and other financial procedures. TPT says that these had already been instituted by the new management that took over in September, 1973.

continued on page

Let's talk it over— broadcaster to broadcaster.



WRA Series
Recording Amplifier



3D Series Reproducer

You want to know something about tape cartridge equipment . . . such as our 3D Series multi-reproducer and the WRA Series recording amplifier. Sure . . . you want to talk to an engineer who knows his equipment. But you also want to talk to someone who understands **your** problems as a broadcaster. We combine both. Our men are former broadcasters and engineers. You'll get straight answers as to which of our equipment will solve your problems best. We think you'll be pleasantly surprised at how much we can help. That's why we have a standing offer to any broadcaster with a question to call us **collect**. And after you buy, we're always as close as your phone. So, let's talk it over — broadcaster to broadcaster . . . today.

CALL 309-828-1381 COLLECT



INTERNATIONAL TAPETRONICS CORPORATION

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NEWS

News Service in Sound To Begin in Fall

The Associated Press, oldest of the extant wire news services, has announced a news service in sound, to start October 1st, and to be available by leased wire to broadcast stations around the country. Called "AP Radio," the service will feature an hourly newscast, plus on-the-spot reports from AP correspondents around the country and the world. In addition, said AP, the service will include a number of specialized programs, such as interviews with those making news, Presidential news conferences, sports, business, and agricultural news. No advertising will be sold by AP; all programs will be available for local sponsorship. About 150 stations had already signed up by mid-July, according to AP.

Video Meet Is Success In Sweden

A conference on video programming and techniques, organized in June in Stockholm by Esselte Bonnier Audio Visual, Swedish company, attracted more than 500 registrants and presented the King of Sweden to hand out the prizes for winners of a video cassette program contest. A full schedule of panels, workshops and technical papers included talks by Marshall McLuhan, Jim Damon of IBM, and a number of European experts in video technology and programming. The success has led the sponsors to plan a "Video 75"; we can agree with their boast "The video industry is gathering momentum in Scandinavia."

Balloon-Borne Stations To Go To Iran

Two balloon-borne wide-area broadcast systems will be built for National Iranian Radio and Television by TCOM Corporation, a subsidiary of Westinghouse Electric Corporation, at a cost of about \$10 million. The systems will provide two channels of television and two FM radio stations to cover southwestern and southeastern Iran. The equipment is suspended from a tethered, aerodynamically-stable balloon at from 10,000 to 15,000 feet. According to TCOM, who developed the concept, it supplies a way of covering remote areas at low cost. A single balloon-borne transmitter can substitute for

continued on page 34

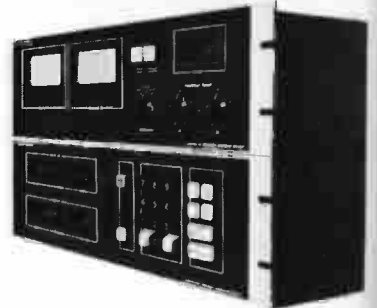
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Program up to 2,000 events and control 12 audio sources with full random access. Expand, as you expand, to 8,000 events and 92 sources. Will interface with all audio sources having full function remotable capability. And the CD28 is virtually mistake proof . . . easily programmed and operated by even the most inexperienced personnel.

CD25G 25Hz Tone Generator



For production studio use to insert the standard 25Hz automation actuating tone. Simple operation.

- Start button starts tape transport in motion and actuates audio muting circuit to eliminate bias pops and other tape transport start noises.
 - Tone button applies 25Hz tone and automatically stops the transport at end of tone.
- This all solid-state unit has been designed to work from all audio sources providing up to +8dBm line level.

CD25S 25Hz Tone Sensor

Provides control functions for sensing the presence of pre-recorded 25Hz tones on audio material. Features a unique built-in fixed tone alarm with 8 second tone activation allowing flexibility in source switching, automatic re-wind of tape and other features including end-of-tape function.

CD60T Time Announce Control Unit

Designed to add versatility to your automation system. Allows the use of 2 single play cart machines, 2 reel-to-reel transports or a combination of cart and reel-to-reel transport for time announcements. Features a built-in power failure interlock . . . will not air a time announcement following a power failure until corrected and reset. Internal IC integrated clock included.

For more information, contact your control design corporation rep or the factory.

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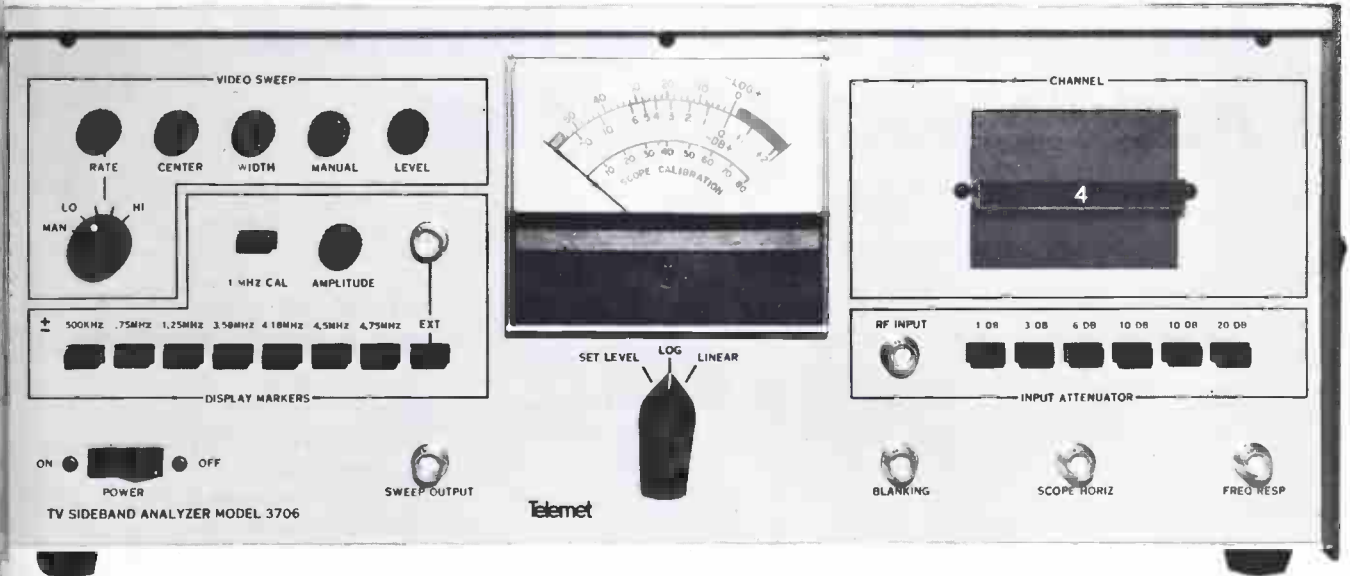
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Model 3705 Group Delay Measurement Set

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- Test Signal Generated with or without Sync and Blanking
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INTERPRETING THE **FCC** RULES & REGULATIONS

Election '74 Permissible Charges For Political Use Of Broadcast And Cablecast Facilities

By Frederick W. Ford and Lee G. Lovett

Pittman, Lovett, Ford and Hennessey, Washington, D.C.

One of the more complex and confusing areas of communications law is the area of rate charges for political use of broadcast and cablecast facilities. The Campaign Communications Reform Act of 1971 imposed a series of rules upon broadcasters and cablecasters that are of particular significance as we approach the important state and federal elections to be held November 5th. This month's article elucidates upon the "charges for political use" rules, what rates may be charged political candidates for air time, and the recent Commission Public Notice addressing the Federal Election Communications Act of 1971 (FECA of 1971).

The Rule

Section 315 of the Communications Act of 1934, as amended, provides:

"The charges made for the use of any broadcasting station by any person who is a legally qualified candidate for any public office in connection with his campaign for nomination for election, or election, to such office shall not exceed¹—(1) during the forty-five days preceding the date of a primary or primary runoff election and during the sixty days preceding the date of a general or special election in which such person is a candidate, the *lowest unit charge* of the station for the *same class and amount of time for the same period*; and (2) at any other time, the charges made for *comparable use* of such station by other users thereof." [Emphases supplied.]

Thus, political use charges fall into two, apparently neat, categories: (1) the lowest unit charge when the primary or general election is imminent (i.e., less than or exactly sixty or forty-five days off respectively) or (2) the comparable use charge when the primary election is more than forty-five days off, and when the general or special election is more than sixty days off. The Rule applies *only* to individual political office candidates; groups, organizations, and the like, *cannot* claim lowest unit charge or comparable use charge rates. Furthermore, while the comparable use provision of Section 315 applies to all legally qualified candidates, the lowest unit charge provisions of Section 315 apply to all legally qualified candidates *except* "candidates for nomination by a convention or a caucus of a political party." *Example*: A candidate seek-

¹ Note that the station or cable system is free to charge *less* than the lowest unit charge; if it does so, all other candidates must be charged the same amount.

ing to have a state convention nominate him for U.S. Senator would *not* be entitled to the lowest unit charge.

Lowest Unit Charge Parameters

The lowest unit charge of the station must be "for the same class (i.e., rate categories such as fixed-position spots, etc.) and same amount of time (i.e., thirty seconds, sixty seconds, etc.) for the same period" (i.e. prime time, drive time, Class A, Class B, etc.).

The lowest unit charge must be applied when a candidate makes use of broadcast or cablecast facilities (i.e., when a candidate "personally participate through use of his voice or image, live or taped, or through film or picture") which entitles an opposing candidate to "equal opportunity" use of said facilities. Lowest unit charge applies *only* to purchase of time (and *not* to additional charges made by a station for other "production oriented" charges such as studio use, audio- or video-taping or remote technical crew charges, etc.).

Discounts (volume or other) and rebates must be applied when calculating lowest unit charges. *Example*: A senatorial candidate purchases 100 fixed-position, one-minute spots for \$1,000 forty days before the general election. The broadcast station ordinarily sells one such spot for \$15. It must sell one such spot to an opposing candidate for not more than \$10.

The lowest unit charge must also adjust for advertising agency commissions. *Example*: Candidate A purchases a one-minute spot announcement *through an agency* for \$100 (\$15 of which is agency commission) thirty days before the general election. Opposing Candidate B wishes to purchase a similar one-minute spot *directly from the station*. The lowest unit charge would be \$85.

The lowest unit charge may vary with the day of the week on which a candidate uses the station. At the same time, if a station does *not* vary its charges to commercial advertisers on different days of the week, it may not vary its charges to candidates for public office on different days of the week. *Example*: Station A charges advertisers \$50 per one-minute spot announcement between 8 and 8:30 PM on Saturday and \$65 for an identical announcement at the same

continued on page

\$2800 Vinten Pneumatic Television Studio Pedestal

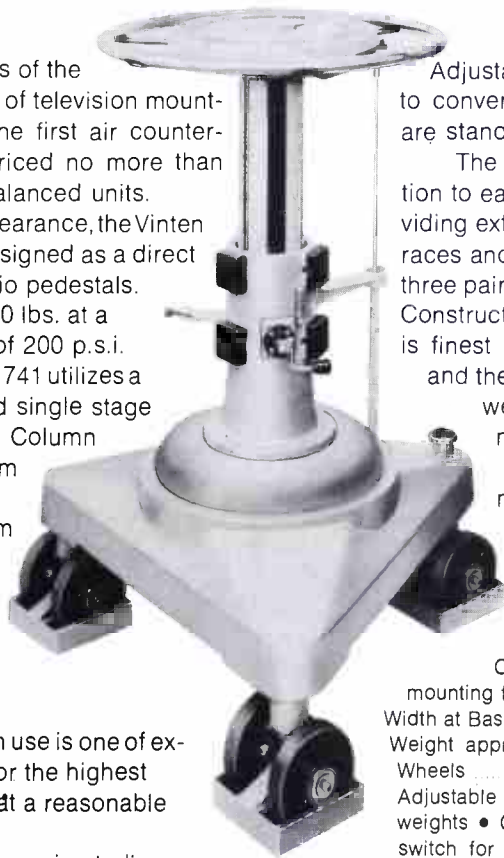
W. Vinten, manufacturers of the world's most complete range of television mounting equipment, introduces the first air counter-balanced pedestal that is priced no more than conventional lead counter-balanced units.

Rugged, yet stylish in appearance, the Vinten 741 pneumatic pedestal is designed as a direct replacement for original studio pedestals.

Total load capacity is 250 lbs. at a maximum working pressure of 200 p.s.i. Unlike previous pedestals, the 741 utilizes a single, low pressure tank and single stage column for minimum friction. Column range is 21" measured to cam head mounting face and the unit is designed to take any cam head currently available. The combined lifting and steering wheel allows precise dollying on-the-air while at the same time operating typical zoom lens controls.

The feel of the pedestal in use is one of extreme smoothness, suitable for the highest quality studio production, all at a reasonable cost.

To compensate for changes in studio temperature, a complement of trim weights is provided to ensure perfect balance at all times.



Adjustable cable guards and foot switch to convert from crab to tricycle steering are standard.

The pedestal features Vinten's attention to ease of service during use by providing external adjustment of column ball-races and tensioning of chain drive to the three pairs of 7" rubber or duthane wheels. Construction throughout (except air tank) is finest quality aluminum alloy castings and the weight of the pedestal, less trim weights, is 250 lbs. Maximum and minimum width of the base are 36" and 29½" respectively and maximum and minimum elevation to the cam head mounting face is 32" to 53".

Specifications

Total Load Capacity	250 lbs.
Column Range (To head mounting face)	Min. 32"/Max. 53"
Width at Base	Max. 36"/Min. 29½"
Weight approximately	250 lbs.
Wheels	3 pairs 7" Dia. (Rubber or Duthane)
Adjustable cable guards	• Complement of trim weights
Combined lifting/Steering ring	• Foot switch for crab to tricycle steer changeover
Maximum working counterbalance pressure	200 p.s.i.

Price* \$2800 F.O.B. Plainview, N.Y.



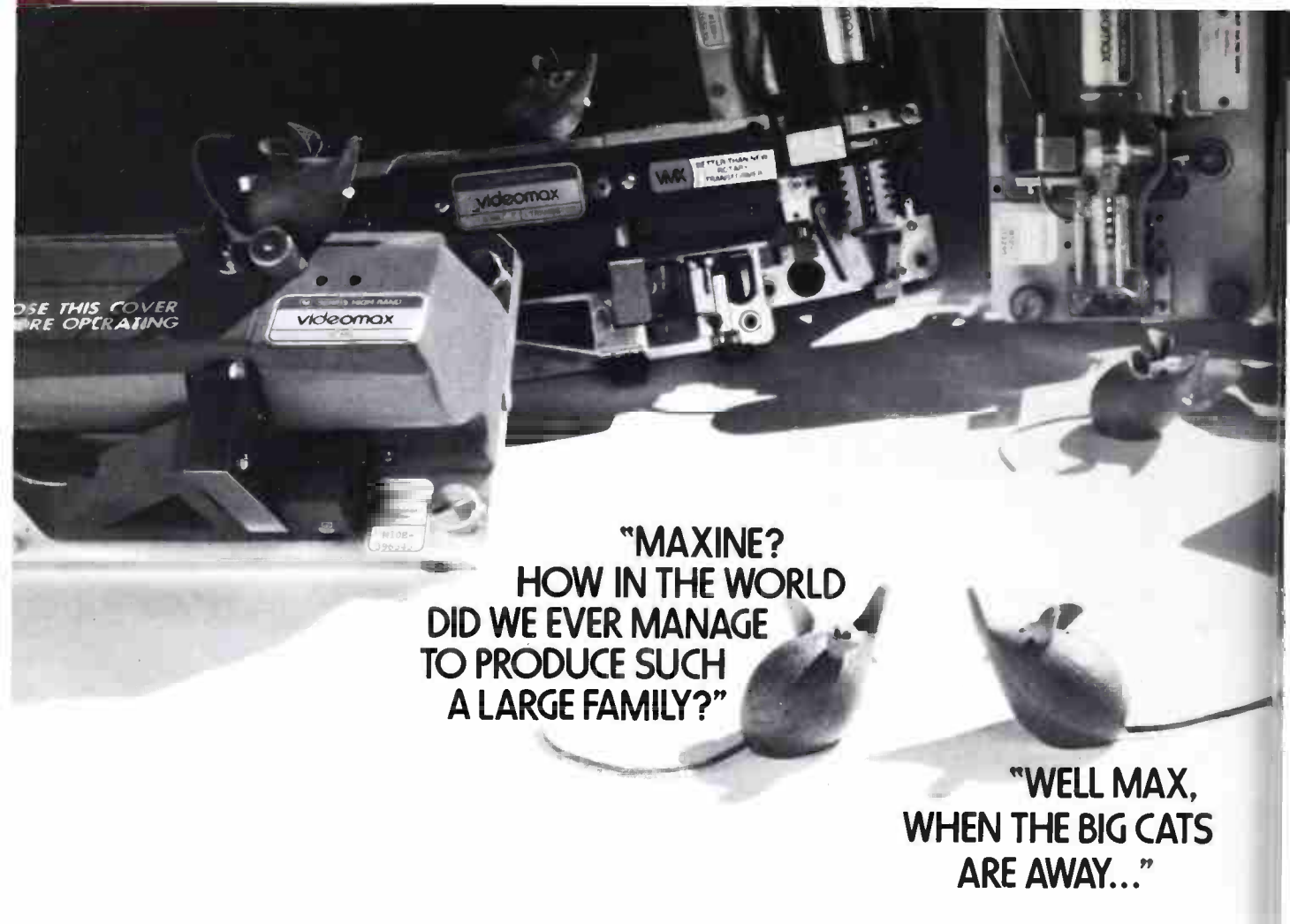
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TO PRODUCE SUCH
A LARGE FAMILY?"

"WELL MAX,
WHEN THE BIG CATS
ARE AWAY..."

FCC Rules and Regs

cont. from page 20

time on Sundays; Station B charges \$60 per one-minute spot announcement between 8 and 8:30 PM every night of the week. Station A's lowest unit charge varies on different days; Station B's does not and cannot vary.

The lowest unit charge for the November 5th general election must be made to candidates for the preceding 60 days (i.e., beginning on September 6th). However, this raises the question of whether the lowest unit charge during the *entire* sixty-day period preceding the election is based on summer rates. The answer (assuming, *arguendo*, that fall rates begin on September 20th) is that the lowest unit charge is based on (1) summer rates from September 6th to September 19th inclusive, and (2) fall rates from September 20th thereafter.

Another problem arises when, in the normal course of business, a station revises its rates up or down pursuant to ARB or Nielsen market reports. The lowest unit charge depends upon when the candidate actually *uses* the air time. Thus, the lowest unit rate does *not* include the rate change if the air time is *used before* the rate change; the lowest unit rate *does* include the rate change if the air time is *used after* the rate change.

Yet another problem arises with regard to the purchase of air time on the networks. As the Commission succinctly stated in its Guidelines:²

² *Federal Election Campaign Act Guidelines*, 34 FCC 2d 510 (1972).

(1) "We emphasize that it is the date of network use that will govern the charge made to any candidate. Thus if \$40,000 is the lowest unit charge for a one-minute spot announcement on a particular program in prime time on October 1, and \$50,000 is the lowest unit charge for a one-minute spot on that program on October 22, candidate A who purchases a one-minute spot broadcast on October 1 pays \$40,000, and candidate B who purchases a one-minute spot broadcast on October 22 pays \$50,000 . . . both candidates are receiving the lowest unit rate at the time of use, that rate being based on audience exposure and giving candidate B greater exposure than A.

(2) "Attention is invited to the fact that the foregoing discussion of network charges to candidates is applicable to uses of a network not involving 'equal opportunity' under Section 315(a) . . . Thus, if candidate A has a one-minute spot on October 1 for \$40,000, candidate B exercising 'equal opportunity' rights on October 22 pays \$40,000 rather than \$50,000."

Note should be made of this subtle but important distinction: the lowest unit charge for network use (referring to the *affirmative* purchase of time by candidates) may result in candidates paying *different* rates for the same class, time and period commercial (i.e. A and B paying \$40,000 and \$50,000, respectively, in the first-quoted example above); *responses* to affirmative purchase of time by candidates arising out of the "equal opportunity" provision may result in candidates paying the *same* rates for the same class, time and period commercial (i.e., A and B each paying \$40,000 in the second-quoted example above). In yet another of a wearying number of exceptions, *responses* to affirmative purchases of time *do not automatically* entitle the responding candidate to the same charges as the initiating candidate. *Example*: Candidate A purchases prime time spots to be *aired prior* to the 45- or 60-day period preceding an election and candidate B purchases prime time spots



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the same character (to respond to A via the "equal opportunity" provision) to be aired *during* the 45 or 60-day period. The station operator can charge candidate B not more than the lowest unit charge prevailing *during* the 45- or 60-day period. With candidate A likely being subject to a lesser charge, candidate B would thus be charged a greater amount for responding to his opponent. *Rationale:* This is not discriminatory since the difference in charges is set by statute.³

The Commission's June 1974 Public Notice

The Commission—likely in anticipation of the upcoming November elections—has issued a "reminder-clarification" of licensee responsibilities under the FECA of 1971. In brief, the Commission emphasized that a licensee may not deny access by candidates for federal elective office to prime time (and to drive time for AM and FM) or "arbitrarily deny candidates the right to purchase spot announcements of certain lengths." The Commission stated quite plainly that the "reasonableness" standard (to be used by the Commission in reviewing all complaints relating to the FECA of 1971) is violated when a licensee "adopts a rigid policy of refusing to sell or give prime time programming to legally qualified candidates for federal elective office." In the case of a multiplicity of candidates, however, the Commission conceded that spot announcements, rather than program time may be appropriate. And finally, to deny candidates

Note the difference, however, when rate discrepancies are determined by factors other than by statute (as in the example above wherein the summer-fall rate change occurred). Candidates responding pursuant to the "equal opportunity" provision must be charged on an *equal* basis with the initiating candidate.

"the opportunity to purchase spot announcements of the type and length which are available to commercial advertisers" is directly contrary to the intent of Section 315 of the Communications Act, as amended.

Conclusion

As the recent Public Notice emphasizes, the Commission is adamant in its intention to monitor the November 5th elections and enforce the provisions of the FECA of 1971 and Commission Rules relating to political use of, and charges for broadcast and cablecast facilities on the federal elective office level and non-federal elective office level (where the laws apply). Penalties for violations range from a maximum of a \$5,000 fine and/or 5 years in prison for *willful* violations to renewal sanctions for *unknowing* violations. For uncontested renewals, such sanctions may include questions by Commission staff which could result in lengthy delay or denial of renewal. In the case of renewal challenges (where a new party seeks to win the license for itself), sanctions may include comparative demerits or disqualifications at the renewal hearings.

The complexity of the "political use and charge" laws is manifest. Despite the dangers of oversimplification, licensees should always focus on two rules of thumb: (1) the *date of use* is controlling when determining lowest unit charge, and (2) the licensee is insulated from violation of the FECA of 1971 and Commission Rules by charging legally qualified candidates the *lowest* air time rate of the station. Of course, should station personnel believe that a higher rate may be legally charged a candidate, the licensee should consult its communications counsel for clarification.

BM/E

GREAT IDEA CONTEST

Which of this month's entries gets your vote? Or do you like them all? To help pick a winner, tell us your preferences. Simply fill in the ballot which appears on the Reader Service Card. Do It Now!

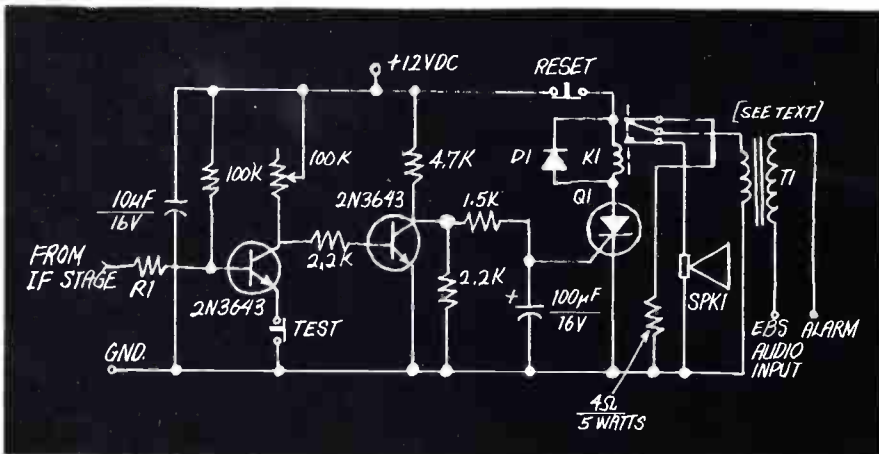
52. A Simple EBS Adapter.

Terry Rutherford, Engineer, WKNO TV/FM, Memphis, Tenn.

Problem: To construct an EBS carrier alarm for use with a solid-state receiver.

Solution: We built a simple, inexpensive solid-state carrier alarm using two 2N3643 transistors, one SCR, and one relay. The alarm was used with a solid-state receiver and performed well.

Resistor R1 (5.2K) is connected to the emitter of the receiver's first IF amplifier. Voltage varies with sig-



Rutherford's inexpensive EBS carrier alarm

nal strength across this emitter resistor. When the station's carrier is interrupted, the bias of Q1 will increase slightly and collector voltage drops. Transistor Q2's bias decrease a few tenths of a volts and allows the collector voltage to increase. With this collector voltage increase, Q1 is triggered on, K1 pulls in. Audio alerting the operator feeds via the output transformer to the speaker.

The 100K pot in the collector of Q1 adjusts the alarm's trip point. Tune in the station and measure the SCR's gate voltage; adjust the pot for a bias that will not trigger it whenever the carrier is interrupted. When setting the pot, the Reset switch is held down.

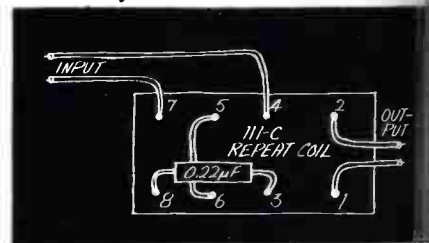
53. Novel Repeat Coil Wiring Cleans Return Cue Audio.

Allan S. Joffe, Radio Supervisor, WCAU-AM, Philadelphia, Pa.

Problem: To clean up a return cue audio feed.

Our station covers baseball from the local stadium and part of the installation is a return cue line. The quality of the return cue audio has always left a good bit to be desired.

Solution: In the interest of control and simplicity, I designed a pre-equalizer. Located at the studio facility, this pretailors the return cue audio by sloping off the low end drastically.



Pre-equalizer for return cue audio

The basic equalizer only utilizes type 111-C repeat coil and a 0.22 µ capacitor. But the secret is in the way the repeat coil and capacitor are wired. First, the capacitor is connected between lugs 8 and 3. The shunt shown is connected between lugs 5 and 6. The shunt represents maximum low cut with the capacitance value shown. If a variable equalizer is desired, the shunt may be replaced with a 500-ohm potentiometer. The input impedance is about 600 ohm and output impedance is about 12 ohms. For the amount of equalization available, the insertion loss is rather low in the pass band.

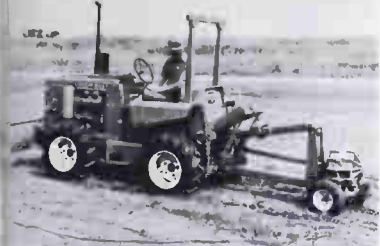
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More than a Trencher!



Ditch Witch Modular-matic vehicles *can* be used as trenchers, and, when they are, nothing in their class can match their performance.

But the Modular-matic concept offers you much more. You get one ruggedly-built vehicle specifically-designed to accommodate a wide assortment of interchangeable, socket-mount modular tools that let you perform many different jobs. And since one machine can do more, you get more for your equipment dollar investment. The Ditch Witch Modular-matic series, available in horsepower ranges from 37 to 65, provides greater versatility than any other line of underground equipment. Look what it has to offer!



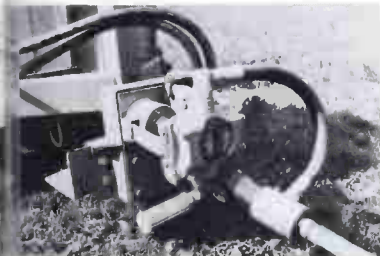
5 and vibratory plow.



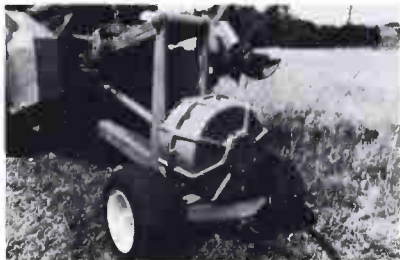
can-sweep broom on R40.



irth Saw on R65.



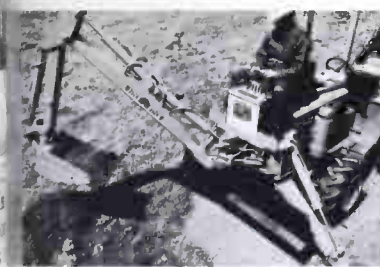
to Witch hydraulic boring unit.



Combo component plowing.



Single-auger digging assembly.



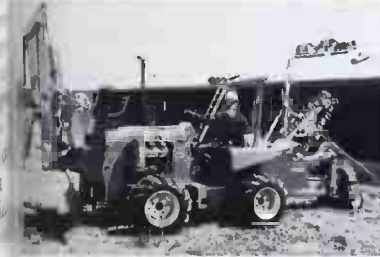
ility backhoe.



Double-auger digging assembly.



Offset digging assembly on Combo.



5 Combo with utility backhoe.

Ditch Witch . . . equipment from 7 - to 195-HP.

CHARLES MACHINE WORKS, INC.
P.O. Box 66
Perry, Oklahoma 73077



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GREAT IDEAS

54. Increasing Remote Pick-up Usefulness In Studio.

C. Donald Rees II, V.P., Chief Engr., WAMX-FM, Ashland, Ky.

Problem: To make the remote pick-up more useful in day-to-day operation. If you use remote pick-up units for news and special events coverage, you know the times when station personnel: announcer; engineer; newsman; general manager; and office girl all want to talk to the remote site operator from their own desk or work area. The circuit shown allows anyone in the station to talk to the remote site if they have a key-type telephone—with one free button.

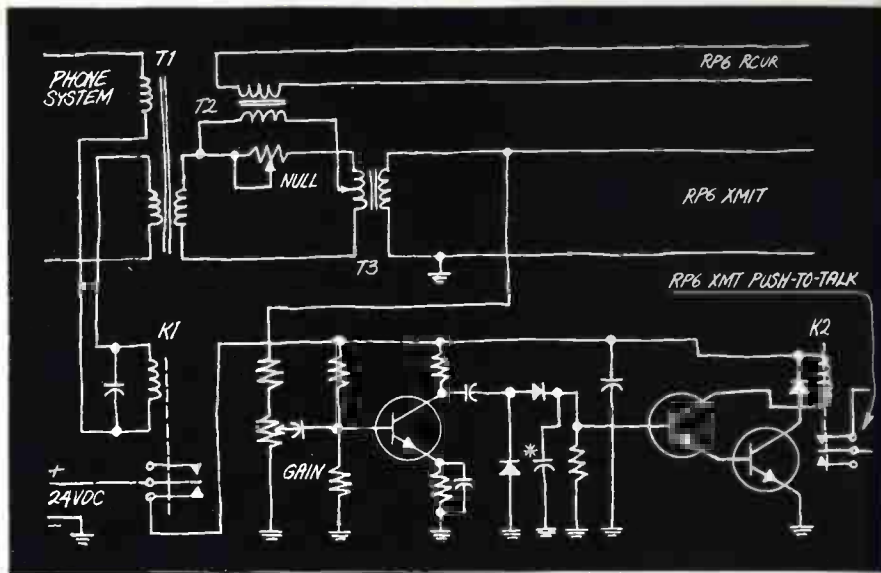
Solution: Most unused lines on multi-button phones are wired to the central building terminal unit. At our station, we identified an unused pair (line no. 6 for all the phones in our plant) and hooked it in series with the phone 24 VDC supply. The line connects to the input terminals of a three-port hybrid and voice-operated relay circuit.

When the phone line is activated, voltage is applied across the input repeat coil, IIIc, (identified as T1 in the schematic) primary winding. Relay K1 pulls in and applies 24 VDC to the VOX circuit. Speaking into the telephone at the remote site causes the VOX amplifier to pull in relay K2 and key up the r.p.u. base transmitter, and hold it on for as long as you speak. A short time delay (determined by the value of C1 and R1) cuts down on chatter between words. Audio is coupled straight through the hybrid to the transmitter mike input. A small pad may be needed to match levels.

Audio from the r.p.u. receiver is introduced to the hybrid at T2. Adjustment of the null pot attenuates this audio at the transmitter terminals, but is carried at full volume to the phone system.

To balance the hybrid, I use the receiver's squelch noise and adjust for best null at the transmitter mike terminal. The null adjustment, once set, should not change. Misadjustment allows receiver audio to trip the VOX circuit (only phone-system audio should activate it).

After installed, punch up the two-



Rees' remote pick-up conference call circuit

way line button on your phone and answer. It's full hands-off, two-way operation.

55 Fresh Air Cools Transmitter, Is Then Exhausted Back Out.

Tom Wirch, Chief Engineer, KORI-FM, Salem, Oregon

Problem: To provide fresh air to air intake at rear of transmitter, yet allow work space behind transmitter, in cramped area.

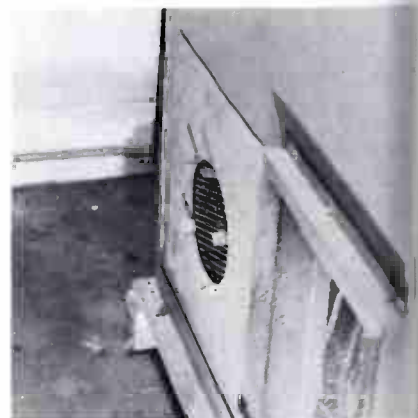
Our FM transmitter has only 2.5 feet of walk space behind it, with the air intake offset from the outside air duct by 4 feet horizontally, and 1.5 feet vertically. Using air from inside the building to supply air to the intake to the transmitter would cause the building's air circulators to allow the building to reach excessive temperatures during summer months, and drain heat from the building during winter months.

Solution: We considered air conditioning to the building, both with refrigeration and water evaporation units, but discarded them due to the cost involved.

We settled on a flexible air duct, the type used for mobile home air conditioning, to connect the two air passages. First, two 20-inch square pieces of heavy gauge metal were cut to fit the air intake and fresh air supply ducts. Each had an 8-inch diameter hole in the middle. One was attached over the transmitter intake with pop rivets, after five pieces of 1 X 1 angle, one inch long, were attached at equal divisions around the inside of the round hole. The other



Looking down at transmitter from above; fresh air duct at left



Modifications to air intake on transmitter

continued on page 2

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SERVICE CARD**

In-depth Local TV News is High Rating News.

In their constant battles for higher ratings, the television networks have come to recognize that *network* news gets higher ratings when backed by strong *local* news coverage. One of the major TV networks has even loaned its research director to several affiliate stations to advise them on how to improve their local news operation. As far as the network is concerned, the local news operation is key!



Indeed, as many of the smaller independent stations and local affiliates have come to realize, on their own, ratings are generally up when TV stations present in-depth local news coverage, backed by mini-documentaries and public service reports that are geared to the needs, concerns and interests of the viewers in that local area.

Making it in the ratings.

Certainly television news is one area where being big or small doesn't count for much. Making it in the ratings really depends on a dedicated staff with sharp TV-journalistic perceptions, and a determination to make ambitious and imaginative use of the best available equipment. Within the limits of the usual budget restrictions.

And the best equipment on the market today, at competitive prices, is Cinema Products' line of CP-16 reflex and non-reflex sound cameras. Ideally suited for small crews and/or one-man-band operation!

Imaginative use of equipment.

Whatever your particular production needs — reflex or non-reflex, or both — the CP-16 and CP-16R are so versatile they lend themselves to the most daring and creative use your news cameramen can think of. You get all the freedom of movement you need . . . silent, dependable, no-nonsense "work-horse" kind of performance . . . plus all the features you would expect on 16mm cameras costing many thousands of dollars more. Without compromising quality.

The price is right!

Whatever your budget, and whatever local news operation you have — network-owned, affiliate, or independent — Cinema Products gives you the choice of the most outstanding TV-newsfilm/documentary sound cameras. Reflex and non-reflex. *And the price is right!*

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**When You Win
 Five First Place
 Associated Press Awards
 For News You Must
 Be Doing Something Right!**

**NEWSCOPE 8
 at 10:00 p.m.**

WQAD TELEVISION

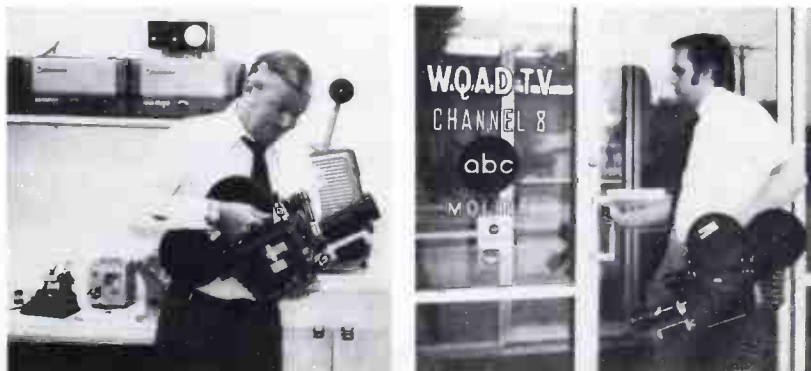
Advertisement placed by WQAD-TV in Moline's Daily Dispatch (May 20, 1974).

WQAD-TV, serving the Quad Cities (including Moline, Illinois), is typical of local affiliate stations, whose serious and imaginative treatment of local news has been rewarded by appreciably higher ratings.

At a recent semi-annual Illinois News Broadcasters Association convention, WQAD-TV picked up five Associated Press *first place* awards for TV-newsfilm coverage, all shot with the CP-16/A. Included in WQAD's award sweep was the Feature Photography award. On two other award categories there was an added notation: "Judges were moved to comment on excellent cinematography."

Also shot with the CP-16/A is WQAD's special on open heart surgery facilities in the Quad Cities — a documentary currently up for a National Heart Association award. Management at WQAD-TV is so pleased with the capabilities of the CP-16/A camera that it is planning to buy another one.

Shown below are two members of WQAD-TV's award-winning news team: News Director Jim King (left) and TV-Journalist/Cameraman Bob Wilford.



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Cooke

DYNA-MITES

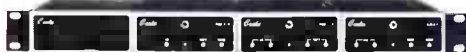
VIDEO AUDIO and PULSE DISTRIBUTION MODULES



SIX DYNA-MITES

- **VDA 1-4 Video Distribution Amplifier**
Bridging, loop thru input and four isolated outputs.
- **VEA 1 Video Equalization Amplifier**
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- **PDA 1-4 Pulse Distribution Amplifier**
Equivalent to all broadcast type PDA's, 1 in, 4 out, regenerative.
- **APA 1 Audio Preamplifier**
Input -70 to +10 db, 250 ohm or high impedance, 70 db gain, 600 ohm +10 dbm output.
- **AMA 1 Audio Monitor Amplifier**
Balanced bridging input, 10 watts RMS output, extremely low distortion.
- **ADA 1-6 Audio Distribution Amplifier**
Balanced bridging input, 6 balanced outputs at +20 dbm, low distortion, flat response.

Cooke's Dyna-Mites are a new series of broadcast quality audio, video and pulse distribution modules. Small and powerful, they have the exacting specifications and reliability for the most advanced studio use, and the economy for the smallest CCTV installation. All modules feature plug in construction with self contained power supplies.



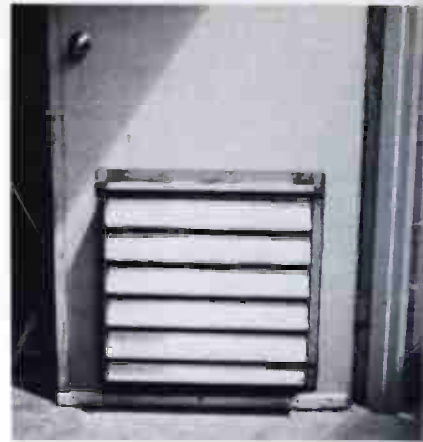
RMH 1-4 Rack Mount Housing
Permits mounting of any combination of 4 units in 1-3/4" x 19" of rack space.

Cooke Engineering Company

Division of Dynatech Laboratories, Inc.
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GREAT IDEAS



Shutters placed in entrance door, outside

piece has the same angles attached to it, but it is not fastened to the fresh air duct. It slides in and out of the channel that holds the air filter. The flexible duct is fastened to this sheet, with pop rivets.

The transmitter end of the flexible duct is screw-adjustable, and can be slipped over the angle pieces, then tightened in place. Our transmitter now receives fresh air from outside the building, and exhausts it also directly to the outside.

56. Cheap Silence Sensor

Bob Shellady, *KXIC AM/FM, Iowa City, Iowa*

Problem: To alert studio personnel that no audio is being broadcast.

Even the best of operators can be the victim of "nothing on the air" situations. The problem is to detect the loss even if a carrier is present.

Solution: A homebrew silence sensor is attached to the speaker terminals of any available receiver. It is set for intervals of low audio, and can be either mini box- or rack mounted. Total cost: under \$20.

The 2000 uF capacitor is charged through the diode by audio at the speaker terminals of the receiver. The transistor is held at cutoff by that charge. A 10 megohm pot wire across the capacitor bleeds the charge off at a rate determined by its setting, allowing a change in time constant for alarm purposes. The 2 V relay is used to allow the sounder (we used a Mallory Sonalert) to be cut off when desired, but will automatically reset upon restoration of audio to prevent inadvertent disabling of the unit. Operation voltage can be tapped from the host receiver.

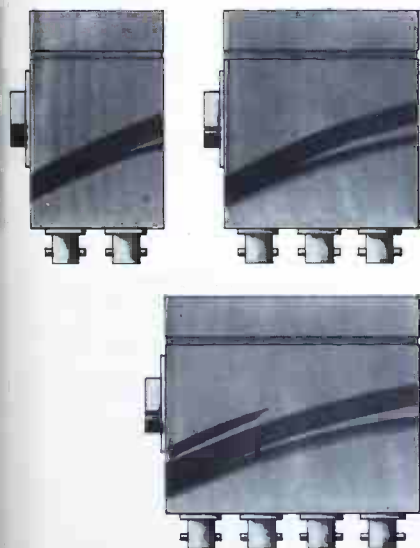
continued on page 30

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- Only WILKINSON Silicon Rectifiers are fully guaranteed and have a safety margin well in excess of tube rating.

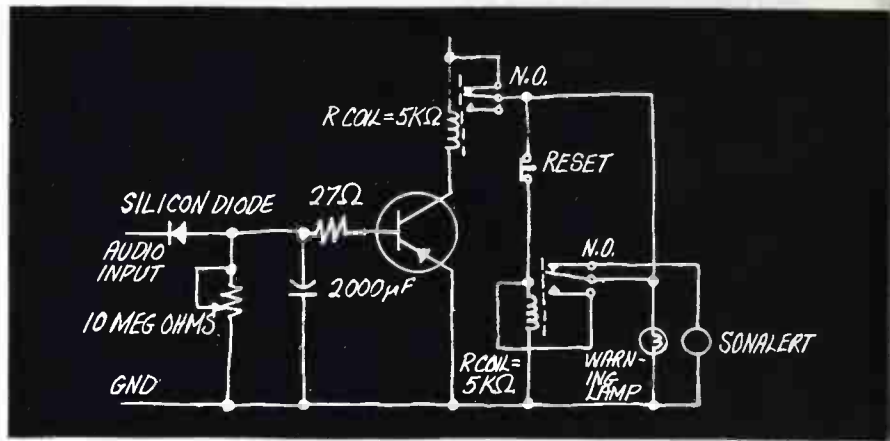
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GREAT IDEAS



Shellady's inexpensive "no audio" sensor

If the receiver doesn't furnish sufficient charging voltage, insert a common voice coil-to-line transformer between the speaker terminals and diode cathode.

57. Locating Faults and Breaks in Cable Bundles

Harry F. Palmer, WKRG-TV, 3200 Emelye Drive, Mobile, Ala.

Problem: To locate and identify opposite ends of single cables, or cable bundles within a facility.

A 20-pair audio cable runs between our studio and control room. All cables are neatly laced in a bundle the length of the run. A short was suspected between two of the pairs, but ohmmeter measurements could not locate the short accurately enough to permit opening up the bundle and repairing the short.

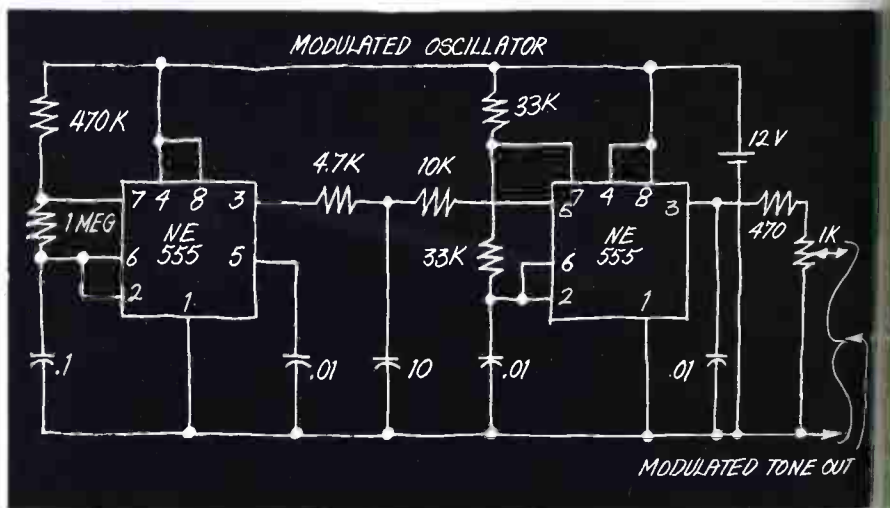
Solution: A portable solid-state generator and companion detection device is used to identify cable ends.

The tone generator is connected to each of the cable pairs and the short is located within inches of the fault with the detector probe. This method eliminates the risks of first opening up and exploring through several feet of the bundle, and damaging the conductors while doing so.

The generator consists of two oscillators, one modulating the other. The major components are a couple of NE555V ICs. The first IC, operating at approximately 7 Hz. modulates the second, 500 Hz. oscillator. The tone output warbles to insure that the generator signal cannot be mistaken for other studio test tones.

The detector consists of two separate devices: a search coil and a probe. The former locates opposite ends of cables, or identifying unknown cable runs. It was built from two coils mounted end-to-end in a cardboard tube, and wired so that the mutual field cancels. Each coil, 1000 turns of no. 32 enamelled copper wire, is wound on a 1/4-in. ferrite rod. Coil construction is not critical.

continued on page 3



Palmer's tone generator circuit

ANTENNA MONITORING WITH A COMPLETE



FCC TYPE APPROVAL NUMBER 3-218

TRUE DIGITAL SYSTEM

The DAM-1 is a true digital antenna monitor designed specifically for measuring the parameters of broadcast frequency directional antenna systems. Digital data is not obtained by adding an A/D converter to the output of conventional analog circuitry; instead, the latest digital techniques and TTL components are applied to achieve a truly digital approach to phase and current ratio measurements. Data is displayed on front panel seven-segment digital readouts to minimize reading error. A simplified selection system reduces operation of the DAM-1 to a straightforward procedure.

- A true digital antenna monitor specifically designed for broadcast directional antenna systems.
- Complies with FCC monitor and remote reading specifications. DAM-1 has received FCC Type Approved Number 3-218.

TWO WIRE TRANSMISSION REMOTE CONTROL UNITS DAML-1/DAMR-1



The DAML-1 and DAMR-1 provide for long distance remote control and readout of the DAM-1. Digital data is transmitted in both directions by integral FSK modems at 300 BPS.

HARDWIRE REMOTE CONTROL UNIT DAMH-1



The DAMH-1 provides for remote control and readout of the DAM-1 at distances to 1,000 feet.

TWELVE TOWER EXTENSION UNIT DAMX-1

The DAMX-1 permits the DAM-1 to be used for directional antenna systems with up to 12 towers.



TOROIDAL CURRENT TRANSFORMERS TCT

The TCT-1 and TCT-2 are precision toroidal current transformers to provide RF sampling voltages for the DAM-1 or other metering applications.

COMBINED DIGITAL TRANSMITTER REMOTE CONTROL AND MONITORING SYSTEM TMCS-1

The TMCS-1 provides full transmitter control and digital antenna monitoring. Includes integral FSK modems.



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GREAT IDEAS

The latter probe may be nothing more elaborate than a standard probe such as that supplied with a VOM or VTVM.

Generator output amplitude is such that electrical contact with the cable under test is rarely necessary. Identification usually consists of touching the insulation on the correct cable.

The search coil probe is used to find the exact location of shorts. When a tone is fed into the faulty pair, and the search coil probe is moved parallel to the cable, it will be loudest at the short. Open circuits may also be found in a similar fashion. Tone amplitude now remains steady until the physical break is reached, and then will gradually fall off.

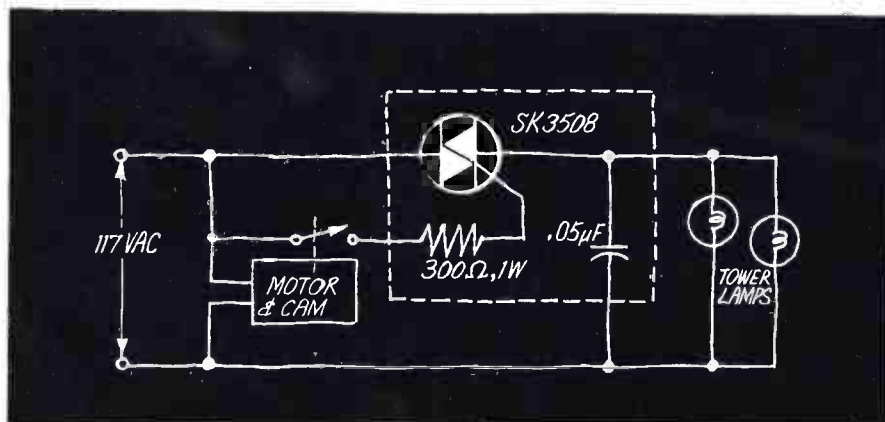
The talk-back circuit may simply be a dc voltage used to drive a carbon microphone and standard telephone headset. A 12 V battery can power both the tone generator and carbon headset/microphone. Some bleed-over of the tone occurs. If objectionable, a separate 5V battery can be used for the talk circuit.

58. Beacon Flasher Takes Load Off the Contacts.

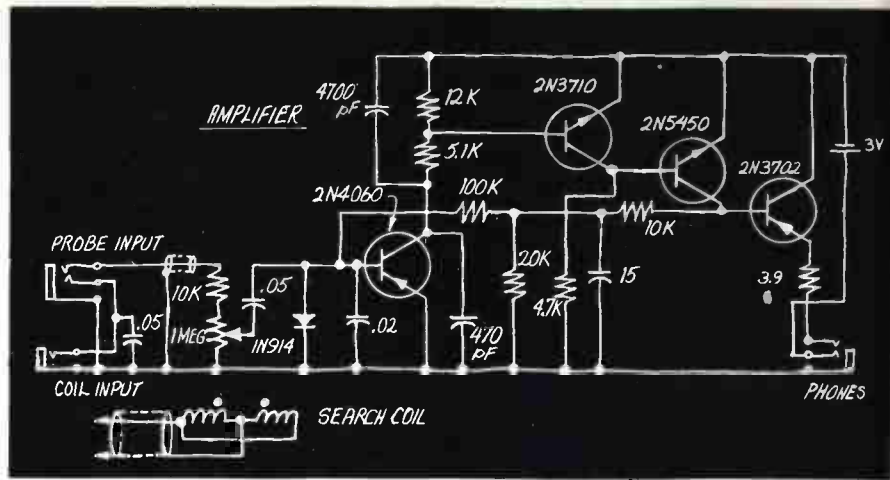
D. Khalil Jones, Studio Engineer, KID-TV

Problem: To eliminate the arcing on tower light flashers.

A constant headache for stations required to operate flashing beacons on their towers is the often premature pitting of contacts. These flashers must switch at least 1000-watt loads and most of them use a set of mechanically cam-driven contacts.



Jones' Triac beacon flasher



Palmer's detection device to identify cable ends

These contacts need considerable attention to keep them in good operating condition.

Solution: Use a Triac to switch the load and use the contacts to operate the Triac. This has solved the contact problem. We have been using three of these modified beacon flasher circuits for several years without electrical failure.

59. Keeping Station Maintenance Chores to a Minimum.

Manuel Taitz, Transmitter Supervisor, WSB-AM, Atlanta, Ga.

Problem: To keep those day-to-day chores from bogging down the transmitter engineer.

Sometimes those preventive maintenance routines are as time consuming as when a major piece of equipment breaks down. The following are some of the ways I've cut down on the time needed to do my "housework."

Solution: For years, we have used

transmitter heat to complement the building heating plant, but with two refinements. Behind the louver grill I mounted a plywood door, hinged at the top so when the transmitter is off the outlet is closed. It opens when the transmitter is started. Additionally, since we had been plagued with condensation during very humid weather causing transmitter failure, I connected flexible vent piping used for clothes dryers from one transmitter exhaust plenum to the other. This circulates warm, dry air into the transmitter on stand-by.

Maintaining reusable air filters has always been a messy job. When I discarded my old automatic dish washer, I brought it to the transmitter, removed the heater unit from the circuit, and ran a cold water line to it. Now I wash the filters three at a time. All that is required is the basin washer with racks removed, a good motor and timer, and access to water and drain.

60. Scope Helps Find Vertical Roll in Monitor

Michale J. Laemers, Technical Supervisor, WUHQ, Battle Creek, Mich.

Problem: To quickly isolate vertical roll problems in video monitors.

One of the most common and time-consuming problems encountered when troubleshooting video monitors is vertical roll. Conventional test techniques (waveform and voltage readings) may localize the problem but after that, it is usually a hit-or-miss substitution process.

Solution: Use an oscilloscope equipped with Z-axis input. Set the horizontal sweep rate to 5 μsec/cm triggered to the input video signal.

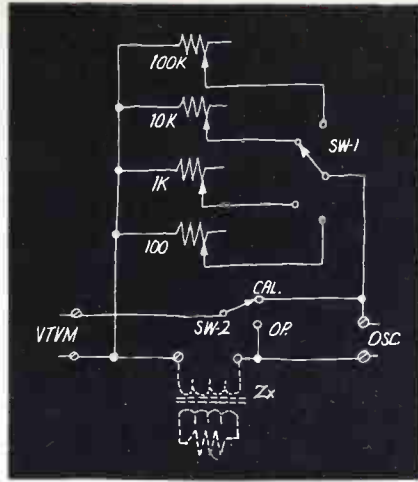
GREAT IDEAS

Connect the Z-axis terminal by feeding a signal to it from the last, or next to last, stage in the video amplifier. Connect the vertical input jack to a 30 Hz. sawtooth picked off from the vertical oscillator. Vertical gain is adjusted until a waveform with sufficient height is obtained. The scope vertical input probe is then moved from input to output of each active device in the vertical oscillator/amplifier stages of the monitor. Advance the probe towards the vertical output terminals. When the picture on the scope starts to roll, the defective component has been found. This process was tried using a Tektronix model 453 scope, and worked very well.

1. Emergency Transformer Impedance Test Method.

Edward L. Enstrom, General Manager KBMY, Billings, Montana

Problem: To measure unknown impedances of transformers with



Enstrom's transformer test method

only common test equipment. When making emergency repairs, as it often happens, the electrical characteristics of a transformer must be determined without the aid of a tech manual or friendly manufacturer's advice. Although "on your own," it's still possible to measure transformer impedance with fair accuracy by using the voltage comparison method.

Solution: The estimated imped-

ance range is selected by SW1 after first removing all known loads from the transformer's winding(s). Apply a 1,000 Hz. voltage (furnished by the audio oscillator) with SW2 thrown to the CAL. mode. Make adjustments via the chosen calibrated carbon potentiometer, as selected by SW1. When an equal AC voltage is obtained, in either position of SW2, the value of the pot is noted. This is the impedance of Z_x . Note: Transformer impedance may be different, depending on whether or not, one of the windings are terminated, and the amounts of resistance seen.

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NEWS

cont from page 1

more than 15 earth-bound systems.

Bell and Howell, Kodak Agree on Advance Data

An antitrust suit brought by Bell and Howell against the Eastman Kodak Company has been settled by agreement between the companies envisaging a program of advance information from Kodak that will enable Bell and Howell to design to new Kodak film products. The unprecedented plan provides that Bell and Howell (and any other photo manufacturer who wants to participate) on payment of a \$10,000 fee, will get 18 months notice that a new Kodak film or cartridge is coming, and will get increasingly detailed data on the product at stated intervals, including a tolerance drawing at nine months and samples at six months.

Harris Has 5.6 Million Contract from Iran

The Gates Broadcast Equipment Division of Harris Corporation will build twenty-one 100-kilowatt broadcast transmitters and six 10 kilowatt transmitters, for the government of Iran, the largest single contract for broadcast equipment in the company's history, totalling about \$5.6 million. Gates will also install the transmitters, at eight different sites in Iran, with shipments to begin in April, 1975. The first transmitter is slated to be on the air in September, 1975, and the whole job to be completed in 1976.

Zenith Opposes Motorola Sale to Matsushita

Expressing strong alarm at the "anti-competitive aspects" of the proposed sale of Motorola's television production to Matsushita, Zenith Radio Corp. has petitioned the Department of Justice to block the sale. It would be, said Zenith in a letter to T. E. Kauper, assistant attorney general, a flagrant violation of section 7 of the Clayton (antitrust) Act. Zenith further offered to buy certain Motorola production facilities and keep them in operation to save the jobs of Motorola employees. Zenith said that Matsushita, already a world behemoth in television with enormous production capacity in low-wage areas and \$2 billion in sales, would jump its share of the U.S. market from 2% to about 9% and become a serious contender for market domination.

Continued on page 1

Conrac announces
the end of
the blue movie...

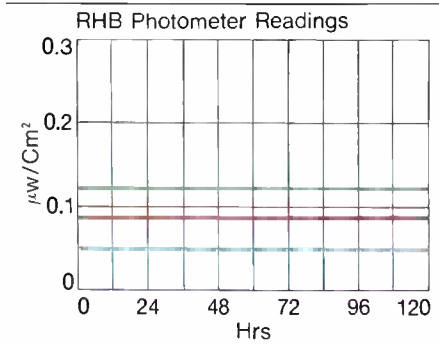


...the green newscast, the red commercial and the purple sports show.



Conrac's new RHB color monitor establishes industry standards for reliability, picture quality and ease of setup.

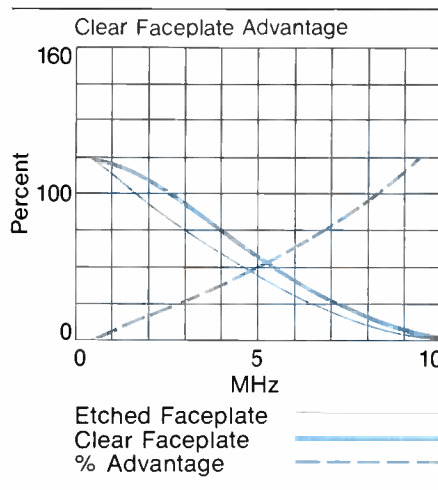
First off, *background stability* of the RHB has been enhanced so that frequent readjustment of background color temperature is a thing of the past. Photometer readings of actual red, blue and green screens are within ± 0.01 microwatt/cm at low brightness levels for over 150 hours of operation.



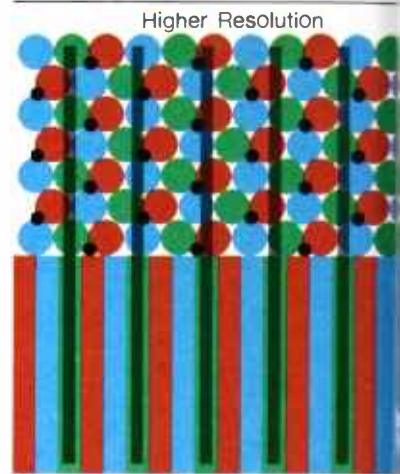
And the RHB sets another standard with its wider band luminance channel with *phase linear aperture correction*. Here, a three-position control permits choice of PRESET, for flat modulation transfer function to 4 MHz, ± 1.0 dB at CRT face; APERTURE CORRECTION OFF, providing video amplifier response flat to 5.5 MHz, ± 0.5 dB; or

CONTINUOUSLY VARIABLE CORRECTION, to compensate for high frequency losses in transmission.

To make sure that what you see on the RHB is what you get from the transmitted signal, we've added a *switchable corrective color matrix*. This unique feature corrects for colorimetry errors introduced by the difference between NTSC-encoded camera outputs and modern rare earth phosphors. By correcting for these differences, the RHB lets you see much more precisely the actual colorimetry of the final transmitted signal. And a front-panel control allows you to switch between the corrected matrix or the NTSC standard when viewing color bars.



Other outstanding features of the RHB are its *clear CRT faceplate*; its improved *horizontal deflection circuit* that minimizes raster ringing, reduces current drain and increases stability; its new *PC board connectors* with leaf spring contacts for greater reliability, especially under mobile operating conditions; and its *keyed back-porch clamp* which establishes a true black level when operating on composite video.



● resolution points, Conrac RHB shadow-mask tube
■ slit locations, single-gun slit-mask tube

Extension of shaded lines illustrates comparison of resolution points of shadow-mask holes of RHB tube and slit-mask of single-gun tube. By counting vertical rows of dots and shaded lines, 7+ rows of dots appear in 6 rows of 6 lines. *Net result: horizontal resolution capability of Conrac's shadow-mask tube higher than that of slit-mask tube*

Top this off with Conrac's *shadow mask CRT* and a *quarter-century* video industry leadership, and you see why the RHB is your best bet for master control and other exacting applications.



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It's The Year Of Automation

by John Price

A paean to the "personal" sound of automation plus a well-designed program service.



Personality Harold Peary gets ready to do voice commentary on "golden age" series, "Same Time . . . Same Station." Author John Price looks on.

I saw my first automation system in 1961 at a large AM station in coastal Virginia. Oddly enough, it used a voice-track tape . . . but in conjunction with, of all things, modified juke box record players filled with 45s. It was a fascinating device, used on the all-night show, and I remember becoming quite excited about the possibilities of the concept. Next, there was the big AMer in the southwest that bloomed across the plains states at night with a rocking, socking sound that didn't sound live, but sure sounded great. My knock at the transmitter house brought a furtive peep, and then a lengthy visit to a room that looked like a Hollywood computer-center set. Little tape recorders told big tape recorders where to go, and they raced back and forth along reels, finding the cut that contained Sugar Shack or the spot for Dr. Pepper.

And the years passed. The Newspaper-TV-AM-FM conglomerate compiled with separate-programming directives by using a magic box to make pleasant noises on the poor relation of their media family.

At the annual NAB exhibits, we smiled benignly and allowed as how someday, if somebody could only organize it, one of those shiny machines might actually cause a second thought inside a real, honest-to-goodness, competitive radio station.

It is someday, Now!

This year, a radio station in your market will make a lot of money with a new morning man that talks at 3 3/4ips. Somewhere in your own home town, an automation system will come in first, or second, or third in the big book. Just as Amos 'n Andy arrived in 1930 and they stopped the movies at the Bijou when 7pm rolled around, now automatic live broadcasting has arrived in 1974 and the night man who costs you no

Mr. Price is Director of Broadcast Services for Alto Communications, a radio program service in Hollywood.

payroll taxes will get more fan mail than you've since you signed on in 1946.

Reasons for automating have spawned more clichés than Helen Trent ever did. But, if your afternoons drive man just opened his show with Blue Swede the seventh consecutive day, and the night jock looking meaningfully at the owner's granddaughter you know what your reasons are.

If you can suddenly stabilize your format 100 percent; if you can send a picture of your midday man the paper and know he won't leave before they print it; if you can be guaranteed of getting every record that is right for your format, you know what your reasons are.

Radio has lagged behind many industries in the field of automation. (Ask your banker how many years it has been since he harbored row upon row of accountants, each with a massive ledger book.) You have some catching up to do, and it is happening fast. State-of-the-art realities now include:

- Automatic remote broadcasts through your system. Your salesman-reporter adds the police-blot and fire reports to your morning show from local between sales calls. Touch-tone telephone codes allow him to break in, wait his turn or merely tape a report for later use.

- Fool-proof synchronization. Once your air personality intros a tune, you are guaranteed that it will play, and that the correct outro will follow it.

- Low-cost, large-capacity memories. You can store enough events to cover all the variety that has been a part of a high-volume radio station.

Just in time, programming is advancing, too:

- Formats are now available that include all time-robbing extras. You spend *your* time on local sales and local news, while a small fraction of your overhead brings promotional graphics, billboard work, spec tapes.

- Just when the supply of promotional records is drying up, you are again on the pipeline with every record that is right for your sound, none that is deadwood. You often get tomorrow's monster hit the air days before your manual competition.

- No longer are listener requests ignored. Calls on your request line are answered shortly on the air with the listener's voice if so desired.

- Topical mini-documentaries dealing with your market and your listeners' problems are, likewise, a part of your format, adding to the immediacy and personalization.

It has been 117 nights since you've fretfully rounded yourself to check just what in the hell your night man is doing with that station that doesn't appear on the log. And it will continue, bolstered by billing increases and strong numbers.

True, the state of the art will continue. The boxes of tapes from your programmer will shrink to a jiffy of cassettes. Clumsy network joining will dissolve into effortless timing via net cue tones. Automatic transmitters will place our industry on a par with aircraft two-way and other users of the ether.

But, 1974 will be remembered as the year the automation machine joined the staff. It is a very good year. **BN**

Packaged Program Sources

Many automated radio stations use one or another of the syndicated program services that have flourished more and more in recent years. But such success is not the automatic result of installing automation and a program service. As reported in other articles in July, the top program suppliers themselves insist that the station management must invest time and talent in shaping the station program and image to the needs of the market.

A number of the program suppliers offer considerable help in this station image-shaping, as noted in the following brief sketches.

Drake-Chenault, Canoga Park, California

This ten-year old company now supplies its programs to automated stations *only*. (About 130 were using them at last count.) The programs are on ¼-inch tape, 10½-inch reels, running at 7½ ips, and thus require reel-to-reel machines for playback—Drake recommends that the station have four such. Cue tones are included for operating the automation. There are five categories of programs, each set up to provide full-time programming, with a number of optional auxiliary services for each: jingles, time announcement with ID's, feature programs, and other elements:

- 'Hit Parade,' an "easy listening MOR format;
- 'XT-40,' a top forty series;
- 'Great American Country,' current country music series;
- 'Classic Gold,' described as "all oldies";
- 'Solid Gold,' a modified top 40 with current hits and great old hits intermingled.

Radio Programming/Management, Southfield, Mich.

This company provides two main formats, "Progressive MOR" and "Beautiful Music." In addition they can supply voice production, custom intros, with IDs for the station, promotional artwork and promotional concepts for an integrated package. The station gets an initial 70 to 100 hours of programming, with regular additions thereafter to maintain a full schedule. Programs are in stereo on open-reel tape, available at 3¾, 7½ or 15 ips (7½ ips is the most popular). At least three reel-to-reel machines are recommended for smooth usage. Cue tones are recorded at the end of each selection.

The company also can supply a monthly service of current record hits transcribed to open-reel tape, called "Top MOR," "Top Country," and "Top City." This is less expensive than the complete programming. Charges for the latter are typically between \$400 and \$1500 a month, based primarily on market size.

Radio Communications, Inc., Hollywood, California (Also Fonic Programming")

This company has four major complete-program services "Big Country," "Rock Unlimited," "Something New," and "Swinging Velvet"; all are designed for

automated stations only. Each one includes talk segments as well as music, the first two with DJ "personalities" who introduce and organize the music elements, in effect doing a "live" show every day. The voice elements are on separate reels which are integrated with the music by the automation sequencer. As with the other programmers, a standard cue-tone system on the tapes triggers the automation sequencing.

The company can supply a number of optional aids for promotion, such as voicing of station's own promotion copy by the program "personalities," jingles, ID's etc. Station gets a large initial library of old favorites and current hits, plus the "Thematic" (voice) material. Weekly and monthly additions update the library.

Stereo Radio Productions, Ltd., 36 East 61st St., N.Y.C.

Like the others, SRP supplies programming primarily in open-reel form, and has made a speciality of "beautiful music." A full supply of program aids and voice items is also available and, like the others, the management will work closely with each station to create a total package with an audience-winning character. SRP, unlike many others, works with both automated and "manual" stations, and has been highly successful on both fronts.

Bonneville Program Services, 485 Madison Ave., N.Y.C.

This is another programmer with a number of big successes among stations using their "beautiful music." Operation is similar in many respects to those already described. They also work with station management on the details of the program, and work with both automated and "manual" stations.

Two Dallas, Texas, companies have been doing well. **TM Programming Inc.** and **Toby Arnold.** Others are:

International Good Music, Box 943, Bellingham, Washington.

Complete programs in a number of formats.

Stereo Broadcast Corp., Fresno Town House, Suite 535, Fresno, California

Adult contemporary rock programming.

Ralph Stachon Associates, 1322 Inwood Rd., Dal- las, Texas

Ten different music series, plus very complete customized ID's, jingles, promotional material.

William B. Tanner Co., 2714 Union Ext., Memphis, Tennessee

Music library services; music series in several popular formats; promotions; customized voice material; other program services.

Watermark, Inc., 10700 Ventura Blvd, Los Angeles, California

"American Top 40," weekly series with voice track for special "host," other feature series.

Cavox Stereo Productions, 502 S. Isis St., Ingle- wood, CA; Library Programming Service, in for pop- ular formats and pre-programmed format service.

How an Architect Takes the Trouble Out of Station Building

No one should build a new broadcast facility nor substantially redesign an old one without the help of an architect experienced in the field; he can save a builder from any number of expensive mistakes.

(Editor's note: The following article, with the title "Architectural Considerations in Broadcast Radio Facility Design," was presented at the NAB Convention at Houston, in March, by Eric Small, broadcast audio consultant, and Justin Henshell, architect, both of New York.)

Introduction (by Eric Small)

Over the past several years I have been directly involved with the construction of several radio stations. For most of these jobs I have had the privilege of working with the same architect and for each of us has come a greater understanding of the other's problems and point of view. The intent of this article is to bring the broadcaster an understanding of the process of how an architect approaches the design of a radio facility.

To me, the most interesting aspect of the process is the extent to which the major design decisions pivot around people rather than hardware. Gradually, I have found this kind of human engineering thinking affecting my day to day broadcast work with some very positive results. I hope that even for the reader who is not contemplating the construction of a new facility, some of the approaches to making environments fit people instead of the other way around will prove useful.

When the management group (ownership, general manager, program director, and chief engineer) of a radio station faces the problems of building a new facility, a number of common questions seem to arise. Mostly they come from an attempt to extend the kind of thinking used to deal with day to day projects into the kind of thinking needed to deal with capital construction. The following is an example of the kinds of questions that often come up:

Why go to the bother and expense of designing a facility in detail rather than "letting it happen?"

How about the contractor designing it?

Or maybe the station chief engineer?

How closely should the layout be planned around the programming format?

What details are commonly overlooked?

Can the studio environment affect the performance of the air personalities?

These questions provide a flavor for the decision making process that seems to take place when a radio facility is being planned. The rest of this paper will discuss how an architect, working closely with the staff of a station, deals with radio station design.

The Architect's Job

It may seem a little presumptuous for an architect to discuss the intricacies of radio station design before a group which knows considerably more about the actual operation. But anyone who has gone through the planning

and construction of a station for the first time will agree that, at the very least, it is traumatic and often frustrating. We hope this paper will make your next project a more satisfactory experience.

Site Selection

Construction programs can consist of a new building, alteration of an existing building for a station or renovation of an existing station for expansion or updating. In any case a successful design must provide an environment in which people can function effectively to produce quality programs. The facility must be economical, flexible and easy to maintain.

The first step in creating such a design is to select a suitable site, be it either an existing building or land for a new one. The second is to evaluate the items that will affect the final design.

Before the owner sets out in search of his perfect site he should establish the location, the optimum rent, and the capital expenditure, consider the need for future expansion and prepare a list of the kind, number and approximate sizes of the required spaces.

The acoustic environment, as well as the design of spaces and construction of the partitions, must be considered in the selection of a building site or an existing building. Noise can come from many sources; from outside the building, within the building, or produced by the station and it is less expensive to pick a site that is not noisy than to construct to control it.

Locations in aircraft flight paths or near railroad tracks are obviously going to be a problem. Others such as steep hills where trucks labor up in low gear are less apparent. For example, at one Station we had to contend with a traffic light at a turnpike exit where heavy trucks roared with tires squealing and gears grinding, creating bedlam whenever they came off the pike and hit a red light. It was very costly to provide sufficient sound attenuation to reduce this noise to allowable limits. If the Owner had realized this initially he might have selected a building at a different location.

In existing buildings common noise sources such as elevator shafts and machine rooms are instantly apparent. Also significant are courtyards or air shafts containing numerous window air conditioning units; and, if not aware of the potential noise from pipe shafts, as well as vibration from traffic and stationary machinery. In one station we found that the owner had planned to locate the studio adjacent to a roof drain pipe. Tapes made during the first heavy rain would have had the roar of water over background music. In this case we were able to revise the plan, but in another Station where we discovered



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before the concern for shutting out external ambient noise. But we must also contend with another situation—the high sound level produced within the studios themselves. D.J.'s and the production staff will often turn up speaker volume to a point where it can not only be heard in adjoining studios, but also in other tenant spaces. This can be a problem. For example, we had to isolate the floor in one station because the studios were over a doctor's office and the sound level produced by the studio speakers could have interfered with the practice of medicine below.

Since the most acoustically sensitive space is the Production Studio, we generally concentrate the greatest amount of sound attenuation there. The room is protected by a sound lock and every effort is made to space the doors to the air studios and the production studio as far apart as possible so that the doors to both spaces will not be open at the same time. We usually install sound absorptive material in the corridors leading to studios to create a noticeable drop in sound levels. Psychologically people tend to lower their voices and become aware of the acoustical sanctity of the studios when the entries are visibly treated with acoustical material.

The air studios must be designed to provide an environment in which the D.J. can operate most effectively for extended periods of time. The design must avoid a claustrophobic atmosphere, provide proper and effective lighting, utilize low maintenance wall finishes, afford visual control of the entrances and, if possible, have an outside view.

Interstudio windows serve the dual purpose of extending the apparent area of the space and allowing visual control of one studio from another. If possible, a window to the outside should be provided. Not only does this broaden the visual confines of the studio but it also permits the announcer to tell the listeners that it's snowing even if the weather bulletin says "fair." Soundproofing and bulletproofing these windows is mandatory.

Good lighting is critical. There should be sufficient light to be able to read and write and fixtures should be located or aimed to avoid veiling reflections. Where discs are used light should be aimed to enable accurate cueing if the turntable is not self illuminated. We prefer incandescent lights to avoid ballast hum and rf interference sometimes present in fluorescent fixtures. These lights are operated by dimmers to allow each D.J. to establish the level of illumination he finds best. Lighting is the least expensive and most effective decorating medium we have—and the possibilities are endless if sufficient flexibility is built-in. Color filters, local switches, variable positions and the full range of wattages and beam concentrations are available to create the proper ambience and an atmosphere conducive to good working conditions. In addition to the lighting required to operate the board, there should also be at least one fixture for general illumination and one for the maintenance technician to work on the rack.

Studio wall treatment and finishes are probably the most controversial, and perhaps the most expensive, item in the design. Finishes must be acoustically reflective or absorptive to properly tune the room. They must also be easily maintained, resist abrasion and damage and provide a pleasant decor. Acoustic cane fiber and mineral tiles, acoustically absorbent fiberglass and foam glass units, plastic faced rigid fiberglass board and even draperies are just a few of the materials used, and too often misused. Many of these materials are too soft and are

easily damaged, some absorb so much sound that the room is acoustically dead. Perforated panels are an invitation for everyone to hang things on the wall. We currently favor panels of perforated vinyl stretched over fiberglass differing densities which cover three walls above a wainscot. The remaining wall area including the wainscot covered in the same vinyl but unperforated. This material is easily cleaned, resists abrasion and is available in wide range of colors and textures. By changing the color on one wall or alternating colored panels the "boxed-in" feeling is reduced and the studio becomes a more pleasant, and less tiring place to work.

Incidentally, a chair rail is highly desirable in both studios and narrow corridors leading to the engineer's shop in order to reduce damage to the walls when turntables, tape decks and similar equipment are moved around.

Before we discuss electrical and mechanical problems let's just touch on a few other miscellaneous architectural items which should be considered.

Paper from the news wire should empty into a close fireproof container; if D.J.'s sit down, carpets in studios should be of static resistant nylon construction with dense, looped low pile to allow casters to roll easily. Rooms devoted to extensive production of interview shows, commercials etc., should have small closets for storing mikes, pads, ashtrays and similar paraphernalia.

The maintenance engineer's shop should have an adequate bench equipped with a sturdy shelf to support test equipment, ample electric outlets and a non-conducting fireproof wearing surface. Space should be allowed for discrete storage of parts and room to work on portable equipment. A glass covered license cabinet will discourage the removal of station and operator licenses.

Doors to studios and sound locks should be provided with glass for inspection and security. We should also mention other measures to assure safety. If the entrance is visible from the air studio it should be well lit and glazed with bullet resistant glass. Remote entries should be guarded with television cameras and intercoms. Doors should be controlled by electric strikes actuated by the D.J.

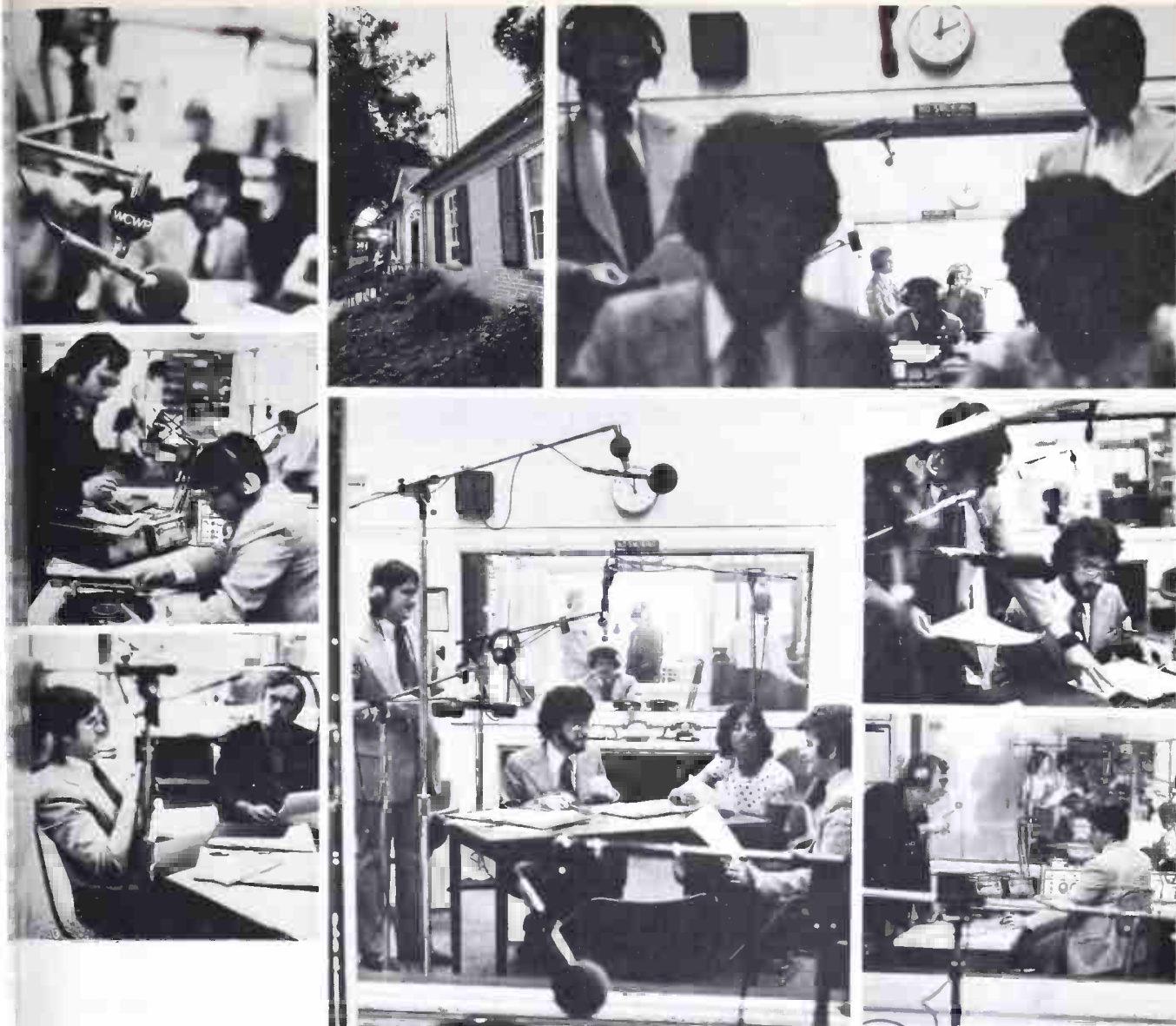
Mechanical

Heating, ventilating and air-conditioning radio studios pose certain special considerations. Systems for studios generally must be in operation continuously. They must be designed to deliver conditioned air quietly and draft free through ductwork which will stop the passage of sound from one space to another.

A completely self-contained mechanical system, independent of the central system, is required to meet the conditions. Such a system usually consists of an air cooling condensing unit or heat pump connected to an air handler which circulates air through supply and return ductwork. Provision should be made for fresh air, humidification and filtration.

Since local climatic conditions, the location and construction of the building, the available fuel, etc., vary, dictate the type of system most suitable to each job. This paper can only discuss the subject in the most general way, covering some points we have found to be common in previous projects.

We have found the most satisfactory method of cooling to be a split system in which an air handler is located in the building near the studios and air cooled condensing units are mounted outside or in a remote window. Because



Shown above during a daytime session at WCWP are: William J. Mozer . . . Nancy Toran . . . William Epperhart . . . Joel A. Feltman . . . Alan Boritz . . . Phil Lebowitz . . . Michael A. Phillips.

A Prime Training Ground For Broadcast Engineers of the Future Finds a Stanton Cartridge in Every Head

Not many college radio stations are as fortunate as WCWP, C. W. Post College, Brookville, L.I., in possessing such a magnificent building and studios. But, college radio stations all over the nation, common with WCWP, prefer Stanton cartridges for all their turntables.

WCWP has become a well known source for radio stations in search of Broadcast Engineers, for here the young trainees learn what they must know in order to qualify for that position in a regular commercial station.

William J. Mozer, Director of WCWP, and an engineer at WABC (shown directly above standing in the studio) says:

"We have never used anything but Stanton Cartridges on all of our turntables. Currently, we are

outfitted with the 681 EE which meets our needs both in terms of reliability and excellent sound quality in on-the-air playback as well as in our production of transfers. We are looking forward to a future step-up to the new Stanton 681 Triple-E".

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Whether your usage involves Broadcasting or Home entertainment, enjoy professional audio quality with Stanton products.



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printing press on the floor above there was nothing to do but isolate the studio areas by floating the ceilings.

In addition to noise there are other factors to be taken into account when selecting a location. In a multiple building the elevators must be operable day and night, seven days a week. Since one cannot expect the building to provide air conditioning or heating on this continuous basis you must be sure there is space and power available to install a self-contained mechanical system to serve the studios. Also check if a building can support masonry partitions—they're less costly to construct than light-weight partitions.

If you are going to locate a station on the top floor of a building be certain that the mechanical equipment on the roof or the water tower for the sprinkler supply is not directly overhead—otherwise workmen will be entering studios to shut off valves or adjust dampers above the ceiling.

If you anticipate the use of emergency generators check on potential locations or you may find, too late, that there is no room for them, or that they are not permitted, or that fuel storage tanks are illegal, etc.

A well planned layout must consider circulation; that is the interrelationship of functions and the separation between the sales and its staff support and the studio facilities. A simple table of organization will not always reveal the traffic flow as well as a functional relationship chart such as that in Figure 1. Your own chart will vary according to the modus operandi of your station and your format. Plans must allow for partition rearrangement should the format change. Obviously the studio block will be difficult to alter, therefore, as we will discuss later, it

should have flexibility built-in so that changes can be accomplished with the least inconvenience and a minimum cost.

Now that we've reviewed the site selection problems let's investigate the design features which must be considered. These can be grouped into Architectural, Mechanical and Electrical.

Architectural Features

A radio station can be compared to a manufacturing facility in which the product is a program. There must be clear separation between the office operation and the production function, while still maintaining a close interrelationship between them. The management and sale areas are comparatively straightforward and easy to plan whereas the operations facilities are considerably more difficult. In planning the studio complex spaces must be properly related to one another, isolated for sound, tuned for proper acoustics and should provide a self-contained environment in which D.J.'s can function at top form. Figure 2 is a plan of Station WNCN that we designed in 1964. It was selected because after 10 years it still functions perfectly with only minor changes—and so will serve to illustrate some of the points we have discussed.

The station is on the sixth floor of an existing office building so toilets, elevators and other facilities were provided. Sales and management are grouped around the studio complex and the operations personnel are close by production studios which are effectively isolated from the air studios.

I'd like to take a moment here to discuss some of the acoustical attenuation problems of studios. We mentioned

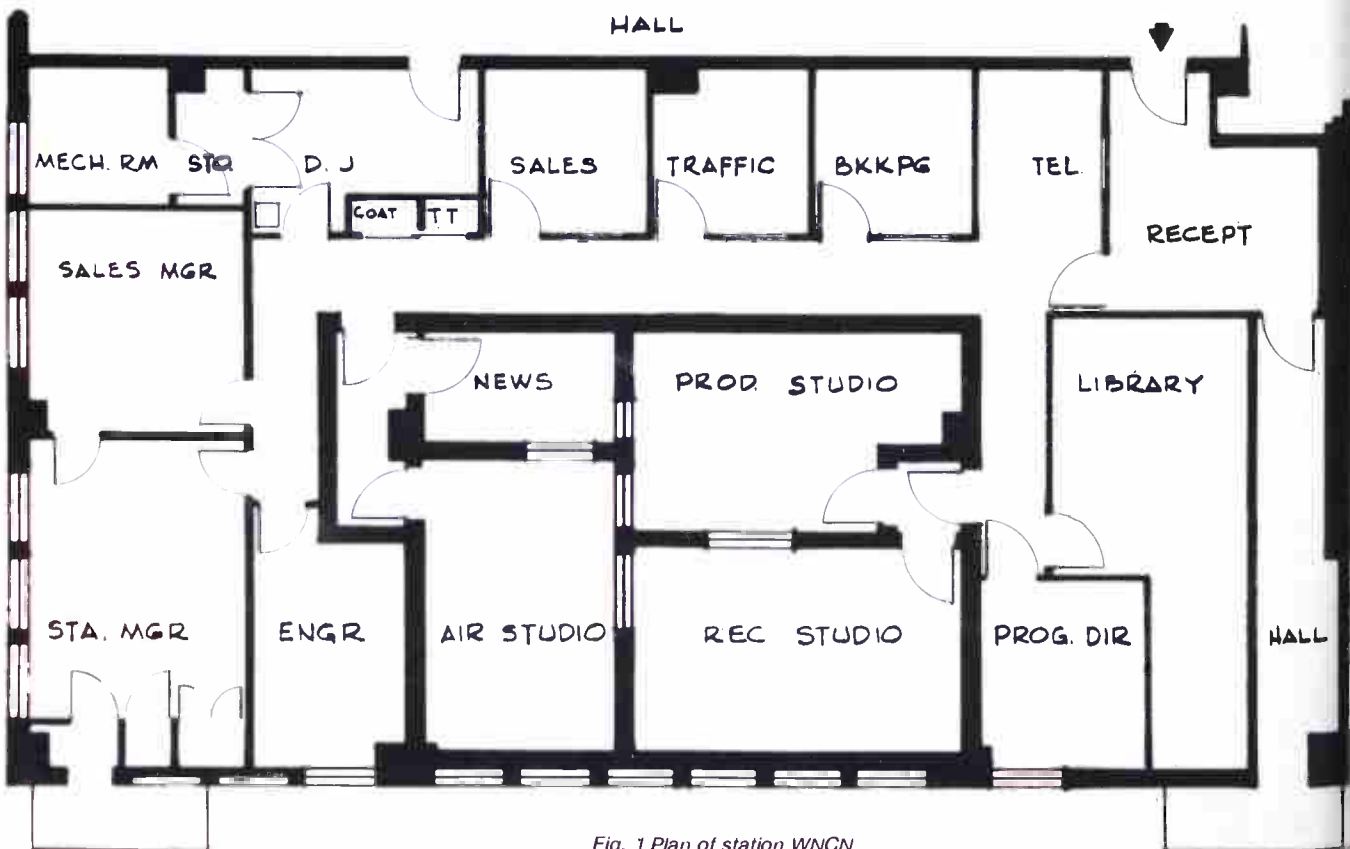


Fig. 1 Plan of station WNCN

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Now that the FCC have approved the use of a 25 microsecond characteristic on Dolby transmission, more and more FM stations will be taking advantage of this ruling to effect even better quality for their listeners.

Obviously now, more than ever, source quality is of paramount importance and the tape the Revox/Dolby B is the obvious answer.

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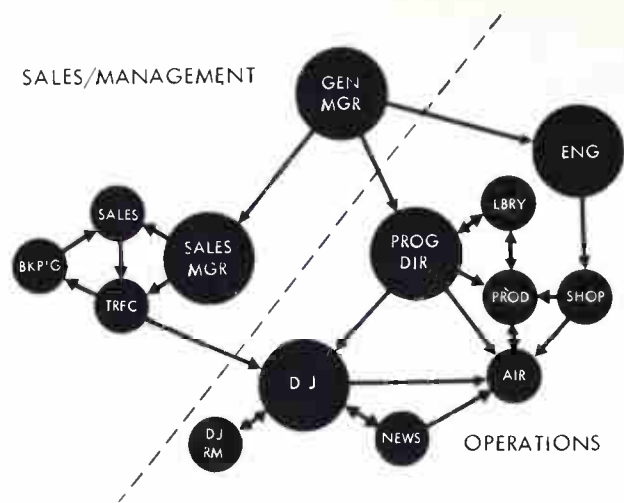


Fig. 2 Function relationship chart will reveal traffic flow

insulation required for sound attenuation and absorption is usually far in excess of that required for reducing heat loss or solar heat gain the main load will be heat gain from people, lights, and equipment. The equipment must also be sized to heat and cool fresh air. Air handlers are rarely shut down for maintenance or repair but heat pumps, evaporative condensers and compressors can be a problem. For this reason, we generally use two of these units to supply a single air handler. Each unit should be capable of providing about 2/3 the total maximum cooling, thus if one is shut down for repairs, the other can condition the spaces without excessive human discomfort. Furthermore, when one machine can handle the load operating savings can be realized.

Electric reheaters installed in the ductwork to each room permit individual temperature control Clicks and pops from static build-up on discs can be reduced by humidifying those studios where discs are used or stored. Precipitators or bag filters will quickly pay for themselves by reducing the dust in electronic equipment and thus improve reliability. Maintenance can be encouraged by placing the air handlers in an accessible location.

Particular attention should be given to the layout and acoustical treatment of the ductwork to avoid creating speaking tubes or flanking paths for noise transfer from the equipment room or between studios. It is also important to insure a complete seal where ductwork penetrates sound isolating partitions and ceilings in order to preserve the effectiveness of the acoustical design.

Electric/Electronic

The design of the electrical and electronic systems should be a joint effort by the architect and the station engineer. They should review emergency power, design for access to electronic wiring, flexibility of conduit systems, and the proper location of racks, consoles and speakers.

Stations change their formats, air studios become production rooms or go fully automated, equipment must be replaced for more sophisticated elements or something just goes wrong and must be repaired. The harried engineer has to accomplish these changes quickly without interfering with the station operation—that's when the flexibility of an installation will prove itself.

Power, telephone and electronic wiring which will pass in and out of the studio complex and between studios must

not reduce the designed sound resistance of the envelope either when initially installed or when alterations are made. Equally important is the need for accessibility for inspection, repair and relocation. To satisfy the first condition we specify looped conduits for cross-overs between adjacent spaces. These are carefully caulked and made discontinuous from the intraspace conduit system. Accessible ceilings and surface mounted raceways with removable covers provide the necessary access. The front consoles and both sides of racks must also be made accessible.

We mentioned earlier that lighting should be provided for working on the back of the rack. In addition you will need receptacles for tools, soldering irons and similar maintenance equipment. The same receptacle can also serve for vacuum cleaners and portable lighting.

Probably nothing gives us as much trouble as speaker selection and location of speakers always seems to get deferred until the end. They're one of the little surprise packages like wall mounted clocks and mike booms that appear out of nowhere and have to be fitted in at the last minute. Wall mounted speakers when run at high sound pressure levels at low frequencies pose a challenge to the attenuation of the best designed walls (and the wall often loses). We prefer to mount speakers on acoustically isolated trapezes, if we know the weight, height, and location in advance. Speakers will also be located outside the studio area and the designer should make some provision for their mounting. We know that there will be one in the reception room but sometimes forget that the D.J. will need one in the toilet room.

Emergency power is a whole subject in itself and can only be discussed briefly here. Most stations prefer to have an emergency generator for the studios as well as the transmitter. Generators are noisy and require fuel storage, exhausts, batteries and fuel supply lines in locations approved by building owners and meeting local ordinances. The question of generators must be considered early, preferably during the station site selection stage, otherwise it may become quite costly.

Conclusion

It should be apparent from the foregoing that the planning and construction of a radio station is very complex and should only be undertaken by experienced designers and planners. Investing in the services of an architect may prevent costly errors in site selection and space planning and improve the efficiency and environment of the facility. The architect can assist the owner in determining his needs, space requirements, circulation and budget. Together with his engineering and acoustical consultants, he will prepare drawings and specifications that set forth the project's requirements in detail so as to avoid ambiguity and eliminate the arguments about the scope of the work and the kind and quality of materials. Precise coordinated contract documents should result in more accurate bids so that while the total cost may not be lower the owner can be more certain of getting his money worth.

In closing we hope that you have gained a better understanding of the role an architect plays as a member of the station design team. He must be a planner, engineer, lighting consultant, cost estimator, and be capable of meshing the acoustics, electronics and environmental requirements into a unified whole where people can work effectively in pleasant surroundings. **BM**

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Stereo Tape Phase Alignment

By Robert M. Crotinger

Editor's Note: Over the past three years or so we have received and published, a number of articles, letters, technical notes on the problem of phase error in stereo tape playback, particularly highlighting the serious distortion that misalignment can produce in a monophonic (summed) signal. Mr. Crotinger's article points out very clearly the dangers in the old "peak-up-15-KHz" alignment method, unless an oscilloscope is used to check the phase relation of the two channels.

The advent of stereo brought a necessity for considering audio waves in both the frequency and time domains. Previously, time consideration for audio were of secondary, or even negligible effect. One channel was involved and the facilities were usually incapable of time disruptions of any consequence.

Consequently the industry grew up with the Bode Plot, which we call a "Frequency Response Curve," and only concerned itself with the phase response when a feedback loop was involved. We also were concerned only with total harmonic distortion, measuring it by filtering out the fundamental and reading everything that remained.

However, the ball game has changed and the possibility of the growth of quad makes the situation even more serious.

By far the majority of head azimuth alignments of stereo equipment are done by the old method which applied to monaural equipment and involved orientation of the heads to peak a 15 kHz wave recorded full track on a standard tape. New stereo equipment instruction books still outline this as the method of azimuth adjustment.

However, let us consider the possible positions for the two pole pieces involved in a stereo tape reproduction head operating at $7\frac{1}{2}$ inches per second. The width of the head gap is commonly 0.1 mil. Fig. 1 shows the length of tape occupied by a half wave at various frequencies when the tape is moved at $7\frac{1}{2}$

Frequency	Length of Tape Occupied by a Half Cycle, $7\frac{1}{2}$ I.P.S.
1000 Hz	3.75 mils
5000 Hz	0.75 mils
7500 Hz	0.50 mil
10,000 Hz	0.375 mil
12,500 Hz	0.30 mil
15,000 Hz	0.25 mil

FIG. 1 DISTANCE PER HALF-CYCLE

Mr. Crotinger is Technical Director, KFMD, San Diego, Calif.

inches per second. The considerations involving equalization to overcome the head output variation across the passband are well known. What apparently is not very well known is the possibility of complete phase reversal between the two channels when alignment of a head gap of such minute dimensions is undertaken with the crude method that was entirely satisfactory for monaural equipment.

Consider for the moment Fig. 2, which shows an enlarged "artist's conception" of what takes place between the tape and the heads during alignment. The head gaps are shown above the tape, with the dotted lines indicating their position of contact on the tape. Since the head is an inductive device, it will produce maximum output when the rate-of-change of magnetic flux is greatest and the gap is shown at this position on the wave in each of the two cases considered. Part "a" shows proper orientation, in which case gap No. 1 and gap No. 2 are both producing peak output from the same wave on the pre-recorded standard tape. Note at this point that the standard tape is recorded "full-track." If a standard tape is properly made, it can be played back in either direction and peak output will be produced from a monaural head without re-orientation.

In sketch "a," the actual dimensions of a 3-track head (as used in a stereo cart machine) are shown with a scale of 100 mils to one inch. Note that the squares containing the head number *do not* represent the gap width, but merely the "face" of the particular head. The actual gap, as noted on head No. 2, is one $\frac{1}{10}$ of a mil, a dimension which is so small that even this magnification cannot show it.

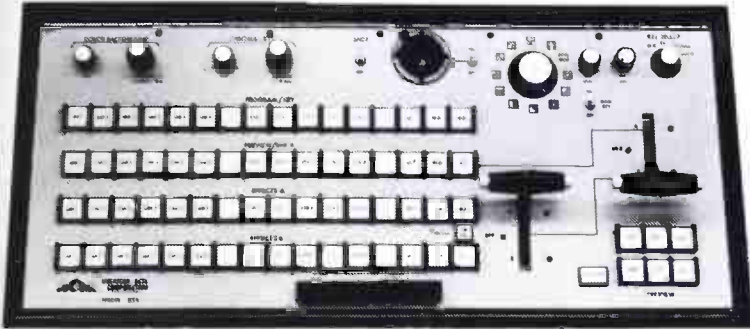
Notice also, the linear distance on track No. 1 which is shown to be occupied by 20 cycles at 15 kHz. This sketch clearly illustrates the fact that a small fraction of a degree of movement of the perpendicular dotted line will cause the track No. 1 and track No. 2 gaps to be contacting different cycles of the recorded wave.

This situation is better illustrated in Fig. 2B, where the vertical scale has been maintained at 100 mils per inch, but the horizontal scale has been "stretched" so that 4 mils occupy one inch. Bear in mind that the angle ϕ by which the improper orientation departs from the perpendicular is only a fraction of a degree. The error in orientation shown here has resulted in a complete 360 degree reversal of phase between the left and right channel waves.

Since the angular position of the head on the tape remains fixed, while the audio frequencies coming from the tape vary in length of tape that they occupy (for a given frequency), the amount of phase error

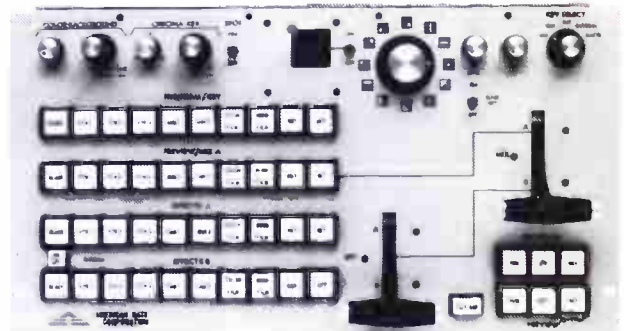
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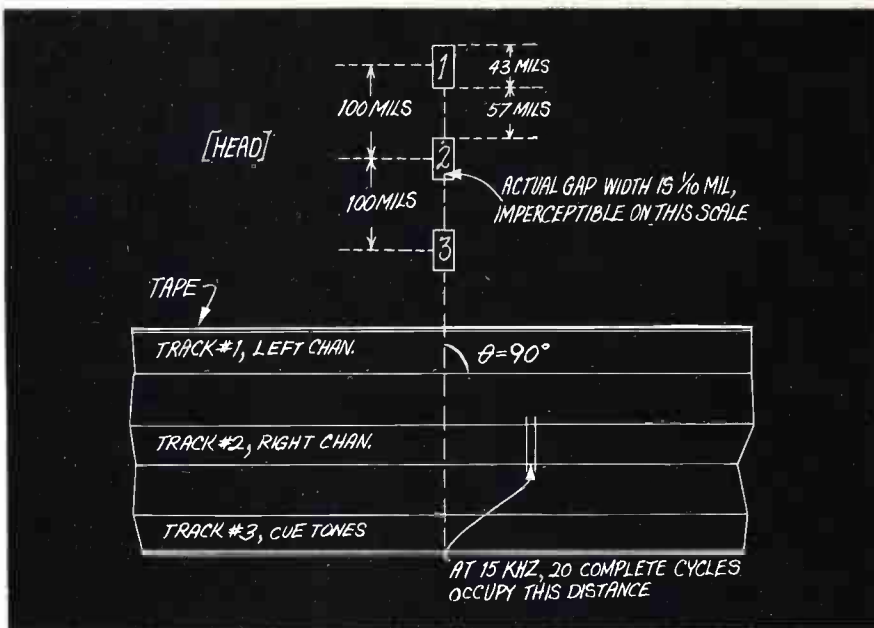
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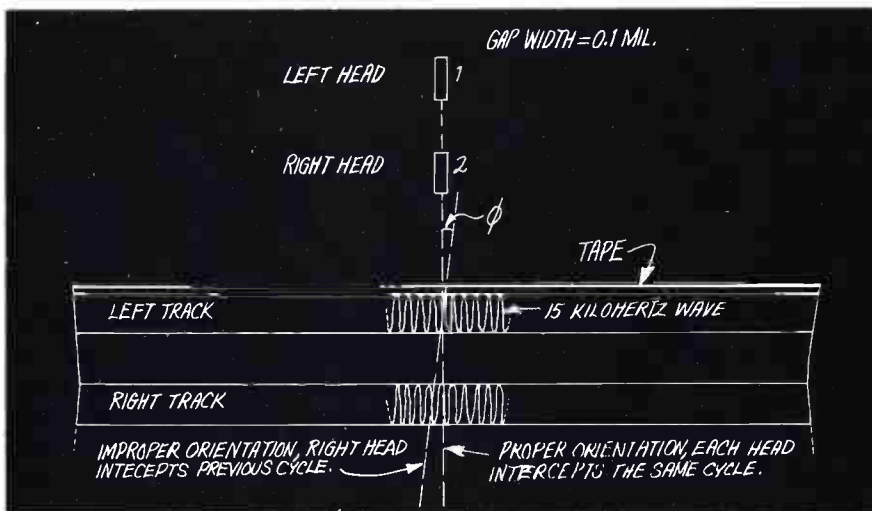
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Enlarged drawing of head gaps and track widths shows how little misalignment is needed to introduce one or more cycles of phase error.



Greatly enlarged representation of kHz signal on tape, shows how azimuth error of head causes right track gap to intercept cycle ahead that at left gap. Actual misalignment to produce this effect is a small part of one degree.

represented by this maladjustment will vary across the passband. Fortunately, there is a very simple and straightforward method of measuring the variation of this phase angle; either during the playing of the standard tape, or while adjusting the record-reproduce function.

This method of assuring proper perpendicularity is by observation of a Lissajoux pattern on an oscilloscope while alignment is being attempted. The scope is set up for an X-Y plot and the left and right outputs of the machine are connected to the X- and Y-inputs of the scope. Remove first one input and then the other to adjust each of the scope channel gains to produce a vertical (or horizontal) line of a fixed, convenient amplitude while playing back the standard tape frequency run midband tones.

Now, rewind the standard tape to the 15 kHz azimuth alignment tone. Observation of the tape machine output meter(s) may be used to "get in the ballpark." The scope presentation will provide a critical look at the channel-to-channel phase departure. The ideal presentation is that of Fig. 3B, which indicates that both channels are exactly in phase. This will be difficult to obtain as a stable presentation at 15 kHz

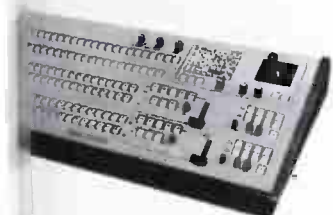
due to the variation in tape speed; the presentation of this frequency will vary from that of Fig. 3B to that of Fig. 3A. The amount of "warble" present in a given machine will be indicated by the stability of this pattern.

Once an apparently correct alignment is achieved, fast forward the standard tape to the "frequency run" section and play it completely through while watching the scope. Ideally, the phase presentation should remain as Fig. 3B for all tones. The most serious deficiency occurs when the phase departure is as indicated in Fig. 3D, which will be approached through the presentation in Fig. 3C. If this occurs, you may be assured that the particular frequencies concerned will be missing when the left and right outputs are unimpairedly combined in loudspeakers as stereo, or when they are combined to produce a monaural signal. You may also be assured that the frequencies above and below these are going to be seriously attenuated.

The cure, of course, is to return to the 15 kHz alignment tone and rotate the azimuth until the Lissajoux pattern undergoes a 180 degree "flip." Then try the frequency run again. Practice with this method will soon give you a "feel" for the proper position.

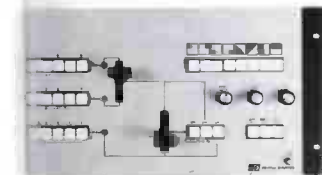
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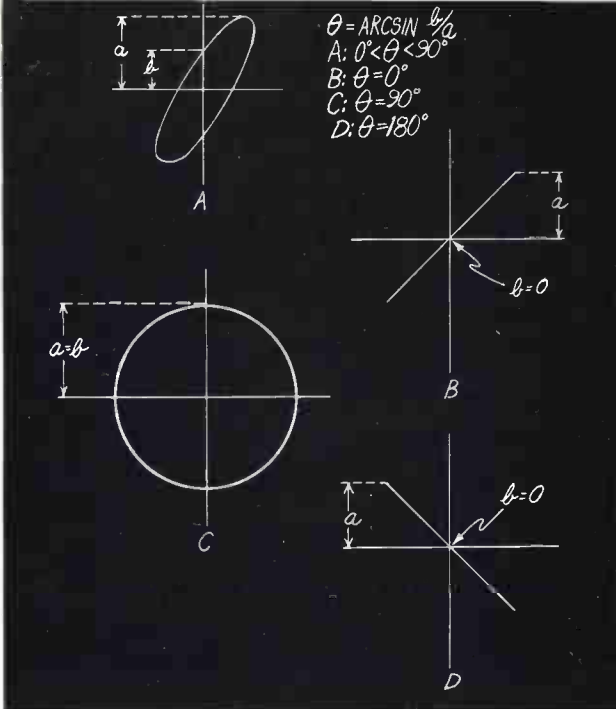
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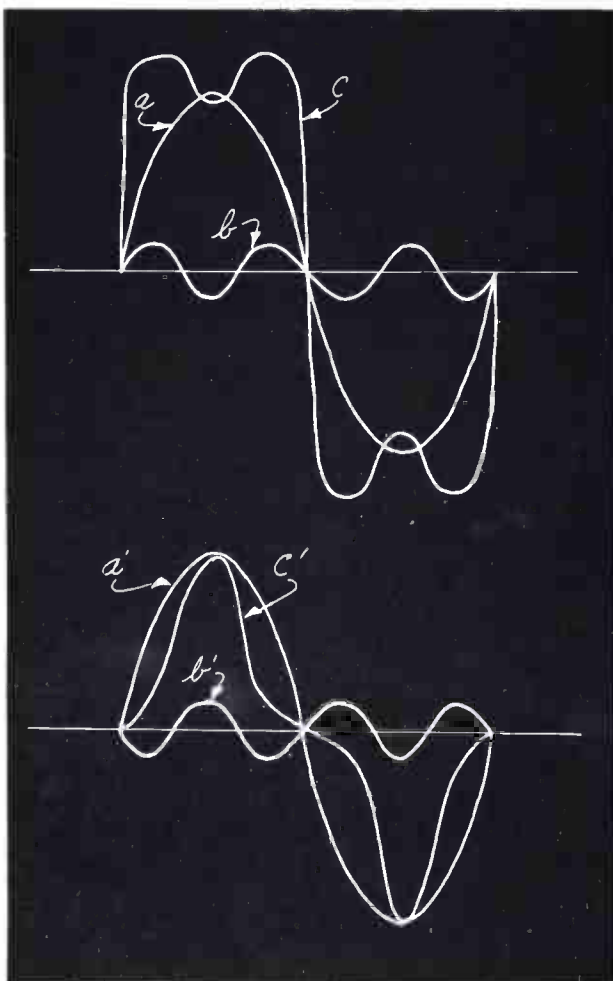
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Lissajous patterns on an oscilloscope show phase relations of the two channels. Pattern B occurs when the two channels are in phase, pattern C for a 90-degree difference, pattern D for 180-degree difference



A shift in phase between the two signal elements a and b to the relation shown as a' and b' shifts the sum signal from c to c', audible as distortion.

My own experience has been that the chances suffering at least one phase turnover when aligning strictly by a meter are greater than 50%. On one occasion, I found three phase reversals within the passband. The difference between the correct and the incorrect position is only a few degrees rotation of the nut driver or screwdriver you are using.

When a satisfactory response has been obtained in the playback mode the same procedure should be followed for the orientation of the record head.

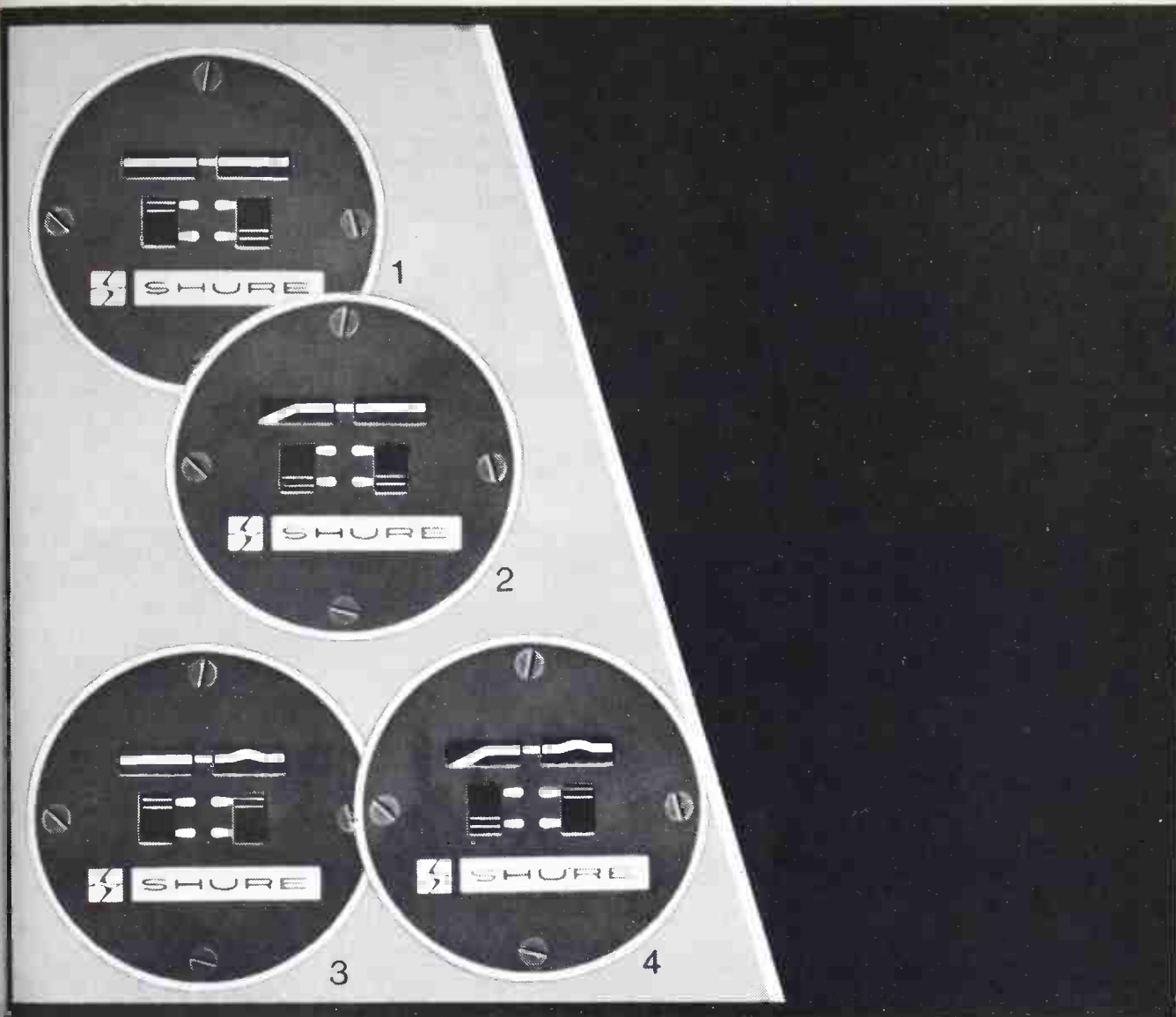
As to the consequences of this type of misalignment, consider the make up of a musical note. For any given instrument, the audible characteristics that distinguish the note are: 1) a rise time; 2) a decay time; 3) a fundamental sine wave; and 4) a combination of harmonics in certain definite amplitude and phase relationships. The first two are primarily considerations of other parts of the system that we are considering here. However, the third and fourth are directly related to our head azimuth and can exhibit detrimental effects.

Musical notes consist of an infinite variety of "strange-shaped" waveforms, which we are accustomed to seeing in the time domain presentation of an oscilloscope. We know that at any given point in time there can only be one voltage across a two-terminal device (such as a loudspeaker). However, if the voltage makes a change that is not at the angular velocity of a sine wave, or in other words not at a constant angular velocity, this results in the creation of energy at different frequencies within the spectrum. This principle is defined by Fourier Analysis and operates in the "frequency domain." In order to faithfully reproduce the tonal quality of a particular instrument, and its apparent position in space (for stereo), we must preserve both the amplitude and the phase characteristics of these various sine waves throughout the passband.

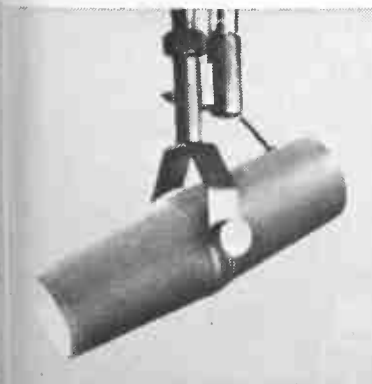
As an illustration of the effect consider the "approximate" square wave of Fig. 4A (waveform "c" which might represent some instrumental note. Waveform "c" is the one we would see in the time domain presentation of an oscilloscope. However, the creation of this square wave was actually the result of energy in the frequency domain, generated as sine waves "a" and "b." These are the first and third harmonics of the note involved. If this note should appear in both left and right stereo channels, and we were to preserve the amplitude response in each channel, but incur a phase reversal for the third harmonic, the resulting time domain wave would appear as in "c'" in Fig. 4. During the first 60 degrees there is now a subtraction of "b" from "a" instead of an addition; and from 60 degrees to 120 degrees there is an addition of these instead of a subtraction, etc. A definite change has taken place in the "air compression" wave that would come from a loudspeaker.

If this sort of thing happens to the various notes of a musical selection, the trained "Golden Ear" (this is always one in our midst), will say that "there's something wrong with it." However, since it is not so more evident distortion due to clipping, etc., it will be more obscure and the "Golden Ear" will "not be able to say exactly what it is, but it's not right." All this is very disconcerting for the technician who uses meters for alignment and makes frequency runs on stereo tape machines.

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 3. TV
 4. portable

Altec*, Ampro*, Audio Services 1-2*, Audiotechniques*, Audiotronics 1-4*, Autogram 2*, Broadcast Electronics*, BSC*, CCA*, Cetec*, Collins, Dipol, Dyma*, Electro Sound 4*, Fairchild 1-4*, Micmix*, McCurdy*, Neve 1-4*, Opamp, Philips*, Quad-8*, Ramko*, Russco 2*, RCA 1-4*, Revox*, Sparta 1-4*, Spectra-Sonic*, Systems Eng. 1-3, Shure*, Sarkes-Tarzian, TeleMation, UREI 1-2*, UAP, Visual Electronics 3, Ward Beck, Wilkinson*, LPB, A-P

Headsets

Audio-Technica*, Audiotronics*, Electro-Voice*, Gotham*, Harris*, Koss, Pulse Dynamics*, Philips*, RCA*, Revox*, Stanton*, Sarkes-Tarzian, TEA*, Telephonics, Telex*, Sennheiser*

Intercom Systems

Altec*, Clear-Com, Dyma, Heath*, McMartin, McCurdy*, McGraw-Ed*, Philips*, RCA*, Revox, Sarkes-Tarzian, TEA, UAP, Video Aids*, Visual Electronics

Microphones
 1. dynamic
 2. condensers
 3. electret
 4. wireless
 5. shotgun
 6. lavalier
 7. booms & dollies

AKG*, Advent 1*, Altec*, Atlas, Audiotechnical 1-3,6*, Audiotronics*, B&K*, Dyma, Electro-Voice*, Gotham 2,6-7*, Harris*, JVC, Philips*, RCA, Revox 1,6,7*, Sony, Sparta 1-7*, Shure*, Sennheiser*, TEA*, Turner, Vega 4*, Vital

Music Synthesizers Arp, Ionic, Electrocomp, Moog

* data on these products verified and on file with BM/IE

Noise Reduction Systems	Advent*, B&K*, Burwen*, DBX, Dolby*
Patch Panels	Audio Services, Cooke*, Dyma, McCurdy*, RCA*, Trompeter
Reverb Unit	Dyma*, Fairchild*, Gotham*, Micmix*, Parasound*, Quad-8*
Tape, Audio 1. reels 2. cartridge 3. cassettes 4. test tape	Advent 3,6*, Agfa-Gevert*, Ampex 1-4*, Aristocart 2*, Broadcast Electronics*, Capitol Magnetic 1-3*, Dyma, Fidelipac 2*, GBC, Memorex*, 3M*, Nortronic 4*, SMC*, Sparta 2-4*, Taber 4*, TDK, Wabash
Tape Accessories 1. empty reels 2. storage rack 3. tension gauge 4. tension control 5. loader	Capitol Magnetic 1*, Fidelipac 2, Inovonics 4*, Micro-trak 2*, Plastic Reel 1, Polyline 1, Sparta 2*, Storeel 2, Tentel 3, Ramko 5*
Tape Heads	Canon*, Electro Sound*, Forglo*, Minneapolis Mag*, Nortronics*, Sparta, Saki*, Taber*, Vikron*
Tape Editing Equip	Automated Processes, Central Dynamics*, Elpa*, EECO*
Tape Recorders 1. portable 2. studio	Advent*, Akai 1-2*, Ampex 1-2*, Audio/Tek 2*, B&K 1*, Crown*, Elpa*, Electro Sound 1-2*, Gotham 1-2*, ITC*, Otari 1-2*, Pentagon, Philips*, Rowe*, RCA*, Revox 1-2*, L. J. Scully, Scully/Metrotech 1-2*, Schafer*, Telex*, TapeAthon, VIF*
Tape Cartridge Equipment	Akai, Ampro*, Audiotronics*, Broadcast Electronics*, CCA*, Control Design*, Garron*, Harris*, Heath, IGM, ITC*, RCA*, SMC*, Sparta, Schafer*, Tapecaster, Telex
Tape Duplicators	Ampex*, Audio/Tek*, Broadcast Electronics*, Cetec*, Electro-Sound*, Pentagon*, Philips, Recortec*, Telex*, Visual Educom*
Tape Erasers	Fairchild*, Fidelipac, Garner*, Nortronics*, RCA*, Taber*, UMC
Turntables, Accessories 1. turntables 2. disc recording 3. arms 4. cartridge stereo 5. cartridge guard 6. stylii	Astatic 4, Altec*, Audio Technica 3-6*, B&K*, CCA, Elpa 1,3*, Gotham 1,2*, Harris*, LPB*, McMartin 1-6*, Philips*, Russco 1,3*, RCA*, Sparta 1,3,4,6*, Stanton 1,4,5,6*, Shure 4*
Speakers	Acoustic Research*, Advent*, Akai*, Altec*, Audiotechniques*, Cetec*, Crown*, Electro-Voice*, Gotham*, Heath*, Pulse Dynamics*, Philips*, RCA*
Audio Accessories 1. time code synchronizer 2. custom switches 3. quad matrix encoder 4. special effects 5. delay 6. stereo phase enhancer	Altec, Ampex 1,9*, Automated Processes 1*, Audio Services 2*, CBS Labs 3*, Dyma 2*, Eventide 4,5*, Garron 6*, Gotham 5, Johnson 7*, Lexicon 5,8*, Pacific Recorder 1,9*, Sansui 3

7. wobbler
8. speech compressor/expander
9. var. speed gen.
10. voice coupler

VIDEO EQUIPMENT

Cameras, TV Color Studio
 1. over \$50,000
 2. \$25-50,000
 3. below \$25,000

Akai 3*, Ampex 1*, CEI*, Cohu 3*, Fernseh 1-2*, GBC*, Hitachi 3*, Harris 2*, IVC 1-2*, JVC 3*, Magnavox 3*, Marconi 1, Philips 1-3*, RCA 1-3*, Sony 3

Cameras TV Portable
 Akai*, ASACA*, CEI*, Editel*, Fernseh*, GBC*, Ikegami, Hitachi*, JVC*, Magnavox*, Moxon*, Philips*, RCA*, Sony, TeleMation*

Cameras TV Mono
 Akai*, ASACA*, Ampex*, Benjamin, Concord, Cohu*, General Dynamics*, Hitachi*, Javelin, JVC*, Koyo, Sony, TeleMation*, Visual Educom*, Vicon

Camera Lens
 Angenieux, ASACA, B&L, Canon*, Comquip, Cosmicar*, JVC*, Rank*, Schneider*, Tele-Cine, Visual Educom, Visual Method, Zoomar

Camera Heads, Mounts, Dollies, etc.
 ASACA, Birns & Sawyer*, Comquip, GBC, ITE, JVC*, KVC*, Listec*, RCA*, Telecom, Vicon, Video Sentry

Remote Control Mounts
 Cunningham, Power Optics*

Character Gens.
 Chiron*, CBS Labs*, Cooke*, Datavision*, GBC, Kansas State Network, Kaitronics, Laird, Lexicon*, Moxon, MSI*, RCA*, TeleMation*, Video Data*

Chroma Keyers
 American Data*, Astrionics*, Central Dynamics*, CBS Labs*, Grass Valley*, Richmond Hill*, RCA*, Telemet*, UAP, Vital*

Dropout Compensators
 IVC*, 3M*

Encoders
 Cohu*, Lenco*, 3M*, RCA*, TeleMation*

Enhancers
 Cohu*, CBS Labs*, Dynasciences*, 3M*

Film Telecine Chains (16mm, slide proj., multiplexers)
 Avtel, B&L, Buhl Optical*, Cohu*, Fernseh*, GBC*, Harris*, IVC*, MSI*, Philips*, RCA*, Singer*, Spindler-Sauppe, Telecom, TeleMation*, Zeimark, Marconi*

Film from Video transfer
 Palmer*

Monitors
 1. b&w
 2. color
 Amtron 2*, ASACA*, Audiotronics 1-2*, Ball(Mirate) 1-2, Broadcast Electronics (Modutec)*, Conrac 1-2*, Electrohome*, Fernseh 2*, Hitachi 1-2*, JVC 1-2*, Magnavox, MSI*, RCA Service*, Sarkes Tarzian, Sharp, Tektronix 1-2*, Unimedia*, UAP*, Video Aids, Visual Educom*, World Video*

Monitor Calibrator
 Minolta, Power Optics*, TEA*, Tektronix*

Processing Amplifiers
 American Data*, Central Dynamics*, CBS Labs*, Control Concepts*, Dynasciences*, Grass Valley*, Lenco*, RCA*, Sarkes Tarzian, Tektronix*, TeleMation*, Telemet, Vital*, 3M

Pulse & Distribution Amplifiers
 American Data*, Bethany, Central Dynamics*, Cohu*, CBS Labs*, Cooke*, Datatek*, Dynascience*, Dynair*, Grass Valley*, Harris*, Hitachi*, Lenco*, Marco Video*, Ominix, Richmond Hill, RCA*, Sarkes Tarzian*, TeleMation*, Telemet*, Viscount*, Visual Educom*, Vital*

Routing Switchers
 American Data*, Central Dynamics*, Cohu*, Dynasciences, Dynair*, JVC, Marco Video*, Ominix, Richmond Hill, RCA, Sarkes Tarzian, TeleMation*, Telemet*, Viscount*, Vital*, 3M

Sync Generators
 American Data*, Central Dynamics*, Cohu*, CBS Labs*, Colorado Video*, Control Concepts*, Dynasciences*, Dynair*, Grass Valley*, GBC, Hitachi*, JVC*, Lenco*, Richmond Hill, RCA, Sarkes-Tarzian*, TeleMation*, Telemet, Video Aids*, Visual Educom*

Special Effects Generators
 American Data*, Ball, Biomation Central Dynamics*, Colorado Video*, Dynasciences, Dynair*, Grass Valley*, GBC, Hitachi, JVC, Ominix, Richmond Hill, RCA*, Sarkes Tarzian*, TeleMation*, Telemet Viscount*, Visual Educom*, Visual Electronics, Visual Methods*, Vital*, 3M

Other Generators
 1. quad split
 2. color black
 3. cue tone
 4. time/temp
 American Data 1*, Central Dynamics 2-3*, Datavision 4*, Lenco*

Switchers, Production
 Central Dynamics*, Cohu*, Grass Valley*, Richmond Hill, RCA*, Sarkes Tarzian*, Telemet*, Viscount*, Visual Elec., Vita*

Other Video Switchers
 American Data, Central Dynamics*, Cohu*, Dynair, Grass Valley*, Lenco, 3M, Marco Video*, Ominix, Richmond Hill, RCA*, Sarkes Tarzian*, Shintron, Telemet*, Viscount*, Visual Electronics and most CCTV suppliers

Switchers, Automated
 Central Dynamics*, Grass Valley*, Sarkes Tarzian*, Visual Electronics, Vital*

Standards Converters
 Fernseh

Time Base Correctors
 Ampex*, CVS, IVC*, 3M*, Televisor Microtime*

Videotape
 Ampex*, Fuji, Irish, Karex*, 3M*, Memento*, Videotape Co.

Videotape Recorder/Player
 1. quad
 2. helical
 3. segmented-helical
 4. automated
 AKAI 2*, Ampex 1-4*, ASACA 1, Echo Science 3*, Fernseh, IVC 2-3*, RCA 1,2,4* Sony

Video cartridge/cassette equip.
 Hitachi, IVC*, JVC*, Panasonic, Philips* Sony*, RCA

Videotape Editing Aids
 1. editors
 2. time code gens.
 3. accessories
 AF Associates 3*, Central Dynamics 1-2*, CMX Systems 1-2*, Datatron 1-2*, Dynasciences 1*, EECO 1-2*, Recortec*, Sony Spectra Vision, Television Res. Int'l., Video Aids 1*

Videotape Access.
 1. tape cleaners
 2. VTR head cleaners
 3. replacement heads
 Nortronics 2*, Recortec 1*, TEA 1*, Taber 3*, Videomax 3*

TV-Film Transfer
 Palmer*, Teledyne

Video Identification Systems
 Central Dynamics, Grass Valley, 3M*, TeleMation*

Video Discs
 Ampex, Arvin, Data Disc

Video Production Aids
 1. time code equip.
 2. colorizers
 3. animation
 4. fixed lens adaptor
 Central Dynamics 1*, Chronolog 1*, Colorado Video 2*, Computer Image 3*, Comquip 4*, Kaitronics 1

Misc. Video Equip.
 1. automatic telecine light control
 2. video film noise reducers
 3. video filters
 4. color correctors
 5. comb decoders
 6. equalizers
 7. A/D converters
 Beston 1*, Burwen 2*, Coastcom 3*, CBS Labs 4.5*, Datatek 6*, Biomation 7*

FILM EQUIPMENT

Cameras, Cine
 Arriflex, Bach Auricons, Canon*, Cinema Products*, Cohu, Kodak*, Eclair*, Frezzolini*, Paillard, RCA*

Camera Lens
 Angenieux, B&L*, Canon*, Cinema Products*, Cosmicar, Eclair*, Frezzolini*

Camera, Tripods
 Birns & Sawyer, Cinema Products*, Eclair*, KVC*, RCA*

Carrying Cases
 Eclair*, GAF*

* data on these products verified and on file with BM/E

	Capital Magnetics*, Cohu, Fuji, GAF*, Kodak*
Cleaners	Treise*
Editing Equipment	Birns & Sawyer, Lipsner-Smith, Magna-Sync*
Processors	Filmline, GAF*, Kodak*, Harwald, Jamieson*, Magnatech*, Treise*, HF Photo*, Pako
Projectors (motion picture, slide)	GAF*, Kodak*, Kalart-Victor, Lipsner-Smith, Palmer*, RCA*
Magnetic Recording Accessories	Cinema Products*, Dolby*, Electro Sound*, Magnatech*, Magnasync*
Color Film (pollution control, silver recovery, slide masks & mounts, color from b&w)	CPAC 1*, Profit Recovery 1, Heindl 2*, Abto 3*

LIGHTING

Lamps	GE*, GTE/Sylvania*
Lighting fixtures incl. stands & hangers	Bardwell-McAlister, Berkey Colortran*, Birns & Sawyer*, Cinema Products*, Kliegl*, Lowell*, Mole-Richardson, Packaged Lighting, Revox*, Skirpan, Strand Century*, Smith-Victor*
Light Dimmer Controls	Berkey Colortran*, Kliegl*, Richmond Hill, Skirpan, Strand Century
Power Terminals	Berkey Colortran*, Kliegl*

STUDIO EQUIPMENT SET DESIGN

Refabricated Machinery	Feller Vacuum
Cameras, titling equip.	Chiron*, Q-TV/Telesync*, Reynolds/Let-eron*, Telecom*, Video Data, UAP
Stage Design	Fiorentino
Stage/Impose Aids	Front Projection, Telestrator

RECEIVING TRANSMITTING EQUIPMENT

Demodulators	Catel*, Dynair*, Harris, RCA*, R&S*, Scientific Atlanta, Telemet, Wilkinson*
Detectors	Alford*, CCA*, Collins*, Continental*, Harris*, RCA*, R&S*, Sparta*
Exciters	Acrodyne*, CCA*, Dynair*, Harris*, McMartin*, RCA*, R&S*, Sparta*, Sintronic*, Varian*, Wilkinson*
Modulators	Catel*, Dynair*, Fung*, Harris, Phasecom* RCA*, Scientific Atlanta*, Telemet, Varian
Microwave Equipment	Andrew*, Alford*, Collins, Communication Carrier*, EMCEE*, Farinon*, GTE Lenkurt*, Hitachi*, Moseley*, Microwave Associates*, Raytheon, RHG*, RF Systems, R&S, Soladyne, Terracom, Varian
Remote Control Programs	Autogram, Bird*, CCA*, Delta*, GTE/Lenkurt*, Harris, McMartin, Marti, Moseley*, RCA*, Sparta, Rust*
Remote Pickup & ST	CCA, Farinon*, GTE/Lenkurt*, McMartin*, Marti*, Moseley*, Rust*, RCA*, Sparta, Wilkinson
Receivers	Conrac*, Fixtune, Heath, TFT*, Unimedia*
Amplifiers	Acrodyne*, Belar*, B&K*, McMartin, Moseley*, Rodelco*, RCA*, R&S*, Sparta, Wilkinson
Speakers	Alford*, Bird*, Continental*, Dielectric*, Electro Impulse*, RCA, R&S*, Television Technology*

RF Switchers	Alford, Dielectric*, Harris, ITT Jennings*, RCA, R&S
SCA Equipment	Belar*, CCA, Johnson*, McMartin*, Moseley*, Permadyne, RCA*, Sparta*
Translators 1. FM 2. TV	Acrodyne 2*, EMCEE 2*, Rodelco 2*, RF Systems*, Television Tech 1-2*, R&S, Varian
Transmitters, AM	AEL, CCA*, Collins*, Continental*, Harris*, LPB*, McMartin*, RCA*, R&S, Sparta, Sintronic*, Wilkinson*
Transmitters, FM	AEL*, CCA*, Collins*, Harris*, LPB*, McMartin*, RCA*, R&S, Sparta*, Sintronic*, Wilkinson*
Transmitters TV	Acrodyne*, CCA*, EMCEE*, Harris*, Rodelco*, RCA*, R&S, Varian
Misc. RF equipment 1. video filters 2. phase equalizer. envelope corrector 3. program subcarrier 4. carrier current 5. phasing networks 6. RF attenuators 7. Satellite stations 8. facsimile	Alden 8, Coastcom 1*, Datatek 2*, Farinon 3*, LPB 4*, Multronics 5*, McGraw-Ed 6*, Scientific-Atlanta 7, TEA 2, Teleautograph 8*, Wavetek 6*

ANTENNAS, TOWERS TRANSMISSION LINES

Antennas, AM	Andrew Tower*, Collins, Continental*, Harris*, Jampro*, Multronics*, RCA*, Stainless
Antenna, FM	Alford*, CCA*, Collins*, Dielectric*, Harris*, Jampro*, McMartin*, RCA*, Shively, Sparta*, Phelps Dodge
Antenna, TV	Alford*, Andrew Corp*, EMCEE (Bognar), CCA*, Harris*, Jampro*, RCA*, Shively, Sparta*, Marconi
Antenna Microwave	Alford, Andrew Corp*, Anixter*, Bognar, Prodelin RF Systems, Scientific-Atlanta*
Towers	Andrew Tower*, Fort Worth Tower*, Grasis, RCA, Rohn*, Stainless
Tower Hardware	AirSpace*, Andrew Tower, Preformed*, Rohn*, Stainless*
Tower Lighting	Andrew Tower*, Dielectric*, Hughney*, ILC, RCA*, Rohn*, Sparta, Stainless
Transmission Line & Connectors	Alford, Andrew Corp*, Cablewave*, Dielectric, RCA, SWS, Sparta, Scientific-Atlanta

MEASURING, MONITORING LOGGING EQUIPMENT

Antenna Monitors	Delta*, Dyma, McMartin*, Micro-Trak, Potomac*, RCA, Sparta, Wilkinson
Clocks, Time Systems	American Data*, Birns & Sawyer*, Bulova*, ChronoLog*, Control Design*, Cooke*, Efraton, ES, Eventide*, MicroTrak, Nationwide, Standard Time*, Systron Donner, Sparta*, Stancil Hoffman, Scully Metro-tech*, Tapecaster, TFT*, Tracor, Visual Electronics
Demodulators	CCA, RCA, Scientific-Atlanta, R&S*
Field Intensity Meters 1. AM 2. FM 3. TV	Ameco 3*, Arvin 3*, B-T, Delta 1*, Fluke, Jerrold 3, McGraw-Ed., Potomac, RCA*, R&S 1-3*, Sadelco 3*, Sparta 1-2*, Singer*
Frequency Counters	Ballantine*, Bulova*, EIP*, ES*, Fluke, Heath*, H-P*, Marconi*, Philips*, R&S*, Systron Donner, Sparta*, TFT*, USC*
Signal Generators, Audio	Ailtech, B&K*, Control Concepts*, Dyma, Elpa*, Gen. Radio, Heath*, H-P, McMartin, RCA*, R&S, Systron Donner*, Sparta*, Spectra Sonic, Texscan*

dB Meters	Ballantine, B&K*, DBX Cetec, Dyma, Quad-8*, R&S, USC*, Weston
Harmonic Distortion Meter	B&K*, Control Concepts*, Crown*, Elpa*, Heath*, H-P*, R&S, Sparta
Intermodulation Meter	Control Concept*, Crown*, Heath*, McGraw-Ed*
Wow & Flutter Meter	DBX, Elpa*, Gotham
Rumble Meter	Gotham
Phase Meters	B&K*, Control Concept*, Delta, Gotham, H-P, Potomac, RCA, Wavetek
Impedance Bridge	Alford*, B&K*, Delta*, Heath, H-P, R&S, Texscan*
Modulation Monitors	Belar*, CCA, McMartin*, Marconi*, RCA*, Sparta*, TFT*, Wilkinson
Picture Monitors 1. b&w 2. color	Amtron 1-2*, Broadcast Electronics*, H-P, Tektronix*, UAP*, World Video
Sideband Analyzers	B&K*, H-P*, Marconi*, RCA, R&S*, Systron Donner
Spectrum Analyzers	Bauch & Lomb, B&K*, H-P, Marconi, R&S, Systron Donner, Tektronix*, Texscan
RF Watt Meters	Bird*, H-P*, McGraw-Ed. R&S*, RCA*
Status & Alarm Indicator	Bird*, McBee, Moseley*, Marti, Rust*, Sparta*
Loggers	Harris, McBee, Moseley, Rust, Revox, Sparta, Stancil Hoffman*, Scully-Metrotech*, TapeAthon
Waveform Monitors	American Data*, Ballantine*, Gen. Radio, H-P*, Tektronix, Telemet, R&S, UAP*, Wavetek*
Video Test Generators	American Data*, CBS Labs*, Marconi*, Philips*, R&S*, Tektronix*, Telecom, Telemet, Wavetek
Vectorscope	Beston, Tektronix
Cross Pulse Generator	Video Aids, Video Concepts*, UAP*
Automatic TV monitor	CBS Labs, Marconi, Tektronix
Special 1. audio chart recorder	Audio-Technica

CABLE TV EQUIPMENT

Antennas, Receiving	B-T, Cadco, Cush Craft, Jerrold, JFD, Lindsay*, RF Systems*, Scala, Sitco*, Scientific Atlantic*, Weingard
Cable 1. distribution 2. drop	Anaconda (System Wire) 1,2*, Ava, Belden 2*, Cerro, Comm/Scope*, Essex 1-2*, General Cable*, Phelps Dodge*, Plastoid, Times Wire, Theta-Com
Connectors	AEL Comm.*, American Tech*, AMP*, Cambridge*, Cerro, Comm/Scope*, Dolphin, Gamco, Gilbert*, GTE Sylvania*, ITT Canon*, ITT Gremer, Jerrold, LRC*, Lindsay*, Magnavox*, Philips Dodge*, Pyramid*, Tidal
Converters	B-T, Digital Comm., Hamlin, Interactive Video, Jerrold, K'Son*, Magnavox*, Oak*, Tocom*
Distribution Amplifiers	AEL Comm.*, Ameco*, Anaconda*, C-Cor*, Coral, Delta-Benco-Cascade, GTE/Sylvania*, Jerrold, Lindsay*, Magnavox*, Oak*, RCA Community*, Scientific-Atlanta, Tocom, Theta Com
Distribution Accessories, Passive	AEL Comm.*, Ameco*, American Tech.*, Anaconda*, Ava, C-Cor*, Cerro, Delta-Benco-Cascade, Gamco, Hamlin, Jerrold, LRC*, Magnavox, RMS, Tocom*, Theta-Com*
HeadEnd Processors	Ameco*, Anaconda*, B-T, C-Cor*, Fung*, Jerrold, Phasecom*, RCA*, Scientific-Atlanta, Tocom*, Theta-Com*, Tomco

* data on these products verified and on file with BM/E

Information Systems	Avtel, Ameco, Cadco, Data Concer, Kansas State Network, Laird, MSI, Sys Matics, TeleMation, Theta-Com, Video Da
Microwave Equipment	Alford*, Andrew*, Catel*, Collins, Co munication Carrier*, Farinon*, Gabn GTE/Lenkurt*, Microwave Associat Raytheon, Soladyne, Terracom, Varian
Non-duplication Switchers	Fung, Jerrold, TeleMation, Theta-Com
Power Supplies	Gulton, Glentronic, Globe, Gould, S Interstate, Topaz
Test Equip., CATV	Avantek, Alford, Ameco*, Arvin, Biddl Bird*, B&K*, B-T, C-Cor, Comsonics, Hills, Dynascan*, Gen. Radio, Heath, H- wick-Douglas, Intech, H-P, Jerrold, K Lampkin, Mid State Comm., Philips*, tomac*, Sadelco, Sencore, Systron D ner*, Singer*, Teleonic, Texscan*, Telect Vitek, Wavetek*
Tools	Ameco*, AMP, Anaconda*, Gen. Cabl Ideal, Instrumental Labs, O.K. Machi Utility Tool, Xcelite
Services 1. maintenance/ consulting 2. construction 3. finance	Able Comm. 2*, Burnup & Sims 2, Cab vision Construction Corp., Gary Commu cations, Meyer-Oak 2-3*, Jackson, N work Analysis 1
Construction Accessories Underground & Pole	Aberdeen, Anixter Pruzan, Christy, C tender, Copperweld, Electrovert, E-Z Wh Fribley, General Cable Apparatus*, Ha ley, Hunt-Pierce, Imperial Plastic, F formed*, QE Mfg., Raychem, Repco

COMPONENTS, HARDWARE

Cabinets, Racks	Amco, Beston*, Borg, Dracon*, Dyr LPB*, McCurdy*, Micro-Trak, RCA, Spa S-A (Optima)*, TeleMation
Camera Tubes	Amperex*, GTE/Sylvania, RCA*
Power Tubes	Electronic Devices, English Electric, RC Thomson-CSF*, Eimac*
Rectifiers	IRC*, Wilkinson*, RCA*
Surge Protectors	Sintronic, Siemens
Wire & Cable	BIW*, Brand-Rex, Essex*, General Cabl Gotham, Mohawk, ITT Suprenaut
Connectors	Alford, Andrews*, AMP*, BIW*, Ca bridge*, ITT Cannon, Trompeter
Cable Reels	Industrial Elect. Reels*
Batteries	Globe*
Delay Lines	Anderson & Assoc.*, Anderson Labs, C ning ESC, Kappa, Matthey, Control C cepts*, TEA*
RF Inductors	Delta*, Multronics*
Input Transformer	Gotham*
Torque Motors	UMC
RFI Gasket	Chromerics
Quartz Crystals	Quaker US
Vacuum Capacitor	ITT Jennings
Tools	Xcelite

SYSTEMS, SERVICES

Aerial Lifts	Durnell, Gen. Cable Apparatus*
Airborne Microwave	Moxon
Computer Business Services	Cable Data, Compu Net, Cox Data, D Comm., Downe Computer, Kaman (BC PSI, US Computer
Emergency Power	Consolidated, Onan
Mobile Vans	AF Associates, Dyma, Editel*, Moxon, RC
Trenchers	Charles*, Davis*, Jacobsen

WHERE ACCURACY COUNTS COUNT ON BELAR

AM FM
TV



FM Monitor, FMM-1



Stereo Monitor, FMS-1



SCA Monitor, SCM-1



FM Amplifier, RFA-1



AM Monitor, AMM-1



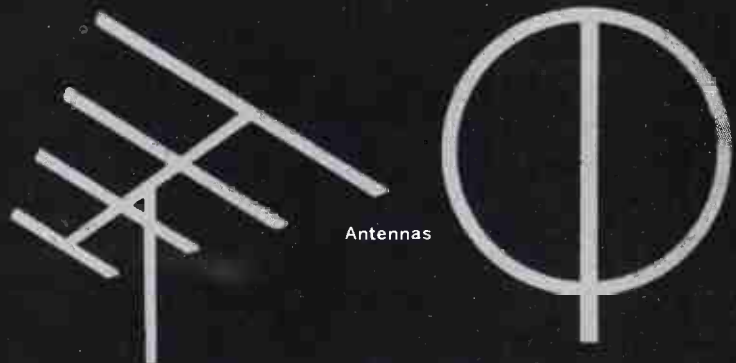
TV Amplifier, RFA-3



TV Frequency Monitor, TVM-2,3



TV Monitor, TVM-1



Antennas



AM Amplifier, RFA-2

The secure feeling that you have purchased equipment that will accurately do the job you intended it to do is most comforting. When you buy Belar AM, FM, or TV frequency and modulation monitoring systems, you'll know that feeling. You'll know that you have the right equipment that will give you ease

of operation, functional checks and unquestionable ACCURACY. And you'll measure all your program material, including the peaks accurately.

Call or write today for more information. We know you'll make the right decision and BUY BELAR.

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Circle 114 on Reader Service Card

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Broadcast Equipment Manufacturers

Including Manufacturer's of Cable TV equipment

The "VS" (▼s) indicates "verified source." The manufacturer filed supporting data with BM/E indicating that the products or equipment listed were in regular production. Omission of the "VS" means that the manufacturer did not file corroborating data.

Distributors that are nationwide exclusive sources for equipment are included in this manufacturer's section. Non-exclusive distributors are in the Rep/Distributor section.

ABERDEEN COMPANY PO BOX 2663 CULVER CITY CA 90230 213 870-5353
lashing wire, messenger strand, pole line hardware, buried system accessories

ABLE COMMUNICATIONS & ELECTRONICS
3422 US 19 NORTH PO BOX 236 PALM HARBOR FL 33563 813 784-2734
cable TV amplifier & other electronic equip. maintenance and consulting services ▼S

ABTO INC 1926 BROADWAY NEW YORK NY 10023 212 787-5000
color from b&w film process ▼S

ACOUSTIC RESEARCH 10 AMERICAN DR NORWOOD MA 02062 617 769-4200
loudspeakers ▼S

ACRODYNE INDUSTRIES INC 21 COMMERCE DR MONTGOMERYVILLE PA 18936 215 368-2600
TV transmitters and translators; rf amplifiers; TV exciters ▼S

ADVENT CORP 195 ALBANY ST CAMBRIDGE MASS 02139 617 661-9500
tape cassette players, reel-to-reel player/recorders, microphones, loudspeakers, tv projection systems. ▼S

AEL COMMUNICATIONS CORP PO BOX 507 LANSDALE PA 19446 215 822-2925
cable amplifiers; passive cable accessories; cable connectors ▼S

A & F ASSOCIATES INC 415 STEVENS AVE RIDGEWOOD NJ 07450 201 447-0096
color framer for editing aid ▼S

AGFA-GEVAERT INC 275 NORTH ST TETERBORO NJ 07608 201 288-4100
magnetic audio tape ▼S

AILTECH (DIV OF CUTLER-HAMMER) 19535 E WALNUT DR CITY OF INDUSTRY CA 91748 213 965-4911
line of signal generators and broadcast instrumentation

AIR SPACE DEVICES INC 15323 GARFIELD AVE PARAMOUNT CA 90723 213 774-4905
tower accessories; safety devices; climbers ▼S

AITKEN COMMUNICATIONS INC 701 TENTH ST TAFT CA 93268 805 765-5403
automation programmer, audio controller, time control ▼S

AKAI AMERICA LTD 2139 E DEL AMO BLVD COMPTON CA 90220 213 774-7710
portable video cameras, portable videotape recorder/players, telecine equip ▼S
See ad pg. 14, 15—refer to rep/dist section
NJ Akai America 6 Kilmer Rd Edison
08817 201 985-3760
CA Akai America 2156 The Alameda San
Jose 95126 408 288-6228

AKG-NORTH AMERICAN PHILIPS CORP 100 EAST 42ND ST NEW YORK NY 10017 212 697-3600
condenser microphones; dynamic microphones; special purpose microphones; headsets ▼S
See ad pg. 61

ALCO PRODUCTS INC 1551 OSGOOD ST

NO ANDOVER MA 01845 617 685-4371
machine knobs

ALDEN ELECTRONIC & IMPULSE RECORDING EQUIP CO INC 1 WASHINGTON ST WESTBORO MA 01581 617 366-8551
fax recording systems; weather data systems

ALFORD MFG CO 120 CROSS STREET WINCHESTER MA 01890 617 729-8050
antennas, FM, TV, microwave; diplexers, rf loads, rf switchers; microwave units; transmission line and line accessories; impedance bridge, CATV test equip ▼S

ALLIED IMPEX CORP (DIV OF AIC PHOTO INC) 168 GLEN COVE RD CARLE PLACE NY 11514 516 742-7300
photographic equip. & accessories including super-8 cameras also optical & miscellaneous accessories

ALLISON RESEARCH INC 2817 ERICA PLACE PO BOX 40288 NASHVILLE TN 37204 615 255-4766
limiter/compressor, console modules

ALPHA ELECTRONIC SERVICES INC 8431 MONROE AVE STANTON CA 90680 714 821-4400
multi-function tone generators, (audible, sub-audible)

ALTEC SOUND PRODUCTS DIVISION 1515 S MANCHESTER AVE ANAHEIM CA 92803 714 774-2900
loudspeakers; microphones; audio consoles; audio amplifiers; turntables, arms, pickups; intercoms ▼S

AMCO ENGINEERING CO 7333 W AINSLIE ST CHICAGO IL 60656 312 867-8500
racks, cabinets, enclosures

AMECO INC PO BOX 13741 PHOENIX AZ 85002 602 252-7731
cable trunk and distribution amplifiers; head-end signal processors; pilot carrier generators; band-pass filters, combining networks; CATV test equip. and tools; video automation equip ▼S

AMERICAN ASTRONICS (DIV OF TECHNICALOR) 291 KALMUS DR COSTA MESA CA 92626 714 528-9505
chroma keyer generators, spec. effect generators ▼S
See ad pg. 103—refer to rep/dist section

AMERICAN DATA CORP AN AIRPAX CO PO BOX 5228 315 WYNN DR HUNTSVILLE AL 35805 205 837-5180
audio & video distribution amplifiers; vertical interval switcher; master control switcher; chroma keyers; pulse distribution amplifiers; production switchers; sync generators; special effects generators digital clocks systems; waveform monitors; video test generators ▼S
See ad pg. 49—refer to rep/dist section
Ala ADC Southeast PO Box 5228 Huntsville 35805 205 837-5180
Tex ADC Southwest 2908 Mulberry Pasadena 77504 713 941-7272
Mass ADC New England 192 Worcester St Wellsley Hills 617 237-2601

AMERICAN ELECTRONIC LABORATORIES INC PO BOX 552 LANSDALE PA 19446 215 822-2929
fm exciters; AM & FM transmitters; sca equip

AMERICAN TECHNOLOGY CO INC 2562 W ENCANTO BLVD PHOENIX AZ 85009 602 272-1234
CATV connectors; passive distribution accessories

AMILLON CORP 49-12 30TH AVE WOODSIDE NY 11371 214 274-17
audio cassette transport mechanisms.

AMPEREX ELECTRONIC CORP EOD DIV PROVIDENCE PIKE SLATERSVILLE RI 02876 401 762-38
tubes for video cameras; camera viewfinder picture tube ▼S
See ad pg. 13

Calif AEC 3760 Cahuenga Blvd No Hollywood 91604 213 762-21
Ill AEC 360 E North Ave Northlake 60164 312 562-47

AMPEX CORP 401 BROADWAY REDWOOD CITY CA 94063 415 367-20
audio tape; audio tape recorders/players (portable, studio, multi-channel); audio time code gen's; var speed ocs., videotape; videotape recorder/reproducers (quad & helical); automatic video cassette recorder/reproducer; broadcast color cameras; time base correctors ▼S

AMPHICON SYSTEMS INC (See Projection Systems)

AMPRO CORPORATION 2220 MAPLEWOOD AVE WILLOW GROVE PA 19090 215 657-3100
audio consoles & mixers; audio controls, equalizers, attenuators; tape cartridge player/recorder ▼S
See ad pg. 86—refer to rep/dist section

AMP SPECIAL INDUSTRIES VALLEY FORG PA 19482 215 647-10
CATV connectors and tools; patch panels and terminals ▼S

AMTRON CORP PO BOX 21043 SAN JOSE CA 95151 408 238-25
video monitors ▼S
See ads pg. 119, CM/E-4

ANACONDA CATV 7465 LAMPSON AVE GARDEN GROVE CA 92641 714 898-26
CATV cable; cable trunk and distribution amplifiers; head-end signal processors; CATV tools; passive cable units ▼S

ANDERSEN (WALTER M A) & ASSOCIATE INC 4 MAIN ST EXT TARIFFVILLE CT 06081 203 658-76
wideband if delay lines; ultrasonic delay lines for chroma keyers, enhancers, time base corrector drop-out compensators, etc ▼S

ANDREW CORP 10500 W 153RD ST ORLAND PARK IL 60462 312 349-33
microwave equip.; antennas, TV and microwave transmission line and line connectors; general connectors ▼S

ANDREWS TOWER INC 1420 LAYTON AV
continued on page

It's our revolutionary "two-way" cardioid dynamic microphone. Only AKG has it.

Before our refoow dna reteewt development, whenever one end of the frequency range was expanded, the other end lost. And there was often trouble in-between.

The solution our people came up with was so simple it was beautiful. And patentable. U.S. Patent #3,204,031 to be exact. Build two microphone elements in the same housing. One for highs. One for lows. Phase them together with an integral crossover network and you've expanded your range without any strain anywhere. Sound familiar? It's the same principle of a modern

speaker system. A "tweeter and woofer"—only backwards.

In the studio, on stage or on location, you have the range you need. Plus a completely flat response over the entire audio spectrum and natural reproduction up to 90° off the microphone axis. Plus no "booming" proximity effect and virtually no feedback problems.

There are AKG "two-way" microphones available for all professional purposes. See the AKG D-224E. The studio version of the "two-way" principle that duplicates the more desirable characteristics of condenser microphones. Or the highly versatile AKG D-202E that works wonders on live and cinema sound stages. And the all-purpose AKG D-200E "two-way" microphone that adds new dimension to P.A., radio-journalism and recording. Speak to your professional equipment supplier. Or write to us for complete details.

AKG MICROPHONES • HEADPHONES

Distributed by
NORTH AMERICAN PHILIPS CORPORATION
100 East 42 St., New York, N.Y. 10017



Refoow dna reteewt.

(Our secret sound ingredient.)

Circle 135 on Reader Service Card

FT WORTH TX 76117 817 831-1222
AM antennas; antenna towers, tower accessories; tower lighting ▼S

ANGENIEUX CORP OF AMERICA 440 MERRICK RD OCEANSIDE NY 11572 516 678-3520
video camera lenses, cine lenses, lens accessories and associated hardware controls ▼S

ANGENIEUX SERVICE CORP OF CALIFORNIA 13381 BEACH AVE VENICE CA 213 821-5080
video camera lenses; motion picture camera lenses; lens accessories and controls ▼S

ANIXTER COMMUNICATIONS SYSTEMS (MARK ANTENNAS) 5439 W FARGO SKOKIE IL 60076 312 675-1500
microwave antennas and accessories ▼S

ANIXTER-PRUZAN 1963 FIRST AVE S SEATTLE WA 98154 206 694-6506
full line of pole line and cable TV construction access.; strand wires; passive components; head-end & distribution equip.; power supplies; converters, local origination equip ▼S

ANNES (R B) CO 1101 N DELAWARE ST INDIANAPOLIS IN 46202 317 637-9282
demagnetizing hits

ANTENNA PRODUCTS CO BOX 520 MINERAL WELLS TX 76067 817 325-3301
antenna services

ARISTOCART DIV OF WESTERN BROADCASTING LTD 505 BURRARD ST VANCOUVER CANADA V7X 1C4 604 687-2844
tape cartridges ▼S
See ad pg. 96

ARP INSTRUMENTS INC 320 NEEDHAM ST NEWTON MA 02164 617 965-9700
music synthesizers

ARRIFLEX CORP OF AMERICA 25-20 BKLYN QUEENS EXPWY (WEST) WOODSIDE NY 11377 212 932-3403
16mm & 35mm cine cameras, camera lenses

ARVIN SYSTEMS INC 1771 SPRINGFIELD ST DAYTON OH 45403 513 254-1797
video disc systems, FIMs for cable TV

ASACA CORP 1289 RAND RD DES PLAINES IL 60016 312 298-4000
portable TV color cameras; monochrome cameras; lenses, heads mounts, dollies; video monitors; videotape recorder/players ▼S

ASSOCIATION OF CINEMA LABORATORIES 901 N WASHINGTON ST ALEXANDRIA VA 22314 703 548-7502
film processing laboratory

ASTATIC CORP BOX 120 CONNEAUT OH 44030 216 593-1111
pickups, microphones, microphone stands

ATLAS SOUND DIV AMERICAN TRADING & PRODUCTION CORP 4 POMEROY RD PARSIPPANY NJ 07054 201 887-7800
microphone stands & accessories, speakers, columns

AUDIO ACCESSORIES INC GILSUM NH 03448 603 352-2320
audio connectors, jack panels, patch cords, plug, jacks

AUDIO DESIGNS MFG INC 16005 STURGEON ST ROSEVILLE MI 48066 313 778-8400
audio consoles

AUDIO DEVICES INC See CAPITOL MAGNETIC PRODUCTS

AUDIO INTERFACE SYSTEMS INC 2708 FIFTH AVE S IRONDALE AL 35210 205 595-6469
audio consoles

AUDIOSEARS CORP SOUTH ST STAMFORD NY 12167 607 652-7305
microphones, dynamic & dynamic windscreens, headsets

AUDIO SERVICES INC 2101 GRATIOT AVE DETROIT MI 48207 313 963-6538
transmitter computer for fault detection, stand-by activation; studio audio switcher, alarm indicators;

digital clock systems; custom-designed studios & studio equip ▼S

AUDIO-TECHNICA US INC 33 SHAWASSEE AVE FAIRLAWN OH 44313 216 836-0246
stereo and quad phono pickups, microphones, arms, headsets, audio chart recorder ▼S

AUDIOTECHNIQUES INC 142 HAMILTON AVE STAMFORD CT 06902 203 359-2312
mixers (Allen & Heath), speakers & accessories ▼S

AUDIO TEK INC PO BOX 5012 SAN JOSE CA 95150 408 244-1776
audio tape cartridge loaders ▼S

AUDIOTRONICS CORP 7428 BELLAIRE AVE NORTH HOLLYWOOD CA 91605 213 765-2645
headsets, microphones, tape cartridge equipment, monitors ▼S

AUDIOTRONICS INC 180-B SO COOPER ST MEMPHIS TN 38104 901 276-6338
audio consoles; line amplifiers; equalizers ▼S
See ad pg. 117—refer to rep/dist section

AUDIO-VIDEO ENGINEERING CO 65 NANY BLVD MERRICK NY 11566 516 546-4239
hum reduction filters

AUTOGRAM PO BOX 456 PLANO TX 75074 214 424-8585
automation equip

AUTOMATED PROCESSES INC 80 MARCUS DR MELVILLE NY 11746 516 694-9212
automated multi-channel mixer, equalizers, synchronizers for editing ▼S
See ad pg. 63—refer to rep/dist section

AVA ELECTRONICS 242 PEMBROKE AVE LANSDOWRE PA 19050 215 284-2500
cable TV multiple dwelling terminals

AVANTEK INC 3175 BOWERS AVE SANTA CLARA CA 95051 408 739-6170
cable TV test equip., sweep generators

AVONIX PO BOX 505 BROOKFIELD WI 53005 414 784-1800
flying erase edit unit for Sony VC

AVTEL CORP 44 RAILROAD AVE GLEN HEAD NY 11545 516 671-8010
video information systems for pay cable, video switcher, film chains

B

BACH AURICON INC 6950 ROMAINE ST HOLLYWOOD CA 90038 213 462-0931
heads, mounts, & dollies; cine cameras & lenses ▼S

BALLANTINE LABORATORIES INC PO BOX 97 BOONTON NJ 07005 201 335-0900
frequency counters; dB meters; waveform monitors; other general purpose equip

BALL BROTHERS RESEARCH CORP MIRATEL DIV 1633 TERRACE DR ST PAUL MN 55113 612 633-1742
color & b&w monitors; video signal multiplexers; special effects generators

BARDWELL MCALISTER INC 12164 SHERMAN WAY NORTH HOLLYWOOD CA 91605 213 875-1913
studio lighting equip., lighting accessories, mounting hardware, dimmers, control systems, color gellatines & distribution equip

BARKER & WILLIAMSON INC CANAL ST BRISTOL PA 19007 215 788-5581
rf amplifiers; audio test equip

BAUSCH LOMB SOPP DIV-OPTIC CTR BAUSCH ST ROCHESTER NY 14602 716 338-6470
TV camera lenses; motion picture camera lenses; spectrum analyzers ▼S

BELAR ELECTRONICS LABORATORY INC BOX 826 DEVON PA 19333 215 687-5550
AM, FM, & TV frequency and modulation monitors rf amplifiers; SCA equipment ▼S
See ad pg. 59

BELDEN CORP (ELECTRONIC DIV) RICHMOND IN 47374 317 966-6681
wire & cable; transmission lines; coaxial cable

BELL & HOWELL (AV PRODUCTS DIV) 7100 MC CORMICK RD CHICAGO IL 60645 312 262-1600
film chains, projectors

BELL P/A PRODUCTS CORP 1209 N FIFTH S COLUMBUS OH 43201 614 299-1400
amplifiers, background music systems, commercial sound systems

BENJAMIN ELECTRONIC SOUND CORP 40 SMITH ST FARMINGDALE NY 11735 694-7960
audio equip.; CCTV equip

BERKEY COLORTRAN INC 1015 CHESTNUT ST BURBANK CA 95102 213 843-1700
studio lights, stands, controls, filters, accessories ▼S

BESTON ELECTRONICS 9024 W 51ST TERRACE SHAWNEE KS 66203 913 384-4400
automatic density light controls; oscilloscope vector displays, rack frames ▼S

BETHANY INTERNATIONAL INC 5750 BINTLIFF HOUSTON TX 77036 713 783-1200
taft audio distribution amplifiers ▼S

BIDDLE JAMES G CO TOWNSHIP LINE & JOLLY RDS PLYMOUTH MEETING PA 19462 215 646-9200
CATV test equipment ▼S

B I ELECTRONICS 128 DONALDSON CTR GREENSVILLE SC 29604 803 277-5000
EBS alert system

BIOMATION 10411 BUBB RD CUPERTINO CA 95014 408 255-9000
analog to digital color video digitizer ▼S
See ad pg. 69

BIRD ELECTRONIC CORP 30303 AURORA RD CLEVELAND (SOLON) OHIO 44139 248-1200
rf wattmeters; rf loads; status & alarm systems ▼S

BIRNS SAWYER INC 1026 NO HIGHLAND AVE LOS ANGELES CA 90038 213 466-8000
camera heads, tripods, dollies; camera and lens accessories; film editing equip.; lights and light stands ▼S

BIRNUP & SIMS PO BOX 2431 WEST PALM BEACH FL 33401 305 683-8000
cable TV construction, strand mapping, field engineering

B K INSTRUMENTS INC 5111 W 164TH ST CLEVELAND OH 44142 216 267-4000
audio line, distribution, preamplifiers; dynamic condenser microphones; open-reel type recorders; turntables; rf amplifiers; signal generators; distortion meters, level meters; impedance bridges, phase meters, sideband analysers, spectrum analysers; CATV test equip ▼S

BLONDER-TONGUE LABORATORIES INC ONE JAKE BROWN RD OLD BRIDGE NJ 08857 201 679-4000
CATV headends, signal processing equip.; MA equip., CATV test equip.; pay-TV systems

BOGNER BROADCAST EQUIP CORP 99 W HAWTHORNE AVE VALLEY STREAM NY 11580 516 561-9000
TV antennas; microwave antennas ▼S

BORG-WARNER (INGERSOLL PRODUCTS DIV) 1000 W 120TH ST CHICAGO IL 60643 312 264-7000
racks and consoles

BOSTON INSULATED WIRE CABLE CO 61 BAY ST BOSTON MA 02125 617 265-2000
cable systems for TV cameras, connectors ▼S
See ad pg. 89

BRAND-REX DIV AMERICAN ENKA CORP PO BOX 498 WILLIMANTIC CT 06226 423-7771
flexible transmission line, coaxial cable, wire & cable

BROADCAST ELECTRONICS INC 8870 BROOKVILLE RD SILVER SPRINGS MD 20910 301 588-4000
tape cartridge players/recorders, automatic

continued on page

A compact console for the audio professional who won't compromise quality



TABLE OR PEDESTAL MOUNTING,
36 $\frac{3}{4}$ " WIDE x 35" DEEP x 18 $\frac{1}{4}$ " HIGH.

AUTOMATED'S

AUDIO CONTROL CONSOLE

Model 1604

...ever before so much for so little.

...ibility, quality and dependability at a cost that
...akes this console a completely practical investment.
The Model 1604 is designed to be used in a studio,
...a remote field unit, or as a production or on-the-air
...nsole with quad or two simultaneous stereo outputs.

FOR RECORDING it will accomodate 16 inputs,
...echo channels, 2 foldback circuits, 4 output channels,
...ubmasters, 4 speaker monitoring, slate, tone and in-
...com circuits ... as well as audition and cue facilities.

FOR BROADCASTING it offers foldback, audition,
...ercom and program interlock features, with options
...remote control of tape machines and turntables ...
...well as remote input pre-selection.

Choose from a variety of modular, interchangeable
equalizers to provide the flexibility you require. The
Model 1604 can be changed or expanded to meet
various operating conditions with no compromise in
quality, performance or function. Modularity also
means ease of servicing. All external connections are
plug-in to allow rapid installation. Available table-top
or pedestal mounted, and options are factory pre-wired
permitting easy incorporation in the field.

Why not get the console with the features you need...
at a price you can afford... from the company whose
business is serving the audio professional with
equipment built to a standard... not to a price.



AUTOMATED PROCESSES, INC.
80 MARCUS DRIVE, MELVILLE, NEW YORK 11746 - 516-694-9212

Circle 136 on Reader Service Card

playbacks, remote consoles, consoles and mixers, preamps, studio accessories, tapeheads ▼S

See ad pg. 34—refer to rep/dist section

BROADCAST EQUIPMENT LEASING CO
1412 GRANT BLDG PITTSBURGH PA
15219 412 281-3768
leasing programs for broadcast & CATV equip

BSC INC 8600 WEST SUNNYSIDE AVE
CHICAGO IL 60656 312 625-0265
portable consoles, mixers ▼S

BUHL OPTICAL 1009 BEECH AVE
PITTSBURGH PA 15233 412 321-0076
CCTV film chains, multiplexer w.o. dedicated cameras ▼S
See ad pg. 122

BULOVA WATCH CO INC—AM TIME PRODUCTS DIV 61-20 WOODSIDE AVE
WOODSIDE NY 11377 212 335-6000
studio clock systems and frequency standards ▼S

BURKEN LABORATORIES 209 MIDDLESEX TWP
BURLINGTON MA 01803 617 273-1488
noise filters, noise reduction systems, audio processors, video film noise filters ▼S
See ad pg. 109

C

CABLEDATA 1931 K ST SACRAMENTO CA
95813 916 442-4760
data processing services available to CATV systems

CABLE FACTS SUB OF UNITED DATA CENTERS 2228 YOUNG DRIVE LEXINGTON KY 40505 606 269-2323
Cable Facts, computerized subscriber billing/management service with tele-processing

CABLEVISION CONSTRUCTION CORP 910 BAY AREA BLDG HOUSTON TX 77058 713 488-6510
construction, services, system mapping

CABLEWAVE SYSTEMS INC 60 DODGE AVE NO HAVEN CT 06473 203 239-3311
transmission lines & line connectors; transmission line pressurizing equipment

CADCO INC POB 18904, OKLAHOMA CITY OK 73118 405 681-5377
catv pre-amps, message systems, antennas

CAMBRIDGE PRODUCTS CORP 101 FOLEY ST SOMERVILLE MA 02145 617 666-3343
CATV connectors and "F" fillings ▼S

CANON USA INC 10 NAVADA DR LAKE SUCCESS NY 11040 516 488-6700
video camera lenses, cine cameras & lenses, tape heads ▼S

See ad on pg. 114. Refer to rep/dist section
Ill Canon USA 457 Fullerton Ave Elmhurst 60126 312 833-3070
Cal Canon OBM 123 Paularino Ave E Costa Mesa 92626 714 979-6000
Cand Canon OBM Canada Ltd Mississauga Ontario 416 678-2730

CAPITAL MAGNETIC PRODUCTS 1750 N VINE ST HOLLYWOOD CA 90028 213 462-6252
audio recording tape in reels, cartridges ▼S
See ad pg. 65

Calif CMP 3117 San Fernando Rd Los Angeles 213 255-5103
Ga CMP 1670 NE Freeway Access Rd Atlanta 404 321-5441
Ill CMP 6401 Gross Point Rd Niles 312 583-4161
Md CMP Century XXI 20030 Century Blvd Germantown 301 428-0795
Mass CMP 149 Elm St Dedham 617 329-5777
NY CMP 1370 Ave of the Americas New York 212 757-7470
Tex CMP 6730 Oakbook Blvd Dallas 214 638-0784

CATEL (DIV UNITED SCIENTIFIC CORP) 1400-D STIERLIN RD MOUNTAIN VIEW CA 94043 415 965-9003
FM modulators & demodulators; FM microwave sub-carrier systems ▼S

CATERPILLAR TRACTOR 100 NE ADAMS PEORIA IL 309 676-3311
emergency power generators

CBS LABORATORIES 227 HIGH RIDGE RD STAMFORD CT 06905 203 327-2000
compressor limiters, peak controllers; SQ encoder-mixer; character generators; chroma keyers; image enhancers; processing, pulse distribution amplifiers; sync generators, color pattern generators; NTSC color corrector, comb-filter decoder ▼S
See ads pg. 67 104,
Calif CBS 1 Embarcadero Ctr San Francisco 94111 415 982-7000

CCA ELECTRONICS CORP 716 JERSEY AVE GLOUCESTER NJ 609 456-1716
AM, FM, UHF, VHF transmitters all ranges, UHF-VHF antennas, transmission lines, AM & FM monitors STL, remote pickup equip., audio consoles, tape cartridge equip., automation, turntables ▼S

C-COR ELECTRONICS INC 60 DECIBEL RD STATE COLLEGE PA 16801 814 238-2461
Cable TV trunk, distribution extender amplifiers; headend equipment; cable passives; cable TV test equip ▼S

CENTRAL DYNAMICS CORP 230 LIVINGSTON ST NORTHVALE NJ 07647
TV automation systems; computerized videotape editing equip.; processing amplifiers, chroma keyers, video production switchers, pulse distribution amplifiers, routing switchers; sync generators, special effects generators, colorblock and cue dot generators, time code generators, time code readers, video mixing amplifiers; CCTV, CATV video production switchers ▼S
See ad pg. 51—refer to rep/dist section

NJ CDC 230 Livingston St Northvale 07647 201 767-1300
Ill CDC 401 E Prospect Ave Mt Prospect 60056 312 259-8099
Ga CDC PO Box 95241 Atlanta 404 963-3141

CENTURY PRECISION CINE/OPTICS 10661 BURBANK BLVD NORTH HOLLYWOOD CA 91601 213 766-3715
wide-angle lenses for 16mm & 35mm cine use; motion picture accessories

CERRO CATV DIV OF CERRO CORP HALLS MILL RD FREEHOLD NJ 07728 201 462-8700
trunk distribution and drop cable

CETEC INC 13035 SATICOY ST NO HOLLYWOOD CA 91605 213 875-1900
Audio processing equip.; consoles, mixers; tape duplicators, speakers ▼S

CHARLES MACHINE WORKS INC 1821 ASH ST PERRY OK 73077 405 336-4404
safety climbing clamps; trenches ▼S
See ad pg. 25

Ark DW P.O. Box 476, Interstate 30 Benton 72015
Calif DW P.O. Box 7672 Long Beach 90807
DW 4661 Ruffner San Diego 92111
Fla DW P.O. Box 1280 Leesburg 32748
Ga DW P.O. Box 90885 East Point 30344
Ind DW 1313 Newton Evansville 47711
Ill DW 124 North Schmale Road Carol Stream 60187
DW 107 Troy Road Collinsville 62234
Iowa DW P.O. Box 156 Slater 52044
Kan DW R.R. 1 Valley center 67147
La DW P.O. Box 15881 Baton Rouge 70815
DW P.O. Box 7161 Alexandria 71301
Mich DW 3401 West Grand River Avenue Howell 48843
DW 2575 1/2 28th Street, S. W. Grand Rapids 49509
Minn DW P.O. Box 198 Shakopee 55379
Miss DW P.O. Box 111 Sullivan 63080
NJ DW R.D. 1 Freehold 07728
NY DW P.O. Box 37 Cattaraugus 14719
ND DW Drawer 20 Mandan 58554
Ohio DW 15320 Brookpark Road Cleveland 44135
Pa DW 697 Pittsburg Road Butler 16001
Tenn DW 930 Lebanon Road Nashville 37210
DW 3681 Old Getwell Road Memphis 38118
DW 343 North Bowen Road Arlington 76102
Wash DW 12810 N.E. 124th Kirkland 98033
Wyo DW 6800 Yellowstone Hwy. Casper 82601

CHIRON TELESYSTEMS 11 GRACE AVE

GREAT NECK NY 11021 516 829-56
character generators; titling equip ▼S
See ad pg. 92—refer to rep/dist section
Calif CHIRON 235 Montgomery St San Francisco 94104 415 788-06

CHOMERICS INC 77 DRAGON COURT WOBURN MA 01801 617 935-48
RFI strip gaskets, conductive RFI o-rings, shringable connector shields

CHRISTY CONCRETE PRODUCTS INC 4410 CHRISTY ST FREMONT CA 94538 415 657070
precast concrete and plastic housing for underground cable systems

CHRONO-LOG CORP 2583 W CHESTER PIKE BROOMALL PA 19008 215 356-67
digital clocks and calendars; time-code generators and readers ▼S

CINEMA BEAULIEU DIV HERVIC CORP 14225 VENTURE BLVD SHERMAN OAKS CA 91403 213 981-23
film cameras and lenses; tripods, camera accessories; microphones, tape recorder/player

CINEMA PRODUCTS CORP 2037 GRANVILLE AVE LOS ANGELES 90025 213 478-0711
16mm film cameras; lenses for 16mm cameras; camera tripods, cases, accessories; camera sound recording systems and accessories; studio and location lights, light stands, accessories ▼S
See ad pg. 27—refer to rep/dist section

CLEAR-COM (DIV OF LUMIERE PROD INC) 759 HARRISON ST SAN FRANCISCO CA 94107 415 989-11
portable intercom systems

CMX SYSTEMS (ORROX CO) 635 VAQUEROS AVE SUNNYVALE CA 94086 415 245-8450
videotape editing equip ▼S

COASTCOM 2346 STANWELL DR CONCORD CA 94612 415 825-75
voice over video duplexers for STL microwave; video low pass filters ▼S

COHU INC ELECTRONICS DIV PO BOX 622 SAN DIEGO CA 92112 714 277-67
TV color and mono cameras, studio and portable color encoders, image enhancers, video switchers, pulse distribution amplifiers; TV film cameras, telecine chains; color pattern generators, sync generators; distribution amplifiers ▼S

See ad pg. 41—refer to rep/dist section
Calif COHU 13750 Lucas Lane Cerritos 90701 213 926-70
Calif COHU 611 Hampshire Rd Apt 521 Westlake Village 91361 805 495-33
Calif COHU 532 Vista Ave San Carlos 94070 408 867-56
Neb COHU 420 Steinway Rd Lincoln 68505 402 467-29
Tex COHU 2109 Woodside Dr Arlington 76013 817 461-17
Ill COHU 1082 Anderson Terrace Des Plaines 60016 312 824-44
Mass COHU 12 Lido Lane Bedford 01730 6275-0307
NJ COHU 23 East Madison Ave Florham Park 07932 201 377-66
Colo COHU 5765 Logan Suite 1-Denver 80216 303 573-88

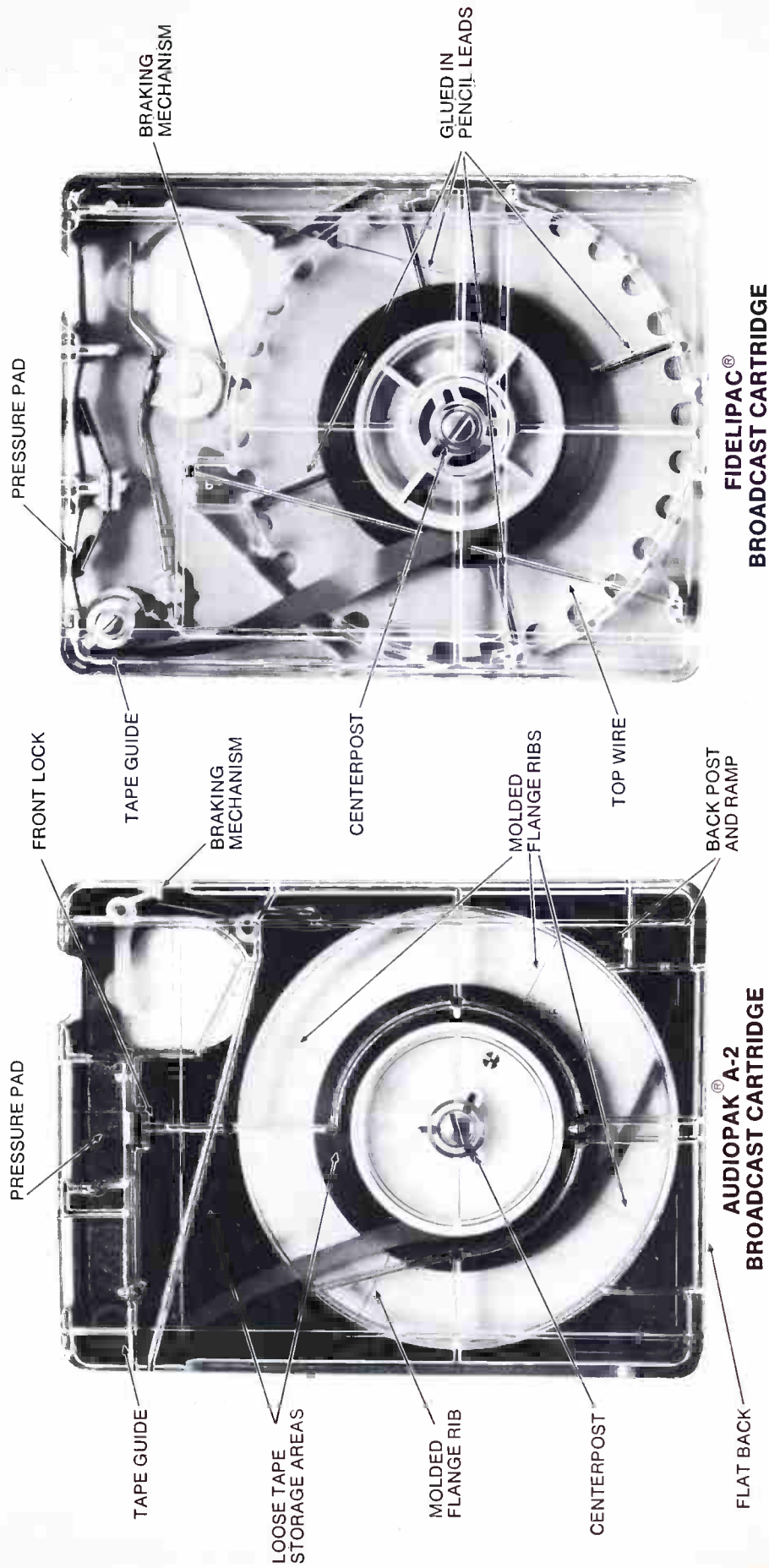
COLLINS RADIO COMPANY (BROADCAST DIV) DALLAS TX 75207 214 235-95
FM transmitters, AM transmitters, antenna systems, audio control consoles

See ad pg. 47—refer to rep/dist section
Ar Collins Box 119, Limestone 72646 501 428-52
Tn Collins Box 103D, Glenmore Dr Rockfor 37853 615 573-97
Fl Collins 14018 W. Parsley Dr Madeira Beach 33708 813 391-80
Mn Collins 200C W. Branch Rd Maple Plain 55359 612 479-26
La Collins 8427 Ridgemont Dr Pineville 71360 318 640-34
Va Collins 1611 N. Kent St Arlington 22209 703 524-95

COLORADO VIDEO INC PO BOX 928 BOULDER CO 303 440-1111
continued on page

How we'll help you do the right thing.

There are at least 10 reasons why the Audiopak A-2 is beating out the competition. Here is Reason No.1. How many times have you had broken or missing pencil leads in a cartridge flange? Can't happen on the Audiopak. There aren't any! We mold the tape support ribs as an integral part of the flange. There are 9 other reasons: write for our literature and free cartridge.



CAPITOL MAGNETIC PRODUCTS A DIVISION OF CAPITOL RECORDS, INC., LOS ANGELES, CALIFORNIA 90028

Circle 137 on Reader Service Card

DER CO 80302 303 444-3972
video compression equip., video disc recorders;
color synthesizers ▼S

COMMERCIAL ELECTRONICS INC 880
MAUDE AVE MOUNTAIN VIEW CA . 415 969-
1910
TV cameras, studio & portable, CCTV
cameras ▼S

COMM/SCOPE CO PO BOX 2406 HICKORY
NC 28601 704 328-5271
coaxial cable for cable TV; cable connectors &
accessories ▼S

COMMUNITY INFORMATION SYSTEMS
JONATHAN VILLAGE CENTER CHASKA MN
55318 612 448-4800
two-way duplex filters for CATV

COMP QUIP INC 366 S MAPLE GLENROCK
NJ 07452 201 444-3800
mfg. of fixed lens adapters for TV; distributor of
lenses and film equip ▼S

COMREX CORP PO BOX 269 SUDBURY MA
01776 617 443-5077
wireless mic systems for news gathering

COMMUNICATION ARTS INC BOX 478
BERNARDSVILLE NJ 07924 201 766-4012
universal crystal sync unit for motion picture
cameras

COMMUNICATIONS CARRIERS INC 33
RIVER RD GREENWICH C 06807 ... 203 661-
7655
microwave communications systems ▼S

COMMUNICATIONS TECHNOLOGY CORP
2237 COLBY AVE LOS ANGELES CA
90064 213 478-5061
cable TV splicing, materials, fittings

COMPU/NET INC 8616 LA TIJERA BLVD
LOS ANGELES CA 213 642-2211
automated business services for radio & TV

COMPUTER IMAGE CORP 2475 W 2ND
AVE DENVER CO 80223 303 934-5801
animation equipment

COMSONICS INC PO BOX 1106
HARRISONBURG VA 22801 703 434-2404
remote switching equip. for cable TV ▼S

CONCORD COMMUNICATIONS SYSTEMS, 23-
08 JACKSON AVE L.I. CITY, NY ... 212 937-
9100
cctv cameras, surveillance systems, cartridge and
cassette vtr's, video switchers,

CONRAC DIV CONRAC CORP 600 N
RIMSDALE AVE COVINA CA 91722 213
966-3511
TV monitors; audio; video receivers; monitor
accessories ▼S

See ad pg. 35, 36—refer to rep/dist section
III CONRAC 2720 Des Plaines Ave Office
#21 Des Plaines 60018 . 312 298-8577
NY CONRAC 122 E Main St Elmsford
10523 914 592-5522

CONSOLIDATED DIESEL ELECTRIC 1500 E
PUTNAM AVE OLD GREENWICH CT. 203
637-4341
emergency power generators

CONSOLIDATED VIDEO SYSTEMS 3300
EDWARD AVE SANTA CLARA CA
95050 408 247-2050
time base correctors, field synchronizers, tape d
duplicators

CONTENDER CORPORATION 433
COMMUNITY LANE PO BOX "D"
WOODLAND CA 95695 916 662-3934
underground plant construction equipment for
CATV

CONTINENTAL ELECTRONICS MFG CO PO
BOX 17040 DALLAS TX 75217 . 214 381-7161
high-power AM broadcast transmitters; AM
antennas; duplexers and rf loads ▼S

CONTROL CONCEPTS CORP 411 N
STONESTREET AVE ROCKVILLE MD
20850 301 762-8580
processing amplifiers; video sync generators; time
base correctors; audio signal generators;
harmonic and IM distortion meters; phase meters
▼S

CONTROL DESIGN CORP 106 S PICKET

ALEXANDRIA VA 22304 703 751-5650
radio automation systems; tape cartridge players;
digital clocks ▼S
See ad pg. 18—refer to rep/dist section

COOKE ENGINEERING CO 900 SLATERS
LANE ALEXANDRIA VA 22314 . 703 548-3889
video, audio and pulse distribution equip.; audio
equalizers & line amplifiers; patch panels;
character generators; master clock systems; time
distribution modules ▼S
See ad pg. 28—refer to rep/dist section

COPPERWELD STEEL COMPANY WIRE
CABLE DIV 1000 MONONGAHELA AVE
GLASSPORT PA 15045 412 664-7131
antennas tower accessories, wire & cable

CPAC PROFIT RECOVERY DATA SYSTEMS
(DIV) 2364 LEICESTER RD LEICESTER NY
14881 716 382-3223
silver recovery, chemical recovery, pollution
control systems for film processors ▼S

CORAL INC 7700 MARINE PLAZA RIVER
ROAD NORTH BERGEN NJ 07047 . 201 656-
2020
CATV trunk and distribution equip.; passive
components

COSMICAR OPTICAL CO LTD 2-568
SHIMOOCHIAI SHINJUKUKU TOKYO JAPAN
video camera lenses; camera heads, mounts &
dollies; CCTV camera lenses, cine lenses ▼S
See ad pg. 98—refer to rep/dist section

COX DATA SYSTEMS INC 1601 W
PEACHTREE ST NE ATLANTA GA
30309 404 892-3456
billing package for cable TV system operators

CROWN INTL 1718 W MISHAWAKA RD
ELKHART IN 219 294-5571
audio power amplifiers, audio preamplifiers; tape
player/recorders; intermodulation distortion test
equip ▼S
See ad pg. 105

CUNNINGHAM CORPORATION 10 CARRIAGE
ST HONEOYE FALLS NY 14472 ... 716 624-
2000
remote control pan and tilt units

CUSH CRAFT 621 HAYWARD ST
MANCHESTER NH 03103 603 627-7877
yagi antennas for cable TV

D

DATA COMMUNICATIONS CORP 3000
DIRECTOR ROW MEMPHIS TN 38131
..... 901 332-3544
computer service for sales, traffic, operational
accounting (TV & radio) ▼S

DATA CONCEPTS INC 80 WEST TRUMAN
AVE SALT LAKE CITY U 84115 . 801 486-3901
automated television information systems

DATA DISC INC 686 W MAUDE AVE
SUNNYVALE CA 94086 408 732-7330
stop video action recorders

DATA PRECISION AUDUBON RD
WAKEFIELD MA 01880 617 246-1600
digital multimeters ▼S

DATATEK CORP 1200 W CHESTNUT ST
UNION NJ 07083 201 964-3656
video/audio routing switchers; video audio & pulse
distribution amplifiers; video color phase
equalizers waveform correctors; audio processing
amplifiers ▼S

DATATRON INC 1562 REYNOLDS AVE
SANTA AVE CA 92707 714 540-9330
videotape editing equip ▼S

DATAVISION INC 15932 SHADY GROVE RD
GAITHERSBURG MD 20760 . 301 948-0460
character generators, including graphic arts
characters ▼S
See ad pg. 97—refer to rep/dist section

DAVIS MANUFACTURING DIV OF JI CASE
1500 S MCLEAN BLVD WICHITA KN
67213 316 265-6251
trenchers for direct cable burial; line layers ▼S

DBX INC 296 NEWTON ST WALTHAM MA
02154 617 899-8090
tape recorder noise reduction systems; dynamic
expanders; noise reduction modules, gain control

modules

DELTA-BENCO-CASCADE LTD 124
BELFIELD RD REXDALE ON CANADA M9W
1G1 416 241-2652
headend, trunk amplifiers, distribution amplifiers
for CATV

DELTA ELECTRONICS INC 5534 PORT
ROYAL R SPRINGFIELD VA 22151 703 :
9845
antenna/transmitter remote control systems;
antenna monitors; field strength meters,
impedance bridges, phase meters; monitoring &
test accessories
See ad pg. 31—refer to rep/dist section
NY Delta Intl Div PO Box AB Mamaroneck
10543 914 698-278

DICTAPHONE CORP 120 OL POS RD RYE
NY 10580 914 967-621
telephone answering equip

DIETRIC COMMUNICATIONS RAYMOND
ME 04071 207 655-455
strobe beacons ▼S

DIGITAL COMMUNICATIONS INC 310 14TH
AVE SOUTH ST PETERSBURG FL
33701 813 895-321
pay-TV systems and software

DIPOL ELECTRONICS INC 1970 ELLESMORE
RD SEARBOROUGH ON CANADA ... MIH 2 W
studio consoles for broadcasters

DITCH-WITCH See CHARLES MACHINE
WORKS INC

DIX HILLS ELECTRONICS INC 25 N MALL
PLAINVIEW NY 11803 516 420-116
cross modulation, intermodulation and distortion
measurement equip. for CATV

DOLBY LABORATORIES INC 1133 AVE OF
THE AMERICAS NEW YORK NY 10036 ...
489-6652
noise reduction systems; audio processing
amplifiers; magnetic recording accessories ▼S

DOLPHIN COMMUNICATIONS 181 CHURCH
POUGHKEEPSIE NY 12601 914 471-358
devices for CATV

DOWNE COMPUTER SERVICE INC 112
TENTH ST DES MOINES IO 50309 515
5131
subscriber billing services for CATV TV

DRACON INDUSTRIES 9541 MASON AVE
CHATSWORTH CA 91311 213 882-859
aluminum relay racks ▼S
See ad pg. 113

DURNELL ENGINEERING INC HIGHWAY 4
SOUTH EMMETSBURG OT 50536 712 1
2611
aerial personnel lift trucks

DYMA ENGINEERING INC R NM 1 BOX 51
TAOS 87571 515 758-268
custom audio consoles for broadcasters ▼S

DYNAIR ELECTRONICS INC 6360 FEDERAL
BLVD SAN DIEGO CA 92114 . 714 582-9211
video pulse & distribution amplifiers, routing &
production switchers, sync generators, spec.
effects generators, modulators, demodulators,
exciters, duplexers, sideband analyzers ▼S
See ad pg. 3
Company products available from all major video
distributors throughout the world

DYNASCAN CORP B&K DIV 1801 W BELLE
PLAINE AVE CHICAGO IL 60613 312 :
7270
cable TV test equip

DYNASCENCES VIDEO PRODUCTS
TOWNSHIP LINE R BLUE BELL PA
19422 215 643-021
videotape editing equip.; automatic program
controllers; image enhancers, processing
amplifiers, production switchers, pulse &
distribution amplifiers, routing switchers, sync
generators, special effects generators ▼S
See ad pg. 33—refer to rep/dist section

E

EASTMAN KODAK CO MOTION PICTURE &
AUDIOVISUAL MARKETS DIV 343 STATE S
continued on page 1

Here's the real lowdown.
Low noise at a new low price.



With the new Mark IV Image Enhancer in your system you'll have an unbeatable signal-to-noise ratio working for you. Better than 55 dB. That means quiet enhancement like you've never seen!

Best of all, better enhancement now costs you less. We've just reduced prices!

So whether you're buying a new live camera or telecine, or updating your present system, don't settle for less. It just doesn't pay to fool around with imitation units. Specify Image Enhancers from CBS Laboratories, the people who created image enhancement. Available for NTSC, PAL or SECAM installations.

For technical information on the Mark IV series, write for Marketing Bulletin 74-01, contact your local distributor, or call us. We'll give you the real lowdown.

CBS LABORATORIES

A Division of CBS Inc.

227 High Ridge Road, Stamford, Connecticut 06905
Circle 138 on Reader Service Card

ROCHESTER NY 14650 716 325-2000
motion picture cameras; motion picture film;
projectors for TV; film processors ▼S

ECHO SCIENCE CORP 485 E MIDDLEFIELD
RD MOUNTAIN VIEW CA 90400 415 961-
7145

portable video tape recorder/reproducers

ECLAIR CORP OF AMERICA 62 WEST 45TH
ST NEW YORK NY 10036 212 869-0490
professional motion picture cameras, lenses;
tripods, cases accessories for cameras ▼S

EDISON ELECTRONICS See MCGRAW-
EDISON

EDITEL COMMUNICATIONS LTD 6510
CHEMIN BOIS FRANC VILLE ST LAUREN
QUEBEC H4S 1A9 514 331-2951
portable TV cameras; custom-built mobile video
units; custom built video design & installation ▼S
See ad pg. Cover IV

ÉFRATOM CALIF INC 3303 HARBOR BLV E-
1 COSTA MESA CA 92626 714 556-1620
rubidium freq. standard

EG&G INC ELECTRO MECHANICAL DIV
MOULTON ST GEORGETOWN MA 01833 . 617
352-6200
cable connectors

EIMAC DIV See VARIAN ASSOCIATES

EIP, INC., 3130 ALFRED ST., SANTA
CLARA, CA 95050 (408) 244-7975
microwave frequency counters

ELECTROCOMP ELECTRONIC MUSIC LAB
INC VERNON CT 06066 203 875-0752
music synthesizers

ELECTROHOME 809 WELLINGTON ST N
KITCHENER ON CANADA 519 744-7111
color & b&w monitors ▼S
See ad pg. 95

ELECTRO IMPULSE INC 116 CHESTNU ST
RED BANK NJ 07701 201 741-0404
dry TV loads

ELECTRONIC ENGINEERING CO OF CALIF
(EECO) 1441 E CHESTNU AVE SANTA ANA
CA 92701 714 835-6000
videotape editing equip., audio editing equip ▼S
See ad pg. 12
NY Telemet Amityville, New York . 516 541-
3600

ELECTRONIC INDUSTRIAL ENGINEERS See
RCA COMMUNITY ANTENNA SYSTEMS

ELECTRONICS MISSILES COMMUNICATIONS
INC PO BOX 116 WHITE HAV P 18661 . 717
443-9575
low power TV transmitters for broadcast; TV
transmitters for ITFS and MJS; TV translators; TV
antennas ▼S

ELECTRO SOUND INC 725 KIEFER R
SUNNYVALE CA 94086 408 245-6600
audio tape recorder/players; portable mixers;
tape duplicating systems, open-reel, cartridge,
cassettes; tape winders, splicers; power
amplifiers; theatre sound systems; magnetic film
duplicators; video cassette winders ▼S

ELECTROVERT INC 86 HARTFORD AVE
MOUN VERNON NY 10553 914 664-6090
harnessing equip., markers

ELECTRO-VOICE INC SUB OF GULTON
INDUSTRIES INC 600 CECIL ST BUCHANAN
MI 49107 616 695-6831
microphones and monitor loudspeakers ▼S

ELPA MARKETING INDUSTRIES INC
THORENS & ATLANTIC AVES NEW HYDE
PARK NY 11040 516 746-3002
source for tape recorder/players (Ferrograph);
tape editing equip. (Editall); test equip (Ferrograph)
signal generators, distortion meters, wow and
flutter) ▼S
See ad pg. 105

ENGLISH ELECTRIC VALVE CO LTD
CHELMSFOR CMI ENGLAND
electron tubes

ESC ELECTRONICS PALISADES NJ
07650 800 631-0853
delay lines, LC filters

ES ENTERPRISES 10418 LA CIENAGA

INGLEWOOD CA 90304 213 674-3021
digital clocks, programming devices

ESSEX INTERNATIONAL INC
COMMUNICATIONS/CATV DIV 6235 SOUTH
HARLEM AVE CHICAGO IL 60638 . 312 586-
3000
coaxial cables, CATV & general; CATV drop
cables; wire & cable generally ▼S

EVENTIDE CLOCK WORKS INC 265 WEST
54TH ST NEW YORK NY 10019 212 581-
9290

audio phase controllers; audio compressor/
expander/limiters; audio digital delay lines ▼S

E-Z WAY PRODUCTS INC 13155
NEBRASKA AVE PO BOX 17196 TAMPA FL
33612 813 971-1961
communication towers

F

FAIRCHILD SOUND EQUIPMENT CORP 75
AUSTIN BLVD COMMACK NY 11725
516 543-5200

audio power, pre-, processing amplifiers;
compressor/limiters; audio attenuators,
equalizers, mixers; audio consoles; TV consoles;
tape erasers ▼S

See ad pg. 118—Refer to rep/dist section

FARINON ELECTRIC 1691 BAYPORT AVE
SAN CARLOS CA 94070 415 593-8491
microwave systems; multiplex equip.; microwave
repeaters; FM over video systems; relay systems
for radio & TV broadcasters; microwave
accessories ▼S
See ad pg. 75

Ga FARINON 5582 Peachtree Rd NE Atlan-
ta 404 451-1982
Tex FARINON 710 No Post Oak Rd Hous-
ton 713 688-5569
NJ FARINON PO Box 148 Sommerville
08776 201 526-2669

F&B/CECO OF CALIFORNIA INC 7051
SANTA MONICA BLVD HOLLYWOOD CA
90038 213 469-3601
manufacture & rental of motion picture equip.
lighting equip. sound equip. editing equip. and
CCTV equipment

FERNSEH GROUP ROBERT BOSCH CORP
279 MIDLAND AVE SADDLE BROOK
NJ 201 797-7400
studio & portable TV cameras; videotape
recorder/players; multiplexer for telecine; video
color monitors; color encoders; TV color
standards converter ▼S

FELLER VACUUM FORM STUDIOS INC 381
CANAL PL BRONX NY 10451 . 212 993-2999
pre-fabricated scenery

FIDELIPAC (DIV OF TELEPRO INDUSTRIES)
3 OLNEY AVE CHERRY HILL NJ
08034 609 424-1234
tape cartridges ▼S
See ad pg. 102

FILMLINE CORP 43 ERNA ST MILFORD CT
06463 203 878-2433
film processors

FIorentino IMERO ASSOC INC 10 W 66TH
ST NEW YORK NY 10023 212 787-3050
kits for testing gray scale of colors, consulting
service

FIXTUNE SOLID STATE ELECTRONICS INC
LW 30th NEW YORK NY 10001
212 983-9353
one station FM receivers

FLUKE JOHN B MFG CO PO BOX 7428
SEATTLE WA 98133 800 426-0361
frequency counters, calibrators, test sets, gen.
purpose test equip.

FORGLO CORP (BRUSH MAGNETIC HEADS
DIV) FRONT & REGAN ST SUNBURG PA
17801 717 286-5611
magnetic recorder heads for audio

FORT WORTH TOWER CO INC 5201
BRIDGE ST PO BOX 8597 FORT
WORTH TX 76112 817 536-5676
towers, prefab bldgs. reflectors ▼S
See ad pg. 122

F & P SYSTEMS 1053 EAST MEADOW
CIRCLE PALO ALTO CA 94303
digital weather station

FREZZOLINI ELECTRONICS INC 7 VALLEY
ST HAWTHORNE NJ 07506 201 427-11
professional 16mm cameras, lenses,
accessories; motion picture lights ▼S

FRIBLEY ENTERPRISES PO BOX 389
CANADA RD PAINTED POST NY 14870
..... 607 962-38

terminal boxes for CATV, MATV

FRONT PROJECTION CO 21 BOND ST NEV
YORK NY 10012 212 673-72
front projection equip. for TV

FUJI, 350 FIFTH AVE, NEW YORK, NY
10001 212 736-33
Videotape

FUNG ENGINEERING CO 111 GLENN WAY
BELMONT CA 54002 415 591-51
CATV Channel switchers, filters, modulators

G

GABRIEL ELECTRONICS PO BOX 626
SCARBOROUGH INDUSTRIAL PARK
SCARBOROUGH ME 04074 207 883-51
parabolic, horn & shrouded antennas; elliptical
and circular waveguides

GAF CORPORATION 140 W 51ST STREET
NEW YORK NY 10020 212 582-78
8mm motion picture cameras; color films, slide
films, motion picture films; film processing equip
projectors; accessories ▼S

GAMCO INDUSTRIES INC 317 COX ST
ROSELLE NJ 07203 201 241-75
CATV fittings; splitters; directional 1 taps; lockin
terminators; hardware

GARNER ELECTRONICS 4200 N 48TH
LINCOLN NE 68504 402 466-18
tape duplication systems; conveyor-type tape
erasers ▼S
See ad pg. 107

GARRON ELECTRONICS INC 1216 KIFER
ROAD SUNNYVALE CA 94086 . 408 736-87
cartridge tape player/recorders; cassette playe
recorders; stereo phase enhancer ▼S
See ad pg. 120

GARY COMMUNICATIONS SERVICE 1213
SIXTH ST BILOXI MS 39530 . 601 388-68
CATV turnkey installations; portable reel stands
radiation sets for 2-way systems

GATELY ELECTRONICS 57 W HILLCREST
AVE HAVERTOWN PA 19083 . 215 446-14
audio amplifiers; playback systems; automation
systems

GATES BROADCAST DIVISION (See HARRI
CORP.)

GBC CLOSED CIRCUIT TV CORP. 74 FIFTH
AVE NEW YORK NY 10011 212 989-44
TV cameras, studio & portable (b&w color);
camera mounts; char gen's; telecine chains;
monitors; sync gen's; spec. effect gen.; VTRs
(helical); videotape; audiotape ▼S
See ad pg. 81

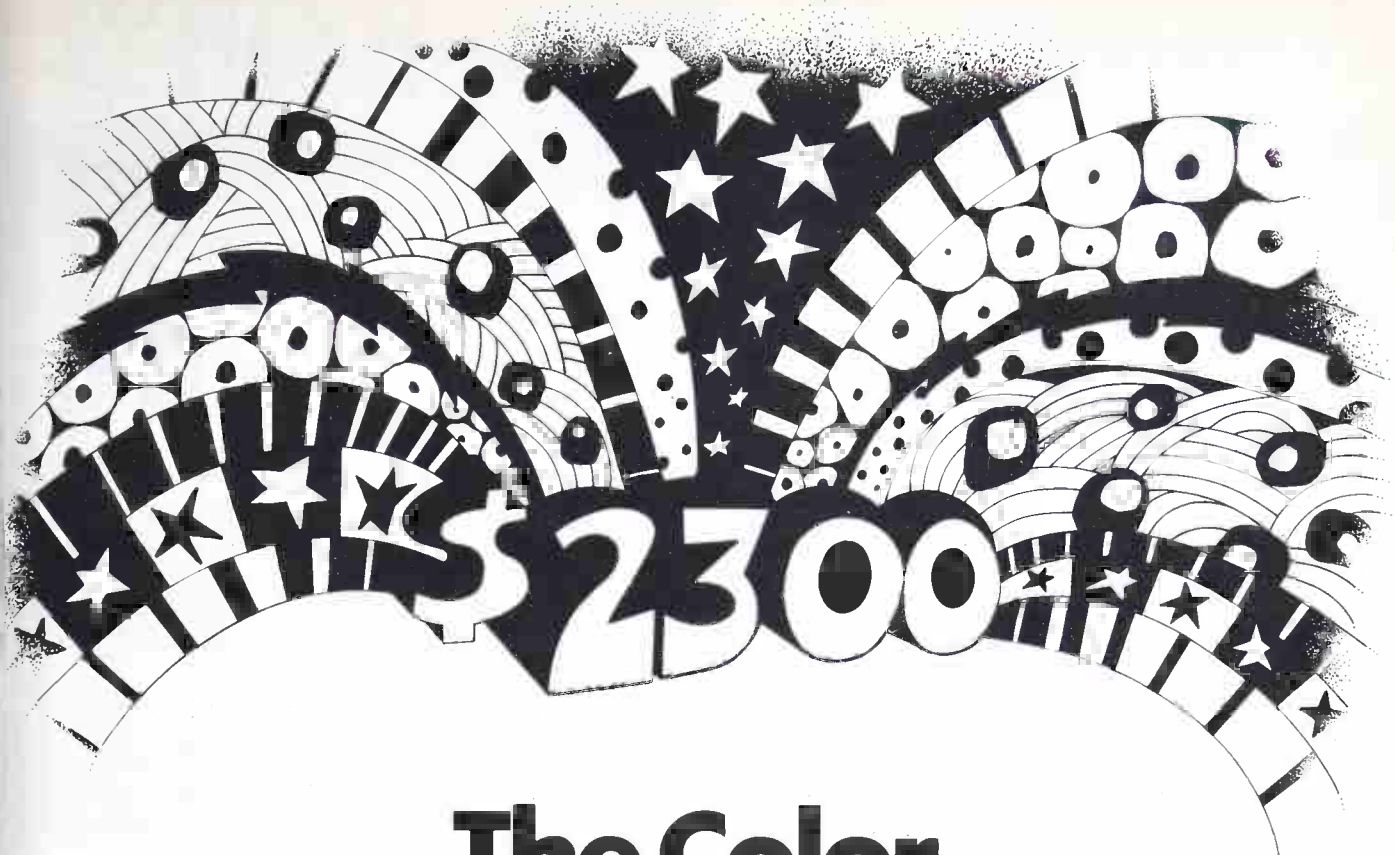
Mass GBC New England Corp. 575 Boylston
Boston 617 261-23
DC GBC Washington Corp 1019 19th St NW
Washington DC 202 785-81
Ill GBC Illinois Corp 1625 Tonne Rd Elk
Grove Village 312 956-12
Mich GBC Michigan Corp. 13221 Cloverdale
Oak Park 313 398-16
Ind GBC Indiana Corp 5335 N Tacoma Indi
napolis 317 257-13

GENERAL CABLE APPARATUS DIV PO BOX
666 5600 W 88TH AVE WESTMINSTER CO
80030 303 427-37
coaxial cable monitoring equipment ▼S

GENERAL CABLE CORP 500 W PUTNAM
AVE GREENWICH CT 06830 . 203 661-01
distribution cable, drop cable for cable TV; cabl
processing systems, aerial lift vehicles;
construction accessories (clamps, supports,
stands, terminal housing); ventilators; heaters;
dryers ▼S
See ad on pg. cm/e 8

Colo GCC 7100 Broadway, Bldg 3 Penhouse
Denver 80221 303 428-81
Calif GCC Suite 611 2444 Wilshire Blvd San
Monica 90403 213 828-51

continued on page 6



The Color Video Digitizer



Here's a new low-cost A/D video digitizer that gives you high quality real-time conversion of color TV or other video bandwidth waveforms. Only \$2300 in onesy-twoseys, it's also available in OEM order lots at substantial discounts.

FEATURES:

Conversion rates to 15MHz
 • 8-bit (1 in 256) resolution • 75 Ohm, 1V full scale input • Precise track-and-hold performance • Balanced ECL

output drivers • Differential ECL strobe input • Easy-to-fix PC card construction
 • Converts NTSC or PAL color signals
 • Has a companion D/A converter for only \$700 to ensure system compatibility.

Data sheets are available. And our reps will be delighted to arrange a demo. Call or write Biomation, 10411 Bubb Road, Cupertino, CA 95014. Phone: (408) 255-9500. TWX 910 338 0226.

biomation

Circle 139 on Reader Service Card

Ga GCC 2200 Parkland Dr Suite 120 Atlanta 30345 404 934-2080
 Haw GCC PO Box 3977 1035 Kikowaena Place Honolulu 96819 808 839-0361
 Ill GCC 1701 Brichwood Ave Des Plaines 312 291-0300
 Mo GCC 500 Northwest Plaza PO Box 1098 St Ann 63074 314 291-0300
 Neb GCC PO Box 30250 Suite 14 5625 O St Lincoln 68503 402 489-9371
 NY GCC 733 Third Ave 20th Fl New York 10017 212 354-2378
 Penn GCC PO Box 1388 2431 W Grandview Blvd Erie 16509 814 838-6536
 Tex GCC Suite 264 PO Box 30384 5952 Royal Lane Dallas 75230 214 691-0200
 Tex GCC 6910 Fannin St Suite 307 N Houston 77025 713 741-2940
 Va GCC PO Box 648 1 4111 W Clay St Richmond 23230 804 355-7878
 Wisc GCC 11430 W Bluemound Rd Milwaukee 53266 414 476-9638
 Mich GCC PO Box 427 Jackson 49204 616 762-2151
 Ill GCC Rt 105 PO Box 152 Monticello 61856 217 762-2151
 NY GCC PO Box 24 Eastwood Station Wavel St Syracuse 13206 315 463-4588
 Wash GCC Bldg 3 300 120th Ave NE Box 1684 Bellvue 98009

GENERAL ELECTRIC CO NELA PARK CLEVELAND OH 44112 216 266-2121
 stage, studio, TV lamps ▼S

GENERAL ELECTRIC HOME ENTERTAINMENT BUS DIV ELECTRONICS PARK NY 13201 315 456-3624
 video display equipment

GENERAL ELECTRODYNAMICS CORP 4430 FOREST LANE GARLAND TX 75042 214 276-1161
 monochrome TV cameras ▼S

GENERAL MICROWAVE CORP 155 MARINE ST FARMINGDALE NY 11735 516 694-3600
 attenuators; switches; power, frequency, noise meters

GENERAL RADIO CO 300 BAKER AVE CONCORD MA 01742 617 369-4400
 test equipment; bridges; sound level meters

GILBERT ENGINEERING CO 3700 N 36TH AVE PHOENIX AZ 85019 602 272-6871
 coaxial cable connectors, adapters, fittings, terminations, accessories, tools ▼S

GLOBE BATTERY DIV OF GLOBE-UNION INC 5757 N GREEN BAY AVE MILWAUKEE WI 53201 414 228-2394
 batteries ▼S

GOTHAM AUDIO CORP 741 WASHINGTON ST NEW YORK NY 10014 212 741-7411
 condenser microphones (Neumann); audio & stereo consoles (Faylon); audio disc cutting equipment (EMT); reverberation units (EMT); audio recorder/players (Telefunken); compressor/limiters (EMT); broadcast turntables (EMT); headsets (Beyer); tape timers; flutter meters (Woeike); phase meters (Neumann); audio attenuators (Danner); polarity testers; rumble meters (Neumann); digital audio delay unit; monitor speakers (K&H); wire & cable (EMT); input transformers (Beyer) ▼S

GOULD INC 467 CALHOUN ST TRENTON NJ 08607 609 392-3111
 power inverters; battery chargers, batteries

GRASIS FABRICATING CO 5601 GARDNER AVE KANSAS CITY MO 64120 816 483-1100
 broadcast, CATV, microwave towers; molded fiberglass head-end buildings

THE GRASS VALLEY GROUP INC PO BOX 1114 GRASS VALLEY CA 95945 916 273-8421
 automation equip.; video production & routing switchers; pulse & distribution amplifiers, chroma keyers, processing amplifiers, sync generators, special effects generators ▼S
 See ad pg. 5

NY GVG Station Plaza E Great Neck 11021 516 487-1311
 Calif GVG 4419 Van Nuys Bl Ste 307 Sherman Oaks 91403 213 990-6172
 Ga GVG 1644 Tullie Cir NE Atlanta 30329 404 634-0521

Tex GVG PO Box 482 Mabank 75147 214 887-1181
 Ill GVG 125 So Wilke Rd Arlington Heights 60005 312 394-1344

GTE LENKURT INC 1105 COUNTRY RD SAN CARLOS CA 94070 415 591-8461
 microwave equip.; remote control systems; remote pickup and STL systems ▼S

GTE SYLVANIA CATV OPERATIONS 114 S OREGON ST EL PASO TX 79901 915 544-7551
 cable TV distribution & trunk amplifiers, passive cable units, connectors, camera tubes ▼S

GTE SYLVANIA (LIGHTING PRODUCTS GROUP) 100 ENDICOTT ST DANVERS MA 01923 (617) 777-1900
 studio, theatre & TV lights, accessories ▼S

GULTON INDUSTRIES INC ENGINEERED MAGNETICS DIV 13041 CERISE AVE HAWTHORNE CA 90250 213 679-0111
 CATV standby power and amplifier protection systems

H

HAMLIN INTERNATIONAL CORP 126 SW 153RD ST SEATTLE WA 98166 206 246-9330

CATV band-pass filters; converters; passive head-end processing devices; couplers; receivers

HANDLEY INDUSTRIES INC 2101 BROOKLYN RD JACKSON MI 49204 517 789-6181
 plastic closures for buried service wires

HANNAY CLIFFORD & SON INC WESTERLO NY 12193 518 797-3791
 standard & custom-built reels

HARRIS CORPORATION GATES BROADCAST DIVISION QUINCY ILL 62301 217 222-8200
 am and fm transmitters; radio automation; tv transmitters; tv exciters, modulators, drivers; rf switches, duplexers; tv, am, fm antennas and accessories; tv studio cameras; telecine equipment; video distribution switchers, color encoders; tv and audio consoles; microphones, turntables, arms, limiting amplifiers; tape cartridge player/recorders; tape accessories; monitor speakers; video monitors; sync generators, waveform monitors; videotape recorder/players; phase, modulation, frequency monitors; rf amplifiers; transmission lines and accessories; remote control equipment. ▼S

See ad pg. 104

Field offices

Ca Harris Corp BE/DIV 1945 S Figuerea Los Angeles
 DC Harris Corp BE/Div 1522 K St NW Washington 20005 202 223-5508
 Ga Harris Corp BE/Div 1745 Tully Circle NE Atlanta 30329 404 636-0906
 NY Harris Corp BE/Div 130 E 34th St New York 10016 212 889-0790
 Oh Harris Corp BE/Div 55 Public Square Cleveland 44113 216 781-6322
 Tx Harris Corp BE/Div 4019 Richmond Ave Houston 77027 713 623-6655
 PQ Gates Div Harris 212 Brunswick Blvd Pointe-Claire 514 695-3751
 On Gates Div Harris 19 Lesmill Road Don Mills M3B-2T3 416 447-7234
 Field managers, radio
 Al J D Miller 413 20th Court NE Birmingham 35215 205 251-0485
 Ca D Roberts 10521 Malvasia Way Rancho Cordova 95670 916 363-8264
 Ca R Switzer 9025 Maza Circle Fountain Valley 92708

The "VS" indicates "verified source." The manufacturer filed supporting data with BM/E indicating that the products or equipment listed were in regular production. Omission of the "VS" means that the manufacturer did not file corroborating data.

FI I Raulerson PO Box 958 Macclenny 32063 904 791-010
 Md C B Patterson 13319 Encanto Lane Maryland Heights 63943 314 434-772
 Mi D Orient 56 S Crestview Dr Adrian 49221 313 423-456
 Nc R Sawicki 2006 Cedar Park Dr Apt A Greensboro 27407 919 855-114
 Io S Whitman Box 2397 Station A Waterloo 50705 319 233-056
 NY R Hallenbeck 11 Ridgecrest Latham 12110 518 785-914
 Ok W Rice 4202 East 101st Place Tulsa 74136 918 299-320
 Sc E R Lowder 7209 Stonehaven Drive Columbia 29033 803 776-205
 Wa N Arveschoug PO Box W Oak Harbor 98277 206 682-6866
 Wi R Gorjance 3320 Ivy Lane Racine 53402 416 639-788

Field managers, television

Ca Tom O'Hara (field office)
 Ga G J Hardy (field office)
 Il V Russell 1810 N Ridge Ave Arlington Heights 60004 312 255-923
 NY Tom Schoonover (field office)
 Tx Merle Arnold (field office)

International Sales Dept.

NY J Guerrero (NY field office)
 Pq Arne B Clapp (Quebec field office)
 On R Gauthier (Ontario field office)
 Puerto Rico Representative
 PR Jose Acosta PO Box 20079 Rio Piedras 00928 809 766-323

Hawaii Representative

Hi Charles Hartman PO Box 1344 Honolulu 96807 808 595-349

Mexico Representative

Ing Ernesto Ruesga Apartado Postal 8319 Mexico 1 DR 905 585-427

HARWALD CO 1245 CHICAGO AVE EVANSTON IL 60202 312 491-100
 film inspection, cleaning equipment; splicers; editing equipment

HARWOOD MFG CO 1800 W FULLERTON CHICAGO IL 60614 312 929-1100
 photographic & electronic lighting equipment; portable lighting bars

HEATH COMPANY BENTON HARBOR MI 49022 616 983-396
 intercoms; tape cartridge equip.; loudspeakers; frequency counters; signal generators, af & rf; distortion meters; impedance bridges; CATV test equip ▼S

HEINDL MASKS MOUNTS 200 ST PAUL ST ROCHESTER NY 14604 716 454-508
 Mounts and masks for photo slides ▼S

HELLER-OAK CABLE FINANCE CO 105 W. ADAMS ST CHICAGO IL 60690 312 346-2300
 cable tv financing ▼S
 See ad pg. cm/e-6

HELWICK-DOUGLAS ELECTRONICS 2409 23RD ST GULFPORT MS 39501 601 863-1295
 CATV test equipment

HERVIC CORP CINEMA BEALIEU DIV 14225 VENTURA BLVD SHERMAN OAKS CA 91403 213 981-239
 hydrofluid tripod

HEWLETT-PACKARD CO 1900 GARDEN OF THE GODS RD COLORADO SPRINGS CO 80907 303 598-190
 oscilloscopes, frequency counters, waveform analyzers, digital multimeters, signal generators, sweep oscillators, spectrum analyzers ▼S

HITACHI SHIBADEN CORP OF AMERICA 58-25 BROOKLYN-QUEENS EXPRESSWAY WOODSIDE NY 11377 212 898-126
 studio & portable color and mono video cameras; video monitors; pulse distribution amplifiers; sync generators videotape recorder/players; video cartridge recorder/players; microwave equip.; semi-conductors ▼S

See ad pg. 10, 11—refer to rep/dist section
 Calif HS 21015 S Figueroa St Carson 90745 213 328-211
 Ill HS 1725 N 33rd Ave Melrose Park 60160 312 344-402
 Tex HS 14169 Proton Rd Dallas 75240 214 233-762

continued on page 7

MINI-PRO!



Little brother to the MX-7000--the MX-5050.



Otari's new Mini-Pro Recorder is everything its name says it is — a compact *professional* recorder. Most important, it's not a warmed over hi-fi recorder with a few semi-professional features tacked on to wow the audiophile. Instead, it's a true professional recorder scaled down in size but not in performance or features.

Who did we design the Mini-Pro for? A whole host of professional users, like the small recording studio, the A/V facility, or the broadcast station that's really beginning to get into production. Or the large studio that needs a compact recorder for its own small studios or its many outside assignments where no-compromise quality is still a requirement. Or for broadcast automation systems where the calculated MTBF of 2000 hours continuous operation can make the difference between success or failure?

How professional is the MX-5050? Check these features: Synchronous reproduce, front panel edit control and mode, two or four channel versions, IC digital control system with motion sensing, optional DC capstan servo system, 15 and 7½ or 7½ and 3¾ ips tape speeds, front adjustable bias, record lockout, built-in test and cue oscillator, head lifters with adjustable-tension cueing feature, plug-in balanced line transformers, built-in mic preamps, Cannon connectors for line input and 600-ohm (+4 dB) output, optional swing-out rack mounting panel, standard reference level calibrate position, and four heads.

Want to know more about this mini with the maxi performance? Or about its MX-7000 big brother, the three-speed machine with built-in test oscillator and some of the best flutter and frequency response specs in the industry? Contact Otari or your nearest Otari Professional Dealer.

OTARI

Otari Corporation
981 Industrial Road, San Carlos, California 94070
(415) 593-1648 TWX: 910-376-4890

In Canada:
Noresco Manufacturing,
Toronto

Circle 140 on Reader Service Card

HOLLAND ELECTRONICS INC 842 E 94TH ST BROOKLYN NY 11236 212 649-7330
crossbar intercom systems

HUGHEY PHILLIPS INC 3050 N CALIFORNIA ST BURBANK CA 91505 213 849-1104
tower lighting, beacons, de-icers ▼S

HUNT-PIERCE CORP 230 OLD GATE LANE MILFORD CT 06460 203 878-7491
aerial platforms; cable handling; pulling equipment

IDEAL INDUSTRIES 1780 BECKER PLACE SYCAMORE IL 60178 815 895-5181
wire, cable stripping equipment

IKEGAMI ELECTRONICS INDUSTRIES INC OF NY 35-37 31ST LONG ISLAND CITY NY 11106 212 932-2577
rugged portable color TV cameras for electronic journalism

ILC TECHNOLOGY INC 164 COMMERCIAL ST SUNNYVALE CA 94086 408 738-2944
CATV tower lighting systems

IMAGE MAGNIFICATION INC 538 BLOOMFIELD AVE VERONA NJ 07044 201 239-1141
large-screen tv projection systems ▼S

IMPERIAL PLASTICS INC 1015 W HOOVER ORANGE CA 92667 714 532-1671
watertight plastic underground boxes; plastic conduit for buried systems; cable clips; tap cabinets

INDUSTRIAL ELECTRIC REELS INC 1125 JACKSON ST OMAHA NE 68102 402 422-1001
cable reels and collector rings ▼S

INSTRUMENT LABORATORIES CORP 315 W WALTON PL CHICAGO IL 60610 312 642-0123
test equip't.; cable locators; fault finders

INTECH LAB 4175 VETERANS HWY RONKONKOMA NY 11776 516 585-6754
automatic catv spectrum analyser

INTERACTIVE VIDEO INC 327 S FOURTH ST ANN ARBOR MI 48108 313 769-0364
interactive terminals for 2-way cable communications; pay-TV terminals; hotel/motel systems

INTERNATIONAL GOOD MUSIC 4041 HOME RD BELLINGHAM WA 98225 206 733-4567
radio automation equip.; tape cartridge player (multicart); accessories for automation

INTERNATIONAL RECTIFIER CORP 233 KANSAS ST EL SEGUNDO CA 90245 213 678-6281
high power cartridge rectifiers; high voltage rectifier columns; solid state tube replacements ▼S

INTERNATIONAL TAPETRONICS CORP 2425 S MAIN ST BLOOMINGTON IL 61701 309 828-1381
tape cartridge equipment, reel-to-reel recorders
See ad pp. 16, 110 ▼S

INTERNATIONAL VIDEO CORPORATION 990 ALMANOR AVE SUNNYVALE CA 94086 408 738-3900
video color cameras; telecine chains; videotape recorder/players; video cartridge player/recorders; time base correctors ▼S
See ad pp. 6, 7

Calif IVC A. Landrum, Sunnyvale 408 738-3900

Calif IVC C. Martin, Los Angeles 213 344-6001
714 506-9130

DC IVC C. Hayworth, Washington 310 431-2638

Ga IVC P. Fletcher, Atlanta 404 633-1462

Ill IVC C. Dillon, Chicago 312 729-5160

Mich IVC D. Dawson, Ann Arbor 313 994-3488

Minn IVC J. Nash, Minneapolis 612 561-4370

Mo IVC B. Pope, St. Louis 314 351-1584

NY IVC R. Henson, White Plains 914 694-1234

Pa IVC B. Martin, Johnstown 814 536-7506

Tex IVC J. White, Houston 713 784-2770

Ont IVC Rexdale, Ontario 416 749-7539

INTERSTATE TELEPHONE ELECTRONICS PO BOX 34497 DALLAS TX 75324 . 214 241-4128
stand-by power supplies for head-end microwave, line amplifiers; emergency lighting

INOVONICS INC 1630 DELL AVE CAMPBELL CA 95008 408 374-8300
solid state replacements for tube-type Ampex recorder chassis ▼S

INNOVATIVE TELEVISION EQUIP BOX 681 WOODLAND HILLS CA 91364 213 888-9421
heads for TV cameras, pedestals, stands ▼S

IONIC INDUSTRIES INC MORRISTOWN NJ 07960 201 539-1040
Music synthesizers

IRISH ELECTRONIC ENTERPRISES INC 270-78 NEWTOWN RD PLAINVIEW NY 11803 516 293-5582
video tape

ITT CANNON ELECTRIC 666 E DYER RD SANTA ANA CA 92702 714 555-4700
CATV coaxial connectors

ITT GREMAR CONNECTORS CANADA LTD FOUR CANNON COUR WHITBY ONTARIO CANADA L1N 5V8 416 668-8881
CATV connectors, fittings; above- & under-ground fittings

ITT JENNINGS 970 MC LAUGHLIN AVE SAN JOSE CA 95116 408 292-4025
coaxial switchers, variable vacuum capacitors
See ad pg. 29

ITT SURPRENANT 172 STERLING ST CLINTON MA 01510 617 365-6331
CATV wire, cable

JACOBSEN MFG CO SOD MASTER DIV 3456 WASHINGTON AVE N MINNEAPOLIS MN 55412 612 529-9566
vibratory plows for cable burial ▼S

JAMIESON FILM COMPANY 6911 FOREST PARK RD DALLAS TX 75235 214 350-1283
color film processors; film processor accessories ▼S

JAMPRO ANTENNA COMPANY 6939 POWER INN ROAD SACRAMENTO CA 95828 916 383-1177
AM, FM, TV antennas

JAVELIN ELECTRONICS 6357 ARIZONA CIRCLE LOS ANGELES CA 90045 213 641-4490
CCTV cameras, lenses, accessories; video tape recorders

JERROLD ELECTRONICS CORP 200 WHITMERE R HORSHAM PA 19044 215 674-4800
CATV; ITFS; MATV; microwave turnkey systems; full line amplifiers, passives, headend equip., converters

JFD SYSTEMS DIV RIKER COMMUNICATIONS 142 CENTRAL AVE CLARK NJ 07066 201 382-3700
amplifier splitters; line stretchers; bridgers; tap-offs ▼S

JOHANSON MFG CO ROCKAWAY VALLEY RD BOONTON NJ 07005 201 334-2676
variable capacitors

JOHNSON ELECTRONICS INC PO BOX 7 CASSELBERRY FL 32707 305 838-2111
FM and SCA broadcast receiving equipment; p.a. amplifiers ▼S

JVC INDUSTRIES INC 50-35 56TH RD MASPETH NY 11378 212 392-7100
video color cameras; portable video cameras; monochrome cameras; lenses, head mounts, tripods, camera accessories; videotape recorder/players; monitors, routing switchers, sync generators, special effects generators; videotape; video cassette players; video superimposers; video mixers

K

KAHN RESEARCH LABORATORIES INC 956 BRUSH HOLLOW RD WESTBURY NY 11590 516 997-4544
communications research & design

KAITRONICS CORP PO BOX 556 BELMONT CA 94002 415 592-4774
video character generators; SMPTE time code equip ▼S

KALVART VICTOR CORP HULTENIUS ST PLAINVILLE CT 06062 203 747-1666
large screen TV projectors; TV image imprinter; optical multiplexer; TV film chain; TV movie projector; accessories

KAMAN SCIENCES CORP (BROADCAST COMPUTER SERVICES) 1500 GARDEN OF THE GODS RD COLORADO SPRINGS CO 80907 303 598-5868
computerized radio and television traffic/accounting systems

KANSAS STATE NETWORK INC 833 N MAIN ST WICHITA KS 67203 316 265-5868
time base correctors, character generators, information systems for catv

KAPPA NETWORKS INC 165 ROOSEVELT AVE CARTERET NJ 07008 201 541-1600
delay lines, networks

KAREX INC 1262 LAWRENCE STATION SUNNYVALE CA 408 734-3344
videotape ▼S

KAY ELEMETRICS CORP 12 MAPLE AVE PINE BROOK NJ 07058 201 227-2000
CATV test instruments, wide assortment

KINETIC TECHNOLOGY INC 3393 DeLaCRUZ BLVD SANT CLARA CA 95050 . 408 249-7755
Filters for telephone signals

KLEIN MATHIAS SONS INC 7200 McCORMICK RD CHICAGO IL 60645 312 588-6820
hand tools; safety equipment for CATV

KLIEGEL BROS UNIVERSAL ELECTRIC STAGE LIGHTING CO INC 32-32 48TH AVE LONG ISLAND CITY NY 11101 . 212 786-7474
lighting control systems & fixtures for remote pick-up, studio locations ▼S

KOLLMORGEN CORP 347 KING ST NORTHAMPTON MA 01060 413 586-2333
visual, TV special optical systems

KORTICK MFG CO 5600 THIRD ST SAN FRANCISCO CA 94124 415 822-6666
pole line hardware

KOSS CORP 4129 N WASHINGTON ST MILWAUKEE WI 53212
headphones, dynamic and electrostatic

K'SON CORP 250 E EMERSON ORANGE CA 92665 714 998-3300
pay TV systems; subscriber control, billing equipment; converters; descramblers ▼S

KVC INC 770 LEXINGTON AVE NEW YORK NY 10021 212 752-3695
portable video camera shoulder braces; camera mounts heads, tripods ▼S

LAIRD TELEMEDIA INC 2125 S WEST TEMPE SALT LAKE CITY U 84115 . . 801 486-6251
character generator; multiplex equip't; slide projectors

LAMPKIN LABORATORIES INC 8400 NINTH AVE NW BRADENTON FL 33505 . . . 813 744-4175
signal generators; frequency meters; modulation monitors; deviation meters; TV signal conditioner

LENCO ELECTRONICS 319 WEST MAIN ST JACKSON MO 63755 314 243-2355
color encoders, processing amplifiers; pulse distribution amplifiers; sync generators; black burst generators; video presence detector; changeover switch ▼S

LEXICON INC 60 TURNER S WALTHAM MA
continued on page 7

Scully Shows You How To Be Perfect Without Paying The Price.

As a professional, you want the finest in a professional recorder. The best sound reproduction possible. Simplicity of operation. Reliability coupled with ease of maintenance. And, you don't want to pay a fortune to get it. In short, you want perfection at a perfect price. You want the new 280-B Recorder/Reproducer.

Unmatched Performance.

By designing the 280-B electronics around the new high-energy tapes. The S/N ratio is perhaps the best available in any recorder at a comparable price. Up to 22 dB on full track 1.5" tape at mastering speed. A sharp 18 dB on two-track .25" and four track .50"

The 280-B also features more head room and an increased record level for maximum signal utilizing the high output tapes. And bandwidths are a very flat ± 2 dB, 20 Hz to 18 KHz. It all adds up to greater performance

than you've ever been used to.

Quick, Simple Operation.

The more sophisticated we've made the 280-B, the simpler we've made it for



you to operate. Our new **Optac**[™] motion sensing system gets a new standard of efficiency in tape motion control. Now you can go from one transport mode to another without touching the Stop button. And enter and leave Record while the

transports in Play. **Optac**[™] and the 280-B's new logic circuitry make the exact moves for you at the right time.

Easy Maintenance.

New solid state circuitry and mother-daughter board architecture give the 280-B a greater reliability factor. They also make testing, repair and replacement easier. All signal electronics are in slide-out drawers. No more bending down and reaching around. Individual channel modules go in and out easily, too.

If the 280-B sounds too good to be true, wait till you hear it. And wait till you find out the price. We've made it very easy for you to get the best.

For more detailed information and prices on the 280-B, call or write: Scully/Metrotech, 475 Ellis Street, Mountain View, California 94040. (415) 968-8389. TLX 345524.

▶ **Scully|Metrotech**
Recording Divisions of Dictaphone

Scully/Metrotech and Optac are registered trademarks of Dictaphone Corporation, Rye, New York, U.S.A.

Circle 141 on Reader Service Card

02154 617 891-6790
audio digital delay system; variable speed tape recorder; speech compressor/expander ▼S

LINDSAY SPECIALTY PRODUCTS LTD 418 CAREDEAN DR HORSHAM PA 19044 215 674-5510
cable TV headend antennas; cable connectors; trunk & distribution amplifiers; distribution accessories ▼S

LIPSNER-SMITH CORP 7334 N CLARK ST CHICAGO ILL 60626 312 338-3040
film inspection projectors; film, tape ultrasonic cleaner

LISTEK TELEVISION EQUIPMEN CORP 35 CAIN DR PLAINVIEW NY 11803 516 694-8963
video camera heads, pedestals, tripods, dollies ▼S
See ad pg. 21—refer to rep/dist section

THE LONDON CO 811 SHARON DR CLEVELAND OH 44145 216 871-8900
modulation meters

LOWEL LIGHT MANUFACTURING INC 421 W 54TH ST NEW YORK NY 10019 212 245-6744
television studio and location lights; light stands, light accessories ▼S

LPB INC 520 LINCOLN HIGHWAY FRAZER PA 19355 215 644-1123
audio consoles, equip't; control room furniture; carrier current AM broadcast equip't ▼S
See ad pg. 111

LRC ELECTRONICS INC 901 SOUTH AVE HORSEHEADS NY 14845 607 739-3844
cable TV connectors; cable TV distribution passives ▼S

L-W PHOTO, INC., 15451 CABRITO RD., VAN NUYS, CA 91406 (213) 781-0457
16 mm film chain projectors

M

3M COMPANY MAGNETIC AUDIO/VIDEO PRODUCTS DIV ST PAUL MN 55101 612 733-1110
full line of recording tape for audio and video ▼S

3M COMPANY MINCON DIV 3M CENTER ST PAUL MN 55101 612 733-1110
video color encoders, videotape evaluator, color drop-out compensator, processing video amplifier, bridging video switchers, video image enhancer, special effects generator, time base corrector ▼S

MAGNASYNC/MOVIOLA CORP 5539 RIVERTON AVE N HOLLYWOOD CA 91601 213 877-2791
film editing equipment; field and studio tape recorders ▼S

MAGNA-TECH ELECTRONIC CO INC 630 NINTH AVE NEW YORK NY 10036 212 586-7240
film sound recording & playback equipment; magnetic tape recorders/reproducers; synchronizers; interlock systems; film projectors ▼S

MAGNAVOX CO CATV DIVISION 100 FAIRGROUNDS DR MANLIUS NY 13104 315 682-9105
cable TV trunk & distribution amplifiers, distribution passives, connectors, terminals, accessories ▼S

MAGNAVOX VIDEO SYSTEMS 1700 MAGNAVOX WAY, FT WAYNE IN 46750 219 432-6511
studio & portable video color cameras; video monitors, educational TV receivers ▼S

MARCONI INSTRUMENTS 111 CEDAR LANE ENGLEWOOD NJ 07631 201 567-0607
modulation monitors; TV sideband analyzers, spectrum analyzers, video test generators; automatic tv monitors, digital synchronizers; noise test sets; a sweep generators; other tv test gear; frequency counters; audio and rf signal generators; distortion meters ▼S

MARCONI ELECTRONICS INC 1309-J STONE MILL COURT STONE MTN GA 30083
TV cameras, telecines, switchers, transmitters ▼S

MARCO VIDEO SYSTEMS INC 6114 N 20TH ST PHILADELPHIA PA 19138 215 849-9500
video routing switchers ▼S
See ad pg. 116

MARTI ELECTRONICS INC BOX 661 CLEBURNE TX 76031 817 645-4091
remote pick-up & aural STL equipment; audio amplifiers; remote control telemetry & automatic digital transmitter logging equipment

MATTHEY PRINTED PRODUCTS LTD. (See TELEVISION EQUIPMENT ASSOCIATES)

McBEE LABORATORIES 5151 WISCONSIN AVE NW WASHINGTON DC 20016 202 244-2345
automatic digital logger, digital remote control equipment

MC CURDY RADIO INDUSTRIES LTD 108 CARNFORTH RD TORONTO ON M4A 2L4 751-6262
audio consoles; audio, distribution, line & preamplifiers; audio controls & alternators; intercom systems; patch panels; turntables, pickup arms; monitor speakers; racks, cabinets, console assemblies; audio tape cartridges ▼S

MC GRAW-EDISON CO EDISON ELECTRONICS DIV GRENIER FIEL MANCHESTER NH 03103 603 669-0940
audio line amplifiers, audio attenuators and potentiometers; intercom systems; rf attenuators; field calibration meters, IM distortion meters; rf watt meters ▼S

MC MARTIN INDUSTRIES INC 4500 S 76TH OMAHA NE 68127 402 331-2000
audio & TV consoles; audio mixers; line amplifiers; PA amplifiers; turntables, arms, intercom systems; rf amplifiers; AM & FM transmitters; exciters; remote control equip.; remote pickup & STL; SCA equip.; FM antennas; antenna monitors; signal generators; modulation monitors ▼S
See ad pg. 92, 113, 124—refer to rep/dist section

Kan
F. Eckhoff 8123 Monrovia Shawnee Mission 66216 913 888-0127

MEDIATECH 824 BUSSE HIGHWAY PARK RIDGE IL 60068 312 693-8366
tape-to-film transfer

MEMOREX CORP 1200 MEMOREX DR M/S 0018 SANTA CLARA CA 95052 408 987-2236
audiotape; audio tape accessories; video tape for all video record formats ▼S

MICMIX AUDIO PRODUCTS INC 9990 MONROE DR SUITE 222 DALLAS TX 75220 214 352-3811
audio consoles; reverberation units ▼S

MICROFLECT CO INC 3575 25TH ST SE SALEM OR 97302 503 363-9267
billboard-type passive repeaters; tower-mounted reflectors

MICRO-TRAK CORPORATION 620 RACE ST HOLYOKE MA 01040 413 536-3551
turntables, arms, pickups; pre-amps, equalizers; monitor speakers; cartridge tape racks ▼S
See ad pg. 119

MICROTRAN COMPANY INC 145 E MINEOLA AVE VALLEY STREAM NY 11582 516 561-6050
bulk tape erasers

MICROWAVE ASSOCIATES INC SOUTH AVE BLDG N BURLINGTON MA 01803 617 272-3000
microwave TV equip't for STL, spurs, intercity systems; air-to-ground microwave TV relay systems ▼S
See ad pg. 17

CA Microwave Associates Inc 850A Stewart Drive Sunnyvale 94086 408 733-0222

GA Microwave Associates Inc 175 West Wieuca Road NE Rm 225 Atlanta 30342 404 252-4311

MO Microwave Associates Inc Loma Vista Office Center Suite 202 8800 Blue Ridge Boulevard Kansas City 64138 816 763-5395

TEX Microwave Associates Inc 4398 Shady Bend Drive Dallas 75234 214 239-2893

MID-STATE COMMUNICATIONS, INC NORTH 7TH AVE BEECH GROVE 46107 317 786-95
frequency measurement equipment; signal level meters; installer's meters

MILLER-STEPHENSON CHEMICAL CO INC DANBURY C 06810 203 743-44
degreaser; head cleaner; contact cleaner

MINNEAPOLIS MAGNETICS INC 8125 PLEASANT AVE SOUTH MINNEAPOLIS MN 55420 612 884-70
magnetic tape recorder heads, replacements for leading recorder brands ▼S

MINOLTA CORP 200 PARK AVE SOUH NE YORK NY 10003 212 674-85
TV crt color analyzer; light measurement equipment; color temperature meter

MIRATEL DIV (See BALL BROS RESEARCH)

MODULAR AUDIO PRODUCTS INC 1385 LAKELAND AVE BOHEMIA NY 11716 516 567-9620
modular audio components; modular line amplifiers, equalizers, compressor/limiters, preamplifiers, power supplies, etc. ▼S
See ad pg. 93—refer to rep/dist section

MODTEC (See BROADCAST ELECTRONICS)

MOHAWK WIRE CABLE CORP 9 MOHAWK DR LEOMINSTER M 01453 617 537-99
broadcast color camera cables, connectors, accessories

MOLE-RICHARDSON CO 937 N SYCAMORE AVE HOLLYWOOD CA 90038 213 851-01
TV, photo lighting equipment; microphone boom perambulators; mechanical special effects equipment

MOOG MUSIC INC POB 131 WILLIAMSVILLE NY 14221 716 633-22
music synthesizers

MOSELEY ASSOCIATES INC 111 CASTILIA DR GOLETA CA 93017 805 968-96
remote digital control systems; automatic log microwave systems for remote pickup and STL; rf amplifiers; SCA equip.; status & alarm indicators ▼S
See ad pg. 91—refer to rep/dist section

MOUNTAIN WEST ALARM 4215 N 16TH S PHOENIX AZ 85016 602 263-88
burglar and fire alarm systems

MOXON INC CTS DIV 2272 MICHELSON DR IRVINE CA 92664 714 833-20
CCTV cameras; surveillance TV cameras; mob vans; airborne microwave TV systems ▼S

MSI TELEVISION 4788 S STATE ST SALT LAKE CITY UT 801 262-84
character generators; weather, news, stock data systems; titling equip.; data casting for cable TV ▼S

MULTIPLIER INDUSTRIES CORP 224 N FIFTH AVE M VERNON NY 10550 914 69-0990
vehicle, aerial bucket, lineman safety equipment

MULTRONICS INC 12307 WASHINGTON AV ROCKVILLE MD 20852 301 881-57
AM antennas; antennas phasing & branching networks; rf power indicators, contractors, related accessories ▼S

MYERS-OAK COMMUNICATIONS CONSTRUCTION CORP CRYSTAL LAKE IL 60014 815 459-50
catv system construction ▼S
See ad pg. 7

N

NAGRA MAGNETIC RECORDERS INC 19 V 44TH ST NEW YORK NY 10036 212 61-8066
miniature reel-to-reel audio/cine recorders

NASCO TELEVISION SYSTEMS 947 JANESVILLE AVE FOR ATKINSON WI 53538 414 563-24
video distribution equip't; special effects units
continued on page

FARINON Makes It..

REMODULATING & HETERODYNE
MICROWAVE EQUIPMENT, FIXED
AND PORTABLE • VIDEO SUBSYSTEMS:
VOICE & DATA CHANNELS • AM &
FM PROGRAM CHANNELS • SYSTEM
MONITORS • CLAMPER & DISTRIBUTION
AMPLIFIERS • 70 MHz MOD-
ULATORS & DEMODULATORS •
SHELVES • ACCESSORIES

TOO..ALL..AND BETTER..Video Transmission Systems in the 2, 7, and 13 GHz Bands

TOO . . because although we're best known for our high quality transmission equipment in the telecommunications fields . . we're well on our way to earning the same reputation for quality and integrity in the world of video transmission. Too.

ALL . . because in addition to offering you a single source for a wide range of equipment . . we can also offer a single source for valuable experience gained meeting the critical needs of major telephone companies, railroads, pipelines and other users of microwave message service in 60 countries. Experience that has practical applications for you . . like our video version of the SS series of remodulating microwave systems. And that's not all.

AND BETTER . . because we've earned our reputation in those other "fields" designing, engineering and building equipment to do the job, better. A case in point . . is our new Farinon FV series of dual-conversion superheterodyne systems for the 2, 7, 11, 12 and 13 GHz bands. The high degree of

rejection of adjacent channel interference inherent in the receiver design techniques allows you to use all the channels, not just every other channel. And, common components in the receiver and transmitter simplify maintenance and spare parts inventories.

Quality . . Integrity . . Availability . . Technical Superiority . . Experience . . just some of the things to consider when you select a microwave system.

To make it even easier for you: **Farinon Electric General Office** San Carlos, CA 94070 - 1691 Bayport Ave., (415) 593-8491. **Sales Offices** Atlanta, GA 30341 - 5582 Peachtree Rd., NE, (404) 451-1982. Houston, TX 77024 - 710 No. Post Oak Rd., Suite 222, (713) 688-5569. Somerville, NJ 08876 - PO Box 148 (201) 526-2269. **Farinon Electric of Canada Ltd.** Dorval, P.Q. - **General Office** 657 Orly, H9P 1G1 (514) 636-0974. Edmonton, Alberta - 216 McLeod Bldg., (403) 422-0566.



Circle 142 on Reader Service Card

NATIONWIDE ELECTRONIC SYSTEMS INC
1536 BRANDY PARKWAY STREAMWOOD IL
60103 316 289-8820
digital stopwatch

**NORTH AMERICAN PHILIPS CORP (SEE
AKG DIV & PHILIPS BROADCAST EQUIP
CORP)**

**NORTRONICS COMPANY INC RECORDER
CARE DIV 8101 TENTH AVE N
MINNEAPOLIS MN 55427 612 545-0401**
magnetic tape recorder heads; tape erasers; test
tapes; recorder care accessories for audio and
video machines ▼S

**RUPERT NEVE INC BERKSHIRE IND PARK
BETHEL CT 06801 203 744-6230**
audio consoles ▼S

See ad pg. 103—refer to rep/dist section
Calif Rupert Neve 1800 N Highland Ave Suite
616 Hollywood 213 465-4822

**NURAD INC. 2165 DRUID PARK DR., BALTI-
MORE, MD 301-462-1700**
quad polarized antennas for remote-TV
broadcasts

O

**OAK INDUSTRIES INC CATV DIV CRYSTAL
LAKE IL 60014 815 459-5000**
converters; pay-TV devices; CATV amplifiers ▼S

**ODETICS 1859 S MANCHESTER AVE
ANAHEIM CA 92802 714 530-6050**
time elapse VTR

**OK MACHINE AND TOOL CORP 3455
CONNER ST BRONX NY 10475 .212 994-6600**
wire-wrapping equip't; connector pressers; pliers;
wire cutters; strippers

**OMNIX CORP 12334 W PICO BLV 90 LOS
ANGELES CA 064 213 826-5605**
video test signal generator; pulse d.a.; video d.a.;
subcarrier d.a.; audio/video routing switchers;
video mixers; special effects generators ▼S

**ONAN DIV ONAN CORP 1400 73RD AVE
NE MINNEAPOLIS MN 55432 . 612 786-6322**
emergency stand-by power generators

**OPAMP LABS INC 172 S ALTA VISTA BLVD
LOS ANGELES CA 90036 213 934-3566**
microphone mixers; operational amplifiers; audio
components; basic amplifier kits

**OPTIMA ENCLOSURES DIV SCIENTIFIC-
ATLANTA 2166 MOUNTAIN INDUSTRIAL
BLVD TUCKER GA 30084 404 939-6340**
racks, equipment enclosures

**OTARI CORPORATION 981 INDUSTRIAL RD
SAN CARLOS CA 94070 415 593-1648**
reel-to-reel audio tape recorder/reproducers; tape
duplicators ▼S
See ad pg. 71

P

**PACKAGED LIGHTING SERVICES INC PO
BOX 285 WALDEN NY
12586 914 778-3515**
portable quartz lighting system for CCTV

**PACIFIC RECORDERS & ENGINEERING
CORP 1760 SORRENTO VALLEY RD SAN
DIEGO CA 92121 714 453-3255**
variable-speed motor drive amplifier; compressor/
limiter; digital timing system ▼S
See ad pg. 88, 112

**PAILLARD INC 1900 LOWER ROAD LINDEN
NJ 07036 201 381-5600**
16 mm cameras/projectors

**PAKO CORP 6300 OLSON MEMORIAL
HIGHWAY MINNEAPOLIS MN 55418
..... 612 540-6011**
film processors

**PALMER (WA) FILMS INC 611 HOWARD S
SAN FRANCISCO CA 94105 415 986-5961**
motion picture film projectors; color TV film
recorders (video to film transfer) ▼S

PANASONIC VIDEO SYSTEMS MATSUSHITA

**ELECTRIC CORPORATION OF AMERICA 200
PARK AVE NEW YORK NY 10017 212
973-5700**

video cartridge, cassette, reel-to-reel recorder/
playback systems; TV cameras; monitors;
accessories

**PANDUIT CORP 17301 RIDGELAND AVENUE
TINLEY PARK IL 60477 312 532-1800**
nylon cable ties, accessories; plastic wiring duct;
terminals

**PAPERWORK SYSTEMS INC 2000 "A" ST
PO BOX 38 BELLINGHAM WA 98225
..... 206 733-8510**
automated billing, accounting, traffic & payroll
systems ▼S

**PARANOUND (ORBAN) INC 680 BEACH S
SAN FRANCISCO CA 94109 415 776-2808**
dynamic sibilance controller ▼S

**PENTAGON INDUSTRIES INC 4751 N
OLCOTT CHICAGO IL 60656 312 867-9200**
high-speed tape duplicators

**PERMADYNE ELECTRONICS CORP 2929
NORTH SOUTHPORT AVE CHICAGO IL
60667 312 525-5559**
SCA receiver

**PHASECOM CORP 13130 S YUKON AVE
HAWTHORNE CT 90250 213 973-4191**
cable TV headend signal processors; rf
modulators ▼S

**PHELPS DODGE COMMUNICATIONS CO 441
SAW MILL RIVER ROAD PO BOX 387
YONKERS NY 10702 914 963-8200**
FIRST STATE BANK BLDG SUITE 510
BEDFORD TX 76021 817 267-1942
(NATIONAL CATV SALES OFFICE)
air-dielectric, form-dielectric aluminum sheathed
coaxial cables; cable connectors ▼

**PHILIPS BROADCAST EQUIPMENT CORP
ONE PHILIPS PKWY MONTVALE NJ
07645 201 391-1000**
A/V DIV
audio amplifiers, audio consoles and mixers;
headsets, intercom systems; microphones and
microphone accessories; tape recorder/players,
tape duplicators; turntables; column
loudspeakers; CCTV cameras; video cassette
recorder/players; mobile tv vans ▼S
See ad pg. CM/E 5

BROADCAST EQUIP DIV
studio and field TV color cameras, telecine chains
Ca PBEC 3760 Cahuenga Blvd N Hollywood
91604 213 766-8185
Ga PBEC 3300 Northeast Expwy Atlanta
30341 404 458-0171
Il Philips Bdcst Equip Corp 7530 Frontage Rd
Skokie 60076 312 579-8600
Pa PBEC Benjamin Fox Pavillion Suite 700
Jenkintown 19046 215 885-3320
Tx PBEC 9800 Northwest Freeway Brookhollow
2 Houston 77018 713 688-3458

**PHILIPS TEST & MEASURING INSTRUMENTS
INC 400 CROSSWAY PARK DR WOODBURY
NY 11717 516 912-8880**
color encoders; sync generators, color video
signal & pattern generators; pulse generators,
video level meter, decoder, if generators;
modulators; frequency counters, audio
generators; video test equip.; multi-meters,
oscilloscopes ▼S

**PLASTIC REEL CORP OF AMERICA 640 S
COMMERCIAL AVE CARLSTADT NJ
07072 201 933-9125**
audio tape cartridges & equip't; recording tape
accessories; video tape reels and film reels

**PLASTOID CORP 42-61 24TH ST LONG
ISLAND CITY NY 1101 212 786-6200**
coaxial cable; direct burial coaxial cables;
moisture sealant coaxial cables

**POLYLINE CORP 1241 RAND ROAD DES
PLAINES IL 60016 312 298-5300**
plastic reels

**POTOMAC INSTRUMENTS INC 932
PHILADELPHIA AVE SILVER SPRINGS MD
20910 301 589-3125**
antenna monitors; field strength meters; antenna
impedance bridges ▼S
See ad pg. 108—refer to rep/dist section

**POWER OPTICS INC PO BOX 266
FAIRVIEW VILLAGE PA 19409**

..... 215 539-5300
remote control systems for television; color
comparators ▼S

**PERFORMED LINE PRODUCTS CO 5349 S
CLAIR AVE CLEVELAND OH 44103
..... 216 881-4900**

antenna tower accessories; preformed metal and
plastic deadends, lashings, guywires, etc. ▼S

**PRODELIN INC PO BOX 131 HIGHTSTOWN
NJ 08520 609 448-2800**

VHF & UHF antennas; flexible & rigid 1
transmission line; transmission line connectors;
microwave antennas, reflectors, waveguides

**PROFIT RECOVERY SYSTEMS PO BOX 25
LEICESTER NY 14481 716 382-3223**
bleach regeneration system; silver recovery;
chemical recovery; pollution abatement systems

**PROJECTION SYSTEMS INC 590 ALPS
ROAD WAYNE NJ 07470 201 696-7177**
television projection systems (Amphicon) ▼S

**PULSE DYNAMICS MFG CORP
COLCHESTER IL 62326 309 776-4544**
remote broadcast originating consoles & equip.;
portable public address systems; PA
loudspeakers ▼S

**PYRAMID INDUSTRIES INC 2612 WEST
ENCANTO BLVD PHOENIX AZ 85009
..... 602 269-2319**
cable TV connectors ▼S

Q

**Q-E MANUFACTURING CO NEW BERLIN PA
17855 717 966-1017**
cable stringing blocks and aerial construction
tools for coaxial cable.

**QRK ELECTRONIC PRODUCTS (DIV OF
CCA) 1568 N SIERRA VISTA FRESNO CA
93703 209 251-4213**
studio turntables, pre-amplifiers; power supply
custom cabinets ▼S
See ad pg. 122

**QSI SYSTEMS INC 993 WATERTOWN ST
WEST NEWTON MA 02165 617 969-7118**
video sequential switcher

**Q-TV/TELESYNC 342 WEST 40TH ST NEW
YORK NY 10018 212 695-2775**
television prompter systems ▼S

**QUAD EIGHT ELECTRONICS 1929 VOSE ST
N HOLLYWOOD CA 91605 213 769-1516**
audio preamps, line and power amplifiers,
equalizers; audio controls; audio consoles and
mixers; reverberation units; dB meters; noise
gates; audio digital delay unit; compressors;
attenuators; tone oscillators; cabinets, racks ▼S

**QUAKER ELECTRONICS INC PO BOX 215
HUNLOCK CREEK PA 18621 717 256-3477**
Quartz crystals ▼S

**QUICK-SET INC 3650 WOODHEAD DR
NORTHBROOK IL 60062 312 498-0700**
tripods; stands; mounts; dollies for TV

R

**RANK PRECISION INDUSTRIES INC 411
JARVIS AVE DES PLAINES IL 60018
..... 312 297-7720**

video camera lenses ▼S
See ad pg. 87
John J Keyes 914 358-4450
James F Tennyson 714 496-3461

**RADIANT CORP 8220 N AUSTIN MORTON
GROVE IL 60053 312 966-4200**
front projection screen

**RADIO CONSTRUCTION 1830 YORK RD
TIMMONIUM MD 21093 301 252-2880**
antenna towers; tower erection

**RAMKO RESEARCH 3516-C L GRANDE
BLVD SACRAMENTO CA 95823
..... 916 392-2100**
continued on page 76

Hello, FM stations in

**Miami, Los Angeles, New York,
Cincinnati, Buffalo, Boston, St. Louis, Phoenix,
Las Vegas, Stockton, Honolulu, San Diego, Sacramento,
Woodland and, yes, Menomonee.**

Are you listening?

If you are not WSHE, KLOS, WQXR, WKRQ, WYSL, WBCN, KMOX, KBBC, KRGN, WGMF, WBUS, KUOP, Oceania Cable, KGB, KZAP, WZMF, KMEQ or KSFM, we've got bad news for you.

Your competition is now using the Sansui QSE-5B broadcast encoder.

They're encoding discrete 4-channel tapes, demodulated Quadradiscs (CD-4*) and even their own live 4-channel material—including commercial spots—and putting them on their FM MPX waves.

They're broadcasting stunning 4-channel realism, for an initial investment

that's as low as US\$900, and still retaining their present service area.

They're reaching all those people who already own QS-capable 4-channel equipment. Or, indeed, anyone who owns FM MPX-equipped stereo equipment. Millions of listeners.

If you're listening to your competition playing everything in QS 4-channel, you probably don't like what you're hearing.

But, believe us, it's not too late to catch up.

We'd love to talk to you today.

*TM JVC Inc.



QS 4-Channel Stereo. *QS* Are you listening?

*QS is a trade mark of SANSUI ELECTRIC CO., LTD.

SANSUI ELECTRIC CO., LTD. 14-1, 2-Chome, Izumi, Suginami-ku, Tokyo 168, Japan/Telephone: 323-1111 **SANSUI ELECTRONICS CORPORATION**
NEW YORK: 55-11 Queens Blvd., Woodside, New York 11377, U.S.A./Telephone: 212-779-5300 LOS ANGELES: 333 W. Alondra Blvd., Gardena,
Calif. 90247/Telephone: 213-532-7670 **SANSUI AUDIO EUROPE S.A.** ANTWERP: Diacem Building, Vestingstraat 53-55, 2000 Antwerp, Belgium/
Telephone: 3-315663-5 LONDON: 39-41 Maple Street, London, W1P, 5FU, England/Telephone: 580-5353 FRANKFURT: Reuterweg 93, 6 Frankfurt
/Main, West Germany/Telephone: 590-700

Circle 143 on Reader Service Card

distribution amplifiers, preamplifiers, mic/line amplifiers, monitor amplifiers; tape head collimeters transistor tester; cartridge & cassette loaders; consoles ▼S

RAPID Q (See GARRON)

RAVEN SCREEN CORP 124 E 124TH ST NEW YORK NY 10035 212 534-8408
front and rear projection screens

RAYCHEM CORP 300 CONSTITUTION DR MENLO PARK CA 94025 415 329-3333
Thermit sleeving and covers; waterproofing products for cable plant; molded parts

RAYTHEON DATA SYSTEMS 1415 PROVIDENCE TNPK NORWOOD MA 02062 617 762-6700
microwave communications equipment

RCA BROADCAST SYSTEMS BLDG 2-5 CAMDEN NJ 08102 609 963-8000
AM, FM & TV transmitters; audio line, power, distribution amplifiers; radio automation equipment; consoles, mixers; automatic tape cartridge recorder/players, audio and video; headsets; intercom systems; microphones; patch panels; audio tape recorder/players; tape erasers; turntables, arms, pickups; loudspeakers; video automation equip.; video color and mono cameras, studio and portable; camera heads, mounts, dollies; character generators, chroma keyers, drop-out compensators, color encoders; telecine chains; production and routing switchers, pulse distribution amplifiers, processing amplifiers, sync generators, special effect generators; video-tape recorder/players; motion picture cameras, tripods, projectors; modulators, demodulators, diplexers, exciters; remote control, remote pickup and STL links; rf amplifiers, loads, switchers; SCA equipment; AM, FM and TV antennas; antenna towers and lighting; transmission line; antenna monitors, modulation monitors, field intensity meters, audio generators; video picture monitors; phase meters, sideband analyzers, rf watt meters, mobile TV vans

See ad pg. 34, 114—refer to rep/dist section
Ala RCA Office Park Bldg #10 Office Park Circle Birmingham 35223 205 871-1155
Calif RCA Suite 531 6363 Sunset Blvd Hollywood 90028 213 461-9171
Calif RCA 330 Promise Rd Suite 305 Burlingame 94013 415 343-2741
Colo RCA 2695 Alcott St Suite 232 S Denver 80211 303 433-8484
Fla RCA 2747 Art Museum Dr Suite 5 Jacksonville 32207 904 398-4588
Fla RCA 3900 RCA Blvd Palm Beach Gardens Bldg 110 West Palm Beach 33403 305 622-1100
Ga RCA 14 Executive Park Dr NE Atlanta 30329 404 634-6131
Ill RCA Gateway II Bldg Suite 1400 120 S Riverside Plaza Chicago 60606 312 782-0700
Ind RCA 2511 East 46th St Suite Q-1 Indianapolis 48205 317 546-4001
Kan RCA 5750 West 95th St Suite III Overland Park 66207 913 642-3185
Mass RCA 40 William St Wellesley 02181 617 237-6050
Mich RCA 24333 Southfield Rd Southfield 48075 313 357-0080
Minn RCA 4522 Excelsior Blvd Minneapolis 55416 612 920-6395
Mo RCA 7701 Forsyth Blvd Suite 455 St Louis 63105 314 862-3660
NC RCA 6230 Fairview Rd Suite 104 Charlotte 28210 704 366-0626
NJ RCA Front & Cooper Sts Bldg 2-2 Camden 08102 609 963-8000
NY RCA 1133 Ave of the Americas 11th Flr New York 212 598-5900
Ohio RCA 11430 Hamilton Ave Cincinnati 45231 513 825-1550
Pa RCA 761 N Washington Rd McMurray 15317 412 941-5570
Tex RCA 3909 Executive Ctr Dr Suite 213 Austin 78731 512 345-2224
Tex RCA 8700 Stemmons Freeway Dallas 75247 214 638-6200
Va RCA 1901 North Moore St Arlington 22209 703 558-4212

Wash RCA 408 Second Ave West Seattle 98119 206 285-2375

RCA/COMMUNITY TELEVISION SYSTEMS (EIE) 7355 FULTON AVE N HOLLYWOOD CA 91605 213 764-2411
distribution amplifiers, headend signal processors, microwave equip. for cable TV ▼S

RCA ELECTRONIC COMPONENTS HARRISON NJ 07029
TV camera tubes, power tubes, display tubes, blank audio tape, batteries, test instruments, digital display devices, CCTV cameras, receiving tubes, semi-conductors, TV picture tubes, instrument cathode-ray tubes ▼S

RCA SERVICE CO (RCA DIV) BLDG 203-3 COMMERCIAL PRODUCT SALES DEPT 1614 CAMDEN NJ 08101 609 779-5892
monitors (b&w/color), stands ▼S
See ad on p. 108—refer to rep/dist section

R-COLUMBIA PRODUCT COT 2008 ST JOHNS AVE HIGHLAND PARK IL 60035 312 432-7915
self-powered electrostatic headphone

RECORTREC INC 777 PALOMAR AVE SUNNYVALE CA 94086 408 735-8821
video tape evaluators; video tape conditioners; video tape tailoring equip't ▼S
See ad pg. 111

REDDING RADIO BOX 344 FAIRFIELD CT 06430 203 579-0284
microphone station identification plates; phone loop induction pickups ▼S

REDIFFUSION INC 5 BROADWAY SAUGUS MA 01906 617 233-8600
switched (dial-a-program) and non switched rf distribution 1 systems

REK-O-KUT (See QRK)

REPCO PRODUCTS 7400 STATE STREET PHILA PA 19136 215 338-1110
CATV closures, for above and below ground

REVOX CORP 155 MICHAEL DR SYOSSET NY 11791 516 364-1900
open-reel tape recorder/players; automatic remote control for tape players (Lamb); head-sets (Beyer); microphones (Beyer); consoles and mixers (Lamb); studio lights (Meteor) ▼S

REYNOLDS/LETERON CO 9830 SAN FERNANDO RD PACOIMA CA 91331 213 899-5281
TV titlers ▼S

RF SYSTEMS INC 155 KIND ST COHASSET MA 02025 617 383-1200
cable TV antennas; yagis for channels 2-13; log periodic antennas; microwave equip., translators, microwave antennas ▼S

RHG ELECTRONICS LABORATORY INC 161 EAST INDUSTRY COURT DEER PARK NY 11729 516 242-1100
microwave equipment ▼S

RICHMOND HILL LABORATORIES LTD 1240 ELLESMERE RD SCARBOROUGH ONTARIO CANADA 416 291-7921
M1P 2X4
automation equip.; chroma keyers, video processing amplifiers, video production and routing switchers, pulse & distribution amplifiers, sync generators, special effects generators; television lights, light controls, stands, accessories; video test generators ▼S

RMS ELECTRONICS 50 ANTIN PLACE BRONX NY 10462 212 892-1000
Coaxial cable passives, connectors, hardware

ROBINS INDUSTRIES CORP. (SEE FAIRCHILD SOUND)

RODELCO ELECTRONICS 365A COMAC ROAD DEER PARK NY 11729 516 643-5110
TV transmitters, TV and FM translators, rf amplifiers ▼S

ROH CORPORATION 170 TECHNOLOGY PARK NORCROSS GA 30071 404 449-0873
audio preamps, line and power amplifiers; audio attenuators; audio test sets; all foregoing in modular form ▼S

ROHDE & SCHWARZ 111 LEXINGTON AVE

PASSAIC NJ 07055 201 773-8011
demodulators; field intensity meters for AM, FM TV frequency counters; audio 1 signal generators; audio harmonic distortion meter; dB meters; impedance bridges; sideband analyzers; rf & transmitting equip't; video noise meters ▼S
ROHN MFG., DIV UNARCO IND INC PO BOX 2000 PEORIA IL 61601 309 697-4400

antenna tower builders and erectors; microwave reflectors ▼S

ROWE INTERNATIONAL INC CUSTOMUSIC DIV 888 PROVIDENCE HWY DEDHAM MA 02026 617 325-4444
automated tape cartridge equip.; background music systems; backgroup music programs ▼S

RUPERT NEVE INC (See NEVE)

RUSSCO ELECTRONICS MFG INC 1070 BROOKHAVEN DR CLOVIS CA 93612 209 299-2167

audio consoles; audio amplifiers & accessories; turntables, arms, preamps ▼S

RUST CORPORATION 168 TREMONT ST EVERETT MA 02149 617 389-3380
automatic loggers, auto status and alarm systems, microwave transmitter remote control equipment, video and audio remote switching equipment ▼S

F B RYAN MFG CO PO BOX 451 CHARITON IA 50049 515 774-5980
underground cable plows

S

SADELCO INC 299 PARK AVE WEEHAWKEN NJ 07087 201 866-0910
cable tv test equipment ▼S

SAKI MAGNETICS INC 1649 TWELFTH ST SANTA MONICA CA 90404 213 451-8511
magnetic tape heads ▼S

SANSUI ELECTRONICS 55-11 QUEENS BLDV WOODSIDE NY 11377 212 779-5300
4-channel stereo encoder ▼S
See ad pg. 77
Calif Gardena 213 532-7670

SARKES TARZIAN INC BROADCAST EQUIP DIV EAST HILLSIDE DR BLOOMINGTON IN 47401 812 332-7251
TV automation equip.; video processing amplifiers, production and routing switchers, pulse and distribution amplifiers, special effects generators, chroma keyers, picture monitors; audio consoles, distribution amplifiers, headsets, intercom systems ▼S

SCALA RADIO 1970 REPUBLIC AVE SAN LEANDRO CA 94577 415 351-3792
broadcast antennas

SCHAFFER ELECTRONICS CORP 75 CASTILIAN DR GOLETA CA 93017 805 968-0755

radio automation equipment; multicart machines, automatic logging equip't, open-reel tape machines. Also handles the following lines: Andrews, Ampro, AKG, Audiopak, Belar, Beyer, Broadcast Electronics, CBS Electronics, Delta, Dielectric Labs, LDorrough, Fidelipac, Garron, Hughey & Phillips, ITC, Jampro, JBL, Inovonics, Kintronics, LPB, Luxo, Marti, McMartin, Multronics, Phelps Dodge, Potomac, QRK, Revovox, Rohm, Scully, Sony, Spir-o-line, Stainless, Sintronic, Shively, Stanton, TFT, UREI, Utility, UMC, Wilkinson ▼S

See ad pg. 115—refer to rep/dist section
Calif SCHAFFER 75 Castilian Dr Goleta 93017 805 968-0755
Fla SCHAFFER Merritt Island 32592 305 452-6950
Ind SCHAFFER Crawfordsville 47933 317 362-2621
Mass SCHAFFER Leominster 01453 617 534-8325
Tex SCHAFFER Dallas 75218 214 328-4944
Utah SCHAFFER Orem 84057 801 224-0190
Inter'l EMI Sound & Vision Equip't Ltd 252 Blyth Rd Hayes Middlesex UB3 1 HW England

01 573-3885
continued on page 80

MICROTIME!

A great group with more great cures for TV jitters.

Introducing the MICROTIME™ family of video signal processing systems and accessories. They eliminate picture rolls, tearing, flag waving, hue shift, skew error or color streaking. Developed and built by a great group of people . . . who developed and built our successful Delta Series Time Base Correctors.

Since no one product can solve all problems, we have an entire family of TBCs and accessories:

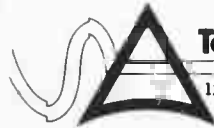
MICROTIME

- 100 Series LU-MATIC Monochrome TBCs
- 200 Series CHRO-MATIC NTSC Direct Color TBCs
- 300 Series NTSC HETROCOLOR Universal Color TBCs
- 400 Series PAL-M HETROCOLOR Universal Color TBCs
- 600 Series DIGI-MATIC Wide Aperture NTSC Color TBCs
- 700 Series VELCOR Velocity Error Correctors

For handling those wild and wiggly signals from low cost VTRs with large tension error, we've added the DIGI-MATIC™ Wide Aperture TBC.

To integrate low cost VTRs . . . dubbing up to broadcast, and sophisticated post-production processing . . . we're offering this bushel of new accessories:
VSD-30 Input Sync Gen/Switcher Accessory to TBC
DVP-40 Output Switcher/Fader Accessory to TBC
SL Series SYNC-LOC Servo Accessories for VTRs

When you stack us up against our competition, we will be the apple of your eye. Because we are the leaders in video signal processing systems, a step ahead of everyone else. Get all the facts. Write for our brochure, today.



Television Microtime, Inc.

1280 Blue Hills Avenue, Bloomfield, Conn. 06002
(203) 242-0761

Available from leading television distributors throughout the United States and Canada



SCHAFFER INTERNATIONAL 1355 HARBOR
DR SAN DIEGO CA 92101 714 236-1200
cassette players for broadcast

SCHNEIDER CORP OF AMERICA 154 LODI
ST HACKENSACK NJ 07601 201 343-3939
video camera lenses; motion picture camera
lenses; lens accessories ▼S

SCIENTIFIC-ATLANTA INC BOX 13654
ATLANTA GA 30324 404 938-2930
cable tv systems; headend modulators,
demodulators, signal processors; satellite ground
stations; microwave antennas; transmission line,
cable television trunk, distribution amplifiers;
cable tv antennas; cabinets, racks ▼S

L J SCULLY MANUFACTURING CORP 138
HURD AVE BRIDGEPORT CT 06604
. 203 368-2332
tape deck reproducers ▼S
See ad pg. 94

SCULLY/METROTECH (DICTAPHONE DIV)
475 ELLIS ST MOUNTAIN VIEW CA
94042 415 968-8389
tape recorders/payers (reel-to-reel), portable,
studio; playback equip. for automation; time code
for loggers; loggers; underground cable locators
▼S

See ad on pg. 73—refer to rep/dist section
Calif S/M 548 Kingsley Dr Los Angeles
213 387-4252
Ill S/M 3434 W Peterson Ave Chicago
312 583-7878
Tenn S/M 1805 Hayes St Nashville
615 327-1747
NY S/M 1501 Broadway New York
212 354-0623
Eng S/M Alberton House Wembley UK
OL-903-1477

SENCORE INC 3200 SENCORE DR SIOUX
FALLS SD 57107 605 339-0100
field strength meters; sweep generators for VHF,
UHF, FM, and chroma; field effect meters; dual-
trace oscilloscopes; AM/FM stereo analyzer

SENNHEISER CORP 10 W 37TH ST NEW
YORK NY 10018 212 239-0190
microphones, earphones ▼S

SHIBADEN (See HITACHI SHIBADEN)

SHINTRON CO INC 144 ROGERS RD
CAMBRIDGE MA 02142 617 491-8700
video consoles, special effects generators, sync
generators, video and audio distribution amplifiers,
sequential video switchers ▼S

SHIVELY LABS INC RAYMOND MAINE
04071 207 655-3844
broadcast antennas; transmission line; filters, rf
loads; coaxial switches, power combiners

SHURE BROTHERS INC 222 HARTREY AVE
EVANSTON IL 60204 312 328-9000
microphones, microphone accessories; audio
mixers and preamplifiers; feedback controllers;
phono pickup cartridges; audio level controllers;
p.a. systems; column speakers; audio consoles
▼S

See ad pg. 53—refer to rep/dist section
SIEMENS CORP 186 WOOD AVE S ISELIN
NJ 08830 201 494-1000
gas-filled surge voltage lightning protectors for
cable amplifiers and power supplies

SINGER EDUCATION SYSTEMS 3750
MONROE AVE ROCHESTER NY 14603
. 716 586-2000
16 mm TV projectors ▼S

SINGER INSTRUMENTATION 5340 ALLA
ROD LOS ANGELES CA 90066
213 822-8061
field intensity meters, test equipment ▼S

SINTRONIC CORPORATION 705 HAVERFORD
RD BRYN MAWR PA 19010 215 LA5-3700
am and fm broadcast transmitters; exciters; line
surge protectors ▼S

SITCO ANTENNA CO 10330 NE MARX ST
PORTLAND OR 97220 503 253-2000
cable tv antennas; antenna preamplifiers; antenna
accessories ▼S
See ad pg. CM/E 6—refer to rep/dist section

SKIRPAN LIGHTING CONTROL CORP 41-43
24TH ST LONG ISLAND CITY NY 11101

. 212 937-1444
studio lights, light systems, solid state dimmers,
light accessories

SMITH-VICTOR GRIFFITH IN 46319
. 219 838-6136
lighting systems ▼S

SOD-MASTER DIV JACOBSEN MFG CO
3456 N WASH AVE MINNEAPOLIS MN
55412 612 529-9566
oscillating plows for cable burial

SOLA ELECTRIC 1717 BUSSE RD ELK
GROOVE VILLAGE IL 60007 312 439-2800
cable television power supplies; cable tv
transformers

SOLADYNE INTERNATIONAL INC 7455
CONVOY CT SAN DIEGO CA 92111
. 714 279-7872
microwave communications equipment

SOLL INC 311 E 72 ST NEW YORK NY
10021 212 249-2031
rf switching systems

SONY CORP OF AMERICA 9 W 57TH ST
NEW YORK NY 10019 212 371-5800
video cassettes, video cassette recorder/players;
videotape recorder/players ▼S
See ad pg. 9

SPARTA ELECTRONICS CORP 5851 FLORIN-
PERKINS RD SACRAMENTO CA 95828
. 916 383-5353

radio automation systems; audio amplifiers, audio
cartridges, cassettes; audio consoles and mixers;
microphones and microphone accessories; tape
cartridge recorder/players; tape erasers;
turntables; arms, monitor speakers; am and fm
transmitters; duplexers, exciters; remote control
equipment; remote pickup and STL systems; SCA
equipment; FM antennas, antenna towers, lights;
transmission lines, antenna monitors; field
intensity meters, frequency counters, signal
generators, distortion meters, modulation
monitors; status and alarm indicators, loggers;
cabinets, cable, connectors ▼S

SPECTRA SONICS 770 WALL AVE OGDEN
UT 84404 801 392-7531
audio consoles; audio preamplifiers; line, mixing,
power amplifiers; compressor/limiters; variable
equalizers, electronic crossover filters; audio
attenuators and accessories ▼S

SPECTRA-VISION CORP 1528 BELFIELD
AVE PHILA PA 19141 215 GL7-6500
videotape editing equipment; videotape
duplication; origination equipment and equipment
service

SPECTROLAB SOUND POWER SYSTEMS
12481 GLADSTONE AVE SYLMAR CA
91342 213 365-4611
solar power systems ▼S

SPINDLER & SAUPPE INC 13034 SATROY
ST NORTH HOLLYWOOD CA 91605
. 213 764-1800
projection systems for film chains ▼S

SPIN PHYSICS INC 11633 SORRENTO
VALLEY RD SAN DIEGO CA 92121
. 714 453-5410
videotape recorder/players; replacement heads
for vtr's ▼S

STAINLESS INC THIRD STREET NORTH
WALES PA 19454 215 699-4871
am antennas; antenna towers; tower lighting,
tower accessories ▼S

STANCIL-HOFFMAN CORP 921 N HIGHLAND
AVE HOLLYWOOD CA 90038
. 213 464-7461
magnetic tape recorder/players; digital clocks;
digital time recorders for magnetic recorders ▼S

STANDARD ELECTRIC TIME 89 LOGAN ST
SPRINGFIELD MA 01101 413 732-1141
electronic master clocks ▼S
See ad pg. 88

STANTON MAGNETICS INC TERMINAL
DRIVE PLAINVIEW NY 11803
. 516 681-0200
stereo phono pickups; headphones; turntables,
arms; turntable preamp/equalizer ▼S
See ad pg. 43—refer to rep/dist section

STOREEL CORP PO BOX 80523 ATLANTA

GA 30341 404 458-3200
cabinets and racks for equipment; storage racks
and enclosures

STRAND CENTURY INC 20 BUSHES LANE
ELMWOOD PARK NJ 07407 201 791-7100
television lighting equipment; lighting controls,
stands, filters, accessories ▼S

WILLI STUDER AMERICA INC 20 DICK RD
DEPEW NY 716 681-5400
audio tape recorder/players; audio consoles;
condenser microphones

SWR INC PO BOX 215 GOFFSTOWN NH
03045 603 497-3000
transmission line accessories; rf equipment and
service

SYSTA-MATICS 510 N SHERIDAN TULSA,
OK 74115 918-835-2310
automatic video cassette player system

SYSTEMS ENGINEERING CO PO BOX 4922
ATLANTA GA 30329 404-633-7200
audio consoles, video consoles, modular line
amplifiers, equalizers, audio distribution amplifier,
power supplies

SYSTEMS MARKETING CORP 1019 WEST
WASHINGTON ST BLOOMINGTON IL
61701 309 829-6300
radio automation equip.; controllers, multiscan
machines, tape cartridge players ▼S

SYSTEMS WIRE AND CABLE INC 3500 S
30TH ST PHOENIX AZ 85040
. 602 268-8700

cable tv coaxial line and drop cables;
interconnection cables; special cable
constructions ▼S

SYSTEMS RESOURCES CORP 223
NEWTOWN RD PLAINVIEW NY 11803
. 516 249-3000

character generators; video titling equipment ▼S
SYSTRON-DONNER CORP TEN SYSTRON
DR CONCORD CA 94518 415 676-5000
frequency counters; digital clocks; sweep
generators; spectrum analyzers; rf watt meters;
time code generators ▼S

T

TABER MFG & ENG CO 2081 EDISON AVE
SAN LEANDRO CA 94577 415 635-3800
replacement audio heads for VTR's and audio
recorder/players; test tapes; tape erasers ▼S

JOEL TALL—see ELPA MARKETING
TAPE-ATHON CORP 502 S IRIS AVE
INGLEWOOD CA 90301 213 776-6900
tape recorders/players (reel-to-reel); playback
equip. for automation, loggers, mono & stereo
music service ▼S

TAPECASTER TCM PO BOX 662 12326
WILKINS AVE ROCKVILLE MD 20851
. 301 881-8800
tape cartridge equip't; digital timers,
programmable, clocks; amplifiers

TASCAM CORP 5440 McCONNELL AVE LO
ANGELES CA 90066 213 390-3500
audio tape recorders/reproducers ▼S
See ad pg. 100

TDK ELECTRONICS 755 EASTGATE BLVD
GARDEN CITY NY 11530 516 746-0800
open reel, cartridge, cassette audio tape

TECH LABS INC BERGEN BLVD PALISADES
PARK NJ 07650 201 944-2200
audio controls, attenuators; program memory
switchers ▼S
See ad pg. 117

TECHNOLOGY INC HF PHOTO SYSTEMS
DIV 11801 W OLYMPIC BLVD LOS
ANGELES CA 90064 213 272-4300
8-, 16-, 35 mm film processors ▼S

TEKTRONIX INC PO BOX 500 BEAVERTON
OR 97005 503 644-0100
oscilloscopes, video & picture monitors, sidebar
analyzers, spectrum analyzers, waveform
monitors, video and signal test generators, sync
generators, automatic video correctors, VIR
equip., vectorscopes, monitor photometers ▼S
See ad pg. Cover III
field offices: continued on page

EVERYBODY KNOWS IT IS IMPOSSIBLE TO LOG 24 HOURS OF TV PROGRAMMING ON ONE REEL OF VIDEOTAPE AND PLAY IT BACK WITH QUALITY PICTURE & SOUND AT TIME LAPSE SPEED EXCEPT GBC!!!

PRESENTING THE GBC TVR-321-24A BROADCAST AUDIO-VIDEO LOGGER...

Now in Use by Major Networks!

For the first time . . . TV stations can now log 24 hours of programming and play it back with full audio with this audio/video logger that costs less than you would have to pay for a video logger alone. Features standard EIAJ-1 format . . . pushbutton controls . . . electrical remote control . . . auto-cycling . . . automatic gain control . . . stand-by mode. Can also be used for normal VTR operations when desired. For more detailed information call us, toll free at 800-221-2240 or write.



GBC **CLOSED**
CIRCUIT **TV CORP.**

"WORLD'S LARGEST CCTV SUPPLIER"

74 FIFTH AVENUE • NEW YORK, N.Y. 10011 • (212) 989-4433

BOSTON • WASHINGTON D.C. • CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS

Circle 145 on Reader Service Card

**how many
switches
should your
switcher switch
when your
switcher should
switch switches...**

**a little?
a lot?**

For any size distribution switching system, TeleMation makes the switcher. The new TVS/TAS-1000 Series Video and Audio Distribution Switchers - Compact (8 3/4" rack frame) - Professional (radical, new crosspoint and control designs) - Inexpensive.

Call TeleMation for solutions to distribution switching problems.



TeleMation, Inc.

P. O. Box 15068, Salt Lake City, Utah 84115, (801) 487-5399

Circle 146 on Reader Service Card

self-supporting, guyed towers; portable towers

TROMPETER ELECTRONICS INC 8936 COMANCHE AVE CHATSWORTH CA 91311 213 882-1020
coax, twinax, triax cable patching equip't; coax, twinax switching matrices
TUCKER ELECTRONICS CO PO BOX 1050 GARLAND TX 75040 214 494-2326
audio, rf test equip't

U

ULTRA AUDIO PIXTEC BOX 921 BEVERLY HILLS CA 90213 213 849-1433
audio consoles; tape editing equipment; chroma keyers; video picture monitors; videotape cleaners; prompters, titling equipment; waveform monitors ▼S
UMC ELECTRONICS CO SENSTROL DIV 460 SACKETT PT RD N HAVEN CT 06473 203 288-7731
hysteresis synchronous motors; splice finders; tape erasers ▼S

UNITED RECORDING ELEC IND (UREI) 11922 VALERIO ST N HOLLYWOOD CA 91605 213 764-1500
audio consoles; amplifier and equalizer modules for audio consoles; compressor/limiters ▼S
see ad pg. 99—refer to rep/dist. section

UNITED RESEARCH LAB CORP 681 FIFTH AVE NEW YORK, NY 10022 212 751-4660
professional tape recorders, rebuilds of Ampex, Scully, etc.

UNITED SYSTEMS CORP (MONSANTO) 918 WOODLEY RD DAYTON OH 45401 513 254-6251
frequency counters, counter-timers; digital clocks; data scanners, digital/analog converters, digital comparators, digital printers, digital voltmeters; frequency converters, frequency synthesizers; pulse, sine, square-wave generators; time base generators; video amplifiers ▼S

UNIVERSAL MEDIA CORP 2301 INDUSTRIAL PKWY W HAYWARD CA 94545 415 782-2600
video picture monitors; speaker amplifiers; demodulators ▼S

UTILITY TOOL CORP TOWN ST E HADDA CT 06423 203 873-8687
hand & machine-powered tools for cable preparation

UTILITY TOWER CO PO BOX 12027 OKLAHOMA CITY OK 73112 405 946-5551
TV; AM; FM; microwave relay towers

V

VARIAN ASSOC EIMAC DIV 611 HANSEN WAY PALO ALTO CA 94303 415 493-4000
power vacuum tubes; rf switches; sockets, accessories, cooling equipment ▼S
see ad pg. Cover III
Az Phoenix 85251 602 947-5461
Ca Los Altos 94022 415 968-7630
Ca Santa Monica 90403 213 828-5588
Fl Clearwater 33516 813 446-8513
Fl Lighthouse Point 33064 305 943-9495
Ga Atlanta 30339 404 252-0045
Il Park Ridge 60068 312 825-6686
Ma Waltham 02154 617 890-4560
Md Cheverly 20781 301 773-7010
NJ Cherry Hill 08002 609 428-6800
NJ Springfield 07081 201 376-6600
NY foregoing
NY Syracuse 13206 315 437-2568
Oh Dayton 45429 513 298-7318
Tx Richardson 75080 214 235-2388

VARIAN ASSOC MICROWAVE DIV 8 SALEM ROAD BEVERLY MA 01915 617 922-6000
ITFS and MDS microwave tv systems; microwave rf and if components, assemblies and subsystems; exciters, modulators, tv translators; AM transmitters ▼S

VEGA ELECTRONICS 3000 W WARNER AVE SANTA ANA CA 92704 714 540-0222
wireless microphone systems; wireless

microphone accessories ▼S

VICON INDUSTRIES 130 CENTRAL AVE FARMINGDALE NY 516 293-2200

VIDEO AIDS CORP OF COLORADO 112 W FOURTH ST LOVELAND CO 80537 303 667-3301
editor-programmer for quad & helical vtr's; switchers; monitors ▼S

VIDEO CONCEPTS INC 1006 W ASHPARK BOX 406 HARBOR CITY CAT 90710 213 530-1911
cross pulse generator ▼S

VIDEO DATA SYSTEMS 657 OLD WILLETS PATH HAUPPAUGE NY 11787 516 234-1010
character generators; tv titling and data display systems ▼S

VIDEOMAX CORP 154 SAN LAZARO AVE SUNNYVALE CA 94086 408 739-5391
rebuilt video recording heads and headwheel assemblies ▼S
see ad pg. 22, 23
Ca 3760 Cahenga Blvd N Hollywood 91604
Md 13708 Stoner Drive Silver Springs 20904
NJ 552 Wyndham Rd Teaneck 07666

VIDEO MEMORY CORP 3070 KENNETH ST SANTA CLARA CA 95050 408 246-5820
broadcast quality helical VTR

VIDEO SENTRY SYSTEMS 1080 RTE 46 CLIFTON NJ 07013 201 777-7600
video/audio TV program loggers

THE VIDEO TAPE CO 4212 LANKERSHIM BLVD N HOLLYWOOD CA 818 351-1111
reprocessed video tape; video tape cleaning & evaluation; helical scan video tape

VIDTRONICS 855 N CAHUENGA BLVD HOLLYWOOD CA 90038

VIF INTERNATIONA BOX 1555 M VIEW CA 94042 408 739-9740
background music systems; automatic program intermix units; tape recorder/players; audio accessories; plug-in amplifier adaptors for Ampex recorders; kit for metal foil reversal system, Ampex recorders ▼S

VIKRON 4918 WEST 35TH ST MINNEAPOLIS MN 55416 612 927-7716
magnetic tape 1 heads ▼S

VISCOUNT INDUSTRIES LTD 105 E 69TH AVE VANCOUVER BC V5X-2W9 604 327 9446
video production switchers; pulse and distribution amplifiers; routing switchers; special effects generators ▼S
see ad pg. 121—refer to rep/dist section

VISUAL EDUCOM INC 4333 S OHIO ST MICH CITY IN 46360 219 879-8311
CCTV cameras; surveillance video cameras; picture monitors, video switchers, distribution amplifiers; sync generators, special effects generators; tape duplicators; pulse amplifiers; wire and cable; connectors ▼S

VISUAL ELECTRONICS CORP 356 W 40TH ST NEW YORK NY 10018 212 736-5840
studio monitors; switching equip't; video, pulse distribution amplifiers; audio, intercom systems

VISUAL METHODS INC BOX 644 200 BIRCHWOOD RD WESTWOOD NJ 07075 201 666-0190
CCTV, security camera lenses; TV housings; optical special effects generators ▼S

VITAL INDUSTRIES INC 3700 NE 53RD AVE GAINESVILLE FL 32601 904 378-1581
television automation equipment; video processing amplifiers; video production and routing switchers; video and audio distribution amplifiers; pulse distribution amplifiers; special effects generators; chroma keyers ▼S

VITEK ELECTRONICS INC 200 WOOD AVE MIDDLESEX NJ 08846 201 469-9400
cable TV test equip't

W

WARD BECK SYSTEMS INC 3400 MARINE

MIDLAND CTR BUFFALO NY 14203 214 253-5941
audio consoles, TV intercom

WATERS MANUFACTURING INC LONGFELLOW CENTER WAYLAND MA 01778 617 358-2777
audio attenuators and controls, rotary and slide ▼S

WAVETEK INDIANA INC 66 N FIRST AVE BEECH GROVE IN 46107 317 783-3221
cable tv test equipment; sweep/signal generators, rf detectors; function, signal, sweep generators, oscilloscopes; phase meters; transmission level test set; programmable waveform synthesizers; test accessories ▼S

WABASH TAPE CORP 2720 DES PLAINES AVE DES PLAINES IL 60018 312 298-8585
helical-scan video magnetic tape; audio magnetic tape

J A WEAVER CO 8676 PENNELL DR S LOUIS MO 63114 314 997-5555
bonded copper ground rods, ground rod clamps; jumper clamps

WILKINSON ELECTRONICS INC 1937 W MCDADE BLVD WOODLYN PA 19094 215 874-5236
AM and FM broadcast transmitters; audio consoles; audio compressor/limiters; distribution amplifiers, equalizers, line amplifiers; demodulators, exciters, rf amplifiers; modulation and frequency monitors ▼S
see ad pg. 30—refer to rep/dist section

WINEGARD CO 3000 KIRKWOOD ST BURLINGTON IA 52601 319 753-0121
CATV antennas, accessories; home system amplifiers

WORLD VIDEO INC PO BOX 117 BOYERTOWN PA 19512 215 367-6055
broadcast & CCTV one-gun (Trinitron) color monitors ▼S
See ad pg. 120

X

XCELITE INC 118 BANK ST ORCHARD PARK NY 14127 716 663-1111
wire stripping tools, hardware

Z

ZEI-MARK CORP PO BOX 182 BROOKFIELD CENTER CT 06805 203 861-1111
optical multiplexer; neutral density wheel; telecine film chain with preview; film chain adapters for 16 mm & super-8 mm film projectors

ZOOMAR INC 55 SEA CLIFF AVE GLEN COVE NY 11542 516 676-1900
optics; optical instruments

THE SOURCE '74 represents a real effort to produce a directory that does not list every manufacturer under every conceivable product category. To make our Instant Source Locator guide and manufacturer's product descriptions reliable and valid we asked manufacturers to check off only those products that are in regular production and for which supporting data such as literature is available. Manufacturers who filed a form carry the VS symbol for verified source. Data on manufacturers not carrying the VS symbol came from a variety of sources. Our editors included only that equipment known through personal knowledge to be available and such listings may be incomplete. The inclusion of field sales offices was restricted to advertisers in the issue.

In the Instant Source Locator guide, some manufacturers neglected to indicate the appropriate subcategories of equipment. We regret that these entries could not have been more complete. Your comments for improving the Source for '75 will be appreciated.

Independent Broadcast Reps/Distributors

Including cross reference to companies whose products are advertised

ALABAMA

BLACK RADIO SUPPLY CO.

101 Fourth Ave.
Birmingham 35233
205-322-0588
Line: audio components

ICS ASSOCS.

322 S. Memorial Pkwy
Muntsville 35807
05-881-6220
Line: video products
Cohu see ad p 41
FT see ad p 106

HEACON ELECTRONIC ASSOC.

604 Green Mountain Rd.
Muntsville 35803
05-881-5031
Line: electronic units
ITT Jennings see ad p 29

AMES W. CLARY CO.

713 Second Ave. So.
Birmingham 35233
05-322-2486
Line: audio components
Micro-Trak see ad p 119

ELECTRONIC COMMUNICATIONS

P.O. Box 1055
05 Lauderdale St.
Selma 36701
05-874-8296
Line: audio equip. monitors

ORBES DISTRIBUTING CO.

522 Fifth Ave. S.E.
Decatur 35601
05-353-4762
Line: audio components
Micro-Trak see ad p. 119

THE MAZE CORP.

P.O. Box 6636
Birmingham 35210
05-592-9678
Line: Full line broadcast (radio and TV)
and recording equipment

HOWELL ELECTRONICS, INC.

906 Jackson Hwy.
P.O. Box 369
Birmingham, Alabama 35660
05-383-333-
Line: video products
KAI see ad p 14, 15

PROFESSIONAL REPS.

34 Floral Ave.
Pelika
05-745-2192
Line: audio and video products
/ Equip. Assoc. see ad p 115

GENERAL ENGINEERING AND SALES

Birmingham
06-595-5855
Line: video systems

ESS SWICEGOOD

P.O. Box 1741

Dothan 36302
205-794-7944
Line: audio equip.; transmitters

ALASKA

KETCHIKAN RADIO SUPPLY

Ketchikan
917-225-4164
Line: audio, video, rf supplies
Sitco Ant. see ad p CM/E-6

HARRY J. LANG & ASSOCIATES

1406 West 47th Ave.
Anchorage 99501
907-279-5741
Line: audio components, equipment

YUKON RADIO SUPPLY, INC.

P.O. Box 406
Anchorage 99501
907-277-1497
Line: audio components
Micro-Trak see ad p 119

ARIZONA

BFA CORP.

4251 North Brown Ave.
Scottsdale 85251
602-946-4215
Line: electronic components
ITT Jennings see ad p 29

MORRIS COURTRIGHT

1450 W. Arroyo Dr.
Yuma 85364
602-783-6380
Line: broadcast equipment
Collins see ad p 47

PERSPECTIVE MEASUREMENTS

7244 E. Indian School Rd.
Scottsdale 85252
602-947-3860
Line: video systems
Cohu see ad p 41

ROH'S INC.

4553 East Broadway
Tucson 86711
602-327-5929
Line: CCTV systems

TELEMATION ARIZONA INC.

(See Mfg's field offices)

ZONAL CORP.

2922 W. Weldon St.
Phoenix 85017
602-264-2100
Line: audio and video
Amtron see ad p CM/E-4

ARKANSAS

CARLTON BATES CO.

6821 Scott Hamilton Dr.
Little Rock 72209
501-562-9100
Line: audio and radio products
Micro-Trak see ad p 119

DAVCE ELECTRONICS CORP.

Batesville
501-793-3816
Line: rf systems
Sitco Ant. see ad CM/E p 6

CALIFORNIA

ANIXTER-PRUZAN

2228 S. Ritchey
Santa Ana 92705
714-556-6270
Line: Sony studio video equip, cable
construction accessories, tools, head-
end, passives, test equip., power
supplies
see Sitco ad p CM/E p 6
see Sony ad p 9

ARCAL SOUND & VIDEO

2001 El Camino Ave.
Sacramento 95821
916-927-4502
Line: audio components
Micro-Trak see ad p 119
Amtron see ad p CM/E-4

AUDIO INDUSTRIES CORP.

1419 N. La Brea Ave.
Hollywood 90028
213-851-4111
Line: audio components, equip

TOM AYE ASSOCIATES

796 The Dalles
Sunnyvale 94087
408-738-1406
Line: audio equip; transmitters
Stanton see ad p 43
Moseley see ad p 91
Control Design Corp. see ad p 18
Ramko see ad p 13

B&L SALES

4312 Colfax Ave
Studio City
Line: audio products
Garner see ad p 107

JACK BERMAN CO.

P.O. Box 6003
9000 Bellanca St. Sta.
8295 South La Cienega Blvd.
Inglewood 90301
213-678-1281
Line: audio components

BROADCAST COMMUNICATIONS DEVICES INC.

480 E. Arbor Ave.
Anaheim 92807
714-528-9505
Line: Broad line audio & video equip
CBS Labs see ad p 67, 104
Stanton see ad p 43
Astronics see ad p 103
TFT see ad p 106

BROADCAST COMMUNICATIONS DEVICES INC.

1368 Arieen Ave.
Sunnyvale 94086
408-739-1941
See above insert

BROADCAST ENGINEERING

1259 Callens Rd.
Ventura 93003
805-648-1000
Line: audio components
Stanton see ad p 43

CAMERA SYSTEMS INTERNATION- AL

Los Angeles
213-748-8925
Line: camera and video systems

CAMEX CORP.

6362 Hollywood Blvd.
Hollywood 90028
213-464-0174
Line: tape recorder/players, audio
consoles, microphones, speakers,
CATV modulators and generators, re-
mote control systems, loggers audio
processors

CARTIER ASSOCIATES

11200 Chandler Blvd.
North Hollywood 91603
213-980-3450
Line: consoles, FM monitoring equip.

DAMARK INC

1582 Stagg St
Van Nuys 91406
213-786-9300
Line: audio equipment
Tascam see ad p 100

DIACOUSTIC LAB

1063 Vine St.
Hollywood 90038
Line: recording accessories

DOBBS-STANFORD CORP.

569 Laurel St.
San Carlos 94070
415-592-5958
Line: sound systems
Crown see ad p 105

DYNAMIC ASSOC.

2500 S. La Cienga Blvd.
Los Angeles
213-837-9123
Line: measuring equip. monitors. TBC
char. generators

EDUCATIONAL ELECTRONICS OF CALIFORNIA

Suite #8
90 Glen Way
Belmont 90004
415-592-5713
Line: CCTV video systems

EDUCATIONAL ELECTRONICS OF CALIFORNIA

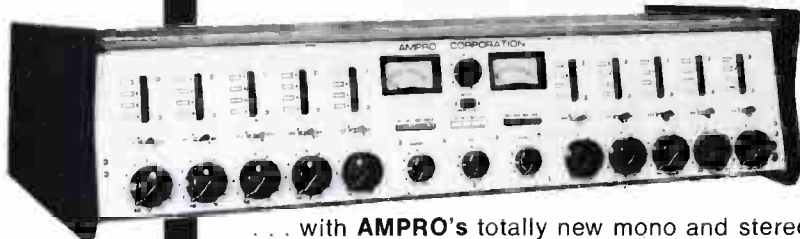
936 West Florence Ave.
Inglewood 90301
213-674-5595
Line: CCTV video systems

EDWARDS ASSOCS.

California Federal Bldg.
Suite 3200

continued on page 86

the plusses have it



Model AC-10-S
10 Channel
stereo Audio
Console.
\$3,995.

... with **AMPRO's** totally new mono and stereo consoles! Everything the competition has **PLUS:**

- 4 input transformer coupled preamps and step type faders with cue on all channels.
- +24dBm protected transformer coupled outputs.
- Protected monitor with 4 muted outputs and separate phone amp.

• Built-in cue, intercom & remote talkback systems. **PLUS** shielded PC board mixing bus to eliminate maintenance problems, 104 dB Mic to Program output and much, much more. 6 standard consoles—dual mono and stereo—6, 8, 10 and 12 channel—priced from \$2,295 to \$4,595. Slide fader configurations also available.

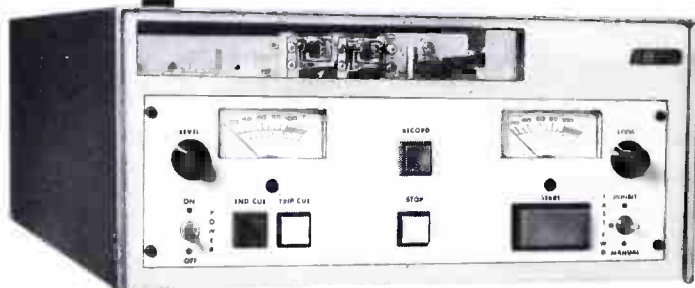
AMPRO also manufacture a complete line of Automatic Tape Cartridge Recorder/Reproducers and Multi-Cartridge units. Call Alex Meyer collect or write today for details.

AMPRO CORPORATION

2220 Maplewood Ave., Willow Grove, Pa. 19090 • (215) 657-3100
Professional Equipment for Broadcasting Professionals

Circle 147 on Reader Service Card

tougher than you are



Model CT3551
Recorder/Reproducer.
\$1,375.

... **AMPRO** Automatic Tape Cartridge Recorder/Reproducers are the rugged ones ... the ones with heavy-duty head mounts, die-cast deck and front panel, self-aligning pinch roller and direct drive 4" Motor. Silent, both mechanically and over your program line (—58 dB snr, ref. 400 Hz 3% THD), air-damped solenoid operation assures positive stop/start, gentle tape handling and long cart life. 30 standard stereo/mono models to choose from, non-slip desk enclosure and rack mount. Priced from \$650 to \$1,575.

AMPRO also manufacture a complete line of dual mono and stereo consoles and Multi-Cartridge units. Call Alex Meyer collect or write today for details.

AMPRO CORPORATION

2220 Maplewood Ave., Willow Grove, Pa. 19090 • (215) 657-3100
Professional Equipment for Broadcasting Professionals

See us at NAFMB, New Orleans October 10-13

Circle 148 on Reader Service Card

608 Silver Spur Rd.
Palos Verdes Peninsula 90274
213-541-2600
Line: switching and patching equip
Cooke see ad p 28

ENGINEERING ASSOC.
999 Commercial St.
Palo Alto 94303
415-326-7842
Line: broadcast equipment compo
nents
ITT see ad p 29

EQUINOX SALES CO.
210 Richman Ave.
Fullerton 92632
714-879-3190
Line: audio and sound systems
Elpa see ad p 105
Stanton see ad p 43

**BRYANT W. ELLIS BROADCAST
CARTRIDGE SERVICE**
1227 N. Vine St.
Hollywood 90038
213-464-5108
Line: broadcast cartridge sales, re
loading, service
Aristocart see ad p 103

EVANS MARKETING CO.
1438 Rollins Rd.
Burlingame
415-432-3030
Line: audio equip
Revox see ad p 45

F&B/CECO OF CALIF. INC.
7051 Santa Monica Blvd.
Hollywood 90038
213-466-9361
Line: cameras, lighting equip., photo
graphic supplies

HANK GABRIEL
600 16th St.
Oakland 94612
415-465-5361
Line: audio components, equipment
Fairchild Sound see ad p 116

ADOLPH GASSER, INC.
5733 Geary Blvd.
San Francisco 94121
Line: camera equip
Cinema Products see ad p 27

**GENERAL ELECTRONICS SYS
TEMS**
4150 Piedmont Ave.
Oakland 94611
415-655-2711
Line: video systems
Contac see p 35-38

GENERAL PHONOGRAPH
7517 Melrose Avenue
Los Angeles 90046
213-651-4814
Line: audio components
Micro-Trak see ad p 119

**ALAN GORDON ENTERPRISES
INC.**
1430 N. Cahuenga Blvd.
Hollywood 90028
Line: cameras, photographic equip
lighting
Cinema Products see ad pg 27

GRAVCO SALES INC.
6515 Sunset Blvd.
Los Angeles 90053
213-462-6618
Line: video amps, proc amps, switch
ers
Grass Valley see ad p 5

DAVE HILL
P.O. Box 1589
Burlingame 94010
Line: video proc amp switchers
Central Dynamics see ad p 51
Datavision see ad p 93

H & K SALES CO.
 P.O. Box 5826
 Redwood City 94063
 415-369-6244
 Line: audio components
 Stanton see ad p 43

HOLLYWOOD BEVERLY RADIO
 7706 Melrose Ave.
 Los Angeles 90046
 213-655-0400
 Line: audio products

HOLMQUIST SOUND
 12912 Venice Blvd.
 Los Angeles 90066
 Line: audio products

INTERLINK SYSTEMS
 10601 Highway 85 Suite 212
 Cupertino 95014
 408-257-7165
 Line: switching and patching equip
 Cooke see ad p 28

NIGHT DIACOUSTIC LAB
 1063 Vine St.
 Hollywood 90038
 Line: audio products

ED LANDA CO.
 1618 Cotner Ave
 Los Angeles 90025
 213-879-0770
 Line: components
 Jennings see ad p 29

MARSHANK SALES CO.
 6455 W. Jefferson Blvd.
 Culver City 90230
 313-559-2591
 Line: sound systems
 Brown see ad p 105

MEYER, ROSS & FLEMING
 5 Dorman Ave.
 San Francisco 94124
 Line: audio products

MOLO OF CALIFORNIA, INC.
 Now Sound City
 759 East Colorado Blvd.
 Pasadena 91106
 313-681-8111
 Line: audio components

THOMAS M. MORRIS ASSOC.
 315 El Solto Ave.
 Campbell 95008
 313-377-6600
 Line: audio components

OUTHROP SALES INC.
 530 East 12 St.
 Oakland 94606
 315-261-7676
 Line: audio components

MEGA ASSOCS.
 169 Hawthorne Blvd.
 Hawthorne 90250
 313-644-3649
 Line: video systems
 Cronson see ad p CM/E-4
 Conrac see ad p 35-36

**PACIFIC RECORDERS & ENG
 CORP.**
 1760 Sorrento Valley Rd.
 San Diego 92121
 314-453-3255
 Line: full line audio equipment, ac-
 cessories
 Micro-Trak see ad p 119
 Stanton see ad p 43

PERSPECTIVE MEASUREMENT
 134 Conroy Ct.
 San Diego 92111
 314-278-8931
 Line: video systems
 Phu see ad p 41

IO-TRONICS COMPANY
 99 South El Camino Real
 San Mateo 94403

415-574-8511
 Line: audio components, equip

RADIO PRODUCTS SALES
 1501 S. Hill St.
 Los Angeles 90019
 Line: audio products

RECORDING SPECIALTIES
 1030 J. East Duane
 Sunnyvale 94086
 Line: audio products

RIGGINS ELECTRONIC SALES
 2331 San Anselme
 Long Beach 90815
 213-596-6247
 Line: audio components, equip
 Broadcast Electronics see ad p
 Stanton see ad p 43

SAN DIEGO CAMERA EXCHANGE
 1071 6th Ave.
 San Diego 92101
 Line: film equipment
 Cinema Products see ad p 27

DAVID S. SIEGEL
 235 Montgomery St.
 San Francisco 94104
 415-788-0600
 Line: audio and video equipment
 Chiron see ad p 92

TEL-ALPHA
 358 Matthew St.
 Santa Clara 95050
 408-247-09111
 Line: full line video equipment
 Vicount Industries see ad p 121

TELEMATION CALIFORNIA, INC.
 (See mfg's field offices)

TRI-TRONICS
 4019 Tujunga Ave.
 N. Hollywood 91604
 213-877-9912
 Line: full line of video equipment
 Conrac see ad 35-36
 Lister see ad p 21
 Viscount see ad p 121

TREGO SALES CO.
 2239 Benedict Canyon Dr.
 Beverly Hills
 213-274-8351
 Line: audio equipment
 Revox see ad p 45
 Stanton see ad p 43

UNITED SOUND
 1805 West Magnolia Blvd.
 Burbank 91506
 213-845-7435
 Line: audio components equip

VICOR INC.
 7385 Conroy St. Ct.
 San Diego 92111
 Line: recording accessories, video
 equipment

VIDEO COMPONENTS, INC.
 13400 Mulholland Dr.
 Beverly Hills 92010
 213-274-4903
 Line: camera lenses, full line CCTV
 video equip., video camera accesso-
 ries, video editors
 Canon U.S.A. see ad p 114

VIDEO COMPONENTS, INC.
 P.O. Box 5218
 Redwood City 94063
 415-365-6263
 Line: camera lenses, full line CCTV
 video equip., video camera accesso-
 ries, video editors
 Canon U.S.A. see ad p 114

VIDEODETICS CORP.
 397 N. Anaheim Blvd.
 714-532-3364

continued on page 88

A QUESTION OF IMAGE

TV Cooke Varotals are designed by Taylor-Hobson to meet operational requirements of directors and cameramen with minimum technical compromise. Varotals 17A and 30 operating side by side offer horizontal angular coverage from 56° wide to less than 1° narrow.

Large diameter front optical elements (135mm for Varotal 17 and 159mm for Varotal 30) combined with

unique wide band anti-reflection coatings provide maximum light grasp.

Superior resolutions and color fidelity are assured by years of Taylor-Hobson zoom lens design and manufacture for professional broadcasters. Self-aligning servo or manual drive modules are interchangeable between lens models and drive functions.

Write for our bulletin, "The Performing Lenses."



**RANK PRECISION
 INDUSTRIES, INC.**
 411 E. Jarvis Ave., Des Plaines, Illinois 60018
 (312) 297-7720

COOKE VAROTALS

Circle 149 on Reader Service Card

R0274

accurate measurement of the fourth dimension

Standard Electric Time has developed and manufactured units for the precise measurement of elapsed time since 1932. These panel mounted or portable units are available in several models with accuracies to plus or minus one millisecond. They can be connected to electrical or electronic circuits for remote start, stop and reset.

For full details request catalog 261.



PANEL MOUNTED



PORTABLE

Model	Scale Divisions	Totalizes	Accuracy
S-100	1/5 sec.	6000 sec.	±.1 sec.
S-60	1/5 sec.	60 min.	±.1 sec.
SM-60	1/100 min.	60 min.	±.002 min.
S-10	1/10 sec.	1000 sec.	±.02 sec.
S-6	1/1000 min.	10 min.	±.0002 min.
S-1	1/100 sec.	60 sec.	±.01 sec.
MST-100	1/1000 sec.	6 sec.	±.001 sec.
MST-500	1/1000 sec.	30 sec.	±.002 sec.

**STANDARD
ELECTRIC TIME**



DIVISION OF JOHNSON SERVICE COMPANY

89 LOGAN STREET, SPRINGFIELD, MASSACHUSETTS 01101



There is only one word to describe the job Pacific Recorders did in designing and equipping our in-house recording studio. Outstanding.

We told Pacific what we thought we needed. Superb recording equipment, cart and cassette machines, mikes, booms, limiters, and a custom built console that could do some pretty special things. And on top of that, a soundproof studio designed for our existing 16 story world headquarters building to house it all.

When Pacific made their proposal, we liked what we saw. And when the job was finished, we liked what we saw even better.

On your next studio project, contact Pacific Recorders & Engineering. You won't be disappointed.

-Michael L. Irwin
Avco Financial Services
Newport Beach, California



**PACIFIC RECORDERS &
ENGINEERING CORPORATION**

1176O Sorrento Valley Road San Diego, California 92121
(714) 453-3255 Telex 695008

Circle 151 on Reader Service Card

Line: video equipment

VIDEONICS

Santa Clara
408-246-9520
Line: video systems
Amtron see ad p CM/E-4

VIDEO SYSTEMS INC.

Los Angeles
213-871-0677
Line: full line video equipment
Amtron see ad p CM/E-4

WESTERN BROADCAST SERVICE

1030 West Evelyn
Sunnyvale 94086
408-738-2100
Line: audio equipment, RF monitors

ZACK ELECTRONICS

1444 Market St.
San Francisco 94102
Line: audio products

COLORADO

BFA CORP.

3027 Zuni St.
Denver 80221
303-744-3301
Line: electronic components
ITT Jennings see ad p 29

BOYD OLSEN

2362 Coors Dr.
Golden 80401
303-279-5894
Line: audio products
Revox see ad p 45

HERB N. DIDIER

P.O. Box 158
Evergreen 80439
303-674-6000
Line: broadline audio and video equip
Astronics see ad p 103
CBS Labs see ad p 67, 104
Datavision see ad p 93
Television Equip. Assoc see ad p 11
TFT see ad p 106
World Video see ad p 120

E. & B. ELECTRONICS

284 S. Lipan
Denver 80223
303-934-2123
Line: sound systems
Crown see ad p 51

ELECTRO TEK

Box 395
Westminster 80030
303-255-4566
Line: audio components, systems
Fairchild see ad p 116

J. A. GEDNEY

7909 West 16th Ave.
Denver 80215
303-238-3112
Line: sound systems
Tascam see ad p 100

GEMINI TELECOMMUNICATIONS

1776 S. Jackson St.
Denver 80210
303-758-8756
Line: audio equipment
Canon USA see ad p 114
Otari see ad p 71

HIGHLAND ASSOCIATES

1380 West Midway Bl.
Broomfield 80020
303-466-3851
Line: full line audio equipment for
broadcaster
CBS Labs see ad p. 104
Control Design see ad p 18
Micro-Trak see ad p 119

continued on page

Announcing the Best-Station Award Contest

If you have built or modernized your broadcast equipment of facilities for dollar-smart-operation—

If the original plan or the modernization did maximize your efficiency and profits

Send Your Story by October 15th to the BM/E BEST-STATION AWARD CONTEST

We will publish in the December, 1974 issue, all stories our editors find acceptable. Our readers will be invited to pick the winner in each of four categories: AM Class 1 & 2, AM Class 3 & 4, FM and TV.

Each winner will get a Best Station Award plaque designed to enhance any station visitor's lobby, manager's office, or studio. Winner will be announced in the March, 1975 issue.

Here are the simple rules:

Describe your construction or modernization briefly, including the logic, in cost-effectiveness, of the main equipment and design choices. Focus on one section of your plant—transmitter, remote control, or studio control room layout, as examples—or describe the whole plant. Write as much, or as little as you need to tell the story clearly. Include photos, block diagrams, schematics, floor plans as needed.

Remember—Get Your Story in by October 15th.

Send it to Best Station Award, BM/E, 274 Madison Avenue, New York, NY 10016. For further information, write or call the Editor, BM/E, at the same address. Tel.: (212) 685-5320.



At NBC...



and CBS...

abc

and ABC...



they use more BIW TV broadcast cable



... than any other brand.

... and now a word from our sponsor:

The major networks prefer BIW TV cable for the same reasons local stations do. For one thing, they get proven reliability. BIW was the first TV cable manufacturer, has more experience than anybody else. We're now the supplier of cable for all TV cameras, plus accessory equipment for other studio cable and connector requirements. We also have both East and West Coast facilities for on-the-spot supply, service, and technical help. Write for literature. Or call.

Thanks for tuning in!

Boston Insulated Wire & Cable Company

65 Bay Street, Boston, Mass. 02125
Court Street, Plymouth, Mass. 02360 • Tel: 617-265-2102

Other Plants and Sales Offices in Los Angeles, Calif. 90061 • Tel: 213-532-9064,
Hamilton, Canada • Tel: 416-529-7151; Kingston-upon-Thames, U.K. • Tel: 01-576-3384; Singapore • Tel: 374797



Circle 152 on Reader Service Card

McLOUD & RAYMOND CO.
2020 South Pontiac Way
Denver 80222
303-756-1589
Line: audio components

SCOWCROFT ASSOCS.
11742 E. Jewel Pl.
Aurora 80010
303-755-2422
Line: audio products
Stanton see ad p 43

TELEMATION COLORADO, INC.
See Mgr's field offices

CONNECTICUT

JOHN B. ANTHONY
2810 High Ridge Rd.
Stamford 06903
203-322-9202
Line: full line audio equipment
Stanton see ad p 43
UREI see ad p 99

AUDIOTECHNIQUES, INC.
142 Hamilton Ave.
Stamford 06902
203-359-2312
Line: full line audio equip. recording
accessories imported and domestic
L. J. Scully see ad p 94

HERBERT ELECTRONICS
1081 Capitol Ave.
Hartford 06106
203-247-0042
Line: audio components
Micro-Trak see ad p 119

FRED LOCKE STEREO
216 West Main St.
Avon 06001
203-678-1797
Line: audio components
Micro-Trak see ad p 119

R. S. REISS ASSOC.
70 Jessie Dr.
West Haven 06516
203-933-8542
Line: audio products
Stanton see ad p. 43

ROBERT SMITH COMPANY
188 Brewster Rd.
West Hartford 06117
203-523-0512
Line: sound systems

TELEMATION EAST, INC.
See Mgr's field offices

DELAWARE

CLEARVIEW ELECTRONICS
P.O. Box 326
Newark 19711
302-368-4000
Line: TV systems

DISTRICT OF COLUMBIA

BRENNER CINE-SOUND
5215 Wisconsin Ave. N.W.
Washington 20015
Line: sound and film equip.
Cinema Products see ad p 27

**COMMUNICATIONS EXPORTING
CORP.**

Washington
202-471-1588
Line: video systems

VIDEO ENGINEERING CO.
Washington
202-882-6131
Line: video systems

FLORIDA

BCS ASSOC. INC.
940 N. Fern Creek Ave.
Orlando 32802
305-896-4881
Line: measuring equip.; monitors;
video products
Cohu see ad p 41

BEACON ELECTRONIC ASSOC.
3902 Burns Rd.
Palm Beach Gardens 33403
305-622-2700
Line: radio products
ITT Jennings see ad p 29

BEACON ELECTRONIC ASSOC.
P.O. Box 1278
Maitland 32751
305-647-3498
Line: radio products
ITT Jennings see ad p 29

MAC R. BOUGERE ASSOC.
8716 Palisades Dr.
Tampa 33615
813-886-8553
Line: audio components
Stanton see ad p 43

F. T. C. BREWER CO.
P.O. Box 8057
Town & Country Plaza
Pensacola 32505
904-433-7932
Line: audio equip.; transmitters
Burwen Labs see ad p 109
Control Design see ad p 18
L. J. Scully Co. see ad p 94

BROADCAST AUTOMATION
5199 NE 12th Ave.
Ft. Lauderdale 33308
305-776-4762
Line: full line audio and video products
Broadcast Electronics see ad p 34
CBS Labs see ads p 67, 104
Control Design see ad p 18
L. J. Scully Co. see ad p 94
Stanton see ad p 43

BROADCAST ENG. CO.
Box 14444
Ft. Pierce 33450
Line: audio products

CONTINENTAL ELECTRONIC
620 West 32nd Pl.
Hialeah 33010
305-822-1421
Line: audio and radio products
Micro-Trak see ad p 119

ELECTRONIC EQUIP. CO.
2701 NW 42nd Ave.
Miami 33142
Line: audio products
Micro-Trak see ad p 119

FIRESTONE ASSOC.
285 NE 185th St.
Hollywood 33021
305-651-3830
Line: audio components, test equip.
Crown see ad p 105

FLAGLER RADIO CO., INC.
1068 W. Flagler St.
Miami 33130
305-373-6548
Line: audio components, equip.
Broadcast Electronics see ad p 34
Stanton see ad p 43

GRICE ELECTRONICS

P.O. Box 1911
Pensacola 32502
904-434-2477
Line: audio components
Micro-Trak see ad p 119

L. P. HENCH CO.
990 Richmond Ave.
Miami
305-251-4343
Line: audio products
Revox see ad p 45

HUTTO-HAWKINS-PEREGOY, INC.
P.O. Box 1277
139 Candace Dr.
Maitland 32751
Line: audio components

IMAGE DEVICE, INC.
811 NW 111th St.
Miami 33168
Line: photo cameras
Cinema Products see ad p 27

J. D. IVEY CORPORATION
617 West Central Blvd.
Orlando 32801
305-843-8982
Line: video systems
Television Microtime see ad p 79

J. & J. ELECTRONICS
5855 Johnson St.
Hollywood
Line: video systems
Viscount Industries see ad p 121

LAUDERDALE ELECTRONIC LABS.
16 SW 13th St.
Fort Lauderdale 33315
305-525-0478
Line: audio components
Stanton see ad p 43

JARRELL C. LESTER
4515 South Hale
Tampa 33611
813-932-4365
Line: video equipment
Television Equip. Assoc. see ad p 115

MANREP CORP.
P.O. Box 4808
14410 NW 60th Ave.
Miami Lakes 33014
305-822-7630
Line: audio components
Micro-Trak see ad p 119

MODEMS PLUS, INC.
P.O. Box 9207
Ft. Lauderdale 33310
305-687-3849
Line: switching and patching equip.
Cooke see ad p 28

PANAMEX CO.
1006 Seybold Bldg.
Miami 33132
305-374-7330
Line: audio components
Control Design see ad p 18
Micro-Trak see ad p 119

PEERSON AUDIO, INC.
509 South Olive Ave.
West Palm Beach 33401
305-832-1921
Line: audio components, equip.

**PROFESSIONAL REPRESENTA-
TIVES**
709 N. Franklin St.
Tampa 33602
813-223-2911
Line: camera lenses, full line CCTV
video equip, video camera equip,
video editors
Canon USA see ad p 114
Otari see ad p 71

REPELECT

Box 7102
Tampa 33603
813-227-5051
Line: audio equip.; transmitters
Fairchild Sound see ad p 116

SOUTHEAST ELECTRONICS
1125 Rosselle St.
Jacksonville 32204
904-356-3007
Line: full line audio componen
equip
Broadcast Electronics see ad p 34

UNIREP
1141 SE 2nd Ave.
Ft. Lauderdale 33316
305-527-1556
Line: sound equipment
Stanton see ad p 43

VAUGHAN ASSOCIATES
Box 15111
Sarasota 33579
Line: audio products

VIDEO COMPONENTS, INC.
1800 San Souci Blvd.
Apt. 305
N Miami 33161
305-895-2262
Line: camera lenses, full line CCT
video equip, video camera access
ries, video editors
Canon USA see ad p 114

WORLD WIDE PRODUCTS
P.O. Box 279
Miami 33168
305-754-5475
Line: audio components, equip, tap
recorders

GEORGIA

ACK RADIO
554 Deering Rd. NW
Atlanta 30309
404-351-6340
Line: audio components & equip

**AFER-ATLANTA FILM EQUIPMEN
RENTALS**
1848 Briarwood Rd. NE
Atlanta 30329
Line: photo supplier & accessories
Cinema Products see ad p 27

ALPHA MARKETING
830 W. Peachtree St.
Atlanta 30308
404-881-9595
Line: audio systems
Elpa see ad p 105

ANIXTER-PRUZAN
4303 Pleasantdale Rd.
Atlanta 30340
404-449-6533
Line: Sony studio video equip, full li
of CATV equip, cable construction a
cessories, tools, head end, passive
test equip, power supplies
Sitco see ad p CM/E-6
Sony see ad p 9

BEACON ELECTRONIC ASSOC.
2285 Peachtree Rd. NE
Atlanta 30309
404-351-3654
Line: radio components
ITT Jennings see ad p 27

BROADCAST SUPPLY OF ATLANT
2971 Flowers Rd. S. Suite 170
Atlanta 30341
404-458-0815
Line: full line audio equip & supplie

CALHOUN COMPANY
Atlanta
404-659-0750
Line: video systems

GRADY DUCKETT SALES

P.O. Box 20967
 Atlanta
 404-451-3529
 Line: audio systems
 Otari see ad p 71

ELECTRONIC EQUIPMENT, INC.
 526 Plaster Ave. NE
 Atlanta 30324
 404-873-5841
 Line: audio components & equipment
 Broadcast Electronics see ad p 34

FIDELICOM, INC.
 P.O. Box 80644
 Chamblee Station
 Atlanta 30341
 404-458-3616
 Line: audio equip.; test equip.
 Crown see ad p 105

BEN GARVIN ELECTRONICS
 P.O. Box 1161
 Atlanta 30301
 404-344-6054
 Line: audio equipment
 Broadcast Electronics see ad p 34

GRAVCO SALES, INC.
 1644 Tully Cir. NE
 Atlanta 30301
 404-634-0521
 Line: video processing equip.; switch-
 ers
 Brass Valley see ad p 5

GRAY COMMUNICATIONS
 709 Steward Ave.
 Albany 31705
 404-439-7610
 Line: video systems
 Television Microtime see ad p 79

JOLLINGSWORTH & STILL
 6 Perimeter East
 Atlanta 30346
 Line: audio products

HILLAR ELECTRONICS, INC.
 110 Maple Dr. NE Rm. 110
 P.O. Box 12137 Northside Sta.
 Atlanta 30305
 404-261-6160
 Line: audio components

DOU RADFORD
 203 Lanier Dr.
 Atlanta 30319
 404-237-6097
 Line: full line audio and video equip.
 Electronics see ad p 103
 Broadcast Electronics see ad p 34
 BS Lans see ad p 67, 104
 Television see ad p 93
 Television Equip. Assoc. see ad p
 15
 World Video see ad p 120

AITLAND K. SMITH, INC.
 10 Robin Rd. RFD #3
 Marietta 30060
 404-971-2831
 Line: sound equipment

SPECIALTY DIST. CO.
 13 Juniper St. NE
 Atlanta 30308
 Line: audio products

SYSTEMS ENGINEERING CO.
 P.O. Box 49224
 Atlanta 30329
 404-82-2446
 Line: audio components
 Cro-Trak see ad p 119

TECHNICAL SYSTEMS REPS.
 80 Peachtree Ct.
 Chamblee 30341
 404-457-0426
 Line: audio equipment
 Tel see ad p 99

TELEVISION ATLANTA, INC.
 9 Mfg's field offices

TELEVISION SYSTEMS MARKETING, INC.
 25 Wood Valley Dr.

continued on page 92

ALL SOLID-STATE AURAL STUDIO-TRANSMITTER LINKS



■ MONAURAL AND
 COMPOSITE VERSIONS

■ OPERATION IN
 ALL STL BANDS—

- 148-174 MHz
- 200-240 MHz
- 300-340 MHz
- 450-470 MHz
- 890-960 MHz

All solid-state aural STL's to fulfill almost every requirement. Moseley Associates has pioneered many STL concepts — solid-state systems, true direct FM modulation, and composite operation (FM stereo on a single link)...just to name a few. Front-panel metering of all important parameters is included on all Moseley STL transmitters and receivers. Subcarrier capability enables wireless remote control, secondary program service, or intercom service.

TRANSMITTER REMOTE CONTROL SYSTEMS

Analogue



Fifteen telemetry and thirty command functions are provided by the TRC-15A. The **Model TRC-15AR**, when used in conjunction with a Moseley STL, or other radio link, will provide total wireless operation. The **Model TRC-15AW** is for use on leased telephone, or other wired circuits.

Digital



Fully digital remote control of a remotely located transmitter point is provided by the **DCS-2 Digital Control System**. Multiple transmitter site operation—a standard option. **Command, telemetry, and status** provided in groups of thirty channels. **Automatic parameter logging** available. Computer-assisted operation of the DCS-2 is another standard option, and can provide **totally automated plant operation**. The **Model DRS-1 Digital Remote System** provides many of the features of the basic DCS-2 at an affordable price. Up to 30 telemetry functions and 24 status channels to a single transmitter site.

REMOTE PICKUP LINKS

Models RPL-3 and PRL-4 Remote Pickup Links provide unsurpassed audio performance for remote broadcasts.

Two full-time microphone and high-level line audio inputs are standard. The RPL-3 and PRL-4 Transmitters are only 4 inches high and weigh a mere 16 pounds — complete with audio mixing and AC/DC power supplies.



For 148 to 470 MHz operation

Other Moseley Products . . .

- FM SUBCARRIER GENERATORS AND DETECTORS
- STEREO GENERATORS
- STL ACCESSORIES
- REMOTE CONTROL ACCESSORIES



MOSELEY ASSOCIATES, INC.
 SANTA BARBARA RESEARCH PARK

111 CASTILIAN DRIVE, GOLETA, CALIFORNIA 93017
 Telephone (805) 968-9621 / Telex 658448 / Cable: MOSELEY

Circle 153 on Reader Service Card

AM·FM·EBS

monitoring systems

the EBS-1 ALERTING UNIT used with the AMR-1 (AM) or FMR-1 (FM) fixed frequency receivers comprise a highly reliable monitoring system. the all solid state design is essentially foolproof. used by themselves, the AMR-1 and FMR-1 offer excellent "OFF AIR" sources for in-house monitoring



EBS-1



AMR-1 or FMR-1 (unit shown)

McMartin

McMartin Industries Inc., 4500 South Seventy-sixth Street
Omaha, Nebraska 68127 Phone (402) 331-2000
Circle 154 on Reader Service Card

Morrow 30260
404-363-4503
Line: audio components & equip.

VISUAL SYSTEMS CO.
4475 N. Peachtree Rd.
Atlanta 30341
404-457-1388
Line: video equip.; char. gen.
AKAI see ad p 14, 15

IDAHO

FUNLAND PRODUCTIONS
1300 Hill Road
Boise 83702
Line: audio components & equip.

HAWAII

THE AUDIO CENTER, LTD.
1020 Auahi St.
Honolulu 96814
805-531-3153
Line: audio components
Micro-Trak see ad p 119

BROADCAST SERVICES INC.
2877 Kalakua Ave.
Honolulu 96815
808-533-3877
Line: full line audio equip; CCTV equip.

JAMES CHANG
190 S. King St.
Honolulu
808-531-2165
Line: audio and video equipment
Revox see ad p 45

HAWAII BROADCAST ASSOCIATES
P.O. Box 1344
Honolulu, Hawaii 96807
808-537-3991
Line: broadcast equipment
Microwave Assocs. see ad p 17

GENE PIETY FACTORS, INC.
P.O. Box 2903
Honolulu 96802
861 Mapunapuna St.
Honolulu 96819
808-839-9059
Line: audio components
Fairchild Sound see ad p 118

NYLEM BROS CO.
Honolulu
808-538-1171
Line: broadcast equipment & comp
nents
Sitco Ant. see ad CM/E p 6

PACIFIC INSTRUMENTATION
5388 Papai St.
Honolulu 96821
Line: video & photographic products
Cinema Products see ad p 27

PACIFIC VIDEO CORP.
Honolulu
808-847-1138
Line: video equipment

INDIANA

COMMERCIAL ELECTRONICS, INC
15 S. Sherman Dr.
Indianapolis 46201
317-894-4844
Line: audio components
Micro-Trak see ad p. 119

GRAHAM ELECTRONICS
133 S. Penn. St.
Indianapolis 46204
317-634-8486
Line: audio components
Micro-Trak see ad p. 119

Total GRAPHICS/TITLING Capability with CHIRON TELESYSTEMS

(pronounced Kyron)

the most advanced, versatile and most effective in use!

CHIRON II ELECTRONIC GRAPHICS SYSTEM (Pictured)



FEATURES:

- Finest graphic quality
- 6 Full fonts — Keyboard selectable
- Infinite Fonts & Logos Library storable on Vididisc
- Rapid loading
- Unmatched composition flexibility
- Extensive message storage with fast retrieval
- Studio can create fonts via TV camera interface

CHIRON III ELECTRONIC TITLING SYSTEM

- Offers most features of Chiron II
- Greater flexibility and comparable quality to leading competitive equipment, at substantially lower cost (under \$20,000)

Send for brochures

CHIRON telesystems

A Division of The Computer Exchange Inc.

11 Grace Avenue, Great Neck, New York 11021 • 516 829-5666
235 Montgomery St., San Francisco, Calif. 94104 • 415 788-0600

Circle 155 on Reader Service Card

J. O. GOETZ SALES

5941 Brendonridge N.
Indianapolis 46226
317-545-5638
Line: audio equipment

HARRISON RADIO, INC.

P.O. Box 327
Corydon 47112
512-738-3241
Line: radio broadcasting equip.

**INFORMATION SYSTEMS SUP-
PORT, INC.**

107 Penny La.
Michigan City 46360
219-872-2211
Line: video equip.; char. gen.

MEADE ELECTRONIC CO.

825 Summer St.
Hammond 46320
219-932-2100
Line: audio and video products

R. E. MILLER, INC.

Merre Haute
12-232-1061
Line: video products

RA-DIS-CO, INC.

14 N. Senate Ave.
Indianapolis 202
317-637-5571
Line: full line broadcast equip.
Control Design see ad p. 18

PAUL STONE SALES CO.

626 Cavendish Rd.
Indianapolis 46220
317-257-9777
Line: audio equipment
Brown see ad p. 105

TECHNICAL REP, INC.

300 Meadows Dr.
Indianapolis 46205

317-255-3777

Line: sound equipment

TELEMAN MIDWEST, INC.

See Mgr's field offices
Hitachi Shibaden see ad p. 10, 11

ILLINOIS**C. C. ABERNATHY**

520 Gates Head N.
Elk Grove Village 60007
Line: audio products

ADVANCED PHOTO SOUND

49 S. Washington St.
Hinsdale 60521
312-232-7464
Line: video and photo equipment
Hitachi Shibaden see ad p. 10, 11

J. D. ALLYN

419 S. Bruner St.
Hinsdale 60521
312-325-0495
Line: audio & broadcast equipment
Modular Audio see ad p. 97

B. W. ASSOCIATES

415 W. Fullerton Pkwy. Suite 701
Chicago 60614
312-935-4900
Line: audio components
Stanton see ad p. 43
UREI see ad p. 99

VICTOR DUNCAN, INC.

676 St. Clair St.
Chicago 60611
Line: photo equipment and supplies
Cinema Products see ad p. 27

GORDON DUVAL CO.

6838 N. Ottawa St.
Chicago 60631

312-774-5115

Line: audio components
Fairchild Sound see ad p. 118

BOB FAULKNER

401 E. Prospect Ave.
Mt. Prospect 60056
312-259-8099
Line: video processing equip., switch-
ers
Central Dynamics see ad p. 51

FREIFELD SALES

2100 Stirling Rd.
Deerfield 60015
Line: audio products

GILL CUSTOM HOUSE, INC.

8813 W. 95th St.
Palos Hills 60465
312-598-2400
Line: audio components & equip.; re-
corders

GRAVCO SALES, INC.

125 S. Wilke Rd.
Arlington Heights 60004
312-394-1344
Line: video processing equip.; switch-
ers
Grass Valley see ad p. 5

LOREN F. GREEN ASSOC.

5218 W. Diversey
Chicago 60639
312-286-6824
Line: sound equip.; test equip.

RAY R. HUTMACHER ASSOC. INC.

6668 Northwest Highway
Chicago 60631
312-631-3248
Line: audio components, communica-
tions equip.; tape recorders
Fairchild Sound see ad p. 118

IRVING ROSE ASSOC.

4334 Oakton St.

Skokie 60076

312-674-6790
Line: audio equipment
Stanton see ad p. 43

LA SALLE AUDIO

1216 N. LaSalle St.
Chicago 60610
312-266-7500
Line: audio equipment
Stanton see ad p. 43

MIDWEST ELECTRONICS ASSOC.

337 N. Dover St.
LaGrande 60525
312-354-3124
Line: audio console; RF monitoring

MILAM AUDIO CORP.

700 W. Main
South Pekin 61564
309-348-3112
Line: audio components, equip.; re-
corders

MUSICRAFT

48 East Oak St.
Chicago 60611
312-337-4150
Line: audio components
Micro-Trak see ad p. 119

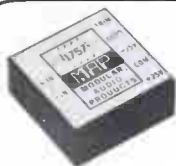
THEODORE PAPPAS

5218 W. Diversey
Chicago 60639
312-685-2338
Line: audio equipment
Crown see ad p. 105
Otari see ad p. 71

RESHAL ASSOCIATES

Arlington Heights
312-398-7660
Line: audio and video products
TFT see ad p. 106

continued on page 94

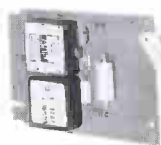
**audio operational amplifier modules:**

For use in mic preamps; tape-phono preamps; mixers; line amplifiers; equalizers; etc.

- Model 1731 — Equivalent input noise — 129dBm max. as mic preamp
- Model 1757 — Power output to 33dBm RMS as line amplifier
- Model 1791 — Power booster can deliver 8 watts RMS at 50% duty cycle
- Model 2731 — Dual channel Op-Amp. low & medium power applications

pc card mounted amplifiers: Popular 'Impac' series plug-in card amplifiers for a wide range of console and studio applications, based on MAP's audio Op-Amps.

- AM-27 — Low level mic preamp, low noise, 27dBm output.
- ABL-27 — For medium to high level signals & to bridge a floating or balanced source.
- AL-27A — Multi-purpose, for line, booster, differential, or combining configurations.
- ATP-27 — Very low noise equalized preamp for use with mag tape heads or phono cartridges.
- PM-40A — Versatile power module with adjustable gain, 15 watt RMS output.

**panel mounted components:** A growing line of controls for equalization, compression, limiting, and expansion based on the state-of-the-art in op-amps and IC's.

- Model 3000 — Variable parameter equalizer, three independent overlapping frequency ranges. Variable bandwidth, center frequency, and levels.
- GME-20 — Graphic module equalizer. Four low and four high frequency selectable equalization points.
- SME-20 — Shelf type equalizer with four frequency shelves controlled by individual switches.
- CL-20 — Lossless compressor-limiter with 10 microsecond attack time, automatic variable release time and variable threshold.

accessories: To complement and add to the versatility of MAP's audio amplifier components.

- PD100C — Highly regulated, PC card mounted ± 15 VDC power supply, ± 100 mA output.
- PD200C — Same as PD100C, with ± 200 mA output.
- PD-2 — Rack mounted ± 15 VDC power supply, 2 amp output.
- MF-17 — A 19" card rack with 34 slides for MAP's PC card amplifiers.
- MB-1 — Versatile mounting bracket to hold a single PC card amplifier.
- Transformers — Audio input and output transformers for the circuit designer.



Modular Audio Products

The Company with Designs on your Audio Requirements

Write for our product literature or Consult your MAP

**MODULAR AUDIO PRODUCTS, INC.**
A Unit of Modular Devices, Inc.

1385 Lakeland Ave.
Airport International Plaza
Bohemia, New York 11716
516-567-9620

Circle 156 on Reader Service Card

RICH, INC.
3531 N. Martens
Franklin Park 60131
312-678-3100
Line: video equipment
Conrac see ad p. 35, 36

ROSCOR CORP.
6116 N. Lincoln St.
Chicago 60659
312-539-7700
Line: video equipment
Hitachi Shibaden see ad p. 10, 11

IRVING ROSE ASSOCS
4334 Oakton St
Skokie 60076
312-674-6790
Line: audio and video equipment
Tascam see ad p. 100

SANKO TRADING, INC.
1386 Jarvis Ave.
Elk Grove Village 60007
312-439-2280
Line: audio and broadcast products
Broadcast Electronics see ad p. 34

SCHUTEN ASSOC.
643 S. Eighty Three
Erlinhurst 60126
312-833-0980
Line: video equipment
ITT Jennings see ad p. 29

EDWARD N. SEVERSEN CO.
11435 Circle Dr.
La Grange 60525
312-246-4883
Line: sound systems

SWIDERSKI ELECTRONICS
Chicago
312-775-3232
Line: video equipment.

TELEMATION MIDWEST, INC.
See Mfg'r's field offices
Hitachi Shibaden see ad p. 10, 11

BRIAN TUCKER
P.O. Box 730
Barrington
312-381-4559
Line: audio products
Revox see ad p. 45

H. E. VAN CLEFF, JR.
2008 Isabelle St.
Evanston 60201
312-866-9875
Line: transmitter products

VITRONICS, INC.
676 N. LaSalle St.
Chicago 60610
312-337-6670
Line: video products
Hitachi Shibaden see ad p. 10, 11

V-TIP, INC.
231 N. Longwood
Rockford 61107
815-968-4683
Line: video products
Hitachi Shibaden see ad p. 10, 11

WEBSTER ENGINEERING CO., INC.
1136 Gail La.
Dundee 60118
312-428-5173
Line: audio equip.; transmitters

IOWA

ALEXANDER ELECTRONICS
Des Moines
515-274-4741
Line: video products

BEAMS
517 Fifth Ave.
Des Moines
515-282-0292
Line: audio equipment
Otari see ad p. 71

MASTERTONE CO.
1105 Maple St.
West Des Moines 50285
515-274-2551
Line: full line audio equip.; transmitters, monitors
Control Design see ad p. 18
Stanton see ad p. 43

REID ASSOC., INC.
901 Merchants Bank Bldg.
Cedar Rapids 52401
319-362-6302
Line: electronic components
ITT Jennings see ad p. 29

VIDEO COMPONENTS, INC.
3116 Dearborn Ave.
Sioux City 51104
712-276-0404
Line: camera lenses, full line CCTV video equip., video camera accessories, video editors
Canon USA see ad p. 114

WARREN RADIO CO.
1205 E. River Dr.
Davenport 52808
319-323-8051
Line: video products
Hitachi Shibaden see ad p. 10, 11

KANSAS

A. K. ELLIOTT CO.
P.O. Box 6129
Leawood

913-649-654
Line: audio products
Revox see ad p. 45

LOWELL-KANGAS & ASSOC. INC.
11202 Johnson Dr.
Shawnee Mission 66203
913-631-3515
Line: elec. components
ITT Jennings see ad p. 29

WILLIAM MENEZES ASSOC.
P.O. Box 6007
Overland Park 66206
913-649-2680
Line: audio products
Stanton see ad p. 43

STEVE SMITH CAMERAS INC.
623 Kansas Ave.
Topeka
913-235-3481
Line: video equipment
Hitachi Shibaden see ad p. 10-11

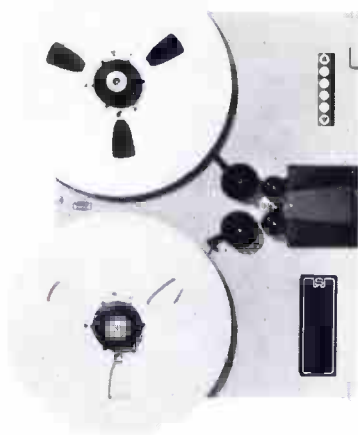
TELEMATION INC.
(See mfg's field offices)

KENTUCKY

ELECTRONIC LABORATORIES, INC.
Suite 2002 800 Bldg.
800 South 4th St.
Louisville 40203
Line: audio components & equipment
Broadcast Electronics see ad p. 34

WILFRED FISHER ELECTRONICS INC.
Vancleve 41385
606-666-5006
Line: broadcast equipment

COMPARE



OURS



THEIRS

Test after test our LJ-10 reproducer came out best. To get this point across, our ad agency wanted to show pictures of the competition and name names. But our lawyers didn't. (You know how lawyers are). So what you see is a compromise. Our LJ-10 may not smell like a bed of roses, but it does offer features that no other competitor has - like mute and cue modes, front panel plug-in circuitry, automatic equalization and linear activated pressure rollers. These, plus lots more, are all standard on the LJ-10. It is advantages like these that give the LJ-10 the reputation for outstanding performance and maintenance-free operation. But don't take our word. Broadcast engineers across the country put the LJ-10 to the test. The results - they ordered LJ-10s. Send for our specs and see why.

L. J. Scully Manufacturing Corp.
138 Hurd Ave., Bridgeport, Conn. 06604

Circle 157 on Reader Service Card

RADIO ELECTRONICS EQUIP. CO.
 Lexington
 606-255-6661
 Line: broadcast components
 Silco Ant. see ad CM/E p 6

SHAIN & YOUNG ELECTRONICS INC.
 426 Chestnut St.
 Berea 40403
 Line: audio components
 Micro-Trak see ad p 119

SIGHT & SOUND, INC.
 P.O. Box 1644
 Louisville 40201
 502-584-5535
 Line: CCTV systems
 World Video see ad p 121

VIDEO COMPONENTS, INC.
 7105 Greenlawn Rd.
 Louisville 40222
 502-426-2929
 Line: camera lenses, full line CCTV
 video equip., video camera ac-
 cessories, video editors
 Canon U.S.A. see ad p 114

LOUISIANA

AUDIOMEDIA ASSOCS.
 P.O. Box 29264
 New Orleans 70189
 504-586-0140
 Line: audio products
 Stanton see ad p 43

ELECTRIC CIRCUS
 Monroe 71291
 18-322-9251
 Line: audio components

INTERSTATE SCHOOL SUPPLY
 New Orleans
 504-581-9500
 Line: audio-visual equipment

IAR ELECTRONICS
 521 E. Louisiana St. Dr.
 Kenner 70062
 504-729-4524
 Line: audio components, equip.
 Micro-Trak see ad p 119
 BS Labs see ads pgs 67, 104

**ATIONAL BROADCAST EQUIP-
 MENT**
 P.O. Box 52844
 New Orleans 70152
 504-522-3089
 Line: audio components equipment
 Micro-Trak see ad p 119

COTT ORMSBY COMPANY
 P.O. Box 7
 313 Combe 70455
 504-882-7248
 Line: sound equipment
 REI see ad p 99

AN AMERICAN FILMS
 22 No. Rampart St.
 New Orleans 70116
 Line: photo supplies and accessories
 Nema Products see ad p 27

MAINE

G. HARRIS ASSOC., INC.
 Portland Pier
 Portland 04111
 Line: CCTV systems

MARYLAND

ARTLETT ASSOCS.
 105 East-West Hwy.
 Bethesda 20014
 1-656-3061

Comparing our \$1000 monitor with their \$1600 monitor is unfair.

To them.



Right away, we have an advantage of several hundred dollars. And without sacrificing the kinds of features you expect from a professional color monitor, including solid state modular circuitry. Lockable control panel. Dynamic beam limiter. The works.

It takes a depth of background in video engineering and production to offer a monitor with features like these. And Electrohome has it. Fact is, we're one of North America's leading producers of audio and visual equipment. Along the way we've developed methods to provide the industry with the kinds of professional video equipment it expects, at a price it doesn't.

Write today for complete information on Electrohome color monitors. B&W monitors too. We'll send a folder-full of specs that make Electrohome monitors an easy choice even at *their* price.

But at *our* price, is there any choice at all?
 Electrohome Limited
 809 Wellington St. N.,
 Kitchener, Ontario, Canada
 In U.S.A.: 9314 West 122nd St.,
 Palos Park, Ill. 60464
 (Telephone: (312) 361-4636)



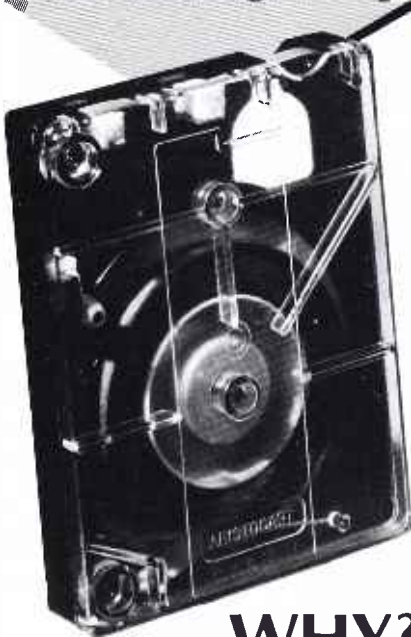
ELECTROHOME

... an extra degree of excellence in video equipment for every application.

Circle 158 on Reader Service Card

continued on page 96

in recent months
most major FM
radio stations
in North America
have switched to
this cartridge...



WHY?

because ARISTOCART'S unique design delivers consistent fidelity approaching that of finest reel-to-reel equipment — 20Hz to 15 kHz. Wow and flutter have been minimized.

because every ARISTOCART cartridge is factory tested before shipment for phase and frequency response. We replace at our expense for any malfunction, however caused.

because ARISTOCART is now priced competitively with cartridges that do not match its uniform high quality and long tape and transducer life.

believe your own ears

Switch to

ARISTOCART

A DIVISION OF WESTERN BROADCASTING LTD.
505 Burrard Street, Vancouver, Canada V7X 1C4
Tel.: (604) 687-2844

Distributors: U.S.A. — McCurdy Radio Industries Inc., Buffalo N.Y. — IGM, Bellingham, Wash. **CANADA** — McCurdy Radio Industries Ltd., Toronto, Ont. — L. A. Varah Ltd., Vancouver, B.C. **GREAT BRITAIN** — Selkirk Communications Limited, London, Eng. **AUSTRALIA** — Syntec Electronic Distributors, Pty., Castle Cove, N.S.W.

Circle 159 on Reader Service Card

Line: video products
Cohu see ad p 41

BROTHERS & CONNEEN ASSOC.
6302 Lincoln Ave.
Baltimore 2 1209
201-764-7189/202-783-3480
Line: audio equipment

CRAMER VIDEO SYSTEMS
Gaithersburg
301-948-6110
Line: video

ROBERT HALVORSON
4000 Thornapple
Chevy Chase 20015
301-654-1680
Line: audio equip.; audio tapes
transmitters

HAYDEN ASSOCS.
16 Decatur Ave.
Annapolis 2 1404
202-296-6059
Line: measuring equip., monitors

MARKTRON INC.
651 Lofstrand Land
Rockville 20850
301-762-6210
Line: radio products
ITT Jennings see ad p 29

MARKTRON, INC.
57 W. Timonium Rd.
Timonium 21093
301-252-7111
Line: radio products
ITT Jennings see ad p 29

J. C. MERICAN CO.
546 Anchor Dr.
Rumsey Island
Joppa 20185
Line: audio products

POTOMAC MUSIC
2122 Beaver Rd.
Landover 20785
Line: audio products

RAYTHEON SERVICE CO.
Glen Burnie Service Center
103 Roseler Rd.
Glen Burnie 21061
301-761-4300
Line: CCTV systems

RECORDING CONSULTANTS INC.
11130 Newport Mill Road
Kensington 20795
301-933-7790
Line: audio components & equip.
Stanton see ad p 43

GENE ROSEN ASSOCS.
9501 Wadsworth Dr.
Bethesda 20034
301-530-8448
Line: audio products
Stanton see ad p 43

TELEMATION EAST, INC.
(see Mfg's field offices)

TV TECHNOLOGY CORP.
Silver Springs
301-565-0770
Line: broadcast products
Sitco Ant. see ad CM/E p 6

VIDEO COMPONENTS, INC.
1603 Auburn Ave.
Rockville 20850
301-424-3916
Line: camera lenses, full line CCTV
video equip., video camera ac-
cessories, video editors
Canon. U.S.A. see ad p 114

WILTRONIX INC.
5504 Waterway
Rockville 20853
301-460-1454
Line: broadcast equip. and accesso-

ries
Television Equip. Assoc. see ad
115
Datavision see ad p 93
American Data Corp. see ad p 99

MASSACHUSETTS

MAC R. BOUGERE ASSOC.
125 Norwood Terrace
Holyoke 01040
413-533-2024
Line: audio equipment

COAKLEY, BOYD & ABBETT
1424 Highland Ave.
Needham 02192
Line: audio products

CRAMER VIDEO SYSTEMS
120 Hampton Ave.
Needham Heights 02194
617-449-2101
Line: CCTV systems
Conrac see ad p. 35, 36

DORON ASSOC., INC.
P.O. Box 1123
Concord 01742
617-369-3538
Line: video equip.; char. gen.

INDUSTRIAL COMPONENTS CORP.
2551 Boston Rd. P.O. Box 68
North Wilbraham 01067
413-596-3854
Line: audio components
Micro-Tr see ad p. 119
Stanton see ad p. 43

JOHNSON ASSOC.
148 Linden St.
Wellesley
617-235-3977
Line: audio products
Revox see ad p. 45

LAKE SYSTEMS CORP.
55 Chapel St.
Newton 02160
617-244-6881
Line: full line audio and video equip.
AKAI see ad p. 14, 15
Amtron see ad p. 119
Stanton see ad p. 43

LEBOW LABS, INC.
56 Chestnut Ave.
Boston 02115
617-566-1125
Line: audio components
Control Design see ad p. 18
Micro-Trak see ad p. 119
Stanton see ad p. 43

**MULLIN TECHNICAL SALES CO
INC.**
945 Great Plain Ave.
Needham 02192
617-444-4780-6363
Line: audio components

TELEMATION EAST, INC.
See Mfg's field offices

VALLEY CINEMA
Chicopee
413-592-4136
Line: video equipment

V. F. SALES, INC.
420 Union Avenue
Framington 01701
617-873-8550
Line: audio and video products
Crown see ad p. 105
Otari see ad p. 71
UREI see ad p. 99

VICTOR ASSOC.
1400 Worcester Rd.
Framingham 01701
617-879-5710
Line: switching and patching equ

ment
Cooke see ad p. 28

VIDEO COMPONENTS, INC.
16 Saddle Club Rd.
Lexington 02173
617-861-0089

Line: camera lenses, full line CCTV
video equip., video camera ac-
cessories, video editors
Canon USA see ad p. 114

VILLSON SALES CO.
Mohawk Rd.
Warblehead 01947
17-631-4016
Line: audio products
Anton see ad p. 43

MICHIGAN

AUDIO DISTRIBUTORS, INC.
342 Division Ave. S.
Grand Rapids 49507
16-452-1596
Line: audio components
Control Design see ad p. 18
Micro-Trak see ad p. 119

OD BUTCHART ASSOC.
P.O. Box "D"
Lansing Station
Detroit 48224
313-773-7870
Line: audio products
Anton see ad p. 43

HAMPAGNE SALES CO.
3915 W. 10-Mile
Bouthfield 48075
413-354-0270
Line: audio equip.; transmitters

CTOR DUNCAN, INC.

11043 Gratlot Ave.
Detroit 48213
Line: photo supplies and equipment
Cinema Products see ad p. 27

H. M. DYER ELECTRONICS
2982 Wixon Rd.
Milford 48042
313-685-2560
Line: time stds., video products
Astrionics see ad p. 103
CBS Labs see ad p. 67, 104
Datavision see ad p. 93
Television Equip. Assoc. see ad p. 115
TFT see ad p. 106

J. MALCOLM FLORA, INC.
P.O. Box 201
165 West Liberty
Plymouth 48170
313-453-4296
313-427-7460 (Detroit Line)
Line: audio components

GENERAL TV NETWORK
Ferndale
313-548-2500
Line: video products

R. F. HERMES CO.
9600 Whittier St.
Detroit 48224
313-886-4567
Line: video products
Conrac see ad p. 35, 36
Hitachi Shibaden see ad p. 10, 11

ROBERT MILSK CO.
19375-95 James Couzens Highway
Detroit 48235
313-342-6660
Line: audio components
Fairchild Sound see ad p. 118

SHALCO, INC.

23529 Woodward Ave.
Ferndale
313-547-4771
Line: audio products
Crown see ad p. 105
Otar see ad p. 71

TELEPRODUCTS
522 S. Campbell Rd.
Royal Oak 48067
313-398-5310
Line: switching and patching equip-
ment
Cooke see ad p. 28

THALER ELECTRONICS LAB.
7235 Jackson Rd.
Ann Arbor 48103
313-761-4506
Line: video products
Hitachi Shibaden see ad p. 10, 11

VIDEO COMPONENTS, INC.
24001 Southfield Rd.
Suite 102
Southfield 48075
313-354-0270
Line: camera lenses, full line CCTV
video equip, video camera ac-
cessories, video editors
Canon USA see ad p. 114

MINNESOTA

GALAXY FILM SERVICE
1511 Hennepin Ave.
Minneapolis 55403
Line: photo supplies and equip.
Cinema PRODUCTS SEE AD P/ 27

CLARK R. GIBB CO.
1311 W. 24th St.
Minneapolis 55405
612-377-1200

Line: audio components
Fairchild Sound see ad p. 118

HASTERSTEIN & BURMEISTER
2629 30th Ave. S.
Minneapolis 55406
612-721-5031
Line: video equipment
Hitachi Shibaden see ad p. 10, 11

THE HEIMAN CO.
5603 Lyndale Ave. S.
Minneapolis 55419
Line: audio products

JAYNUS ASSOC., INC.
10700 Lyndale Avenue S.
Minneapolis 55420
612-884-1700
Line: broadcast equip. transmitters
Conrac see ad p. 35, 36
Television Equip. Assoc. see ad p. 115

K & M ELECTRONICS
7360 Ohm La.
Minneapolis 55424
612-835-3080
Line: video amp.; video switchers

KODO ASSOC., INC.
8100 Penn Ave.
Minneapolis 55431
612-881-1255
Line: sound systems

MAGNATECH CO.
3601 Park Center Blvd.
Minneapolis 55416
612-920-6677
Line: audio components and equip.,
FM monitor equip, transmitters
Control Design see ad p. 18
Micro-Trak see ad p. 119
Potomac Instrument see ad p. 112

continued on page 98

GRAPHIC ARTS CHARACTERS!

Broadcasters... Now You Can Buy a Video Generator With Beautiful Graphic Arts Characters at Thousands of Dollars Less. You'll Get the Applause of: Art Director; Producer; Engineer...and Treasurer.



We've taken advantage of today's solid-state technology, the higher reliability and quality of today's components, and our years of experience in engineering cost-conscious character generators. The result...meet the DATAVISION D-3000.

Character quality equal to the most expensive equipment on the market, with 1120 element resolution. High-speed, random access "floppy disc" storage system

You have to see it...to believe it! Phone or write today for a free, on-site demonstration.

- OTHER FEATURES • 2 INDEPENDENT OUTPUT CHANNELS • 2 SPEED ROLL AND CRAWL • CHARACTER EDGING • WORD FLASH • TITLE INSERT MODE • LOW-SPEED AUDIO STORAGE OPTION • COMPACT • SELF-CONTAINED • PORTABLE



DATAVISION
INC.

15932 Shady Grove Road
Gaithersburg, Maryland 20760
(301) 948-0460

Circle 176 on Reader Service Card

Stanton see ad p. 43
Wilkinson see ad p. 30

NORTHERN STATES SALES CO.
1109 W. 78 1/2 St.
Minneapolis 55420
612-866-3468
Line: audio components

R. C. SALES
10052 County Rd.
Maple Grove
612-425-5543
Line: audio products
Revox see ad p. 45

SKOR
1E21 University Ave.
St. Paul 55104
612-645-6461
Line: audio products
Crown see ad p. 105

SMITH ENGINEERING ASSOC.
285 N. Snelling Ave.
St. Paul 55104
612-646-4851
Line: audio products
Stanton see ad p. 43

SOUND 80, INC.
2709 Rast 25th St.
Minneapolis 55406
612-721-6341
Line: audio components, equip.; re-
cording accessories

MISSISSIPPI

MISSISSIPPI SCHOOL SUPPLY
Jackson 39205
601-948-8600
Line: audio-visual equipment

BOB MC RANEY ENTERPRISES, INC.

P.O. Box 758, Henry Clay Hotel
West Point 39773
601-494-5872
Line: audio components & equip.

SIVAN ELECTRONICS
324 North Gallatin
Jackson 39205
Line: audio products

SOUTHERN VIDEO SYSTEMS
527 Northside Dr.
Jackson 39205
601-982-8734
Line: CCTV systems

MISSOURI

ALEXANDER ELECTRONICS INC.
1820 Wyandotte St.
Kansas City 63108
816-474-6858
Line: broadcast equipment
Broadcast Electronics see ad p
Conrac see ad p 35-36

ANIXTER-PRUZAN
9449 Aerospace Dr.
St. Louis 63134
314-423-9555
Line: Sony studio video equip., full line
of CATV equip., cable construction
accessories, tools, headend, pass-
ives, test equip., power supplies
Sitco see ad p CM/E 6
Sony see ad p 9

CALVIN CINEQUIP INC.
215 W. Pershing Rd.
Kansas City 64108

Line: photo products and video prod-
ucts
Cinema Products see ad p 27

COMMUNICATION SYSTEMS INC.
Drawer C
Cape Girardeau 63701
314-334-6097
Line: audio transmitters
Control Design Corp. see ad p 18
Stanton see ad p 43

CORPLEX INTERNATIONAL CORP.
St. Louis
314-534-3323
Line: audio and video products

ENGINEERING SERVICES CO.
8420 Delmar Blvd.
St. Louis 63124
314-997-1515
Line: switching and patching equip.
Cooke see ad p 28

**FORRISTAL-YOUNG SALES COM-
PANY, INC.**
7110 Oakland Ave.
St. Louis 63117
314-645-2360
Line: audio components
Crown see ad p 105

CECIL JACKSON & ASSOCIATES
1111 Harmony
Cape Girardeau 63701
Line: audio components
Stanton see ad p 43

K S W ASSOCIATES
7546 Troost Ave.
Kansas City 64131
816-363-5651
Line: audio components
Fairchild Sound see ad p 118

**LOWELL-KANGAS & ASSOC
INC.**

12015 Manchester
St. Louis 63131
314-821-4050
Line: video equipment
ITT Jennings see ad p 29

MOELLER/PICKETT & ASSOC.
2260 Grisson
St. Louis 63141
Line: audio products

MOELLER/PICKETT & ASSOC.
12506 Grandview Rd.
Grandview 64030
Line: audio products

TELEMATION MIDWEST, INC.
(See mfg's field offices)

TV ENGINEERING
400 Crestwood Bank Bldg.
Crestwood 63126
314-821-2444
Line: broadcast equipment
CBS Labs see ads p 67, 104

VIDEO COMPONENTS
11221 E. 76th St.
Raytown 64138
816-358-6638
Line: camera lenses, full line CC
video equip., video camera
cessories, video editors
Canon U.S.A. see ad p 114

S. VINES
St. Louis
314-821-2440
Line: Video equipment
Datavision see ad p 93

PERFECT YOUR CCTV SYSTEM WITH COSMICAR® LENSES

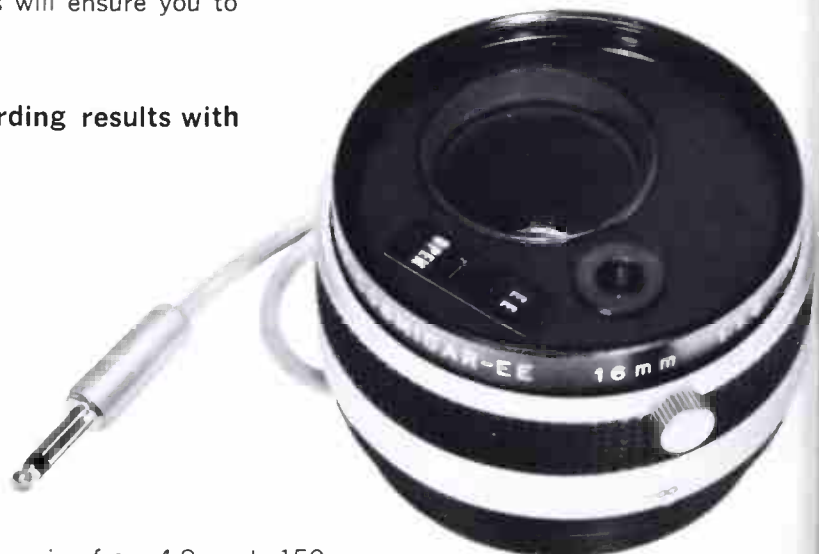
A rich variety of COSMICAR CCTV lenses will ensure you to satisfy any of your technical purpose.

Be sure to get the finest image recording results with quality COSMICAR lenses.

EE lenses:

- F.L. 16mm F/1.6 for 2/3" Cameras
- F.L. 12.5mm F/1.4 for
1" & 2/3" Cameras
- F.L. 25mm F/1.4 for
1" & 2/3" Cameras
- F.L. 50mm F/1.8 for
1" & 2/3" Cameras

Also available are scores of other lenses, ranging from 4.8mm to 150mm telephoto, zoom and those motordriven among them, for immediate delivery after being tailored to your specifications.



COSMICAR OPTICAL CO., LTD.

424, Higashi-Oizumi, Nerima-ku, Tokyo, Japan

Cable Address: "MOVIEKINO TOKYO"

Representative & Service Office: Asahi Optical (America) Inc. 15 East 26th Street, New York, N.Y. 10010, U.S.A.

Circle 177 on Reader Service Card

NEBRASKA

ALEXANDER ELECTRONICS

Omaha
402-391-2080
Line: video equipment

K & M ELECTRONICS

Omaha
402-55-17600
Line: video equipment

NEVADA

PORTER INDUSTRIES

3276 Spring Mountain Rd.
Las Vegas 89102
702-876-2413
Line: audio components, equip.

VIDEO VISION

524 Denslowe Dr.
Reno 89502
702-329-6323
Line: video systems
Television Microtime see ad p 79

NEW HAMPSHIRE

V & H PRODUCTIONS, INC.

8 Everett St.
Manchester 03104
603-669-9999
Line: audio and broadcast equipment

NEW JERSEY

ASSOCIATED ENTERPRISES

20 Somerset St.
New Brunswick 08903
609-249-1551
Line: CCTV systems

AUDIO & ELECTRONIC CONSULT.

VCE.
3 Kiel Ave.
Innerton 07405
201-838-0080
Line: CCTV systems
Television Microtime see ad p 79

B PRODUCTIONS

2 Stuyvesant Ave.
Newark 07106
201-373-6603
Line: CCTV systems

CONTINENTAL SALES CO.

275 Bloomfield Ave.
Bloomfield 07006
201-575-8300
Line: audio and video equipment
Television Microtime see ad p 71

THOMAS-DUGGAN SOUND SYSTEMS

4 Sussex Ave.
Morristown 07960
201-538-9047
Line: audio components
Micro-Trak see ad p 119

DISERCO

100 Eastal Place
Greenbrook 08812
201-968-0344
Line: audio and broadcast products
Television Microtime see ad p 105
TEI see ad p 99

FRIDMAN ASSOCS.

10 Halsted St.
West Orange 07018
201-673-2500
Line: switching and patching equip.
Television Microtime see ad p 28

FRETSON CO., INC.

11 Oak St.

Has Your Transmitter Lost Any Listeners Lately?

If you're losing listeners in the fringe areas, your competition probably has a Modulimiter. He's now getting extended coverage and more efficient transmitter output.

The Universal Audio BL 40 MODULIMITER provides independent adjustments for RMS and peak limiting without clipping, and variable positive overmodulation of up to 125%. Now, also, a proprietary new PHASE OPTIMIZER which automatically maintains most favorable polarity. You can now tailor your modulation envelope to any program format or transmitter characteristics: constant full modulation or a more conservative approach. So, get back those lost listeners or take some away from your competitor with Modulimiter.

Modulimiter has low-noise, low-distortion, integrated circuitry, and a test switch for proof-of-performance.

Available through your UREI dealer.



11922 Valerio Street, No. Hollywood, California 91605 (213) 764-1500

Exclusive export agent: Gotham Export Corporation, New York

continued on page 100

Circle 178 on Reader Service Card

Tenafly 07570
201-568-2354
Line: elec. components
ITT Jennings see ad p 29

H. M. HÖLZBERG ASSOC.
P.O. Box 322
Totowa 07512
201-256-0455

Line: audio equip., program automation, video switchers, proc. amp., monitors, char. generators, transmitters, STL, microwave
Datavision see ad p 93

LANDY ASSOCIATES
12 Buston Road
Cherry Hill 08034
609-424-4660
Line: audio consoles, video proc. equip.
Astrionics see ad p 103
Fairchild Sound see ad p 118
Stanton see ad p 43
TFT see ad p 106

MERRILL LENT
P.O. Box 189
East Hanover 07936
201-887-4849
Line: video equip., char. gen.
Datavision see ad p 93

METROREP
1 Oxford Dr.
Freehold
201-462-1221
Line: audio and video equipment
Crown see ad p 105
Otari see ad p 71

OPTIMEDIA SYSTEMS INC.
Clifton
201-777-7600
Line: audio and video products
Amtron see ad p 119

DE PILLIS ASSOCIATES

15 Tanner St.
Haddonfield 08038
Line: audio products

QUALITAPE DUPLICATION LABS
101 Broadway
Runnemede 08078
Line: audio products

RAYTHEON SERVICE COMPANY
5090 A Central Highway
Airport Industrial Park
Pennsauken 08109
609-622-4322
Line: CCTV systems

SONNY SIMBERKOFF ASSOCIATES, INC.
71 Valley St.
South Orange 07079
201-763-7900
Line: audio components

TELEMEASUREMENTS, INC.
145 Main Ave.
Clifton 07014
201-473-8822
Line: full line audio & video equip.
AKAI see ad p 14-15
Conrac see ad p 35-36

THOR ELECTRONICS
741 Livingston St.
Elizabeth 07207
201-354-2420
Line: power receiving, camera, industrial tubes

WILRAY AUDIO VISUAL, INC.
P.O. Box 97
Port Murray 07865
201-689-1300
Line: CCTV systems

WILRAY AUDIO VISUAL, INC.
9170 State Highway 35
Box 113
Middletown 07748

201-671-4600
Line: CCTV systems

NEW MEXICO

BFA CORP.
9004 Manual Blvd., N.E.
Albuquerque 87112
505-296-8303
Line: elec. components
ITT Jennings see ad p 28

BFA CORP.
P.O. Box 1237
Las Cruces 88001
505-523-0601
Line: elec. components
ITT Jennings see ad p 28

DYMA ENGINEERING
Rt. 1 Box 51
Taos 87571
505-758-2686
Line: full line audio equip., transmitters
Broadcast Electronics see ad p 34
Micro-Trak see ad p 119
Stanton see ad p 43
Wilkinson see ad p 30

STALEY COMPANY
2925 Charleston NE
Albuquerque 87110
505-294-2660
Line: sound systems

TELEMATION NEW MEXICO, INC.
(See mfg's field offices)

G. C. VIDEO,
Albuquerque
505-296-5653
Line: video products

WALKER RADIO
102 Granite Ave., N.W.
Albuquerque 87125
Line: audio products

NEW YORK

ANIXTER-PRUZAN
180 Dupont St.
Plainview 11802
516-822-8585
Line: Sony studio video equip., full line of CATV equip., cable construction accessories, tools, head end, passives, test equip., power supplies
See Sitco ad p CM/E 6
see Sony ad p 9

ARTEK SYSTEMS
275 Adams Blvd
Farmingdale 11735
516-293-4420
Line: CCTV systems

AUDIO-VIDEO CORPORATION
55 Delaware Ave.
Delmar 12054
518-439-7611
Line: audio equip.
AKAI see ad p 14-15

AVTEL
44 Railroad Ave.
Glen Head 11545
516-671-8010
Line: full line CCTV system

BACH SALES
4 Longview Place
Great Neck
212-233-3300
Line: sound systems
Otari see ad p 71

DAVID BAIN ASSOCIATES
P.O. Box 1014
Port Washington 11050
516-883-4818
Line: audio equip., transmitters, CC systems

continued on page 1



Series 70 Recorder/Reproducers

When you've got more talent than money

TASCAM Series 70 recorder/reproducers were designed for people who've outgrown high-end consumer audio products but can't afford full professional studio gear.

Whether you need single, two or four channels, you define the Series 70... it doesn't define you. Your choices are expanded, not restricted, without paying a performance penalty.

The versatile Series 70 electronics come in two versions, one for direct recording and one for use with a mixing console like our Model 10. Whichever you need you'll get uncommon quality and reliability. But this time you can afford it.

Series 70 recorder/reproducers. When you've got more talent than money.

 **TASCAM CORPORATION**
5440 McConnell Avenue
Los Angeles, Calif. 90066

Circle 179 on Reader Service Card

BROADCAST EQUIPMENT

Oscilloscope has 5 MHz bandwidth, is portable (2¼ pounds), and has a calibrated vertical deflection range from 10 mV/div to 1 V/div. Model SC-501 has sweep rates to 200 ns/div, and calibrated control extending rate to 1 sec/div. \$650. TEKTRONIX. **300**

Bulk tape eraser is for every format of tape up to ¼" wide. Model R24017 reduces noise below normal



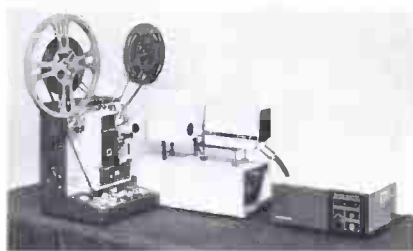
erase head levels, works on open-reel, cartridge, and cassette tapes. \$26.50. ROBINS INDUSTRIES. **301**

Video color test pattern generator supplies a complete set of color reference signals. Model 216-RGB has bar, dot, H bar, V bar, color bars,



dot grating, window, gray scale, and about ten other patterns. VISUAL INFORMATION INSTITUTE. **302**

Low cost uniplexer includes HV-1500 TV color camera, has automatic neutral density wheel for control of light intensity. Model UPF-15 assembly includes camera, lens system, and projector, either the Kodak TV-12M6 16mm, or the TVM-100A Super 8. With 16mm, system is \$7595; with super 8mm, \$7350.



HITACHI SHIBADEN. **303**

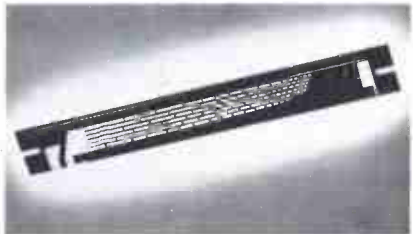
Low-cost video color camera weighs under six pounds, can be used as portable or in studio. Model PCC-49 is also available in a complete portable



"Color Pak" with tape recorder and electronics. Camera, under \$2000; Color Pak, \$4495. CONCORD COMMUNICATIONS SYSTEMS. **304**

Complete accessories for producing photo slides include masks, mix masks for multi-projector shows, heat seal mounts, glass binders, many others. HEINDL MASKS N MOUNTS. **305**

Audio-taper potentiometer elements have useable outputs to 90 dB's. Strokes are available to 6", with ter-



minimal resistance from 600 ohms to 10 K ohms. COMPUTER INSTRUMENTS CORPORATION. **306**

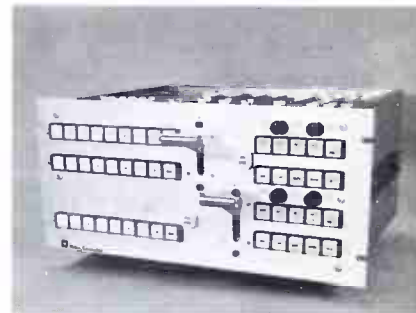
Character generator system has resolution of 1120 elements, two character sizes, two-channel display allowing preview, three speed roll or crawl, other features. Model D-3400 includes a "floppy disc" random ac-

cess memory unit, each disc holding about 300 pages of information, ac-



cessible in about ½ second. DATA-VISION, INC. **307**

Video switcher has eight to 16 inputs, up to three separate mix, lap, key, or wipe functions. Model 3081 has vertical interval switching, four to eight independent key sources,



computer compatible control, six video outputs, forty wipe patterns. \$6500. COMPUTER IMAGE CORP. **308**

Power oscillator covers band 2 to 8 GHz. Model 126A has anode-cathode line tuning, cavity power oscillator. \$5750. AILTECH. **309**

Thermocouple power sensors for input to power meters operate to frequencies as low as 100 kHz. model 8482A is 50-ohms, range 100 kHz—4 GHz; 8483A covers 100 kHz to 2 GHz, at 75 ohms; 8481A reads powers up to 3 watts from 10 MHz to 18 GHz. 8482A, \$400; 8483A, \$400; 8481A, \$495. HEWLETT-PACKARD. **310**

Broadcast remote control systems each has 52 control actions and 24 metering positions. Model RC-2600EA is low-cost analog metering version. Model RC-2600ED used digital readout. Both are "silent-ser-

continued on page 102

ON AIR

... your Broadcast Studio will really be off limits when Fidelipac's new Studio On Air Light is lit. Its brilliant red lettering on jet black background can be seen even in the brightest ambient light conditions. Face plate made of unbreakable Plexiglas® comes complete with lamps and mounting hardware. Measures 5" high by 10" long by 2½" deep. Available now from your Fidelipac distributor for just **\$28.95**



FIDELIPAC®

3 Olney Ave., Cherry Hill, N.J. 08034
(609) 424-1234

Fidelipac is a registered trademark of TelePro Industries Incorporated
Plexiglas is a registered trademark of Rohm and Haas Company

Circle 180 on Reader Service Card



Fidelipac's Hot Convertible



The new Cart-A-round Storage Racks. Each WR-25 Modular Rack holds 25 Type A Cartridges... eight can be mounted on our Mobile Carousel Base to make up the MR 200 Convert to wall mount by using the brackets supplied.

Want more information on Cart-A-round Racks and the other new Fidelipac Professional Accessories? Contact your distributor or

FIDELIPAC®

3 Olney Avenue
Cherry Hill, N.J. 08034
(609) 424-1234

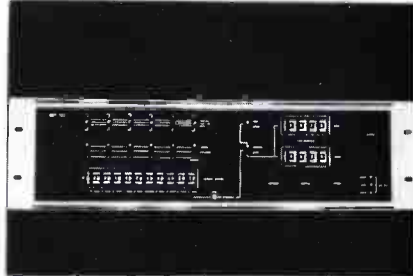
Fidelipac is a registered trademark of TelePro Industries Incorporated

Circle 181 on Reader Service Card

PRODUCTS

vice" designed, for use in room with live microphone. RC-2600EA, \$1990. RUST CORPORATION. 311

Digital automatic programming controller for TV can control up to eight hours of material from up to six vid-cotape sources. Model DAC-100



records its own start and stop tones for a ten-step automatic sequence, can be used with videocassettes as well as other standard audio sources. DYNASCIENCES. 312

Hand-grip zoom control holds all the servo circuitry plus thumb-activated direction/proportional speed control. Model J-5 is for the CP-16 reflex and non-reflex 16mm cameras. Control with motor, \$675.00. CINEMA PRODUCTS. 313

Portable fading device can be added between any video source and a vid-cotape recorder. Vidi-Fade requires



no external sync, has lights showing status of fade, works with black and white or color. VIDEONIX. 314

Low cost version of color keyer (Chromatech) provides "soft" proportional ceying. Chromatech Jr. Has three operating controls, accepts two composite or non-composite NTSC signals. \$3500. ASTRIONICS DIV., TECHNICOLOR. 315

Power-line surge protectors use three-electrod gas tube to ground
continued on page 104

IF BEN FRANKLIN WERE ALIVE TODAY HE WOULD PRODUCE THE MOST PROFITABLE, IMAGE BUILDING, LOCAL BICENTENNIAL RADIO PROGRAM AVAILABLE IN THE U.S.



He's not alive today . . . But, we are!

We're the American Legacy . . . and we've produced a highly saleable sustaining radio feature that even Ben would envy. It runs the entire duration of the Bicentennial celebration. The program starts with a custom jingle, personalized with your station's call letters or slogan. The format continues with 731 individual vignettes that recreate with music, character voices, narration and sound effects the events as they happened 200 years ago on the air date. But . . . we don't stop there. Each month, you receive our newsletter — "The Musket" — with information on Bicentennial events, promotional ideas for your station and sponsor, products-premiums-incentives to help run those promotions, and information on what other Legacy network stations are doing. The American Legacy is a market exclusive and we would like your station to join the network.

We're reasonably priced and ready to go to work.

Call, write or wire for more — no obligation — information.


the
**American
Legacy**

SUITE 202

345 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84111
PHONE: (801) 532-1776

Circle 182 on Reader Service Card

Announcing Chromatech Jr.

The Outline And Halo Eraser



Now for only \$3,500, you can have a soft keyer that will upgrade the color keying capability of your switcher by providing natural looking pictures without outlines and halos. With only three simple operating controls, Chromatech Jr. can be used in live broadcasting applications, without the need for pre-show alignment and setup.



Chromatech Jr. is built for 19 inch switcher rack mounting, and includes a 3½ inch square panel mountable remote controller. Its dc control circuits allow the remote controller to be installed at any distance from the main chassis.

Call or write today for a demonstration or our detailed brochure.

Technicolor®

American Astrionics Division
291 Kalmus Dr., Costa Mesa, Calif. 92626
(714) 540-4330

Circle 183 on Reader Service Card

Neve introduces an end to air pollution.



It's the new Neve 858 Audio Control Console. And it can help you avoid the "polluted", somewhat muddy and distorted sound that all too often rides the air waves.

With ordinary broadcasting consoles, you get ordinary results. But the Neve 858 is something else. It's designed to help your station produce the purest, richest sound in town, no matter how many rival stations there are in your area.

In this one console Neve combines 26 inputs, 6 stereo outputs, 6 mono outputs, simultaneous stereo/mono output capability, clean-feed input for automated systems, total harmonic distortion guaranteed to be less than 0.075%, and much more.

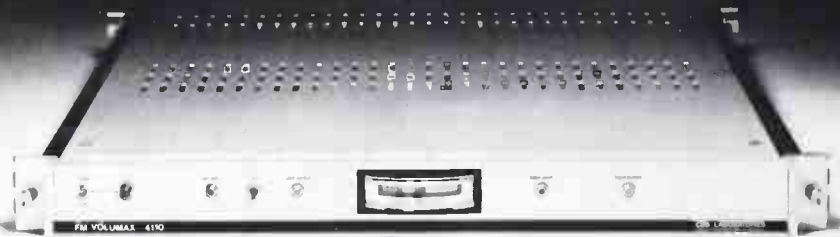
The sound of Neve is worldwide. Neve Consoles are used in broadcasting, music recording and film production in more than 48 countries. Why not get full details—before a competitive station does?

Rupert Neve Incorporated, Berkshire Industrial Park, Bethel, Conn. 06801 (203) 744-6230 • Hollywood: Suite 616, 1800 No. Highland Ave., Hollywood, Ca. 90028 (213) 465-4822 • Rupert Neve of Canada, Ltd., 2717-19 Rena Rd., Malton, Toronto, Ontario, Canada (416) 677-6611 • Rupert Neve & Co., Ltd., Cambridge House, Melbourn, Royston, Herts, England

Neve

Circle 184 on Reader Service Card

Send only
the best.



The FM Volumax by CBS Laboratories is the very best way to insure bright, crisp sounds! Allowing maximum signal strength, it prevents overmodulation without distortion, and has gentle control action. Unconditionally guaranteed to outperform all other related devices, the FM Volumax is the ultimate in automatic peak control. Available in monaural or stereo. From CBS Laboratories, of course.

CBS LABORATORIES

A Division of Columbia Broadcasting System, Inc.
227 High Ridge Road, Stamford, Connecticut 06905

Circle 185 on Reader Service Card

SOUND LIVE

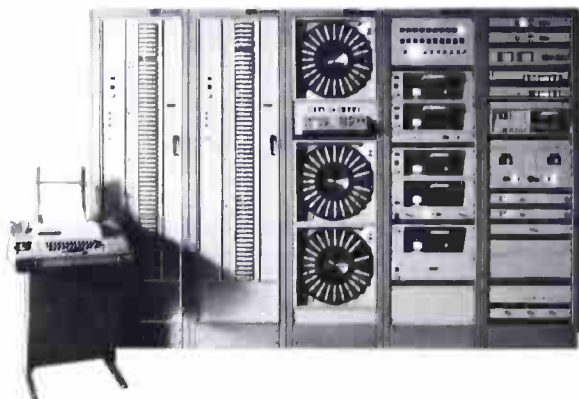
Harris/Gates digital program automation systems provide a real "live sound" capability. Because we take the time to custom design each system to your particular needs. And add the flexibility to change easily if your needs should change.

A Harris/Gates system can also help you maintain tighter control over your programming. Maximize the efforts of your staff. And give you significant operating economy.

For additional information, write Harris Corporation, Gates Broadcast Equipment Division, Quincy, Illinois 62301.



HARRIS
COMMUNICATIONS AND
INFORMATION HANDLING



Circle 186 on Reader Service Card

PRODUCTS

both sides of line on leading edge surge. Series TII-410 are available with or without cords, for 100 or 200 vac, single or three-phase. TEL: COMMUNICATIONS INDUSTRIES 31

Camera identification units provide on-monitor identification of up to ten cameras. Model CID-10 has ten positions, CID-10/8 has eight, CID-10/4 has four. User programs each position; character size, display width, screen position are all adjustable. DATAVISION 31

Spring steel switch actuator has .5 inch overtravel. With E61-00 subminiature switch, the Model 141887 actuator also has "natural" memory, returns to unbenched position. \$1.71. CHERRY ELECTRICAL PRODUCTS 31

Digital VOM has 3½-digit display, autopolarity, overrange indication. Model 360 has 29 x ac, dc and resistance ranges, analog output jack, dual/slope A/D conversion, operation on batteries or ac. SIMPSON ELECTRIC CO. 31

Monolithic function generator includes voltage controlled oscillator, an analog multiplier, sine wave buffer amplifier. Model XR-220 produces sine, square, triangle and pulse waveforms with the aid of passive external network. FM and AM modulation by external voltage available; two built-in current switches allow choice of frequency with FSK keying. Frequency range is 0.01 Hz to 1 MHz. \$4.00 (quantity). EXAR INTEGRATED SYSTEMS 31

Frequency synthesizer covers 0.1 Hz to 13 MHz with a minimum of 10 digit resolution in display. Model 1013 has metered output to 3 volts rms, with output attenuator in 10 dB steps to 90 dB, and continuous control; output is sine and square wave. \$1595. COMSTROMCORP. 31

Oscilloscopes for dc-to-15 MHz weigh 14 and 17 pounds, respectively, have carrying handle. Model 77 (single trace) and 87 (dual trace) have rise time of 23.3 nsec, sweep rates from 0.2/sec div to 0.5 mic/sec/div, in calibrated steps. Model 77, \$550; Model 87, \$625. SYSTEM ELECTRONICS 32

Solid state and hybrid time delay relays continued on page 1

ELPA

Marketing Industries, Inc.

Announces the establishment of its new Professional Products Division for the sale and distribution of the finest components, test equipment and accessories to broadcasting stations and recording studios.

Representing these leading professional product lines:

Ferrograph Tape Decks
Super 7
Studio 8

Ferrotester Tape Recorder
Testing Unit
RTS-2 with Auxiliary Unit

EDITall Tape Splicing
Blocks and Tabs
for all Audio and Video Requirements

Thorens Electronic
Transcription Turntables
highlighting the TD-125AB Mark II

For further information, write to:

John King, Technical Director
Elpa Marketing Industries, Inc.
Professional Products Div.
Atlantic & Thorens Aves.
New Hyde Park, N. Y. 11040

Circle 187 on Reader Service Card

Year after Year Crown tape recorders pay off.

...IN THE PRODUCTION STUDIO

CX822 Mastering Recorder

computer logic control for safe, rapid tape handling and editing ■ full remote control optional ■ Trac-Sync available ■ each channel has two mixing inputs and individual bias adjust and equalizers ■ third-head monitor for meters or headphones with A/B switch



...IN THE CONTROL ROOM

SP722 Studio Player

simple tape transport system has only 9 moving parts ■ remote start/stop optional, automatic stop in play mode



...ON LOCATION

SX822 Recorder/Mixer

integral mixing facility simplifies setup ■ same tape transport system and meter monitoring as CX822 ■ two mic or line inputs per channel



Crown tape recorders pay for themselves with years more reliable service. These precision instruments make clean, accurate, effortless recordings years after the "economical" semi-pro decks have succumbed to chronic breakdown. Design lifetime is ten years (18 hours a day, 7 days a week) with three factory overhauls.

Every unit is ruggedly constructed, rigorously tested and guaranteed to meet or exceed specs. Modular construction and plug-in circuit boards mean fast, easy field servicing. Standard speeds include 15, 7½ and 3¾ ips. There are individual record, erase and play heads for one to four channels.

More than forty models plus professional accessories are described in the 8-page tape equipment catalog from Crown, Box 1000, Elkhart, Indiana 46514.



CROWN

Circle 188 on Reader Service Card

Going remote?



Use the only monitors made for it,
from TFT

If you're considering remote control, or upgrading existing operations, TFT frequency and modulation monitors give you performance no other monitor can match — in AM, FM, FM Stereo or TV.

One important reason is that you don't need an RF amplifier. This results in a much cleaner RF signal. Interference from intermodulation products of unwanted signals is virtually eliminated.

What's more, TFT monitors are easy to install. Just plug-in the antenna. You don't need several tuning stages. And they're stable. Once in operation, they don't need periodic maintenance or tuning.

TFT monitors also have wide-range AGC. So, signal strength variations at the remote location won't affect monitor performance.

Both analog and digital (BCD) outputs are available on TFT monitors

for use with remote logging equipment. You can also choose a number of alarm options: Carrier-Off; Loss-Of-Modulation; and Off-Frequency.

TFT remote-optimized monitors come in either frequency *and* modulation, or modulation-only models: for AM, FM, and TV (UHF or VHF). Every model also has high level inputs for direct connection at the transmitter.

All TFT monitors meet applicable FCC requirements and make FCC-required proof-of-performance measurements. Frequency models can be calibrated directly against NBS with the TFT Model 735 WWV receiver.

For a demonstration on *your* frequency, call or write TFT at the address below. In Canada: Glen-tronix, Ltd., Don Mills, Ontario, Canada.

TFT TIME AND FREQUENCY TECHNOLOGY, INC.
3000 OLCOTT STREET, SANTA CLARA, CA 95051 (408) 246-6365

Circle 189 on Reader Service Card

PRODUCTS

lays are plug-in cased. Series "C" are available in several ranges from 0 to 180 seconds, factory set or user adjustable, with operation voltage from 6 to 115 v ac or dc, contacts to 2 amperes. \$14.62 to \$19.54. TD ELECTRONICS. 32

Hockey-puck SCR's handle 21 amps rms, with blocking voltages 1200 volts. Series 125PM has maximum turn-off time of 20 microsec. 125PL is 30 microsec, 125PLB is 4 microsec. \$68.27. INTERNATIONAL RECTIFIER. 32

Line of VHF and UHF transistors are rated up to 50 watts output power. Series has infinite VSWR: all phase angles, gold metallization for ruggedness and reliability. TR SEMI-CONDUCTORS. 32

Zoom lens for one-inch color Plum-bicon cameras has range 15mm to 150mm, at 1/f2. Model PV-10X1 B2 has adjustable back focus, instant change bayonette mount, focusing 1 3/2 feet. CANON. 32

Variable video delay unit is screw adjustable 3 ns to 9 ns. Model UN3 9 is insertable in 75 ohm coaxial links, with BNC connectors. MATTHEY (TELEVISION EQUIPMENT ASSOCIATES, U.S. DISTRIBUTOR). 32

Tension gauge for magnetic tape measures dynamic or static tension.



of all sizes of tape. Model T2 available in 5, 12, and 20-ounce full scale ranges. \$179 up. TENDEL. 32

Automatic splice finder for tape cartridges kicks out cartridge stopper just beyond splice. Device also has switchable bulk eraser to combine two operations if desired. UMC ELECTRONICS. 33

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

Catalog shows complete line of **sequential and random access slide projectors**, audio visual programmers, slide dissolve controls and multi-image producers. Spindler and Sauppe. **250**

Data sheet covers **linear power amplifiers** for rf and microwave applications, covering 5 MHz to 4.2 GHz. Microwave Power Devices, Inc. **251**

New catalog presents complete line of **broadcast equipment**, including AM and FM transmitters, automatic switching and control systems, and audio consoles. Collins Radio Company. **252**

Tape duplication heads for open-reel, cassette and cartridge formats, mono, stereo and quad, are subject of 8-page brochure giving all technical data. Ferroxcube. **253**

Application note is cross-reference for over **1800 zener voltage regulators**, showing "competitive" number and IR equivalent. International Rectifier Corp. **254**

"Signals", a **company produced magazine**, carries articles on Jerrold products, solutions to problems, news of the industry, promotion tips. Jerrold Electronics. **255**

Electronic Market Data book of the Electronic Industries Association for 1974 is 116-page statistical study of electronic industry, with comprehensive breakdowns of markets for all major assemblies and components, government procurement, sales and financial trends of industry over extended periods (among hundreds of facts, it shows electronic sales for 1973 7.4% above 1972). Copies are \$10 for EIA members, \$20 for others, from EIA at 2001 Eye St, N.W., Washington.

Data sheet gives technical information on **solid-state microwave signal sources**, 1 GHz to 12.6 GHz at 250 mw, 50 mw and 10 mw power levels. Micromega, Division of Bunker Ramo. **256**

Application Note describes use of **large-screen CRT displays**, with data on interfacing to a variety of sources.

Hewlett-Packard. **257**

Catalog shows **extensive line of snap-mount plastic lights**, "Littelites," including circular and rectangular series, in a wide variety of lens styles and colors, housing colors, lamps, voltage ratings. Littelfuse, Inc. **258**

Eight-page catalog covers complete line of **wiring components**, including cable ties, clamps, marker ties, cable installation tools, plastic duct, terminals, splices, etc. Panduit Corp. **259**

Motion-picture **film laboratory price book** covers all services—developing, force developing, printing etc—on every variety of film, film strip, and slide. Bebell, Inc. **260**

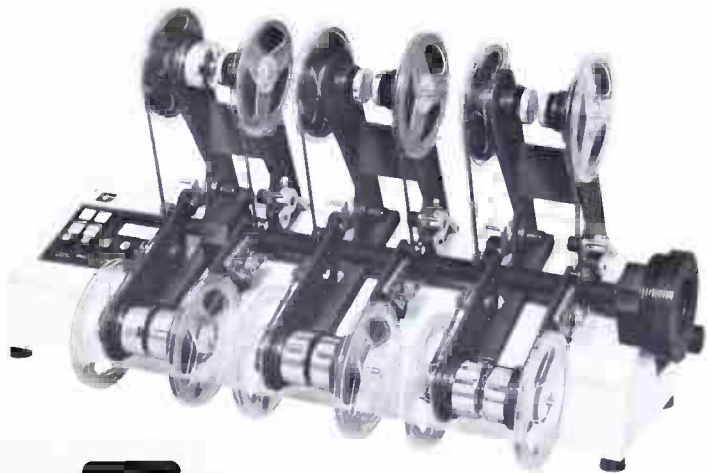
Summer 1974 edition of comprehensive telephone directory and reference **guide to the Federal Government** has been issued; \$50 from Federal Telephone Directory, 1133 15th Street, N.W. Washington D.C. 20005.

Specification sheet for **back-coated video tape** shows characteristics and prices for 1/4", 1/2", 3/4", and 1" tape, in formats matching many popular videotape machines. Irish Magnetic Tape Co. **261**

Four-page data sheet gives technical data on Model 126A **power source** (2 GHz to 8 GHz, 10 watts) and Model 125 (0.2 GHz to 3 GHz, 100 watts). Ailtech. **262**

After you use the 1056, we'll know one thing about your dub quality: it just got better.

Professional studios that make lots of dubs for radio, welcome the speed and quality they get using the Garner 1056. It offers a whole new set of advantages for producers of reel-to-reel duplicates for radio, AV, or educational needs. Some of those are: • Single capstan drives the master and all five copies. • Solid-state electronics and special heads provide outstanding frequency response. • Two-speed drive allows either 30 or 60 i.p.s. duplicating. • Extra-fast rewind of master tape speeds production. • Unique forward tilt of transport mechanism aids threading. • Conveniently located controls feature push button operation.

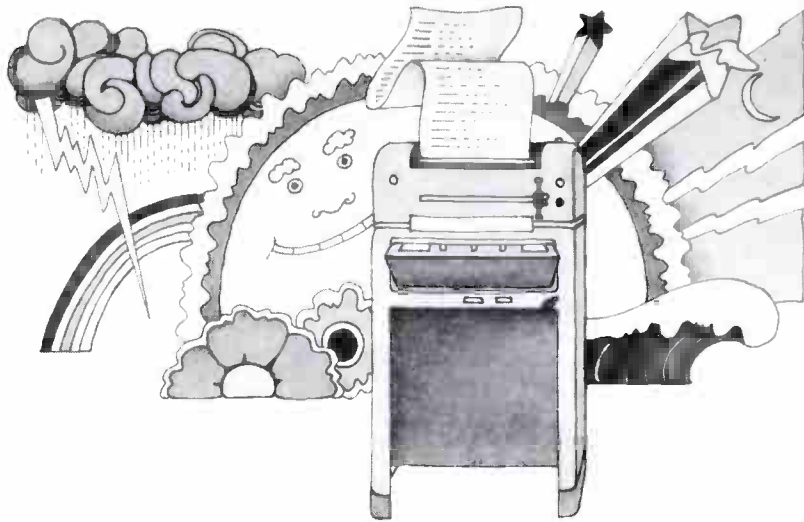


GARNER ELECTRONICS

4200 NORTH 48TH STREET
LINCOLN, NEBRASKA 68504

Circle 190 on Reader Service Card

And now the weather...



Get your weather forecasts via a teleprinter from RCA. Teleprinter, including maintenance, on a lease basis — just \$59 per month. Also available on outright purchase.

The teleprinter prints out the weather forecast automatically, and we make sure it keeps running reliably. Maintenance is prescheduled and automatic. Installation and service are fast, because RCA data communications specialists are based in over 140 cities, and our warehouse network is nationwide.

The weather changes, but RCA reliability stays constant.

Call us at (609) 779-4129.

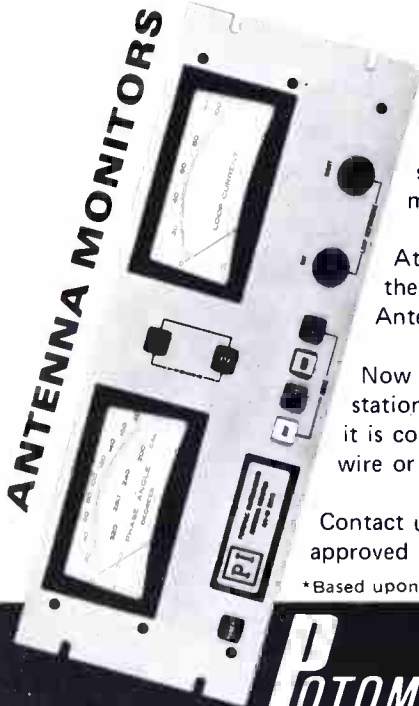
RCA Service Company, A Division of RCA
 Technical Services, Bldg. 204-2, Camden, N.J. 08101



WE GIVE YOU MORE OF WHAT YOU'RE LOOKING FOR.

Circle 191 on Reader Service Card

FCC Rule 73.69 + \$1660 = AM-19(204)



The FCC now says that you must have an approved Antenna Monitor. Since this is an added expense, consider carefully what is required of the monitor versus what it will cost.

At \$1660*, the Model AM-19 (204) is the lowest priced, FCC type approved Antenna Monitor available.

Now after several years of use at many stations, it has proven its reliability. And, it is compatible with virtually every type of wire or wireless remote control system.

Contact us now on this and other FCC type approved Antenna Monitors.

*Based upon 2 tower, DA-2.

POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.
 SILVER SPRING, MARYLAND 20910 (301) 589-3125

Circle 192 on Reader Service Card

BRIEFS continued from page 34

Scientific-Atlanta will build a turn key distribution system for Fairfield Cablevision, Lancaster, Ohio ... Annual convention of the **Central Canada Broadcasters Association** will be October 20-22, 1974 at the Bonaventure Hotel, Montreal; date from E. D. Duffield, Box 2880, London, Ontario.

Jerrold Electronics Corp. announced a general price increase of between 5½% and 6%, effective Sept. 3, 1974 ... Cable systems of **Sierra Video**, operating in five central California towns, were sold to **Cable Ko Communications**, who will expand coverage ... **Kaiser Broadcasting** sold radio station WCAS, Cambridge, Mass., to Wickus Island Broadcasting Company.

Cinema Products Corp. announced in July sale of the 100th reflex CP 16 camera, introduced in March.

Broadcast Electronics has bought the Modtec line of video monitor from Circuit Science, Inc., will manufacture them at the BE Silver Spring plant ... The "new IGM," was host in Bellingham, Wash., in July to 50 broadcasters who came for training in the use of IGM's computerized automation system; the largest group was from the CBS network-owned stations, who have bought about \$500,000 of IGM equipment.

Ampex Corp. has sold to TV Globo Network, in Brazil, videotape recorders and automated videocassette machines with total value above \$2 million ... **Howard Cable Television Associates**, holding the franchise for Howard County, Maryland, has given a cable management contract to **Daniels and Associates** of Denver; the latter company will design, construct and manage the cable system.

What is probably the first doctoral program in communications theory and research will begin in September at the **Annenberg School of Communications** at the University of Southern California; eleven students have already been selected from applicants from all over the country.

The Maine Public Broadcasting Network is expanding TV coverage, with a new UHF station and additional studio equipment, bought from RCA for nearly \$2 million.

Marconi announced the sale of more than two million pounds' worth of the new integrated telecine, model B3404 ... **Telecable Corp.** of Norfolk, Va., bought the assets of Piedmont Cablevision, Greenville, S.C., from Teleprompter ... **Otar**

Corp., a subsidiary of Otari Electric of Japan, has been set up in San Francisco to provide American distribution of and servicing for Otari's line of professional tape recorders and duplicators.

Telemation Inc. has set up a branch office in Beirut, Lebanon, for sales to broadcast, education, and other buyers in the Middle East . . .

Koenick Electronics will build a 12-channel cable system in Elk Rapids and Kewadin, Michigan for Great Lakes Cable Co., using Ameco head-end, trunk, and distribution equipment . . . **LPB, Inc.**, has sold to the U.S. Government, for use at Fort Gordon, Georgia, AM carrier-current transmission equipment totaling more than \$75,000 in cost.

Sphere Audio Sales is a new rep organization, set up in Nashville by Wallace W. Wilson, and specializing in professional audio products . . .

Jerrold Electronics is moving the parts and repair department from Hatboro, Pa., to a larger facility in Chicopee, Mass. . . . Sales of **Ferrograph**, **Editall** and **Thorens** equipment to broadcast stations and recording studios will be handled by a new **Professional Products Division** set up by Elpa Marketing.

Vior Corporation, of Parsippany,

N.J., makers of a monochrome video projector, set up a West Coast headquarters in La Mesa, California . . . Another station using waste transmitter heat to cut fuel bills is **WISN-TV, Milwaukee**; plan initiated by Chief Engineer G. R. Robinson cut oil consumption from 2000-3000 gallons a year to about 800.

Ampex Corp. received in June the 100th order for the AVR-2 videotape machine, introduced in March at the NAB convention in Houston . . .

Raymond L. Weiland and **R. T. Bethel** announced purchase of all the stock of **International Nuclear Corp.**, Nashville Electronics company; Weiland was founder of the company, and president until April 1, 1970; he now becomes chairman and president.

The Board of directors of the **National Cable Television Association** have set up an award to be given to outstanding associate members, and honoring the late **Robert Beisswenger**, former president of Jerrold and an industry pioneer, who died in a boating accident in May . . . **Audiotronics Corp.** will buy the Acoustifone Corp., a subsidiary of Canoga Industries, and a manufacturer of acoustic headphones and other listening systems.

continued from page 100

MARTY BETTAN SALES, INC.

77-15 164th St.
Flushing 11366
212-969-7600
Line: audio components

BROWN RADIO SERVICE

250 East Ave.
Rochester 14604
716-232-5580

Line: audio components
MicroTrak see ad p 119

W. G. BROWN SOUND EQUIPMENT

Syracuse
315-475-5161
Line: audio & video products

BURDEN ASSOCIATES

342 Lexington Ave.
Mount Kisco 10549
914-666-3730

Line: audio systems

THE CAMERA MART

456 West 55th St.
New York 10019
212-757-6977
Line: cameras & accessories
Cinema Products see ad p 27

CELEBRATION SOUND

161 Gray Rd.
Ithaca 14850
607-272-8964
Line: audio components
Micro-Trak see ad p 119

CHROMACORD CORPORATION

60 Margaret St.

continued on page 110

Burwen Noise Reduction Products for Broadcasters

These 3 Burwen noise reduction units are specifically engineered for the noise problems associated with broadcasting. For full information on this unique technology, ask your Burwen representative or call Ron Bollman at (617) 273-1488.



DNF 1500D

Dynamic Noise Filter for class D telephone lines and shortwave reception. 6 to 20 dB noise reduction. Operates 250 cps to 4 kc.



DNF 1500A

Dynamic Noise Filter for class A telephone lines and video tape sound tracks. 5 to 12 dB noise reduction. Operates 10 cps to 8 kc.



DNF 1100

Dynamic Noise Filter for use in program and production channels. 6 to 14 dB noise reduction. Operates 10 cps to 30 kc.



209 MIDDLESEX TURNPIKE, BURLINGTON, MASS. 01803 TEL. (617) 273-1488

Circle 193 on Reader Service Card

Plattsburgh 12901
Line: audio components
Stanton see ad p 43

CIVIONICS DATA SYSTEMS
RD 2 Goode St.
Ballston Spa 12020
518-457-2384
Line: CCTV systems

MPCS COMMUNICATIONS INDUS.
New York
212-586-3690
Line: video products

COMPREHENSIVE SERVICE CORP.
250 West 64th St.
New York 10023
Line: recording accessories

C T L ELECTRONICS
86 W. Broadway

New York 10007
212-233-0754
Line: CCTV systems

P. M. ELECTRONICS
83 Russell Rd.
Garden City 11530
516-248-4858
Line: measuring equip.; monitors; TBC
Time and Frequency Tech. see ad p 106

FOTO OPTICAL CORP.
88 Harbor Rd.
Port Washington 11050
516-767-3960
Line: CCTV systems

FRAUENHEIM PROCESS CO.
180 S. Park Ave.
Buffalo 14203
716-856-0548

Line: CCTV systems

GARRETTSON CO. INC.
2 Willard Ave.
Pocantico Hills
Larytown 10591
914-631-2650
Line: elec. components
ITT Jennings see ad p 29

GARRETTSON CO. INC.
99 Hillside Park 11596
516-747-6610
Line: elec. components
ITT Jennings see ad p 29

SYLVAN GINSBURY LTD.
425 Park Ave. South
New York 10016
212-695-3768
Line: audio components
Micro-Trak see ad p 119

GRAVCO SALES INC.
Station Plaza E
Great Neck 11022
516-487-1311
Line: video processing equip.; swit-
ers

HENRY GROSSMAN ASSOCIATES
519 South 5th Ave.
Mount Vernon 10550
914-664-5393
Line: audio components
Stanton see ad p 43

HARVEY RADIO CO.
60 Crossways-Park W.
Woodbury 11797
212-297-7577
Line: audio components & equip.
Micro-Trak see ad p 119
IVC see ad p 6-7
L. J. Scully see ad p 94

TONY HAWKINS
224 6th Ave.
Brooklyn
212-789-7829
Line: audio equipment
Revox see ad p 45

HB ELECTRONICS
100 Thompson St.
New York 10013
212-431-5497
Line: CCTV systems

ISSCO
1 Station Square
Forest Hills 11375
212-261-3255
Line: CCTV systems

JOSEPH ASSOCIATES
8 Cove Lane
P.O. Box 307
Port Washington 11050
516-883-1829
Line: audio equipment; RF monitors
Fairchild Sound see ad p 118

L. H. LEGGETT
245 Park Ave.
New York 10017
212-661-6530
Line: broadcast equipment
Collins see ad p 47

L. S. M. ASSOCIATES
27 Orchard Park
Phelps 14532
315-548-4891
Line: audio components
Fairchild Sound see ad p 118

MARTIN AUDIO CORP.
320 West 46th St.
New York 10036
212-265-6470
Line: audio components, equip.,
cording accessories
Television Microtime see ad p 79

WENDELL MARTIN CO.
3573 Howlett Hill Rd.
Camillus 13031
315-673-2943
Line: audio equip.; RF monitors

HERBERT MARX
11 Grace Ave.
Great Neck 11021
516-829-5666
Line: video equipment
Chiron see ad p 92

GILBERT E. MILLER ASSOC.
375 N. Broadway
Jericho 11753
212-895-0429
Line: sound systems, audio products

**MURLYN EDUCATIONAL PRO-
DUCTS**
14 Seabro Ave.
N. Amityville 11701
516-598-2500

Reel-to-reel... for real



Exciting things are happening in the reel-to-reel market. And it's all caused by a new machine called the ITC 850 Series. Here is the result of a long series of consultations with broadcasters to determine what they most desired in a reel-to-reel machine. Then we added a few innovations of our own. Truly, the 850 Series is equipment designed specifically with the professional broadcaster in mind. Some 850 features: motion sensing, multi-function edit mode, super quiet operation, automatic tape lifters, TTL logic circuitry, capability of handling dissimilar size reels... and more too numerous to mention here. If you're in the market for something new and vastly improved in reel-to-reel, a **collect** call to us will reveal an interesting story that you may have been waiting to hear. Make the real move to reel-to-reel... ITC. Collect number 309-828-1381.



INTERNATIONAL TAPETRONICS CORPORATION

2425 South Main Street • Bloomington, Illinois 61701

Marketed exclusively in Canada by McCurdy Radio Industries Ltd., Toronto

Circle 194 on Reader Service Card

Line: CCTV systems

NATIONAL CINE

4140 Austin Blvd.
Island Park 11558
516-889-4600

Line: cameras, CCTV systems

NORTHEAST BROADCAST EQUIPMENT

RR #2
Westport 12993
518-962-4567

Line: broadcast equipment

Control Design see ad p 18

Wilkinson Electronics see ad p 30

NORTHEAST BROADCAST LABS

15 Charles St.
South Glen Falls 12801
518-793-2181

Line: audio equipment

NYCOM INC.

2002 Teall Ave.
Syracuse 13206
315-437-8343

Line: elec. components

ITT Jennings see ad p 29

W. J. O'CONNOR ASSOCS.

3 Willow Park Center
Farmingdale 11735
516-293-8888

Line: audio products

Tascam see ad p 100

PASTON-HUNTER CO., INC.

2002 Tealle Ave.
Syracuse 13206
315-437-2992

Line: sound equipment

JOSEPH PLASENCIA, INC.

521 Fifth Ave.
New York 10017
212-867-8084

Line: audio components

Micro-Trak see ad p 119

PROFESSIONAL ELECTRONICS CO.

Latham
518-785-1660

Line: video products

ROSNER CUSTOM SOUND INC.

11-38 31st Ave.
Long Island City 11106
212-726-5600

Line: audio components & equip

Micro-Trak see ad p 119

F. EDWIN SCHMITT CO., INC.

311 Meacham Ave.
Elmont 11003
516-437-8150

Line: audio components

SENECA AUDIO-VISUAL CORP.

Buffalo
716-832-2100

Line: audio & visual equipment

SENECA COMMUNICATIONS INC.

112 Killewald St.
Tonawanda 14150
716-693-8446

Line: audio & video products

AKAI see ad p 14-15

SINGER PRODUCTS CO.

World Trade Ctr.
New York 10018 212-239-8900

Line: audio & video equipment

Conrac see ad p 35-36

Viscount see ad p 121

SOUND & LIGHT PRODUCTIONS

35 West 53rd St.
New York 10019
212-265-5685

Line: CCTV systems



TOPS!

That's LPB's stereo S-13B console, our top-line audio control center.

Features include:

- 18 stereo and 6 mono inputs.
- Step attenuator mixers.
- Telephone-type switches.
- Plug-in fiberglass circuits.
- Stereo 12 watt/channel monitor.
- Internal cue amp and speaker.
- All transformer input and output.

The features and quality of LPB's S-13B just can't be found in other consoles at comparable prices. Take a hard look at the S-13B before you make a mistake!

LPB has a complete line of mono consoles, too, and everything that goes with them. Call or write today for complete information.



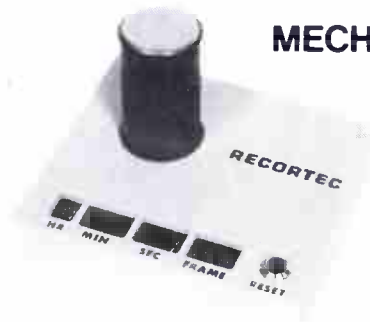
LPB Inc.

520 Lincoln Highway, Frazer, Pa. 19355
(215) 644-1123

Circle 195 on Reader Service Card

Video Tape Timer

**REPLACES
MECHANICAL TIMER
ON
AMPEX
AND
RCA VTR'S**



- Hour-minute-second-frame display
- Bright LED readout
- All solid state
- Direct replacement on VTR
- Remote display option

RECORTEC, INC.

777 PALOMAR AVENUE • SUNNYVALE, CALIFORNIA 94086 • (408) 735-8821

Circle 196 on Reader Service Card

continued on page 112

SOUND SYSTEMS INC.
42-12 28th St.
Long Island City 11101
212-786-4474
Line: CCTV systems

TEL-COM, INC.
1475 East Henrietta Rd.
Rochester 14623
716-442-7900
Line: CCTV systems

TELEMERICA INC.
25 W. 43rd St.
New York 10036
212-687-0370
Line: audio and broadcast products
Broadcast Electronics see ad p 34

TELESCO INT'L (EXPORT)
1044 Northern Blvd.

Roslyn 11576
Line: audio, video, broadcast products
Fairchild Sound see ad p 118

TELEVISION EQUIPMENT ASSOCIATES
Box 1391
Bayville 11709
516-628-8068
Line: brand line radio & TV equip.; accessories

TELSEC SYSTEMS
P.O. Box 3152
Poughkeepsie 12603
914-454-4922
Line: CCTV systems

ITT
141 Manorhaven Blvd.
Port Washington 11050
516-883-4440

Line: CCTV Systems

VICOMM TELEVISION SERVICES, INC.
126 Highland Ave.
Syracuse 13203
315-474-2865
Line: CCTV systems

VIDEO CIRCUITS, INC.
Elmsford
914-592-8068
Line: video products

VIDEO COMPONENTS, INC.
P.O. Box 1014
Port Washington 11050
516-883-4818
Line: camera lenses, full line CCTV video equip.; video camera accessories, video editors
Canon U.S.A. see ad p 114

VIDEO COMPONENTS, INC.
601 S. Main St.
Spring Valley 10977
914-356-3700
Line: camera lenses, full line CCTV video equip.; video camera accessories, video editors
Canon U.S.A. see ad p 114

VIDEO ENGINEERING COMPANY, INC.
356 West 40th St.
New York 10018
212-564-7400
Line: CCTV systems

VISITEL CORP.
New York
212-752-3690
Line: video products

VSM LEASING CORPORATION
6010 Goodrich Road
Clarence Center 14032
716-741-3100
Line: audio components, equip.
Stanton see ad p 43

WINDSOR TOTAL VIDEO SYSTEMS CORP.
652 1st Ave. 5th Floor
New York 10016
212-725-8080
Line: CCTV systems

NORTH CAROLINA

ADAMS & ASSOCIATES, INC.
P.O. Box 9256
1300 Westover Ter.
Greensboro 27408
919-272-6838
Line: audio components
Fairchild Sound see ad p 118

BCS ASSOC.
1310 Beamon Pl.
Greensboro 27408
919-273-1918
Line: video products
Cohu see ad p 41
Time & Frequency Technology see ad p 106

BLANCHARD ELECTRONICS
P.O. Box 5
Kenansville 28349
Line: audio components
Micro-Trak see ad p 119

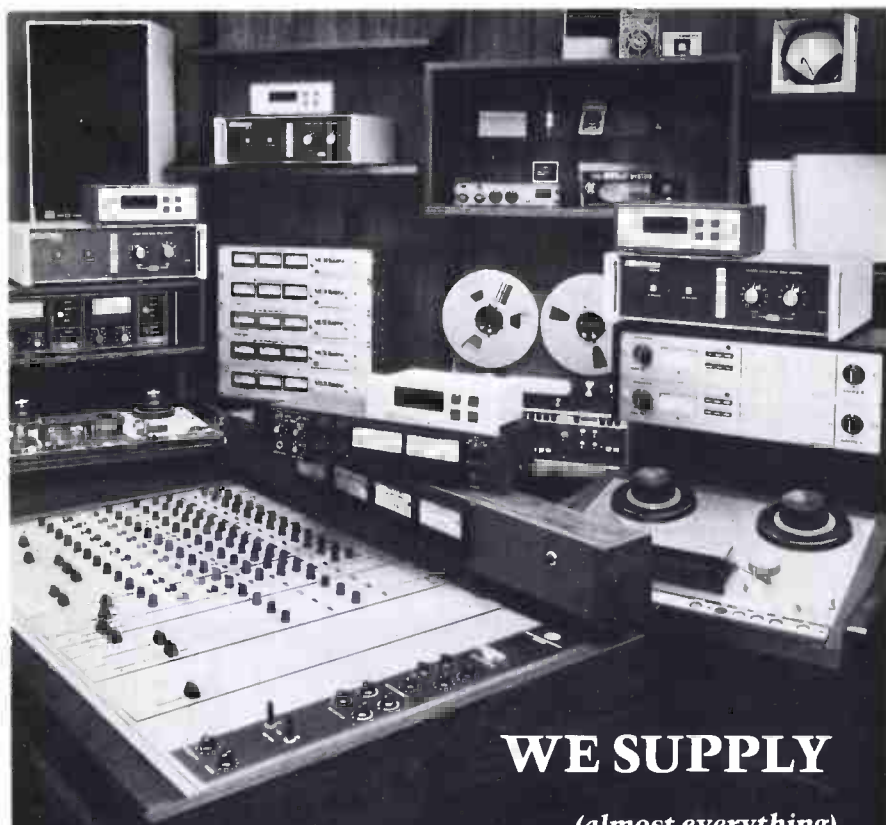
ELECTRONEERING, INC.
P.O. Box 85
Selma 27576
919-965-8073
Line: audio tape recorders, consoles, turntables, microphones, accessories

A. W. GREESON, JR.
219 Homewood Ave.
Greensboro 27403
919-292-1791
Line: full line audio equip., RF monitoring equip.
Broadcast Electronics see ad p 34
CBS Labs see ad p 67, 104
Micro-Trak see ad p 119
Moseley see ad p 91
Potomac Instruments see ad p 112

HAMMOND ELECTRONICS, INC.
2923 Pacific Ave.
P.O. Box 21728
Greensboro 27406
919-275-6391
Line: audio components
Micro-Trak see ad p 119

HOLLINGSWORTH & STILL
P.O. Box 25344
Charlotte 28215
Line: audio products

KIRKMAN ELECTRONICS, INC.
Drawer K



WE SUPPLY

(almost everything)

Modulimiter—the proven limiter of the leaders. Sounds clean and loud—available only from Pacific Recorders with Automatic Polarity Correlator—remember, you can hear the difference.

Multisync—the ultimate variable speed drive for turntables and tapes—gives a continuously variable 3:1 speed range with most synchronous motor driven equipment.

Digitimer—a digital stopwatch with large display, silent pushbuttons, display hold, remote control capability, and a small price.

Monitor Mixdown Panel—for the Tascam Model 10 gives much needed flexibility in monitoring—3 tape machine inputs, headphone cue mix, stereo mixdown, and separate controls for booth and production.

M-S Matrix for stereo microphones—finally a complete control unit for Neumann and AKG stereo microphones in one package.

And remember, Pacific Recorders is the supplier for all your audio broadcast needs: Consoles, tape decks, speaker systems, amplifiers, microphones, headphones—we supply from most leading manufacturers. Call or write today.



PACIFIC RECORDERS AND ENGINEERING CORPORATION
11760 SORRENTO VALLEY ROAD, SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255 TELEX 695008

Circle 197 on Reader Service Card

Salem Station
Winston Salem 27108
919-724-0541
Line: video systems
Television Microtime see ad p 79

LONG ENGINEERING CO.
Winston-Salem
919-725-2026
Line: video products

SOUTHEASTERN SIGHT & SOUND
1717 South Saunders St.
Raleigh 27606
919-828-2311
Line: video systems
Television Microtime see ad p 79

STANDARD THEATRE SUPPLY CO.
125 Higgins St.
Greensboro 27220
919-272-6165
Line: cameras and accessories
Cinema Products see ad p 27

TECHNICAL VIDEO SYSTEMS
1148 Burke St.
Winston-Salem 27101
919-725-2026
Line: CCTV systems

P. D. THOMPSON
550 Weymouth Rd.
Winston-Salem 27103
919-765-3157
Line: full line broadcast equip. (audio & video)
Broadcast Electronics see ad p 34
CBS Labs see ad p 67, 104
Coseley see ad p 91

OHIO

ASTRO SALES

672 Alpha Dr.
Cleveland 216-461-4500
Line: video and audio equipment
Otari see ad p 71

A/V MEDIA, INC.
3344 W. Broad St.
Columbus 43204
614-272-0014
Line: video and audio products
Stanton see ad p 43
Television Microtime see ad p 79

NEAL BEAR CORP.
3435 Streetsboro Rd.
Richfield 44286
Line: audio products

CENTRAL VIDEO SYSTEMS, INC.
7311 Valley View Dr.
Independence 44131
216-524-9696
Line: video products
Hitachi Shibaden see ad p 10, 11

DOUG COOK
2185 Trent Rd.
Columbus 45229
614-471-4114
Line: audio equip.; transmitters

F. A. DAUGHERTY CO.
6025 Mayfield Rd.
Cleveland 44124
216-449-1122
Line: audio products
Stanton see ad p 43

DAYTON COMMUNICATIONS CORP.
2971 Bluefield Ave.
Dayton 45414
513-278-7937
Line: CCTV systems
Viscount see ad p 121
continued on page 114

the new **McMARTIN / BA-1K**
1000/500/250 watt AM TRANSMITTER

unique interior accessibility
125% positive peak • 1200 watts output
remote control/metering capability
FCC TYPE ACCEPTED



McMartin

McMartin Industries Inc • 4500 South 76th Street
Omaha, Nebraska 68127 • Phone (402) 331-2000
Circle 198 on Reader Service Card

DRACON Aluminum Relay Racks...Economical and Available!

IN STOCK, and ready to ship, Dracon channel-type aluminum relay racks are available in standard 19" and 23" sizes with choice of self-supporting or overhead supported styles. Construction is of durable high-grade aluminum extrusions with a smooth satin finish and choice of gold iridite or telephone gray enamel colors (custom colors and finishes are available on special order).

PRICED COMPETITIVELY with heavier steel models, Dracon Aluminum Relay Racks can also appreciably reduce shipping, handling and storage costs. And, because of their lighter weight (about 40 pounds for even the largest standard sizes), one man can easily carry and install them. Floor loading is significantly reduced in large installations.

COMPLETE DETAILS AND PRICES of Dracon aluminum channel-type relay racks are available from Dracon Industries or local offices of major telephone supply houses.

DRACON
INDUSTRIES

9541 Mason Avenue, Chatsworth, CA 91311 (213) 882-8595

Circle 199 on Reader Service Card

AUDIOWAVES

The choice is practically infinite...
RCA Audio Consoles



Start with 30 off the shelf models,
including mono, dual and stereo.

Next consider our custom consoles where we combine money-saving standard modules in practically limitless ways. They all offer quality performance at affordable prices.

Details? See your RCA representative. RCA Broadcast Systems, Camden, N. J. 08102

RCA

Microphones • Consoles • Tape and Transcription Equipment
Automation Systems • Amplifiers and Speakers

Circle 200 on Reader Service Card

Canon 10x HAND-HELD CAMERA ZOOM

One-Inch Plumbicon Color Camera Zoom



PV 10X15

15mm to 150mm; f/2.0

- Wide Angle
- Small Size
- Lightweight
- Excellent Quality
- Operational Flexibility
- "Macro Focus" Operation
- Light Transmission Over 80%
- For All Cameras

Canon
BROADCAST OPTICS

CANON U.S.A., INC., 10 NEVADA DRIVE, LAKE SUCCESS, N.Y. 11040

(516) 488-6700

Circle 201 on Reader Service Card

ELECTRONIC PRODUCTS CORP.

1231 Main Ave.
Cleveland 44113
Line: video amplifiers, switchers
Amtron see ad p 119, CM/E 4
Conrac see ad p 35,36

TOM GRANT ASSOC.

2510 Medina St.
Medina 44256
216-725-6528
Line: audio products
Crown see ad p 105

JANSON INDUSTRIES

2602 Harrison Ave. NW
Canton 44711
216-455-2241
Line: recording accessories

KLOPF A/V COMPANY

5045 N. Main St.
Dayton 45415
513-276-3938
Line: video products
Conrac see ad p 35,36
Viscount see ad p 121
Television Microtime see ad p 79

KLOPF A/V CO.

Cleveland
216-88-0880
Line: video products
Television Microtime see ad p 79

MANDABACH ASSOCIATES

1350 Crestwood Ave.
Columbus 43227
614-235-0265
Line: audio components
Fairchild Sound see ad p 118

MAYBERN CO.

12815 Detroit Ave.
Lakewood 44107
216-333-2531
Line: audio products
Stanton see ad p 43

McFADDEN SALES, INC.

150 E Broad St.
Columbus 43215
614-221-3363
Line: audio components

THE WHELAN CORP.

4541 Gateway Cir.
Dayton 45440
513-434-7551
Line: elec. components
ITT Jennings see ad p 29

OKLAHOMA

DELCOM

2744 S. Breden St.
Tulsa 74114
918-936-7777
Line: video products
Conrac see ad p 35,36

TELEMATION SOUTHWEST, INC.

See Mfr's field offices

OREGON

RON MERRIT CO.

2035 SW 58th Ave.
Portland 97221
Line: audio products

OREGON A/V SYSTEMS, INC.

Portland
503-224-4313
Line: video products
Amtron see ad p 119

UNITED RADIO SUPPLY

Portland
503-342-3381
Line: broadcast equipment
Sitco Antenna see ad p CM/E 6

PENNSYLVANIA

ATLANTIC INSTRUMENT CO.
20 Berwick Rd.
Philadelphia 19131
215-664-8457
Line: CCTV systems

BARTLETT ASSOC.
130 W. Lancaster St.
Wayne 19087
215-688-7325
Line: video equipment
Cohu see ad p 41

BROTHERS & CONNEEN ASSOC.
12 South Newtown St.
Newtown Square 19073
215-353-2241
Line: audio equipment

COLORIGATION
William Flynn Highway Rt. 8
RD 3
Valencia 16059
412-793-5479
Line: CCTV systems

COMMUNICATION MEDIAS
P.O. Box 54
Allentown 18105
215-437-9447
Line: full line audio equipment
Broadcast Electronics see ad p 34
Micro-Trak see ad p 119
Stanton see ad p 43

JERRY CONN & ASSOC.
550 Cleveland Ave.
Chambersburg 17201
717-263-8258
Line: CATV electronic units; coaxial cable, cable connectors; broadcast antennas; TV and FM modulators, processors; microwave systems.

C. S. COOPER ASSOC.
112 Oakwood Rd.
McMurray 15317
412-941-6473
Line: audio products
Stanton see ad p 43

EASTERN TELECOM, INC.
700 Seco Rd.
Monroeville 15146
412-373-2170
Line: CCTV systems

MILTON ESHELMAN CO.
2902 Sycamore St.
Harrisburg 17111
717-564-2437
Line: CCTV systems

GARRETTSON CO., INC.
Fairway Plaza Suite 305
Philmont Ave. & Red Lion Rd.
Beth Ayres 19006
215-464-2275
Line: elec. components
ITT Jennings see ad p 29

GENERAL TECHNICAL PRODUCTS
780 Lorraine Dr.
Warrington 18976
215-343-3000
Line: CCTV systems

HOLT TECHNICAL SERVICE
428 Broadhead Ave.
Bethlehem 18016
215-866-8074
Line: audio and video products
Control Design see ad p 18

IMPOSSIBLE ELECTRONIC TECHNIQUES
P.O. Box 467
212 Pennsylvania Ave.
Ardmore 19003
215-687-5400
Line: CCTV systems

LERRO ELECTRICAL CORP.
3125 N. Broad St.

SPORTS Commentator Headset

Dynamic Boom Microphone; 400 OHMS, frequency range 50-15,000 Hz, sensitivity 2mV (loaded) for close speech.

Double Headphones; independently wired, 200 OHMS each, frequency range 50-15,000 Hz.

Ventilated Foam Cushions eliminate perspiration and let you hear ambient sound (optional ear enveloping cushions).

Weight 6½ oz. Practically unbreakable components. Optional cough switch.



Television Equipment Associates, Inc.

BILL PEGLER 516 • 628-8068
Box 1391 • BAYVILLE, N. Y. 11709

Price: \$75.00
Delivery from stock

Circle 202 on Reader Service Card

schafer
IS RADIO AUTOMATION !



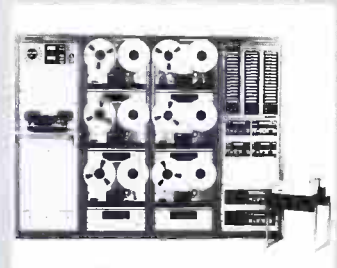
700 SERIES COMPUTERS

You can't outgrow a Schafer/NTI 700 system with integral computer! Each 700 is totally modular and may be expanded at any time to provide virtually unlimited storage and programming control. From the smallest 730 to the ultimate 770, each Schafer/NTI computer system offers standard features not available on any other system at any price. To prove it, we have a new brochure that outlines the capabilities of all the 700 computer models. Why not send for it and see for yourself . . . YOU CAN'T OUTGROW A SCHAFER/NTI 700 COMPUTER.

900 SERIES CONTROL UNITS

Pictured is the Schafer 903 time-oriented MOS Memory system with 24 hour (or up to 7 days) advance programming capability. More features are standard equipment on the 903 than on any other comparably priced system. Automatic Memory loading and Verified Encoded Logging are available, too.

The Schafer 902 is the goof-proof system. 48 format sequence thumbwheels make the 902 the ultimate in simplicity. Add a Random Access 2000-step MOS cartridge programmer, and you have the most flexible low-cost automation system in the world.



THE AUDIOFILE

THE random-access cartridge system you've been waiting for! The AUDIOFILE is all solid-state, fast, and has audio quality equal to the best single-play cart machines. Use it in your automation system, or with DJ control in your studio. THE NEW STANDARD IN MULTIPLE CARTRIDGE MACHINES . . . The AUDIOFILE. Exclusively from Schafer.

Don't forget . . . Schafer is the one-stop source for all your equipment requirements. When you need studio equipment or transmitting gear, automation or Audiofiles, reel-to-reel or cartridge recorders, consoles or turntables, transmitters or antennas, remember . . . SCHAFER HAS IT ALL.

schafer

SCHAFER ELECTRONICS CORPORATION
75 Castilian Dr.
Santa Barbara Research Park
Goleta, California 93017

Name _____
Station _____
Address _____
City _____
State _____ Zip _____

Circle 203 on Reader Service Card



make
your
station
more
profitable...

NATIONAL RADIO BROADCASTERS CONFERENCE & EXPOSITION IN NEW ORLEANS

October 10th thru 13th

- ★ Exhibits & Demonstrations by Leading Equipment Manufacturers
- ★ Broadcast Services Hospitality Suites
- ★ Technical Seminars
- ★ Management, Programming, Promotion & Sales Panel Discussions an Indepth Conference for all Radio Broadcasters

For Reservations
Call Collect
TODAY!

**NATIONAL
ASSOCIATION
FM BROADCASTERS**
(Area 212) 755-9330

Circle 204 on Reader Service Card

Philadelphia 19132
215-223-8200
Line: audio and video products
AKAI see ad p 14,15

SAMUEL K. Mac MacDONALD, INC.
1531 Spruce St.
Philadelphia 19102
215-545-1205
Line: audio components

MACRO VIDEO SYSTEMS, INC.
6114 North 20th St.
Philadelphia 19138
215-849-9500
Line: CCTV systems

NEBCO ASSOCIATES
P.O. Box 274
Enon Valley 16120
Line: audio products

NORTHEASTERN FUTURO, INC.
Suite 4300, Ambassador East
Pittsburgh 15221
412-243-1300
Line: audio and video products
AKAI see ad p 14,15

PENNSYLVANIA EDUCATIONAL AIDS
307-311 E Carson St.
Pittsburgh 15219
412-381-2826
Line: CCTV systems

PIERCE PHELPS, INC.
2000 N 59th St.
Philadelphia 19131
215-477-9000
Line: audio equip.; CCTV video systems
Conrac see ad p 35,36
Micro-Trak see ad p 119

HENRY RHEA
1229 Hunt Club La.
Media 19063
215-566-6558
Line: audio equip.; transmitters

RPC ELECTRONICS
Pittsburgh
412-782-3770
Line: video products
Television microtime see ad p 79

SOUND SYSTEMS
6 Bysher Ave.
Flourtown 19031
215-242-3500
Line: CCTV systems

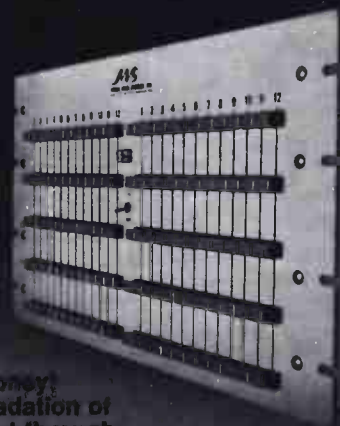
WARREN RADIO, INC.
Erie
814-454-5285
Line: video products

WIEGAND AUDIO LABS
R.D. No. 3
Middlebury 17842
717-837-1444
Line: audio components
Micro-Trak see ad p 119

VAL-TRONICS, INC.
Box 666
Avoca 18641
717-457-8886
Line: audio equip.; RF monitors
Potomac Instruments see ad p 112
Stanton see ad p 43

VIDEO COMPONENTS, INC.
455 Concord Ave.
Box 277
Eaton 19341
215-363-7377
Line: camera lenses, full line CCTV video equip., video camera accesso-

What A Figure...



Marco Video Series RS Routing Switchers give you the **best** signal-to-noise figure for your money! 69 dB S/N assures minimal degradation of video-audio quality even when fed through the switcher many times. Add in:

- Hand-trimmed Differential Gain and Phase to meet and exceed the most stringent tolerances.
- Compact size to reduce rack space requirements.
- Configurations from 12 X 6 through 12 X 200.
- Low Price

Call DeWitt Smith today for details.

MARCO VIDEO SYSTEMS, INC.

6114 N. 20th Street, Philadelphia, Pa. 19138 ● 215 VI 9-9500

Circle 205 on Reader Service Card

ries, video editors
Canon USA see ad p 114

VIDEO COMPONENTS, INC.
1910 Cochran Rd.
Pittsburgh 15220
412-561-3321
Line: camera lenses, full line CCTV video equip., video camera accessories, video editors
Canon USA see ad p 114

RHODE ISLAND

LAVINE DISTRIBUTORS
27 Dryden La.
Providence 02904
401-421-4000
Line: CCTV systems

WRH PRODUCTIONS
5 Industrial Way
Riverside 02915
401-434-6272
Line: full line audio components, equip, RF monitors
Micro-Trak see ad p 119
Stanton see ad p 43

SOUTH CAROLINA

R. L. BRYAN COMPANY
P.O. Drawer 368
Columbia 29202
803-779-3560
Line: audio and video products
AKAI see ad p 14,15
Television Microtime see ad p 79

R. L. BRYAN COMPANY
3025 W. Montague Ave.
Charleston 29411

803-554-9440
Line: video systems
Television Microtime see ad p 79.

CALHOUN A/V COMPANY
Columbia
830-772-9130
Line: audio and video products

DIXIE RADIO SUPPLY CO.
1900 Barnwell St.
Columbia 29202
803-235-5333
Line: audio components
Micro-Trak see ad p 119

TENNESSEE

ALLIED SOUND-VISUAL EDUCATION DIV.
Memphis
901-396-4747
Line: audio/visual equipment

BARRY TRADING CO.
P.O. Box 609
Lebanon
615-444-0305
Line: audio components
Micro-Trak see ad p 119

BILL BILLINGS PHOTO
129 S. Front Ave.
Rockwood 37854
Line: photo products
Cinema Products see ad p 27

BROADCAST DISTRIBUTORS
Bible Place
Cleveland 37311
615-472-8200
Line: audio components and equip.
Broadcast Electronics see ad p 34
Micro-Trak see ad p 119

BROADCAST EQUIPMENT & SUPPLY CO.
Weaver's Pike
Bluff City 37618
615-764-8032
Line: full line audio equipment
Broadcast Electronics see ad p 34
Micro-Trak see ad p 119
Stanton see ad p 43

CARTWRIGHT & BEAN
560 South Cooper
Memphis 38014
Line: audio products

CONSOLIDATED ELECTRONIC SYSTEMS
Knoxville
615-947-2881
Line: audio and video products
IVC see ad p 6,7

CREATIVE EXPRESS
1905 Broadway
Nashville 37203
615-327-1573
Line: audio products
Tascam see ad p 100

DELTRONICS
819 Woodland St.
Nashville 37206
615-262-3177
Line: video systems
Television Microtime see ad p 79

ELECTRA DISTRIBUTING CO.
1914 West End Ave.
Nashville 37203
615-329-3971
Line: audio components
Micro-Trak see ad p 119

GRAY COMMUNICATIONS
209 Bass Road

Chattanooga 37421
Line: video systems
Television Microtime see ad p 79

MOTION PICTURE LABORATORIES, INC.
781 South Main St.
Memphis 38102
Line: cameras and accessories
Cinema Products see ad p 27

STUDIO SUPPLY COMPANY
P.O. Box 280
Nashville 37203
615-327-3075
Line: audio components, equip.; recording accessories

TELEPHASE CORP.
Memphis
901-323-1171
Line: video products

WARREN RADIO CO.
190 S. Cooper St.
Memphis 38104
901-630-3600
Line: audio components, equip.
Micro-Trak see ad p 119

TEXAS

BOB AMOR & ASSOCIATES
916 Green Hill Rd.
Dallas 75232
214-371-3233
214-741-3674
Line: audio consoles, FM monitoring equip., audio equip.; transmitters
UREI see ad p 29

ARNOLD BARNES CO.
P.O. Box 9748

continued on page 118

GRANDSON

LOOK AT IT THIS WAY.

“Grandson”

will help make an impact on your listeners and your profits using proven multi-track production techniques. We guarantee you'll love GRANDSON'S new production results and unique versatility. Where else can you find an affordable, fully modular, professional recording / production console with 54 inputs—18 mixing positions—and on-air capability?

Ask us about GRANDSON today.



auditronics, inc.

P.O. Box 12637 / Memphis, Tenn. 38112 / 901/276-6338

The world leader in recording consoles at sensible prices.

Circle 207 on Reader Service Card

Austin 78766
512-454-4371
Line: audio and video products

ARNOLD BARNES CO.
7616 LBJ Freeway, Suite 501
Dallas 75240
214-233-5535
Line: audio and video products

ARNOLD BARNES CO.
3801 Kirby, Suite 834
Houston 77006
713-523-4333
Line: audio and video products

ARNOLD BARNES ASSOC., INC.
802 Lingco
Richardson 75080
214-235-4553
Line: audio, video, broadcast products
AKAI see ad p 14, 15

BESCO
8585 N. Stemmons Freeway
Dallas 75247
214-630-3600
Line: recording equipment
Broadcast Electronics see ad p 34

CAMPION SALES CO.
Addison Airport
P.O. Box 396
Addison 75001
214-239-9196
Line: audio components

CROUSE-KIMZEY COMPANY
2507 West Vickert—Box 9830
Fort Worth 76107
817-737-9911
Line: audio components
Stanton see ad p 43

D & J SALES COMPANY
2307 59 St.

Lubbock 79412
806-792-0001
Line: audio products, transmitters

R. A. DIMIER & ASSOC.
Stemmons Tower S. Suite 311
Dallas 75207
214-272-5055
Line: recording accessories

DOBBS-STANFORD OF TEXAS
110 W. 6th St.
Irving 75060
214-252-5502
Line: audio and video products
Crown see ad p 105

VICTOR DUNCAN INC.
2659 Fondren Ave.
Dallas 75206
Line: cameras & accessories
Cinema Products see ad p 27

EL-WILCO
P.O. Box 34466
Dallas 75234
214-242-5321
Line: sound systems

JOHN FITZGERALD
13844 Peyton Dr.
Dallas 75240
214-631-5470
Line: video equipment; char. generators

GEE-GIBSON ELECTRONIC ENTERPRISES
2002 E. Houston
Victoria 77901
512-578-4323
Line: audio, video products
Stanton see ad p 43

GRAVCO SALES INC.
Redbird Airport D
Dallas 75221

214-330-1245
Line: video processing equip.; switchers

GUARANTEE RADIO SUPPLY CORP.
1314 Iturbide St.
Laredo 78040
512-722-3233
Line: audio components
Micro-Trak see ad p 119
Broadcast Electronics see ad p 34

LEE SALES CO.
5635 Yale Blvd.
Dallas
214-363-3831
Line: audio products
Revox see ad p 45

CHARLES LUCAS SALES CO.
P.O. Box 24632
Dallas 75224
214-330-8181
Line: audio equipment
Stanton see ad p 43

MARKETING ASSOCS.
6909 Ashcroft
Houston 77036
713-772-9562
Line: audio products
Tascam see ad p 100

MARTIN ZIENKOSKY BROWNE & ASSOCS.
3801 Kirby
Houston 77006
713-523-4333
Line: full line video
CBS Labs see ads p 67, 104
Time & Frequency Technology see ad p 106

MARTIN ZIENKOSKY BROWNE & ASSOCS.
P.O. Box 9748

Austin
512-456-4371
Line: full line video equip.
CBS Labs see ads p 67, 104

NATIONAL BROADCAST EQUIP.
1401 S. Floyd Rd.
Richardson 75080
214-690-3131
Line: audio and video equipment
Stanton see ad p 43

PROFESSIONAL AUDIO SERVICES
P.O. Box 1953
Fort Worth 76101
817-536-6254
Line: audio components
Stanton see ad p 43
Aristocart see ad p 96

R & R ELECTRONIC SUPPLY
P.O. Box 1860
Lubbock 79408
806-765-5733
Line: audio components
Micro-Trak see ad p 119

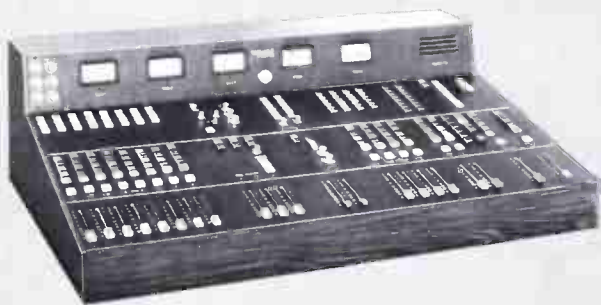
J. Y. SCHOONMAKER CO., INC.
P.O. Box 20840
Dallas 75220
214-357-8481
Line: tape recorders, audio equip.

STEWART, STEWART & ASSOC.
3415 Westminister Ave.
Dallas 75205
Line: audio products

STUDIO SOUND SERVICE
12810 Cott Road
Dallas 75230
214-661-5937
Line: audio components, equip.

E. T. SUDDUTH
2809 Raintree Drive

THE RIGHT MIXER



Now there's reason to celebrate!

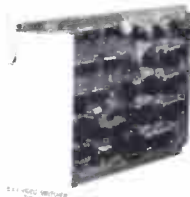
For as low as \$9995 you can have the ROBINS / FAIRCHILD Model 1632 Audio Mixing Console ... With such outstanding features as 16 input channels, which handle 64 sources / three submaster mixing channels / dual program output channels / plug-in I.C. op-amp circuitry and illuminated push button switching ... Plus many options to make the Model 1632 ideally suited to your specific needs.

FOR COMPLETE DETAILS CALL OR WRITE RICK BELMONT.

ROBINS & FAIRCHILD
A Robins Industries Corporation
75 Austin Boulevard, Commack, N.Y. 11725
(516) 543-5200

Circle 208 on Reader Service Card

switch a little!



TeleMation makes a little broadcast switcher — TVS/TAS-525 (video and audio) ideal for little switching jobs, like:

- Projection Area Film Chain Selection
- Announce Booth Video Monitor Input
- VTR Input/VTR output
- Preselect to Production or Van Switcher
- Transmitter and Line Test Outputs (or anything else you can think of)

Switchers are 5x1 building blocks; stack them for expanded input capability. Smooth vertical interval switching - 5 3/4" modular mounting.

How many little switching jobs do you have?



TeleMation, Inc.
the discovery people

P.O. Box 15068, Salt Lake City, Utah 84115—(801) 487-5399

Circle 209 on Reader Service Card

Carrollton 85006
214-242-2690
Line: full line video equip.
Astrionics see ad p 103
Datavision see ad p 93
Central Dynamics see ad p 51
Television Equip. Assoc. see ad p 115

TELEMATION TEXAS, INC.
(See mfg's field offices)

TERRELL SUPPLY CO., INC.
2848 Cullen St.
Fort Worth 76101
817-336-8731
Line: CCTV systems

TEXAS VIDEO SYSTEMS
P.O. Box 533
Richardson 75080
214-235-4945
Line: CCTV systems

THE THORSON CO.
4400 Sigma Drive
Dallas 75240
214-233-5744
Line: switching and patching equip.
Cooke see ad p 28

VIDEO COMPONENTS, INC.
2809 Raintree Dr.
Carrollton 75006
214-242-2690
Line: camera lenses, full line CCTV video equip., video camera accessories, video editors
Canon U.S.A. see ad p 114

VIDEO SYSTEMS
2000 A Governors Circle
Houston 77018
713-686-9651
Line: video systems
Television Microtime see ad p 79

VIDEO ELECTRONIC SYSTEMS INC.
3000 Carlisle St.
Dallas 75204
214-741-1440
Line: CCTV systems
Amtron see ad p 119

WHALIN'S PRO AUDIO SALES
2910 Buena Vista
Arlington 76010
Line: full line audio and recording equip.
Stanton see ad p 43

W. M. SALES
635 Woosley
Dallas
214-942-3460
Line: audio equipment
Otari see ad p 71

WYBORNY SALES CO.
P.O. Box 42080
Houston 77042
918-775-9242
Line: audio components, equip.
Fairchild Sound see ad p 118

UTAH

BROADCAST SERVICE INC.
145 Social Hall Ave.
Salt Lake City 84111
801-524-2500
Line: audio & video products
CBS Labs see ads p 67, 104
L. J. Scully see ad p 94

INDUSTRIAL ELECTRONICS
Salt Lake City
801-466-1611
Line: broadcast, CATV equipment
Silco Ant. see CM/E p 6

INTERMOUNTAIN VIDEO SYSTEMS
Salt Lake City
801-486-8417
Line: video products

PARTRIDGE ELECTRONICS SALES
P.O. Box 21205
Salt Lake City
801-486-8417
Line: audio products
Revox see ad p 45

STOCKDALE & CO., INC.
200 East First So.
Salt Lake City 84111
Line: cameras and accessories
Cinema Products see ad p 27

TELEMATION SALES INC.
(See mfg's field offices)
Viscount Industries see ad p 121

VERMONT

GNS TELESYSTEMS CORP.
Shelbourne
802-985-2922
Line: video products

VIRGINIA

AVEC ELECTRONICS CORP.
2009 Williamson Rd.
Roanoke 24012
703-344-6288
Line: video systems
Television Microtime see ad p 79

AVEC ELECTRONICS CORP.
2002 Staples Mill Rd.
Richmond 23230
804-359-6071
Line: audio & video products

Television Microtime see ad p 79

BALATON MARKETING INC.
2438 Southgate Sq.
Reston
703-620-3586
Line: audio & video products
Revox see ad p 45

DAVID GREEN BROADCAST CONSULT.
21 N. Wirt St.
Leesburg 22075
703-777-8660
Line: broadcast products
Control Design see ad p 18

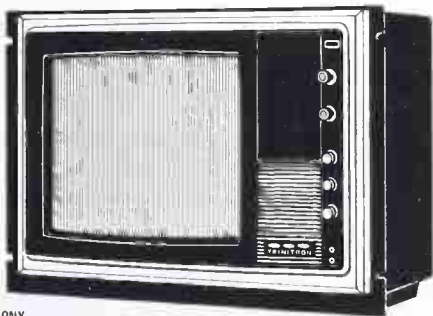
LEE HARTMAN & SONS
P.O. Box 659z
3236 Cove Rd. N.W.
Roanoke 24004
703-366-3493
Line: audio components
Micro-Trak see ad p 119
CBS Labs see ads p 67, 104

MARKTRON INC.
510 Berwick Court
Charlottesville, 22907
703-973-5874
Line: electronic components
ITT Jennings see ad p 29

MIDWEST TELECOMMUNICATIONS
1514 Springmeadow Blvd.
Norfolk 23518
804-855-1056
Line: audio & video products
AKAI see ad p 14-15

PROGRAMMED MATERIALS, INC.
Box 360, RFD #7
Roanoke 24018
703-774-1974
Line: audio equip., transmitters
continued on page 120

How about a 12-inch, solid-state, color monitor with a Trinitron* color system, pulse-cross scan delay with automatic brightness, switchable internal/external sync, fully-isolated power supply which fits in only 12¼-inches of standard rack space ... for under \$700!



*TM SONY

Amtron has smaller and larger sizes, too. 9-inch, 12-inch, 15-inch, 17-inch and 19-inch—in portable, rack-mount and yoke-mount versions. Write or phone for complete catalog.

AMTRON

P.O. Box 21043, San Jose, Ca. 95151 (408) 238-2522

Circle 210 on Reader Service Card

CAN YOU FIND--

YOU

OURS **THEIR'S**

THE HAPPY ENGINEER



STONE ARMS
PRE-AMPS



TURNTABLES
STUDIO FURNITURE



CLOCK SYSTEMS
TAPE CART RACKS

WE CAN MAKE YOU HAPPY
MICRO-TRAK
620 RACE STREET
HOLYOKE, MASS. 01040
413-536-3551



Circle 211 on Reader Service Card

WASHINGTON

AERO MARC COMPANY
Seattle
206-722-7400
Line: audio & video products

ANIXTER-PRUZAN
1963 First Ave. So.
Seattle 98134
Line: Sony studio video equip., full line of CATV equip., cable construction accessories, tools head end, passives, test equip., power supplies
Sitco Ant. see ad p CM/E 6
Sony see ad p 9

AUDIO CRAFT INC.
208 S. Mead St.
Seattle 98108
Line: audio products

BAILIE VIDEO WORLD
170 Denny Way
Seattle 98109
206-682-3770
Line: audio products
AKAI see ad p 14-15

BENNETT ENGINEERING CO.
Box 23
Mercer Island 98040
206-232-3550
Line: audio and video products
CBS Labs see ads p 67, 104
Moseley see ad p 91
Time & Frequency Tech. see ad p 106
Microwave Associates see ad p 17

BROADCAST SUPPLY CO.,
2607 Bridgeport Way W.
Tacoma 98466
206-565-2301
Line: broadcast products
Micro-Trak see ad p 119

Aristocart see ad p 96

DAVE CHAMPLIN
12347 Lake City Way
Seattle
206-233-3300
Line: audio products
Revox see ad p 45

CUSTOM VIDEO SYSTEMS
8742 Greenwood
Seattle 98103
206-752-2080
Line: video equipment
Amtron see ad p 119
Viscount Industries see ad p 121
Television microtime see ad p 79

DATAKOM ASSOCIATES
111 Tower Place
Seattle 98109
208-285-2525
Line: recorders, audio consoles, FM monitors

RUSH S. DRAKE ASSOCS.
6133 Maynard Ave.
Seattle 98108
206-763-2755
Line: switching and patching equipment
Cooke see ad p 28

FLEEHART & SULLIVAN INC.
10109 Aurora Ave. N.
Seattle 98133
206-522-1533
Line: audio components

GLAZER's CAMERA SUPPLY
1923 Third Ave.
Seattle 98101
Line: cameras and accessories
Cinema Products see ad p 27

HENRY HONCAS CO.
P.O. Box 7260

Seattle 98133
206-364-8609
Line: audio products
Stanton see ad p 43

WM. LAMPHEAR CO.
4031 Stoneway N.
Seattle 98103
206-633-4900
Line: audio products
Crown see ad p 105

JOHN MCCLAMROCK CO.
127 Southwest 156 St.
Seattle 98166
206-244-9391
Line: audio components, transmitters
Wilkinson see ad p 30

RON MERRIT CO.
1320 Prospect Ave.
Seattle 98109
Line: audio products

NORTH STAR
2150 N. 107th St.
Seattle 98133
Line: video products
Viscount Industries see ad p 121

NORTHWEST ELECTRONICS
East 730 First Ave.
Spokane 99220
Line: Video Products
Viscount Industries see ad p 121

JOHN NUTTING
Seattle
206-775-2707
Line: video products & accessories
Television Equip. Associates see ad p 115

PHOTOTRONICS
223 W. Lake St.
Seattle 98109

Line: electronic & photo products
Cinema Products see ad p 27

SOUND RECORDING CO.
503 W. Indiana
Spokane 99210
Line: audio products

VIDEO COMPONENTS, INC.
815 W. Ewing St.
Seattle 98119
206-284-8020
Line: camera lenses, full line CCTV video equip., video camera accessories, video editors
Canon U.S.A. see ad p 114

WASHINGTON SCHOOL SUPPLY
Seattle
206-682-5695
Line: audio visual equipment

W. J. WOLFENBARGER
2217 42nd Ave. S.W.
Seattle 98116
206-932-7747
Line: audio products
Stanton see ad p 43

W. K. WOOD
251 SW 153rd St.
Seattle 98166
206-246-5111
Line: audio products
Tascam see ad p 100

WEST VIRGINIA

ELECTRONIC SECURITY CO.
Charlestown
304-343-5656
Line: video products

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NEW from World Video:

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Designed for the Professional/CCTV user, the RK6700 is a high quality, solid state display monitor. Its innovative mechanical design and many broadcast features make the RK6700 the most desirable all-purpose color monitor available.

16 other World Video color monitors for broadcast and CCTV applications are available from 5" to 19".



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- Playbacks
- Stereo
- Mono



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(408) 736-8737 (ZIP) 94086

Circle 213 on Reader Service Card

Princeton 24740
304-425-4665
Line: transmitters
Wilkinson see ad p 30

MIDWEST TELECOMMUNICATIONS
300 First Ave.
Nitro 25143
304-722-2921
Line: audio & video products
AKAI see ad p 1415

PREISER SCIENTIFIC
P.O. Box 551
900 MacCorkle Ave., S.W.
Charleston 25322
304-343-5515
Line: CCTV systems

WISCONSIN

AVIONIX DIVISION
AV ELECTRONICS INC.
P.O. Box 505
21675 Dorat Rd.
Brookfield 53005
Line: video systems
Television Microtime see ad p 79

CAMERA CORNER, INC.
Green Bay
414-494-1151
Green Bay
Line: video products

CONCORD COMMUNICATION SYSTEMS
11901 W. Dearborn Ave.
Milwaukee 53226
414-778-0210
Line: audio & video products
AKAI see ad p 14-14

MILWAUKEE VIDEO
Milwaukee

414-224-0660
Line: video products

SATTERFIELD ELECTRONICS
1900 South Park St.
Madison 53701
608-257-4801
Line: audio and video processors
CBS Labs see ads p 67,104

TELEMATION MIDWEST, INC.
(See mfg's field offices)
Hitachi Shibaden see ad p 10-11

CANADA

ADVANCE INDUSTRIAL ELECTRONICS
538 Berry St.
Winnipeg, Manitoba
204-772-0386
Line: video systems
Television Microtime see ad p 79

APPLIED ELECTRONICS
399 Evans Ave
Toronto 18
416-252-3761
Line: audio & video products

ATLANTIC VIDEO CENTRE
151 Mountain Rd.
Moncton, N.B.
506-854-1108
Line: video systems
Television Microtime see ad p 79

AUDIO SCIENCES LTD.
2110 West 125th Ave.
Vancouver 9, B.C.
Line: recording accessories

BIO-ELECTRONICS
P.O. Box 52
Don Mills, Ont

416-752-3371
Line: audio components
Micro-Trak see ad p 119

BROADCAST ENGINEERED SYSTEMS
1466 Kalligan Court
Mississauga, Ont.
416-277-0277
Line: audio equip.

CALDWELLA/V EQUIPMENT CO.
1080 Bellamy Rd. North
Scarborough, Ont.
416-291-5595
Line: audio equipment, audio tape, transmitters
CBS Labs see ads p 67,104
Micro-Trak see ad p 119

CENTURY 21 AUDIO
654 King Edward St.
Winnipeg, Man. R 3H OP2
204-775-8231
Line: audio components, equip

ALEX L. CLARK LTD.
3751 Bloor St. W.
Islington M9A-1A2
Line: electronic & photo products
Cinema Products see ad p 27

CONWAY ELECTRONIC ENTERPRISES LTD.
8890 Arrow Rd.
Weston, Ontario
416-742-6631
Line: Intercoms, headsets, microphones, audio generators, flutter meters, phase meters, audio components

COMMERCIAL ELECTRONICS LTD.
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Vancouver 1, B.C.
604-685-0301
Line: audio components, equip.

DELBEE ASSOCIATES LTD.
1555 Pitfield Blvd.
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514-334-5763
Line: audio consoles equip.

ELECTRO-TEC MARKETERS, LTD.
1624 West Third St.
Vancouver, B.C.
604-736-6377
Line: audio consoles, equip.

EV OF CANADA LTD.
395 Herbert St.
Gananoque
613-382-2141
Line: broadcast products
McMartin see ad p 92,113,124

T. WILF FARROW ASSOC.
P.O. Box 181
Islington, Ont.
Line: audio products

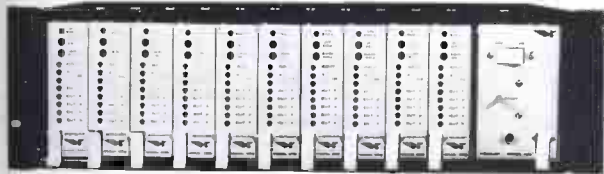
GLENTRONICS LTD.
160 Duncan Mills Rd
Don Mills Ont.
416-444-8497
Line: video products
CBS Labs see ad p 67,104
Astronics see ad p 103
Conrac see ad p 35-36
TFT see ad p 106

E. S. GOULD SALES CO., LTD.
9429 Cote de Liesse
Montreal 760, PQ
514-636-0220
Line: sound systems

J-MAR ELECTRONICS, LTD.
6 Banigan Dr.
Toronto, 17, Ont.
416-421-9080

continued on page 122

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- *TEN BROADCAST QUALITY D.A. PER SHELF
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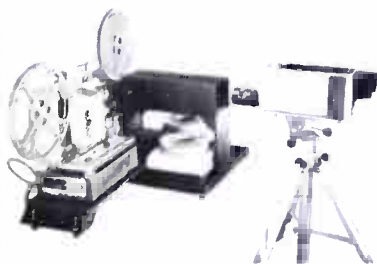
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Phone (209) 251-4213

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Without
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Use standard TV zoom lens
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BUHL OPTICAL COMPANY

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Pgh., Pa. 15233
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Circle 217 on Reader Service Card

Line: audio equip.
Broadcast Electronics see ad p 34

M. S. C. ELECTRONICS LTD.
254 Wildcat Rd.
Downsview Ont. M3J-2N5
416-661-4180
Line: transmitting and studio equip.;
for AM, FM, TV audio, radio, video test
equipment.

NORTEC WEST, LTD.
315 West 5th Ave.
Vancouver 10, B.C.
604-872-8525
Line: audio equip
Broadcast Electronics see ad p 34
Conrac see ad p 35-36

PINEWAY ELECTRONICS LTD.
1875 Leslie Street Unit 3
Don Mill's Ont.
416-449-1343
Line: audio components, equip.
Broadcast Electronics see ad p 34

QUEALE ELECTRONICS
1205 Quadra St.
Victoria, British Columbia
604-873-3996
Line: video systems
Television Microtime see ad p 79

A. C. SIMMONDS & SONS, LTD.
285 Yorkland Blvd.
Willowdale, Ont. M2J 1S8
416-491-1010
Line: audio components

TELE-RADIO SYSTEMS
301 Supertest
Toronto, Ont.
416-661-3221
Line: time stds.

TELE-TECH ELECTRONICS LTD.
15 McCulloch Ave.
Rexdale, Ont.
416-248-5647
Line: recording accessories; audio
Broadcast Electronics see ad p 34
Wilkinson see ad p 30

TRACAN ELECTRONICS CORP.
4996 Place de la Savane
Montreal PQH4P-1Z8
514-341-4163
Line: video products
Cohu see ad p 41

TURNELLE ASSOCIATES LTD.
17-2 Grenfell Crescent
Ottawa, Ontario, Canada
613-825-4511
Line: video systems
Television Microtime see ad p 79

**UNIVERSAL BROADCAST CON-
SULTANTS**
4374 Blvd. St. Laurent
Montreal, PQ
Line: audio equipment

L. A. VARAH LTD.
2077 Alberta St.
Vancouver, B.C.
604-873-3211
Line: audio equipment
Aristocart see ad p 96

PUERTO RICO

JOSEPH BAHR
P.O. Box 335
Fredericksted St. Croix 00840
Line: Broadcast equipment
Control Design see ad p 18

ELECTRONICA FERNANDEZ
208 Eleanor Roosevelt St.
Hato Rey 00919
809-767-3500
Line: audio components & equip.
Broadcast Electronics see ad p 34

GERMAN ORTIZ, INC.
Darlington Bldg.
Rio Piedras 00925
809-766-4672
Line: CCTV systems

PHILLIPS ELECTRONICS INC.
Center Commercial Villa Mavanex
Rio Piedras 00927
809-265-4021
Line: audio & video products
CBS Labs see add p 67,104

PEDRO SANCHEZ
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Summit, San Juan
Line: audio products

SAN JUAN ELECTRONICS
San Juan
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Line: audio & video products



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Circle 218 on Reader Service Card

BM/E CLASSIFIED MARKETPLACE

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DISPLAY CLASSIFIED ADVERTISING: \$32.50 per inch 1x; \$30.00 per inch 6x; \$27.50 per inch 12x. ALL OTHER CLASSIFIED ADVERTISING 35¢ per word; minimum \$3.50. BLIND BOX NUMBER: \$1.00 extra charge. Replies sent to address below will be forwarded to you. PAYABLE IN ADVANCE; send check with order. CLOSING DATE: 5th of 2nd month preceding issue date.

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Leading cable television MSO is presently interviewing for the following Headquarters positions:

SYSTEM DESIGN MANAGER — Minimum 5 years experience in system design with supervisory experience. Will supervise drafting section of Engineering Department.

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VIDEO TECHNICIAN — responsible for installation and maintenance of color studio and remote truck. Experienced in maintenance of broadcast color equipment and helical VTR's. New England, West, Mid-West locations.

Submit written reply with salary history to Corporate Personnel Dept.,

LVO Cable, Inc.,

P.O. Box 2848, Tulsa, Oklahoma 74101

REGIONAL SALESMANAGER BROADCAST EQUIPMENT

We are expanding our sales offices and need TV equipment salesmen for the Eastcoast and Midwest offices

Applicants must have an operational and technical understanding of Production switching techniques.

We will give thorough training.

Salary plus commission

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Sarkes Tarzian, Inc.
Broadcast Equipment Div.
Bloomington, In. 47401

ENGINEER immediately available at upper midwest university. Install, maintain and operate broadcast and audio circuit equipment. Award-winning, full color operation. FCC 1st class license or E.E. degree. Salary dependent on qualifications and experience. Equal Opportunity employer. Box 974-2, c/o BME, Blue Ridge Summit, PA. 17214.

engineering positions are available in rapidly expanding media production department of educational society. Chief Engineer—to design, implement and maintain a professional broadcast video and audio system. Prefer degree in engineering. Requires extensive experience and FCC 1st Class license. Assistant Engineer—to coordinate with chief engineer in technical and design matters. Prefer degree in engineering. Requires at least 2 years electronics experience and FCC 1st Class license. Submit resume and salary requirements to Box 974-3 c/o BME, Blue Ridge Summit, Pa. 17214. (Please specify position sought.)

POSITION WANTED

POSITION WANTED. CATV field or regional engineer. 25 years experience all phases CATV, electronics inclusive. Two-way experience, first-class FCC license. Prefer Large MSO. Box 974-1, c/o BME, Blue Ridge Summit, PA. 17214.

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The Town of Newburgh, Orange County, New York, invites proposals for the construction and operation of a CATV system to serve that part of the town west of Interstate Highway 87. Copies of "Request For Proposals" are available at the address below. Proposals to be submitted no later than November 12, 1974. All proposals received will be available for public inspection at the address below. Town Clerk, Town of Newburgh, 20-26 Union Avenue, Extension, Newburgh, New York 12550. Telephone: (914) 564-4554

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BROADCAST AND RECORDING EQUIPMENT: Scully, V.I.F. International, Metrotech, Langevin, Electrodyne, Q.R.K., Micro Trai, MRL, Nortronic, McMartin, U.R.E.I., E.V., A.K.G., Stevenson, Gately, D.B.N., Advent, Altec, Fairchild, Audio Designs, 3M, Magnecord, Telex, Inovonics, Nagra, Uher, Tape-Athon, Package Deals, Installations, Service, Request Flyer. Weigand Audio, Middleburg, PA. 17842. (717) 837-1444.

Solid-state audio modules-console kits, power amplifier kits, power supplies, Octal plug-ins—mic. eq. line, disc, tape play, tape record, amplifiers. Audio & tape bias oscillators. Over 50 audio products. Send for free catalog and applications. Olymp Labs, Inc., 1033 N. Sycamore Los Angeles, Calif. 90036. (213) 934-3566.

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MICA AND VACUUM transmitting capacitors. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 1147 Venice Blvd., Los Angeles, Cal. 90015 (213) 382-6985.

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Phone: 503/246-8080

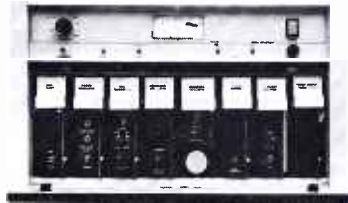
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 Omaha, Nebraska 68127
 (402) 331-2000

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ADVERTISERS' INDEX

AKAI America, Ltd.	14, 15
AKG Div. North American Philips Corp.	61
American Data Corp.	49
American Legacy	102
Amperex Electronic Corp.	13
Ampro Corp.	86
Amtron	119, CM/E-4
Aristocart	96
Astrionics Div. Technicolor	103
Auditronics, Inc.	117
Automated Processes, Inc.	63
Belar Electronics Laboratory, Inc.	59
Biomation	69
Boston Insulated Wire & Cable Co.	89
Broadcast Electronics, Inc.	34
Buhl Optical Co.	122
Burwen Laboratories	109
CBS Laboratories, a Div. of CBS Broadcast Systems, Inc.	67, 104
Canon, U.S.A. Inc.	114
Capitol Magnetic Products	65
Central Dynamics, Ltd.	51
Charles Machine Works Inc.	25
Chiron Telesystems, Inc.	92
Cinema Products Corp.	27
Cohu Electronics Inc.	41
Collins Radio Co.	47
Conrac Corp.	35, 36
Control Design Corp.	18
Cooke Engineering Co.	28
Cosmicar Optical Co. Ltd.	98
Crown International	105
Datavision, Inc.	97
Delta Electronics, Inc.	31
Dracon Industries	113
Dynair Electronics, Inc.	3
Dynasciences Video Products	33
Editel Communications, Ltd.	Cover IV
EECO	12
Eimac Varian	Cover III
Electrohome, Ltd.	95
Elpa Marketing Industries, Inc.	105
Farinon Electric	75
Fidelpac Div. of Telepro Industries, Inc.	102
Fort Worth Tower Co., Inc.	122
GBC Closed Circuit TV Corp.	81
Garner Electronics, Inc.	107
Garron Electronics, Inc.	120
Gates Broadcast Equip. Div. Harris Corp.	104
General Cable Corp.	CM/E-8
Grass Valley Group, Inc.	5
Heller Oak Cable Finance Corp.	CM/E-6
Hitachi Shibaden Corp. of America	10, 11
ITT Jennings	29
International Tapetronics Corp.	16, 110
International Video Corp.	6, 7
LPB, Inc.	111
Listec Television Equipment Corp.	21
McMartin Industries, Inc.	92, 113, 124
Marco Video Systems, Inc.	116

Myers Oak Communications Construction Group.	CM/E
Micro Trak Corp.	1
Microwave Associates, Inc.	
Modular Audio Products, Inc.	
Moseley Associates, Inc.	
National Assn. FM Broadcasters	1
Neve, Inc. Rupert	1
Otari Corp.	
Pacific Recorders & Engrg. Corp.	88, 1
Philips Broadcast Equipment Corp.	CM/E
Potomac Instruments	1
QRK	1
RCA Broadcast Systems	34, 1
RCA Service Co.	1
Rank Precision Industries, Inc.	
Recortec, Inc.	1
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Robins Fairchild	1
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Schafer Electronics Corp.	1
Scully Corp. L. J.	
Scully Metrotech Div. Dictaphone	
Shure Bros. Inc.	
Sitco Antennas	CM/E
Sola Basic Industries, Dielectric Communications	
Sony Corp. of America	
Standard Electric Time Corp.	
Stanton Magnetics	
Tab Books	
Tascam Corp.	11
Tech Laboratories, Inc.	12
Tektronix, Inc.	Cover
Telemation, Inc.	83, 1
Telemet, A Geotol Company	
Television Equipment Associates, Inc.	1
Television Microtime, Inc.	
Time & Frequency Technology, Inc.	11
Urei	
Videomax Corp.	22,
Viscount Industries, Ltd.	13
Wilkinson Electronics, Inc.	1
World Video	1

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 274 Madison Avenue
 New York, New York 10016

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 274 Madison Avenue
 New York, New York 10016
 212-685-5320
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WESTERN STATES
 1111 Hearst Building
 San Francisco, California 94130
 415-362-8547
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1940

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1943

EIMAC provides quantity production of the secret Zahl tube (VT-158), the "radar tube that changed the war."

1942-1945

EIMAC leads the world in mass production of VHF pulsed power tubes for military radar: over 125,000 tubes per month!

1946

EIMAC introduces the 4-250A family of tetrodes for HF and VHF operation.

1948

EIMAC introduces the external anode 4X150A tetrode for HF and VHF service, followed by the 4X150G coaxial-based version for ECM service.

1955

EIMAC produces the first ceramic-metal tetrode, the 4CX5000A, for broadcast and FM service.

1957

EIMAC introduces the 4CX1000A high gain, external anode tetrode for single side-band HF linear amplifier service.

1961

EIMAC produces the 3-400Z and 3-1000Z high-mu triodes for cathode driven linear amplifier service.

1962

EIMAC introduces the first high power family of 35-100 kW tetrodes for broadcast service.

1966

EIMAC develops the 4CX1500B focused tetrode for high linearity service.

1970

EIMAC produces the 8877 external anode VHF triode for cathode driven service.

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1974

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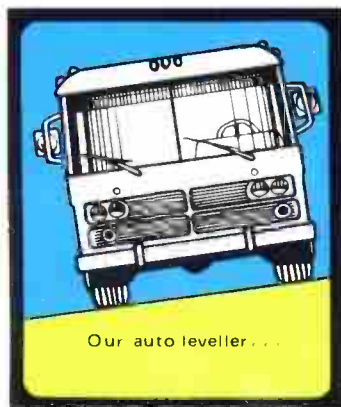


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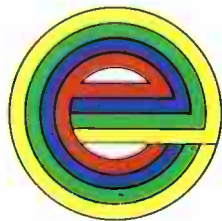
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