BROADCAST engineering®

September, 1979/$10.00

1979 BUYERS' GUIDE ISSUE

The broadcast industry's comprehensive product directory

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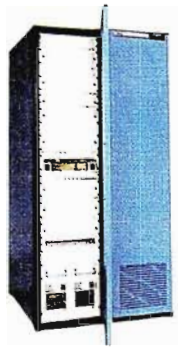
Wherever reliability, transparency, power and size conservation are of critical importance, NEC's Television Routing Switcher takes first place honors. The TKA-105 is capable of behind the scene operation in any 60X60 matrix or larger application, from fixed station to Olympic coverage.

All audio signals are digitized in the TKA-105, with provisions for up to 4 discrete audio channels for each video input. Major design advancements include 8X1 crosspoint chips,

1980 Olympics



1X6 video distribution amplifier chips, and full microprocessor logic in every controller. Optional NTC-7 VITS signals may be added asynchronously to each input for automatic signal verification. Controllers are available in a variety of styles including touch-pad with the ability to select any of the four audio channels and perform A/B comparisons.

The TKA-105 Switcher offers performance specifications far superior to the equipment signals it routes, and is capable of outside data interface, permitting computer, mini-computer, or microcomputer switching commands plus switch station feedback loops. Whatever events you want to cover you can "make the scene" thanks to LSI technology, from NEC, the worlds' leading manufacturer of semi-conductors.

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NEC

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NEC America, Inc.
Broadcast Equipment Division
130 Martin Lane
Elk Grove Village, Illinois 60007
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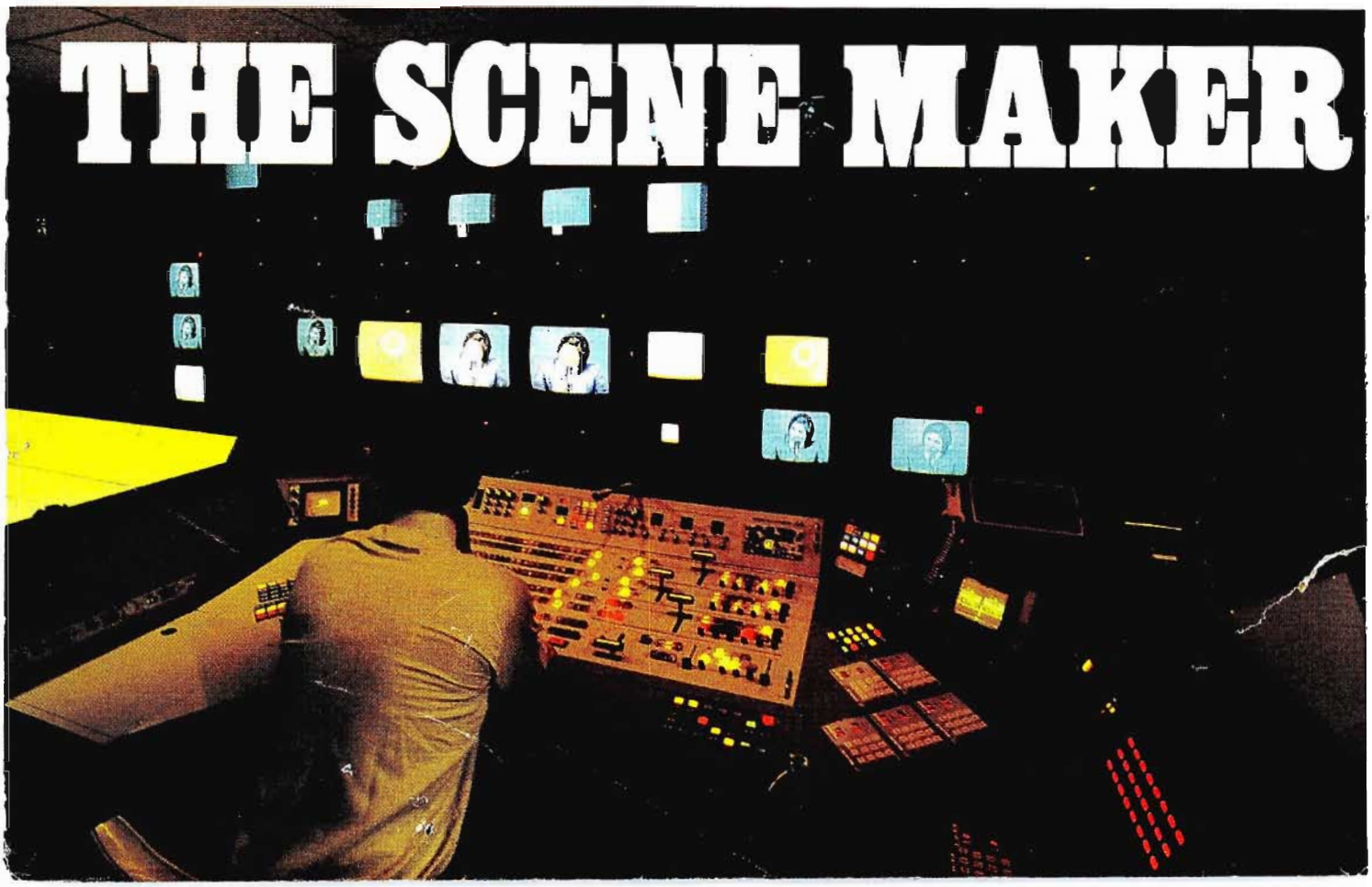
NBC will be using the TKA-105 in their coverage of the Moscow Olympic Games in 1980.

THE SCENE MAKER



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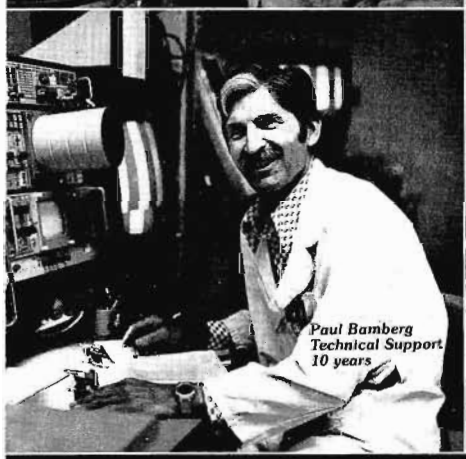

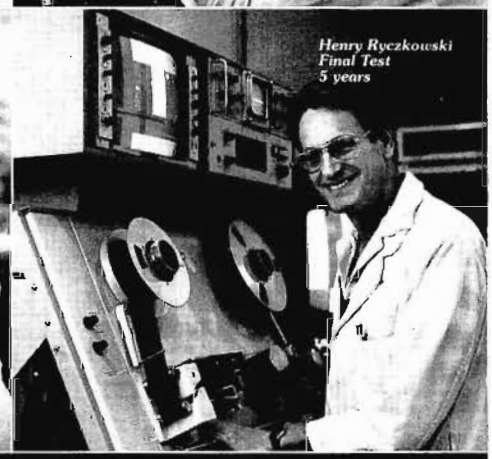

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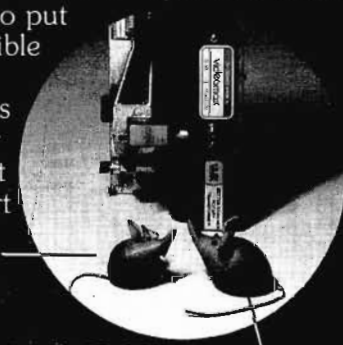

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BROADCAST engineering

The journal of broadcast technology

September, 1979 ☐ Volume 21 ☐ No. 9

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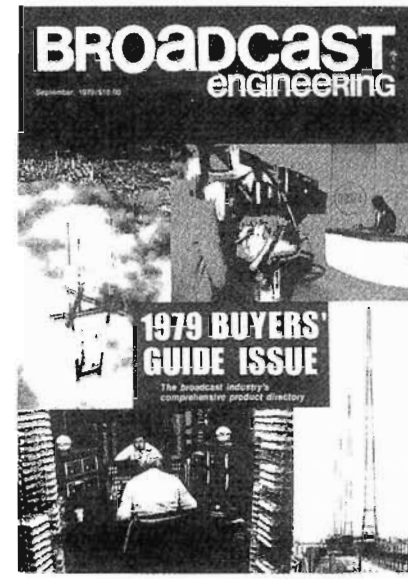

THE COVER

The 1979 **Broadcast Engineering** Buyers' Guide cover reflects the two major markets for manufacturers of broadcast equipment: television and radio.

Counter-clockwise from upper right, the cover depicts

- a simulated TV news studio as demonstrated at NAB'79 in Dallas (*Photograph by Christopher Cave, One to One Photography, Dallas, TX*);
- the Mt. Sutro transmitting tower which dominates the San Francisco skyline (*Photograph by Don Lincoln, KPIX, San Francisco, CA*);
- the WABC/Radio studios in New York (*Photograph by Robert Deitsch, WABC/Radio, New York, NY*); and
- a directional antenna array for radio (*Photograph by Harris Corporation, Quincy, IL*).

NEXT MONTH

- Preview of SMPTE and AES meetings
- TV automation: Case study of KOMO
- Audio processing: Keeping the sound clear and punchy
- Audio processing: Technology trends

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Best In The Field

HITACHI SK-90

Outside the studio, the remarkable Hitachi SK-90 does it all. For EFP, it sports a studio style 5″ viewfinder. All key functions can be controlled with your choice of Remote Operating Unit (ROU) or Digital Command Unit (DCU). For ENG, slip off the SK-90's studio viewfinder, slip on the 1.5″ viewfinder and shoulder mount. Your SK-90 is now a compact, lightweight self-contained portable!

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Hitachi SK-90: portable ENG mode

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- Seattle (206) 575-1680

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Digital Command Unit (with coax/triax option)

Remote Operating Unit (features RGB out)

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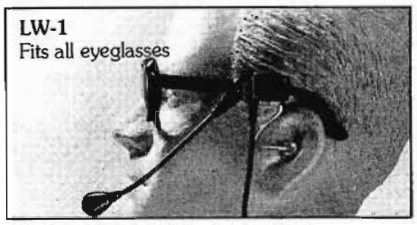
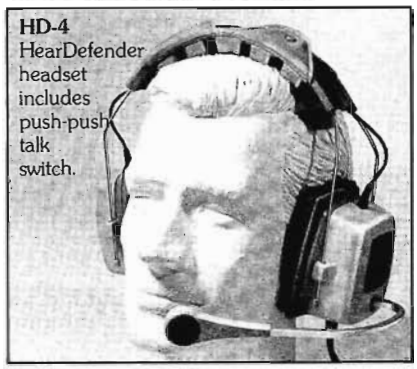
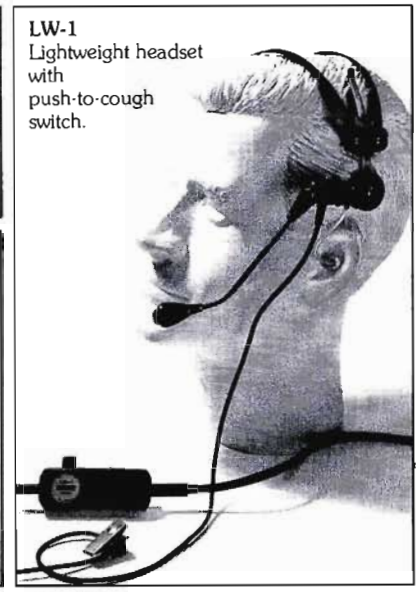
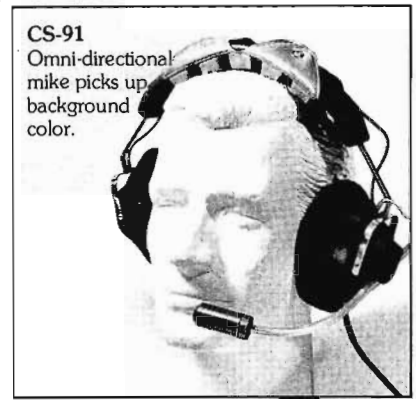

LW-1
Fits all eyeglasses


HD-4
HearDefender headset includes push-push talk switch.


LW-1
Lightweight headset with push-to-cough switch.

Play by play, Color or Interview... Sportscaster Headsets cover them all.


CS-91
Omni-directional mike picks up background color.

Sportscaster Headset CS-91

Perfect for booth, track or field or whenever you want background color and the excitement of a crowd added to the clear sound of an announcer's voice. Omni-directional dynamic mike. Binaural headphones receive cues and monitor program while screening out ambient noise. Equipped with "push-to-cough" switch.

Sportscaster HearDefender™ HD-4

For interviews in a speedway pit or play-by-play on the sideline, the announcer's voice cuts through the din with this noise cancelling electret mike. High noise attenuating monaural receivers deliver clear cues, monitor the program and eliminate the tendency to shout over the noise. His voice sounds crisp, clear and natural. Equipped with push-push talk switch.

Sportscaster Headset LW-1

In an open broadcast booth or in the hush on a tennis court, the announcer's natural voice is transmitted crystal clear with a close-talking, noise cancelling electret mike. Unobtrusive even on camera, this super lightweight single side receiver headset is worn with headband or clips to eyeglass bows. Unmatched for comfort and equipped with push-to-cough switch.

In the booth or in the crowd, on track, field or court, Telex Sportscaster headsets cover it all. Write for free information.

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BROADCAST ENGINEERING (USPS 338-130) is published monthly by Intertec Publishing Corporation, 9221 Quivira Road, P.O. Box 12901, Overland Park, KS 66212. Postmaster, return from 3579 to the above address.

BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other station management personnel at commercial and educational radio and TV stations, teleproduction studios, recording studios, CATV and CCTV facilities, and government agencies. Qualified persons also include consulting engineers and dealer/distributors of broadcast equipment.

SUBSCRIPTIONS: **BROADCAST ENGINEERING** is mailed free to qualified persons in occupations described above. Non-qualified persons may subscribe at the following rates: U.S., one year, $20; all other countries, one year, $26. Back issue rates, $3, except for the September Buyers' Guide issue, which is $10. Rates include postage. Adjustments necessitated by subscription termination at single copy rate. Allow 6-8 weeks for new subscriptions or for change of address. Controlled circulation postage paid at Kansas City, MO.

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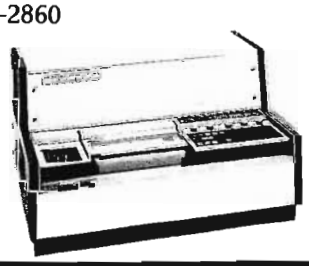
SUNNYVALE, CA 94086
PHONE (408) 735-8821

HBU-4400

You don't need a "gorilla" to carry the portable HBU-4400. It weighs only 22 lbs. without the battery and provides 10 full minutes of recording time per cassette. Cassettes are preferred for portable applications because you don't have to monkey around with reel-to-reel tape. High band "quad" quality is achieved by tripling the head-to-tape speed of the U-format recorder and adding Recortec electronics to a transport with proven interchangeability. For reliability reasons the capstan and scanner speed increase is achieved without any change in motor rpm and, of course, all bearings are still well within their design limits.

And when you need a studio machine for playback and editing there is the HBU-2860 that will faithfully reproduce your high quality HBU tapes. We kept the 2860 remote control interface unchanged so it can work with your computerized editing system.

HBU-2860



The HBU format is economical to own and economical to use. The HBU costs less than a third of machines of other formats with the same video quality. Tape costs are lower too. CONCLUSION: Buy the HBU and donate your "gorilla" to the zoo.

Other products from Recortec are: Video Tape Conditioners and Video Tape Evaluators for all tape widths, Video Cassette Evaluators, Video Tape Timers and Reel Servo Modifications (R-MODs) for quad recorders and Video Tape Addressors which record time code on two-inch tape at high speed.

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Perhaps we should begin by telling you that the Arvin-Echo Slo/Mo-1 is one of the best investments you can make.

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Regardless of your activities—Sports, News, or Commercials—Slo/Mo-1 can make a big difference.

A difference like Animation! Imagine being able to incorporate Animation from any source into your productions!

If that's not enough, let's add the fact that Slo/Mo-1 uses our unique Discassette® rather than a hard disc or 1" tape. Because it is a disc, it operates equally well in either forward or reverse. And that means even the most difficult editing job can be greatly simplified!

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We set out to design the best Slo/Mo possible. And we built in the features that will make your productions stand out from the competition!

Features like *Field/Frame Select, Time Lapse Recording, Digital Comb Filter, High Band Color.* And configured to be so *small, rugged,* and *portable* that two men can easily *transport* it to almost any location. Plus Slo/Mo-1

Don't get wrapped up with 1."

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Address letters to go in this column to Feedback Editor, P.O. Box 12901, Overland Park, KS 66212.

AM stereo: Which system?

I hope you have information on the situation of AM stereo broadcasting. KEZY Radio, licensee of KEZY/AM, would like to go to the stereo mode of transmission the day it is approved. To do so, we need advanced knowledge on the subject of which system or combination of systems the FCC is favoring, based on performance and technical compatibility with existing receivers.

I would really appreciate obtaining any papers or other literature at your immediate disposal.

Mark R. Moceri
KEZY Radio
Anaheim, CA

Editor's note: Mark, the whole industry would like to know which way the FCC will rule. We will just have to wait and see. There are five systems being considered, and any one might get the FCC nod.

From Ontario

I was interested in the article in the February 1979 issue of **Broadcast Engineering** dealing with "FM antenna and line measurements."

The techniques and equipment setups described also have been successfully used in cable television. We have used the techniques on FM broadcast antennas as well. Recently we purchased a new HP 8568A spectrum analyzer system with controlling computer, digital plotter and printer and have found that it facilitates the measurements described. The excellent calibration and stability of modern electronic instruments remove the needs for the comparator setups described.

I. Switzer
Switzer Engineering Services
Mississauga, Ontario

"Doc" Herrold's station

The radio pioneer section in your May issue was of great interest.

You show the picture of Dr. Charles D. Herrold's pioneer station located on the roof of State Bank Building in San Jose. I turned that picture over to CBS along with the complete history of KQW-San Jose that was established by Dr. Herrold.

I pioneered KFWM in Oakland, CA, going on the air in February 1925, and in 1926 Dr. Herrold went to work for us at KFWM, having sold KQW at San Jose.

I organized, in 1927, the first network of stations to carry a coast-to-coast program from the West Coast. There were 300 stations carrying it in the United States, nine in Canada and four international shortwave.

Dr. Herrold successfully completed a microwave in

Well, Alex...

If Alexander Graham Bell had to choose between his own great invention and Moseley's new Telemetry Return Link, he might have a tough time. Bell, like many great inventors, was always open to new ideas. Moseley's reputation is built on new ideas and the TRL-1 is the most recent example.

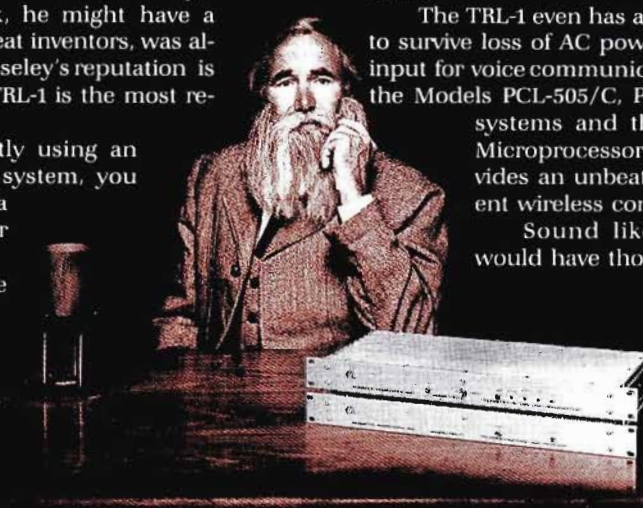
Even if you are currently using an STL with a remote control system, you may still depend on either a phone line or your transmitter carrier for return telemetry.

Moseley's alternative, the Model TRL-1, allows you to transmit telemetry data back to your control point on the 450 MHZ band Remote Pick-up Link frequencies. No more dependence on phone lines and no more worries if your broadcast carrier goes down.

The TRL-1 even has an optional battery pack to survive loss of AC power and a separate MIC input for voice communication. Installation with the Models PCL-505/C, PCL-505 or PCL-101 STL systems and the new Model MRC-1 Microprocessor Remote Control provides an unbeatable, totally independent wireless combination.

Sound like a good idea? Alex would have thought so!

Pending FCC type acceptance.



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Measurements (.0009% or > 100 dB)

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in strong RF fields

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When you need to know about distortion, pick from the analyzers that are easier, faster, and tell you more

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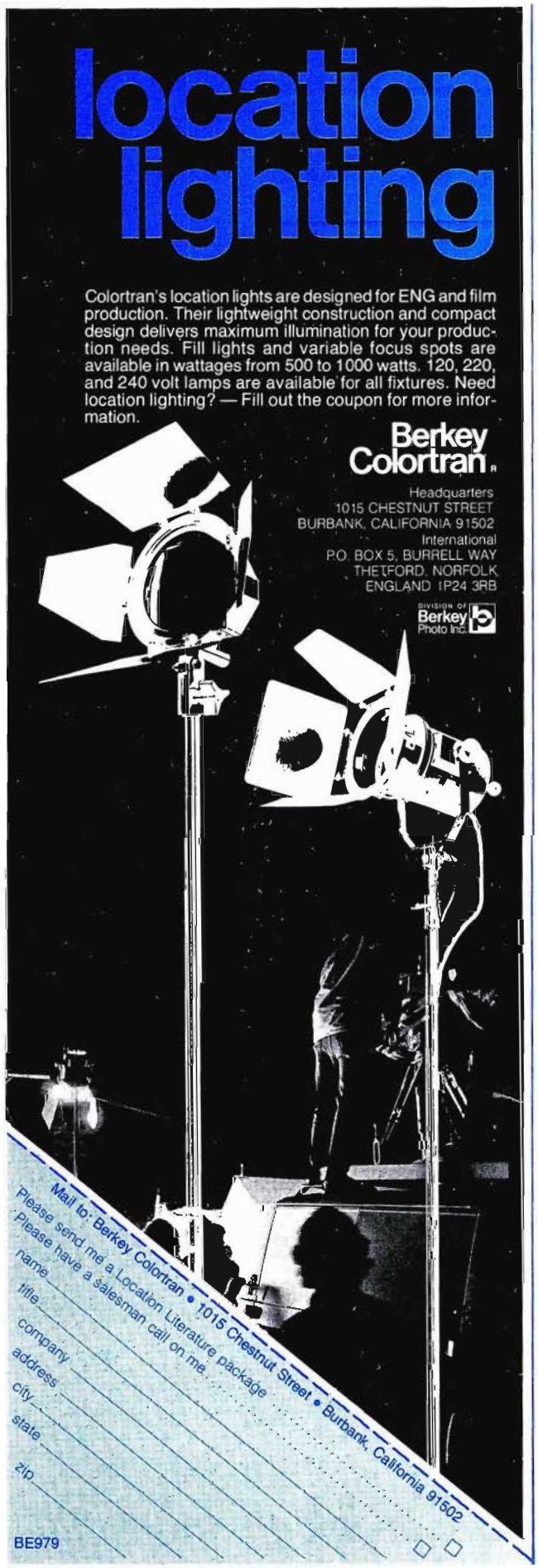

Feedback

April, 1909. So, he used Victrola and Edison phonographs to play recorded music, plus a piano (he was a fine musician) on the first broadcast ever on earth of modern radio. On this day, the staff (as shown on page 98 of your May issue) began playing music and Dr. Herrold, standing in the studio door, announced the records DJ-style while the operator ran the records.

After about two hours of this, the first broadcast recorded in history, the telephone rang. It was the Mare Island Navy Yard. Mare Island's wireless operator asked, "Are you playing music on our wireless channel?" The answer was yes and the boys went wild.

I am 82 and still active managing my station KICO in the Imperial Valley.

W. L. Gleeson
President, KICO
Calexico, CA

From Illinois

Please allow me to hand you some flowers. Yours is one of the finest publications for our industry. When time allows, I read virtually every word, and very often save complete issues for future reference. Many thanks from a working engineer for a fine, up-to-date, and informative magazine.

E. Neil Pike,
WSIE,
Edwardsville, IL

From New York

Request you clarify circuit changes in steps 6 and 7 of Station to Station, "Transistors solve tube problems for 529" (**Broadcast Engineering,** December 1978). Both paragraphs indicate installation of a 10 µF silver mica capacitor from pin 3 to V-264 socket to ground. I believe you meant to say V-164 in paragraph 6 and V-264 in paragraph 7.

S. Charles Campione
APO New York

Editor's note: The article was in error and thanks to Mr. Campione the error has been corrected.

From Illinois

This is a letter that I have been meaning to write to you for some time because it appears to be too good to be true.

As president of a communications consulting firm and a video production company, the Kapco Communications division, I need to know what developments are taking shape in the field of closed-circuit video. Because I'm intrinsically involved in the communications process, I also want to keep up with the broadcast and technical aspects of my business. Consequently, I read both *Video Systems* and **Broadcast Engineering** magazines and find them to be way above the quality of other like publications.

My only criticism is with the lack of a letters column. I think it would be great to have some method for feedback. Anyhow, keep up the good work!

Kenneth Rubel
K. L. Rubel and Associates,
Chicago, IL

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We've got you covered...

24 hours a day. Every day!

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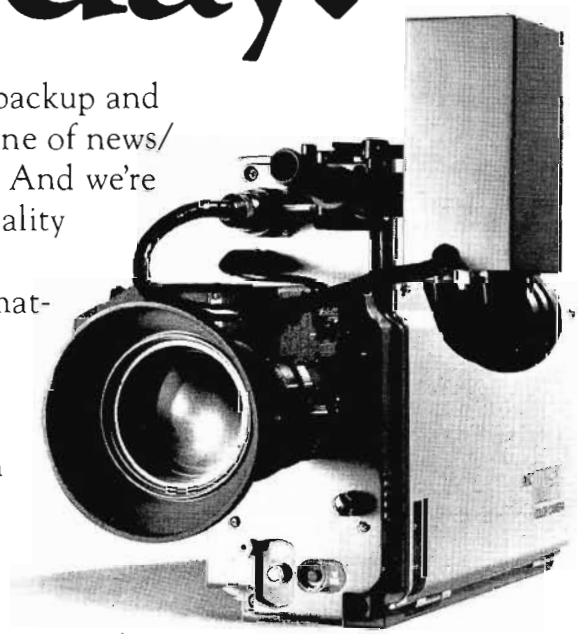

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industry news

FCC rearranges and adds to broadcasting rules in "reregulation" effort

With the death of the Communications Act rewrite, H.R. 3333, and little hope held out for Senate bills S-611 and S-622, broadcasters must rely on the mercy of the FCC for any deregulation. The commission expects to have its own proposals ready later this year. Until then, the commission has been pursuing a path it calls "reregulation," or restructuring the broadcast rules.

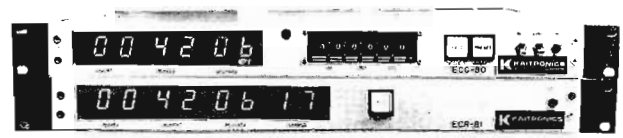
So far, the FCC has reshuffled its "Broadcast Applications and Proceeding" from Subpart D of Part 1 to Subpart H of Part 73 (substantially the same rules—different location); it has referenced some of its policies to its rules; and it has amended 32 separate rule sections of Parts 73 and 74.

The new amendments include the following.

- Delete the requirement for annual skeleton proof of AM station directional antennas used with remote control operation for all stations having approved antenna sampling systems;
- Permit AM stations to use the indirect method of power determination whenever there is a temporary malfunction of a remote reading, remote control or extension meter indication of antenna or common point current;
- Provide guidance in obtaining data necessary to correctly design approved sampling systems for AM directional antennas, with sampling transmission lines of unequal length;
- Clarify the technical requirements for TV remote control and failsafe circuits to avoid use of unnecessarily complex devices that could result in loss of program service to the public and unnecessary expense to station licensees;
- Resolve ambiguity in tolerance specifications for TV video waveform equalizing pulses, by redefining the tolerance in terms of duration rather than area of the pulse;
- Restructure and rewrite the rule on rebroadcasting of signals from other broadcast and non-broadcast stations with editorial corrections requested by the National Bureau of Standards and the Naval Observatory on the use of standard time signals;
- Permit the use of automatic Morse Code for station identification of remote pickup stations for licensees wishing to do so for operating convenience. The code identification procedures are identical to those adopted previously for stations in the Private Radio Services;
- Relax the station identification requirements for auxiliary broadcast stations to agree with previous relaxations in the AM, FM and TV rules;
- Clarify the operator and station identification requirements for fixed microwave links used by broadcast licensees. These stations may now operate fully unattended, similar to

SMPTE Edit Code Generator and Reader

Generator/Reader, Slave Gen, Edit Code/ Computer Interface, Character Generator, Syndicated Tape Programmer .....



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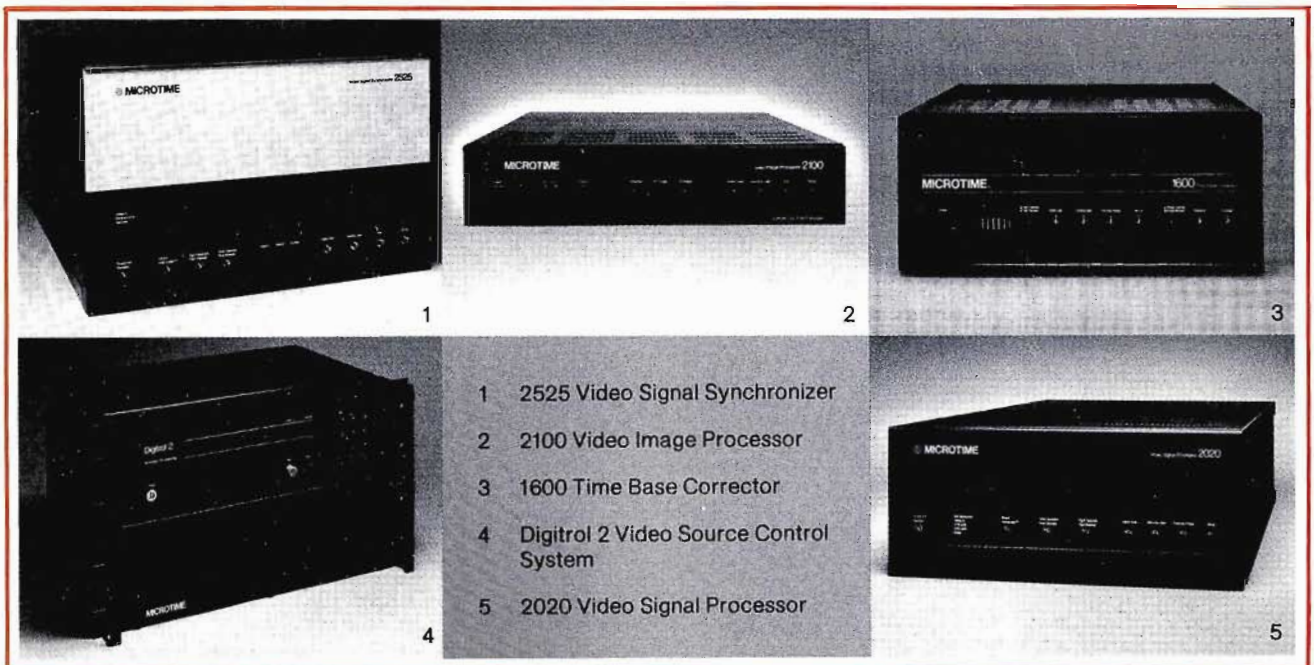

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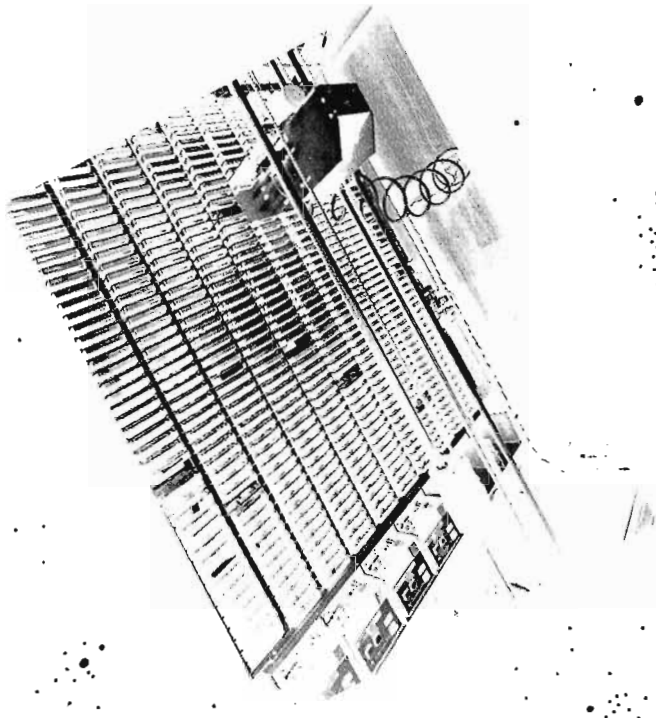

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Industry news

the unattended operation of similar stations in the Common Carrier and Private Microwave Services;

- Relax the requirement that licensees of remote pickup station transmitters attach or display full license information on the portable or mobile transmitter units. Similar identification and license posting requirements were previously deleted for the Private Radio Services as no longer having any regulatory purpose; and
- Revise or add technical definitions for frequency modulation, frequency tolerance and radio frequency radiation to conform with American National Standards definitions and with other FCC rules.

FCC wants to know why commercials seem loud

The FCC has begun another inquiry to obtain information and comments on measuring the loudness of commercials broadcast by radio and television stations. (The last inquiry lasted three years and ended 14 years ago.) The commission said it would prefer that the industry resolve the problem of objectionably loud commercials itself, but threatened regulatory action if industry measures are likely to be ineffectual.

Some of the questions on which the FCC is seeking comments from the industry (due December 15) include the following:

- What methods (devices) are suitable for measuring the instantaneous loudness of complex sounds such as voice or music?
- How can a sound segment be characterized in terms of loudness?
- How can two sound segments be compared in terms of loudness?
- To what extent (how loud and how many) are commercials objectionably loud?
- To what extent is there objectionable loudness in other types of material such as public service announcements or station promotionals?
- What causes objectionable loudness in commercials?
- Do listeners confuse loudness with noisiness or annoying sound?
- Is there some factor that is primarily the cause of excessive loudness?
- Is modulation the key, only one of several factors, or an unreliable indicator of loudness?
- What forms should loudness standards take and what limits are reasonable?

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Industry news

- Is there some one factor which, if controlled, would minimize the problem?
- In what way are the marketplace forces delinquent in this area?
- In what way could government regulation and marketplace forces act together to minimize the problem?
- Should the FCC control loudness solely by regulation, what specific form should such regulations take, and do current regulations aggravate the problem? and
- Could an automatic loudness control be incorporated into TV sets that would be adjustable for the receiver location and listener preference?

1978 is record year for TV ad revenues

Advertisers spent $8.06 billion, or 17.8% more on television in 1978 than in the previous year, according to figures released by the FCC. Total industry revenues, less agency commissions, were $6.9 billion. Industry expenses increased 17.3% to $5.3 billion and pre-tax profits rose 17.6% to $1.65 billion.

Of the $8.06 billion of television advertising expenditures, $3.72 billion were for network advertising, up 14.9% from 1977; $2.30 billion were for national and regional advertising, up 16.8%; and $2.03 billion were for local advertising, up 24.5%.

The three national networks reported revenues of $2.96 billion, up 14.8% from 1977. But, profits from network operations were $373.5 million, down 8% from 1977. The three networks reported spending $265 million on their news and public affairs operations. This compares with $207 million in 1976.

FCC releases station and complaint totals

The FCC has released the following totals for broadcast stations on the air as of June 30, 1979: 4548 AM radio (no change from May), 3111 FM radio (no change), 993 FM educational (down one), 220 UHF commercial (no change), 517 VHF commercial (no change), 158 UHF educational (no change), and 105 VHF educational (no change).

The commission also reports that broadcast complaints totaled 14,400 in May 1979, a decrease of 814 from April. Other comments and inquiries for May totaled 2694, a decrease of 11,810 from the previous month. The FCC sent 2079 letters in response to

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3CX15000A7	990.00
3CX20000A7	1099.00
3CV30000H3	1240.00
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3-500Z	85.00
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4CX250BC	63.00
4CX300A	132.50
4CX300Y	181.00
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4CX1000K	411.00
4CX1500A	403.00
4CX1500B	362.00
4CX3000A	606.00
4CX5000A	689.00
4CX10000D	799.00
4CX15000A	1095.00
4CX35000C	3795.00
4X150A	43.50
4X500A	201.00
4-65A	54.00
4-125A	60.00
4-250A	71.00
4-400A	71.00
4-400C	78.50
4-500A	123.00
4-1000A	294.00

TYPE	PRICE
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5-500A	173.00
575A	32.75
802	32.00
805	50.75
807	6.75
810	53.00
811A	13.75
813	38.00
828	75.00
833A American	139.50
833 European	85.00
845	52.50
866A	8.25
872A	16.75
892R	1475.00
F1099	877.00
5671	5210.00
5762 American	550.00
5762 European	425.00
5879	3.65
5924A	675.00
5933	14.25
6076	535.00
6076A	509.00
6146A	6.20
6161	295.00
6166A/7007	1825.00
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6696A	1860.00
6697A	2230.00
7237A	517.00
7289	38.00
7459	575.00
7527	75.00
7527A	144.50
8008	19.10
8122	64.75
8791V1	254.50
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	5Y4, 5Z4, 5AX4, 5AV4, 5931, 6004,				
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SSR-6	5R4GY, 5R4W	F.W.C.T.	2800	500 Ma.	5.75
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SSR-8	6X4, 12X4, 6032	F.W.C.T.	1600	500 Ma.	4.50
SSR-9	6Z4, 84	F.W.C.T.	1500	.085 A.	4.40
SSR-10	575A	H.W.	15,000	1.5 A.	36.00
SSR-11	673	H.W.	15,000	1.75 A.	42.50
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SK–600A	40.00	SK–831	224.00
SK–602	44.00	SK–840	224.00
SK–602A	45.00	SK–860	139.00
SK–607	43.00	SK–890B	156.00
SK–610	43.00	SK–900	196.00
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SK–640	28.00	SK–1470A	234.00
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SK–516	33.00
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6AH6	3.22	6CL6	2.38	6X4	1.76
6AK5	2.30	6CL8A	2.35	6X5GT	1.77
6AK6	1.79	6CM6	2.06	12AB5	1.77
6AL5	1.58	6CM8	1.91	12AT7	1.67
6AM4	4.32	6CS7	1.92	12AU6	1.65
6AM8	2.52	6CX8	2.71	12AU7A	1.49
6AN4	2.41	6DC6	1.64	12AV6	1.43
6AN8A	2.24	6DE7	2.15	12AV7	2.30
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6BA6	1.64	6EW6	1.74	12JB6	3.15
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6BH6	1.84	6HQ5	2.45		
6BJ6	1.91	6J4	3.63	5879	3.03
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6BM8/ECL82	2.01	6JB6	2.93	6973	2.40
6BN6	2.25	6JS6	3.59	7027	3.61
6BN8	2.04	6KD6	4.10	7189	2.06
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CALL TOLL FREE 800-645-2322 N.Y. State call collect 516-536-8868

Dear Friends:

If you've been wondering where Dave Gilden went, please read a little further. I'm going out on my own. The name of my new corporation is "R.F. GAIN, LTD.". We are located in Rockville Centre, N.Y. just 15 minutes from JFK Airport.

I hope to provide you with the service, speed, and accuracy you're accustomed to. I have taken all the feedback you've given me and will provide some new ideas to cater to your needs.

Our product line will be expanded in the beginning to provide you with integrated circuits at reasonable prices. My Transistor cross-reference list is expanded with an emphasis on cross-referencing RF Power Transistors. Finally, we will provide you with Tubes of all major manufacturers with more choices available. Our inventory will be the largest in the country.

As before, we request everybody to call us on our toll-free number - 800-645-2322. We will have sales engineers familiar with the products we sell so, remember "Dave is Back" to provide you with more savings per order, fast delivery, prompt warranty service, and a friendly voice.

If you've been pleased with my service in the past, let me continue to supply your firm in the future.

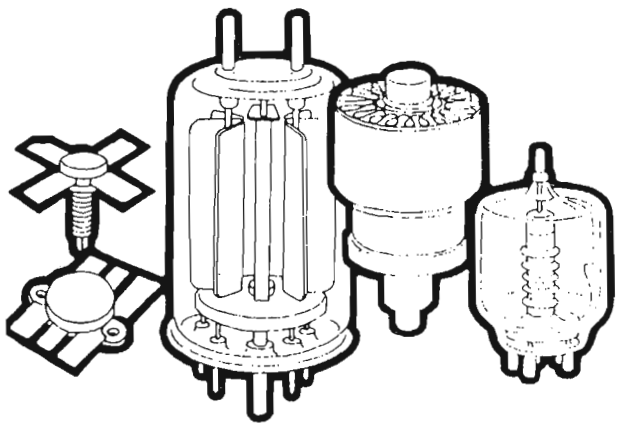
Sincerely,

Dave

Dave Gilden

POLICY STATEMENT

Terms: - Rated Firms — Net 30 Days
Other — Furnish Trade References — 2% Discount if payment accompanies order
All shipments F.O.B. RFG, usually within 24 hours of order. Emergency Shipments Our Specialty.
All products carry Standard Factory Guarantee.
All prices subject to change without notice.



RF Gain Ltd.

For Off-The-Shelf Delivery

on Factory Boxed

Current Code

Transmitting Tubes.

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these comments, inquiries and complaints.

MDS report guidelines

The FCC has released guidelines on what information MDS interference studies should contain in the event that the location of the transmitting antenna of a proposed MDS station is less than 50 miles from an authorized or previously applied for station. This includes the following:

- A map showing the contour of a 45dB carrier to interference level around both the proposed station and any authorized or previously applied for transmitting antenna sites.
- If the applicant believes that other factors will significantly alter the above contour, these factors shall be listed along with a second 45dB contour illustrating their effect.

In cases where the existing previously authorized or proposed station is or would be affected by other authorized or proposed stations within 50 miles of it, the following should be provided as part of the engineering statement:

- A map showing the contours of the 45dB carrier to interference levels around all such authorized or previously applied for stations without the effect caused by the new applicant, assuming the stated transmitting site characteristics.
- A map showing the contours of the 45dB carrier to interference level taking into account both the authorized or previously filed for stations and the station proposed in the new application.

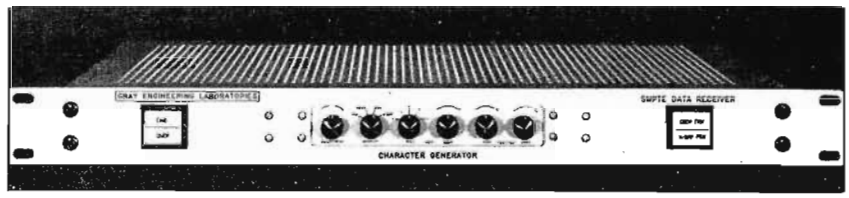
For more information, contact Herb Wilson, FCC, 1919 M. St. NW, Washington, DC 20554, (202) 632-6440.

Channel use study out

Television Channel Utilization as of December 31, 1978, is a FCC report showing by market, how commercial and noncommercial channels are being used. It details the number of VHF and UHF channels licensed, the number for which construction permits have been granted, the number for which an application has not been filed, the number of UHF channels allocated for television but not available until further FCC action, and the total number of channels allocated.

The report shows that, as of December 31, 1978, applications were pending for 42 UHF commer-

SMPTE EDIT-CODE READER AND CHARACTER- GENERATOR



THE NEW STANDARD OF THE INDUSTRY

FEATURES: "THE McFADIN WINDOW"® wide-range digital decoder; 1¾" rack mounting; Drop-Frame indicator; vertical interval inserting; choice of Time-Code or User-Bits; all front panel controls; regenerated Time-Code output (DUB). **MODEL DR-107**

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INCORPORATED

See us at the SMPTE conference, booth 565, in Los Angeles, Oct. 21 to 25, 1979.

504 W. Chapman Ave.
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714-997-4151

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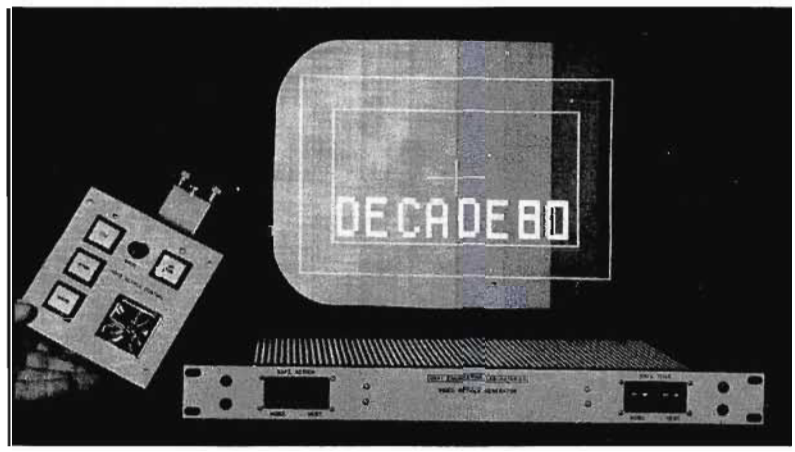
Camera Titling Made Easy



WITH THE NEW VIDEO RETICLE GENERATOR VR-116

—Independent control of Safe Title and Safe Action reticles
—Unrestricted selection of limits both horizontally and vertically
—Remote control switching of Safe Title, Safe Action and cross-hairs
—Continuous brightness control from 0 to 100% luminance value
—Joy-stick control of Safe Action reticle from dead-center to edge of blanking area

GRAY ENGINEERING LABORATORIES
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See demo of this equipment at the SMPTE show booth 565, Los Angeles, Oct. 21-25

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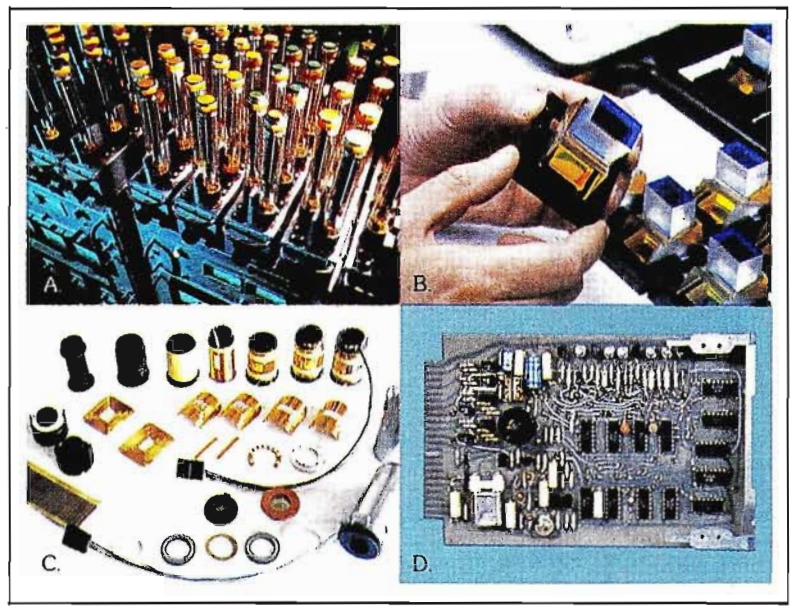
Family Technology



A. Plumbicon™ Tube Technology
B. Prism Technology
C. Yoke Technology
D. Electronic Circuitry Technology

Philips called it, "Focus on Technology" at NAB '79 in Dallas. Simply put, it was a demonstration of the single, most important reason for the basic superior technology and design advantages that make Philips the acknowledged leader in color television:

"Philips is the *only* camera manufacturer who designs, develops and produces *all* four, critical, picture-determining components— Pick-up Tubes, Prisms, Deflection Yokes, and Electronic Circuitry —each designed for optimum, total camera system performance."

This basic technological advantage enables Philips to continue offering the world's finest line of broadcast cameras. The most diversified camera family in both price and application. *The Technology Family*.

PHILIPS

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Technology Family

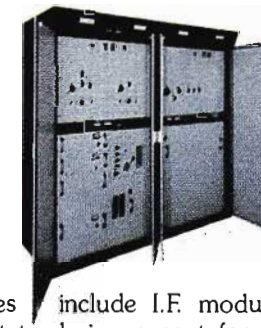
LDK-14—Newest technological breakthrough. ⅔-inch ENG/EFP/Studio broadcast camera with picture quality and features of Philips larger studio cameras. Lightweight, rugged, one piece with the look and feel of a film camera. Low power consumption; high sensitivity; dynamic beam control (DBC); fully automatic operation including auto-centering, and switchable black stretch. Available with simplified remote control or full facility control unit with full bandwidth chroma key.

LDK-25 Family with ACT or new 1-inch 73XQ Diode-Gun Plumbicons and camera circuitry for higher resolution and lower lag than 30mm cameras. With better than 65% depth of modulation at 400 lines! Makes the finest, state-of-the-art multicore studio and field camera ever produced better than ever. And Philips exclusive rear-loading design delivers the maximum out of this new Diode-Gun technology.

Rounding out the LDK-25 family are: the LDK-5, a digitally controlled triax version for remotes and modernized studio operation; and the LDK-15L, an LDK-5 in a self-contained mode or can be used with the LDK-5 or 25 CCU in system configurations.

VIDEO 80... innovative convertible camera system for multi-use applications. Unique, three ⅔-inch Plumbicon camera head converts in seconds from studio mode (available with optional, multi-position, tiltable viewfinder) *to* new, lightweight EFP field production mode with 1½" viewfinder *to* totally self-contained ENG portable. Even *to* special application modes for telecine, microscopy, endoscopy, etc. Easy set up and operation by non-technical personnel and automatic features for total mobility. VIDEO 80 also offers a complete expandable production system for start up or expansion of existing systems.

I.F. Transmitters...Philips is also the recognized world leader in transmitter technology, now with the fastest growing UHF/VHF transmitter line in North America. Output ranges up to 110kW. Equally suited for single or parallel operation with automatic or remote control for unattended operation.



Features include I.F. modulation, solid state design except for power stages, high stability and ease of installation and maintenance. SAW filter, reducing number of controls to achieve proper group-delay. Small size and minimum floor space made possible by the advanced design and a unique common exciter that can be retrofitted into earlier competitive systems.

Also included in Philips "Focus on Technology" and part of our growing family of system products:

- One-inch **Video Recorders** to meet your specific requirements.
- New digital **Video Noise Reducer** —Fully automatic.
- A state-of-the-art **Tape Synchronizer** for totally integrated systems operation.

It all adds up to the widest range of cameras and television equipment in the industry. More information is yours simply by writing today on your company letterhead (indicating product interest) to: Philips Broadcast Equipment Corp., 91 McKee Drive, Mahwah, N.J. 07430 (201) 529-3800. (Canada: Philips Broadcast Equipment, 601 Milner Ave., Scarborough, Ontario M1B 1M8).

Innovative Leader in World Television

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cial channels located in the top 50 markets, and for nine channels in the second 50 markets. In the top 100 markets, 111 UHF commercial channels had not been applied for. In markets 101-200, applications were pending for 23 UHF commercial channels; 90 channels were vacant and not applied for. Of the 61 vacant and not applied for VHF commecial channels, 5 were located in markets 101 through 200 and the remaining 56 were outside 200 markets; applications are pending for 11 VHF commercial channels. Copies of the report may be obtained from the Office of Public Affairs, Room 207, 1919 M St. NW, Washington, DC 20554, (212) 632-7260.

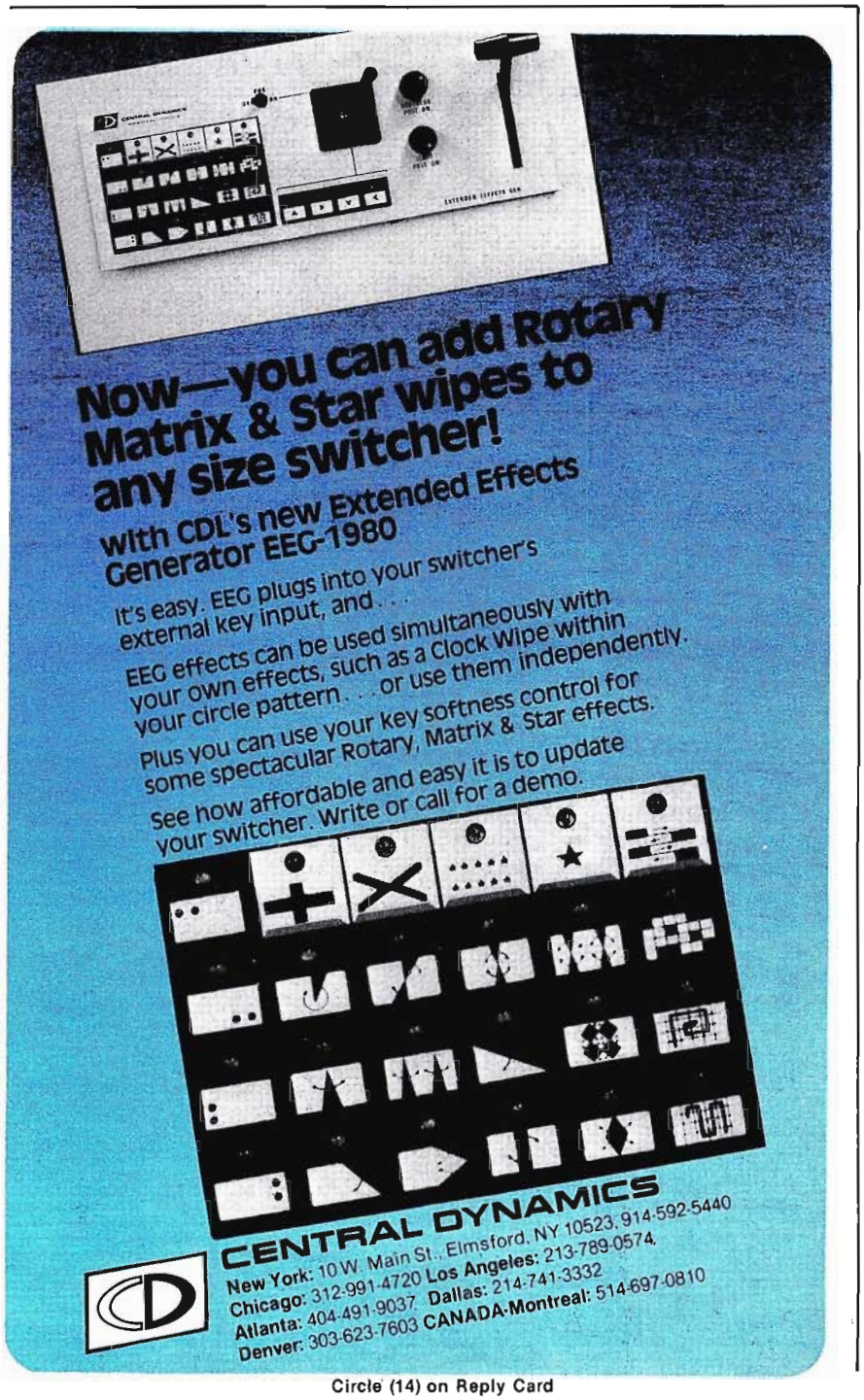
French television pioneer wins ITU Centenary Prize

The International Telecommunications Union (ITU) has awarded its first ITU Centenary Prize to Georges Valensi, a French engineer and scientist, for his contribution to the development of international telecommunications.

Besides playing a cardinal role in developing international telephony and the world telecommunications network, Valensi contributed to the emergence of color television. His detailed research in physiological optics and colorimetry led to a French patent in 1938 which was the basis for British and American patents validating his reverse compatibility concept for color signal transmission. NTSC, PAL and SECAM make use of this underlying principle, even though the coding methods differ.

The prize will be presented September 23, 1979, in conjunction with the 3rd World Telecommunications Exhibition, Telecom 79, in Geneva.

The ITU is the United Nations' specialized agency for telecommunications. It was founded in 1865 and has 154 member countries.



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US and Canada negotiate for UHF-TV allocations

Negotiations are being conducted between Canadian and United States representatives to relocate Canadian UHF-TV allocations to channels below Channel 70. This is a result of steps to implement Land Mobile operation in the 806-890MHz band (TV channels 70 through 83).

Some conflicts remain between US allocations and some of the Canadian proposals listed in the new plan. Negotiations to resolve these conflicts are continuing and corresponding adjustments to the plan will be developed as necessary.

Inter-satellite links ahead

INTELSAT has awarded a US $170,000 contract to the Electron Dynamics Division of the Hughes Aircraft Company for the design, fabrication and testing of a feasibility model of a Travelling Wave Tube (TWT). The TWT would be a vital component of the on-board satellite equipment required to operate an inter-satellite link.

This is the 102 member-country organization's first step towards establishing inter-satellite communications links within its systems. The objective is to advance technology in this area sufficiently to enable it to install facilities for inter-satellite links on its satellites launched after 1984.

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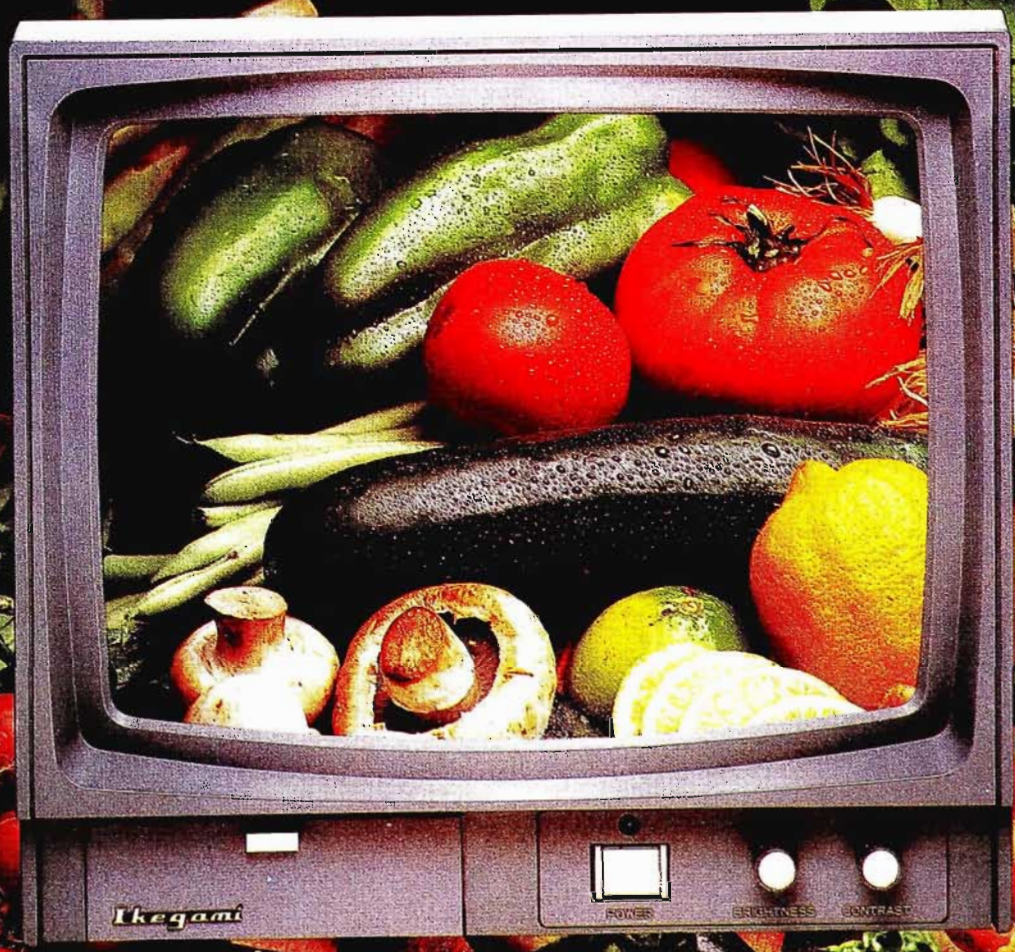
ALL NATURAL.

(for a healthy image.)



Take the purity, quality and precision of nature and incorporate it into a broadcast monitor capable of providing the most exacting picture imaginable, and you'll have created the "All Natural" Ikegami Broadcast Color Monitor.

All Natural because what you'll see is a picture in its purest form: down to the finest detail or defect.

Ikegami Broadcast Color Monitors maintain a healthy image.

It's why more and more engineers are specifying *Ikegami Broadcast Color Monitors*.

With features like our comb filter which results in resolution at 600 plus lines; shadow mask CRT's; power-protective circuits to avoid damage to the picture tube, an active convergence circuit, a phase lock system which eliminates horizontal hold control, sturdy construction, modular PC boards for simple servicing and maintenance, a built-in degaussing circuit and magnetic shield (to permit movement without affecting picture quality, and a wide range of models including 25, 20, 16, and 14 inch units (14 and 20 inch units offering standard and high resolution models), isn't it time you got into shape with Ikegami Broadcast Color Monitors?

For high-end, precision broadcast color monitors, it's Ikegami—naturally!

For details and additional information contact: Ikegami Electronics (USA) Inc., 37 Brook Ave., Maywood, N.J. 07607, (201) 368-9171; West Coast: 19164 Van Ness Ave., Torrance, Calif. 90501, (213) 328-2814; South West: 330 No. Belt East, Suite 228, Houston, Texas 77060, (713) 445-0100.

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The organization claims that such links would have significant advantages. At present, direct satellite transmissions can only be provided between points within a single satellite coverage area—about one-third of the earth's surface.

Communications bound for destinations outside the coverage area must complete their journey via land-based links or through a second satellite hop.

With inter-satellite links, these signals could be switched directly from the first satellite to the second—thus saving one down and one up link transmission, freeing this capacity for other communications.

INTELSAT says it also would enable one earth station to communicate through more than one satellite in each area, improving system flexibility by increasing the number of receive stations which can be accessed directly.

FCC fears limited powers if RF radiation regulated

Controversy over the effects of low-level and long-term exposure to RF radiation is on the increase. So, the FCC has opened an inquiry on how to discharge its regulatory duties if a health and safety agency should limit allowable RF radiation exposure levels.

The commission said a parallel purpose of the inquiry is to provide documentation so that it can participate in rulemaking proceedings of the health and safety agencies and ensure that any new standards adopted take into account the impact on the licensees and equipment regulated by the FCC and on the public.

Comments are due by December 15 and replies by March 15, 1980.

Radiation is classified in two types for health and safety purposes. High frequency-high energy radiation such as x-rays and gamma rays, which are beyond the range of frequencies the FCC regulates, are capable of causing harm through ionization of atoms in living tissues. FCC-regulated frequencies do not have sufficient energy to cause ionization, but in sufficient amounts are capable of causing damage through generation of heat.

A spokesman at one electronic shielding manufacturing company says the level of worldwide radio frequency radiation has risen from virtually zero a few decades ago to today's "pollution-level index." Arnold Zais of Keene Corporation, calls it "radio frequency pollution" and says it is increasing at the rate of 50% a year.

Sources of radio frequency radiation include commercial radio and television; radar and microwave communications; military, amateur, citizen's band and police radios; communications and other satellites; high voltage electrical transmission lines; industrial and military equipment; lighting systems; and natural radiation phenomenon from outer space.

FCC enters environment assessment business

After consulting with the Council on Environmental Quality, the FCC has proposed amendments to its rules covering the environmental impact aspects of communications facilities it authorizes.

The proposed commission rules provide that, before action is taken

3D SERIES

Proven.
Over 5,000 ITC 3D's in use—15,000 decks—Stereo and Mono.

Economical.
Three premium line reproducers cost little more than two SP Series single decks.

Compact.
Three deck convenience in the space of two SP single decks.

Recorder.
Add a WRA Recording Amplifier and the bottom deck becomes a Master Recorder/Reproducer.

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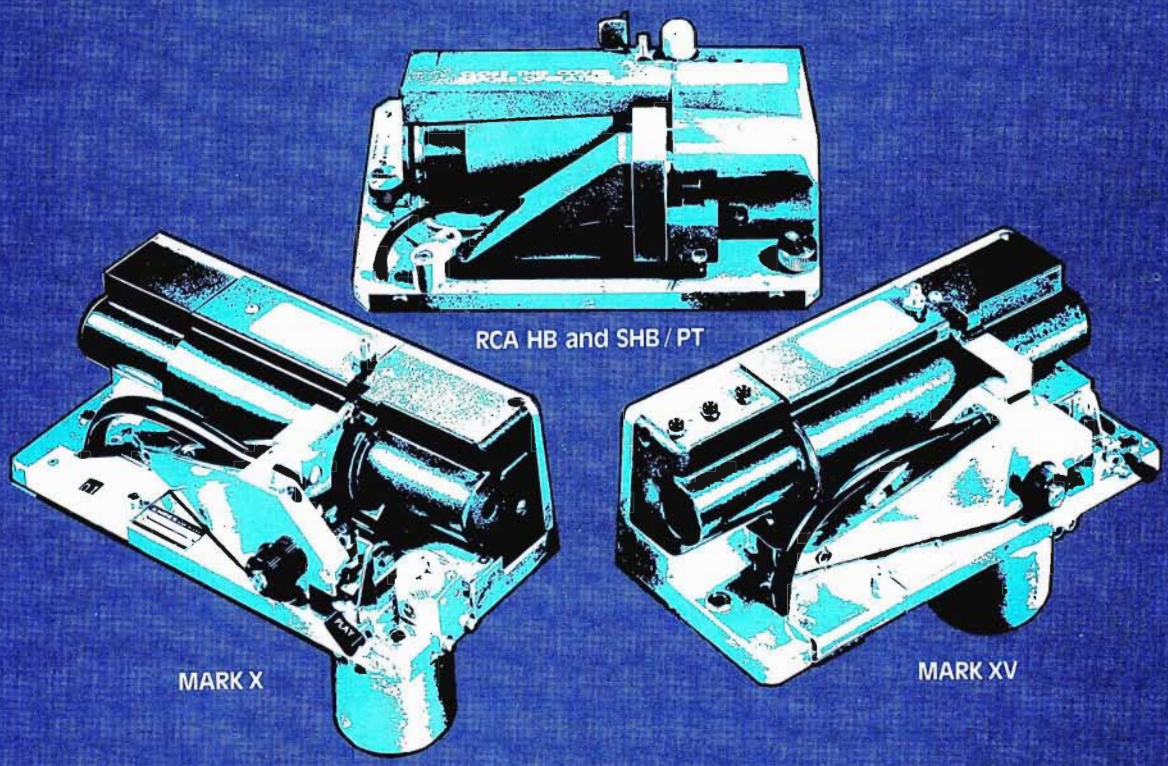
QUAD PANEL REFURBISHING SERVICE



Superior pictures at lower cost! Join the ferrite generation.

Spin Physics will save you 25% to 40% of your costs and give you 2 to 5 times longer life than you receive from ordinary video heads. Get the facts from our full-time field engineer who serves your region.

Superior pictures and significant savings are yours when you specify state-of-the-art high technology hot-pressed ferrite quad video heads from Spin Physics. Bring your quad machines into the new generation — the ferrite generation. The money you save on refurbishing may help toward new generation equipment in some other aspects of your operation. Our steadily growing customer list includes smart operators in all sizes of stations and production centers, and in NTSC, PAL and SECAM standards. You owe it to yourself to compare Spin Physics' advantages.

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CENTRAL: LeRoy Koonsman, 214-245-1816
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For factory direct information, contact David Franssens, Video Products Manager, or Gene Long, National Sales Manager at 714-453-5410

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AUDIO CONSOLES (The Silent Series)

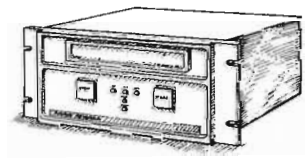
DC-38: 5, 8 or 10 mixers, up to 40 inputs; $2,447 to $4,980.

SC-5, DC-5, DC-8: 5 & 8 mixer, 12 to 18 inputs: $995 to $2,375.

P5M: Portable: 5 mixers, 8 inputs; built-in compressor: $545.

DC-12: Remote control; up to 12 mixers (expandable to 20) with 2 inputs each: $4,200 to $5,200.

THE PHASE-ERROR-FREE CART PRODUCTION CENTER



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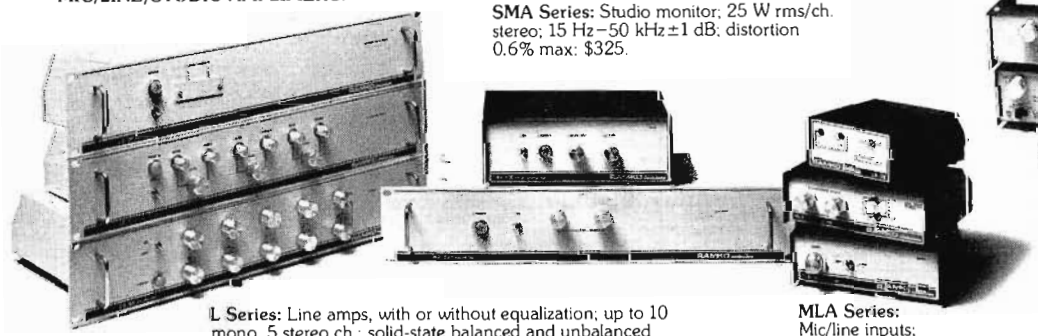
PhaseMaster: Phase-error-free record/reproduce/duplicate; full complement of broadcast features and construction.

MA Series: Studio monitors; 12 W mono, 20 W stereo; 10 Hz–50 kHz±1 dB; distortion 0.05% max: $121 and $171.

DML Series: Dual mic in to amplify, mix, limit and control gain; built in compressor; AC and DC: $239 to $281.

MIC/LINE/STUDIO AMPLIFIERS:

SMA Series: Studio monitor; 25 W rms/ch. stereo; 15 Hz–50 kHz±1 dB; distortion 0.6% max: $325.

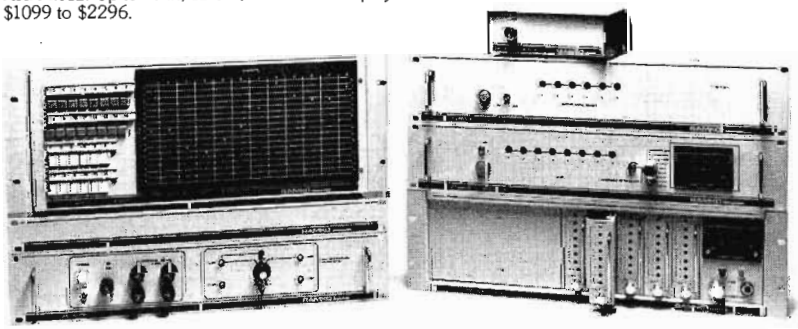


L Series: Line amps, with or without equalization; up to 10 mono, 5 stereo ch.; solid-state balanced and unbalanced inputs; +21 dBm max. in and out; response 10 Hz–50 kHz +0, −1 dB; distortion 0.008%: $135 to $453.

MLA Series: Mic/line inputs; studio or remote: $128 to $185.

TURNTABLE PREAMPLIFIERS
MP-8 & SP-8: Mono & stereo; S/N −77 dB; ±1 dB RIAA: $98 & $144.
ESP-38: 0.03% distortion; S/N −85 dB; ±.25 dB RIAA: $325.

AUDIO ROUTER/AMPLIFIER
ARA-1612: Up to 16 in, 12 out; LED status display: $1099 to $2296.



AUDIO DISTRIBUTION AMPLIFIERS
DA Series: 12 versions from 1 x 30 mass feed to 20 x 80 rack mount; 20 Hz to 20 kHz±0.5 dB; −75 dB separation: $145 to $2276.

Prices subject to change without prior notice.

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2WEEKS.

***You can use any of the gear you see free for 2 weeks (with credit approval prior to shipment).**

Play with the cart/cassette record/playback/duplication center that eliminates stereo phase shift error once and for all. The most advanced turntable preamp in captivity. Consoles so advanced, so silent you're not going to believe them until you try them. Or an audio router that makes whatever you've got now look—and sound—like so much spaghetti.

Then, if it's not for you, just ship it back.

But in all fairness, we have to warn you—once you've tried Ramko, chances are you're hooked for life.

Phase shift doesn't matter in mono.

So instead of adding failure-prone electro-mechanical components or re-inventing the cartridge, in the Ramko PhaseMaster Cart/Cassette Duplicating Center, we simply encode the stereo before it ever sees the heads or tape, then decode the signal after it leaves these two major sources of stereo phase shift error.

The result is phase-error-free recording/reproduction/duplication, and performance specifications that meet or exceed whatever cart drives you're using now.

Features include: an A and B cart deck; an A cart deck; and a cassette deck. Simple cassette-to-cart(s) and cart-to-cassette duplication. Automatic switching of record/playback, encoding/decoding and mono/stereo. Left, right and phase analysis meters. Front panel input selection. Three cue tones. And so much more that you'll just have to contact us for details and a demonstration.

Ask for the Ramko PhaseMaster.

Just another turntable preamp?

Look at what one user wrote:

"Three days ago I replaced the (brand name) preamps in our studio with your ESP-38 preamps."

"The result was astounding. The next day we had six unsolicited calls from local stereo stores. All commented on our improved disk reproduction and wanted to know what we had done."

"The comments from listeners have been excellent."

Try it. You're going to like it a lot.

For AM stereo, or an FM station upgrade.

Ramko consoles come with features you won't even find in more expensive competitive units.

Total dc control of all mixing and switching function means no more noisy pots and switches, no stereo tracking error, and much more resistance to RFI.

We've developed solid-state *balanced* inputs for better sound. Added gain select on each input. Included switch-programmable cue and monitor mute selection. Provided mono, stereo and phase meters as standard features.

And then we backed everything with a 2-year warranty (4 years on the DC-38 and DC-12).

Kiss your patch panels good-bye.

Because with the Ramko ARA-1612 Audio Router/Amplifier you use front panel pushbuttons to route 16 inputs to any of 12 outputs, simultaneously or individually, with an instant LED display of what is going where. You've never seen anything like it.

IC switching and isolation buffers mean no loading and no degradation of S/N or frequency response with multiple feeds (stack them for up to 45 in and *thousands* out). On-board switches change stereo to mono instantly. Individual gain control on all inputs allows precise level matching. Frequency response is 20 Hz–20 kHz±0.5 dB; S/N is −75 dB; distortion <0.3%; and input/output levels are +21 dBm max.

And all this is yours at the lowest cost per crosspoint in the industry.

The music goes 'round and 'round...

For moving sound around, we offer more different kinds of amplifiers than anybody.

Ten models of Audio Distribution Amplifiers, each with 10 Hz–20 kHz±0.5 dB frequency response, less than 0.1% distortion, and more inputs and outputs for the size and price than any other comparable ADA.

Four different Line Amplifiers with 20 Hz–50 kHz+0, −1 dB frequency response, 0.008% distortion, balanced in and out, and +21 dBm max out.

Portable and studio dual function MIC/LINE amplifiers with balanced in and out, built-in RFI suppression, 20 Hz–20 kHz±0.5 dB frequency response, gain from 64 dB on MIC to 26 dB on the high level channels, and distortion at an inaudible 0.1%.

And isn't that music to your ears? To hear more, contact: Ramko Research, 11355 Folsom Blvd., Rancho Cordova, CA 95670.

Or just call (916) 635-3600 collect today.

RAMKO

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in design, performance and features

Spotmaster®

5300B

MULTI - DECK

The cart machine with features competitors can't match . . .

FEATURES	5300B	ITC 3D	HARRIS 90-3
Nortronics® Duracore™ Heads	YES	YES	No
Single Connector Plug-In Decks	YES	No	No
Companion Record Amplifier	YES	YES	No
Low-Voltage Solenoid	YES	No	No
Independent Azimuth Adjustment	YES	No	No
Shielding Above & Below the Head	YES	No	No
LED Service Aids	YES	No	No
Tapered Cartridge Guides	YES	No	No
Companion Audio Switcher	YES	YES	No
Do the decks lock in place to a bulkhead permitting operation with the front panel down?	YES	No	YES

Plug-in removable decks and superb electronics make this the most up-to-date monaural or stereo three deck cart machine available. Rugged machined deck, quiet air-damped solenoid, unique cartridge guidance system, drop down front panel and run lights next to each deck. The improved 5300B now includes individual level controls for each cue tone.

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Industry news

on authorizations for facilities classified as "major" because of their location, an environmental assessment will be prepared and published.

FCC commissioner Abbott Washburn was alone in dissenting the action and issued a statement saying that the FCC doesn't know anything about environmental protection and that FCC person-hours should not be tied up in reading environmental assessments which the FCC is not compelled by law to require.

For more information on the proposed rule, contact Upton Guthery, FCC, (202) 254-6530.

TV experiments for deaf

Captioning for the hearing impaired is a subject that has been on the FCC's agenda lately, but the commission says it is awaiting the outcome of voluntary closed captioning before making any moves. In upholding a recent denial of a complaint by the Los Angeles Council on Deafness against eight TV stations, the FCC claimed that if closed captioning should not be successful, it might be necessary to regulate.

One such voluntary closed captioning project the commission is watching is being undertaken by the Public Broadcasting System, the National Broadcasting Company and the American Broadcasting Company. If successful, a total of up to 20 hours of captioned programming for the hearing impaired will be broadcast weekly by 1980. Special decoding devices needed will be provided by Sears, Roebuck & Company, with no mark-up for profit. The Department of Health, Education and Welfare will help establish and fund a nonprofit National Captioning Institute that will caption programming for the networks.

In the meantime, the FCC has made available a videotape of a meeting it held on the subject last April. The meeting included a briefing on plans for closed captioning of TV programs and a panel discussion among representatives of the broadcast industry, the Public Broadcasting Service and the federal government.

Copies of the 4-hour tape may be taken out on loan from or viewed at the FCC's various field offices. For more information, call Jon Crowe, Public Service Branch chief, at (202) 634-1940. □

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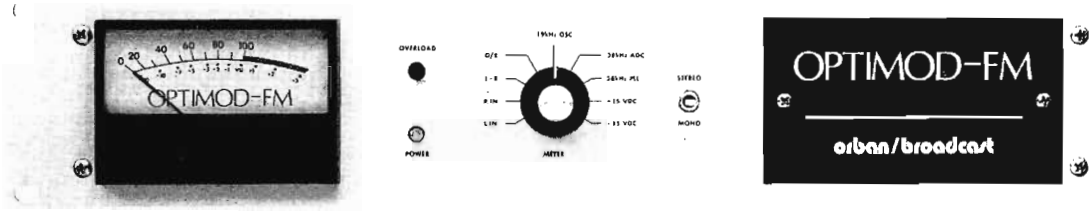

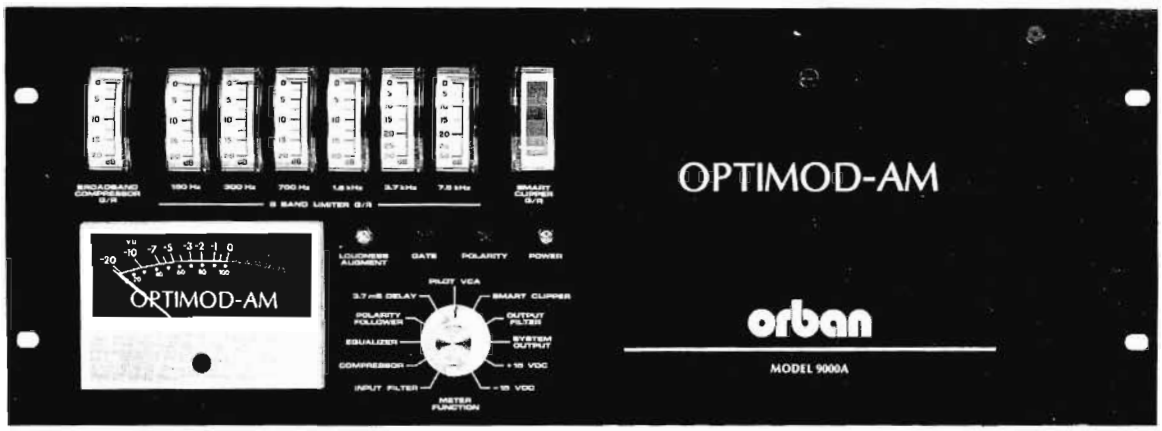

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For more information on Optimod-AM circle (20) on reply card
For more information on Optimod-FM circle (21) on reply card

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business news

Bell & Howell purchases Mach One video editing

Bell & Howell's TeleMation division has acquired the assets and business of Mach One Digital Systems. The company's Mach One videotape editing systems will complement TeleMation's existing line of broadcast and teleproduciton equipment, according to Bell & Howell Video Group president Robert B. Pfannkuch. The editor will be sold and serviced through TeleMation, which also will start to manufacture the Mach One system at its Salt Lake City plant by the beginning of the fourth quarter of 1979.

Bell & Howell also has announced its entry into the field of designing and manufacturing display monitors for the computer terminal, word processing and medical markets. The products will be marketed to the computer industry and other OEM markets under the Bell & Howell name and will be marketed to the professional video markets under the TeleMation brand name.

3M Mincom wins Maker of the Microphone award

The Maker of the Microphone Award has been presented to 3M's Mincom division for "outstanding contribution to the world of sound." Specifically, the division was commended for its development of a practical digital audio recording system with electronic editing and disc-mastering interface.

The award is a trophy presented annually in memory of Emile Berliner, who invented the microphone, the disc record, the disc record player (gramophone) and the method of mass producing discs from a single master record.

The award was presented by his grandson, Oliver Berliner (left), to Marshall Hatfield, vice president of the division.

CFRN CFRY CKCY KBOX KGRO KLOE-TV KINT KLIN
KNXV KPAC KRVN KYAK KYXY W VATD
/BOK WCBQ WFLN WDAR WDLB /FOS
WFTN WHAT WHP WIBF WIBX WIKZ J WW
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VRSC WLW WRVA WNNR W O
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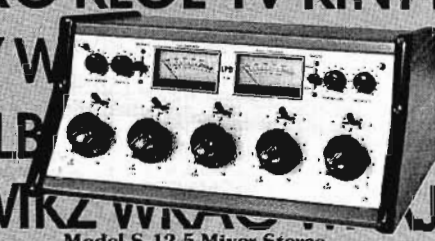
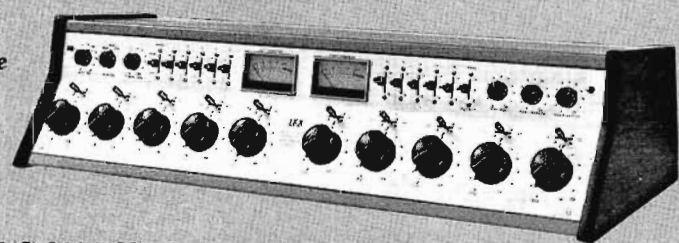


Model S-12 5 Mixer Stereo

Model S-13C 8 Mixer Stereo/Mono



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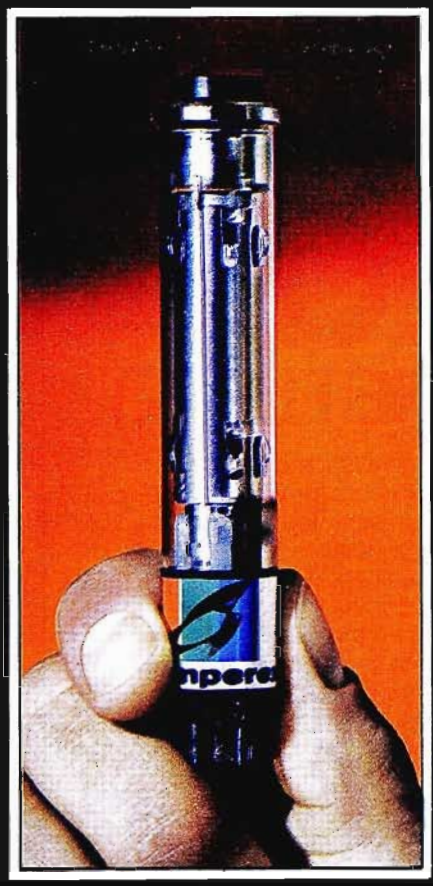

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Business news

TeleMation recently signed a marketing agreement with Dytek Industries of Denver, CO. TeleMation will distribute Dytek's production switcher line, known as the SL Series Video Controllers and its DVC Series switchers.

Harris plans to buy CVS

Harris Corporation has purchased Consolidated Video Systems (CVS) of Sunnyvale, CA, for approximately $13 million. Harris said the move will enable it to enter the digital video equipment market. CVS, with current sales of about $9 million annually, produces video equipment for television stations, cable TV companies and industrial, educational and government TV users.

In 1974, CVS won an Emmy for the technical contribution to television provided by the company's digital time base corrector. The Harris acquisition plan calls for CVS to remain in California and to be operated as part of the Harris Broadcast Products division.

In other news at Harris, the company has formed a new division to market information systems overseas. The new unit, the Harris Information Systems International Division, will handle sales and customer service for computers, distributed data processing systems and interactive and remote batch terminals in all countries outside the US and Canada.

M. Andrew Haladej has been named president-general manager of the new division.

Microwave Associates

Microwave Associates has entered the semiconductor service business to be headed by Walter Sobie. The new operating group will market services which include custom metallization, photo-resist scribing techniques using lasers, diamonds and saws, scanning electron micro-scopy, energy dispersive x-ray analysis and atomic emission spectrometer services.

Black Africa to invest heavily in communication

According to a 530-page study by Frost & Sullivan, Black Africa will invest between $12.5 billion and $15 billion in telecommunications systems and equipment through 1990 (1978 prices). Black Africa comprises 41 separate states covering 12 million square miles.

Only some $2.1 billion in contracts

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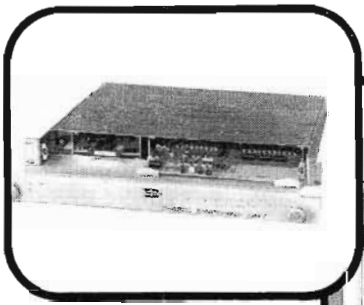
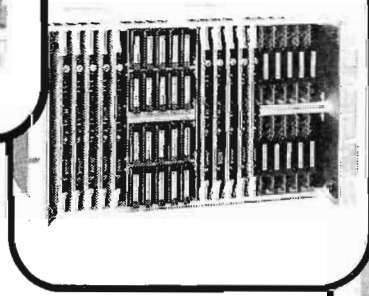


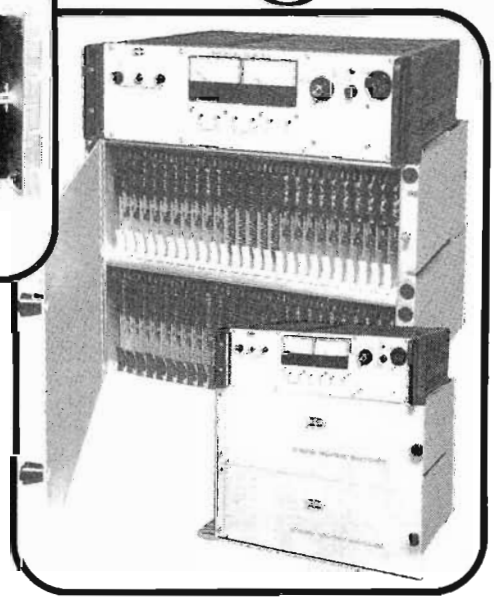
D-4300 Series
Video & Audio Switchers
Available as 6x1 video, 6x1 audio, 16x1 audio-video, 20x1 video and 20x1 audio. Video only, audio only, or video-audio. May be stacked for multiple output bus applications. Uses digital control system with coax remote control cable. Each output bus has an independent control system.

medium



D-400 Series
Video & Audio Switchers
Available in 20x10, 20x15, 20x20, 30x10 and 30x15 video and audio basic matrix sizes which may be used as building blocks for larger systems for up to 100 inputs. Control system is BCD. Each output bus has an independent control system.

Large



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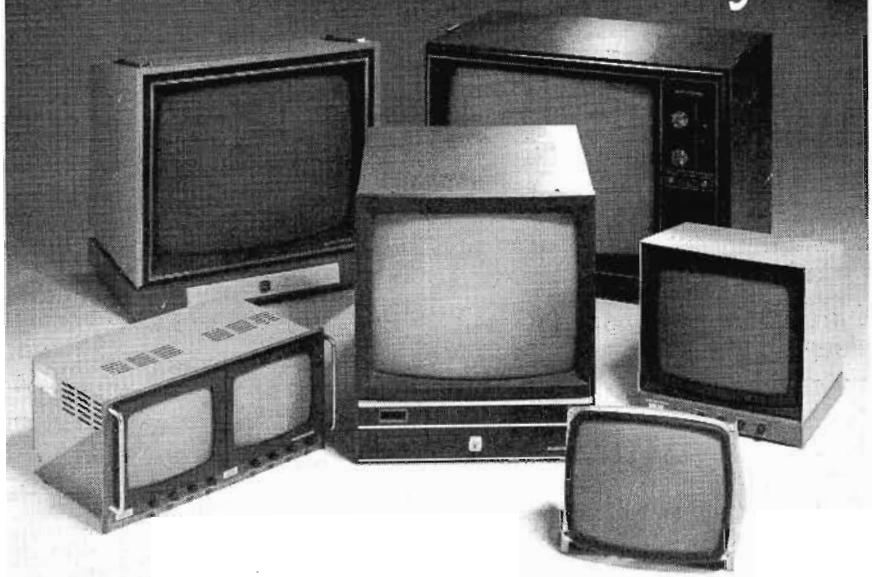

As manufacturers of solid state video equipment, Electrohome has gained worldwide acceptance with reliable, high-performance 9″, 11″, 14″, 17″, 23″ monochrome, 19″ and 25″ color monitors. Built to NTSC and PAL standards, these monitors are specifically designed for broadcast, educational, industrial, commercial, medical, security and data applications.

Now, we have added the new 2000 Series to our product range. Developed to meet high standards of the broadcast industry, the 2000 Series color monitor is modular for easy adaptability to RGB/NTSC/PAL encoded signals. Available in 19″ case and rack and 25″ case, the 2000 Series maintains Electrohome's high standard of engineering.

In addition to an expanded line, Electrohome has a new west coast distributor network to provide fast delivery. For complete information on all our video equipment, contact Electrohome Limited at one of these offices:

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(714) 545-6991

Electrohome (U.S.A.) Limited
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(716) 694-3332

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Business news

have been placed so far, the study finds, with British companies having secured the biggest market chunk.

The study warns, however, that "there is a high probability that investment will be delayed either as a result of inflation or through difficulties in raising funds." The market outlook also shows a wide disparity among countries, from the least-developed country, the Republic of Benin, to oil-rich Nigeria.

For more information, contact Customer Service, Frost & Sullivan, Dept. BE, 106 Fulton Street, New York, NY 10038, (212) 233-1080. Report number E300.

Tube company formed

Dave Gilden has formed RF Gain, Ltd., which will supply transmitter and other tubes to the broadcast industry. The company is located at 100 Merrick Road, Rockville Center, NY 11570, (516) 536-8868.

INTELSAT reports 25% increase in satellite use

Demand for worldwide international telecommunications via the INTELSAT satellite system increased by more than 25% during 1978. This does not include occasional use services such as international satellite television, which jumped by 53.3% to over 11,600 channel hours. INTELSAT is the 102-member country organization which owns and operates the telecommunications satellites used by countries around the world.

The organization also predicts global international telecommunications via satellite to increase by about 100% by 1983. This prediction came out of the 1979 Global Traffic Meeting in Washington, DC. More than 200 delegates representing over 100 countries attended the week-long meeting with the purpose of determining short, medium and long term demand forecasts for the telecommunications service provided by the INTELSAT global satellite system.

Ampex: Belgium VTRs; scraps duplication plans

Ampex has announced that it will begin producing VPR-2 helical scan VTRs and TBC-2 digital time base correctors at its Nivelles, Belgium, facility. The facility will produce VPR-2s in the PAL and SECAM broadcast formats.

The company also has reached an

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1968 HANDHELD WIRELESS MIC
1969 TRANSISTORIZED SYSTEM
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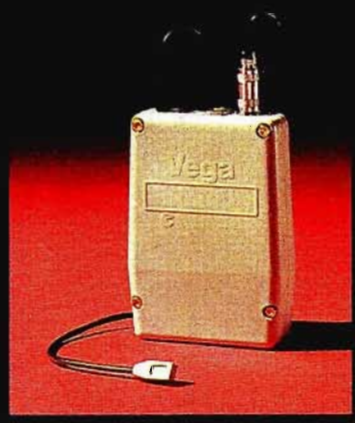

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We have continually improved our systems during the past 15 years, so you can be assured that today's Vega systems are designed with the latest in high-technology electronics and sophisticated audio engineering. Besides offering you the finest systems available, Vega is constantly working with the industry to further the art of audio processing. One example is Vega's F.C.C. petition which resulted in obtaining clear wireless channels for broadcasters and filmmakers last year.

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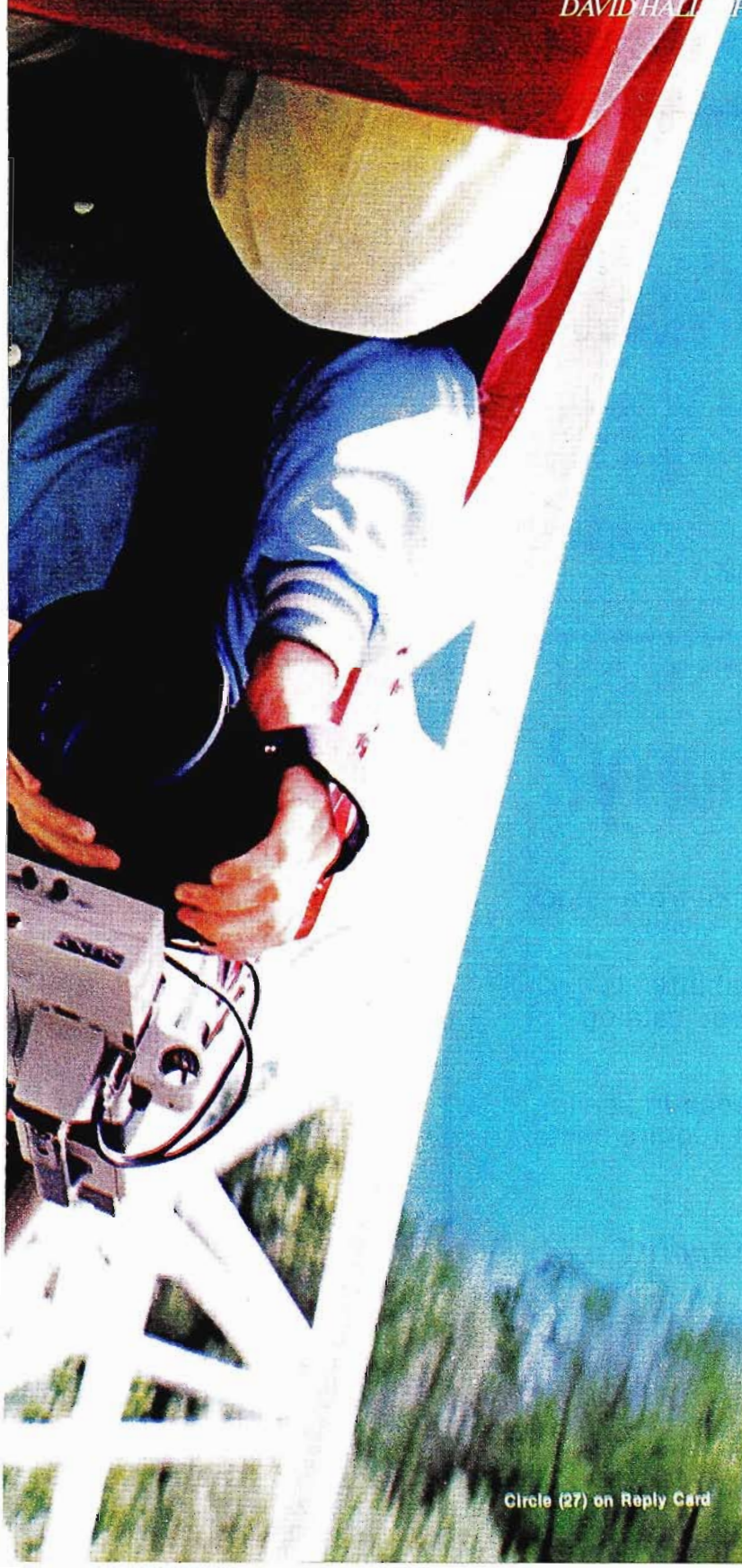

Opryland Productions is one of the largest video production houses east of the Mississippi. The company's facilities have been used for shows as varied as "Nashville on the Road," "Big Ten Basketball," and "Dance in America."

David Hall, General Manager of Opryland Productions, has been using the Sony BVH-1000 video recorder for close to two years and two BVH-500 portable recorders for about six months.

"Sony one-inch equipment has expanded our capabilities considerably," says Hall. "With a BVH-500, we were able for the first time to get broadcast quality tape on a roller coaster for an upcoming special.

"We also took the BVH-500 on a ferris wheel and in a helicopter to tape 'Superstars at the Ohio State Fair.' It performed as well as they did.

"Now we're using Sony on almost all shows we tape in the field. The big advantages are portability and cost. Durability, too. Sony even bailed us out when we were taping a quad production and our equipment broke down. We used Sony to finish the job, then transferred the results to quad. The client was more than satisfied.

"And when the Dominican Republic asked us to tape the visit of Pope John Paul II, we couldn't have done it without our Sony video recorders," Hall adds.

"Because they travel so well, we could get down there fast and do a professional job."

Of course, Sony makes a full line of one-inch broadcast equipment, all of it backed by state-of-the-art technology. We have video recorders, cameras, editors, and the BVT-2000 digital time base corrector.

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Business news

agreement to sell the machinery and related inventory of its custom duplicating facilities in Elk Grove Village, IL, to CBS Records.

Poniatoff awards

Ampex presented four 1979 Alexander M. Poniatoff (AMP) awards to its employees for technical achievements. Winners were Peter Jensen, engineering section manager, audio-video systems division; Billy Baker, senior staff engineer, data systems division; Chi Chao and Bhupendra Shah, project engineers, magnetic tape division.

Jensen was honored for contributions to the development of video time base correctors. Baker received his award for the invention of the super high bit recorder automatic tracking system for instrumentation recorders. Chao and Shah shared an award for their development of the sandmill process used to manufacture some of the company's videotape.

Scully bought by Ampro

Ampro Broadcasting has purchased Scully Recording Instruments, formerly a division of Dictaphone, and has changed its name to Ampro/Scully to reflect the new association. Ampro/Scully has added facilities in Newtown, PA, for manufacturing and warehousing Scully recorders. Executive offices also have been relocated to 826 Newtown/Yardley Road, Newtown, PA 18940, (215) 968-9000.

SALES CONTRACTS

Bosch Fernseh

Sales of Bosch Fernseh's BCN range of 1-inch VTRs continue to rise rapidly, according to the company. Over 100 orders were received for BCN units in April.

Robert Bosch GmbH, Darmstadt, is scheduled to deliver two high-speed reporter vehicles for the 1980 Moscow Olympics. The ENG/EFP vehicles will travel about 100 mph at fully loaded top speeds. They will be equipped with two KCA cameras with base stations. Monitoring, VTR, audio mixing and radio link equipment is built into the car.

Coastcom

Coastcom has received an official notice to proceed from the Collins Transmissions Systems Division of

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Contact Ampex Corporation, Magnetic Tape Division, 401 Broadway, Redwood City, CA 94063, 415/367-2011.

AMPEX

AMPEX MOSCOW 1980

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Rockwell International to produce and ship nearly $1 million of Coastcom's Model 412 single channel per carrier (SCPC) modulators and demodulators during the remainder of 1979.

E-Systems

E-Systems TelSatCom Division, Garland, TX, has signed a contract with Empresa National de Telcomunicadiones TELECOM Bogota, Colombia, to engineer, furnish and install a 13-meter non-standard Intelsat earth terminal on a turnkey basis. The terminal, to be located in Leticia, Amazonas State, will be linked to the Colombian domestic satellite network, utilizing leased satellite capacity of the Intelsat system.

Marconi Communication

Marconi Communication Systems is under contract to supply and install a 750kW broadcast transmitter to the Kuwait Broadcasting and Television Service. The contract, valued at nearly $4.4 million, also provides for any necessary updating of the three Marconi 750kW transmitters currently in use.

Marconi also has received contract for VHF and UHF television transmitters to be used by RAI—Radiotelevisione Italiana. The nearly $2.2 million order calls for the VHF transmitters to replace existing equipment operating on the first TV channel while the UHF transmitters are a part of a major project which includes replacement of some transmitters of the second TV channel and the establishment of an additional color TV channel.

Another large order has been received by Marconi for five television cameras, two telecines, installation materials, spares and training of the personnel at the Radio and TV Organization of the Yeman Arab Republic. The order will re-equip two studios at the television center in the nation's capital.

Microdyne

Microdyne booked over $1.2 million in new orders for satellite TV receiving equipment at the National Cable Television Association convention in Las Vegas. A company spokesman indicated that this was the highest volume of business ever booked by the company at a single trade show.

Neve Electronics

Neve Electronics International has received orders for two consoles from Anglia TV's facilities in Norwich. The largest of the two was a custom-built 36-input channel mixing desk based on the 5315/24-input channel model. The second was an 8301 10-channel "Kelso" transportable console.

Neve also reports sales of a 44-input 32-track 8088 console to Queen Village Recording, and a 8068 recording console with a custom 48-channel Necam automation system to Sound Labs.

Quantel

Quantel Limited has received an order for 15 DPE 5000 NTSC Digital Production Effects systems and other digital video devices valued in excess of $2 million from the

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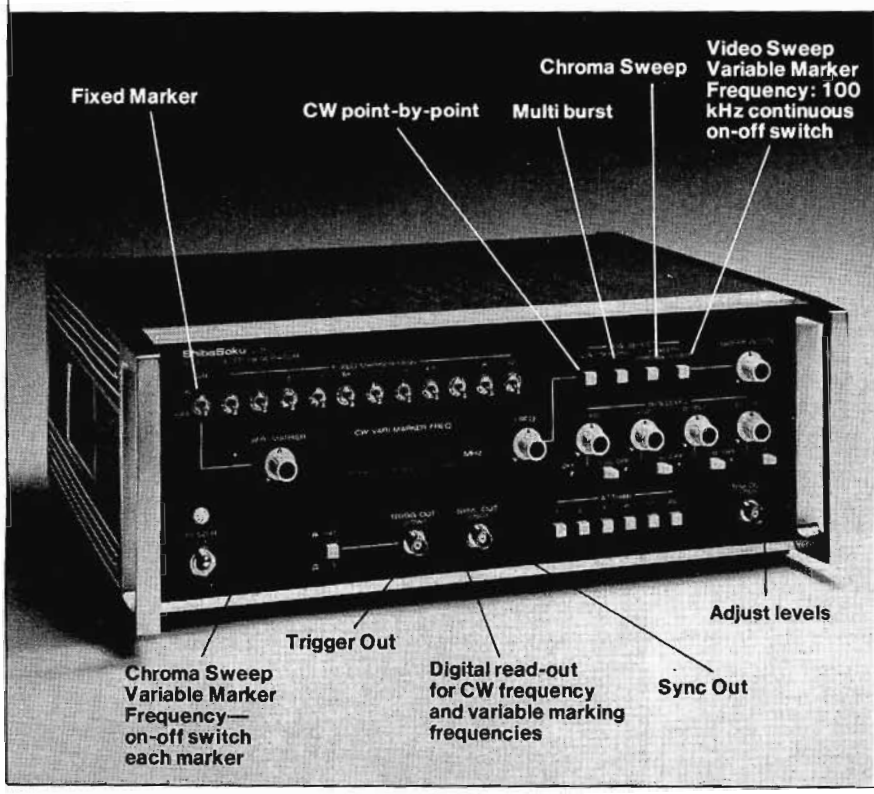

AND MAINTAIN IT!! Measures frequency response on TVs, VTRs and other video equipment.

The Asaca Video Sweep Generator 205 contains a built-in standard color sync signal generator. The color burst can be switched on and off so the 205 is ideal for oscillator comparisons to measure frequency response of color equipment.

There is a selection of output signals: video sweep (0.1 - 10 MHz), chroma sweep (sub carrier ±2MHz), CW and multi-burst.

Also, the 205 features facilities for composite sync signal outputs and trigger pulse outputs (H. D/V. D. Selectable) and so it can be used for oscilloscope triggering. Digital read out for CW frequency and variable marking.

Contact your Asaca distributor for details or demonstration. Or write to:

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National Broadcasting Company. Besides the digital effects systems, the order includes four NTSC DFS 3100 digital framestore synchronizers, five DPE 5001S digital production effects systems, four DFS 3001S digital framestore synchronizers and a DSC 4002 digital standard converter for converting the Soviet Secam signals to NTSC.

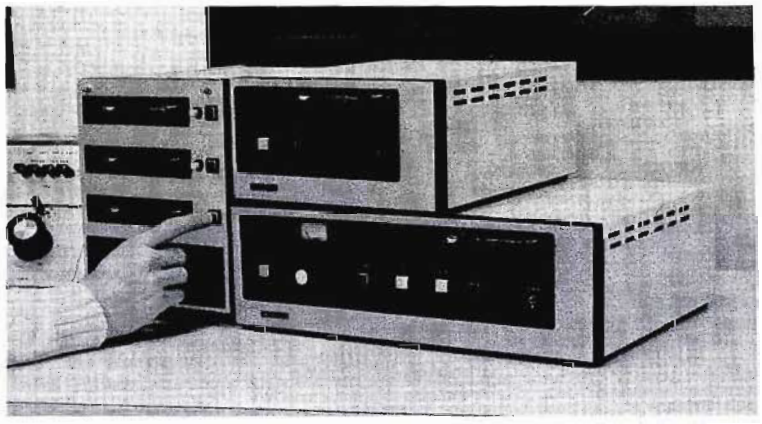
RCA

RCA reports the following major sales and contracts since the first of June:

- 90 color TV cameras and associated equipment, valued at about $5.5 million, to Radiotelevisione Italiana (RAI);
- Cablevision Systems equipment and installation services, valued at about $4.5 million, to Fresno Cable TV;
- television program production equipment, valued at more than $1.5 million, to KCET, Los Angeles;
- transmitting and studio equipment, valued at more than $1.5 million, to Ziff Davis Broadcasting;
- television program production equipment, valued at more than $1.5 million, to The Production Company, Houston;
- television program production equipment, valued at about $1.1 million, to Televisao Guaiba Ltda., Porto Alegre, Brazil;
- transmitting and studio equipment, valued at more than $600,000 to Radio Difusora do Maranhao, Brazil;
- studio and editing equipment, valued at more than $500,000, to Synatrak, Hollywood, FL;
- a 2-way radio system, valued at more than $125,000, to ABC-TV for coverage of the Winter Olympics; and
- 15 portable color television cameras to Bulgarian Television. Bulgaria.

Fight Inflation With Harris Criterion 90 Series

Unbeatable Price and Performance



For the discriminating broadcaster whose demand for quality is increasing, but whose budget isn't, Harris offers the inflation fighting Criterion 90 cartridge machine.

100% solid state construction and simplicity of design coupled with computerized testing and strict quality control guarantees the Criterion 90 a long life of superior audio performance—and the price is well within your budget.

Call Harris Corporation, Broadcast Products Division, Quincy, Ill. 62301, for more information on inflation fighter prices and a 30 day field trial.

See you at NRBA
Oct. 7-10
Booths 3-7

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COMMUNICATION AND INFORMATION PROCESSING

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Sony Broadcast

Sony Broadcast has sold electronic news gathering equipment valued at more than $1 million to the five owned and operated television stations of Group W (Westinghouse Broadcasting Company). The order included 30 BVP-300 broadcast video cameras and 50 BVU-50 ¾-inch videotape recorders.

Thomson-CSF

Radiotelevisione Italiana (RAI) has ordered television and video equipment from Thomson-CSF. The first delivery will include UHF 2+2kW and 10+10kW transmitters. The company will supply nine still image analyzers for color slide projection.

FINANCIAL

Ampex

Ampex has declared its first dividend in its 35-year history. The dividend of 5 cents per quarter, payable August 28 to stock of record July 26, was declared less than two weeks after the company reported record net earnings and revenues.

Anixter Brothers

Third quarter net income rose 159% on a 46% sales gain at Anixter Brothers. Sales for the third quarter totaled $69.8 million over $47.8 million in the period the previous year. Net income rose to $2.3 million or 71 cents per share, from $888,000 or 28 cents per share last year.

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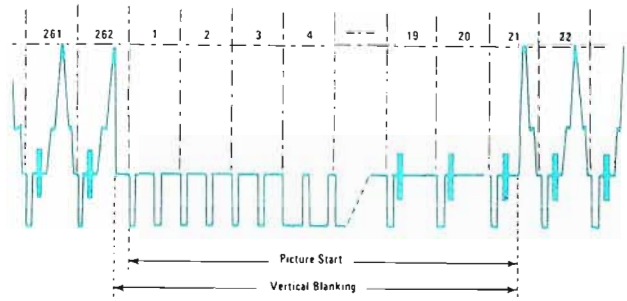
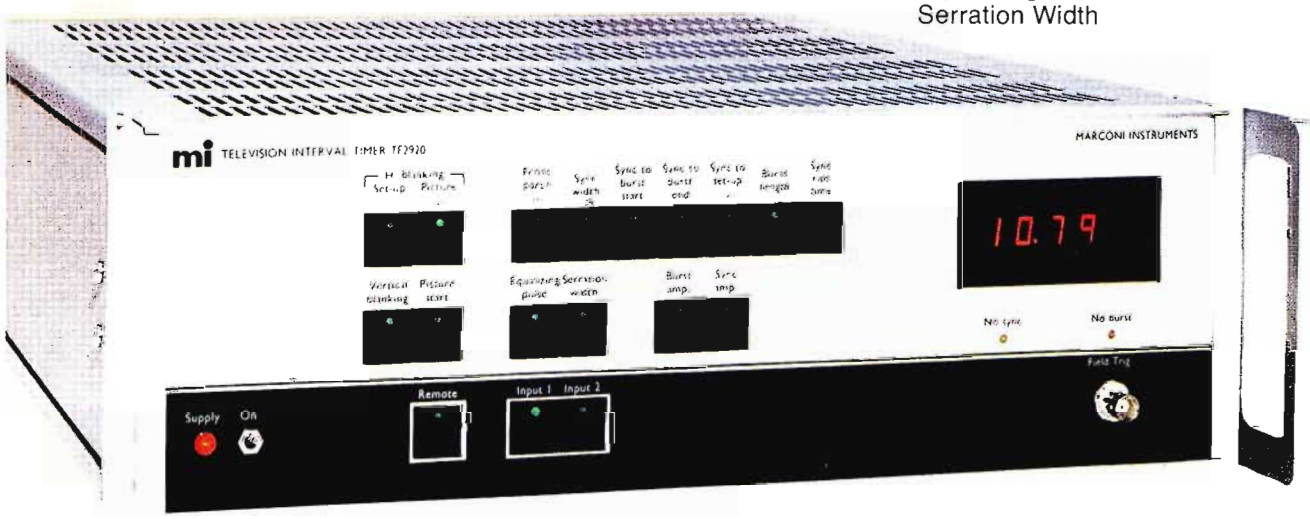
MARCONI has the proven answer to 'H' & 'V' Blanking Measurements

Marconi Television Interval Timer Model 2920 measures the following parameters



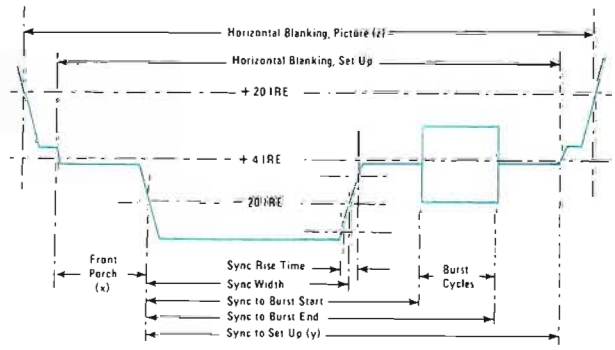
VERTICAL BLANKING MEASUREMENTS

Total Vertical Blanking Interval
Picture Start
Equalizing Pulse Width
Serration Width



See How Easily Timing Measurements Can Now Be Made

- Fast accurate measurements at the touch of a button
- Results from samples taken throughout active field
- Blanking at set-up (+4 IRE) and picture (+20 IRE) measured independently to 10 nsec. resolution
- Vertical Blanking resolved to 1/10 line
- Printout from BCD output on command
- All functions may be remotely controlled for simple system integration
- Manufactured in U.S.A., domestic price $4950



HORIZONTAL BLANKING MEASUREMENTS

Set Up Blanking (+4 IRE)
Picture Blanking (+20 IRE), (z)
Front Porch, (x)
Sync Width
Sync to Burst Start
Sync to Burst End
Sync to Set-Up, (y)
Burst Length in cycles
Sync Rise Time

REFERENCE MEASUREMENTS

Burst Amplitude in IRE
Sync Amplitude in IRE

marconi instruments

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TELEPHONE: (201) 767-7520 • TWX: 710-991-9752

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Atlantic Research

Earnings at Atlantic Resarch for the first six months of 1979 increased by 17% over the same period last year. Net income was $734,000 on sales of $24.8 million, compared to $625,000 and $21.5 million for a like period in 1978. Earnings per share were 63 cents this year compared to 62 cents in 1978.

Cohu

Cohu reported net income of $475,035 or 28 cents per share for the first six months of 1979. Revenues were $10.6 million compared to income of $216,759 or 13 cents per share on revenues of $9.1 million in the like period of 1978. An eighth consecutive quarterly cash dividend of 4 cents per share has been declared by the directors.

Comcast

Comcast has declared a quarterly cash dividend of 3 cents per share on Class A and Class B common stock. The payment will be made September 27 to shareholders of record as of September 6.

COMSAT

Consolidated second quarter net income of $10.6 million or $1.32 per share, has been reported at COMSAT. This is an increase of 37% from $7.7 million or 96 cents per share for the second period of 1978. Compared with the first quarter of 1979, second quarter net income decreased by $1.3 million or 17 cents per share.

Datatron

Datatron reported a profit of $34,254 on sales of $1,249,477 for the third quarter ended March 31.

Farinon

Farinon has announced increased sales and earnings for its fiscal year ended March 31, 1979. Sales for the year were $92.8 million or 23% above last year's sales of $75.4 million. Net income at $5.7 million was also 23% above the previous year's income of $4.6 million. Net income per share for the year was $1.18 compared with last year's $1.00.

RCA

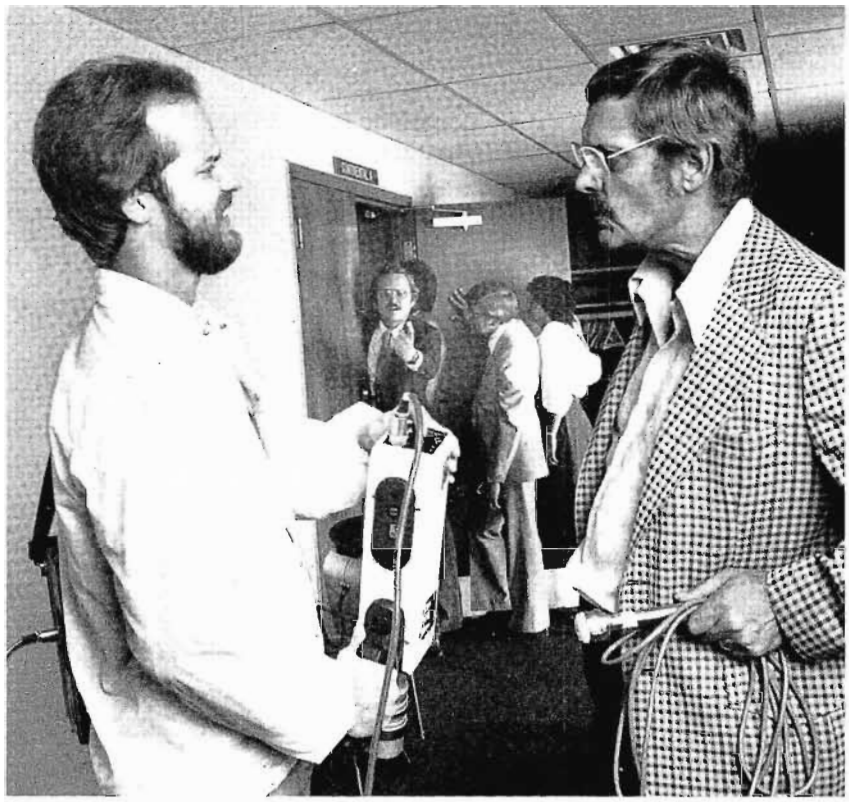
Second quarter earnings at RCA rose 9% over the record profit in the same quarter of 1978 on a sales gain of 17%. Net profit for the three months ended June 30, 1979, was $85.6 million, compared with $78.3 million in the same period last year. Quarterly earnings per common share rose from $1.02 a year ago to $1.13. Sales for the quarter reached $1.89 billion, against $1.61 billion a year ago.

Scientific Atlanta

Scientific Atlanta reported sales of $86 million for the nine months ended March 31, 1979. That is 29% over the same period last year. Net earnings of $5 million were 37% higher than in the first nine months of last year. Net earnings were equal to $1.85 per share, compared with $1.50 per share in the first nine months of previous year.

Sennheiser Electronic

Sennheiser Electronic of West Germany has reported sales of $28.9 million in 1978, an increase of 10% over the previous year. Headphones now account for almost half of the manufacturer's sales, compared with only 1% 10 years ago. □



The Senator just announced he's running again.

Too bad your camera isn't.

If you've lost a story because of weak, unreliable batteries, take a look at Alexander Ni-Cad replacement batteries. Alexander was a pioneer in the development of nickel-cadmium batteries for ENG and EFP. And we're working closely with station engineers and videographers to develop new power products for even greater reliability.

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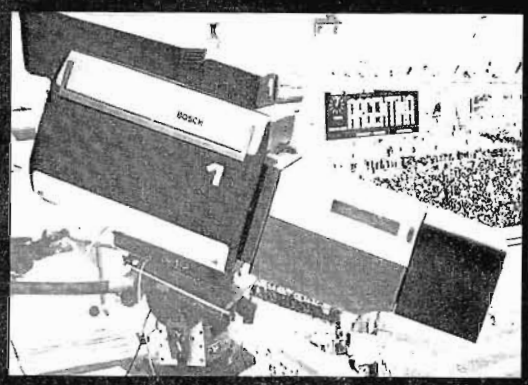
New economic 2/3 inch option: KCP.
Self contained multipurpose camera system KCA with comprehensive base station features.
Ease of operation with a high degree of automation. The latest technology with the economy and flexibility of system design. A rational and progressive camera concept in all color standards.
From Bosch.



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Television Systems Division

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improves antenna stability for AM directionals.

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"Since these non-metallic synthetic guys eliminate white-noise arcing, they should be considered where high water tables and common grounding, severe lightning storms, or frequently inclement weather tend to create transmission and reception problems.

"Several broadcasters improved antenna stability for AM directionals by replacing steel guys with PHILLYSTRAN."

See US at NRBA Booth 502 Oct. 7-10

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Partner
Sherman and Beverage
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Medford, NJ

PHILLYSTRAN® Tower Guys are • non-conducting • maintenance-free • easy-to-install

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☐ "10 reasons why your best buy for tower guys is PHILLYSTRAN®"

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association news

National Association of Broadcasters

1771 N Street, NW
Washington, DC 20036

Lerner elected chairman of NAB radio board

Arnold S. Lerner and Edward O. Fritts have been elected to 1-year terms as chairman and vice chairman, respectively, of the National Association of Broadcasters' radio board of directors. Lerner is chairman of WLLH, Lowell, MA, and Fritts is president of Fritts Broadcasting, Indianola, MS. In the new positions, both will serve on the executive committee which advises Vincent T. Wasilewski, president, on the implementation of NAB policies.

FCC asked to rethink microwave frequency decision

The NAB has asked the FCC to reconsider its decision on microwave frequency use and not allow the expansion of Cable Television Relay Service (CARS) into the band set aside for broadcast auxiliary service which includes ENG operations. The petition stated that, "with an astounding lack of foresight and with little, if any, regard for the full record, the FCC has struck a critical blow to the future of ENG, creative public service programming and overall video responsiveness by the broadcast television medium." If the commission insists on some entry of the CARS service into this band, "it must do so on either a waiver basis or by according CARS nothing more than a secondary status, at least in the top 100 television markets."

Voluntary receiver performance program proposed

In two separate actions made recently, the NAB proposed a voluntary program of AM and FM radio performance standards and an inclusion in the capability of television receivers to reject noncommercial FM interference to channel 6.

In the area of radio performance standards, the NAB is proposing that receiver manufacturers voluntarily submit tests to NAB or an independent laboratory. Under the plan, the NAB would authorize the manufacturer to attach a seal signifying compliance if the radio meets the standard. Three classes of performance are proposed: A, B and C. The purpose is to encourage design improvements in receivers and to help buyers utilize electrical performance as part of their purchasing decision.

Regarding TV receiver performance, the NAB said that the action would be a long-term solution and urged the FCC to adopt their earlier plan which asked for FM station assignment policy modifications, FM power limitations, FM vertical polarization requirements and the creation of an FCC task force to consider the channel 6 interference problem and prepare a plan of action.

NAB asks FCC to regulate home satellite reception

The NAB has requested that the FCC make an inquiry and adopt policies governing home satellite reception before proliferation of receive-only earth stations occurs. According to the association, "unregulated growth of such reception antennas could lead first to the serious impairment of the program supply market, through unlawful and uncompensated use of program product, and second, could threaten the conventional terrestrial television system and the principle of local video service responsive to local needs and interests." The NAB urged the commission to maintain a system of earth station licensing and

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Direct drive made Panasonic Series 9000 a great 3/4" editing system. Here's what makes the new 9000A an even better one.

The new Panasonic Series 9000A offers even more impressive performance, even more quality, and more professional features than the Series 9000 did last year. And we still have the lowest price tag in the business.

The new system consists of the NV-9500A editing recorder, the inexpensive NV-9200A player/recorder, and the NV-A950, the versatile editing controller that goes between them.

Together, they deliver the cleanest Panasonic frame-to-frame edits ever.

S/N ratios are our highest ever, 46 dB color and 50 dB black and white, thanks to new crystal-oriented HPF™ video heads. And in addition to those crisp, clean edits, you get reduced audio delay at the edit point. And substantially increased frequency response at the first generation.

That's not all: The newly increased frequency response works with a patented dubbing mode for even better dubbing quality. And still another of the many important improvements is a new tape guide path on the video head cylinder. It reduces tape edge movement for an even better RF envelope, and an even better signal—the best yet from Panasonic.

You get all these improvements, plus professional features you can count on in a Panasonic editing system: Like controls that are completely solenoid-operated. A separate RF output for use with an external DOC. Even subcarrier and external sync inputs for use with a time base corrector.

The Panasonic Series 9000A ¾" editing system. The only thing that looks better than its performance is its price.

For more information, write: Panasonic Company, Video Systems Division, One Panasonic Way, Secaucus, N.J. 07094. In Canada, Panasonic Video Systems Department, Mississauga, Ontario.

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noted that any proliferation of earth stations or modification of current satellite uses would be in direct violation of domestic and international restrictions.

Advisory team requested

In a letter to the secretary of the FCC, Erwin Krasnow, senior vice president of the NAB, repeated a request that the commission establish a joint government-industry advisory committee on full-time radio services. Krasnow stated that the committee should be "established to make a comprehensive review of all proposals pertaining to aural allocations, including the proposed restructuring of some of the Class I-A clear channels." The NAB believes that an overall national radio allocations policy is necessary rather than a piecemeal approach.

Antitrust suit brought

The US Justice Department recently requested that the US district court of Washington, DC, rule that the NAB television code standards are in violation of the Sherman Antitrust Act and should prohibit their use. The code, in effect since 1952, places the following restraints on nonprogram time, including commercials:

- for network affiliates: in prime time, 9½ minutes per hour, and 30 seconds per hour for promotional announcements when deemed necessary;
- in children's programming on Saturdays and Sundays, 9½ minutes per hour;
- in children's programming on other days, 12 minutes per hour;
- all other time, 16 minutes per hour;

time, seven minutes per half hour; and

- in all other times, eight minutes per half hour.

According to the government's suit, the codes place unreasonable restraints on trade and commerce, however, the NAB contends that the codes are in the public interest.

Minority fund grows

The Minority Investment Fund established last February by the NAB to assist minorities in purchasing broadcast facilities has received corporate guarantees and cash contributions of almost $9 million to date. The goal is to obtain $15 million in contributions from individuals and corporations which will be supplemented by matching funds from the Small Business Administration.

Dismissal of complaint against form requested

The dismissal of a Citizens Communications Center complaint against their request that the FCC modify and clarify its revised annual employment report has been requested by the National Association of Broadcasters (NAB). NAB says the complaint contains "seriously distorted characterizations of NABs petition and of the employment and employment reporting practices of the broadcast industry."

In its original filing the association had suggested that the commission add job titles erroneously omitted from the revised form, include particular titles in more than one job category and reinstitute the provision allowing licensees to place employees in job categories where equivalent to similar positions are found. □

Wang Time Tunnel(TM) because: What they don't hear can't hurt you!

All it takes is one inadvertent obscenity or ethnic slur and away goes a chunk of the market you are trying so hard to nail down.

Time Tunnel(TM) solves the problem for 26 cents an hour with a six second digital delay that lets you drop, chop or bleep anything you don't like, long before it hits the air.

Call the gang at Wang at 800-258-1034
for information on our free trial offer.
It could be the last time you ever have to worry
about your station airing the wrong words at the wrong time.

WANG

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LEADER LAG-125 LOW DISTORTION AUDIO GENERATOR

- Clean square waves test transient response.
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- Pushbotton frequency range switching, 5 steps.
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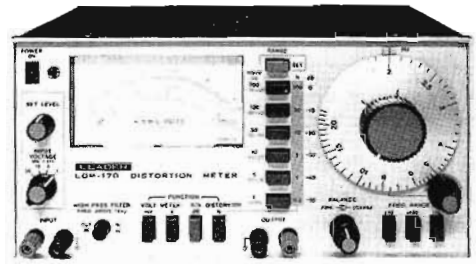

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- Completely RF shielded
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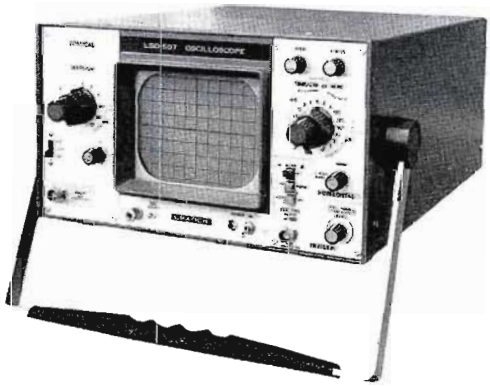

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association news

NRBA

National Radio Broadcasters' Association

1705 De Sales Street, NW
Washington, DC 20036

NRBA proposes new radio deregulation measures

The NRBA has begun to press for a radio deregulation bill now that HR-3333 is dead. The association has submitted a summary of radio deregulation proposals to Representatives Lionel Van Deerlin and James Broyhill. These congressmen will share the proposals with other members of the House Communications Subcommittee in the near future.

Highlights of the proposals include the following:

- Radio licenses extended to 7 years;
- Licensees will meet the public interest, convenience and necessity standard by broadcasting a certain percentage of non-entertainment programming—this percentage, to be determined by the FCC, shall not exceed 8% for AM stations or 6% for FM stations;
- License revocation only in cases of willful and intentional reporting of false information to the FCC, willful and repeated failure to operate as set forth in the license, violations of lottery, fraud and/or obscenity laws as outlined in the United States Criminal Code;
- The FCC shall be prohibited from evaluating program content, format, presentation or topics covered in non-entertainment programming in renewal proceedings;
- Section 317 of the Communications Act of 1934, sponsorship identification rules, will be repealed;
- In the event a renewal application is designated for hearing, competing applications will not be entertained;
- Ownership will be limited to 10 AM and 10 FM stations—no restrictions on cross-ownership of AM and FM stations;
- FCC required to set standards for petitions to deny or revoke, and to establish sanctions for abuse of these processes—parameters for standards and sanctions to be set by statute; and
- Establish fund to make moneys available to minority applicants qualified to own and operate a radio station. Fund to be administered by the FCC.

Benefit questions asked

The NRBA has distributed forms to its member stations in order to determine their interest in developing several employee benefit plans. This includes Group Life, Basic Hospitalization, Major Medical,

DOES YOUR SYSTEM PERFORM TO ITS FULL POTENTIAL?

Restore your signal to the quality you should expect
with the Sigma Electronics video processing system.
Sigma's video processing system consists of the field-proven genlock
sync generator, CSG-300, and the new video processing amplifier, VPA-100.
Optimize your video signals by independently controlling
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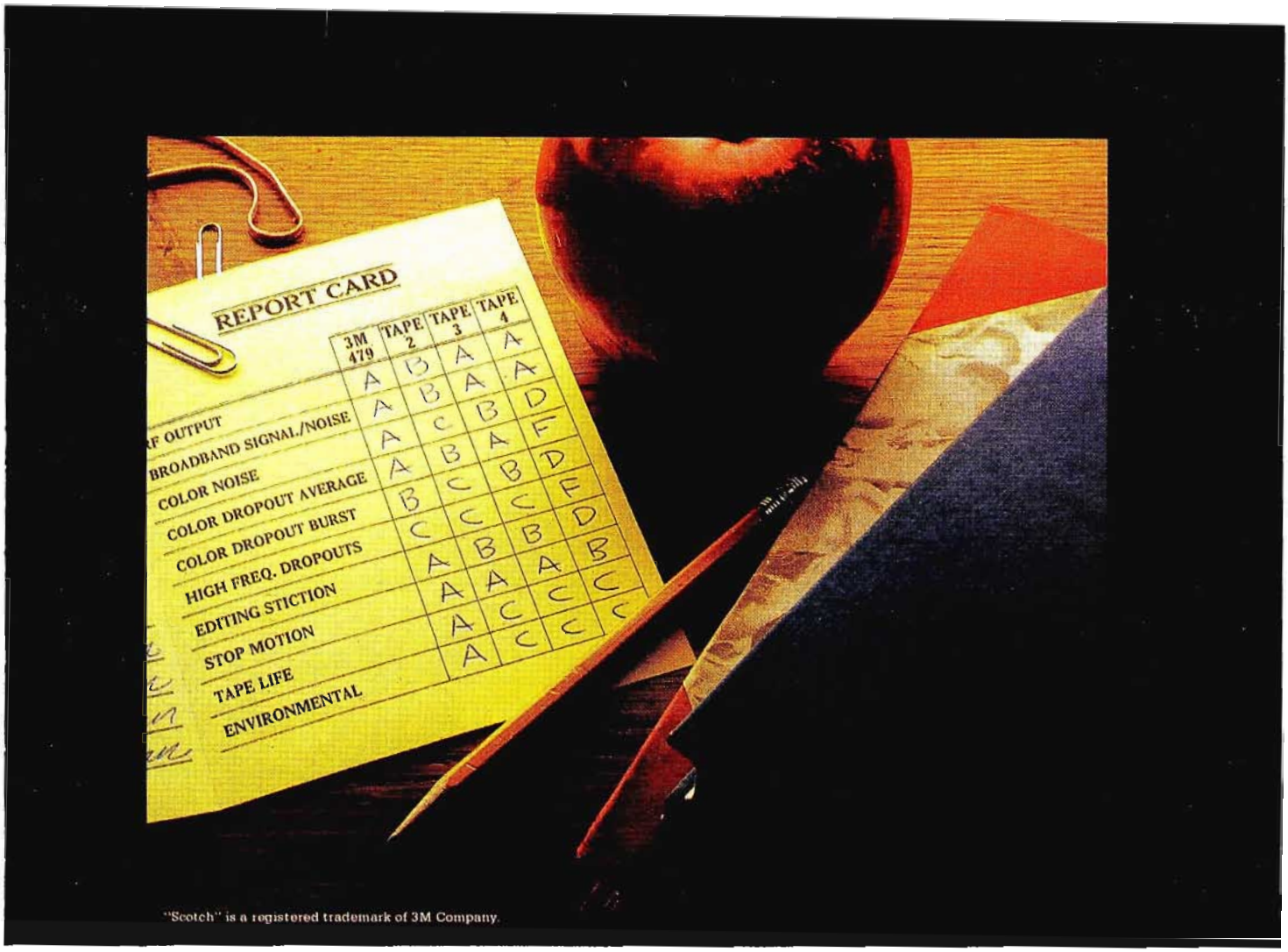

IN A TEST OF ONE-INCH VIDEO TAPES, WE ACED OUT THE COMPETITION.

When we tested the top four brands under strict lab conditions, the overwhelming performance leader was Scotch 479 Master Broadcast Video Tape. In fact, we came out on top in all ten performance categories.

If that isn't reason enough to make us your choice, maybe this is. We're the only one-inch supplier that winds your tape onto a special cushioned flange reel to protect against shipping and handling damage. And we pack and ship our tape in a flame-retardant case to give you even more protection.

We're the people who pioneered the development of video tape 25 years ago. And according to the pros who know video tape best, we're still the best video tape. Give or take an inch.

3M

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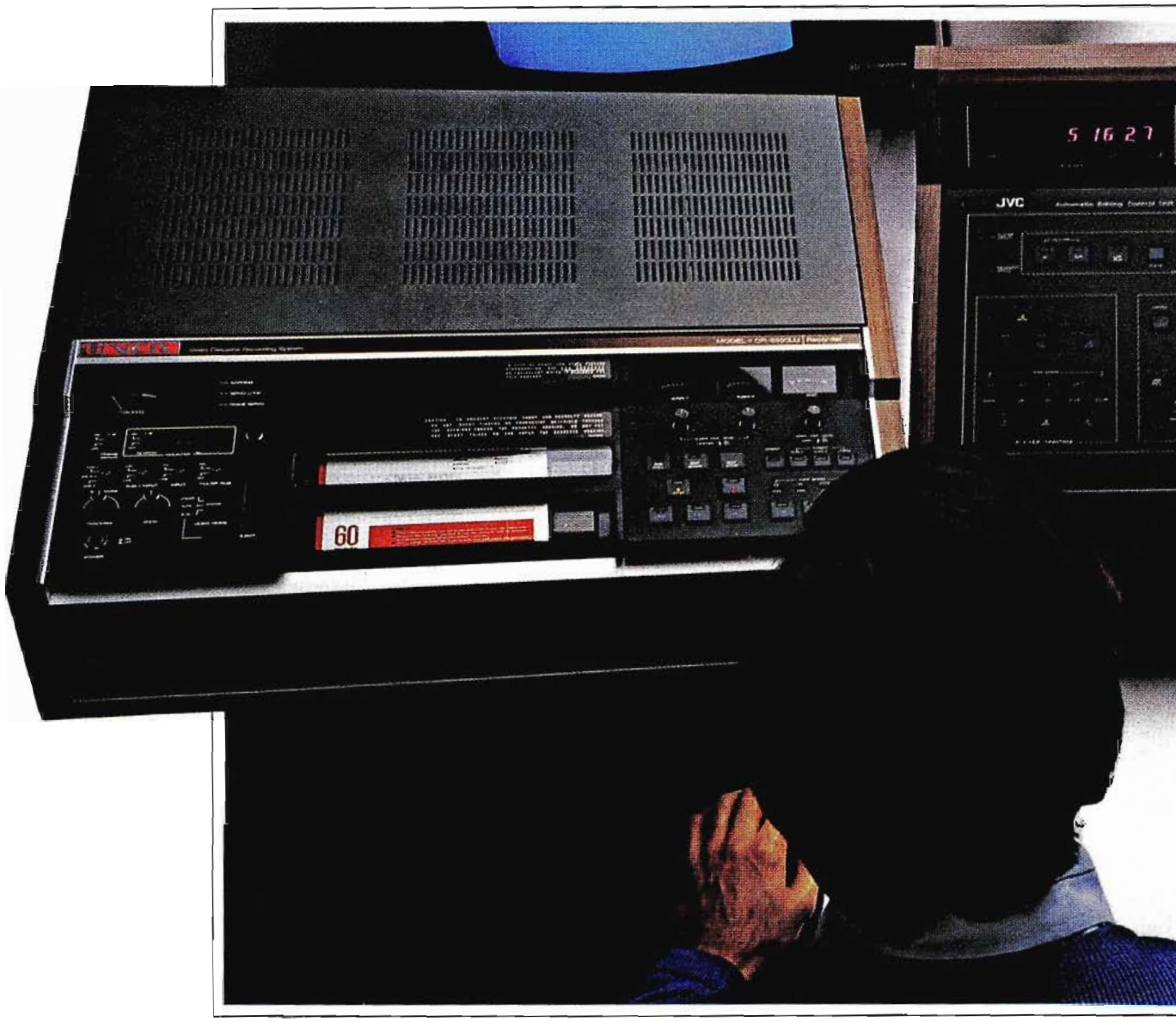
JVC's $17,000 editing system.



If you think a third audio channel and 10 extra lines of resolution are worth an extra $6000 in a ¾" video editing system, read no further.

But if you'd like to save $6000 compared to the nearest performing competition...yet perform advanced editing functions at tape speeds up to 10 times normal (a JVC exclusive)...and produce broadcast quality tapes even if you're not an expert...then the CR-8500LU system including RM-85U Editing Control Unit is for you. It has many features you won't find elsewhere except on that higher priced system. Plus some you won't find even there.

Fast, no-glitch editing

With pushbutton ease, you get distortion-free frame-to-frame editing, thanks to JVC's built-in rotary erase head, blanking switcher and advanced servo mechanism. First, you have a choice of 11 forward and rewind search speeds, from still-frame to an unequaled 10 times normal. After picking edit points, you also have a wide choice of automatic preroll times. (The more expensive system limits you to 2 or 5 seconds.) Then you can preview your edits and adjust edit points. Preroll again, and edits are made automatically, electronically, at exactly the selected points ±2 frames—an accuracy equal to the higher priced system. There's also a horizontal sync phase compensator to minimize timing error. A patented dubbing switch for maintaining stable color. And much more.

The RM-85U Editing Control Unit has independent LED displays for player and recorder. Each gives elapsed tape time in

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For those who need funds, not frills.

minutes, seconds and frames. Or, the exact length of one edit —a JVC exclusive. But wait! Maybe you don't even need a full system.

Stand-alone versatility

Let's say you just want to assemble or insert edit live material onto a tape. All you need is one CR-8500LU Recorder/Editor...which still gives you the benefit of automatic preroll. By contrast, the higher priced brand makes you buy a control unit as well.

Let a JVC dealer show you how our editing system gives you much more for your money. For the name of your nearest dealer, call one of these numbers collect: East, 212-476-8300; Midwest, 312-364-9300; South, 713-741-3741; West, 213-537-6020. US JVC Corp., 58-75 Queens Midtown Expressway, Maspeth, NY 11378.

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BE-9/79

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Title _____

Company _____

Address _____

City, State, ZIP _____

Phone _____

Type of operation _____

_____

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Dental Insurance, Long Term Disability and High Limit Accident. The form asks, for each plan, whether the station now has, would be interested in or might join if the NRBA comes up with a better plan than the station now has.

The form was due August 1.

Community service study

According to a recently completed NRBA survey, radio stations in one and two station markets will continue to serve their communities of license in the absence of government regulation.

The study was prompted by concerns expressed by the National Telecommunications & Information Agency and the White House Domestic Policy staff that one and two station radio markets might not be subject to the same types of competitive marketplace conditions that would force larger radio markets to meet the needs of the listening public.

The survey found that 93% of single-station markets receive an average of 12 strong radio signals from other markets. More than 85% of these indicated that the outside radio stations also sell advertising in their markets.

The study also cited results from 1978 studies by Frank Magid Associates which showed that good local news coverage is a primary reason people choose one station over another.

Severeid receives award

Eric Severeid, semi-retired CBS news correspondent, will be awarded the NRBA Golden Radio Award October 8, during the Sixth Annual Conference and Exposition at the Washington Hilton in Washington, DC.

The Golden Radio Award is presented when merited for outstanding contributions to the radio industries. Previous recipients include Representative Lionel Van Deerlin, ex-FCC chairman Richard Wiley and Lowell Thomas.

5 new regional directors elected to NRBA board

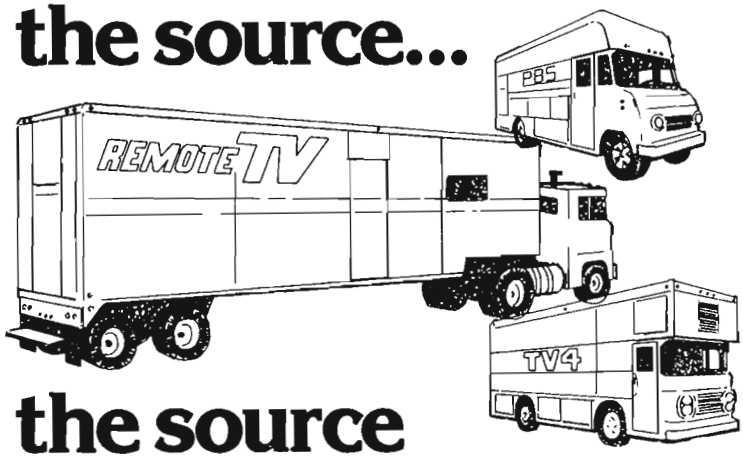
The ballots have been tallied and five new NRBA regional directors have been elected. The following will serve 2-year terms: Bob Herpe, WPLR/WOMN, New Haven, CT, Region 1; Bernie Mann, WGLD/WOKX-High Point, WKIX/WYYD-Raleigh, Region 3; Ron Kempff, WHIO AM/FM, Dayton, OH, Region 5; Paul Lange, KDLR, Devils Lake, ND, Region 7; and Eric Hauenstein, KDKB AM/FM, Phoenix, AZ, Region 9.

Suspect petition misuse

The NRBA has filed with the FCC a request for an inquiry into the uses which have been made of petitions to deny over the last 10 years.

The association says that the basis for the request is that an "aura of misuse and abuse has grown up around petitions to deny." It added that it appears that petitioners frequently file frivolous and unsupported applications and burden the commission's staff. Further, questions have occasionally been raised about the propriety of the reimbursement aspects of some agreements under which petitioners withdraw their petitions (or agree not to file them in the first place) in return for reimbursement of expenses, among other things. □

When you cover the action from the source...



the source for mobile studios should be Gerstenslager.

In a van or trailer, your most modern, best equipped studio could be your Gerstenslager. It all starts when you tell us what you need. The job to be done. Then we'll work with your engineers and principal equipment suppliers. Develop the plans. Detail placement of every piece of equipment, generators, wiring, climate control, consoles. Exactly as you want it. Then, build the unit from the frame up. A studio on wheels that is actually a dependable broadcasting station comparable to conventional studio systems.

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ADM

Control the complete audio spectrum. At the controls of the new ADM® broadcast consoles you command every aspect of audio broadcast production. At your fingertips is a unit far beyond the scope of ordinary expectation. It's designed to the most exacting standards; manufactured to the most rigid tolerances. Its functions appear limitless; its quality obvious. So confident is ADM of their consoles, that they're backed with an exclusive five year warranty. For a complete catalog and list of users contact Audio Designs and Manufacturing, Inc., 16005 Sturgeon, Roseville, MI 48066. Phone: (313) 778-8400. TLX-23-1114.
The Audio Company.

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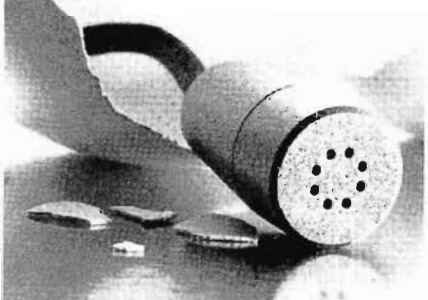
Some things are easily broken...

...not the CO90!



The CO90 miniature condenser microphone was designed by engineers who understand the "real world" requirements of a studio microphone. They've included things like cable assemblies that can be easily and inexpensively replaced in the field. But the CO90 has one feature that no other manufacturer can offer – the Electro-Voice warranty.

Electro-Voice backs up the CO90 with the only two-year unconditional warranty in the business. That means Electro-Voice will repair or replace your CO90 when returned to Electro-Voice – *no matter what caused the damage.*

Electro-Voice can offer that type of warranty because the CO90 was designed to withstand the rigors of professional use. If your application demands a miniature condenser microphone that can take less-than-gentle treatment, the CO90 is the one you should buy.

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association news

AMERICAN SOCIETY OF TELEVISION CAMERAMEN, INC.

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Take 1: More feedback on jobs and training in TV

The current series of columns relating to jobs, training and pitfalls, as relating to the TV operations area, has set off an avalanche of incoming mail. Letters have been received from interested parties such as guidance counselors at the radio/TV universities, vocational institute representatives, employers and lastly, would-be employees.

This response is welcome as evidence that we are relating what seemingly is important and relevant to **BE's** readers. Also, that we may be able to be of some real assistance to these various parties that represent quite a comprehensive cross-section of the TV Family.

Without identifying individuals, here are some brief extracts of what is being received. An instructor at a midwestern technical institute writes: "...You addressed some common problems...many of which concern us as a broadcast training station. ...As we continue to send graduates into the broadcast field, we are encountering the importance and necessity for 1) a national broadcast organization that would promote professional standards within the industry; 2) a national job information clearinghouse;...and 3) a resource information center that would provide the broadcast worker and trainee with seminars, newsletters, new equipment and happenings in the industry." Another letter from a graduate coordinator at a large northern university's school of radio/TV says, "Please send information on how ASTVC can help our students prepare for careers in television. We have nearly 700 undergraduate majors in radio and television...arrange for a rep of ASTVC to visit our campus."

A systems division manager of a southwestern production house wrote "Our company is involved in field production, post-production editing and duplication based here in Arizona...Your article in **BE** attracted my attention because we are having the same problems related in the article. ...I would be interested in receiving...information you can send me regarding *qualified* personnel as we will require very shortly one producer, one director, four camera-people, script writers, etc...I would...entertain the prospect of receiving resumes from those interested."

This next letter is representative of many expressing similar points of view, and quite possibly is the one most common criticism we hear. "...As a recent colllege graduate, the article was just what I was looking for in terms of job-seeking guidance. I do not consider myself (as yet) a cameraperson...although I did take the (required) TV/film courses...for my MassComm BA degree. Most of my years in college centered around the student-run... station. My college courses failed to prepare me for a career in broadcasting because of a lack of state-of-the-art equipment, and although new facilities are being built, the department's staff has dwindled to one full-time professor. Such is the case with many...schools."

We believe that the letters printed (in extract form) for your general information and guidance represent the thoughts and experiences of so many people in our industry. Still, this is just a superficial view of the many complicated and frustrating

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WHY FUJI?

Just a few short years ago, few people in the industry even knew our name. Let alone, what we stood for.

Then we introduced H701E—the low noise, high-band broadcast videotape that gave the industry a whole new set of performance standards. And Beridox. A videocassette tape formulation combining the best features of chromium and ferric oxide. Now available in one-inch, as well.

Now, it seems a lot of people are standing in line for our products. Because they know—and like—what we stand for.

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problems that present themselves to all those interested in the *human* resources factor of this industry. In future issues of this column, we will examine related areas of concern and, by telling it like it is, endeavor to answer those questions put to us by member and non-member alike. We are most grateful to the editors of **Broadcast Engineering** for providing us with the means to present this forum which we know to be of interest and value to so many of our readers.

Take 2: The Arabs are coming!

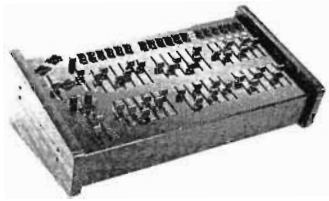
Our column in the June issue of **BE** related how the ASTVC was chosen by the US Department of Labor to coordinate the training program for several visitors representing Yemen Broadcast Authority. As stated then, we believe that what we learn through our efforts to provide a comprehensive training program for these people will prove most useful to the ASTVC in aiding us in many of our own programs for members.

We would like to say how pleased we are for those offers to cooperation and assistance extended us by organizations such as NBC, WNET (PBS), USMA-TV and the pending commitments of several others. These guests of the Labor Department's Bureau of International Visitors will first undergo an extensive English language refresher course slated to begin at Georgetown University on or about August 6. At the conclusion of this course, present plans call for a period of intern or over-the-shoulder type training at one or more Washington-based outlets. From there, they will travel to NYC to undergo related training at still more broadcast and/or production houses. For one or two of them, there will be a period of indoctrination at one or more transmitter sites.

Additionally, there may be a period of residence instruction provided by one of the vocational/technical schools to be chosen if necessary. Once again, the ASTVC hopes to learn much that can be of future value to our membership and the readers of this column. We will analyze most carefully the training programs (and results) provided by this project and the various participating agencies. □

. . . in lighting control systems

EDI's New Trouper Line . . . The Clear Choice



It is The Clear Choice because this portable controller line Truly Cuts Costs . . . many standard Trouper features may be optional elsewhere, even if they can be found in a trouping configuration.

The basic Trouper comes in a desk or trouping model and comprises two scenes of up to 36 channels each, with switches above the channels indicating operational modes: Master, Independent, and Full Independent. Two time faders (0-100 seconds) associated with split cross faders-plus a switch to defeat the split mode-mean precise, dipless cross fades. Unique to the Trouper is a **third** time fader, providing a timed Independent Master.

With EDI's Trouper you also save time and money on calibration. Calibration for the entire unit requires just a single adjustment to one control card.

Prices start at $695.00 for a 2 scene 12 channel Trouper and range to $1495.00 for a 2 scene 36 channel. More on the Trouper? It's expandable . . . add other units and slave them to the original. For even more, write us or call (Phone (503) 645-5533)

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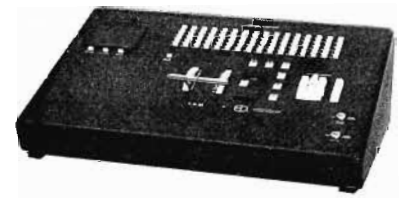
. . . in lighting control systems

T.A.M. . . .

The Adaptable Memory



. . . with Multi-Scene Preset

The T.A.M. . . . from E.D.I. . . . adds memory to virtually any multi-scene manual controller. Installation is simple and quick. Operation is manual or memory . . . or a combination of either.

- ☐ Channels — up to 120.
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- ☐ Many Other Features.

If you're thinking memory in lighting controls, compare adaptability — compare the T.A.M. from E.D.I. There's other reasons why you should keep the T.A.M. in mind. Phone or write us about them or send for the T.A.M. descriptive brochure. (Phone (503) 645-5533)

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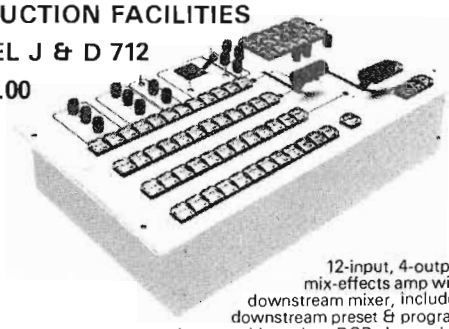
(Also available in PAL and PAL-M versions)

FOR REMOTE & SMALL PRODUCTION FACILITIES

MODEL J & D 712

$7,400.00



12-input, 4-output mix-effects amp with downstream mixer, includes downstream preset & program busses with cut bar, RGB chroma key

Standard Features

- 12 inputs including Black-burst and Color Background
- Built-in Black Burst Generator
- Built-in Colorizer
- Built-in RGB Chroma keyer
- Four Switching busses
- Downstream Preset and Program Busses with cut bar
- Rack-mounted electronics
- Adjustable Soft Wipe
- Adjustable Border edges
- Color Matte
- Vertical Interval switching thru-out
- Illuminated Momentary Contact push buttons
- Internal, external, Chroma-key, and matte inputs to keyer
- Built-in pattern modulator with frequency and amplitude controls
- Full Tally
- Pattern symmetry control
- Illuminated Momentary contact push buttons for effects selection
- Normal/Reverse/Normal-reverse wipe transitions
- Pattern limit controls for presetting size of patterns or varying vertical and horizontal aspect ratio
- Loop-through inputs
- Input amplifiers with clamping
- Synchronous/Non-synchronous inhibit
- Modular construction with front access plug-in modules

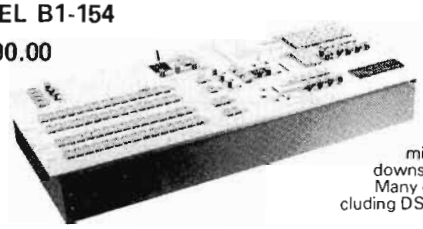
Options:

Downstream Keyer

FOR MODERATE SIZE FACILITIES

MODEL B1-154

$10,990.00

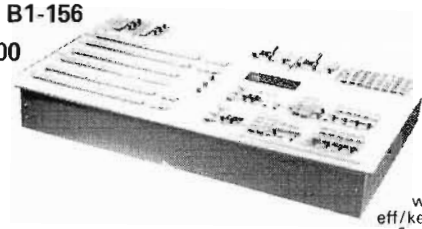


15-input, 4-bus mix/eff/key amp with downstream mix/key amp Many optional features including DSK & quad-split, etc.

FOR SOPHISTICATED FACILITIES

MODEL B1-156

$21,795.00



15-input, 6-bus with two full mix/eff/key systems & dir. pgm & pre busses: many options available, DSK, quad. etc.

MODELS 154 & 156

STANDARD FEATURES

1. **Switcher Models 154 and 156** are of the same basic design and utilize the same electronic sub assemblies. These switchers have the same standard basic features, differing only in the number of busses and in the number of mix/effects units. The basic standard features include 32-pattern mix/effects, color black and color matte background generator, and a mix/key unit in the case of the Model 154.

2. Input Amplifiers
   - loop through high impedance input • gain equalization for 1000' cable • 22° sub carrier phase control • clamped inputs (10% to 90% APL) • sync addition on non composite signals if desired.

3. Tallies
   - isolated dry contact relay closure on all inputs (2 amps at 50 v.)

4. **Mix-Effects Units (Includes Keying Function)**
   - **One** (1) used in Model B1-154
   - **Two** (2) used in Model B1-156.

   Fades (or Supers), Wipes, Keys may be produced.
   Positioner Joystick for each M/E positions patterns.
   - **Pattern Modulation** may be accomplished by an internal waveform generator. Modulating sources may be either (1) sine wave, (2) square wave, (3) saw tooth, or (4) an external customer generated source.
   - **Mix Key** and **Wipe Key** available.
   - **Soft Wipe** and **Soft Key** available with adjustable variations.
   - **Push to Preview** obtained by depressing knob on clip potentiometers (provides for M/E monitor output).
   - **Wipe Mode**—3 interlocked buttons select "NOR", "REV" or "N/R".
   - **Hard Wipe, Soft Wipe or Border** can be selected with degree of softness made by "Edge" control adjustment.
   - **Border** may be **Colorized by adjustment of "Hue" and "Luminance" control.**
   - **Symmetry of Pattern** may be adjusted by "SYM" knob.
   - **Preset Wipe Limits** are set by potentiometers. "H" and "V" vertical preset limits activated by Pattern Limit button.
   - **Spotlight** alternate action push button produces a 6 db. level difference between "A" and "B" input channels in the "Wipe" mode. (Operates on all patterns.)
   - **Pattern Assignment** is made by depressing "**ASSIGN**" button. Pattern select feature may be "locked" to pattern matrix by depressing the "**ASSIGN**" button a second time on the same pattern. Patterns assigned appear on LED display on M/E control panel.
   - **Non-Synchronous Inputs.** An "NS" indicator is provided. Tearing is prevented by not allowing a non-synchronous signal to be switched except at extreme position of fader handle where a "cut" transition occurs.
   - **Key Input Sources** may be either (1) "A" bus video for self keying, (2) preview Key bus, (3) chroma key, or (4) an external key source.
   - **Key Invert** selector provided to accommodate either positive or negative video as a keying source.
   - **Key Fill** may be either "A" video for self keying or a colorized matte.
   - **Mix/Key** provided a lieu of second Mix/Effects system for Model B1-154 switching system. Provides for all mix and keying functions of mix/effects system (as previously described) except for the pattern effects.

OPTIONAL FEATURES

May be added at any time (required control panel wiring already installed)

Chroma Keyer (C.K.) **$950.00**
• **Hue**—selects hue of keying color • **Gain**—adjusts the amplitude • **Clip**—adjusts the clip level for keying • **Camera (4 x 1) input switcher**—selects RGB output of any one of 4 cameras to feed C.K.

Down Stream Keyer (DSK) **$1,275.00**
• Keys in titles, inserts, or fades to black with or without insert • Color matte background • Key sources: (1) Mix/Effect, (2) Chroma Key, (3) External • Push to Preview (Monitor)

DSK Border **$1,200.00**
• **Border**—black edge around insert • **Shadow**—black edge on right side and bottom of insert

Quad Split **$1,190.00**
Provides four (4) variable size quadrants from ten possible sources with variable width border.

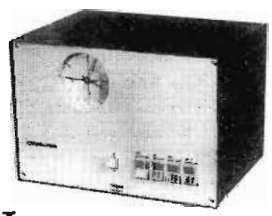
Aux Busses—(Model 156 only) **$2,100.00**
Two remote outputs are available—remote control panel and amps required.

All Beaveronics Switching Equipment Carries a Two Year Warranty

OTHER ITEMS AVAILABLE FROM BEAVERONICS

- Master control switchers AFV with audio breakaway
- Routing switchers with AFV

CHECK BEAVERONICS FOR:
- Specialized custom switchers
- Selected terminal equipment



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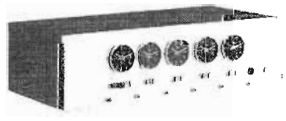
Available with accuracy better than 1 second/yr.



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Prices and Specifications Subject to Change Without Notice.

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State broadcasting organizations and other associations

State associations

Arkansas Broadcasters Association

The ABA has joined several organizations in a combined effort to inform the public about the Freedom of Information Act in Arkansas. June 1st was proclaimed as a special day to observe the operation and the openness of municipal courts in Arkansas.

Colorado Broadcasters Association

Due to changing the date of the 1980 Winter Convention, now January 24-26, there will be a change in dates for the submission of entries in the Colorado Broadcasters Association Annual Awards of Excellence. It is anticipated that for 1979 only, entries must be broadcast on or before November 30, 1979, and submitted by December 5, 1979.

Georgia Association of Broadcasters

Fred Pierce of WJCL Radio/TV, Savannah, has been elected 1979-80 president of the GAB. In accepting the job, Pierce called on broadcasters throughout Georgia to get involved in the fight to influence legislation positive to the broadcast industry.

Kansas Association of Broadcasters

The Annual KAB Engineer's Seminar, held June 6 at The Hilton Inn, Wichita, attracted more than 30 participants. Engineers discussed such topics as AM Stereo, FCC field inspections and Broadcast Loops—What's New, and How to Keep Telco Costs down for Your Station.

Kentucky Broadcasters Association

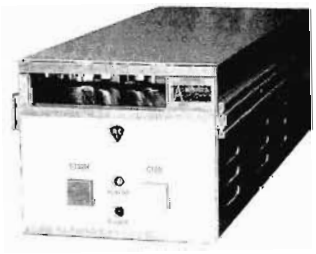
The Kentucky Broadcasters Association has announced that four new members of the board of radio district directors have been elected. All candidates were unopposed and will serve 2-year terms beginning November 1, 1979. They are Shelby McCallum, Radio WCBL-AM/FM; Charles M. Anderson, Radio WKVE; William J. Laney, Radio WNVL; and Roy A. Redmond, Radio WFTM-AM/FM.

Senator Barry Goldwater will speak at the October 24-26 convention at the Lexington Hyatt Regency.

Missouri Broadcasters Association

The MBA fall meeting will be held October 18-21. A big program area will be the elections of 1980: how to handle candidates, both news and

at AUDI-CORD we build CARTRIDGE MACHINES
and — we're not done yet — more new products coming

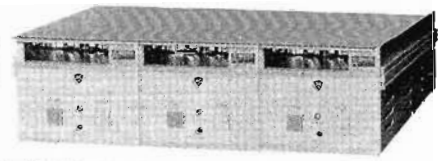


"A" SERIES

An intermediate priced cartridge tape machine series with most of the quality and features found in units costing much more.

1 Tone Models:
Mono—$649
Stereo—$699.
(For 3 Tones
Add $20.)

3 TRANSPORT REPRODUCER:



1 Tone Models:
Mono—$1919.
Stereo—$2069.
(For 3 Tones
Add $60.)

THE "A" SERIES PLAYBACK:

- Modular constructed for easy service.
- Interchangeable transports and other assemblies.
- 1 or 3 tone — mono or stereo.
- Replay reminder system.
- Full remote control — automation compatible.
- Meets the needs of the 1976 NAB standards.
- Latching connectors — slip/lift cover.

GIVE US A CALL AND TALK CARTRIDGE NEEDS

Modu-Cart 100 Series

MODEL 115 RECORD-REPRODUCER

1 Tone Models:
Mono—$1389.
Stereo—$1509.
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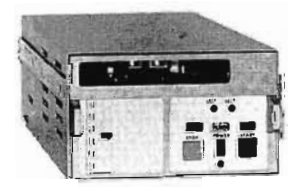
Add $40.)
Timer Add $130.

look at the features:
100% Modern Solid State Electronics; Replay Lock-Out Circuit—Prevents Double Airing; Front Access Controls—Removable Desk Covers; Heavy Duty Inverted Head Mountings; Rugged Mechanical Design—Cool and Quiet; Optional Digital Recording Timer; Internal Record Response Test System; Six Position Auto-Switched Meter; +18 dBm Audio Output—Wide Headroom; Desk or Rack Mount Optional; 24 Model Variations For Your Needs.

AT AUDI-CORD
VALUE IS NOT EXPENSIVE

RACK CABINETS OPTIONAL FOR ALL MACHINES.

MODEL 100 REPRODUCER



1 Tone Models:
Mono—$809
Stereo—$889.
(For 3 Tones
Add $40.)

Tomorrow's Design Today — At Yesterday's Prices

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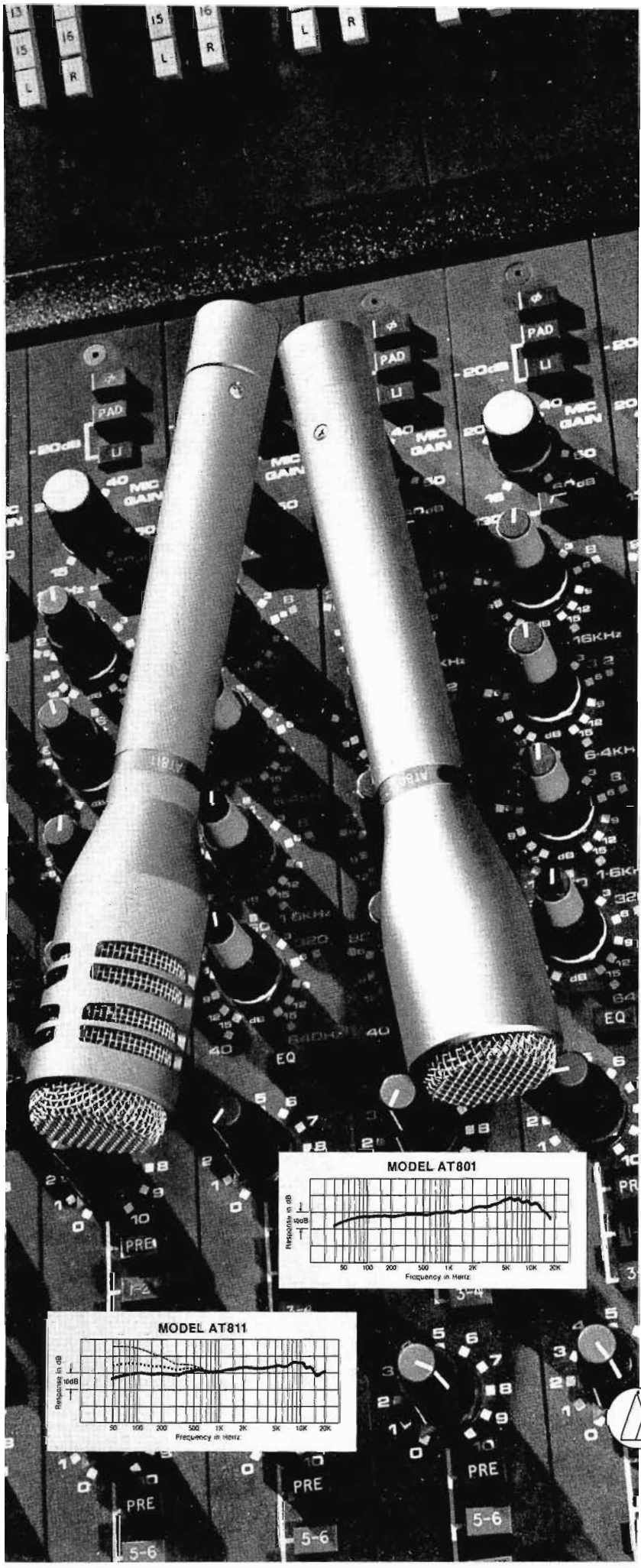


The Audio-Technica philosophy:

EQ should be used to improve the sound... not to fix the mike!

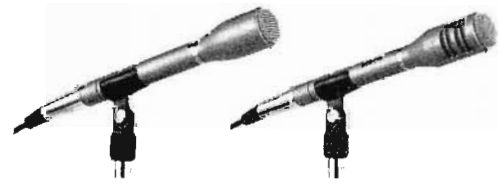
Introducing affordable smooth sound. The remarkable AT801 and AT811 Electret Condensers. With curves so smooth you would have to pay a bundle to match them anywhere else.

Response like this has a number of benefits. First, your EQ is used only to touch up the sound, not to correct built-in errors of the microphone. Which leaves more leeway to control the overall sound.

And without unwanted peaks you have more usable headroom. That's vital when you're working near the dynamic limit of a preamp or line amp. Sound stays clean and sharp. Compressors or limiters sound less forced, because they are controlling peaks in the *sound,* not peaks in the *mike!*

But perhaps the biggest advantage is the versatility of these A-T condensers. Because they have just the right amount of presence for today's recordings, they're not limited to just one kind of instrument...just one type of voice. Put them *anywhere* in the mix: brass, reeds, percussion, chorus, or strings. Then listen. What you hear in the studio you'll hear at the console. Which is a great place to start in miking any session.

At their highly affordable prices, these are two of the best bargains you'll find these days. Reliable, clean-sounding, and the most predictable microphones you can use. Make them a mainstay in your studio today. Write for spec sheets and dealer list.



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Other associations

sales; election return computation at national and state levels; and returns broadcasts in smaller markets.

Ohio Educational Television Network

WGTE-TV Toledo, and WGUG-FM, Cincinnati, were winners in the 1979 Ohio Educational Broadcasting Awards competition presented June 11 in Bowling Green. The Toledo station accepted Oebies in both the Public Information and Development categories with its "Vibrations in Black" awareness campaign and Studio Club Membership drive respectively while WGUC-FM claimed honors in the same categories with its "Show Off '78" awareness campaign and fund raising marathon.

Rhode Island Broadcasters Association

The association has elected the following officers: Dave Russell, president; Sandy Davey, executive vice president; Bob Carson, treasurer; and Don Kane, secretary.

South Carolina Broadcasters Association

At the last meeting of the South Carolina Broadcasters Association, the board of directors announced that judging of the entries for the association's awards activities had begun. Also, a form has been sent to all member stations requesting information about their EBS status.

Broadcast media teams must be ready at a moment's notice. With Christie's integrated system; the REFLEX® 20 Charger and sempiternal ni-cad battery packs, there is virtually no wait. Recharge? The fastest in the industry. 12 to 20 minutes and you're completely charged.

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National/International groups

ABES

An association of broadcasters dedicated to the establishment and maintenance of optimum technical standards in the regulation of radio broadcasting, the Association of Broadcast Engineering Standards, is now actively expanding its membership and addressing industry issues. According to William Potts, Jr., ABES secretary, a special committee of the board of directors has been formed to screen and select an executive director. The special committee is currently meeting with candidates and hopes to have an executive director, who will be based in Washington, selected early in September.

At a major meeting on March 25th the ABES elected the following officers for a 1-year period: Richard R. Miller, KBOW, Butte, MT—president; Jeffrey Hatch, Communications Investment, Salt Lake City, UT—vice president; Thomas K. McKnight, Combined Communications, Phoenix, AZ—vice president; Col. John Bowman, Washington, DC—treasurer; and William J. Potts, Jr., Haley, Bader & Potts, Washington, DC—secretary.

The ABES Technical Committee includes the following members: James Wulliman, WTMJ, Milwaukee, WI; Russel Arnold, Wabash Valley Broadcasting, Terre Haute, IN; Col. John Bowman, Washington, DC; Ralph Green, CBS Radio, New York; Everett Lawson, WLAC, Nashville, TN; and George J. Capalbo, RKO Radio, Boston, MA. All have been elected to the committee for a one-year term.

Persons interested in joining the ABES, or in making their views clear on critical issues, may write William J. Potts, Jr., ABES Secretary, Suite 700, 1730 M Street Northwest, Washington, DC 20036.

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WRE's wide range of degaussers are designed for years of dependable service for clean and simple erasure of magnetic film and tapes in just about any configuration.

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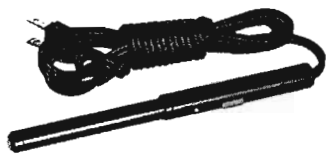
TYPE 9205A Degausser is ideally suited for complete erasure of program and residual noise from video, audio, and data recording tape and magnetic film—in reels, cartridges and cassettes. This unit will bulk erase reels up to 2 inches thick and 17 inches in diameter. Available for 115 or 230 volt operation.

TYPE 642-21 Degausser is similar to the 9205A except it is limited to erasure of 10½ inch reels. This unit is recommended where size and cost are limiting factors.



TYPE 8905 Magnetic Erasing Pencil is an excellent tool for erasing limited, small areas of tape or film and for demagnetizing record/play heads. In program material, words, complete sentences, and even syllables may be erased. This unit is equipped with a press-to-operate switch on the handle.

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Other associations

SMPTE

The record for the greatest number of booths taken at a SMPTE exhibit has been broken by the upcoming SMPTE exhibit that is scheduled for the Century Plaza Hotel in Los Angeles October 21-26. Three hundred booths have been taken so far; the previous record was 220 booths at the Los Angeles Exhibit in 1977. There will be 140 companies from both the motion-picture and television industries participating in this exhibit. In addition to the exhibit the conference will feature a 5-day program of sessions on the subjects of television and motion-picture technology. More than 7000 people from the motion-picture and television industries are expected to attend. For more information, contact SMPTE, 862 Scarsdale Ave., Dept. BE, Scarsdale, NY 10583.

PMPEA

"The Visual Effect of Special Effects" symposium hosted by William A. Fraker, ASC will be presented by the PMPEA in conjunction with the 121st SMPTE October conference in Los Angeles. The association is now sponsoring its fifth annual seminar that has each year produced an informal hands-on atmosphere of hardware usage. Tickets will be on sale prior to the show at the Century Plaza Hotel during the SMPTE Sunday registration and Monday exhibit hours. Tickets are $6 per person. Mail requests and inquiries to PMPEA National Headquarters, Dept. BE, University Tower, Suite 806, 6440 N. Central Expressway, Dallas, TX 75206, (214) 696-1448.

AMTA

The Antenna Measurement Techniques Association was formed March 12-13 in Atlanta as a non-profit organization composed of individuals interested in advancing the art of antenna measurement. The meeting was attended by key personnel from government and commercial organizations representing the interest of the antenna test and measurement field and manufacturers of antenna test instrumentation. Plans for the organization include a software pool which would be available to all members to assist in the development of programming for automatic systems.

For additional information, contact Joe Pape, Scientific-Atlanta, 3845 Pleasantdale Road, Atlanta, GA 30340, (404) 449-2354. □

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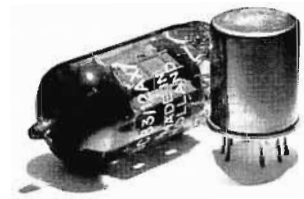

The Price: $33.00 each. Some Ampex models require an Adaptor, available at $16.00 each.

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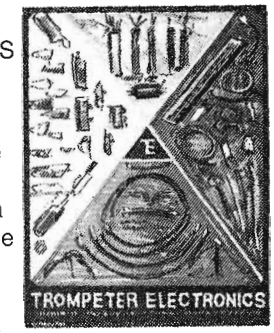

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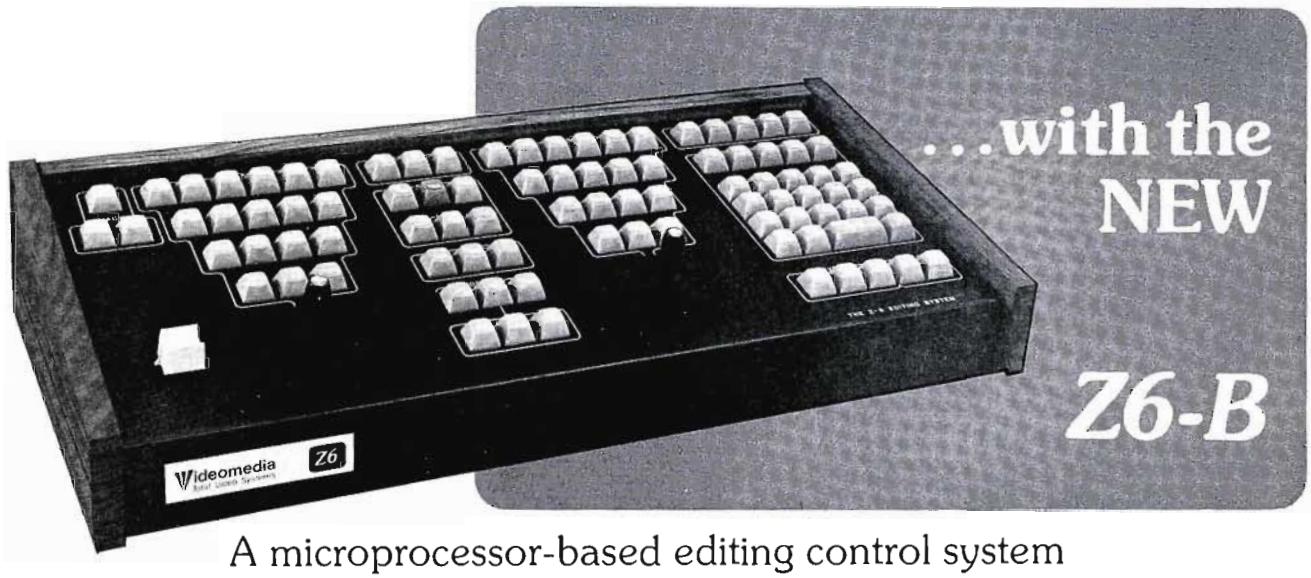

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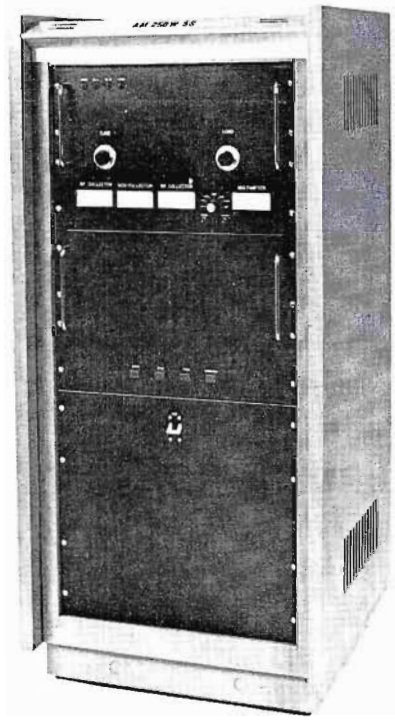

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The Wilkinson Electronics AM-250SS is an all solid state 250 watt Am transmitter housed in an attractive 24 inch cabinet, 52 inches in height. All components are mounted in two drawers for maximum accessibility and ease of maintenance. Space is available in the cabinet fora second transmitter making it possible to combine two 250 watt units to obtain 500 watts. It is also available at any power below 250 watts at a reduced price.

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people in the news

Radio/Television

Robert N. Ordoñez, vice president, Donrey Media Group's broadcast division, has resigned. **Gene Spry,** also general manager of Donrey's KORK-TV, Las Vegas, will assume the additional duties of vice president of the broadcast division.

Solaris Television Studios' new vice president/general manager is **Jerry O'Brien.** Formerly vice president/finance of the television production and post-production company, he will be responsible for all corporate financial management and studio supervision.

John A. Tagliaferro has been appointed vice president-operations at the Hughes Television Network. Tagliaferro has been vice president-communications services since 1977. In his new position he will be responsible for the division and technical and production capabilities at the Madison Square Garden facilities.

The New Jersey Public Broadcasting Authority board of commissioners has named **Gordon A. MacInnes, Jr.** as its executive director. MacInnes was selected from a field of 130 applicants. From 1970 to 1978 MacInnes served as the executive director of The Fund for New Jersey and assisted in the development of the New Jersey Coalition for Fair Broadcasting, the Center for Analysis of Public Issues, the Office of Newark Studies and Schoolwatch.

Outlet Company recently announced the appointment of **Charles F. Kennedy** as senior vice president of the television station group as a reorganization of the broadcast division. Kennedy was most recently the division's vice president of planning.

Recent elections at Cox Broadcasting have resulted in the following: **Alan D. Chunka** to vice president; **John Boyette, John J. Rouse, Jr.,** and **Robert E. Gartin** to assistant treasurers; and **Linda Stewart** to assistant secretary. **Elaine K. Boryk** has been appointed controller.

Edward L. Corn has been appointed chief engineer, KORK-AM/FM, Las Vegas. He has spent the last three years in engineering positions with KIOA and KCBC, Des Moines, IA.

Reid Carpenter has been promoted from director of engineering to vice president and director of engineering at KUTV. Carpenter has been with the Salt Lake City station since it went on the air in 1952 as design construction engineer and studio supervisor.

Jonathan E. Fricke has been named operations manager of WSAI, Cincinnati with responsibility for the supervision and direction of all station departments except for sales. Fricke most recently served as program director.

The Christian Broadcasting Network has named **Tom Smith** to the position of general manager at WXRI-FM. Smith also will serve as general manager and general sales manager of the CBN operated WYAH-TV station. He will be responsible for sales management,

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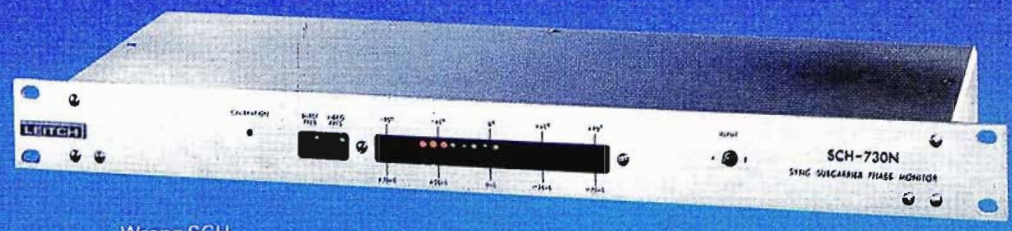
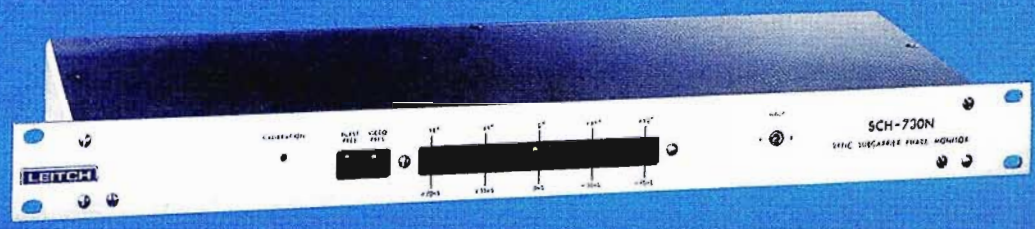


Wrong SCH



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administration and operation of the FM station.

At KCET-TV/Los Angeles, **Steve deSatnick** has been promoted to vice president of operations and engineering. Previously, deSatnick was the station's director of operations and engineering.

Steve Flyte has joined KABC-TV/Los Angeles as a mini-cam engineer for their news department. Flyte was formerly with KATU-TV/Portland, OR, in the same capacity.

Emmett H. Massie is now director of engineering for public television station WUFT, Gainesville, FL. Massie formerly was chief of technical operations for the United States Army Intelligence School at Fort Devens, MA.

Recent staff appointments at KFVS-TV, Cape Girardeau, MO, include **Warren Bottorff** to chief engineer, and **Jerrold Hollis** to production manager. Bottorff was most recently at WRVY-TV, Dothan, AL; Hollis has been with KFVS-TV.

Don Kerouac has been promoted to chief engineer of WKAN, Kankakee, IL. Kerouac joined the station a year ago.

WGN Continental Broadcasting Company has announced the retirement of **Ralph F. Batt**, vice president and manager of engineering. Batt had been with WGN since 1940.

George Semyan, WJLA-TV technician in Washington, DC, died May 17, 1979, of a heart attack. The 59-year-old television pioneer had been with the station for 31 years. He pioneered televising early presidential inaugurations, press conferences, medical TV experimentation, Redskins' football, parades and congressional hearings (Army-McCarthy hearings).

Agencies/Associations

Thomas E. Bolger was elected to a 1-year term as chairman of the 48-member National Assocation of Broadcasters' board of directors. Bolger is president, WMTV-TV, Madison, WI.

The National Association of Broadcasters' Television Board of Directors has elected **Robert K. King** as its chairman. King is senior vice president, Capital Cities Communications, Philadelphia.

Ragan Henry, owner of Broadcast Enterprises Network, has been elected president of the National Association of Black-Owned Broadcasters. **Elliott E. Franks** has become chairman. Other officers elected were **Pierre Sutton** of Inner City Broadcasting, and **Eugene Jackson** of the National Black Network.

The SMPTE's executive director, **Denis A. Courtney,**

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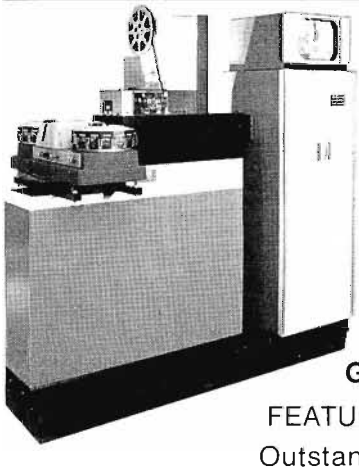

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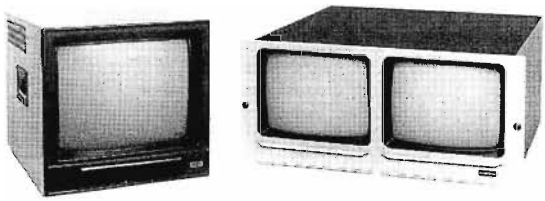

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People in the news

has retired after 26 years with the organization. **Donald F. Breidt** has succeeded him. Breidt comes to SMPTE from Harcourt Brace Jovanovich.

Robert B. Mitchell will succeed Wayne C. Cornilis as vice president for membership for the National Association of Broadcasters it was recently announced. Mitchell, who joined the staff in January, has been in broadcasting since 1955, in various capacities. In another appointment, **Peter A. Lund,** vice president of the CBS owned AM stations in New York City, was named to the board of directors.

Richard J. Shiben has been named chief of the FCC Broadcast Bureau. Shiben has been with the commission since 1962, most recently as chief of the bureau's renewal and transfer division.

The FCC has appointed **Frank G. Washington** deputy chief of the Broadcast Bureau. Washington, who has been serving as chief of the policy and rules division of the Broadcast Bureau since May 6, joined the FCC in November 1977.

The FCC has announced that **Roy J. Stewart,** chief of the Broadcast Bureau's transfer branch, has been appointed chief of the bureau's renewal and transfer division.

Henry L. [Jeff] Baumann has been named chief of the FCC policy and rules division. Formerly chief of the Broadcast Bureau's renewal branch, he has been with the FCC since October 1969.

Officers for The Society of Cable Television Engineers for 1979-80 are: **Harold R. Null,** vice president of engineering for Storer Cable TV, president; **William H. Ellis,** engineering director for Evansville Cable TV, eastern vice president; **Frank J. Bias,** vice president of engineering for Viacom Communications, western vice president; **Kenneth S. Gunter,** executive vice president and director of UA-Columbia Cablevision, secretary; and **Thomas A. Olson,** president of Tomco Communications, treasurer.

Roger Allan, WRKO, Boston, has been elected to the board of director's post for the Radio and Television News Directors Association. He has served on the board of directors for two terms in the past.

Animator **Harry Klynn** and programmer **Stu Rosen** have been added to the Academy of Television Arts & Sciences board of governors.

David Schnuelle, chief engineer at TPC Communications, has been named to a committee of the Audio Engineering Society, which will study the problem of transmission of audio signals in TV broadcast. Schnuelle worked with National Teleproductions and the University of Kentucky Television Center before joining TPC in 1974.

Manufacturers/Distributors

UMC Electronics has announced two appointments. **James C. Leu** is now president of the company. He was president of the US Electrical Motors division of the Emerson Electric Company. **Philip Lohman** is now vice president-marketing, UMC. He was previously assistant vice president-international for the US Elec-

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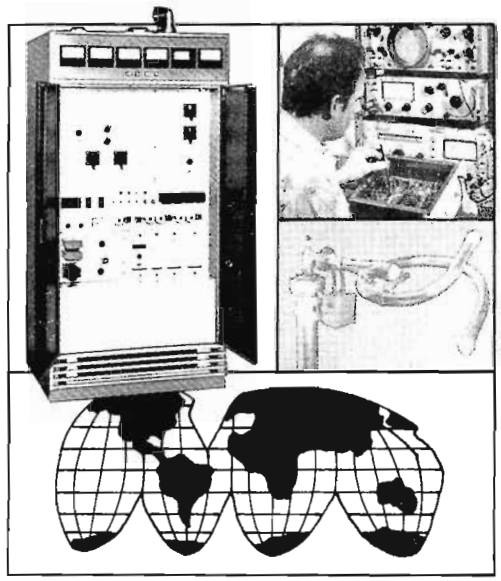

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People in the news

trical Motors division of Emerson Electric Company.

Ampro/Scully has announced several management changes: **Tom Creighton**, formerly national sales manager, is now vice president of sales and marketing; **Bill Hamilton**, formerly eastern regional manager at Scully, has been appointed national sales manager; and **Ed Zdobinski** has been appointed customer service manager for Scully products.

Richard N. Lawrence has been promoted to general manager of Lenco Electronics Division. Previously, Lawrence was sales manager for the company.

Philips Test & Measuring Instruments has named **Robert Hynes** national sales manager. He was eastern regional sales manager for the company.

William C. Ebell has joined A. F. Associates as national sales manager. Ebell was senior sales engineer with Ampex, AVSP division.

Ken Kohda, TDK Electronics, adds the title of general manager to that of vice president of the quality audio and videotape marketer/manufacturer for the firm. **Ann Boutcher** has been appointed advertising and publicity manager.

Sharp Electronics has promoted four executives: **Mike Akamatsu** has been promoted to a new executive level position with the company's international division in Japan. **Charles Daigneault** has been promoted to executive vice president. **Ted Inoue** has been named assistant executive vice president and **Ted Nakano** has been promoted to general manager, business administration, consumer electronics division. Also at Sharp, **Ron Colgan** will assist the company's West Coast dealer network for the professional products department. Two new regional salesmen also have been named: **Jim Freeman** to southeastern regional sales manager, and **Robert McNeill** to eastern regional sales manager.

RCA has announced several staff appointments: **Stanley E. Basara**, promoted to division vice president and general manager of RCA Broadcast Systems; **Donald M. Cook**, appointed division vice president and general manager of RCA Distributor and Special Products division; **Dr. James Vollmer**, elected RCA group vice president with responsibility for the Commercial Communications Systems division and the Government Systems division; and **Paul R. Tatge**, appointed manager of Satellite Communications Services for the RCA Service Company.

Hitachi has announced the appointment of **Clyde W. Smith** as vice president of research and development. Smith was director of audio/video engineering at Thompson-CSF and was responsible for the Microcam Program.

Microtime has announced the appointment of **Robert J. Anderman** as director of marketing. Anderman came to Microtime from McMartin Industries where he served as broadcast sales manager.

John F. Delissio returns to the broadcast products division of Harris as vice president of international sales. Delissio previously served as director of international sales and then as director of domestic sales until his appointment of vice president of

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People in the news

marketing at the satellite communications division in 1977.

Scientific-Atlanta has named **Donald Begitschke** manager of engineering for its Optima Division. Begitschke will have responsibility for the engineering and design functions for the enclosure manufacturer.

UMC Electronics has named **David M. Kelly** sales and marketing manager for their broadcast products division. Kelly most recently served as an associate with the Chapman Company, a nationwide radio and TV station broker.

Ampex has added three sales engineers to the marketing staff of the audio-video systems division: **Bob Natwick,** video sales engineer for the northeast; **Tony Dean,** audio sales engineer for the northeast; and **Earl Higgins,** video sales engineer for the southeast.

EEV has announced **Robert E. Knowles** as product sales manager for Arkansas, Kansas, Louisiana, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota and Texas. **Harry Kozicki** has been appointed product sales manager for Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia and Puerto Rico.

Sony Consumer Products has named **Don LaDieu** national accounts manager. Previously, LaDieu served as regional sales manager in Sony's New England Office.

Electro-Voice's new high fidelity products marketing manager is **Tony Satariano.** He comes to the company from the Koss Corporation where he was midwest regional sales manager.

Harvey Ray is Commercial Electronics Incorporated's new eastern regional sales manager. He was formerly vice president at ITI Glendale. **Dave Lindsey** is CEI's midwestern regional sales manager. He was formerly national product manager at GBC.

Herman Schloss has been named vice president of US JVC's Pro Vid division. Prior to his appointment, Schloss directed the division's operations as national sales manager.

Telex Communications announced the appointment of two representative organizations for its broadcast and professional audio products group. On the East Coast **LCA Sales** was appointed for greater NYC, New Jersey, Delaware and Eastern Pennsylvania; **Robert Milsk Company** was named for Indiana and Kentucky.

McMartin Industries has appointed **Don Denver** to national sales administrator. Prior to joining the company, he held an administrative and engineering post at KECK in Lincoln, NE. Also at McMartin, **Charles E. Goodrich** has been named director of marketing. Formerly, he was director of engineering.

Richard F. Corrigan and **Stanley Risetter** have joined Fuji Photo Film USA as sales representatives in the Midwest and Southwest. Both will specialize in sales and support of broadcast products. □

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A JILLION CAMERAS SINCE 1968. We've been at it longer and better than most. Consequently, we know TV cameras. In 1977 we committed CEI to a new direction in broadcast color television cameras. At last components were small. Needs were different. Flexibility was key. And portability was a must. So, we developed the 310 system and not just one more bulky contraption with unnecessary flaps, doors, handles, corners, louvers, wires, cables ... and weight.

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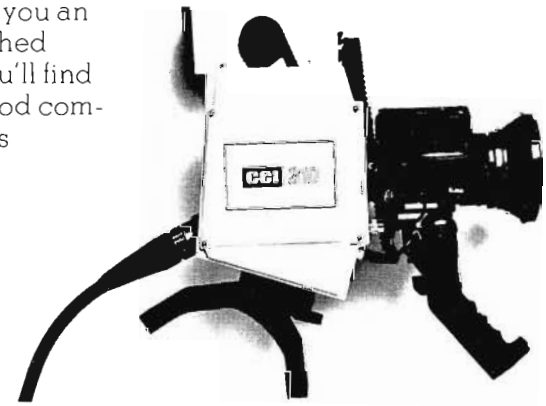

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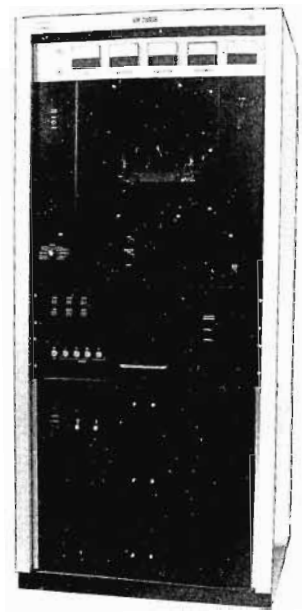

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meetings, events&seminars

September 19-26—The World Telecommunication Forum will be held in the Palais des Expositions of Geneva, Switzerland. The forum is organized by the International Telecommunication Union (ITU) and professional engineering societies from around the world.

Part 1 of the forum, "Telecommunication perspectives and economic implications," takes place from September 19 to 21; Part 2, the "Integration of the world telecommunications network," will take place from September 24 to 26.

For more information, contact Rita Glita, American Express Travel Service, 7, rue du Mont-Blanc, Boite postale 859, 1211 GENEVE 1 (Switzerland), (022) 31 76 00.

September 20-26—The Third World Telecommunications Exhibition, TELECOM 79, will be held in the Palais des Expositions of Geneva, Switzerland. Specialists, delegates of the telecommunications administrations in some 140 countries, engineers and industry representatives will be on hand to assess the displays of nearly 600 exhibitors from about 40 countries.

The exposition will coincide with the opening in Geneva of the World Radio Conference.

For more information, contact Rita Glita, American Express Travel Service, 7, rue du Mont-Blanc, Boite postale 859, 1211 GENEVE 1 (Switzerland), (022) 31 76 00.

September 24-November 30—The World Administrative Radio Conference (WARC) will open on September 24, 1979. Organized by the International Telecommunication Union, it will last 10 weeks and will be held at the Geneva International Conference Center and in the ITU headquarters building. The purpose of WARC-79 is to revise, harmonize and bring up to date the international regulations applicable to all radio communication services. As a governmental conference, the decisions made will have the force of a treaty. For more information contact Union Internationale Des Telecommunications, Place des Nations, 1211 Geneve 20, (022) 99 51 11.

October 7-10—The National Radio Broadcasters Association (NRBA) will hold their Sixth Annual Conference and Exposition at the Washington Hilton hotel in Washington, DC. For more information contact the National Radio Broadcasters Association, Suite 500, 1705 DeSales St., NW, Washington, DC 20036.

October 9-13—The Inter-American Association of Broadcasters will meet at the Mayflower Hotel in Washington, DC.

For more information, contact Hector Armengual, Inter-American Association of Broadcasters, Calle Yi, 1264-Montevideo, Uraguay, 90-4456.

October 11-14—The American Film Institute national conference on film and television is scheduled for the Sheraton Universal hotel, Universal City, CA.

For more information, contact the American Film Institute, Kennedy Center, Washington, DC 20566.

October 16-18—The 10th annual Video Expo/New

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One call is all it takes to get anything and everything you need in broadcast equipment — from turntables to AM and FM transmitters.

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3. Flexible financing arrangements. If it's under $1000, you can use your own or your company's Master Charge. For larger orders, take your choice of time-purchase (up to 5 years) or lease plans.

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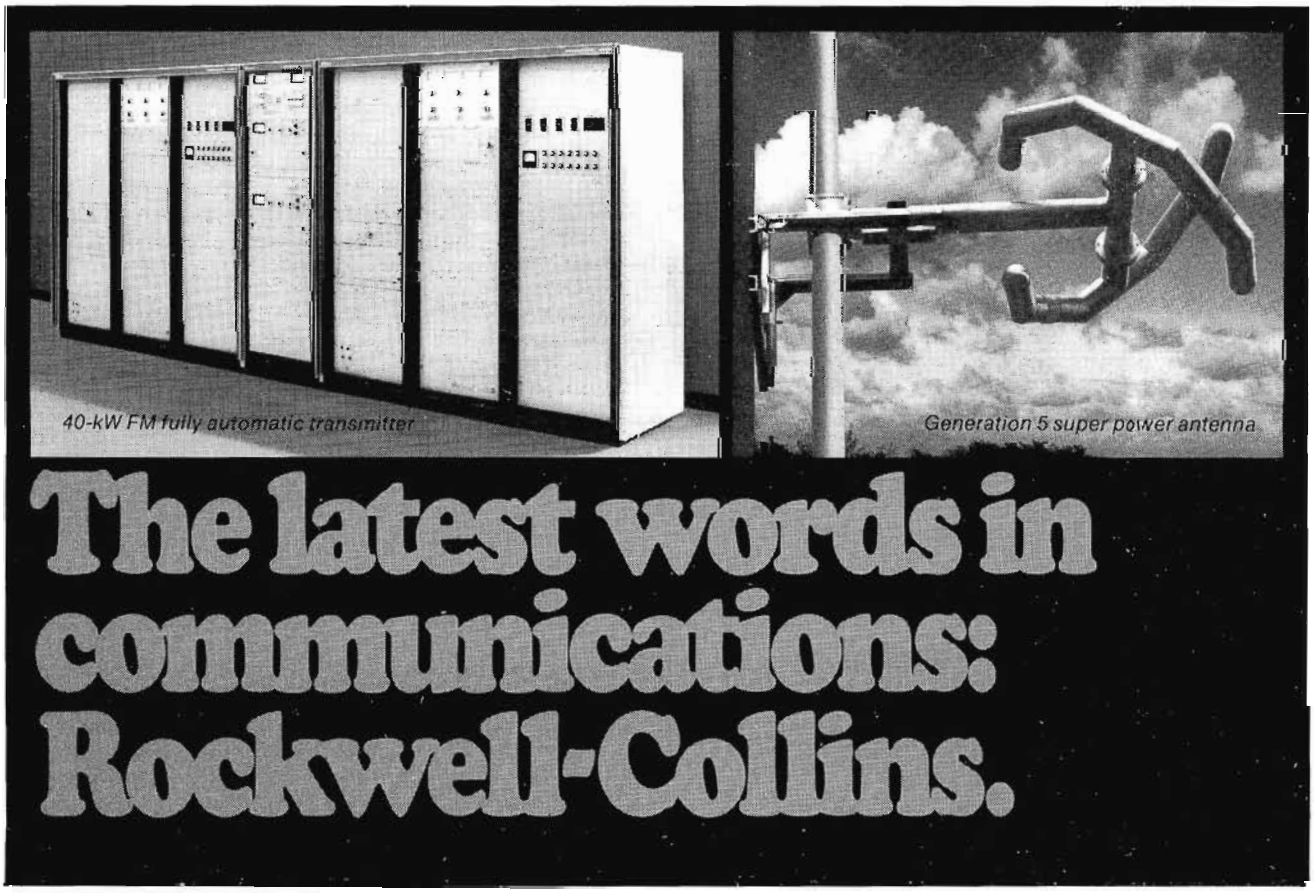

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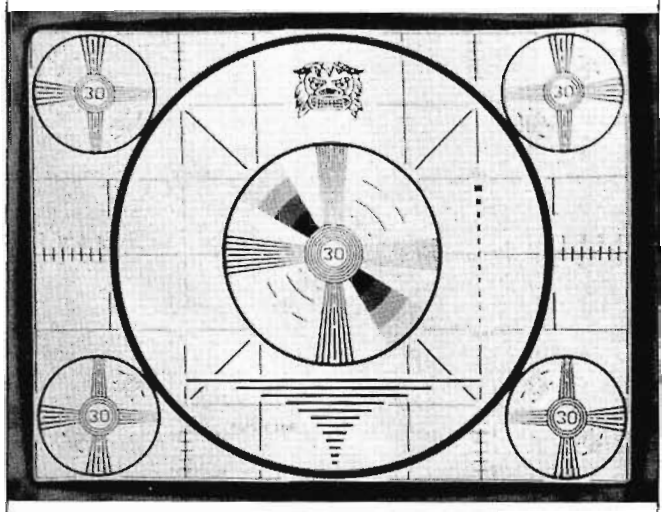

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The test pattern is produced by circuitry that is completely digital in nature and which substitutes for a monoscope tube. The digital circuit is very dependable and stable. There is no distortion. No pattern deterioration. There is an excellent signal to noise ratio.

Pattern data is stored in a read-only memory element (ROM). This standard-test-pattern generator can be employed both for adjusting television video equipment and for judging its merits and demerits . . . both on production lines and for the maintenance of broadcasting equipment.

The 588 generator can be applied to these picture quality checkpoints: resolution, focus, screen's center size, deflection linearity, vertical/horizontal aspect ratio, shading, streaking, gradation and luminance settings, interlace.

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Meetings, events & seminars

York will be held in the Rotunda of Madison Square Garden. The world's largest non-broadcast television trade exposition, Video Expo will feature exhibits, general sessions and seminars.

For more information, contact Knowledge Industry Publications, 2 Corporate Park Drive, White Plains, NY 10604, (800) 431-1880 outside New York state or (914) 694-8686 in New York state.

October 21-26—The 121st Technical Conference and Equipment Exhibit of the Society of Motion Picture and Television Engineers (SMPTE) will be at the Century Plaza Hotel in Los Angeles, CA. The conference will feature five days of technical sessions on motion pictures and television. The SMPTE equipment exhibit, beginning Monday, is expected to have more than 250 booths of equipment with many of the major film and video equipment manufacturers participating. For additional information write SMPTE Conference, Dept. BE, 862 Scarsdale Ave., Scarsdale, NY 10583.

October 27-November 3—Telemark '79, the 2nd Exhibition of Installations and Equipment for radio/television stations and the 2nd Borsa Programmi for producers and distributors of programs for radio/television will take place at the Exhibition Park of Novegro, Airport Milan/Linate. For more information, contact COMIS Lombardia, Via Boccaccio, 7 - 20123 Milano, Italy, Telephone (02)80 92 81.

October 29-31—Scientific Atlanta's 5th annual Satellite Earth Station Symposium will be held at the Marriott Hotel in downtown Atlanta. The meeting is offered to executives and technical managers of cable systems, broadcasters and other communications firms. The symposium will feature the experiences of communications firms now receiving satellite-relayed programs and signals by the use of satellite earth terminals. For additional information contact Kenneth F. Leddick, broadcast marketing manager, Scientific-Atlanta, Dept. BE, 3845 Pleasantdale Road, Atlanta, GA 30340.

November 2-5—The 64th Technical Meeting and Exhibits fall conference of AES will be held at New York City's Waldorf-Astoria Hotel. Convention chairman is Eric Porterfield, Columbia Records, 51 West 52nd Street, New York, NY 10019, (212) 975-4461.

November 7-8—A fall engineering conference on emerging technologies will be hosted by the Society of Cable Television Engineers. The meeting will explore fiber optics and its impact on cable television/broadband communications.

For more information, contact SCTE, 1100 17th Street NW, Washington, DC 20036, (202) 659-2131.

November 11-15—The National Association of Educational Broadcasters will hold their *55th Annual Convention* at the Conrad Hilton in Chicago. Highlights include the 2nd Annual Video Fair, a preview of programs being distributed to public broadcasting.

For more information, contact: National Association of Educational Broadcasters, Dept. BE, 1346 Connecticut Avenue NW, Washington, DC 20036.

November 15-18—The First International Video Music Conference, sponsored by *Billboard* magazine, will be held at the Sheraton-Universal in Los Angeles.

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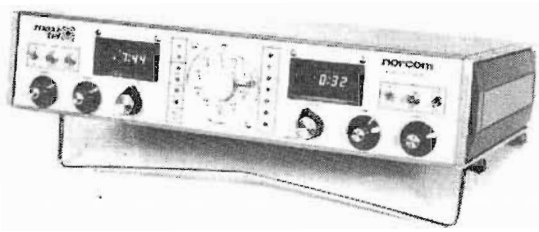

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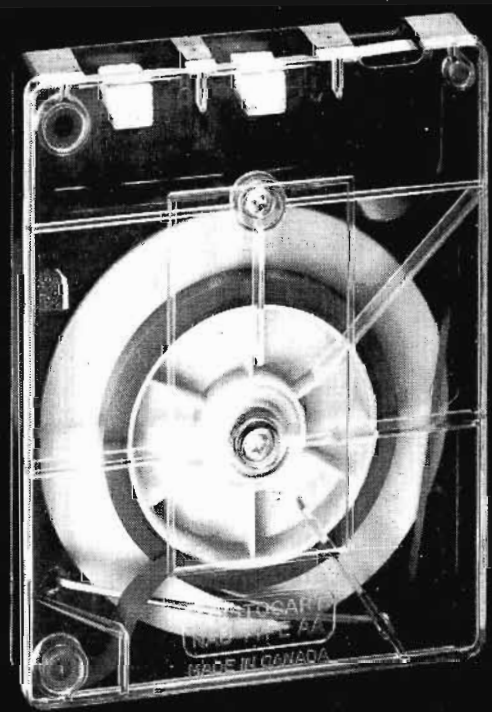
For more information, contact Billboard International Video Music Conference, 9000 Sunset Blvd., Los Angeles, CA 90069, (213) 273-7040.

November 26-27—Video Rights '79 is being held at the Cafe Royal, London, under the chairmanship of John Johnson, program consultant, and professional broadcaster in sound and vision. It was designed to examine the solutions to the rights tangle. For more details, contact Agneta Moe, Nord Media Ltd., Dept. BE, 37 New Bond Street, London W1Y 9HB, England, 01-629 9381., telex 25567.

November 27-29—The National Telecommunications Conference will be held at the Shoreham-Americana Hotel in Washington DC. NTC '79 is co-sponsored by the Communications Society, Aerospace and Electronic Systems Society, and Geoscience Group. For more information contact Dr. Thomas P. Quinn, chairman, Technical Program NTC '79, Dept. BE, P.O. Box 31031, Temple Hills, MD 20031.

January 9-11, 1980—The Armed Forces Communications and Electronics Association will host the first Western Conference & Exposition (Western Expo '80) at the Disneyland Hotel in Anaheim, CA. The conference will feature the participation of key leaders in the military, industry and government community whose areas of interest are electronics,



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So what goes into the microphone comes out again at the same sound level. And nothing takes away from the thrill of performance.

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And while many wireless systems are put together with a mixture of components from several manufacturers, Sony uses only one: Sony.

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The system also comes with a shoulder-strap antenna and a leather carrying case. Altogether, it's compact and efficient and offers outstanding sound.

For studio and stage use, Sony has a modular rack-mounted system that can be engineered in any combination you want, from single-channel to multi-channel diversity reception.

It can be portable or fixed, and runs from 110 volts AC or 24 volts DC.

For more information, call Sony Professional Audio Products at (212) 371-5800, extension 143 or 145.

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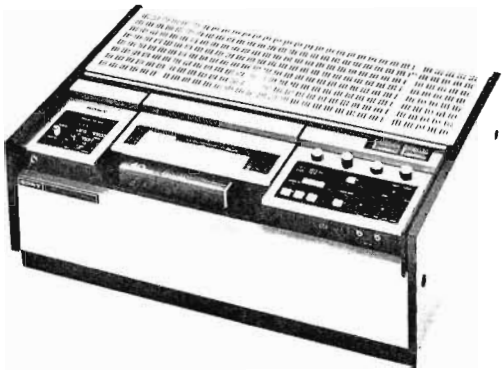

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For more information, contact Judith H. Shreve, AFCEA National Headquarters, One Skyline Place, 5205 Leesburg Pike, Suite 300, Falls Church, VA 22041, (703) 820-5028.

January 20-23, 1980—The National Religious Broadcasters convention will take place at the Washington Hilton, Washington, DC.

For more information, contact Box 2254, Morristown, NJ 07960, (201) 540-8500.

April 13-16, 1980—Las Vegas will be the site of the 1980 convention of the National Association of Broadcasters. For additional information contact NAB, Dept. BE, 1771 N St., NW, Washington, DC 20036.

April 28-30, 1980—ISCAS/80 will be held at the Shamrock Hilton Hotel, Houston, TX. Workshops will be conducted by various technical committees of the Circuits and Systems Society immediately preceding the symposium on April 27. The symposium, sponsored by the IEEE Circuits and Systems Society, will be the 13th annual international conference devoted to all aspects of the theory, design and application of circuits and systems. Authors may contribute either a full paper, summary or abstract for presentation at the symposium after July 1, 1979, to the technical program chairman, Professor T. A. Bickart. For additional information contact T. A. Bickart, Dept. of Electronic and Comp. Engineering, Dept. BE, Syracuse University, Syracuse, NY 13210. □

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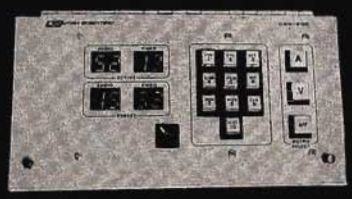
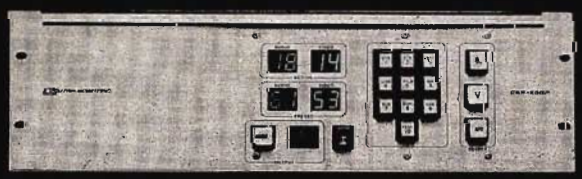


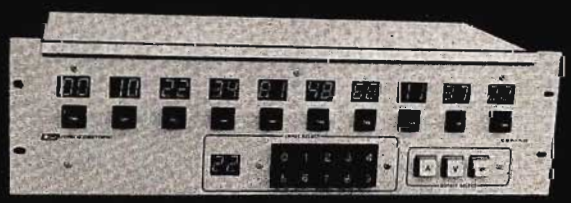
CSP-200

Permits audio and/or video selection--including simultaneous A/V switching from different sources--on a single output bus. Available in recessed mount, one unit per rack panel and two units per rack panel versions



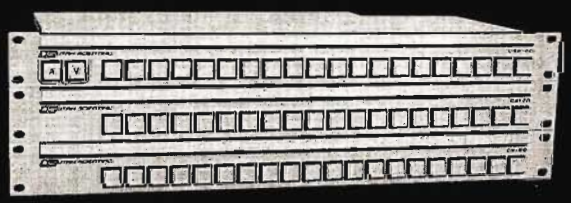
CSP-300/R

Full Matrix Control Panel. Permits audio and/or video switching on any selected bus. Encoded version can be restricted to switch only on specific pre-assigned busses. Rackmount or recessed.



CSP-10

Controls and statuses ten busses (20 with Program Select switch installed). Provides separate audio and video switching and statusing.



CSP-20/CX-20

Permits button-per-source input selection on assigned bus. Basic panel accommodates 20 inputs. Expansion in 20-button increments is provided by adding CX-20 slave panels. Permits fast single-stroke selection of any input. Button lamps provide both audio and video status from refresh memory while *Only* buttons permit selective audio or video switching.

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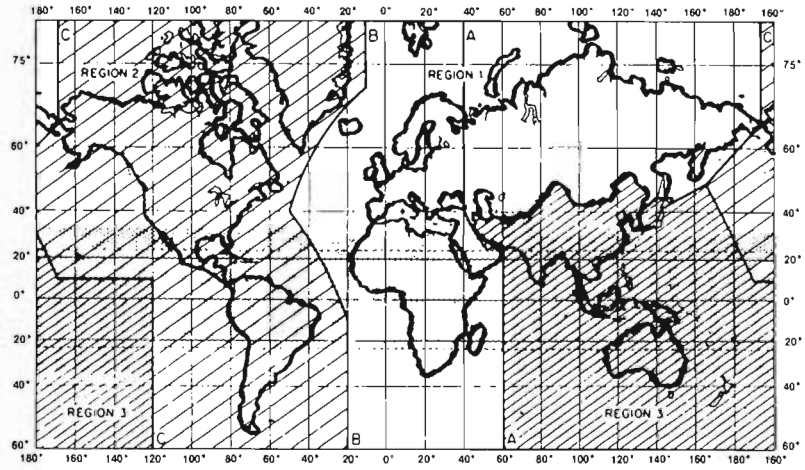
World Administrative Radio Conference: Ten decisive weeks for the future of broadcasting/telecommunications

Chart of Regions as Defined in Table of ITU Frequency Allocations



The shaded part represents the Tropical Zone as defined by ITU.

The World Administrative Radio Conference (WARC), the most important radiocommunications conference to be held for 20 years, will be opening September 24, 1979. Organized by the International Telecommunication Union (ITU), it will last 10 weeks and will be held at the Geneva International Conference Centre (CICG) and in the ITU headquarters building.

The purpose of WARC-79 is to revise, harmonize and bring up-to-date the international regulations applicable to all radiocommunications services. It is a governmental conference whose decisions have the force of a treaty. The international legislation governing telecommunications, established and approved by the 154 member countries of the ITU, comprises the International Telecommunication Convention, a treaty which defines the basic principles in telecommuni-

International Telecommunications Union

The International Telecommunication Union (ITU) is the specialized agency of the United Nations for telecommunications. It regulates, plans, coordinates and standardizes telecommunications of every type. It was founded in 1865 and has 154 member countries. Its headquarters in Geneva comprises four permanent organs: the General Secretariat, the International Frequency Registration Board (IFRB), the International Radio Consultative Committee (CCIR) and the International Telephone and Telegraph Consultative Committee (CCITT).

The Plenipotentiary Conference is the supreme organ of the Union and is responsible for revising the International Telecommunication Convention and defining the general policies of the ITU. The first such conference was held in Paris in 1865.

World Telecommunication Day is celebrated on May 17 each year by 154 ITU member countries. This date marks the anniversary of the signing of the first International Telegraphic Convention in Paris in 1865.

TELECOM 79

Opening concurrently with WARC-79, the 3rd World Telecommunication Exhibition, TELECOM 79, will be held at the Palais des Expositions, Geneva, from September 20 to 26.

This exhibition, organized by the ITU in accordance with the wish expressed by its 154 member countries, is placed under the patronage of the Swiss government. With more than 500 exhibitors from some 40 countries occupying nearly 70,000 square meters, it will be the largest telecommunication exhibition ever held. In addition to the exhibition itself, the following events will be held in connection with TELECOM 79:

- the 3rd World Telecommunication Forum, attended by some 2000 participants: senior telecommunications officials, economists and engineers;
- the 3rd International Festival of Telecommunication and Electronics Films, *The Golden Antenna*;
- the 1st World Book Fair on telecommunications and electronics.

Among the tens of thousands of visitors expected will be many ministers and directors-general of telecommunications.

Canadians face WARC issues

According to Canada's communications minister, Jeanne Sauvé, the federal government has approved recommendations for Canada's participation in and proposals to the WARC.

"All users of the air waves, from ham radio operators to broadcasters, have a stake in the outcome of the conference," Mme. Suavé said. "Since the spectrum is a valuable, but limited, natural resource, and since the demand for telecommunication services using the spectrum is growing, Canada and other nations must ensure that this resource is used in a manner that will ensure that frequencies are available for the development of services in the years ahead."

As Canadian radiocommunication requirements have grown, Canada's participation in WARC has increased in order to ensure adequate

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COLOR PROJECTORS									
PJ 5000	550	220	280	750	300	1200	1600	525 li./60 fps; 625 li./50 fps	(1)
PJ 5050	1250	500	650	750	300	1600	2150	525 li./60 fps; 625 li./50 fps	(1)
PJ 5800	550	200	280	750	600	1200	1600	875 lines, 60 fps	(2)
PJ 5850	1250	500	650	750	600	1600	2150	875 lines, 60 fps	(2)
PJ 5100	550	200	280	750	650	1200	1600	1023 lines, 60 fps	(2)
PJ 5150	1250	500	650	750	650	1600	2150	1023 lines, 60 fps	(2)
MONOCHROME PROJECTORS									
PJ 7000	1000	600	750	800	400	1000	1350	525 li./60 fps; 625 li./50 fps	(3)
PJ 7050	1700	1000	1250	800	400	1000	1350	525 li./60 fps; 625 li./50 fps	(3)
PJ 7055	3300	2000	2400	800	475	1500	2000	525 li./60 fps; 625 li./50 fps	(3)
PJ 7800	1000	600	750	800	650	1000	1350	875 lines, 60 fps	(3)
PJ 7850	1700	1000	1250	800	650	1000	1350	875 lines, 60 fps	(3)
PJ 7855	3300	2000	2400	800	650	1500	2000	875 lines, 60 fps	(3)
PJ 7100	1000	600	750	800	750	1000	1350	1023 lines, 60 fps	(3)
PJ 7150	1700	1000	1250	800	750	1000	1350	1023 lines, 60 fps	(3)
PJ 7155	3300	2000	2400	800	750	1500	2000	1023 lines, 60 fps	(3)

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Canada position

provisions for the operation and growth of Canadian radiocommunication systems. Canada is one of about 20 countries that submit proposals which are used as the basis for revisions; the other member countries of the ITU usually participate in the conferences but do not submit proposals.

For WARC-79, the Canadian preparations began in late 1974 with the formation of the Canadian Interdepartmental Committee (CIC) made up of frequency management experts representing all federal government departments and agencies with interests in radiocommunications (Communications, Transport, Defense, External Affairs, Energy, Mines and Resources, NRC, CRTC, CBC, RCMP, Teleglobe and Telesat). After extensive technical studies and public consultations with the private sector and provincial governments, including the public distribution of two drafts, the CIC has prepared two groups of technical proposals for revising the International Radio Regulations.

The Canadian proposals for this WARC are contained in a 200-page document. Among the main Canadian proposals are the following:

- that additional spectrum be allocated for mobile communications in the UHF band;
- that the standard AM broadcasting band be extended to provide for additional channels to permit coverage of areas in Canada not at present adequately served;
- that the amount of shortwave spectrum employed for international broadcasting be substantially increased;
- that additional radio spectrum be provided for Canadian and international requirements for radiocommunications by satellites;
- that additional spectrum be provided for the amateur radio service.

As **BE** goes to press, 41 delegates have been selected to represent the Canadian interests at WARC.

As a result of the public consultations and the interdepartmental participation in the preparations, it is considered that the proposals fully reflect current and future Canadian radiocommunication requirements. Since the WARC will establish new technical standards for radiocommunication equipment, particular care has been taken to ensure that the Canadian proposals are compatible with the current and planned models of radiocommunication equipment manufactured in Canada.

WARC-79

cations and which sets out the structure and *modus operandi* of the ITU.

This convention is supplemented by administrative regulations which govern the use of telecommunications and are binding on all members of the ITU:

- telegraph regulations;
- telephone regulations;
- Radio Regulations (RR) which deal with the use of the frequency spectrum, the use of the geostationary orbit, conditions for the operation of radio stations and the relevant administrative provisions; and
- additional Radio Regulations, which deal with questions relating to traffic and charges in the aeronautical mobile service and the maritime mobile service.

It is the last two bodies of regulations, the Radio Regulations being the most voluminous (1473 pages including appendices, resolutions and recommendations against 51 pages for the additional regulations) which will be reviewed to a large extent by the conference.

The last conference with a comparable mandate was held in Geneva in 1959. Since that time, specialized world conferences have

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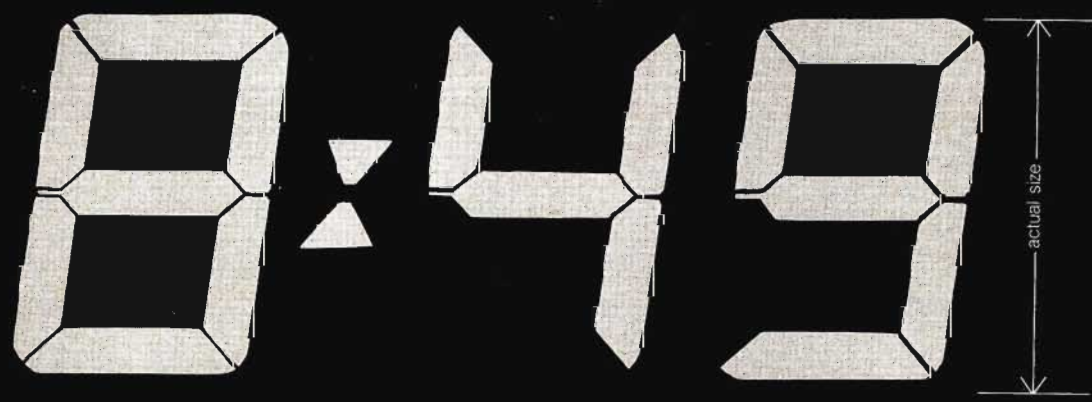

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WARC-79

met to take account of new technical developments and new frequency requirements for each particular radio service: the service using space techniques, the maritime mobile, aeronautical mobile, sound and television broadcasting and direct satellite broadcasting services.

The international regulations revised by WARC-79 will, in all likelihood, remain in force until the year 2000 or longer. They will have a considerable influence on the development of all types of telecommunications in the 21st century.

Origin of WARC-79

The tenth Plenipotentiary Conference of the ITU (Malaga-Torremolinos, 1973) adopted a resolution to convene WARC-79, considering:

- that, since 1959, various world administrative radio conferences

Historical notes

The advent of radiotelegraphy at the end of the nineteenth century was due to the work of scientists such as Maxwell, Lodge, Hertz, Branly, Popov, Marconi and many others. Ships were the first to benefit from the new technique: unlike cables or wires, electromagnetic waves are not subject to artificial boundaries and the distances they cover generally depend on the transmission power.

From the very beginnings of radiotelegraphy it was acknowledged that radiocommunications are by their very nature international. In 1903, less than two years after news of the first transmission of a radiotelegraph signal across the Atlantic (December 12, 1901) had been received, the first intergovernmental radio telegraph conference was held to establish international regulations governing the use of radio waves.

Many intergovernmental radio conferences have been held to establish or revise radio regulations on a world or regional level. All of these conferences stem from the Radio Regulations drawn up in 1906 and have been organized either in response to an invitation by a member of the ITU or by the ITU itself. The objective of the ITU, when it was founded in 1865, was the establishment of international regulations for telegraphy; later it concerned itself with telephony and then finally with radio, in 1903.

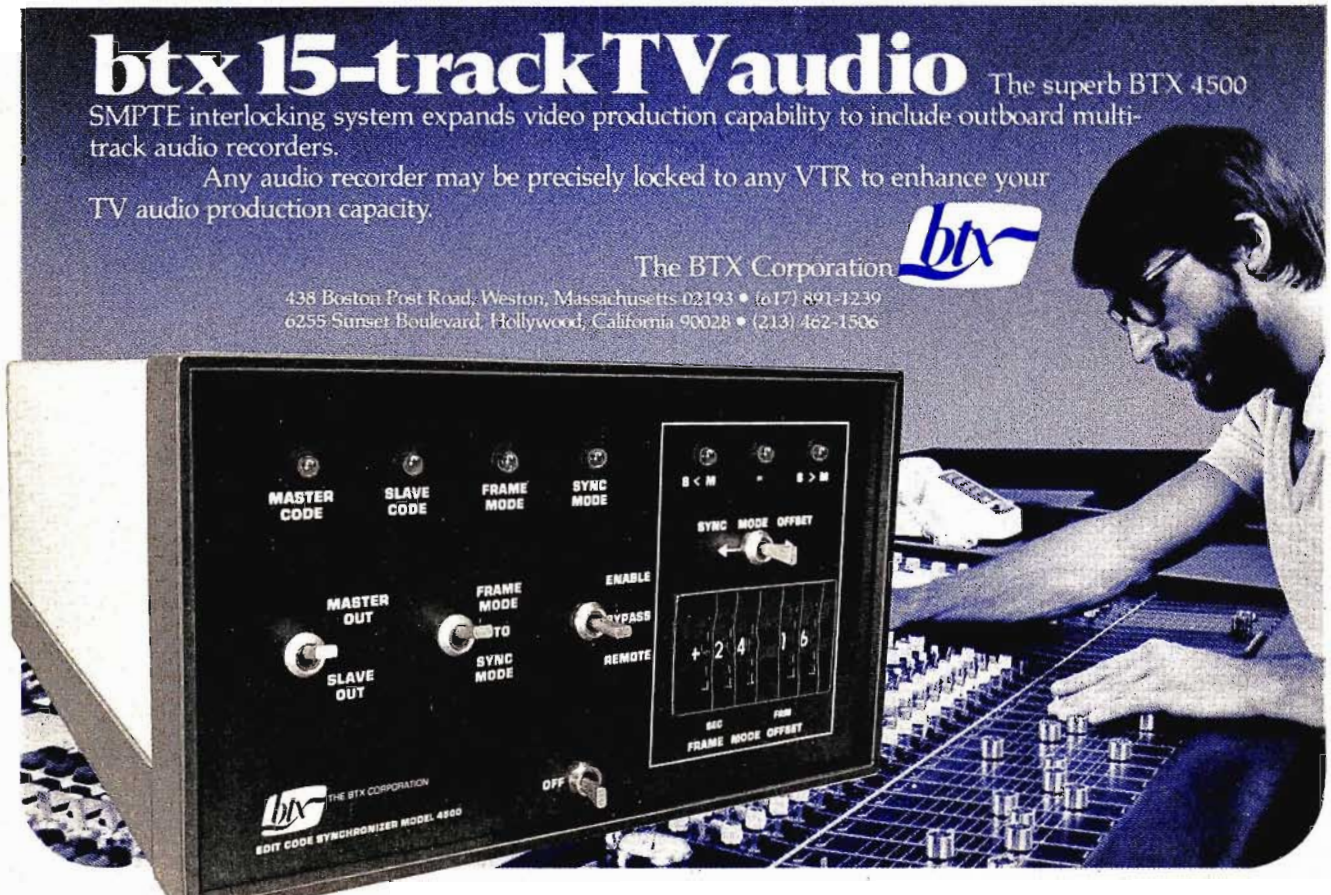
US plans strong delegation to WARC

Under the leadership of Glen Robinson, formerly an FCC commissioner and now a law professor at the University of Virginia, the US delegation of around 64 specialists will descend on Geneva to represent US interests at WARC-79.

Robinson is now on leave and working for the state department to coordinate the US effort. Members of the delegation representing the broadcast interests will be Neal McNaughten and Charles Breig of the FCC Broadcast Bureau and George Bartlett of the National Association of Broadcasters.

The US proposals for WARC-79 are contained in a formal document already before the WARC. Work behind this document represents extensive efforts by people and organizations from every facet of broadcasting and telecommunications.

Technical inputs for the broadcasting proposals contained in the US document to the ITU were obtained chiefly through eight notices issued by the FCC. These resulted in working groups to allow industry and private sectors to participate in establishing the US position on



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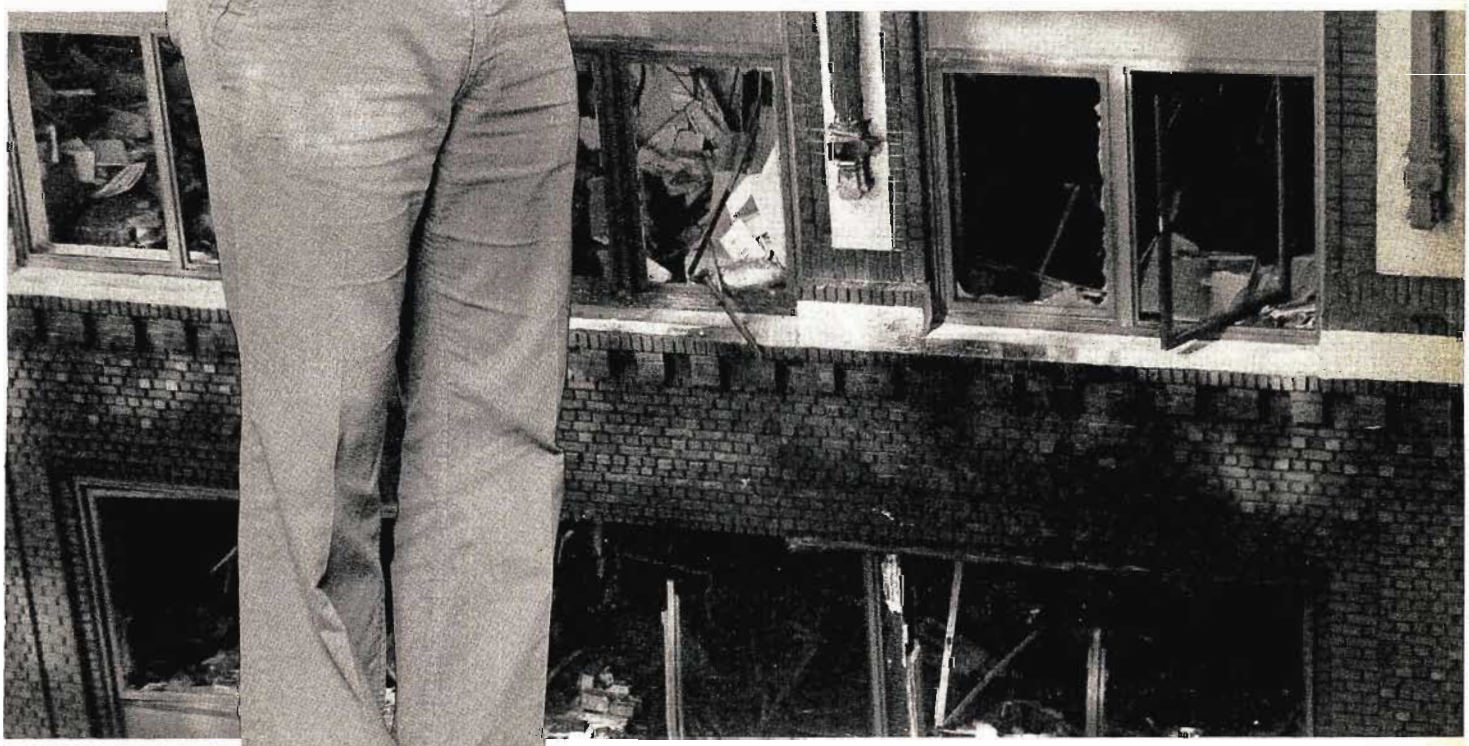

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US position

significant issues, including television, AM and FM radio, international broadcasting, and satellites. These groups provided a wealth of inputs to the FCC, including requirements for the spectrum allocation tables.

In addition, the FCC considered inputs from private individuals, interested companies, station personnel, and the three major networks.

The formal positions of the US contained in the document submitted to WARC is now public information. But, there are fall-back positions on issues that remain confidential. The impact of some of the negotiated decisions to be made at WARC may not be felt for months or years to come.

In brief, some of the proposals contained in the US document include the following.

- Expansion of the AM band from 1605kHz to 2000kHz to be shared with the radio location service. Very little change is being reported for FM.
- For television, a sharing of the band is being proposed for fixed and mobile services.
- For satellite service, a new band of 500MHz is being proposed to extend the band from 12.2 to 12.7GHz. The fixed satellite services would retain the 11.7 to 12.2GHz band and the broadcast satellites would utilize the proposed extension.

The associated problem is to find an uplink to feed the broadcast satellite. The US is proposing a shared 17.1 to 17.6GHz band, but agreement on the sharing circumstances may be difficult to attain.

There will be extensive work required following WARC to put decisions made there into perspective. Plans are under way for a March 1980 meeting in South America on the MF broadcasting band throughout Region 2, in which the United States is located. This meeting presumably would resolve the 9kHz/10kHz spacing problem in Region 2. The FCC is still accepting filings on this topic to pave the way for a US position at this meeting.

WARC-79

have amended the Radio Regulations and additional radio regulations on specific points without having been able to harmonize the decisions taken because of the limited nature of their agenda;

- that, as a result of technical advances, some of the provisions in these regulations should be reconsidered, particularly with regard to certain services which are developing rapidly;
- that, for these reasons, a general revision of the Radio Regulations and of the additional radio regulations should be undertaken in a world conference in 1979.

As directed by the Plenipotentiary Conference, the ITU Administrative Council at its annual sessions took adequate measures to ensure the administrative and technical preparation of the conference. On the technical level, the Administrative Council's action was 2-fold: to structure the Radio Regulations so as to provide the conference with a framework for the revision of the regulations, and to provide technical standards to equip the conference with international standards on which to base its decisions.

Structure of the regulations. At its

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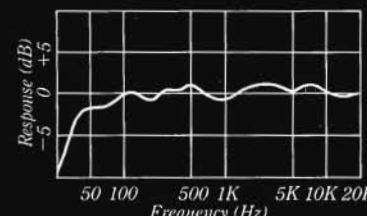

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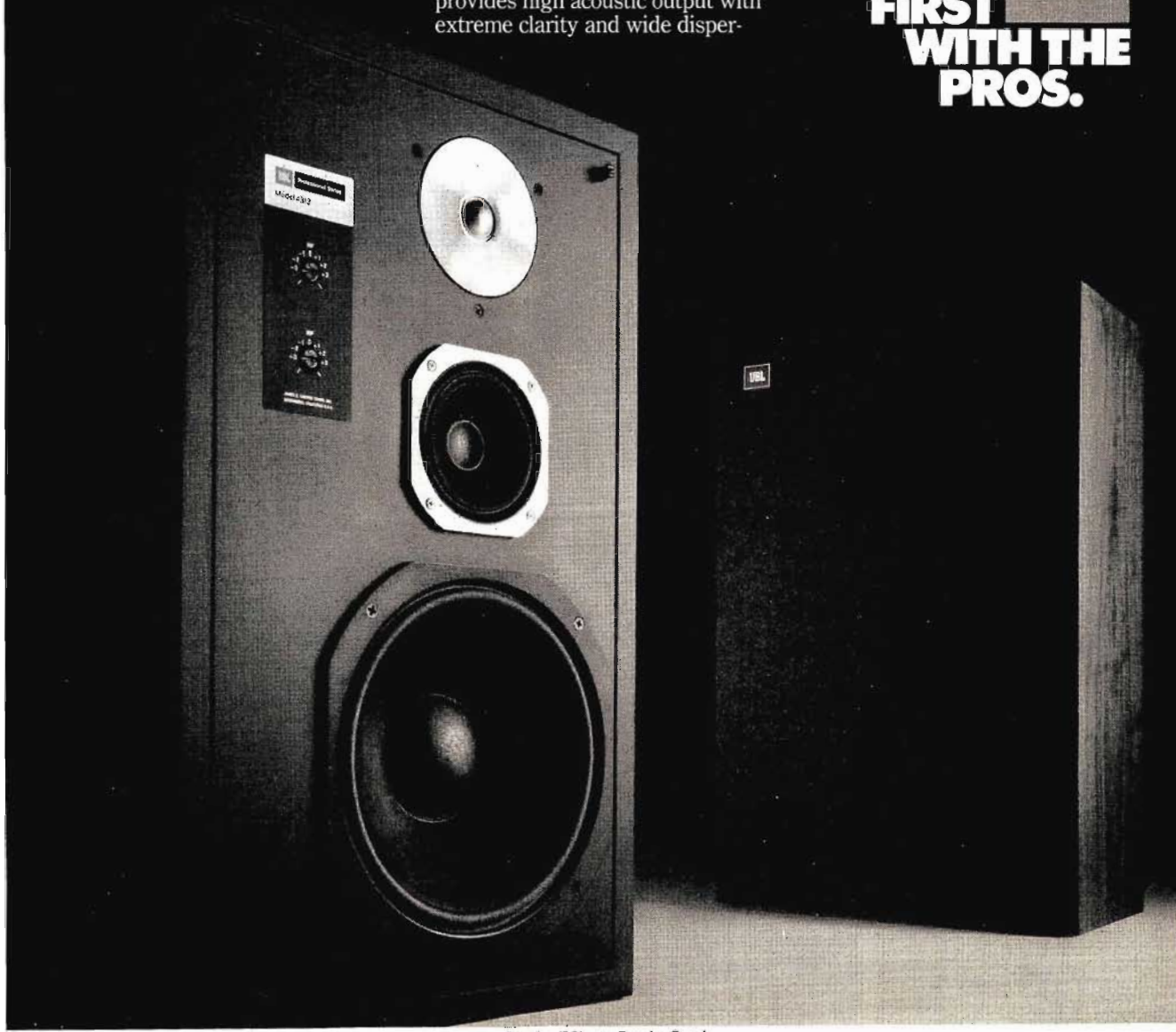

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30th session in 1975, the Administrative Council convened a group of experts to prepare the draft of a possible rearrangement of the Radio Regulations.

This group, which comprised experts from telecommunication administrations of members of the ITU assisted by representatives of the permanent organs of the union, met in Geneva on January 19, 1976 and worked for four weeks. Its task consisted of separating in the existing regulations the administrative provisions from those relating to operation, and to classify the latter according to the various services concerned. The group's report was considered and approved by the World Administrative Broadcasting-Satellite Radio Conference (Geneva, 1977) and was subsequently distributed by the ITU to all member administrations so that it could be used as a framework for the preparation of their proposals to WARC.

Technical standards. At its 31st session the Administrative Council instructed the International Radio Consultative Committee (CCIR), one of the permanent organs of the ITU:

- to carry out the studies necessary to achieve timely provision of the technical information likely to be needed as a basis for the work of the conference; and
- to arrange for a special joint meeting of CCIR study groups at the end of 1978 to assemble this technical information.

Participation in the conference

The national delegations to ITU conferences are designated by the members of the union. A *delegation* is defined in the International Telecommunication Convention as "the totality of the delegates and, should the case arise, any representatives, advisers, attachés, or interpreters sent by the same country. Each member (country) shall be free to make up its delegation as it wishes. Accreditation of delegations to administrative conferences shall be by means of instruments signed by the head of state, by the head of the government, by the minister for foreign affairs, or by the minister responsible for questions dealt with during the conference."

The following are also entitled to attend conferences: United Nations observers; observers from regional telecommunications organizations; observers from specialized agencies of the United Nations and from the International Atomic Energy Agency; observers from accredited international organizations which have submitted a request for admission; and representatives of recognized private operating agencies duly authorized by the member country to which they belong.

About 1500 delegates from some 140 member countries of the ITU are expected.

ITU member activities

Many member countries of the ITU have set up national governmental coordination committees grouping the various users of radiocommunications to prepare proposals for submission to the conference. Numerous bilateral and multilateral discussions also have been held by member countries to coordinate their proposals as far as possible. Many of these proposals already have been received at ITU headquarters; they may only be submitted by members of the union. They are currently expected to amount to more than 3500 typed pages by the eve of the conference.

In addition, a number of national or international organizations concerned with radiocommunications have already held or will hold meetings to discuss preparations for WARC. □

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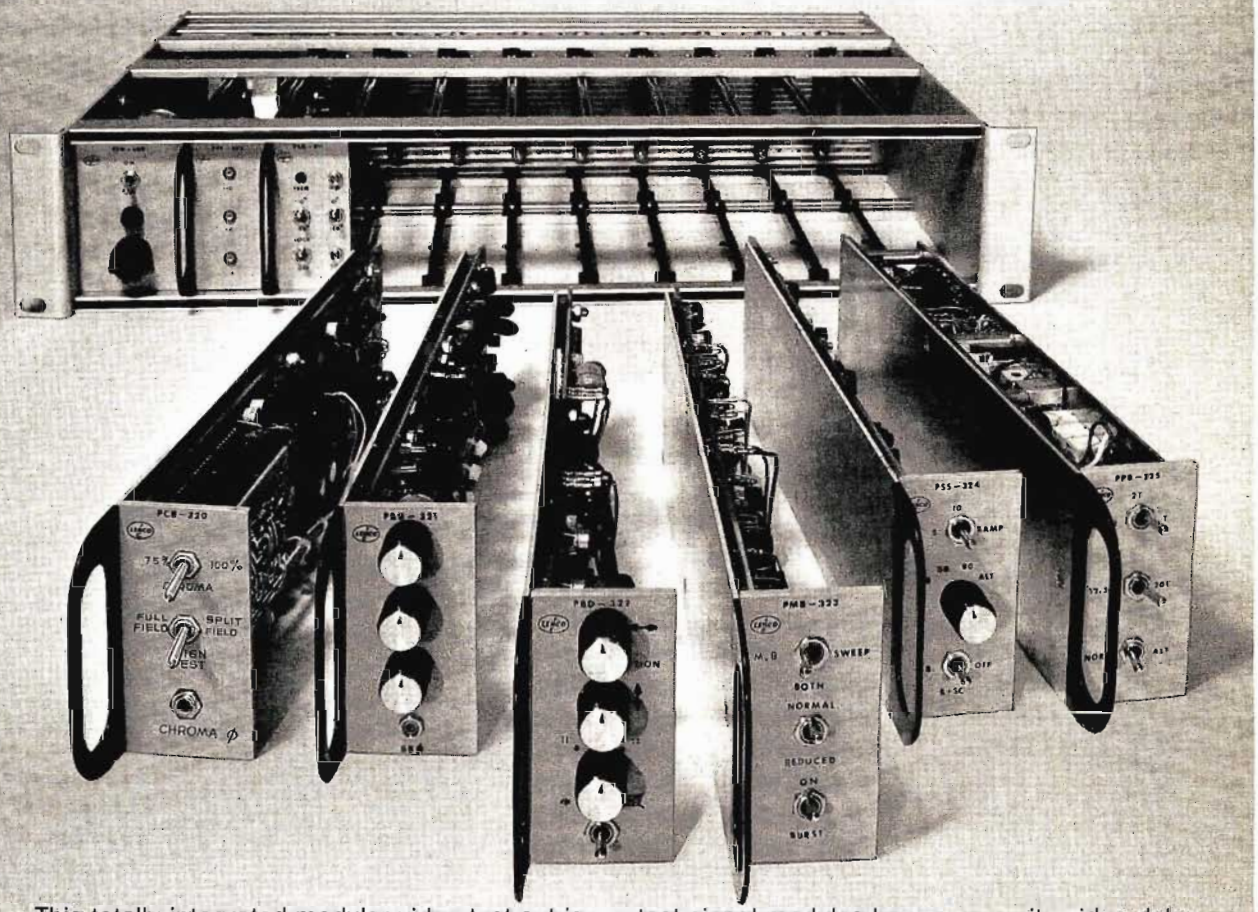

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Technical achievements in producing *Live from Lincoln Center*

By Donald W. Redell, Broadcast Engineering correspondent

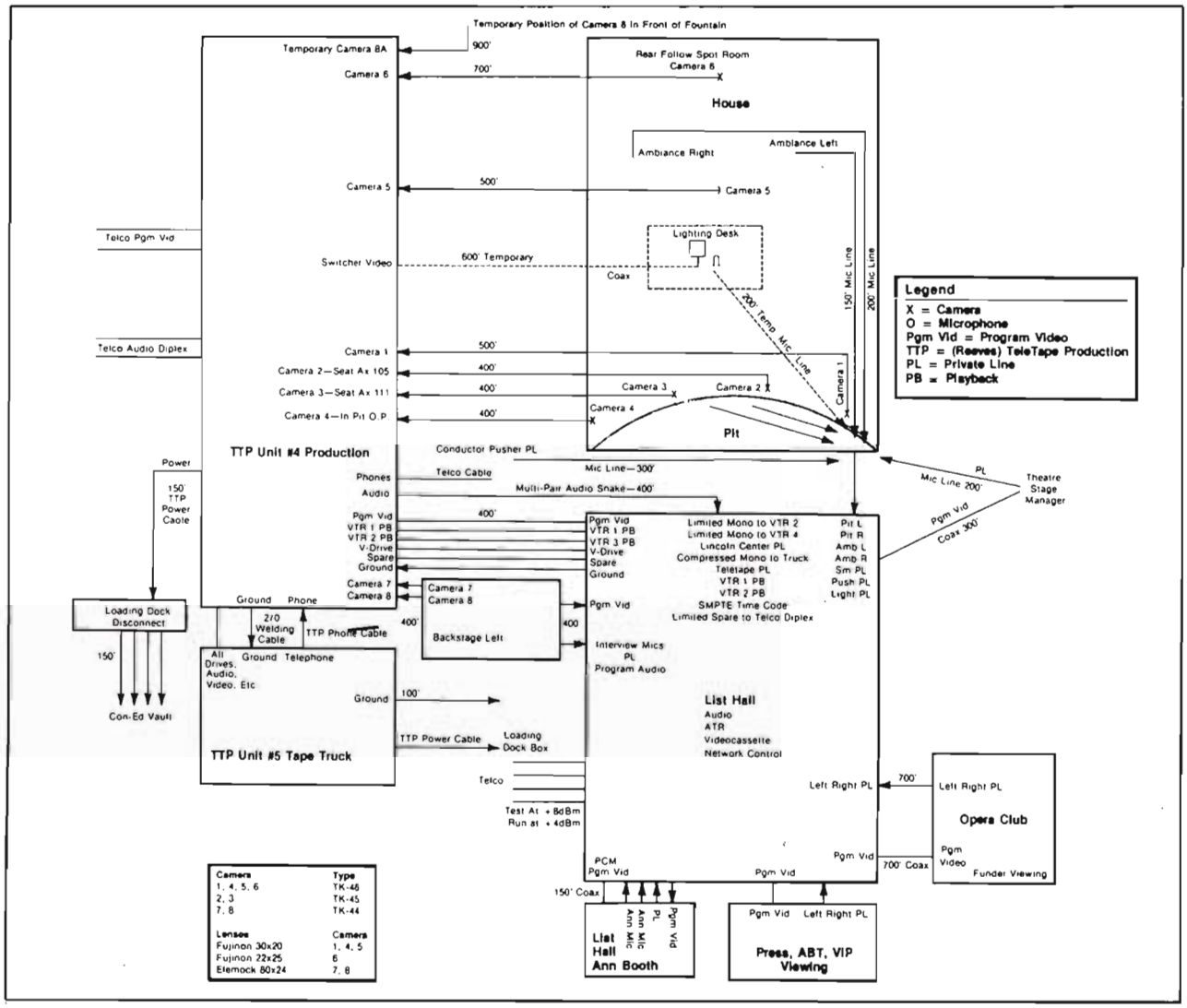
Since the advent of videotape about 20 years ago, there has been very little live television aired on the three major networks except for sports, news and ***Saturday Night Live.*** *The fourth network, PBS, offers an alternative in live programming—****Live from Lincoln Center.***

On January 30, 1976, *Live From Lincoln Center* began providing live television events to the Public Broadcasting network and has broadcast 27 of them since. The latest was The American Ballet Theater's production of Sleeping Beauty in May. Nearly every form of the serious musical and performing arts events has been produced at Lincoln Center in this series: ballet, opera, symphony orchestras and virtuoso recitals—all live.

Live From Lincoln Center, however, is a new kind of networking. Before videotape, getting the program on Telco facilities, across the country on phone lines and to the viewer was all that was necessary. Video was the major problem; after all, networks had been doing radio since the 1920s, and audio was easy. In addition, the needs of the cameras and of the television production staff came first; the on-stage production and the audience had to adjust.

Live From Lincoln Center has changed all that. Audio now is at least as important as video; the Lincoln Center audience is never aware that there is a television pickup present, and the performers are never asked to vary their performances for the cameras. In fact, there is never a special camera rehearsal. All television planning is done around the live production and never interferes with it.

To accomplish this feat, experimentation began in 1971 with the first Lincoln Center for the Performing Arts program to be telecast. *Le Coq D'Or*, which originated at The New York State Theater, was seen by cable subscribers on TelePrompTer's Manhattan CATV system. Between November 1971 and May 16, 1975 there were nine experimental *Live From Lincoln Center* broadcasts of various kinds, each of which had at least one engineering or production first, and in the 27 succeeding broadcasts there were 18 more firsts. Out of all of these



This cable layout for the American Ballet Theater production is typical for a *Live from Lincoln Center* event.

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experiments and broadcasts evolved the following set of parameters.

Lighting—Light levels often fall below 1 fc and rarely exceed 25 fc; lighting ratios often exceed 1000: 1; dimmed incandescent lights often are used in the same scene as xenon and carbon arcs; all lighting instruments may be gelled different colors; bare flames, bare bulbs, flashbulbs and flash powder must often appear in a scene.

Contrast—Within these lighting conditions characters may appear together wearing everything from black velvet to white satin with sequins.

Camera positioning—Cameras which may have to pick up a tight face shot may be located more than 100 ft from their subject; cameras used in ballet must be located at front row center for proper perspective and must have their lenses above stage level, yet must remain invisible to the audience; cameras used in outdoor shots may endure subzero blizzard conditions and then must be repositioned indoors, set up again, and ready to go within the space of a single scene; cameras often are located in virtually inaccessible positions, cramping operators and making maintenance difficult.

Sound pickup—Microphones must be invisible to the

Lincoln Center media development "firsts"

November 9, 1971—First performing arts program telecast on a CATV system: Rimsky-Korsakov's *Lo Coq D'Or,* by the New York City Opera, televised live by Teleprompter Manhattan Cable Television from the New York State Theater.

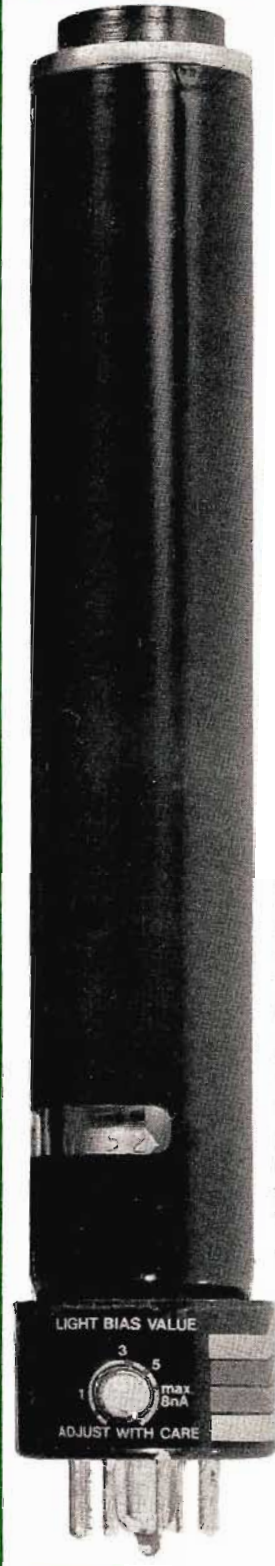
December 3, 1973—First use of an image intensified color TV camera in any television production, during the experimental taping of the Metropolitan Opera's *Tales of Hoffman.*

November 20, 1974—First live anamorphic video projection experiment, in conjunction with Camera Mart, General Electric and Video Camera Services.

January 28, 1975—First transmission of ballet via satellite: The Colorado Concert Ballet via NASA's ATS-6 satellite from Denver to New York. This was also the first time a television signal from a satellite had ever been received directly within the City of New York and the first interactive dance instruction by satellite.

May 16, 1975—First use of ultra long focal length lenses in televising a concert, during an experimental taping of the New York Philharmonic.

tube talk



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Live from Lincoln Center

audience; in operas, singers must be picked up as far as 150 ft from the edge of the stage or as much as three stories above the stage floor; intermission guests often refuse to wear a microphone, yet must be picked up in a noisy environment amidst stagehands changing scenery or musicians tuning up; in addition to the microphones picking up a performance, separate microphones must be used for each position of the host, each intermission guest (occasionally in different locations), and announcers, who may be located more than 500 ft from the audio mixing board.

Sound transmission—All shows, domestic or international, must be transmitted live with stereo sound, even though that may involve satellites, microwave, land lines, delay lines and as many as 14 different common carriers; international feeds may require different announcers or videotape audio than domestic feeds and may desire video without titles and subtitles as well; sound networks must be established and tested immediately before air time.

Overall—All shows are transmissions of live performances with paying audiences: neither the audience nor the performance (staging, lighting, etc.) may be interfered with. Given those constraints, the show must look as good as any network studio show (lest it be turned off) and must sound like a high-fidelity stereo recording. Foreign language operas must be subtitled live. Program synopses must be transmitted somehow both visually and orally.

Countdown to broadcast

To accomplish this and to broadcast on schedule,

Media "firsts"

January 30, 1976—First concert ever broadcast under existing performance conditions; first nationwide live television-stereo simulcast network; first stereo simulcast via satellite—all during *Live From Lincoln Center—The New York Philharmonic* on PBS and in stereo in 15 cities. Nominated for Emmy Awards for best classical music program, best sound, and outstanding achievement for the stereo simulcast network.

February 3, 1976—First patent ever issued for an accessory to allow high fidelity stereo audio reception of television programs, Number 3,936,594.

April 21, 1976—First opera ever broadcast under existing performance conditions; first live stereo network ever to reach more than half of all US television households—both during *Live From Lincoln Center—The Ballad of Baby Doe* on PBS and in stereo in 48 cities.

June 30, 1976—First broadcast of a full-length ballet, *Swan Lake,* on PBS and in stereo in 50 cities.

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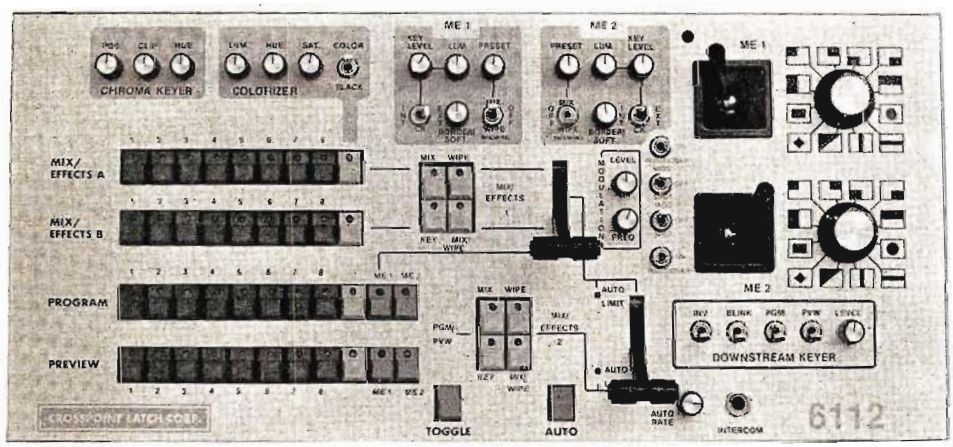

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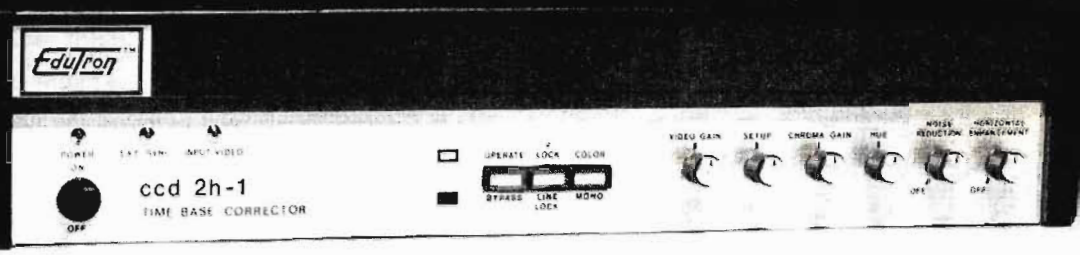

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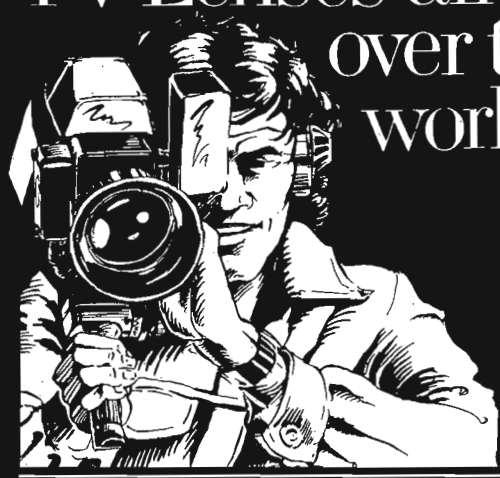

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TV 13× Studio	1.7/14.5–190
TV 15× Wide Angle	1.7/12.5–190
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TV 30× Standard	1.7/16–480
TV 30× Wide Angle	1.7/12.5–375
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Live from Lincoln Center

design engineer Mark Shubin starts about a year in advance by booking the AT&T circuits with Telco representative Paul Dujardin, to whom Shubin attributes much of the success of the network. The fall show's master list carries 69 separate lines, including all the lines booked (locally and nationally) from the three Lincoln Center auditoriums to and among various points, such as NBC, WNET (New York), Western Union and NR (Telco's Network Radio). Telco's Dujardin works closely with Shubin on each show, from booking the lines through to sign-off, putting out all the fires as they occur and rerouting when necessary.

The next booking is with the facilities company which supplies the mobile unit and maintenance crew. Usually that's Reeves/Teletape, and with the unit comes John Leay, engineering consultant. About six months in advance a hold is put on the facilities and confirmed a month before the broadcast. Next, all the equipment is checked out at the facility's studios.

The audio equipment, dollies, monitors and cables arrive at Lincoln Center three days before the broadcast. The stage hands lay cable and the audio staff begins setting up the extensive audio equipment in List Hall, a small recital hall near Metropolitan Opera's backstage. Two days before air the camera unit arrives, cameras are set up, chipped and aligned. (Chipping is done live with a young man wearing a black T-shirt with a color chart on the front. Chip chart and skin tones in one!)

The Chyron is loaded with crawl copy and other graphic

Media "firsts"

August 18, 1976—First live 3-D video projection experiment, in conjunction with General Electric, Camera Mart and Stephens & Associates.

August 30, 1976—First stereo simulcast tariff ever filed with the FCC goes into effect; filed by Western Union specifically for Lincoln Center.

September 30, 1976—First satellite/terrestrial network test to prove insignificant delay regarding lip-synchronization, utilizing NBC Television Network.

November 3, 1976—First television show ever transmitted under a stereo simulcast tariff.

November 28, 1976—First live full-length recital televised, André Watts.

March 15, 1977—First live telecast of an opera from the Metropolitan Opera at Lincoln Center, *La Boheme.*

June 2, 1977—First telecast of a ballet from the Metropolitan Opera, American Ballet Theatre's *Giselle.*

September 24, 1977—First use of unobtrusive cameras within the orchestra in a

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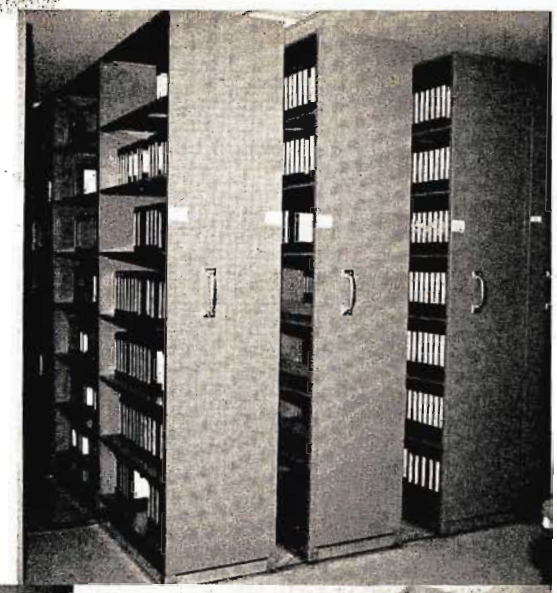

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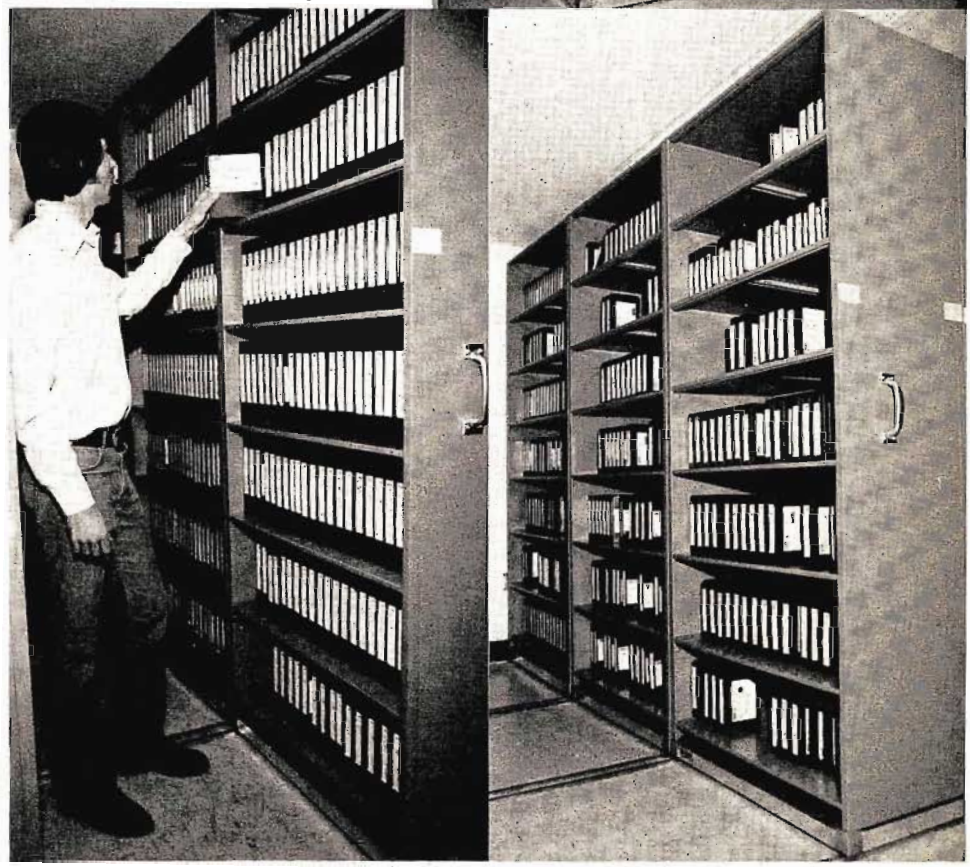

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Live from Lincoln Center

material. On the afternoon before air, director Kirk Browning and the camera crew view the single camera, wide-angle videotape that was shot at a dance rehearsal and camera shots are set. At 8 PM there is a performance which the television crew uses as a dress rehearsal and which is taped on ¾-inch tape for viewing the next day.

On air day, after the cameras are fired, there is a rehearsal of the intermission interviews, and at 2 PM the cameramen and Browning view the previous day's tapes to refine the shooting script. At 5 PM the opening is rehearsed—the roll-in reel cues, the Chyron, etc. From 6:05 to 7:05 PM Shubin tests the network—and until 8 PM if there are problems. 8 PM to 11 PM is AIR—LIVE.

To broadcast *Live From Lincoln Center-ABT's Sleeping Beauty* on May 2, it took, besides the production staff:

8 Cameramen
2 Video operators
2 Videotape men
3 Audio engineers
1 Audio designer
1 Technical consultant

1 Electronic graphics man
1 TD/switcher
1 Senior technician
3 Maintenance men
1 Technical designer

This technical crew operated eight cameras, the entire audio and network control room in List Hall, four mics for

Media "firsts"

live concert, The New York Philharmonic, Zubin Mehta conducting.

October 18, 1977—First live opera transmitted with subtitles, New York City Opera's *Manon*.

January 31, 1978—First live telecast of the New York City Ballet, *Coppelia.*

February 12, 1978—First live solo recital telecast from the Metropolitan Opera, Luciano Pavarotti.

September 20, 1978—First live transatlantic stereo simulcast, *Horowitz: Live!,* fed simultaneously to the NBC, BBC, Antenne 2 (France), ZDF (Germany), and ORF (Austria) networks, tape delayed for Japan with the first international distribution of a television program on stereo SMPTE Type C 1-inch videotape.

December 10, 1978—First live telecast of chamber music from Alice Tully Hall.

March 12, 1979—First test of the PBS Digital Audio Transmission Equipment system from a broadcast site, utilizing common carrier facilities.

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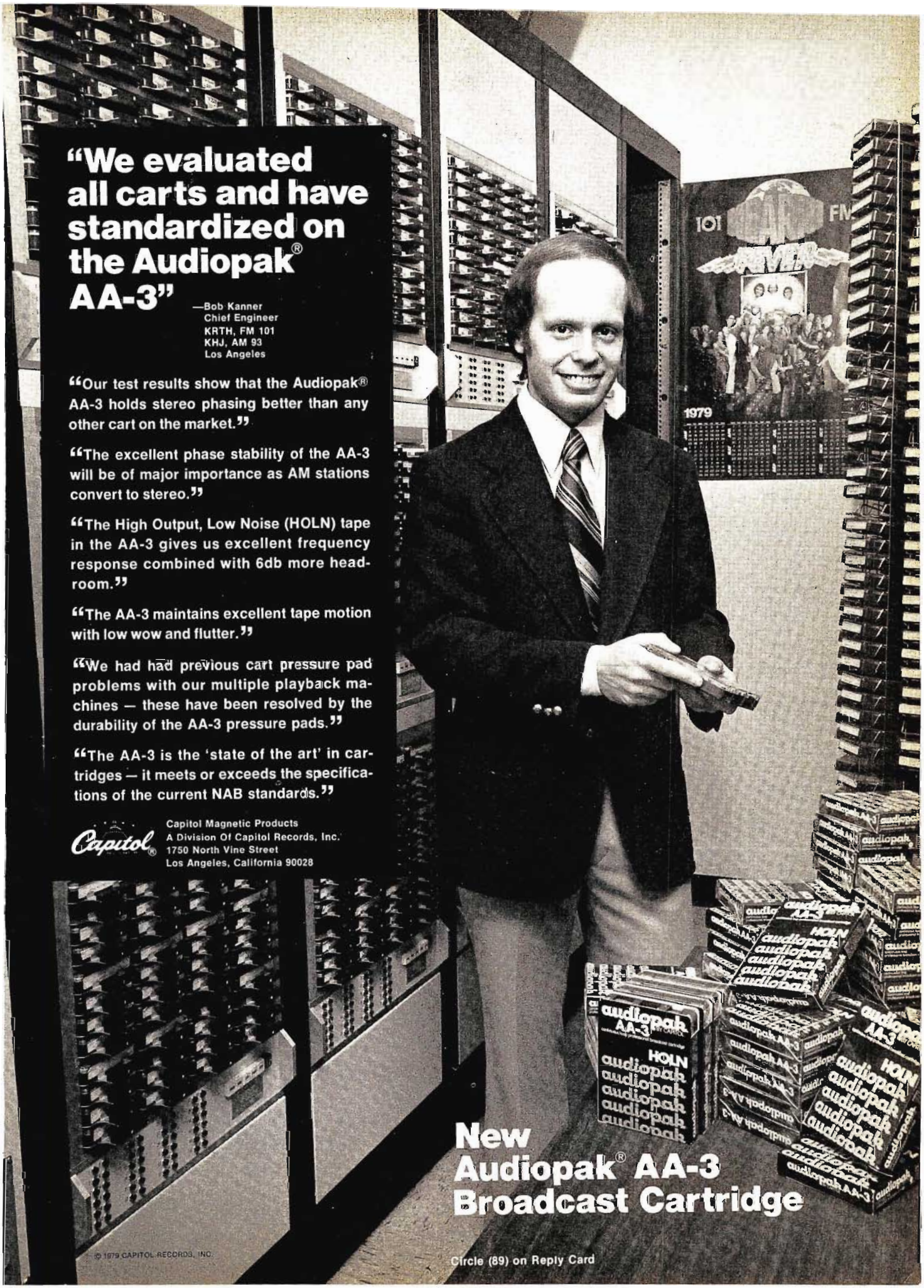

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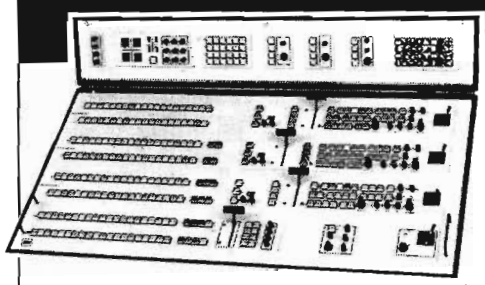

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Live from Lincoln Center

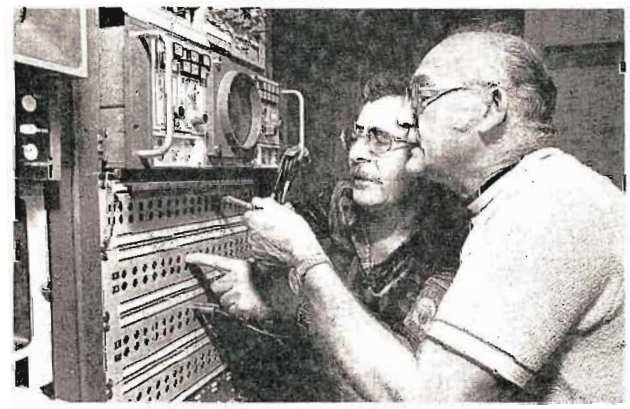
the performance, and two mics for the intermission interviews.

Support equipment

Much of the technical equipment is either special or specially operated.

• **First, the cameras.** Because the Metropolitan Opera House and Avery Fisher Hall are very large, and the parameters listed above must be observed, the cameras (TK 46s and TKP 45s) are not out of the ordinary, but the lenses and set-ups are. The TK 46s are fitted with Fujinon lenses, which were chosen because of their exceptional optical quality and coating. The TKP 45s have a developmental lens designed by Rank Taylor Hobson in England and custom fitted to the cameras. The lens and a bracket are mounted on the camera tripod, and the camera is attached to the lens (so that the lens supports the cameras rather than the reverse).

The cameras are set up to run with extended gain at the expense of some noise like a sports pick up. The tubes are hand picked for minimum problems in black, to lessen noise, and for minimum lag and microphonics since the two TKP 45s are in the front row next to the orchestra. In addition, the stage scenes are evaluated for lighting; hot spots and follow spots are brought down so that contrast is more nearly controlled. Generally the



Harold Dunn (left) and Bill Kidda, of Reeves Teletape, set up to broadcast *Live from Lincoln Center.* (*Photograph by Susan S. Perry*)

The audio technical crew prepares for broadcasting the New York City Opera. From front left are Mark Schubin, technical director; Gino Lombardo; Raymond Matthews; and Michael Shoskes, audio technicians. (*Photograph by Susanne Faulkner Stevens*)

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picture leaves Lincoln Center looking pretty good. On occasion a little noise is evident, but given the requirements of the broadcast, the video is excellent.

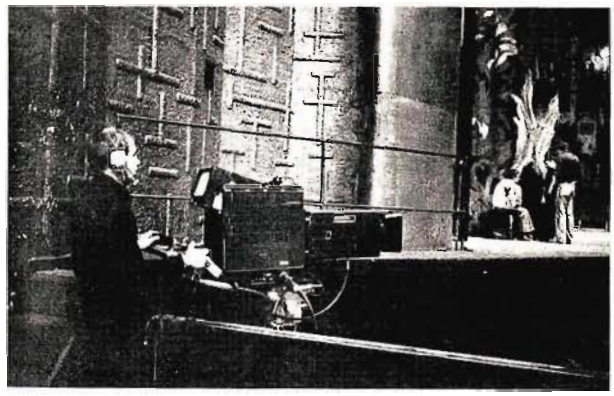
• **Next the audio** is fed to List Hall in stereo (incidentally, ¾-inch videocassettes are recorded there) where it goes through two identical boards. One feeds the whole audio portion of the program and one provides a clean feed, without announce and similar material, for foreign broadcasts.

Audio emphasized

Lincoln Center and producer John Goberman felt from the beginning that in order to succeed with *Live From Lincoln Center* a major development in the recording and transmitting of sound was needed. Since the inception of television broadcasting and up to the present, audio has been secondary to video. Microphones generally are visible or on booms outside the shot. In addition, the quality of audio has not been emphasized since television sets have 3-inch monaural speakers, and the attitude has been to "get the sound there, that's enough."

Live From Lincoln Center producers planned to broadcast serious music, and satisfying the serious

The control booth is the scene of tense action in broadcasting the New York Philharmonic, *Live from Lincoln Center,* Zubin Mehta conducting. Director Kirk Browning sits in the center. (*Photograph by Susanne Faulkner Stevens*)



The cameraman focuses on a scene from "An Evening of Ballet with the American Ballet Theater," *Live from Lincoln Center.*

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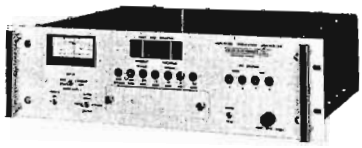
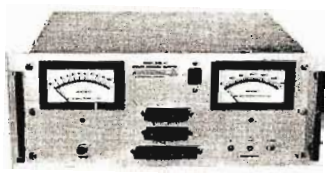


The **Amplitude Modulation Controller** is the only modulation controlling system that provides a completely closed loop around the transmitter. The sampling of actual modulation levels after the PA output network assures precise adjustment for optimum modulation levels. The AMC-1 also keeps a digital count of positive and negative overmodulation bursts for both present and previous one minute periods.

DAM-1

The **Digital Antenna Monitor** couples pushbutton ease of operation with digital accuracy. The DAM-1 will accept RF samples from up to 12 towers (with an auxiliary panel) and features ± 1° phase and ± 2% current ratio accuracies. Remote panels and other accessories are available.

AAM-1



The **Analog Antenna Monitor** gives stable phase and ratio readings even in high RF fields. Separate phase and ratio mirrored-scale meters assure accurate meter indications.

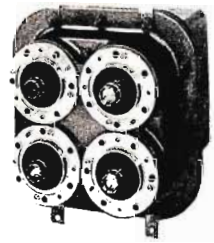
TMCS

The **TMCS Antenna/Transmitter Remote Control System** offers complete transmitter and antenna parameter control for stations utilizing the DAM-1 Antenna Monitor. Alarm indications and failsafe circuitry is also provided, giving complete transmitter system control.

APC-1

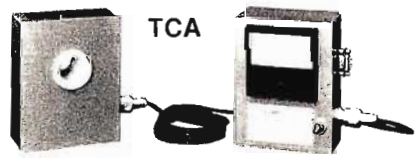
The **Automatic Power Controller** is your insurance against citations for over- and under-power operation. The APC-1 continuously monitors the transmitter output power, and makes automatic power adjustments with the transmitter loading control. This assures proper power adjustment at all times.

6730-E
6740-B



Designed to switch two transmitters from antenna to dummy load, the 6730E interfaces with 1 5/8 inch coaxial cable. For 3 1/8" lines, the 6740-B transfer switch is used. Either manually or remote controlled, the **Transfer Switch** is fully interlocked and can be wired to existing equipment to prevent "hot" switching.

TCA



State of the art antenna current metering has arrived in the **TCA Ammeter Systems.** Accurate, Modulation-free, temperature stable current indications are found in the TCA. Models include single and dual scale meters.

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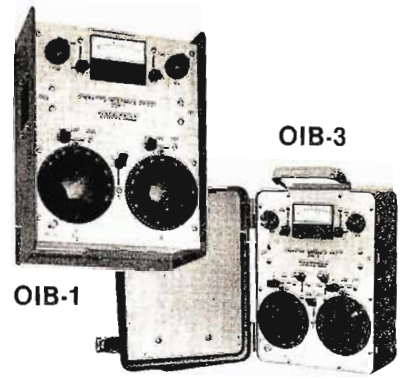
Delta's **Toroidal Current Transformers** provide accurate sampling current and phase values without the problems associated with sampling loops. Three output voltage ranges are available, as well as high voltage models for high-power facilities.

OIB-3
OIB-1



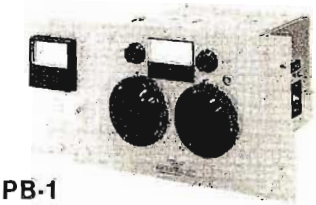
The **Operating Impedance Bridge** measures the impedance of networks, radiators, and the like while they operate under full power. VSWR as well as complex impedances of up to 400 ± j300 ohms can be measured.

The **OIB-3 Operating Impedance Bridge** provides extended resistance and reactance ranges, measuring up to 1000 ± j900 ohms. The bridge has a built-in carrying case and RF amplifier for improved nulling.

RG-3

The **Receiver/Generator** combines a two-watt RF output and a correlation detector circuit that virtually eliminates interference problems. The RG-3 can be used in conjunction with any conventional impedance bridge including the OIB series.

CPB-1



The **Common Point Impedance Bridge** is designed for permanent installation; and allows continuous monitoring of the common point, thus facilitating network adjustment. This model can be provided with one of Delta's TCA ammeters mounted in the front panel.

DPM-1

Delta's **Digital Panel Meter** displays up to sixteen channels of information in a 3 1/2 digit LED display. Any combination of operating parameters can be selected, such as plate current and voltage, common point current, base currents, etc.

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music audience requires the sound to do more than just get there.

The nearly three years of experimentation developed high quality mics, many designed by the Lincoln Center technical staff. Then the problem became delivery of that high fidelity sound. It was decided to simulcast in stereo via FM radio stations and to diplex and multiplex the signal.

A Van Cliburn recital with the New York Philharmonic on January 30, 1976 was the first network *Live From Lincoln Center.* Nine days before the show a test of diplexing equipment was initiated with Western Union, and the next day it worked. Five days before the show, Lincoln Center's desire to use the equipment was presented to Western Union's Board of Directors and four days before air the Board approved it but required that specific West Coast equipment be used. On the day before air it arrived, was unpacked and set up. It worked. For the second show, *The Ballad of Baby Doe*, two and a half months later, new diplexing equipment had been specially designed and approved.

For the Van Cliburn concert the network consisted of 13 cities plus New York and Los Angeles, making the network national. The second show had 40 cities, using about 12 different network carriers, and the program was available to 50% of the US audience. Now the network reaches, via satellite and the audio network, 250 Public Television stations, and 60 to 70 FM stations.

Audio/video routing

The audio and video take two different network routes. The audio leaves the board, and goes to a *Rack* (called Rack, designed by Mark Shubin), which adds limiting necessary for reception by the satellite, and splits and isolates the various stereo feeds to the network. If there is a failure of one or two feeds, the others won't go down either. Rack has two normal audiometers plus 28 *idiot meters* which indicate that the audio is going through, with no indication of quality or gain. Son of Rack is in design now for next year's series.

From Rack, the audio goes to WNET via New York Telco where it's put into a 250ms delay unit to compensate for the time lost when the video goes up to the satellite and back. From there it goes by land line to NR at AT&T. It is then microwaved to the stations by diplexing on the AT&T video network and by multiplexing into the multiplex message network (like the telephone system) occupying the space of 12 phone calls. At the local TOC (Television Operating Center) the diplex signal is decoded and the multiplex is pulled off onto a local loop and sent to the station.

The video signal leaves the mobile unit via coax to the microwave transmitter on the roof of Lincoln Center to the Telco building on 11th Avenue in New York. From there it's sent to WNET which acts as master control. WNET sends the signal either to Washington, DC or to Hartford, CT, via Telco microwave. At the Hartford Eastern Educational Network uplink, or the one at MacLean, VA, video goes to the Westar satellite PBS transponder and to the ground station at each receiving PBS station. *Sleeping Beauty* was the first *Live From Lincoln Center* to be received by every station via satellite.

After nine major experimental productions and 27 *Live From Lincoln Center* broadcasts, producer John Goberman says, "Each show becomes a little easier, but it's basically about the same as in the beginning. The difference is that we have a few better lenses, better cameras, and more people can do it now."□

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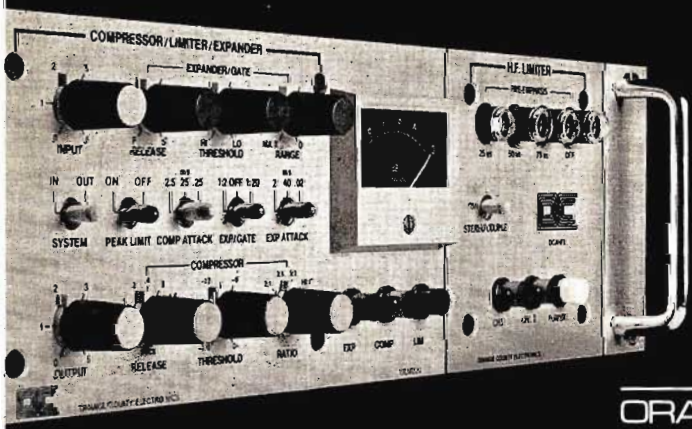

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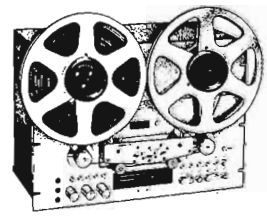

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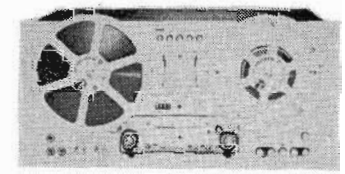

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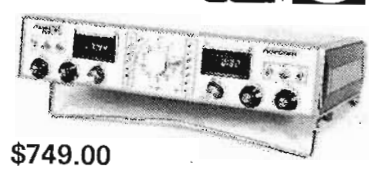

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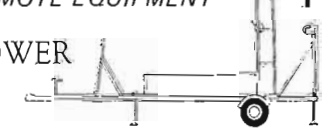

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Introductory digital circuits Part 2: Logic circuits and simplification

By Dr. Ron Jetton, Bradley University, Peoria, IL

This article covering the basics of digital circuitry is Part 2 of a series on digital technology for broadcasters. The continuing series will include applications to audio and video portions of broadcasting and will consider implementing digital into station operation.

TABLE 1

Basic laws:	$0 \cdot A = 0$		1
	$1 + A = 1$		2
	$1 \cdot A = A$		3
	$0 + A = A$		4
Manipulative laws:	$A + B = B + A$		5a
	$AB = BA$		5b
	$A + (B + C) = C + (A + B)$		6a
	$A(BC) = C(AB)$		6b
	$A(B + C) = AB + AC$		7a
	$A + (BC) = (A + B)(A + C)$		7b
deMorgan's theorem:			
	$\overline{AB \text{ ---- } N} = \bar{A} + \bar{B} + \text{ ----- } + \bar{N}$		8a
	$\overline{A + B + \text{--- } N} = \bar{A}\bar{B} \text{ --- } \bar{N}$		8b
Simplification theorems:			
	$AB + AC = A(B + C)$		9a
	$(A + B)(A + C) = A + BC$		9b
	$AB + A\bar{B} = A$		10a
	$(A + B)(A + \bar{B}) = A$		10b
	$A + AB = A$		11a
	$A(A + B) = A$		11b
	$A + \bar{A}B = A + B$		12a
	$A(\bar{A} + B) = AB$		12b
	$AB + \bar{A}C + BC = AB + \bar{A}C$		13a
	$(A + B)(\bar{A} + C)(B + C) = (A + B)(\bar{A} + C)$		13b

Part 1 of this series examined the mathematical language of digital circuits. A summary of the important theorems and laws of Boolean Algebra is given in Table 1. It is extremely helpful in gaining an understanding of logic circuits and their design and simplification if the basic concepts of Boolean Algebra are well understood.

Part 1 showed the relationship between logical, true/false statements and Boolean variables. The next step is to discuss the relationship existing between Boolean algebra and switching circuits.

A switching circuit can be considered in its elemental form to be simply a black box with input and output terminals as shown in Figure 1.

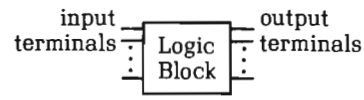

Figure 1

The input and output terminals of the logic block will be thought of in a more restricted sense than in ordinary analog circuits. Each input or output terminal must be in one of two possible states. Depending on the nature of the block, the states may be on or off, up or down, positive or negative, or high or low.

First consider circuits in which an output is determined only by the present states existing at the inputs. Such circuits are referred to as *combinational* while circuits in which outputs are a function of past states as well are termed *sequential*. An understanding of combinational

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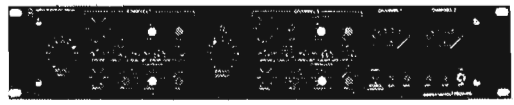

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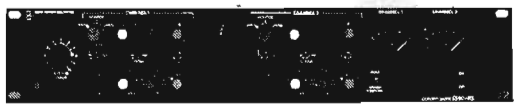

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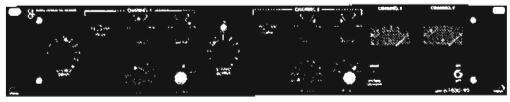

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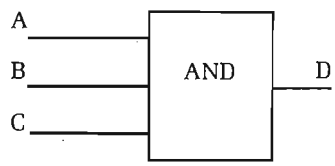


A	B	C	D
0	0	0	0
0	0	1	0
0	1	1	0
0	1	0	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Figure 2

circuits is necessary to proceed in a rational way to sequential circuits.

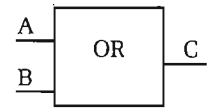
Since the output of a logic circuit is a function of its inputs and a Boolean expression is a function of its variables, manipulations and simplification of a Boolean expression are related to network simplification.

Logic blocks

The five basic logic blocks needed to make up functional circuits are AND, OR, NOT, NOR, and NAND.

The AND block output equals 1 only when all of the inputs are 1 and is 0 when one or more inputs are 0. Figure 2 illustrates a 3-input AND block with its corresponding truth table.

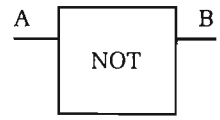
The OR function output equals 1 only when one or more of the inputs equal 1 and equals 0 only if all of the inputs are 0. Figure 3 illustrates a 2-input *inclusive* OR block and its corresponding truth table.



A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

Figure 3

The NOT function equals 1 only when its input equals 0. Also, the function equals 0 when its input equals 1. This block, of course, has only one input. Figure 4 illustrates the NOT circuit and its truth table.



A	B
0	1
1	0

Figure 4

The NOR function is, of course, a

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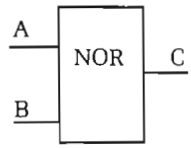
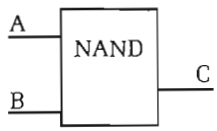
complemented OR (NOT OR) function. The output of this functional block is 0 only when one or more of the input variables equals 1. The output will be 1 only when all of the input variables are equal to 0. The NOR circuit and its truth table are illustrated in Figure 5.



A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

Figure 5

The last of the basic building blocks is the NAND function (NOT AND). This function has an output equal to 0 when all of its inputs equal 1 and an output of 1 when one or more inputs are 0. Figure 6 illustrates a 2-input NAND circuit and its truth table.



A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

Figure 6

These five logic functions use the Boolean values 0 and 1 to represent the values taken on by the various variables. Realizing that 1 or 0 may be replaced by any discreet pair of values such as "+" and "-," or "on" and "off," the truth tables containing the algebraic values 0 and 1 can be used to describe the conditions on actual logic blocks. Just pair off the Boolean values 1 and 0 with *state* values such as voltages, polarities or other physical quantities. For instance, a value 1 may be assigned to the higher of two voltage levels and 0 to the lower. All that is necessary is that there be two distinct values of voltages to consider.

Positive and negative logic

The discussion above assumes that the Boolean value 1 will correspond to a "higher" or "up" or "on" physical value. This is not always done, and it is sometimes convenient to employ the opposite assignment of values.

$$- = 1$$
$$+ = 0$$

This results in what is referred to

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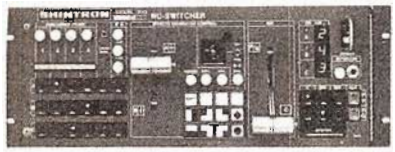

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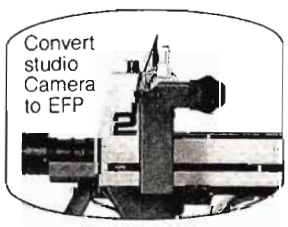

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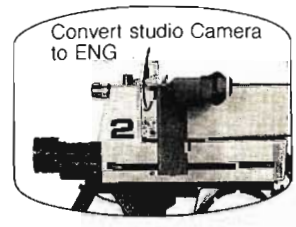

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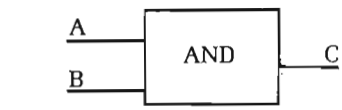
as negative logic, and in terms of the logic blocks previously considered the following statements can be made:

- an OR circuit performs the AND function
- an AND circuit performs the OR function
- a NOR circuit performs the NAND function
- a NAND circuit performs the NOR function
- a NOT circuit is still a NOT function.

To avoid confusion it is helpful to label the block with the function it performs and use a notation that will indicate when negative logic is being used on an input or output. An example of this concept is the use of the so-called bubble notation. A small circle or *bubble* is drawn at the junction of an input or output line and the function block to indicate the assignment of negative logic to that line.

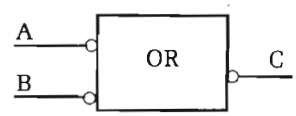
As an example, consider the block shown in Figure 7.

A voltage or physical state truth table for *both* circuits of Figure 7 would be as shown in Figure 8.



A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

(a)



A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

(b)

Figure 7

A	B	C
-	-	-
-	+	-
+	-	-
+	+	+

Figure 8

The negative logic versions of the OR, NAND and NOR circuits are shown in Figures 9, 10 and 11.

Note that by making use of complementation (inverters) OR gates may be used to perform an AND function and AND gates may be used to perform an OR function. This reasoning leads to the following statements regarding realization of Boolean expressions:

- Any Boolean function can be realized with AND and NOT functions only.
- Any Boolean function can be realized with OR and NOT functions only.
- Any Boolean expression can be realized with NAND functions only.
- Any Boolean expression can be realized with NOR functions only.

In the latter two cases the NOT function can be obtained by using only one input of the NOR or NAND blocks.

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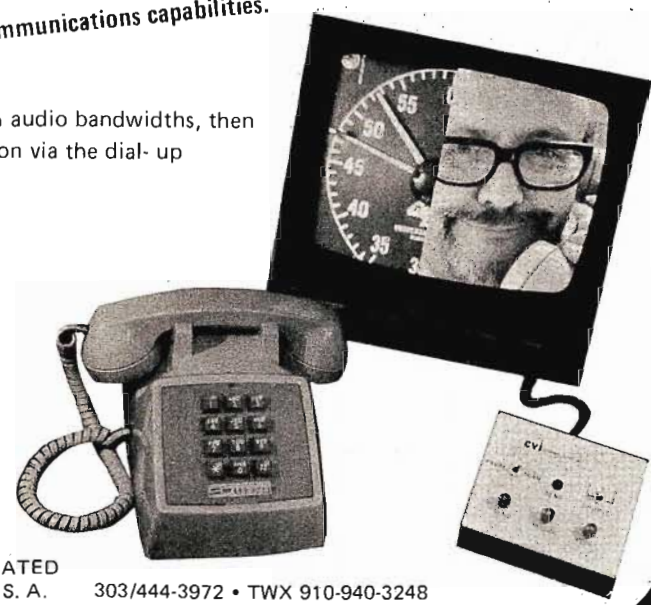

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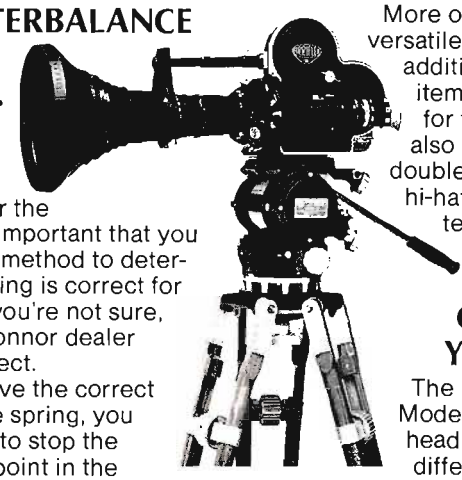

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State		
A	B	C
-	-	-
-	+	+
+	-	+
+	+	+

Positive logic		
A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

Negative logic		
A	B	C
1	1	1
1	0	0
0	1	0
0	0	0

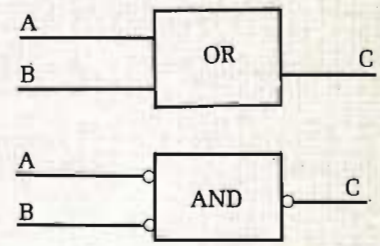

Figure 9 (OR circuit)

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State		
A	B	C
-	-	+
-	+	+
+	-	+
+	+	-

Positive logic		
A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

Negative logic		
A	B	C
1	1	0
1	0	0
0	1	0
0	0	1

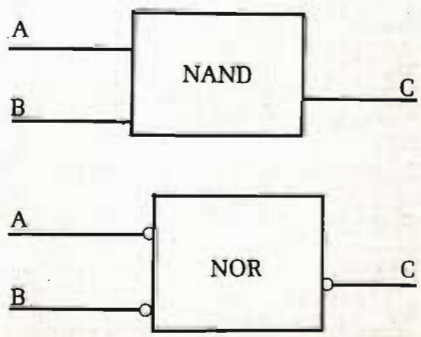

Figure 10 [NAND circuit]

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-	+	-
+	-	-
+	+	-

Positive logic		
A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

Negative logic		
A	B	C
1	1	0
1	0	1
0	1	1
0	0	1

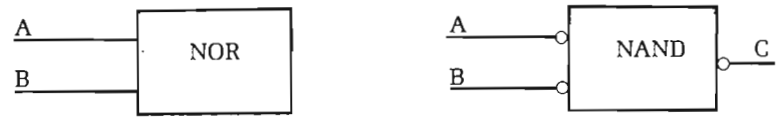

Figure 11 [NOR circuit]

Digital basics

very common forms for logic expression or Boolean equations. Either form may be used as the basis for a logic circuit. A special form of truth table (which is now obsolete) was the origin of the terms.

• The minterm form may also be thought of as a sum of products formulation. For example:

$$X = (AB\bar{C}) + (\bar{A}B\bar{C}) + (\overline{ABC})$$

• The maxterm form can be considered to be a product of sums formulation such as:

$$X = (\bar{A} + \bar{B} + C)(A + \bar{B} + \bar{C})$$

In terms of logic circuits, a particular expression may be implemented by either form as a result of deMorgan's Theorem. For example, to implement the expression

$$X = (\bar{A}B) + (AB),$$

a minterm formulation would be as shown in Figure 12.

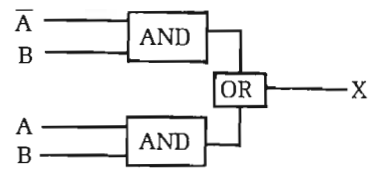

Figure 12

A logic function may be implemented in maxterm form as shown in Figure 13.

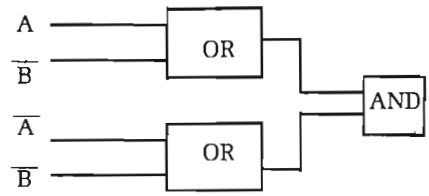

Figure 13

This circuit is obviously implemented from the expression

$$X = (A + \bar{B})(\bar{A} + \bar{B}).$$

The sum of products, or minterm form of an expression, may be written directly from a truth table. That is, the truth table can be considered to be a minterm formulation. For example, the truth table in Figure 14 can be translated into the circuit as shown.

A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

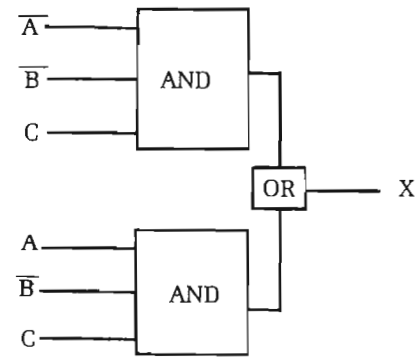

Figure 14

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Consider a 0 in the A column to be $\bar{A}$ and a 1 in the A column to be A with a similar interpretation for the B and C columns. Thus,

$$X = \bar{A}\bar{B}C + A\bar{B}\bar{C}$$

can be written for the X variable by forming terms for each combination that results in X having an entry of 1. The circuit shown can be drawn directly from the Boolean equation.

The minterm form is the most commonly used; however, the maxterm form may be used. It is formed by complementing a minterm truth table. For example, given the minterm table in Figure 15(a), complementation results in the maxterm table of Figure 15(b).

A	B	A
1	1	0
1	0	1
0	1	0
0	0	1

(a)

A	B	X
0	0	1
0	1	0
1	0	1
1	1	0

(b)

Figure 15

The minterm and maxterm forms perform identical logic functions and are interchangeable from the standpoint of logical function. One of the formulations may appear to be more complex than the other due to redundant terms. Inclusion of these redundant terms represents an unnecessary expense and needless complexity when designing a circuit. Therefore, it is desirable to denote some design effort to simplification of the algebraic expressions or networks.

The next part of this series will consider some of the methods of simplification. These methods are all based on the basic premise that input combination can be divided into three groups:

- combinations for which an outut is desired, i.e. output equals 1;
- combinations for which no output is desired, i.e. output equals 0; and
- combinations which can't occur (physically impossible) or where it doesn't matter if the output is 1 or 0.

The inclusion of terms of the third type may either complicate an expression (increasing the complexity and cost of a circuit) or may actually simplify an expression (reducing the cost and complexity of a resulting circuit). Thus, the simplification methods discussed are crucial in optimizing a design. □

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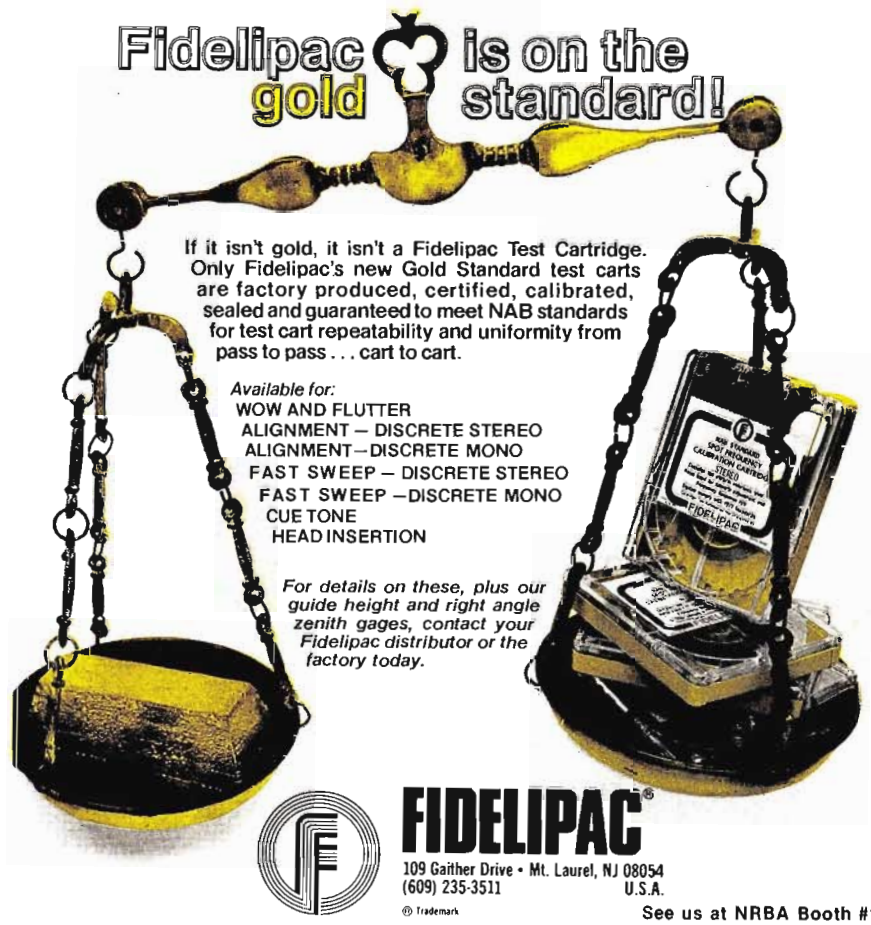

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National Radio Broadcasters Association 6th Annual Conference & Exposition

October 7-10, 1979
Washington Hilton Hotel
Washington, DC

NRBA '79 attendees will see the largest show in NRBA history. Previous exhibitor sign-up records already have been exceeded, and new attendance records are expected.

The exhibitor list for the convention is still growing, but registrants will receive a program listing all exhibitors and their booth assignments.

Those not attending NRBA '79 may use the following list to receive NRBA '79 exhibitor data. This listing is up-to-date as of press time, but a complete replay of NRBA '79 containing information gathered at the show will appear in the November issue of **BE**. For exhibitor information, circle the number following the equipment or service on **BE**'s reader service card. The exhibitor(s) will mail the requested information. (Where available, specific exhibitor products for NRBA have been listed; where this information is not yet available, "product line" indicates that NRBA-related information will be mailed.)

The italicized listings denote new products being introduced at NRBA '79.

Further information on the convention may be obtained by contacting the National Radio Broadcasters Association, 1705 De Sales Street N.W., Suite 500, Washington, DC 20036, (202) 293-3570.

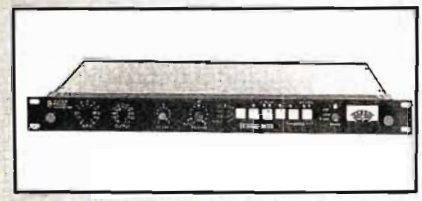
NRBA Exhibitor/Products

American Quotation System
Data screen & printer (250)
PROdata system (251)

Ampro/Scully
Broadcast consoles (252)
Cartridge machines (253)
Audio recorders (254)

Andrew
Product line (255)

Audio & Design Recordings
Ex-Press Limiter (256)
Dual noise gate (257)
Transformer mic preamp (258)
Delay lines (259)
Distribution amplifiers (260)
Limiters/compressors/equalizers (261)



The Ex-press Limiter by Audio & Design Recording is a compressor/limiter/expander with the function mode controlled by digital logic momentary switches.

Auditronics
Product line (262)

Automated Broadcast Controls
Sequential controller (263)
25Hz tone detector (264)
Microprocessor interface (265)
Automation controls system (266)
Clocks/loggers (267)
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Automated Music
Music formats (269)

Automated Processes
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Intercom system (273)

Automation Electronics
Autotron traffic system (274)
Radio sales system (275)
Traffic logging system (276)
Word-processor (277)
Music analysis (278)

Belar Electronics Laboratory
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Bloomington Broadcasting
Music research package (280)
Business computer systems (281)

Bonneville Broadcast Consultants
Product line (282)

Bonneville Data Systems
Product line (283)

Broadcast Consultants
Product line (284)

Broadcast Electronics
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Broadcast Programming Int'l.
Special holiday programs (286)
Music formats (287)

Bureau of Census
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CCA Electronics
To announce several new products (289)

Cablewave Systems
Transmission lines (290)
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Capitol Records
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CaVox Stereo Productions/Tape-Athon
Tape-Athon programmer (295)
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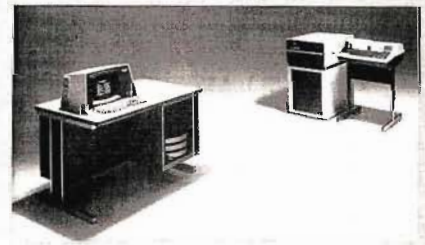
Audio systems (298)

Century 21 Programming
Music programs (299)

Cetec
Product line (300)

Computer Concepts
Broadcast traffic systems (301)



Computer Concepts will feature their building-block broadcast traffic computer systems which allow customers to buy only as much system as is needed.

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Computers & Peripherals
Product line (302)

Comrex
Low frequency extenders (303)

Concept Productions
Radio formats (304)
Voice/music synchronizer (305)

Consolidated Electronic Industries
Servo motor cart machine (306)
Reel-to-reel stereo tape reproducer (307)
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Custom Business Systems
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From Studio B
Comprehensive sales/promo package (330)
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Lending library/A-V cassettes (333)

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Facilities controller (336)
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AM stereo system (338)

IGM/NTI
Live assist system (339)
Automation system (340)
Instacart system (341)
Go-Cart system (342)
Automatic logging system (343)

International Business Services
Product line (344)

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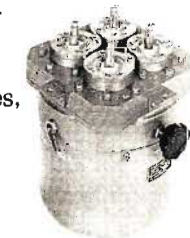

Broadcast Industry - circle **233**
Telephone Industry - circle **234**
2-Way Radio Industry - circle **235**

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Audiotape cartridge machine (345)
1K library storage system (346)
Cartridge recorders/reproducer (347)
Reel-to-reel recorders/reproducers (348)
Erase/splice locator (349)
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Irv Joel & Associates
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LPB
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Money Machine
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Moseley Associates
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Subcarrier main frame (388)
Microprocessor remote control (389)

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Musicworks
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Mutual Broadcast System
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Fred A. Nudd
Towers (397)
Monopoles (398)

Orban Associates
Live processor (399)
Live equalizer (400)
Live de-esser (401)
Spring reverb (402)
Stereo limiter (403)

Orban equalizer model 672A is a quasi-parametric equalizer designed to enhance the announce microphone and to create special effects to make a station stand out.

Otari
Product line (404)

Phelps Dodge
Product line (405)

Philadelphia Resins
Antenna guy rope (406)

Progressive Radio Network
Product line (407)

QEI
Product line (408)

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Turntables/tone arms (411)

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Product line (412)

RCA
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RCA American
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Rockwell-Collins
AM/FM transmitters (415)
Stereo consoles (416)

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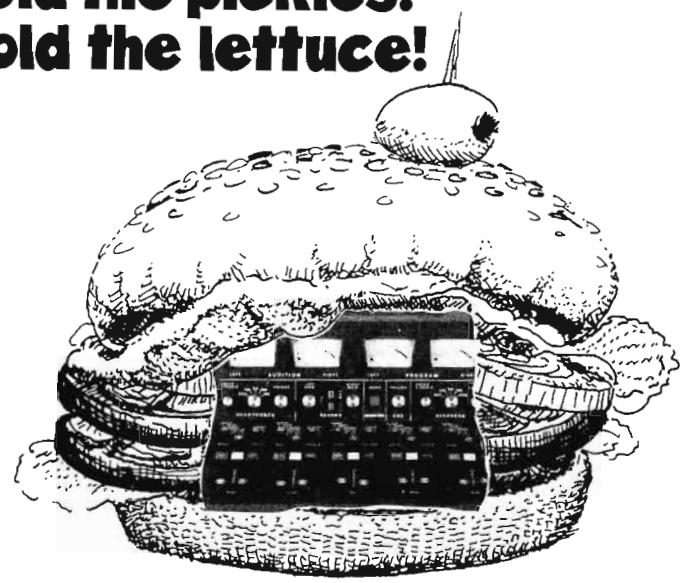
Hold the lettuce!



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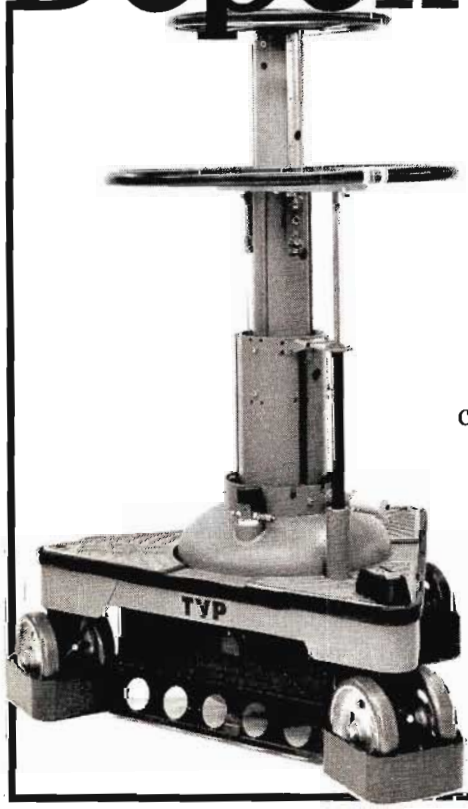

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NRBA convention

Sharepoint Systems
SCA generator/processor (417)
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Peak program meter (419)
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Video DA (422)
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Time & Frequency Technology
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Torbet Radio
Product line (443)

Trac-Lab Computer Systems
Computerized logging and billing systems (444)

Trac-Lab introduces its stand-alone computerized business systems to provide logs and billing information for radio, TV and cable systems.

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UMC Electronics
Announce assist system (445)
Stereo production console (446)
Cartridge player (447)
Cartridge recorders/reproducers (448)
Splice finders/erasers (449)
Audio control console (450)
Replacement heads/motors (451)

UPI
Audio network data (452)
Broadcast wire/datanews (453)

US Tape & Label
Promo strips, labels, iron-ons, caps (454)

Thomas J. Valentino
Production music library (455)
Production sound effects library (456)
IDs and logos (457)

Versa-Count Engineering
10W/50W FM exciters (458)
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Stereo monitor (460)
RF power amplifier (461)
FM translators (462)
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Stereo generators (464)
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Audio distribution amplifiers (466)

Wang Laboratories
Product line (467)

Wang Voice Communications
Product line (468)

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Custom imprinted clothing (469)

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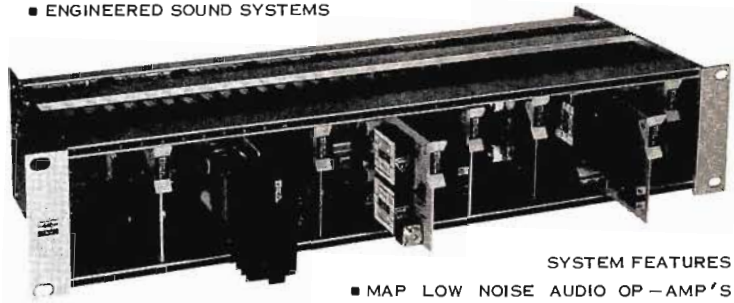

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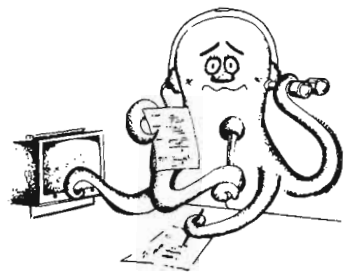

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WGBH engineers talk about the Ikegami HK-312

WGBH covers Boston Pops Orchestra concerts with Ikegami HK-312 cameras from Symphony Hall, Boston.

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Eight Ikegami HK-312 studio color cameras are in service at WGBH, Boston, some dating back to October 1977 – long enough for intelligence on their performance. From recent interviews with key WGBH people, read these excerpts.

Pops without noise
Tom Keller, Director of Engineering:

"The HK-312s have such high sensitivity that we were able to reduce significantly our light levels at the Boston Pops and Symphony telecasts. Yet, despite the major light reduction, we experienced no visible noise with the HK-312s . . . With their remarkable reliability record, we can depend on 6 cameras for 6-camera coverage, and not 7 for 6 as in the past. After all, you can't stop a live orchestra performance for a retake if you've lost a camera."

2 IRE, but a complaint
Ken Hori, Senior Engineer for Advanced Development:

"We tested several camera makes for RFI within a quarter-mile of a 50 KW radio transmitter. The HK-312 measured 2 IRE, whereas most others were in the 5 to 7 IRE area, and some as high as 20 IRE . . . For symphony remotes we'd need 2 to 5 hours for warm-up, but nowadays we're set up in less than an hour . . . We like its straightforward design – example, its truly high signal-to-noise ratio as compared to other cameras that resort to reduced bandwidth to attain a comparable ratio but wind up delivering noise too . . ."

We did get one complaint from the maintenance crew. They said that because they rarely found the problem of a down HK-312, they would never get to know the HK-312 well enough to fix it.

Washouts and dropouts
Bill Fairweather,
Video Control Engineer:

"During a lighting seminar staged here by Imero Fiorentino Associates, an actor in a normally lighted scene held up a sheet of white paper with printing on it to show loss of detail in the case of more than 60 percent tv white reflectance. The HK-312, however, was able to retain enough detail for the printing to be readable on the monitor.

Next came a demonstration of the dangers of too much or too little light on a chroma-key background. The HK-312 held the key to such a low light level on the blank background that the lecturer grinned and said, "I guess WGBH has pretty good cameras!" and went on to the next subject."

The HK-312 is the camera that met WGBH criteria for performance, stability, and reliability. They also have HL-53s, high-performance portable cameras that interface with HK-312 CCUs and can operate portably with their own CCUs.

Adapters for triax cable, using digital techniques, make their cameras remote-usable at nearly a mile from base stations, yet easily revertible to multicore cable whenever needed.

In daily use, their HK-312s and HL-53s are interfaced with microprocessor-computer control units that automatically cycle them through all set-up adjustments, including black-and-white balance, flare and gamma correction, video gain, and eight registration functions, then recheck all those adjustments – all within 45 seconds. The cameras can also operate independently of the set-up computers, a feature that is an Ikegami exclusive.

If all of this suggests that the HK-312 is probably the best studio/field color camera in the industry, consider this: camera, set-up computer, and triax adaptor are not only operational, they are deliverable. For details or a demonstration, contact **Ikegami Electronics (USA) Inc.**, 37 Brook Ave., Maywood, NJ 07607, (201) 368-9171 / West Coast: 19164 Van Ness Ave., Torrance, CA 90501, (213) 328-2814 / Southwest: 330 North Belt East, Houston TX 77060, (713) 445-0100.

Ikegami HK-312

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Circular polarization (CP) field tests

By Bill Loveless, chief engineer, Bonneville International

Circular Polarization (CP) does not provide better television reception than the traditional Horizontal Polarization (HP), based on a series of field tests Bonneville International Corporation conducted in the Salt Lake Valley. Both the field tests and electromagnetic field theory demonstrate that horizontal signal polarization is generally superior to CP in poor reception areas.

The tests were implemented to evaluate the installation of a CP transmitter in Bonneville International Corporation's Seattle, WA, television outlet, KIRO. The tests were conducted in the Salt Lake Valley because the company has two similar high-band VHF stations with transmitters located at the same site. Both are public television stations, and so both broadcast materials from the same sources. However, one station uses a CP transmitter, and the other employs the traditional HP transmission mode. Thus, the tests were conducted under actual broadcast conditions and in a wide variety of receiver locations, including open areas, urban high-rise building areas, mountainside areas, and others.

Booneville International Corporation recently purchased a double power TV transmitter for a new CP installation at the company's Seattle outlet, KIRO TV Channel 7, on the premise that CP is a good solution to correct TV reception defects such as multipath ghosts, as reported in various trade journal articles. However, two well-known TV consulting engineers independently expressed to us their concern about the degrading effects of CP under certain reception conditions. In order to help solve our dilemma and to get some factual information first hand, Booneville Engineering decided to run some comparative field tests and document the results.

Being based in Salt Lake City, it was convenient to make comparative CP/HP tests, since the two VHF TV stations co-located at the same transmitter on Mt. Vision, 20 miles southwest of Salt Lake City. KBYU, Channel 11, is CP with the new Harris transmitter and antenna, while KUED, Channel 7, is conventional HP. The field tests were designed to address the following questions:

- Does CP cancel multipath ghosts and reflections in the TV picture? If so, under what conditions and how much?
- Does CP provide a stronger, more snow-free TV picture than HP? If so, under what conditions?
- How much does CP cause multipath ghosts and reflections that degrade rather than improve TV reception? Under what conditions?

Test antennas—A specially built CP receiving antenna cut to Channel 11 was ordered from Simplicity Tool Company of Portland, OR. The antenna consists of a 5-element horizontal yagi mechanically phased 90° in front of a 5-element vertical yagi on the same boom. The boom is end mounted to the mast behind the vertical reflector for minimum mast interaction. A remotely switchable phasing system is used to switch the CP antenna feeds between vertical, horizontal, right-hand circular, left-hand circular and a separate rabbit-ear antenna mounted atop the vertical mast. The rabbit-ear antenna length was adjusted halfway between maximum Channel 7 and 11 video carrier signal strength on the field meter with elements set 45° from vertical.

Additionally, two separate 5-element horizontal yagis (one cut to Channel 7 and the other cut to Channel 11) on separate masts were used to compare the HP component of the Channel 11 CP signal with the Channel 7 HP signal. A Rohde & Schwarz field meter, a 17-inch Sony color TV set, and a 35 mm SLR color film camera were used to document the picture.

Test procedure—Using a control site with near perfect TV reception conditions approaching free space, the video carrier signal strength readings along with color photographs of the TV set picture were taken using the various antenna and polarization combinations on the CP station, Channel 11, and the HP station, Channel 7. After obtaining predictable free space results at the control site, 11 other sites, each with various reception conditions, were selected and visited. The same group of measurements and photographs were taken at each site. In every case, the antennas were positioned for a uniform signal field at a fixed height of 15 ft and oriented for maximum signal.

Results of CP tests—In the good reception areas, the CP signal delivered the expected "double power" signal strength on the CP receiving antenna with excellent picture quality and no ghosts. However, to our great disappointment, at the poor reception sites where ghosts and multipath are visible, the Channel 11 CP signal on the CP receiving antenna did *not* reduce ghosts and multipath reflections. In fact, the conventional HP Channel 7 had the strongest signal with the least ghosting on all the antenna combinations, including rabbit ears. The performance of CP was disappointing, to say the least.

In trying to explain the poor CP results, the theory was studied again. Theory indicates that in order for a CP receiving antenna to cancel CP ghosts, condition 1, the

Editor's note: In the wave of advances in CP antenna design and installation successes, this paper suggests some caution may be exercised in system selection. The data and its interpretation, along with the conclusions and recommendations, are those of the author. They are printed here as a service to the industry, but, such publication does not imply **Broadcast Engineering** endorsement as to test results, interpretation or recommendations.

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vertical component of the CP ghost signal, must be phased 90 degrees leading and of equal amplitude to the horizontal component of the CP ghost.

Furthermore, to obtain double power from the CP receiving antenna, condition 2, the vertical component of the direct CP signal, must be phased 90 degrees lagging and of equal amplitude to the horizontal component of the CP signal. Both of these free space conditions seemed to be closely approximated in the good reception areas but not in the multipath ghost area.

CP theory also indicates that if the CP reflected ghost signal does not have the desired phase and equal amplitude relationship between its horizontal and vertical components, then the ghost is amplified and the direct signal is reduced. This is condition 3.

Realizing that there are two different types of ghosts, a study was made to determine what two reflection conditions will produce a condition 1 ghost, cancellable with a CP receiving antenna, and a condition 3 non-cancellable ghost. An important clue was found by comparing the TV set picture photos from the separate horizontal and vertical antenna signal components of the CP signal. In the multipath areas, the vertical component was consistently lower in amplitude and contained significantly more multipath ghosts, while the horizontal component was stronger and relatively free from ghosts. It became obvious that the defective vertical component of the CP signal was causing the condition 3 ghosts. With this clue, further study of Electromagnetic Field Theory confirmed and explained the CP test results so that predictions could be made.

General predictions regarding CP— Condition 1 ghosts can be produced by a CP signal reflecting from a highly conductive flat surface, such as the side of a metal skinned

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CP tests

building. These ghosts should be reduced by using a proper CP receiving antenna.

Condition 2 is a CP signal under free space conditions without ground reflections. Double power can be captured with a proper CP receiving antenna.

Condition 3 ghosts can be produced by a CP signal reflecting from a poor conducting dielectric surface such as concrete, asphalt, brick, dirt, rock, mountains, trees, water, grass, ice, apartment and office buildings and ground reflections. These ghosts cannot be cancelled by a CP receiving antenna. Path obstacles, irregular metallic shapes and power lines also can produce condition 3 ghosts. The critical angle associated with reflections from poor conducting surfaces is the Brewster angle. For typical ground reflections, the Brewster angle is 6 degrees. The CP signal component normal to the surface is reflected with rapidly changing amplitude and phase near the Brewster angle.

At angles of incidence equal to the Brewster angle, the normal component is absorbed and not reflected. At small angles near zero degrees, both the normal and parallel components are reflected with equal amplitude and uniform 180 degree phase shift. At higher angles the normal component is poorly reflected with increasing amplitude and phase shift approaching zero degrees The CP signal component parallel to the surface is reflected at full amplitude and 180 degree phase shift for all angles of incidence. These CP signal reflections produce condition 3 ghosts that cannot be cancelled with a CP receiving antenna.

The Electromagnetic Laws of Physics and CP Theory may be used to explain and predict the poor results obtained in the CP tests in the multipath areas. The same laws and tests also confirm the conclusions reached by panel 9 of the National Television Standards Committee, NTSC, when in 1941 it observed that horizontal polarization was superior to vertical polarization in regard to multipath and ghosts.

Conclusions—After gaining an understanding of the practical capabilities of CP, with its limitations, the useful benefits of CP seem to be somewhat diminished. CP works properly under free space conditions where it is really not needed. Under these ideal conditions, CP's advantages are:

- Condition 1 ghosts can be reduced with a proper CP receiving antenna.
- Double power can be extracted with a proper CP receiving antenna.
-
- Rabbit-ear and fish-pole antennas are less critical to adjust because the vertical component is present in CP. However, as expected, these antennas produce no more power from a CP signal than from an HP signal.

In the fringe and multipath reception areas where help is really needed, CP has a disadvantage. The defective vertical component of the CP signal is usually low in amplitude and has multipath ghosts. This non-correctable condition causes condition 3 ghosts and reduces the signal strength on all antennas, including CP and rabbit ears.

Recommendation—Both CP field tests and Electromagnetic Field Theory demonstrate that horizontal signal polarization is generally superior to CP in the poor reception areas on all types of antennas. Standard HP is therefore recommended over CP as the preferred mode of TV transmission. □

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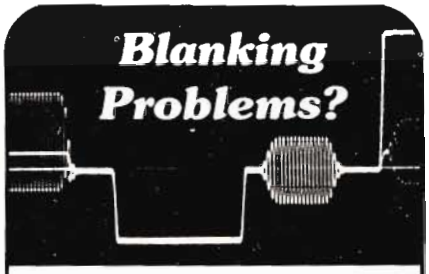

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station-to-station

Tape recorder air-checks programming

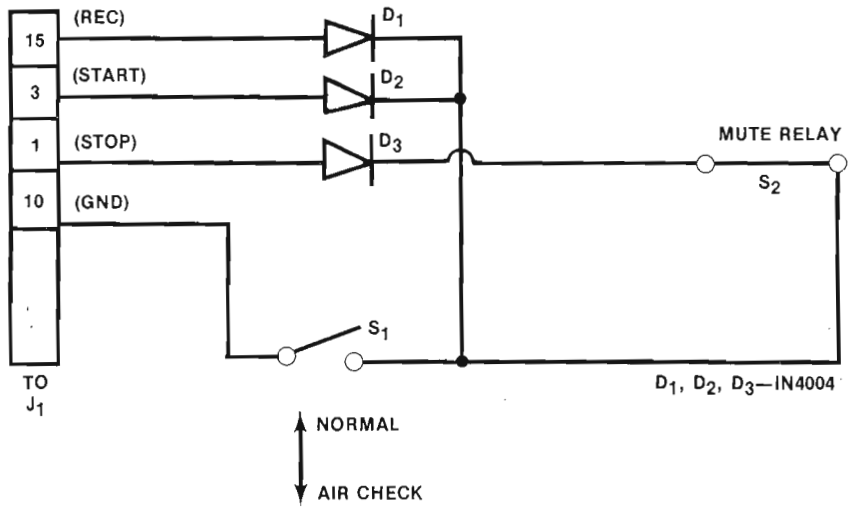
By John Shepler, chief engineer, WROK/WZOK, Rockford, IL

Many program directors and announcers air-check their shows by having a recorder running only when the studio microphone is on. The usual method involves wiring the motor circuit of a cassette machine through the microphone muting relay. Although this works, it is desirable to have a studio quality reel machine start and stop in conjunction with the microphone switch.

At WZOK there are two ITC 850 reel-to-reel recorders in the FM control room. An enclosed circuit starts the recorder when the microphone is on and stops it when the mic goes off. A switch (S1) determines whether the machine will run normally or in the air-check mode. When S1 is closed, the record and start circuits are energized through diodes D1 and D2. The stop circuit is controlled through diode D3 which is routed through a set of normally closed contacts on the microphone mute relay in the board (S2).

If the microphone is off, the mute contacts are closed and the stop circuit is energized. The stop circuit will take precedence over the other circuits and the machine will remain stopped. When the relay contacts open (microphone on) the stop circuit will be open and the machine will start in the recording mode.

The circuit is simple to construct using three rectifier diodes (type 1N4004 or equivalent). The recorder connections are made on the remote control plug (P1) which may also be used for its normal function. When the switch S1 is open, the recorder behaves just as though the air-check features was not connected. All normal remote control connections also remain the same.



Back in action with improvised horn feed

By Steve Flyte, ENG engineer, KATU, Portland, OR

KATU, the ABC affiliate in Portland, OR, has used live/tape ENG capabilities extensively and aggressively since January 1976. So, I figured December 27, 1978 was going to be more or less a routine day for me. I was driving our Mobile Two news van to Salem, 50

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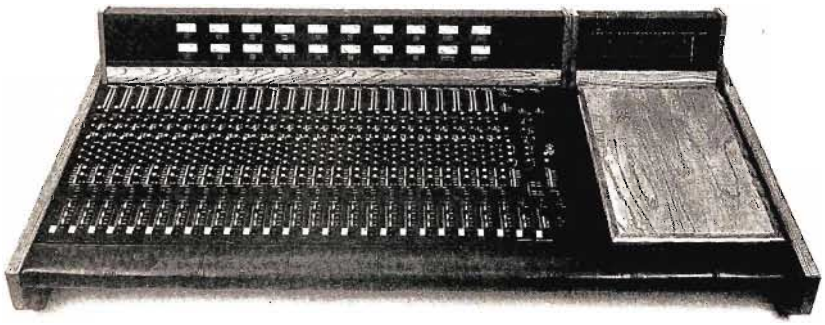

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miles south of Portland, to meet the Channel 2 and ABC Network news teams to transmit their videotapes back to Portland for their respective news broadcasts.

After meeting with the crews and discussing our operation plans for the day, I proceeded up the hill not far from the Marion County Courthouse to establish our microwave circuit. It was when I arrived up on the hill that I discovered our Nurad circularly polarized feed section for our 4-ft dish on the roof was missing. Like most of the news vans around the country, Mobile Two stores its feed section inside the van when traveling, and when the dish is erected for transmitting, the center feed horn with its four arms is held to the dish with four small tabs.

Without that one component, our $275,000 news van was not worth a thing to anybody. The first idea that came to mind was to try to fabricate some sort of makeshift assembly to fit to the dish. A telephone call to the local TV station proved negative—no extra 2GHz dish components laying around the shop. Next, I tried the Microflect Company. They install large microwave repeater sights all over the nation. After going through their junk box, all we could come up with was a feed horn for a 10-ft dish, instead of something for the 4-footer mounted on the van. Figuring that the focal length would be wrong, I decided to try it anyway.

The borrowed feed assembly was quite heavy and approximately 4-ft long. It required lots of rope and gaffer tape to hold it into place.

After installation, I contacted the studio—nothing. I really didn't expect anything with the focal length being so far off.

Almost ready to bag it with the agony of defeat, I decided to try one more thing. There happened to be a short piece of RG-11/U coax in the van with an N connector on it. I called back to the station and asked the assistant chief engineer to look up in the Nurad manual what the proper focal length was supposed to be. He called back and said approximately 22 inches.

At this point, I took some of my 15 years of experience with amateur radio antennas to mind (dipoles and yagis) and fanned the shield and center conductor on the end of the coax into a small dipole, each side being ¾-inches long. I ran the coax through a small hole in the center of the dish, pulled it out to 22 inches

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from the center, and just held the little dipole out in midair with lots of gaffer tape supporting it. I oriented the dipole in the horizontal configuration, and called the station again to look for my signal.

I went up on the roof of the van and started tuning the dish. To everybody's surprise a trace of bars were starting to appear on the monitors and scopes at the station. We all felt like Marconi sending his first radio signals across the Atlantic. More tuning proceeded, and finally the studio told me we had a fine quality, fully broadcastable signal with this Rube Goldberg concoction. We were all amazed. (Have you ever opened up one of the Nurad horns and seen the complexity of plumbing, coaxes, etc.?)

Soon, Channel 2 News and ABC arrived, and they sent their tracks and everybody was happy. Later that night, I drove back to Portland, and we did a live basketball remote from Memorial Coliseum for Channel 2 News. What a day!

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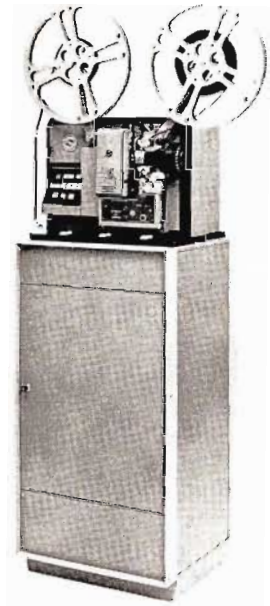

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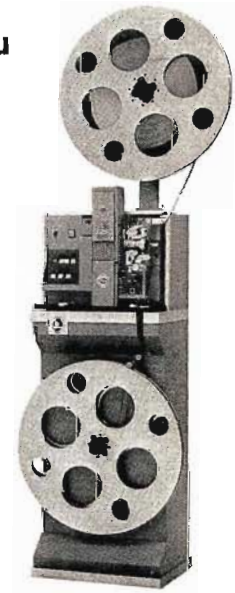

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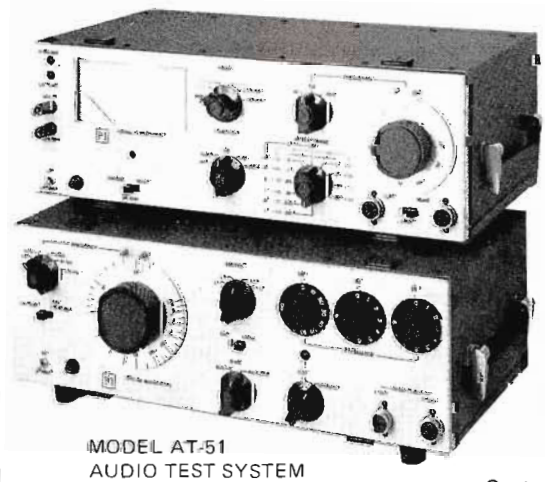

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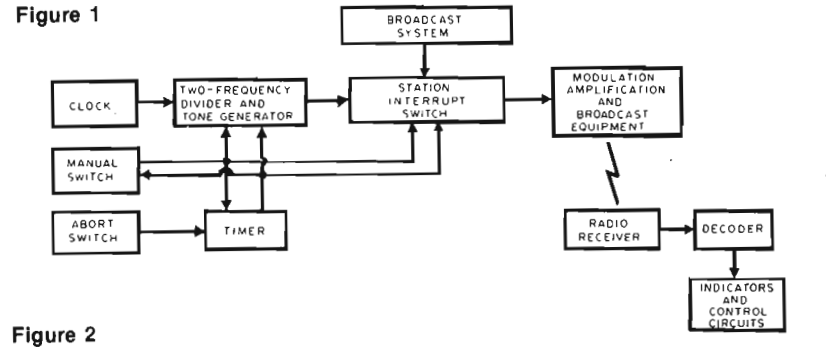
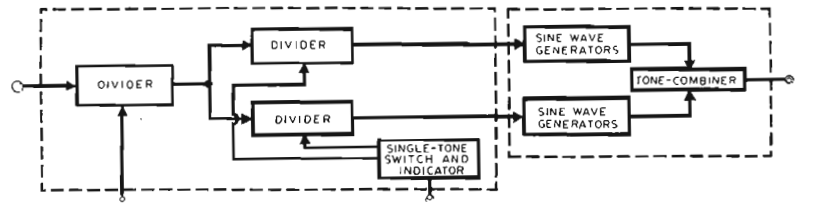


Figure 2



2-tone attention signal broadcasting system

By Patrick Bryant, studio/theater engineer, ABC, Hollywood, CA

In the past, the FCC has required participating broadcast stations to have equipment for broadcasting a warning signal in the form of a carrier-break followed by a 1000Hz tone. The FCC now requires two tones to be broadcast simultaneously at 853Hz and at 960Hz with a variation of less than ±0.5Hz for a period of time between 20s and 25s.

One class of such 2-tone broadcasting equipment includes a manual switch, that, when depressed, causes a switch to interrupt the audio signal from the broadcast studio and a generator to generate the 2-tone signals and a circuit that combines the two signals for amplification and modulation.

Conventional implementing of such a system suggests that (1) the time that the warning signals are broadcast is controlled by an analog circuit (such as an RC circuit); and (2) two sine-wave signals are generated in tank circuits for combination and application through the interrupt switch to the amplification and modulation equipment. Such circuitry is known in other types of tone transmitting systems. This type of system has the disadvantage of being relatively expensive and not as precise as desired. The expense occurs because timing equipment with the required accuracy and the equipment necessary to generate the sine waves is expensive.

Signaling systems are known which generate the two frequencies digitally, convert them to sine waves, and combine these sine waves for broadcasting. Such a system is disclosed in US Patent 3,676,780 to Niemann. However, this type of equipment has relatively high distortion and low accuracy in the timing of the signals. One cause of the distortion is that the digital signals are applied directly without differentiation to resonant tank circuits for conversion to sine waves. This distortion, coupled with any distortion from the application of the signals through telephone wires from the interrupt switch, is a disadvantage which would impede the direct use of such equipment in a 2-tone attention signal generator.

A new circuit (US Patent 4,103,235) provides a novel 2-tone attention signal broadcasting system. The circuit was designed to provide (1) a 2-tone attention signal broadcasting system which is relatively inexpensive; (2) a system with a relatively simple and inexpensive timing system that provides precise timing of the duration of the signals; (3) a low distortion 2-tone system;

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(4) a sine-wave generator which provides a low distortion sine-wave output signal from a square-wave input signal; (5) a system for generating two frequencies from a single clock frequency and combining them into a 2-tone sine-wave audio signal; and (6) an interrupt system for terminating the audio signal from a broadcasting station and transmitting instead a 2-tone attention signal to the amplification, modulation and transmitting equipment.

Accordingly, the 2-tone attention signal broadcasting system described here includes an encoder and an interrupt switch. The switch interrupts the audio signal which is being transmitted from the studio to the modulation, amplification and broadcasting equipment upon the depressing of a manual switch and transmits instead a 2-tone signal developed by the encoder for a fixed period of time between 20s and 25s. The 2-tone signal is received by receivers forming part of the 2-tone attention signal broadcasting system and decoded to provide an alarm and to demute certain radio receives for a reception of further information.

Complete details of the entire system may be obtained by purchasing referenced patent from the US Patent and Trademark Office, Washington, DC 20231.

Building a digital lock

By John Linebarger, WREG-TV, Memphis, TN

We have constructed a digital lock to eliminate a large number of keys that would be necessary if a majority of station employees were to have access to the building entrance or any door for that matter. Additionally, eliminating the need for even having a key would eliminate lost or stolen keys.

The lock can be constructed using TTL logic devices available from the shelf of any electronics retailer. A power supply of 150 mA should be plenty for power with the exception of the external door controls or alarm.

The circuit is very straight forward. In order to gain access, one presses four buttons or flips four switches to enable the device to function. After this is done, a TTL logic level is sent to a transistor driver for door release. If the wrong

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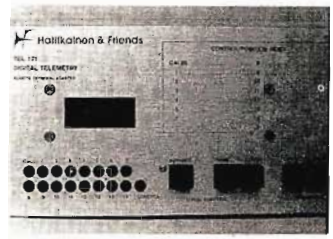

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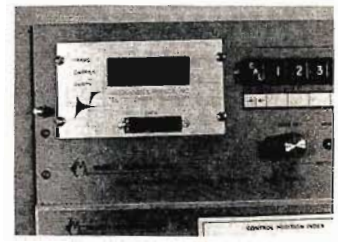

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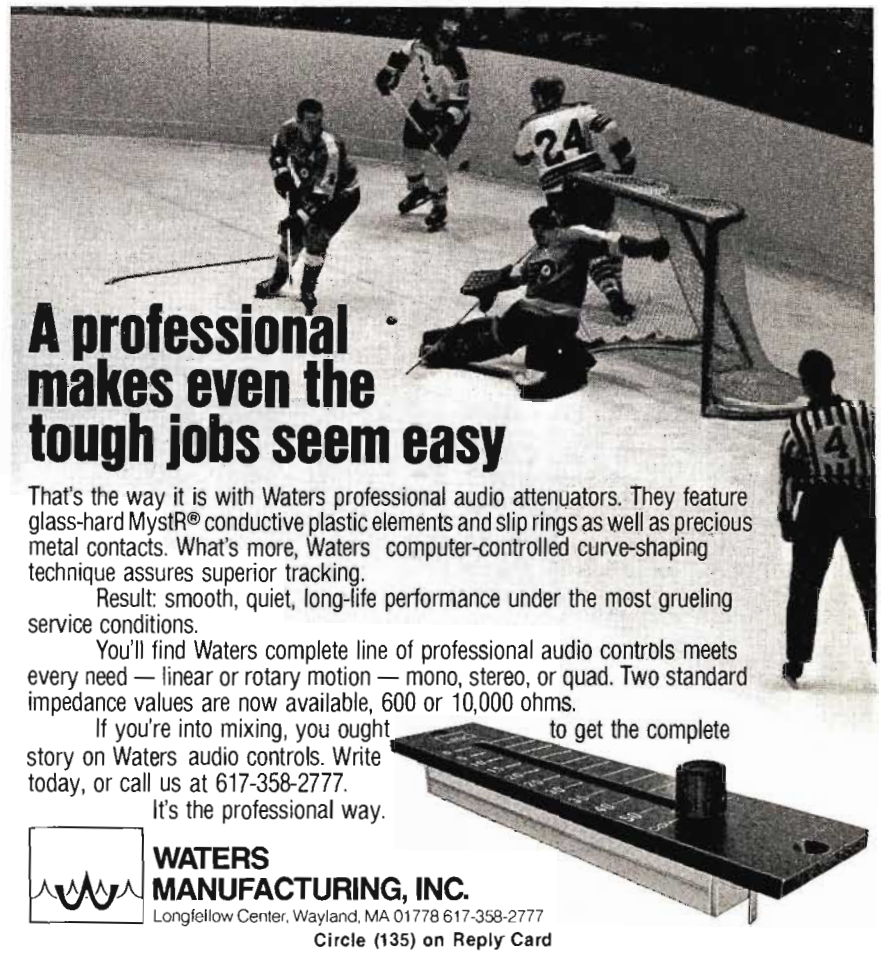

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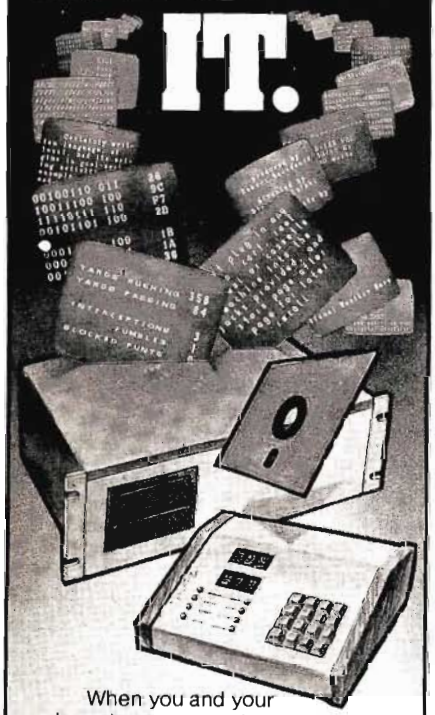

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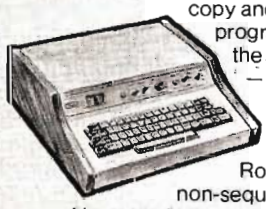

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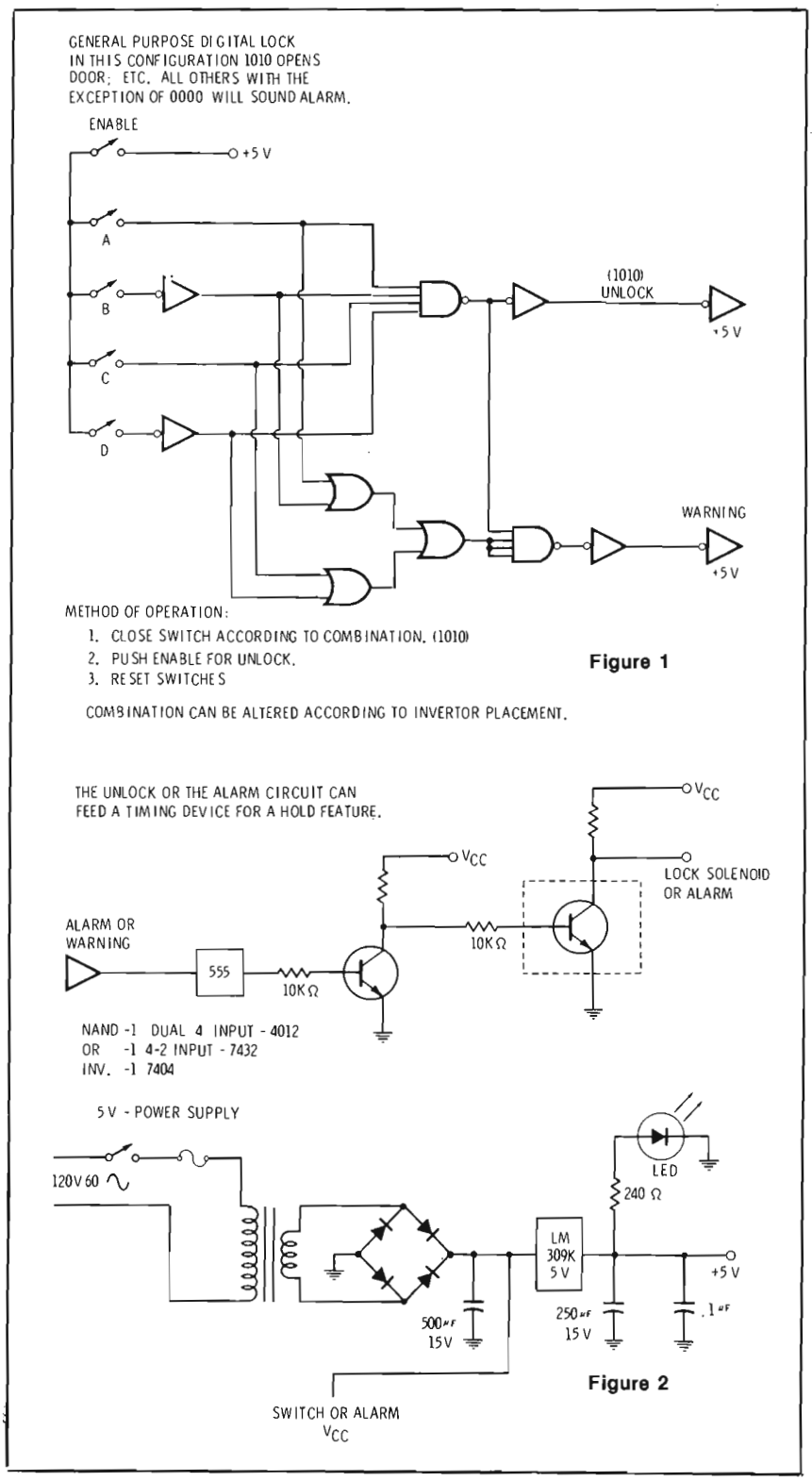
Station-to-station

code is pressed and then **enable** is pressed, an alarm TTL level is sent. Again this signal can drive a transistor stage to sound an attempt to open the door.

The device was installed on an interior door that only certain employees have access to. It has worked very well but a series of set-reset flip flops for the code buttons would have simplified things. It is a little awkward pressing five buttons at once. Of course, the more devices in the lock the less likely someone is going to want to build it.



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An improved digital logic probe

By Edward P. Alciatore, III, weekend supervisor, WCKT-TV, Miami

There was an article in November, 1977, **BE** on how to build an inexpensive digital logic probe. Since everything is becoming more digital, I immediately started looking for the parts for this useful device. Several days later, after spending even less than the $3.50 claimed by the original author, I had my probe ready for testing. The high and low lamps worked perfectly, but the pulse lamp would not function.

I determined that the circuit would work if the 1/μF capacitor had a large amount of leakage. This struck me as a rather undesirable situation, so I revised the pulse detector section as shown in Figure 1. I also raised the input impedance by using voltage divider R1 (680 K), R2 (300 K) to bias the probe at 1.5 V when no input is present and I selected resistors R3 (2600), R4 (1900) and R5 (500) to provide a low threshold of 0.5 V and high threshold of 2.4 V. This combination of probe bias and threshold voltages provides a better match to TTL characteristic and turns all the lamps off when the probe is not being used or if the circuit being probed is in a high impedance state. This precludes getting false low readings.

I used this version for some time but found that, useful as it was, it did not show the fast, low duty cycle pulses often found in digital circuits. These pulses are one of the prime reasons for using a logic probe. You always miss them on the scope due to limited bandwidth, improper triggering or a brightness control that stops 1½ turns before the necessary intensity level is reached.

Looking at the circuit again, I quickly determined that the limited bandwidth of the LM339 was the problem. However, since we are trying to detect logic pulses, logic ICs should provide a good means of catching them. In Figure 2, the 74123 is a dual, edge triggered, mono stable multivibrator. By using the normal input on one section and the inverting input on the other section, one of the outputs will be present for either positive going or

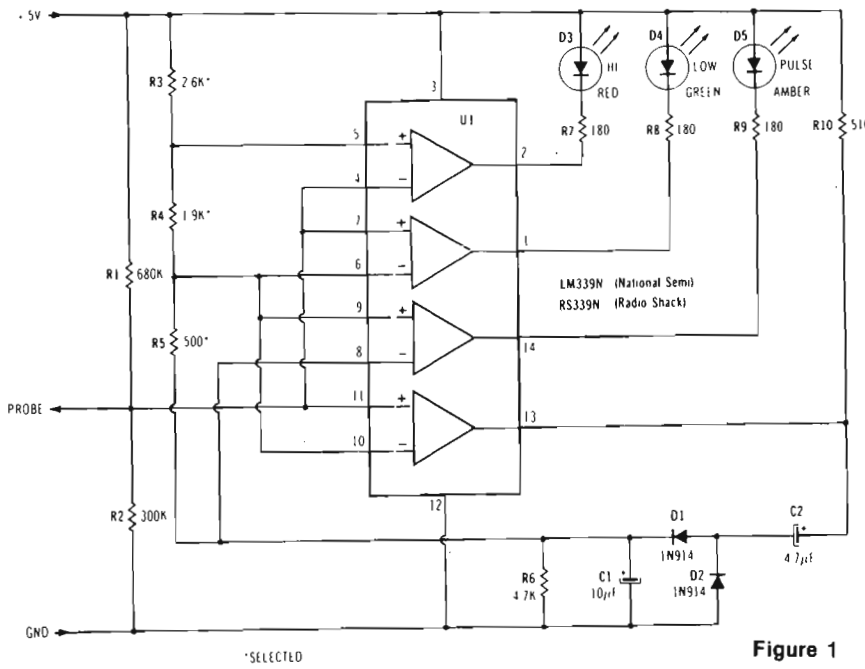
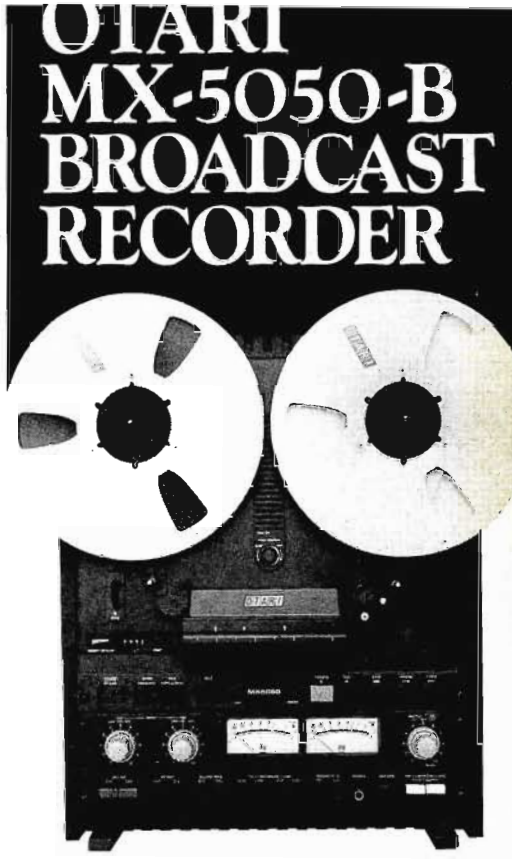


Figure 1

OTARI MX-5050-B BROADCAST RECORDER



Otari's new MX-5050-B continues the proud heritage of the MX-5050 Series, a recorder now extensively used by television and radio broadcasters worldwide. The new version has all the proven features of the earlier pace setter, including front adjustable bias and record EQ, built-in test oscillator, edit and cue, splicing block, motion sensing, selective reproduce, and adds many new features all its own: ultra reliable TTL switching, noise free inserts, three speeds in field-selectable pairs of 15/7½ or 7½/3¾ ips, 24 dBm headroom with 28 dBm output into 600 ohms, dc capstan servo with ±7% speed control (to match program length to a time slot), peak reading LED plus standard full sized VU meters, return to zero memory, and LED function indicators, among others.

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negative going transitions. R11-C1 and R12-C2 determine the length of the output pulses and therefore how long the pulse lamp is lit. The values shown should provide about 0.1 s.

The inverted outputs from U2 are combined in U3 which acts as a NOR gate. This output will be high for 0.1 s after each positive or negative transition in the probe. The third section of U1 compares this with a 1.5 V reference and drives the pulse lamp, D3. The other section of U3 is used as a buffer between the probe and U2; it accounts for most of the input loading of 1.2 unit TTL loads.

The high and low detectors are simple voltage comparators as in the original circuit. F1 and D4 form a protection circuit which I haven't tested so you may use them or not as you wish.

I packaged the circuit with a double sided PC board in a 1"x2"x 3" (nominal) plastic box with a metal cover. The circuit board is mounted on four 4-40X ¾-in screws used as standoffs and the LEDs are mounted with long leads to allow them to fit through holes in the cover. I kept the probe and power leads to a reasonable length to avoid stray capacitance and pickup. A single sided board with jumpers, perfboard or even the IC bricklaying techniques could also be used.

The main disadvantage of this approach is that the probe is now limited to the various forms of TTL and a 5 V supply voltage. On the positive side, the 74123 is guaranteed to detect 40 ns pulses and in tests, my probe detected the shortest pulses I could breadboard, about 8 ns. This, plus the other improvements, should make it a very good TTL probe.

My cost was well under $10 although you could exceed this amount if you pay top price for too many of the parts. I have found this probe to be an excellent TTL troubleshooting aid and it fits well in my policy of acquiring minimum cost test equipment with the maximum possible utility.

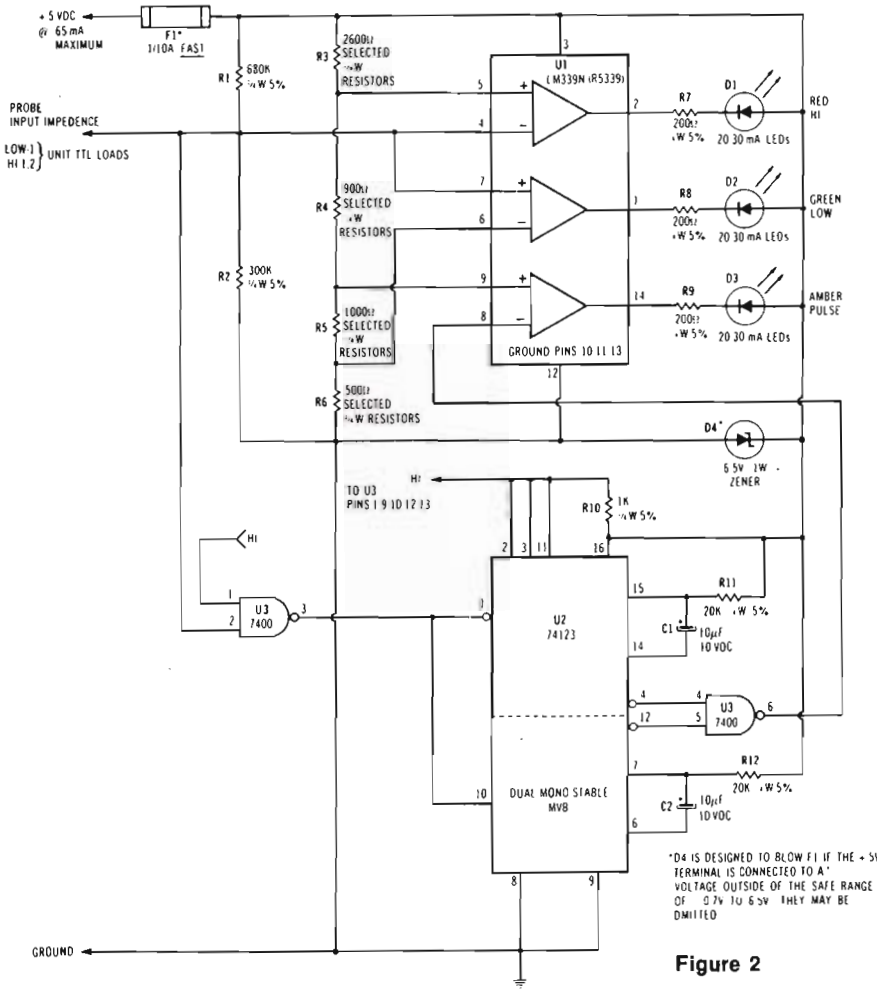

Figure 2

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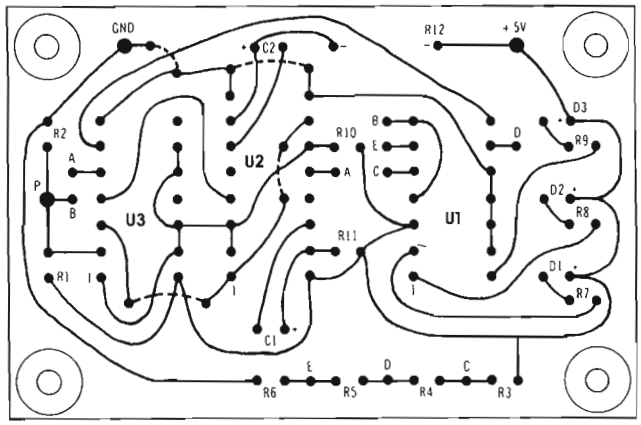
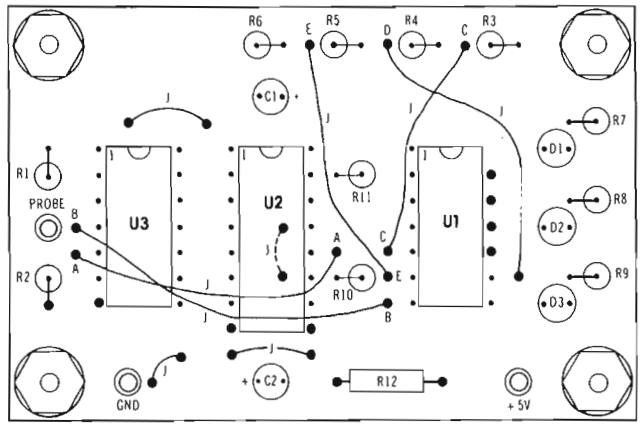
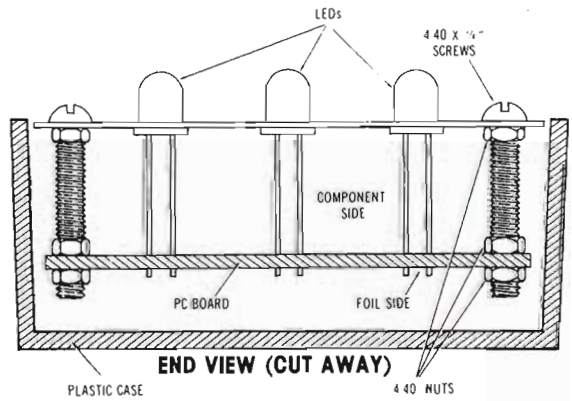


DASH LINE INDICATED JUMPERS ON COMPONENT SIDE

COMPONENT SIDE



J = JUMPER (9 JUMPERS TOTAL)



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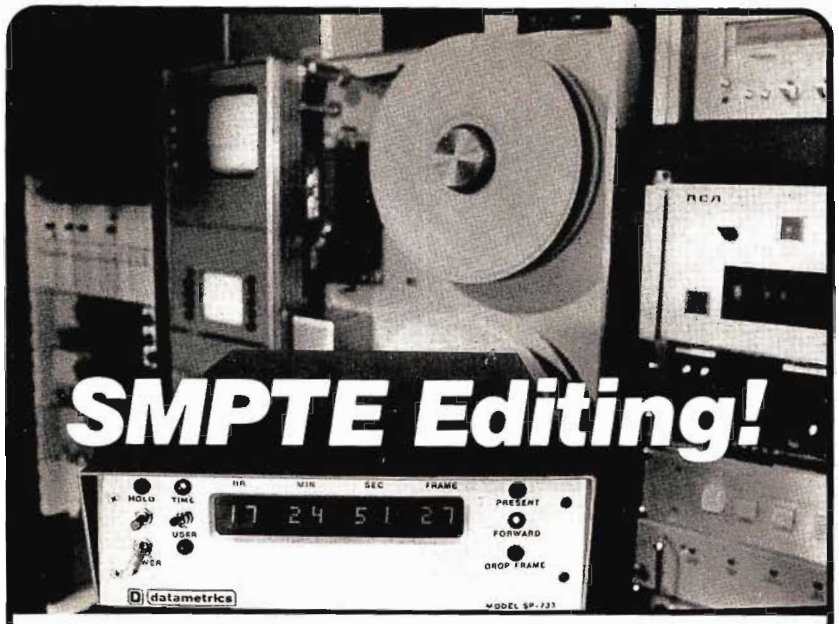

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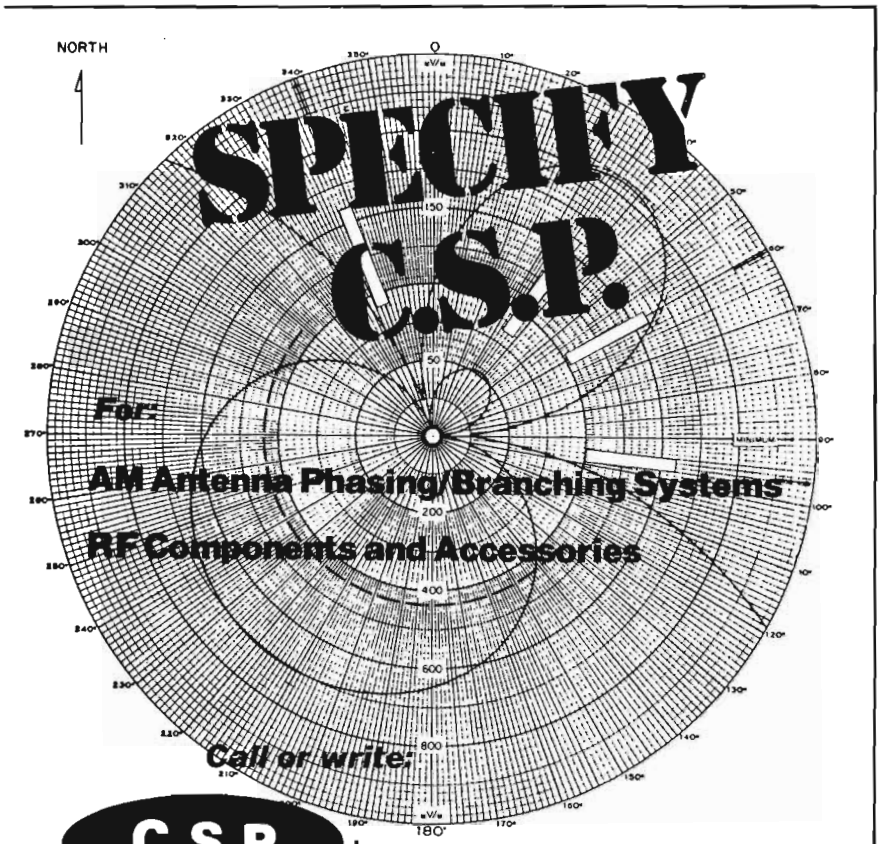

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Station-to-station

The 150 Hz/8kHz tone detector for cartridge machines

By Tom M. Cupp, broadcast operations engineer, WCTE-TV, Cookeville, TN

I have designed and built a 150 Hz/8 kHz tone detector for cartridge machines. A description of the circuit and components follows.

The power supply for the tone detector is a dual voltage supply that supplies the +30 Vdc (relay pull-in voltage) and the regulated +5 Vdc (detector circuit voltage). C1, C2 and C3 are filter capacitors. R1 is a 2 W dropping resistor. Five detector circuits can easily be powered by this circuit.

The preamp may or may not be needed, depending upon the cart machine used. I found it necessary with the ITC-3D and the Harris Criterion machines. This circuit amplifies the tone to a level that provides a good sample at the detector IC input. The amplifier is common to both the 150 Hz and the 8 kHz tones.

The 150 Hz detector IC is a LM 567 tone decoder phase locked loop with a 0 to 14% controllable bandwidth determined by R8 and R9 and adjusted by R9. These resistors provide an approximate bandwidth of 140 Hz to 160 Hz.

When the determined tone is detected IC 1 provides a saturated transistor switch to ground which, after passing through a 7404 inverter (one section of the 7404), is fed to the relay pull in circuit.

To best adjust the detector circuit:

- Hook a frequency counter to pin 5 of the IC. Adjust R9 until 150 Hz is obtained. You are adjusting the current controlled internal oscillator.
- From a reliable audio oscillator, feed 150 Hz into the IC on pin 3. (1 V or less)
- Place a dc voltmeter on pin 8 of the IC. If the circuit is working properly, you will read zero V when the tone is present.
- Remove the tone from pin 3. You should now read +5 V on pin 8.
-
- A slight adjustment of R9 may be necessary to compensate for characteristics of tape and cartridge machine.

Basic operation of the 8 kHz detector is the same as the 150 Hz

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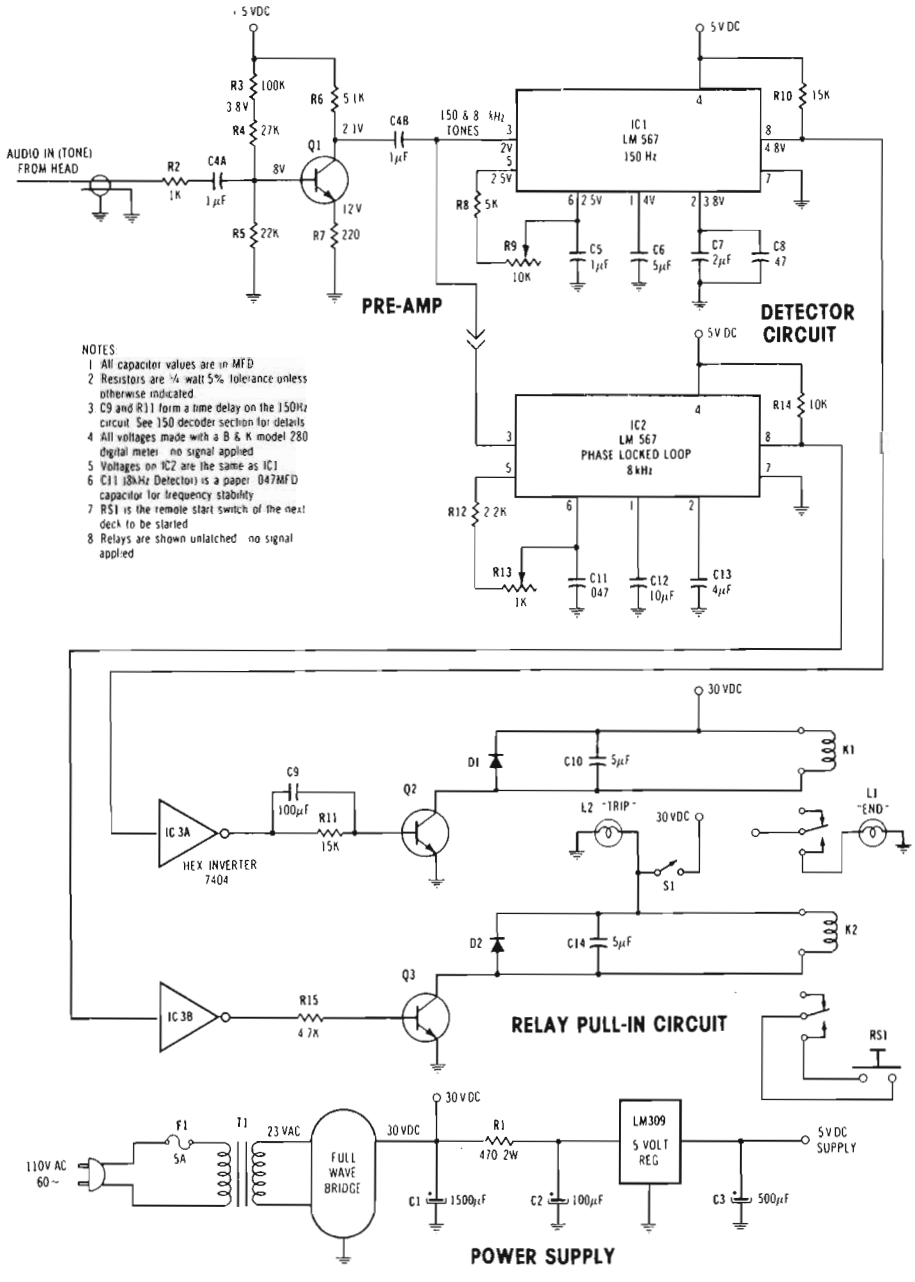
detector but the frequency determining components are different. Also C11 is a paper .047 µF used for stability. Frequency adjustments are made with R13. Frequency range or bandwidth is from 7500 Hz to 8500 Hz.

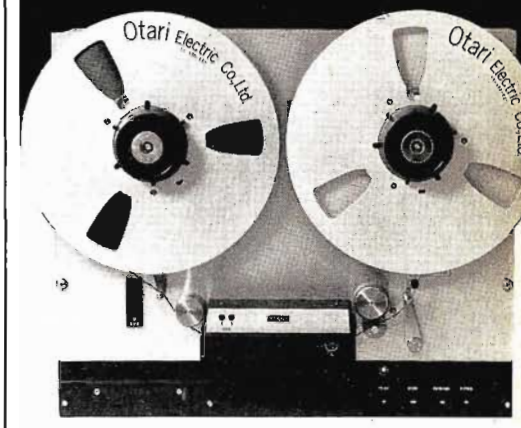
After passing through the 7404 inverter, the signal passes through a special delay circuit. This circuit may or may not be desirable for your operation. Some cart machines run through 150 Hz oscillator being started up. This action causes the 150 Hz detector (if used as an end of message detector) light to momentarily flash. The delay circuit is of 1 to 2 s delay and will prevent this. When saturated with several bursts of 150 Hz, the delay will in effect become invisible to the signal. Again, this action may not be undesirable to your operation. The delay circuit consists of C9 and R11.

The basic operation with the 8 kHz relay pull in circuit is the same as the 150 Hz circuit, but the delay circuit should not be used.

Practically all parts used in the circuit were bought at a local Radio Shack. Each deck or cart machine requires a 150 Hz and 8 kHz detector costing about $30 each. The power supply costs about $15.



ARS-1000 AUTOMATED RADIO STATION REPRODUCER



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Station-to-station

Transmission line pulser

By Victor Castens, KOAM-TV, Pittsburg, KS

We developed a simple circuit (Figure 1) to enable us to locate noisy bullets or bad joints present in a transmission line. The test circuit is a 555 square-wave oscillator driving a one transistor output line driver.

Figures 2 and 3 show the results that were obtained when we checked each of the two feed lines to a RCA TF-12BH antenna. In Figure 2, T1 is located at the matching section near the base of the antenna, 573 ft from the test location. Figure 3 shows the results of a test made of the second feed line to the same antenna. This oscilloscope photo shows the effects of a noisy bullet at 9.5 μs, point T, 465 ft. Notice the thickened line to the right of T. This bounce is due to the varying resistance of the bullet near that level.

Figure 4 is a graphic diagram of the results of the pulse generator output with no line attached, an open cable and a shorted cable. A listing of velocity factors also is included for use in computing the distances involved to a line problem.

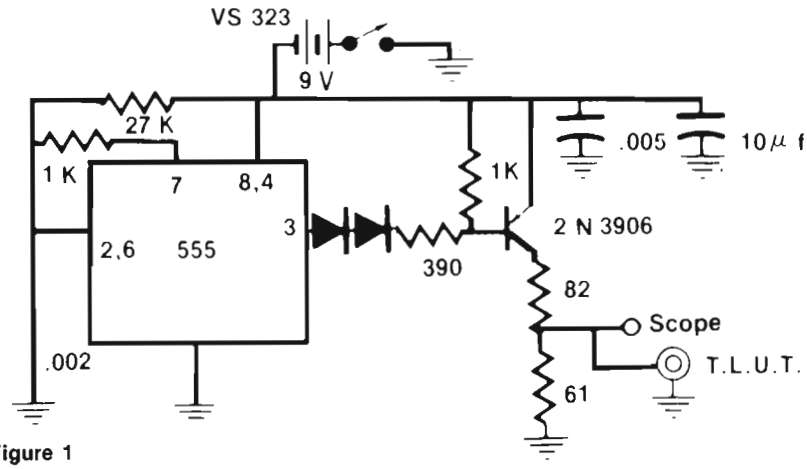


Figure 1

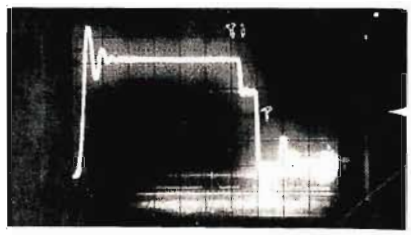


Figure 2

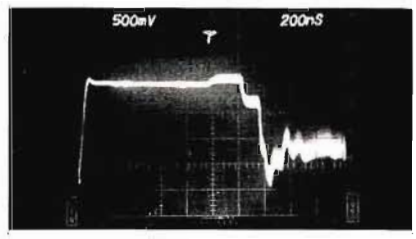
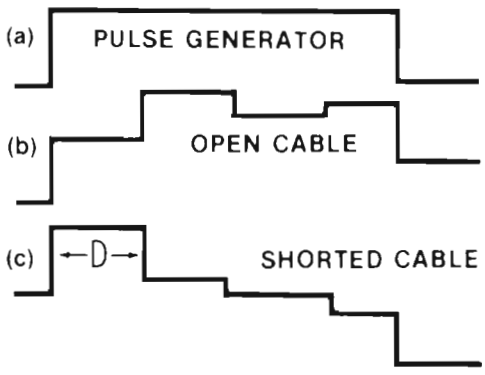


Figure 3



D = ROUND TRIP, MICROSECONDS
V = VELOCITY FACTOR: 3" = 100%
RG9 etc. = 66%, Foam = 80%.
490xVxD = Length, feet.

Figure 4

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Electret condenser mics

By Ian M. Evans, news director, KRCR-TV, Redding, CA

KRCR-TV uses five miniature electret condenser microphones on the news set each night. Several more are used with the mini-cams by our commercial production department. We're satisfied with them, and while the $50 to $75 price each isn't hurting the station's finances, $2.49 is more attractive.

You can readily see why the electret condensor microphone elements advertised for $2.49 in a Radio Shack flyer (Catalog 270-092) caught my attention. Fidelity seemed fine, comparing favorably with the Sony ECM-50s we've been using. My response check was a little on the informal side, amounting to plugging one Radio Shack and one Sony into separate channels of a mixer and then listening to the mixer output on a good pair of headphones. If anything, the Radio Shack unit had a better bass response. A small response chart printed on the back of the blister pack that the microphone element came in showed a slight peak in output at 6 kHz, but, if it was there, I couldn't hear it.

Your $2.49 investment brings only the actual microphone element, you'll have to think up a package and cabling for it. I developed the idea of sticking the element and a necessary capacitor inside the plastic barrel of a ¼-inch phone plug. The element makes a snug fit and no glue is necessary to hold it in place. Like most broadcast stations, the 3-wire Cannon-type plug is our standard and one was readily available from the engineering department's junkbox.

That little capacitor in with the mic element allows you to superimpose the audio output signal on the wire carrying the power. That's necessary if you're unable to come up with miniature 2-conductor shielded cable. The capacitors I used were 5 µF at 15 V, electrolytic. You can substitute on capacitance value here, anything reasonably close should work. Supply voltages from about 3 V through 10 V should work, I chose 9 V because of the easy accessibility of the NEDA 1604-type battery.

So far, the units I've put together have been running more than six months with no battery failure. If so, then 12 of these batteries amount to a 6-year supply. Naturally, a more expensive alkaline type battery should last substantially longer, probably well over a year.

Fastening the microphone to the talent's tie or lapel can be done with an alligator clip or an old tie clasp. I fastened the mic to the clasp with a couple of drops of cyanocrylate glue. This dries in a few minutes, with a strong bond.

The experiment also gave me a chance to improve on what I've considered a weak spot in the physical design of miniature micro-

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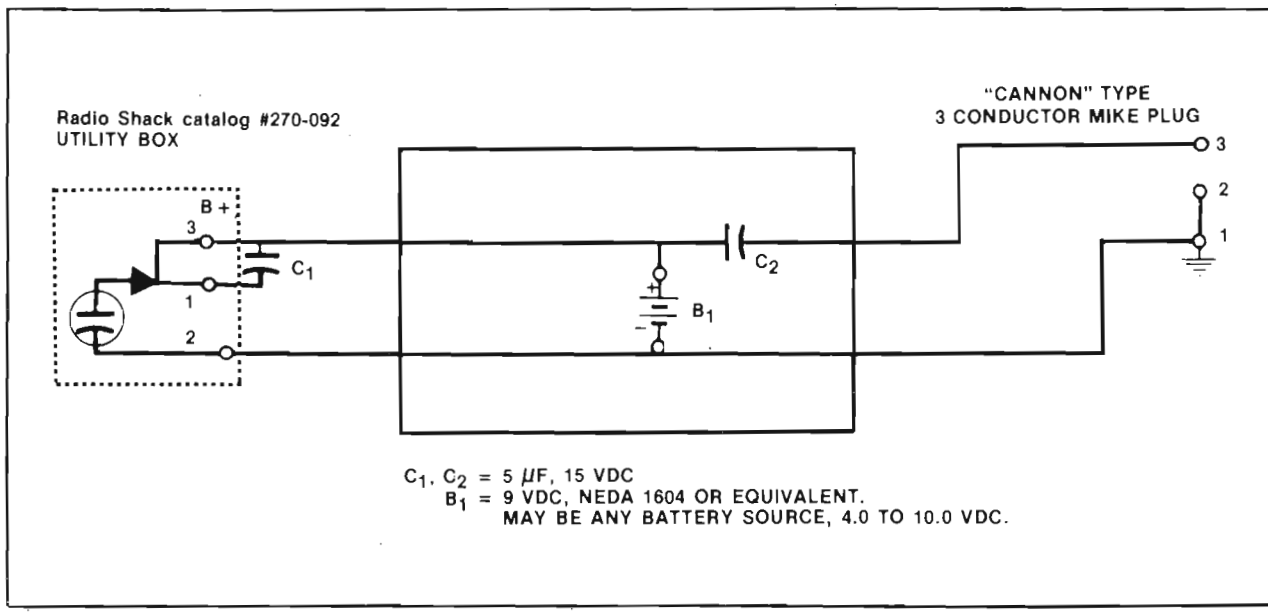
phones. My station always has at least one of these units in the shop for repairs, usually broken leads either at the microphone or at the output connector. I mounted the battery, battery connector and coupling capacitor in a small plastic utility box that fastens at the waist. An unexpected tug pulls off an easy-to-repair solder joint rather than those microscopically tiny connections. The banker's clip used to hold the utility box to the wearer's belt is available at office supply stores.

You may have noticed the output of this microphone is unbalanced. Our microphones are 60 ft of cable away from the control room, but we notice no problem. It will be necessary to ground the unused contact in the microphone output plug. This allows the microphone's output voltage to appear across the mixer's input transformer or transistor, while still keeping the cable shield at ground potential. □



Announcing the New PW-200 Pulse Width Measuring Set

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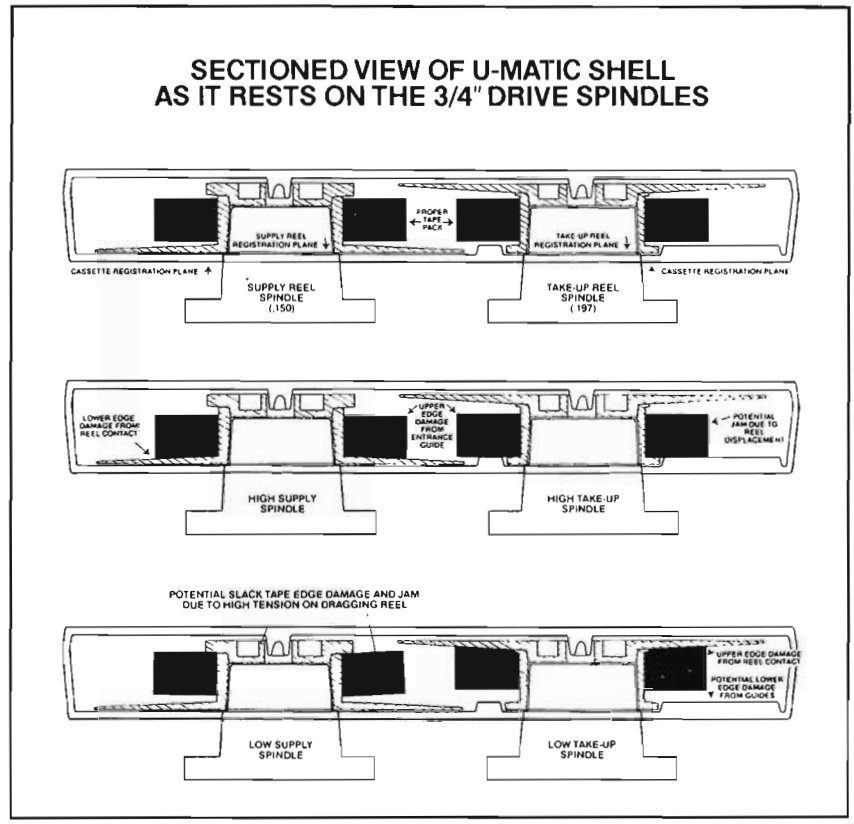
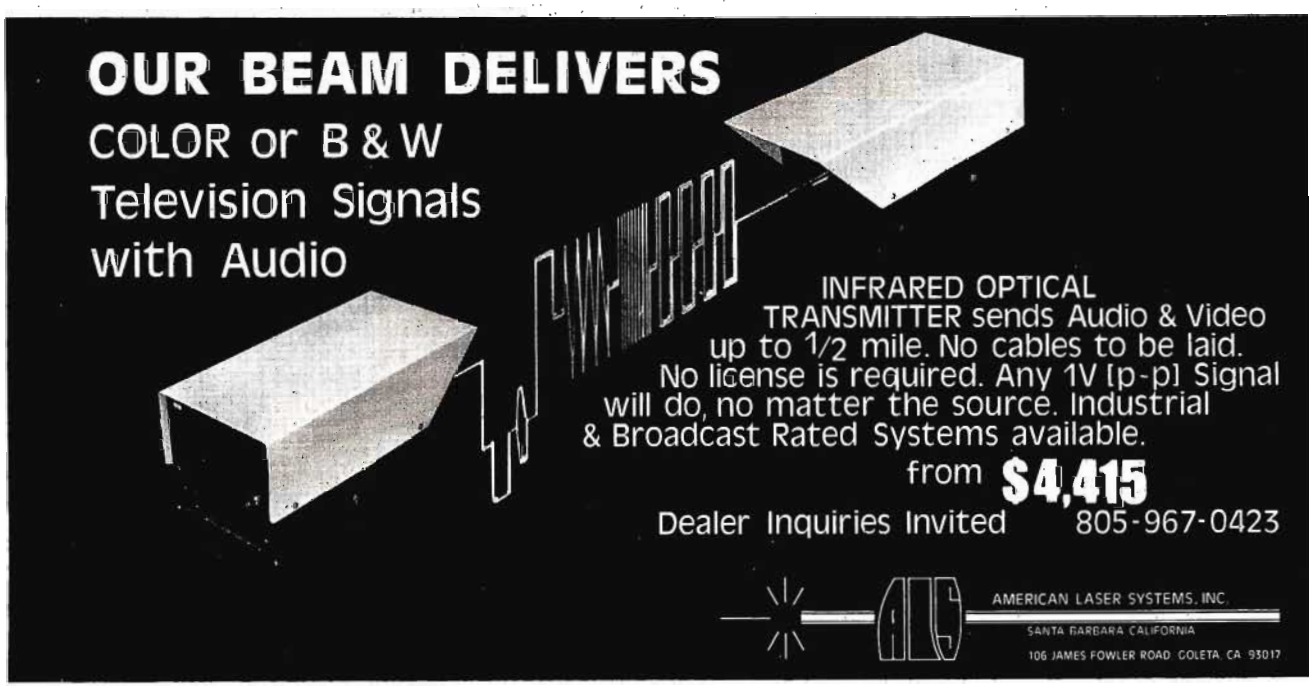
Tech note:
The solution to ¾-inch tape edge damage

Most tape edge damage in ¾-inch cassettes occurs when the pack rides at the wrong height inside the cassette, having been positioned at that height by a misaligned spindle. In some cases, the tape will continue to play in the defective drive without any sign of damage, since the tape in the cassette has adjusted to the particular height of the misalignment. But as soon as the cassette is moved to a correctly-adjusted drive, or a drive that is adjusted to a height different from the first, the tape edge rubs against the guides as it travels around the scanner to the take-up reel, or against the edge or reel of the cassette as it enters the cassette housing. In some cases, tape edge

Editor's note: *Hardware Report* contains notes and short articles about manufacturer's broadcast products and technology advances. **Broadcast Engineering** has not tested the products to confirm the manufacturer's specifications. The sources cited should be contacted for complete data.





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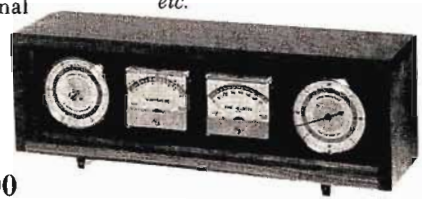

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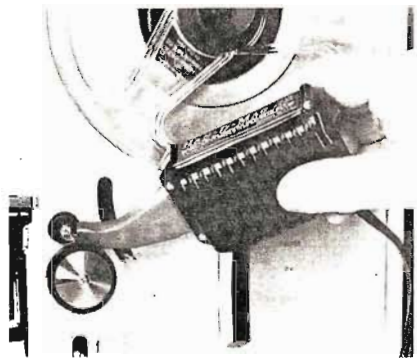
TAPE EQUIPMENT DEMAGNETIZER



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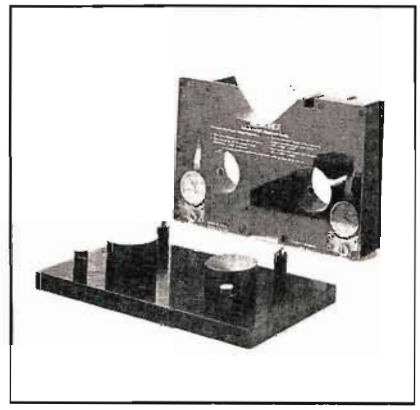
damage may occur immediately; at other times, the tape may be packed so high on the supply reel that it slips off the transport in the threading operation and wraps around the scanner, necessitating disassembly of the machine. This spindle height misalignment frequently causes the take-up pack to jam against the housing as it rotates inside the cassette. The resulting friction may become so serious that take-up is slowed; the capstan continues to pull tape off the supply reel without take-up tension and the tape rides loosely around the transport. When the hindered take-up reel intermittently moves, it yanks the loose tape into the cassette, resulting in stretched tape in addition to edge damage.

Tape edge damage is often unnoticeable by the naked eye when inspecting the tape, but the slightest damage along the edge of helical scan tape can have serious adverse effects on tape performance.

Symptoms of edge damage

The results of tape damage are visible long before the most obvious stage of malfunction—loss of vertical lock. When tape is pulled away from the traveling heads, even for



only a moment, loss of sync causes tearing and skewing of the picture in the RF portion of the screen and can travel up into the viewing area of the picture if damage is severe. Control track pulses recorded along the tape edge are crucial in maintaining proper head drum and capstan sychronization. When there is edge damage, the tape loses contact with the heads, which results in a rolling picture that continues to roll until the moving head can lock up with the next available sync pulse. Tape damage of this sort is usually permanent,

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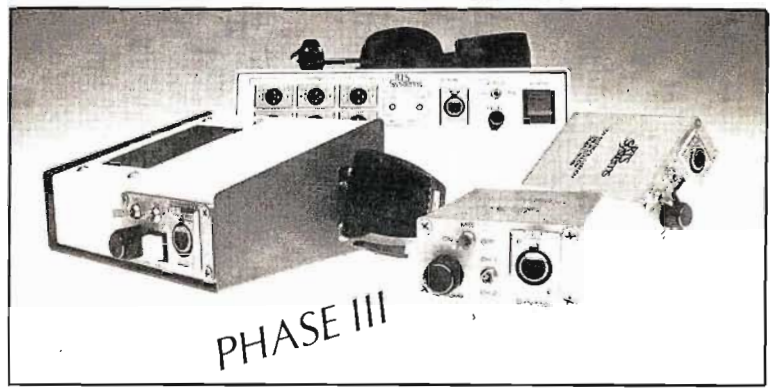
rendering that portion of the tape useless.

All of these problems can be solved by the proper alignment of reel tables. If the tape travels at a centered height, it will wind into the cassette without rubbing against the plastic reel, cassette housing or machine guides. The reels inside the cassette are able to rotate freely and smoothly with the motor speed. In addition, if reel tables are adjusted to the correct height above the drive registration planes, cassettes can be played on any correctly-adjusted drive without the resulting edge damage. Cassette life will be dramatically increased once the machine spindles are properly aligned.

Because previous manual means of measuring alignment were inadequate to measure and solve the problem, Memorex, 1200 Memorex Dr., Santa Clara, CA 94303, developed a cassette-like gauge called SHAG (Spindle Height Alignment Gauge). SHAG has dial indicators which, when placed into the drive, quickly register the difference between the machine registration post and the machine registration surfaces of the drive spindles. A mini-cassette version was also developed and tested, again with good results. The final version of the gauge can be used on all brands of standard or portapack VCRs.

With SHAG it is possible to check the registration planes to reel table height in less than a minute. The SHAG is placed on a set-up block which is designed for the standard heights of ¾-inch cassette reel tables. Two dial indicators, one for the supply spindle and one for the take-up spindle, are zeroed using thumb screws on the side of the gauge. SHAG is then lifted off the block and placed into the videocassette drive, and the reading of the indicators give the height deviation from the standard spindle height (i.e. supply reel: 0.150-in; take-up reel: 0.197-in). Proper spindle height specifications within 0.0005-in are indicated on SHAG, with no disassembly of the machine necessary for the reading. This reading indicates the exact amount of shimming necessary to achieve proper spindle height alignment, and upon completion of adjustment and reassembly, SHAG will confirm that proper alignment has been achieved. *Richard Engebretson, Engineering Services Manager, Memorex.*

THE SUPER SYSTEM



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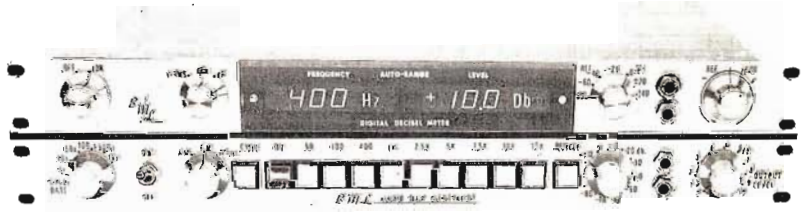

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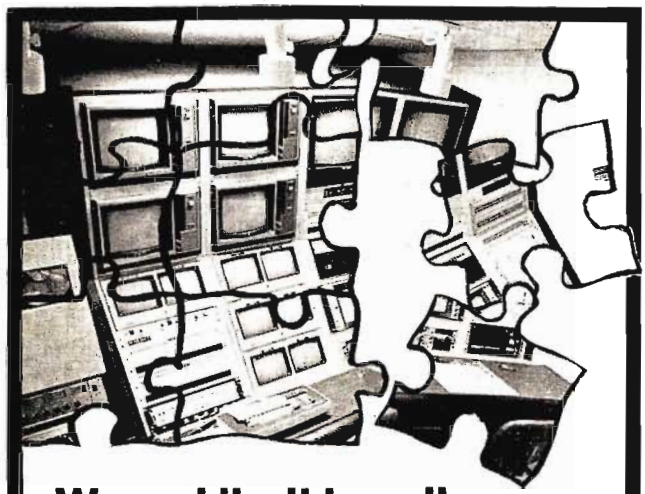

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new literature

Electro-optics design

AMP—Designer Digest 11 covers new electro-optics packaging, plating in the electronics industry, crimping conductive inks and easier connection termination. The 14-page brochure also covers basic fiber optic terminology and includes a table on contact plating materials.

Circle (475) on Reply Card

Replacement batteries

Alexander Manufacturing—Batteries for pagers, hand-held 2-way radios, portable videotape recorders, cameras and emergency medical equipment are included in a 12-page catalog. Nickel-cadmium, alkaline, mercury and single-cell batteries, as well as automatic battery chargers, are all described.

Circle (476) on Reply Card

Tools & safety equipment

Anixter Pruzan—More than 6000 tool and safety equipment items are illustrated and described in a 150-page pocket size catalog. The items are designed for those who build and maintain CATV, telephone and power lines.

Circle (477) on Reply Card

Microphone selectors

Audio-Technica—Three slide-rule microphone selectors to help recordists, sound installers and professional musicians choose and position the right mics for sound reinforcement and recording situations are available. Information covered includes the sound frequency range of 26 instruments, male and female voices, plus complete band and orchestra.

Circle (478) on Reply Card

TV signal distribution

Blonder-Tongue—The company's complete line of television signal distribution products for MATV, CATV, audio-video and home use are described and illustrated in a catalog. Individual product specifications, application drawings and product features are highlighted.

Circle (479) on Reply Card

TV furniture

Bretford Manufacturing—Two TV brochures are available. A 4-page booklet displays the company's TV/VTR cabinets, centers and stands. The second is a 2-page brochure featuring mobile tables with TV and AV applications.

Circle (480) on Reply Card

Slide presentations

Buhl Video—A free booklet describes how to produce slide presentations and how to transmit their programming to video using the Mobile Multiplexer filmchain. "Care and Feeding of the Mobile Multiplexer" offers information on techniques for making slides, a sample story board, and choices and recommendations for dissolve controls.

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Digital & linear ICs

Cherry Semiconductor—A 12-page guide to designing custom digital and linear bipolar ICs is available. Included is a discussion of the three phases: design and breadboard, layout and prototype, and circuit review and production release.

Circle (482) on Reply Card

Monochrome TV monitors

Cohu—The DM Series monochrome monitors is the subject of a product data sheet. The illustrated brochure includes features and specifications of the modularly constructed series.

Circle (483) on Reply Card

TV equipment

Cohu—A new edition of Short Form Catalog Number 6-545 describing the company's current line of broadcast television products is available. Included are descriptions and photographs of all equipment.

Circle (484) on Reply Card

Remote camera system

Cohu—A product data sheet describes the DTMF series remote camera control system which can remotely control up to 100 camera locations. Product description, features, specifications and photographs are included.

Circle (485) on Reply Card

Power supply

Computer Products—The Power Products division is offering an updated 20-page catalog with functional descriptions, photographs, electrical/mechanical specifications, prices and ordering information for four series of power supplies. The series consist of high-efficiency switchers, encapsulated high-efficiency switchers, dc-dc converters, and linear encapsulated power supplies with single, dual, triple and logic outputs.

Circle (486) on Reply Card

Test & measuring

Continental Specialties—A 32-page catalog features frequency counters, logic troubleshooting tools, an ultravariable pulse generator, a sweepable function generator and solderless breadboarding. Each section includes photographs, specifications and descriptions.

Circle (487) on Reply Card

Editing systems

Convergence—A 15-page catalog describes the company's line of ECS-100 Superstick Editing Systems. Besides illustrating the basic series, the catalog includes interface packages, VCR upgrade packages, interface modules and general specifications.

Circle (488) on Reply Card

Mast & tower data

Decca Austin Instruments—Product data sheets de-

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If seeing the same time on all your clocks is important, select **ES 192** - Line Frequency timebase, for only $300.

If a guaranteed accuracy of three seconds per month is what you want, choose **ES 160** - $966.

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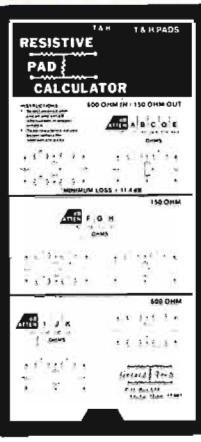

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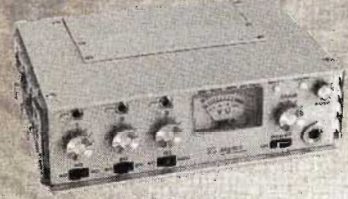

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New literature

scribe the firm's line of mast and tower equipment: guy strain insulators, base insulators, lighting transformers, and static drain resistors.

Circle (489) on Reply Card

Multi-image production

Eastman Kodak—A book of programmed multi-image production, "Images, Images, Images," examines the justification for as well as the planning, production, and presentation of multi-image programs. The 244-page book covers various topics, including setting objectives, selecting the media and visual format, writing the project proposal, choosing the right equipment, producing the visuals, creating the script, editing the visuals and programming the equipment.

Circle (490) on Reply Card

Resistive pads

Electric Sound of Minnesota—A 28-page "Resistive Pads Manual" is offered in the Audio Reference Series. Contents include adjustable pads, center-tapped pads, choosing pads, measuring attenuation, VU meter pads, bridging pads, lattice splitting pad and specifications. A resistive pad calculator also is offered.

Circle (491) on Reply Card

FCC proceedings update

FCC—The *Annual Report on Major Matters*, which reflects the status of major proceedings as of December 31, 1978, is available. Written in a "plain English" style, the document is designed to keep Congress, the public and the commission's staff apprised of pending proceedings.

Circle (492) on Reply Card

CATV equipment

GTE Sylvania—A catalog describes the company's line of CATV equipment and accessories. The 71-page booklet includes technical specifications, charts and block diagrams covering the family of mainline and distribution amplification stations and accessories.

Circle (493) on Reply Card

Oscilloscope bulletin

Gould—The OS3500 oscilloscope and optional DM3010 digital measuring unit are described in a 2-page illustrated bulletin. The portable scope features a bandwidth from dc to 60MHz (-3dB); and 8cm x 10cm CRT operating at 12kV; and maximum vertical sensitivity of 2 mV/cm.

Circle (494) on Reply Card

Oscillographic recorders

Gulton—Full details on 2, 4, 6 and 8 channel oscillographic chart recorders using plug-in signal conditioners and 1 and 2 channel multiple sensitivity oscillographic recorders are featured in a catalog. It includes photos of all recorders, electrical and mechanical specifications, plug in signal conditioner specifications, and options.

Circle (495) on Reply Card

Microwave handbook

Hewlett-Packard—More than 350 microwave compo-

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nents used in coaxial and waveguide measurements are featured in the 1979-80 edition of the *Coaxial and Waveguide Catalog*. Sections include a microwave measurement handbook, attenuators, detectors, couplers, filters, power sensors, slotted lines and 75 Ω items.

Circle (496) on Reply Card

Fiber optics

Information Gatekeepers—Volumes I and II of the company's Fiber Optic Manual and Handbook series has been published. The manuals are written for communications engineers and specialists with little or no experience in fiber optics technology and include such areas as typical equipment parameter design methods and specifying waveguide digital connector systems.

Circle (497) on Reply Card

Mosfet transistors

International Rectifier—SPA 913 is an 8-page application note which describes power Mosfet transistors and compares them with conventional bipolar devices. The brochure describes basic applications including switching power supplies, audio amplifiers, motor speed controllers and RF amplifiers.

Circle (498) on Reply Card

ITA source directory

International Tape Association—A 56-page directory which lists products, service and activities of ITA member companies is available free. It encompasses all areas of the audio/video tape and disc industry.

Circle (499) on Reply Card

Video glossary

JVC—Harry Elias, Vidstar division vice president, has assembled a glossary of the most commonly used video terms. It was compiled to aid the informed selection of a VCR system.

Circle (500) on Reply Card

Equipment rental

Leasametric—Rental catalog contains model numbers, descriptions and rental rates for more than 4000 separate pieces of equipment. Listed in the free catalog are 1, 3, 6 and 12-month rental rates for I/O terminals, general-purpose test instruments and microprocessor development systems.

Circle (501) on Reply Card

Film guidebook

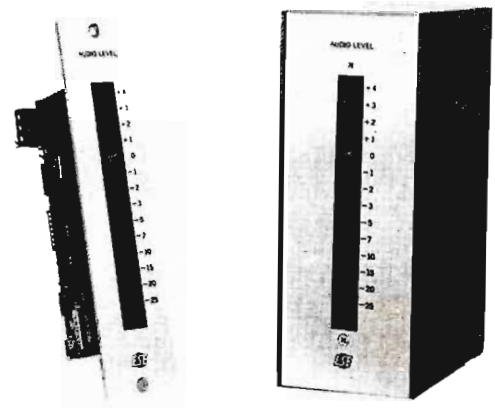
The Means Ltd.—A Colorado film guidebook is designed as a personnel and services directory for on-location shooting of television programs, motion pictures, documentaries and commercials within the state. The listings include location scouts, light personnel, grips, set designers, wardrobe and costume houses, stylists, hotels, motels, restaurants and catering services.

Circle (502) on Reply Card

Film catalog

Modern Talking Picture Service—A 41-page catalog of more than 400 films available on free loan to television stations is available. The films are sponsored by business firms, trade associations, government agen-

Perfect Levels



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There are a number of Audio Level Indicators using L.E.D. bar graphs on the market today. Their acceptance is becoming widespread due to obvious advantages. However, the ES 214 gives you more: Transformer Isolated Input others consider too costly; A Power Supply Regulator on the circuit board, so you can use any unregulated D.C. voltage from + 15 to + 35 while others require dual supplies; The Standard Scale so you don't have to adapt to new numbers; and, the ability to select Peak Responding Mode or a special Fast Averaging Mode to approximate Apparent Loudness.

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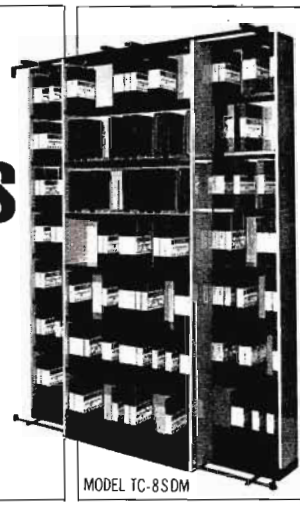

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In addition to the new Reproduce Calibrator and the Standard Tape Manual, STL offers the most complete selection of magnetic test tapes available - Frequency Alignment - Pink Noise - Sweep - Speed & Flutter. All are available in reel-to-reel, cassette and cartridge.

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New literature

cies, professional societies and other organizations. It includes public service messages, documentaries, how-to-do-it features, sports and travel pieces.

Circle (503) on Reply Card

Oscilloscope how-to book

Parker Publishing Company—The *Practical Oscilloscope Handbook* by John Douglas-Young covers servicing, operation, maintenance and repair of the oscilloscope, as well as giving detailed analyses of all principal waveshapes. More than 100 drawings, photographs and fault-finding tables are included.

Circle (504) on Reply Card

Tower guys

Philadelphia Resins—Ten advantages of nonmetallic, non-conducting tower guys for radio and TV and for CATV applications are explained in a brochure. The Phillystran tower guys are said to be essentially maintenance-free, even around salt-laden, corrosive atmospheres.

Circle (505) on Reply Card

Testing & measuring

Philips Test & Measuring Instruments—A catalog contains informational, technical specifications and illustrations of all the company's current products. The free catalog groups products by category, including oscilloscopes, counters and counter/timers, recorders, signal generators, and radio and TV service equipment.

Circle (506) on Reply Card

Telecommunications' future

Prentice-Hall—*Future Developments in Telecommunications* is a guide to digital transmission, storage and manipulations which forecasts future trends. Written by James Martin, the book encompasses topics from video telephones to satellite antennas on rooftops. A table of events for probable growing trends up to the year 2000 is included.

Circle (507) on Reply Card

Flat cable system

Robinson-Nugent—A short form catalog features information on the IDC flat cable system as well as material specs, dimensional drawings and ordering information on the R-N line of IDC socket connectors, headers, cable plugs and transition connectors.

Circle (508) on Reply Card

Frequency and time equipment

Rohde & Schwarz—A 24-page brochure entitled *Frequency and Time* describes applications of standard frequency and time equipment and a history of standard time and standard frequency. A table lists frequency and time emissions.

Circle (509) on Reply Card

TV monitors

Rohde & Schwarz Sales—A 24-page brochure features the full line of Barco professional color TV monitors. Included in the brochure are technical specifications, display performance, detailed descriptions of all controls, illustrations and ordering information.

Circle (510) on Reply Card

www.americanradiohistory.com

Signal source

Scientific-Atlanta—A brochure contains applications information, specifications and ordering instructions for the Series 2150B signal source, designed for antenna range applications. The signal source and RF plug-in oscillators may be located at the transmit site and may be remotely tuned up to 2500ft away. Locating the signal source at the transmit site provides maximum RF power to the transmit antenna.

Circle (511) on Reply Card

Enclosures

Scientific-Atlanta—A brochure describes the Optima line of enclosures, including small cases, vertical cabinets, desks and consoles. New products and accessories illustrated include modular desks and plexiglas doors for cabinets.

Circle (512) on Reply Card

Saticon cameras

Sharp Electronics—A brochure is available which describes the company's line of 3-tube, ⅔-inch Saticon bias-lighted color cameras. The publication features the XC-530 self-contained professional portable ENG/EFP color camera and a XC-500 multi-function professional studio color camera. Features, specification charts and a list of available accessories for each camera are included.

Circle (513) on Reply Card

Corporate brochure

TPC Communications—A full color brochure provides information about the firm including major areas of performance and a review of the capabilities of the subsidiary companies. A description of the company's StarTruck mobile video unit also is featured.

Circle (514) on Reply Card

Product selector

UMC Electronics—A 6-page Quick Reference Product Selector provides capsule information on all products in the firm's line. A photograph, short description, and price are given for each product, including cart machine rack adaptor kits, accessories and options.

Circle (515) on Reply Card

UL video standards

Underwriters Laboratories—The first edition of the *Standard for Safety, Low Voltage Video Products Without Cathode-Ray-Tube Displays, UL-1409*, has been published and becomes effective April 1, 1980. Products covered include videotape recorders; video-receiving, -processing, -producing, and -amplication equipment; television cameras without CRT viewfinders; television-antenna amplifiers, cable television converters; picture tube degaussers; and similar video equipment.

Circle (516) on Reply Card

Character generators

Unitel—Literature is available describing the Scriptel range of microprocessor-controlled character generators. Two units are detailed: The Scriptel P features color, proportional spacing, many composition and animation facilities, and several options; the Scriptel V is designed for OB vans or small TV studios and

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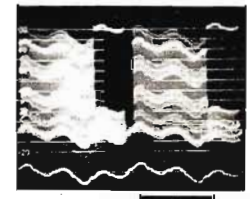

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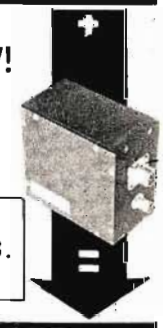

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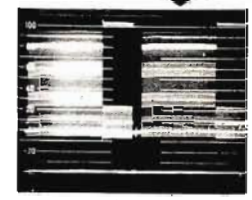

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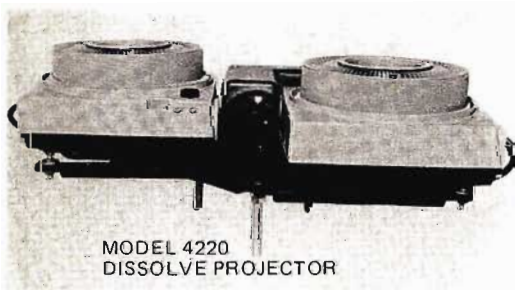

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Circle (164) on Reply Card

New literature

features internal time counter and 16 page memory.

Circle (518) on Reply Card

Film & video rental

Victor Duncan—A catalog lists and describes the full line of video and film cameras plus accessories available from the company. Rental terms and conditions are included in the back of the catalog.

Circle (519) on Reply Card

Breadboarding

Wainwright Instruments—A catalog describes the company's Breadboarding System. Included are photographs and descriptions. A price list also is available with detailed information on kit contents. □

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new products

TV blanking analyzer

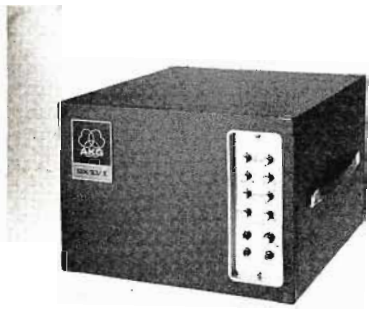
A.F. Associates' HV-100 Television Blanking Analyzer allows horizontal or vertical blanking measurements to be taken using only a waveform monitor or pulse-cross picture monitor.

Measurements include picture blanking; set up blanking; front porch; sync width; burst length; sync to burst-end, burst-start or set-up; and vertical blanking. The unit, in its rackmount or table-top version, is designed to be inserted into a video monitor feed. It provides a video input and output, operating on 115V, 60Hz.

Circle (521) on Reply Card

Reverberation unit

AKG Acoustics has begun shipping the EZ version of the BX-10 portable reverberation unit. The torsional transmission line system



has been redesigned and equalization has been added to the TTL system electronics. For speech applications there is a special short-decay time version available, the BX-10E2-Short.

Circle (522) on Reply Card

Make up controller

An automation make up controller

has been added to *Aitken Communications'* existing automation system. Features include an active notch filter to remove 25 Hz program material and a low distortion oscillator. A front panel or remote pushbutton which overrides the timer controls the unit.

Circle (523) on Reply Card

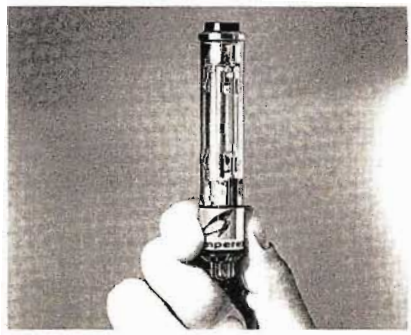
Boom box

The Boom Box from *Allied Broadcast Equipment*, was created for the disco market but lends itself to constructive use with pop and AOR formats. The unit creates subharmonics of existing program material. Because the unit operates on the principle of synthesis there is some audible fuzzing of the human voice as the unit attempts to provide bass for the person speaking. Various methods are being employed to minimize or eliminate this effect.

Circle (524) on Reply Card

Plumbicon camera tube

A ⅔-inch Plumbicon camera tube, type 74XQ, has been introduced by *Amperex Electronics*. The unit is a diode gun tube with very high resolution, typically 55% response at 400 TVL. A high beam reserve can provide 4 f stops for highlight



protection when used with the dynamic beam control. The tube is suited for studio use as well as ENG and EFP applications.

Circle (525) on Reply Card

1-inch videotape

A 1-inch broadcast quality videotape developed to achieve maximum performance from the helical scan video recorders has been introduced by *Ampex*. Ampex 196 Series broadcast helical videotape is compatible with all 1-inch high-band helical recorders and all video standards.

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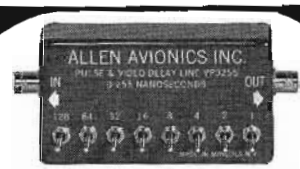

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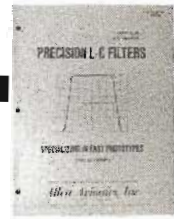

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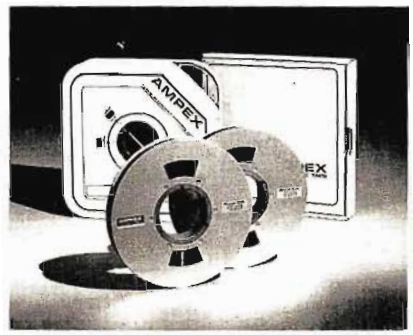
New products

Two packaging styles are also provided. The standard Tyvek-coated shelf box features built-in

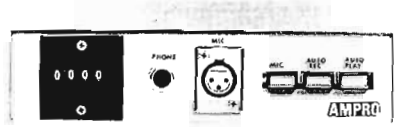


hub support and a moisture and soil repellent exterior. The tape is also available in a flame retardant stackable shipper.

Circle (526) on Reply Card

Telephone interface

Ampro/Scully's PhoneCon is an interface device allowing Ampro cartridge tape equipment to be used



for telephone answering and message recording. The unit incorporates a built-in FCC-approved telephone line coupler to avoid continuous monthly charges for a phone company supplied coupler. Also, a separate Ampro cartridge tape recorder can be controlled by the PhoneCon to record the caller's reply.

Circle (527) on Reply Card

Weather radar accessor

Arvin CATV is offering a system, Tel-Weather TW-2, which accesses and displays NOAA weather radar data. The system can be connected to virtually any of the US National Weather Services' 111 weather radars. The system is independent of the Weather Bureau's Remote Radar transmitters which provide the weather data as an analog signal by phone line.

The TW-2 provides direct access of radar direction, range and intensity information, and converts these data into digital form for transmission over a 1200 baud dedicated communications line to a receiver where it is reassembled into a line-by-line television signal.

Circle (528) on Reply Card

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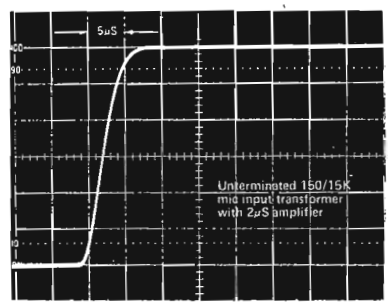

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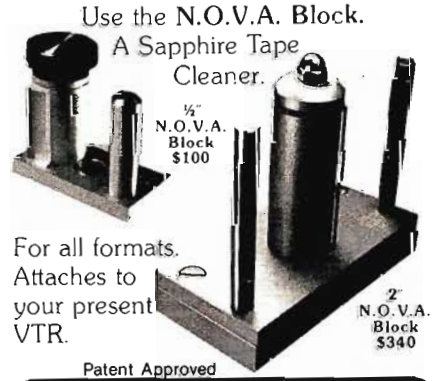

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Recording mics

Audio-Technica's AT-816 unidirectional dynamic microphone also

is supplied in stereo matched pairs as the AT-816/2. The microphones are said to be ideal for tape recording.

Circle (529) on Reply Card

Audio step generator

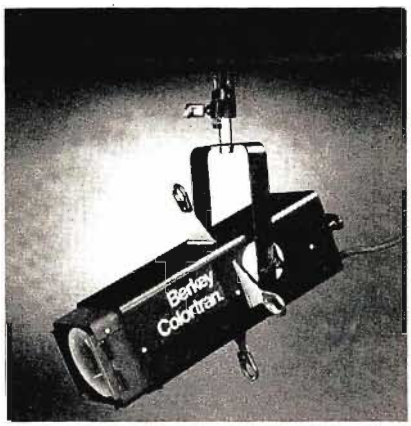
Bald Mountain Lab's model 1760 FM audio step generator offers nine precise crystal controlled frequencies which are available instantly.

Frequencies are pushbutton selectable and can be sequentially stepped one time or repeatedly. Output impedance is 600 or 150 Ω. A precision output attenuator and front panel output jack are featured.

Circle (530) on Reply Card

Spotlight

Berkey Colortran offers a 4.5-inch 500 W ellipsoidal reflector spotlight designed for use in theatrical, photographic and television studio

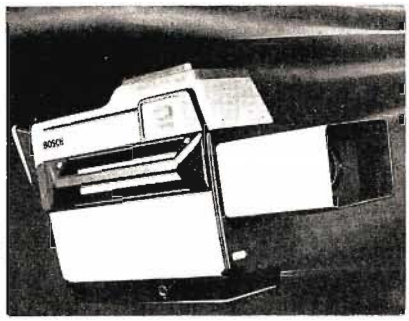


applications. The lens barrel design permits a 50, 40 or 30 degree field of angle to be achieved by the movement of one lens within the lens barrel. The unit accepts 250, 400 and 500 W 120 V mini-can screw base lamps.

Circle (531) on Reply Card

Production camera

The KCP 60 from *Bosch Fernseh* is a studio and outside broadcast camera utilizing three ⅔-inch pick-



up tubes and dynamic beam control circuitry, which can handle up to 16 times overload when used with diode gun tubes.

The camera includes a weatherproof head with shock resistant optics and an adjustable viewfinder.

Circle (532) on Reply Card

Mobile multiplexer

Buhl Optical is offering a videocassette tape entitled *Ready One! Take One!*, which demonstrates their mobile multiplexer filmchain. The system is a filmchain without a dedicated camera which allows switching a video camera with a standard TV zoom lens from filmchain to studio use. The tape also shows how the unit interfaces audiovisual and video operations.

Circle (533) on Reply Card

Broadcast cartridge

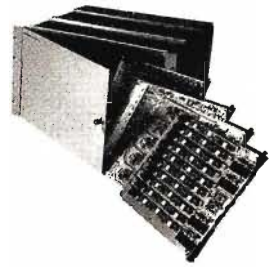
The Audiopak AA-3 stereo phase broadcast cartridge from *Capitol Magnetic Products* features a ramp and cone tape guidance which is said to provide optimum geometry for movement of the tape from the center of the spool to the proper operating plane. Capitol's high output, low noise (HOLN) lubricated tape designed for studio mastering is used in the cartridge. The low friction binder on the backcoating and oxide sides reduces wear and extends the life of the tape.

Circle (534) on Reply Card

Camera stabilizer

A second version of the steadicam film/video camera stabilizing system (universal model II) is available from *Cinema Products*. Several modifications in the unit permit

Computer Controlled Switcher



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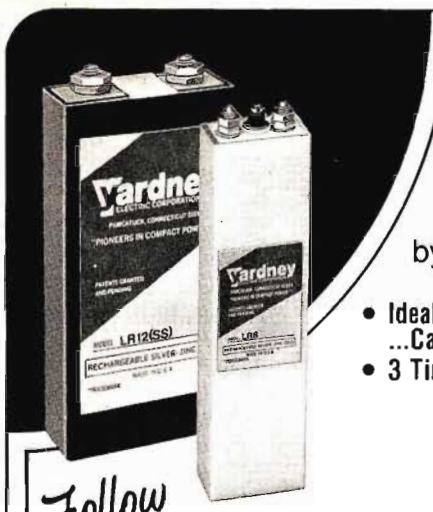

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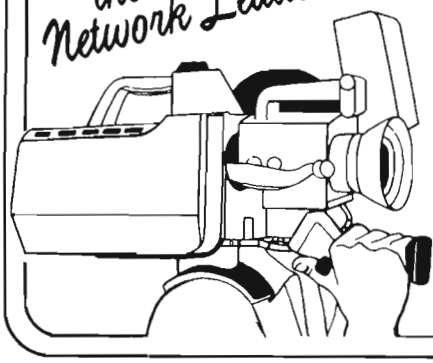

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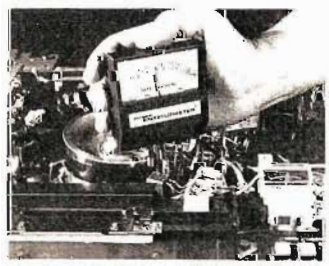

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Circle (173) on Reply Card

New products

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For further information, write to Cinema Products, 2037 Granville Avenue, Los Angeles, CA 90025.

Remote station

The RS-250 remote station by *Clear-Com* enables cameramen, floormen and crane operators to separately and simultaneously monitor two channels of intercom and one program feed on binaural headphones with individual volume controls. Standard features include binaural output, microphone on/off switch, talk channel select and balanced transformer isolated program input.

Circle (535) on Reply Card

Remote camera system

The DTMF remote camera control system by *Cohu* features dual tone multi-frequency encoding and digital techniques to remotely control up to 100 television cameras.

The basic system consists of a transmitter at the control station and a receiver at each camera location. Available options include a

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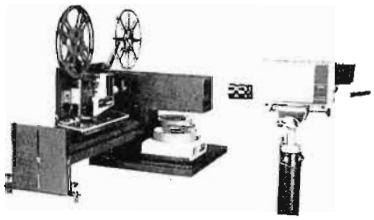

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Studio camera adapts to film chain use in seconds
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893AR	6423	7805
1089	6424	8461
5667	6425	8550
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5681	6427	23185
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computer interface with remote control interlock, remote status feedback and switcher control.

Circle (536) on Reply Card

Transceiver

Model 280 transceiver from *Colorado Video* allows video teleconferencing over normal, dial-up telephone lines. Three functions are combined in the unit: freezing of a

single frame of video, conversion of the frozen picture to a slow scan television signal for transmission over audio channels, and reception and reconversion of slow scan TV signals to conventional TV standards. Standard features include solid state design, operation in moving environments, remote control, real time monitoring of A/D operation and gen-lock to other video sources for systems operation.

Circle (537) on Reply Card

Edit code reader

Datametrics SMPTE edit code reader SP-733 features time or user bit operation, eight digit hexidecimal display/output, range of 1/5 to 40 times recorded speed, and automatic forward/reverse sensing. Displays include code present indicator, forward direction indicator, drop frame format indicator, time operation indicator, user bit operation indicator, and display hold indicator.

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Lightning/surge arrestor

Delta Lightning Arrestors offers a protector which prevents damage to electrical equipment caused by lightning or surge. The unit presents a low resistance path to ground, while blocking the power current. When in the conduction mode, the arrestor's internal resistance is comparable to a 1ft bus of number four aluminum. When shut off, the resistance goes to a billion ohms.

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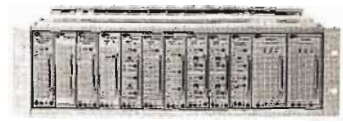
Videodisc recorder/electronic slide

Eigen Video has combined random

Color Terminal Equipment



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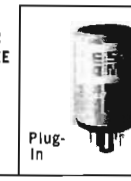
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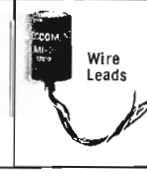
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New products

access control of 600 electronic slides with full instant replay slow motion. A keyboard control addresses any location within the 600-capacity disc chassis. Once located, a sequence can be played as single steps, animation crawl or at speeds up to full motion, in either direction.

The single images can be displayed as either fields or frames. Sources for slides are live camera, film chain or ENG tapes. The model 16 includes high-band signal system, J-control and digital time base corrector/dropout compensator.

Circle (540) on Reply Card

Omnidirectional mic

Electro-Voice has introduced a shock-mounted omnidirectional microphone, the D056. Primarily intended for hand-held broadcast and

sound reinforcement, the main acoustic cavity and the diaphragm/voice coil assembly are isolated as an integral unit from the case. Frequency response extends to 18,000Hz. There is a slight emphasis in the 2000-12,000Hz range, with a slow rolloff below 200Hz to reduce low frequency noise interference.

Circle (541) on Reply Card

Bulk eraser

Fidelipac has introduced a hand-held bulk eraser called Blank-IT. The unit includes a high mu core capable of erasing magnetic tape of all formats, including audiotape of up to 1-inch, computer tape and both VHS and Beta videocassettes.

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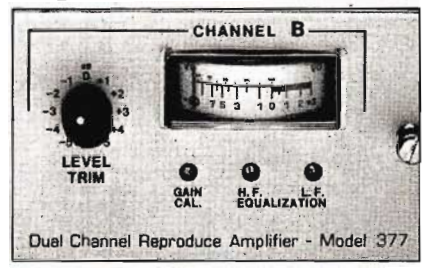

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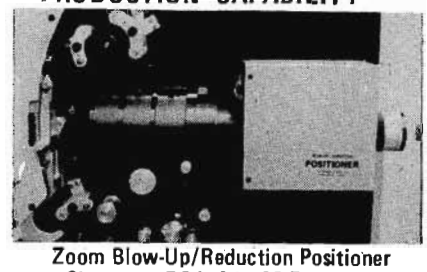

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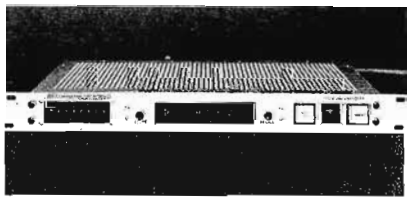
Duty cycle for the unit is five minutes on, 15 minutes off (the unit

shuts off when its duty cycle has been exceeded).

Circle (542) on Reply Card

User-bit encoder

Gray Engineering Labs' User-Bit Encoder, UBE-118, features the use of multiplexing 320 separate user bits in the SMPTE edit code, every 10 frames. This allows the operator to transmit many more kinds of information, such as calendar date, video machine number, titles, reel number, operator identification, company code, customer code, etc. These data can be encoded in memory and can be transmitted, changed or recalled at will.

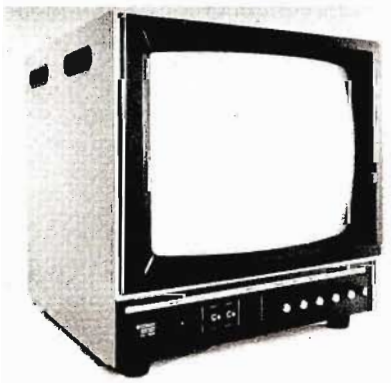


The unit is designed to be used with the company's Edit Code Generators DT-104, DT-113, or the User Bit Modifier-Display MD-111.

Circle (543) on Reply Card

Color monitor

Hitachi's CM-182 18-inch color monitor features resolution in excess of 370 lines. Signal-to-noise ratio is more than 46dB, and deflection linearity is less than 2% (within the central zone of diameter equal to picture height).



The NTSC monitor is recommended for broadcast and medical TV applications which demand accurate colorimetry.

Circle (544) on Reply Card

Production switcher

The PAL and PAL-M versions of *ISI's* model 902 video production switcher is now available. The unit features two mix effects systems utilizing a shared pattern generator with rotate and modulate enabling hundreds of possible wipes. Standard features include electronic spotlight, border generator, preset pattern limit, key invert, matte key and joystick positioner.

Circle (545) on Reply Card

Automation preamp

Inovonics has introduced a dual-channel tape playback preamp. The model 377 interfaces with a wide variety of tape heads and transports

and is pin-compatible with Ampex and Schafer equipment. The preamp is RFI-proofed and offers balanced outputs capable of 24 dBm. Panel features include multiturn gain and equilization adjustments.

Circle (546) on Reply Card

RGB-to-NTSC encoder

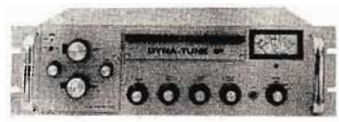
Lenco has introduced an RGB-to-NTSC color encoding system that enables computer graphics or alphanumeric information to be displayed on standard commercial color television monitors.

The CCE-850 is designed to encode high-resolution RGB colorgraphic computer displays, regardless of scan rates.

The encoder may be used with any computer graphics system when NTSC video is required for videotaping and distribution. An additional feature includes a color reference test pattern to allow for proper NTSC color monitor alignment.

Circle (547) on Reply Card

Off-air TV Demodulator



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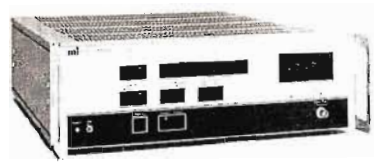
New products

TV interval timer

Marconi has introduced the television interval timer model 2920. The timer provides digital readout



of 15 different parameters. Changes in measurements can be monitored directly by front panel selection of the particular parameter of interest. All functions may be controlled remotely.

Circle (548) on Reply Card

Audio control center

The "S" system by *Micro-Trak* is a packaged 6-channel broadcast system which provides turntables,

turntable preamplifiers, interconnecting wiring and the model 6618 6-channel audio control console. The 30"x80" operating desk provides space for desk top equipment such as cart machines as well as accessory space in the pedestal.

Circle (549) on Reply Card

Amplifiers

Modular Audio Products (MAP) has introduced models 7821 and 7822 rack mounting audio distribution amplifiers. Both feature low distortion and noise through the use of MAP audio op-amps in a transformerless bridging input, differential amplifier configuration. Both units also feature self-contained power supplies.

Model 7821 provides eight balanced outputs from one input, while model 7822 provides 16 balanced outputs from two separate inputs. All outputs are 600 Ω at up to +20dBm level per output, with a minimum of 80dB of isolation between outputs, and from output to input. Alternatively, model 7821 can provide 16 unbalanced outputs and model 7822 can provide 32 unbalanced outputs. Inputs can be strapped for a single source feed. The amplifiers are internally protected against short circuit and input overload.

Circle (550) on Reply Card

TV transmitters

NEC offers the PCN-1200 series VHF and the PCU-700 series UHF TV transmitters. The PCN-1200 series transmitters employ IF modulation and feature a minimum of vacuum tubes. Other features include a broad-band matching system allowing full spectrum coverage of Band III (170-230 MHz) without adjustment, integrated circuit technique to minimize the number of electrical and mechanical parts and integrated CIN Diplexer for size reduction and ease of installation and maintenance. The series is available in 1, 2, 5, 10 and 25 kW models.

The PCU-700 series uses all solid-state IF modulator and exciter high-efficiency Klystrons for both visual and aural power amplifiers. Features include 30% reduction in parts by use of IC and other current circuit techniques high-performance non-linear distortion compensation circuit for both DG and DP adopted at IF frequency and new vestigal side-band SAW type filter for steeper sideband response. The series is available in 10, 30, 40, 55, 60 and 110 kW models.

Circle (551) on Reply Card

Equalizer accessory

Orban Associates has announced the availability of a transmitter equalizer accessory for their Optimod-AM compressor/limiter/equalizer system. The equalizer is designed to compensate for low frequency tilt inherent in many transmitters and also to compensate for transmitter-antenna system overshoot and ringing.

Two separate equalizer sections (remotely switchable) permit independent adjustment of day/night transmitters or day/night power levels. Each section has three controls: one for low-frequency tilt and

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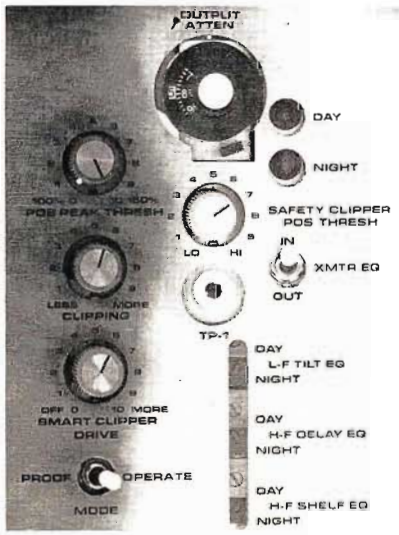
two for high-frequency compensation. When desired, the entire transmitter equalizer can be switched out. A front panel jack permits convenient insertion of square wave test signals for initial setup. LEDs indicate the day/night status of the circuit.



It is available as an accessory kit for retrofit into existing units and is being included on all current production units.

Circle (552) on Reply Card

24-track recorder

The MTR-90 Masterecorder from *Otari* is available in 16 or 24 track versions or in a 16 track prewired for 24 tracks. The unit features symmetrical pinch-roller-free direct

drive, 30 and 15 ips tape speeds, fulltime servo system for capstan and reel motors, digital tape timer, automatic monitor switching and variable-speed cue control. Auto locator with full shuttle search-to-cue capabilities and 10 memory capacity and a 16/24 track conversion kit are optional.

Circle (553) on Reply Card

Camera tubes

Philips has announced the 74XQ series of ⅔-inch Plumbicon television camera tubes for ENG applications. Resolution for these tubes is typically 55% at 400 TV lines (uncorrected for the lens). The 74XQ has a high beam reserve and when used with dynamic beam control it can provide four F-stops of highlight protection to minimize comet-tailing.

The ⅔-inch camera tube also is suitable for studio use, such as continuity, interviews and news reading, as well as for electronic field production (EFP).

Special features of the 74XQ series are the use of a photoconductive layer for increased resolution, and the use of a diode electron gun for dynamic beam control to minimize comet-tailing and blooming.

Circle (554) on Reply Card

16mm telecine

RCA has introduced a 16mm film handling system with advanced capabilities for specialized broadcast and teleproduction telecine applications. The FR-16 projector system features an incremental 16mm film handling system designed for presenting an illuminated film frame to a telecine camera. A servo controlled film drive mechanism functions as a film drive station using a low-inertia dc servo motor with a large diameter sprocket.

Start, from zero to cine speed (24 or 25 frames per second), occurs in less than five film frames. Stop occurs in less than one film frame. A smooth stop-reverse-start sequence, as a special effect, occurs in less than one-half second.

In the freeze frame (still) mode, the application of light remains the same as when the projector is operating, with no degradation of the picture.

Circle (555) on Reply Card

Microphone mixer

The model HPMO41 microphone mixer by *RTS Systems* is designed for professional applications ranging from location film and tape to major recording console input augmentation.

Input features include four Lo-Z mic inputs, a 3-position attenuator switch, a 3-position high pass switch, limiter circuit on each input, a phase reverse switch for each input, and an auxiliary input. Other features include a tone oscillator with on/off switch on front panel and trim pot on the circuit card, a peak indicator LED on the front panel, an illuminated VU meter with buffer amplifier and range select switch for +8dB or +4dB for zero reading on the meter, and a 1W

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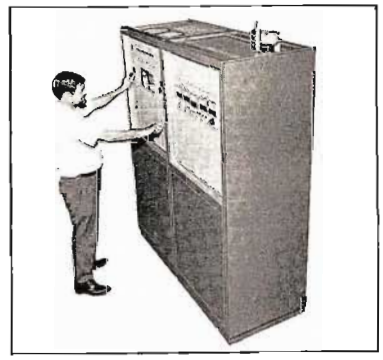

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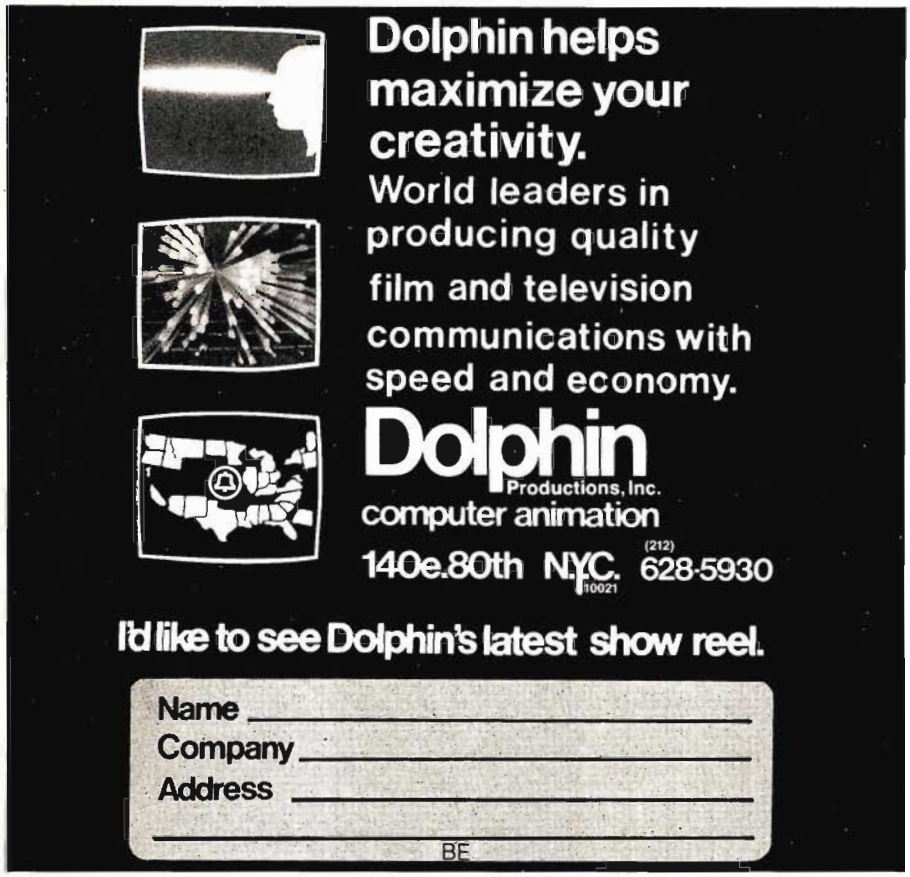

Circle (187) on Reply Card

Circle (177) on Reply Card

New products

headphone amplifier with front panel volume control and headphone jack.

Circle (556) on Reply Card

Monitor

The model MAS-1 monitor amplifier/speaker from *Ramko Research* is an all purpose utility amplifier with

speaker and headphone jack. Standard features include a 20k balanced bridging input, 1 W RMS audio amplifier, 12 position input select switch and level control.

Circle (557) on Reply Card

Wireless microphones

The Schaffer B&T wireless instrument and microphone by the *Ken Schaffer Group* is said to have the same performance capabilities as its more expensive counterpart, the

Schaffer-Vega Diversity System, with one exception: Musicians must allow a few minutes for a sound check to ensure the absence of dead spots by selecting optimum antenna placement. Signal-to-noise ratio of better than 90dB, crystal controlled stability, interference proof performance and no tuning are common to both systems.

Circle (558) on Reply Card

Distribution amplifiers

The Masterline series of UHF/VHF distribution amplifiers designed for small TV signal distribution systems is available from *Singer Products*. The system is a medium

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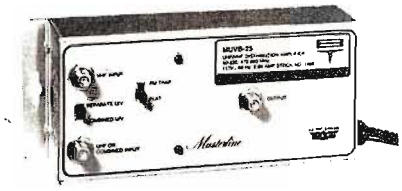
gain, low noise, broadband amplifier with both VHF and UHF amplifiers.

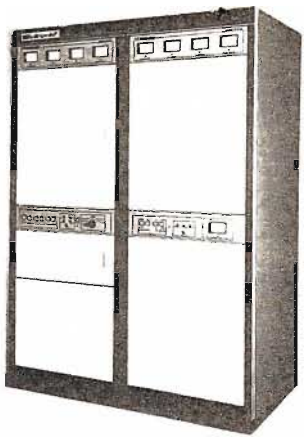


Front panel switches permit the selection of combined or separate VHF/UHF inputs and the switching in of a built-in FM stop filter.

Circle (559) on Reply Card

FM transmitter

Sintronic has introduced the model S1-F-25 FM broadcast transmitter, 27.5kW, designed for long-term performance in the 87.5-108MHz FM broadcast band.



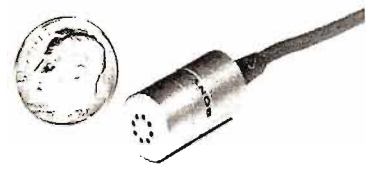
The transmitter is housed in a dual section, single cabinet. The left section consists of the driver and the right section houses a complete RF power amplifier with separate power supply. A combination of meters, illuminated pushbuttons and LEDs provide full visual monitoring of transmitter status and primary operational parameters at a glance. Major control panel and facilities are included in the transmitter for remote control and metering.

The company's S1-10E exciter is the heart of the transmitter. It uses six ICs and four transistors in its front-panel visual monitoring system. Operating status is monitored continuously by five LED indicators which normally are illuminated through electronic sensing circuitry.

Circle (560) on Reply Card

Lavalier microphone

The ECM-50PS lavalier microphone by *Sony* is suited to binaural recording because of its compact size, S/N ratio of 66 dB and sensitivity of 56 dB. The mic uses



the standard cannon output connector and is equipped with a 2-way power system (battery or studio power supply).

Circle (561) on Reply Card

Audiocassette tape

TDK Electronics has developed a metal tape, designated MA-R, which is loaded into a Reference Standard cassette mechanism made of die-cast metal.

The 60-minute metal cassette tape utilizes particles which have greater magnetic energy than oxide particles. Coercivity of the new tape is

1050 oersteds, while remanence has been fixed at 3000 gauss. In a suitably biased cassette deck, an increase of high-frequency maximum output level (MOL) of as much as 7dB can be expected.

The die-cast metal shell is said to be less sensitive to warp than conventional plastic molded shells, and is not subject to deformation caused by changes in ambient temperature or humidity.

Circle (562) on Reply Card

Sportscaster headset

A professional boom-mic headset for live sports broadcasting has been introduced by *Telex*. Designed for use in moderately noisy conditions, the Sportscaster II is effective for broadcasts from a press box, interview on the side lines, or reporting from the playing field or track.

The headset, model CS-91, features an omnidirectional dynamic microphone and an in-line push-to-cough switch which lets the announcer mute the microphone when

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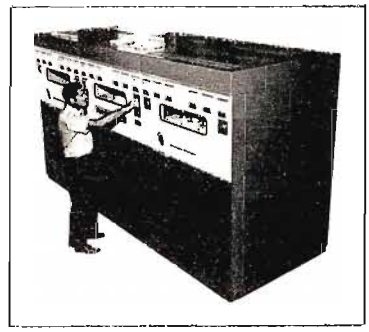

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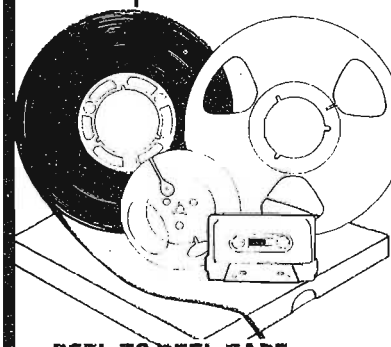

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New products

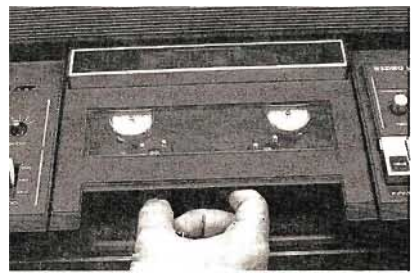
needed. The circumaural cushions of the binaural headphone receivers attenuate noise to let the announcer

monitor the program in one ear while receiving cues in the other. Extra comfort socks for the ear cushions are included, and a snap-on foam filled headband cushion provides ventilation during prolonged periods of use.

Circle (563) on Reply Card

Spindle height gauge

The *Tentel* U-matic Spindle Height gauge (TUSH) is designed for ¾-inch video recorders. It has two indicators which read in thousandths of an inch, mounted on a ½-inch thick aluminum die plate.



The TUSH not only measures the heights of both the supply and take-up spindles, but can measure out of flatness of the four cassette locating pins. The gauge includes a master checking block, instructions and carrying case.

Circle (564) on Reply Card

Videocassette storage

A videocassette storage system designed for ¾-inch and mini-¾-inch cassettes has been designed by the magnetic audio/video products division of *3M*.

A shipper/storage case, a metal bar that can be cut to any length and mounted on a studio or storage room wall and a portable 6-pack

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hanger rack make up the Scotch hanger system. A 4-wheel mobile

cart is capable of holding and transporting more than 100 boxed or unboxed videocassettes.

Circle (565) on Reply Card

Digital monitoring

A digital remote control and status monitoring system (model 7815) is available from *Time & Frequency Technology*. The system features fully duplexed digital data with parity check, control and status functions for 15 channels (expandable to 45), double scan compare logic for full data integrity, built-in crystal controlled FSK data modems and interconnection adaptability for phone line or radio.

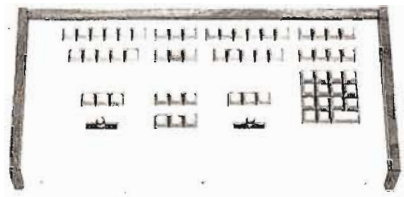
The configuration of the system consists of 15 independent front panel toggle switches for easy control of 15 on/off functions. Each function is verified by an adjacent and independent LED status indicator which is activated by a telemetry signal from the remote site.

The system may be expanded by the addition of up to two model 7830 channel expanders to give an ultimate capability of 45 separate control and status functions. A time sharing communications link with other remote control and telemetry systems also is available as an option. A site selector may be added to the system to provide control and monitoring of up to 16 separate locations with a single system.

Circle (566) on Reply Card

Editing system

A single event, frame accurate editing system is available from *Videomedia*. Mini Z features bidirectional shuttle arms, auto search, cruise control, auto tag and edit—rehearse, perform and review.

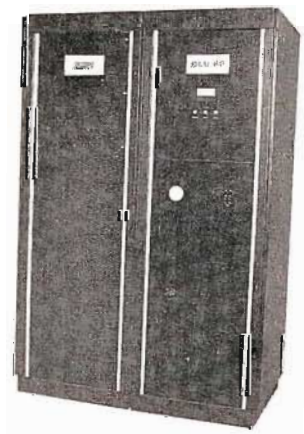


With the Micro-Loc option, the system is dead-lock accurate and offers a numeric display in either SMPTE format or pulse count readout. The editing system incorporates a complete data readout with all editing parameters displayed and continuously updated as the editing session progresses. Error messages prompt the operator through each sequence, calling attention to illegal or illogical commands.

Circle (567) on Reply Card

Dummy load

Wilkinson has introduced the DLU 80-80kW self-contained calorimeter dummy load. Using a closed loop system and film type resistor, the unit permits accurate power measurement up to 80kW. It features nonmeasurable VSWR, frequency



range of dc to 1.8GHz, easy power readout, and mobility for multiple uses. The unit exceeds FCC specifications.

Circle (568) on Reply Card

Dubbing console

Winsted Corporation's 990 dubbing console features rugged steel construction and caster-mounted

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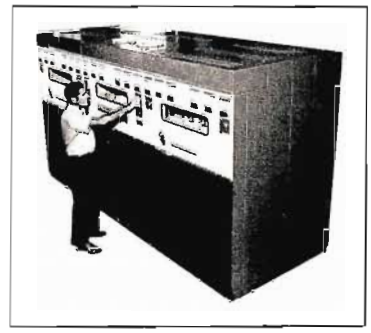

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Circle (198) on Reply Card

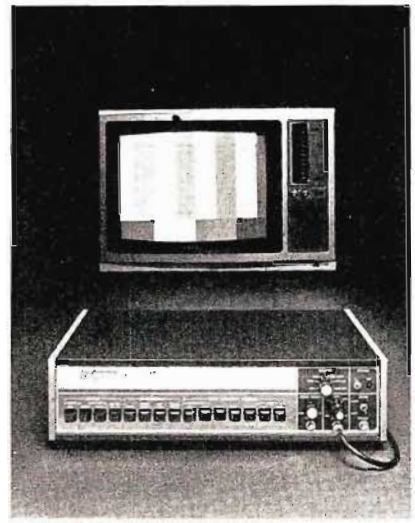
New products

mobility and will hold all sizes of VTR equipment. Four all-steel VTR drawers and monitor shelves which adjust on 1-inch increments are featured.

Circle (569) on Reply Card

Color generator

The *B&K-Precision* model 1250 NTSC generator is a cost-effective unit intended for broadcast, CATV and industrial television applications. It generates the standard



NTSC bar pattern with a -IWQ signal occupying the lower quarter of the pattern as well as the full-screen color bar pattern. Another feature is the 5-step staircase pattern with selectable chroma levels. Other patterns include dot, crosshatch, center cross and color raster for convergence checks and adjustments.

Circle (570) on Reply Card

Analog TBC

Consolidated Video Systems has introduced an analog TBC for non-broadcast, heterodyne VTR users. The CVS 506 reduces or eliminates skew, jitter, flagging and other picture distortions. It uses charge coupled device (CCD) circuitry and works with any heterodyne VTR format, including ¾-inch, Beta and VHS.

Standard features of the CVS 506 include a built-in proc amp and automatic color/mono selection.

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Circle (200) on Reply Card

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Lamps

Custom Audio Electronics has announced the availability of gooseneck lamps for illumination of control panels and work spaces in dimly lit areas.

The lamps come equipped with a bayonet type bulb and 360-degree swivel base. A kit including lamp, base, dimmer, power supply, cable and mounting hardware is offered.

Circle (572) on Reply Card

Microphone system

Edcor has introduced the E-COM 150-210 MHz band wireless microphone system, complimentary to the 30-50 MHz wireless mic systems.

Transmitter includes the E-COM 1 pocket transmitter and the E-COM 2 handheld microphone transmitter. Receiver includes the single channel crystal controlled E-COM 3, the E-COM 5 true diversity receiver for using two antennas and the E-COM 7 mini-receiver.

Circle (573) on Reply Card

Mono/stereo matrix

Eventide's Monstermat model RD770 mono/stereo matrix converts the stereo signal into left-plus-right and left-minus-right, putting the L+R mono signal on one cart track. The second track carries the difference, L - R, signal. Full stereo is restored on playback and dematrixing. Using the dbx noise reduction system, the unit is available in two formats: record/play, which provides encoding and decoding for one cart machine; or play/play, which can handle two cart machines in the play mode.

Circle (574) on Reply Card

Marking beacon

Flash Technology Corporation of America has introduced a flashing white aviation obstruction marking beacon. The FTB-319 ElectroFlash Beacon meets the new FAA night/twilight marking requirements.

Flashing 40 times per minute, it features self-contained solid state timing and photoelectric controls and has an expected flashtube life exceeding two years. The beacon is a 75 W, AC-powered, flashing light that needs less than 10% of the power consumed by conventional 300mm incandescent beacons.

Circle (575) on Reply Card

dBS system

The Swintek dBS system, available on *Alan Gordon Enterprises'*

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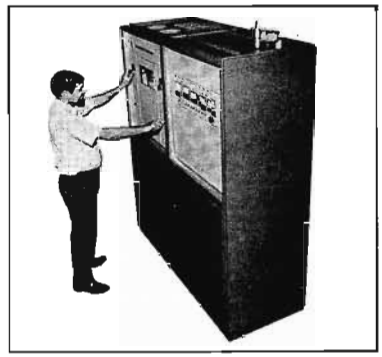
Amarillo, Texas



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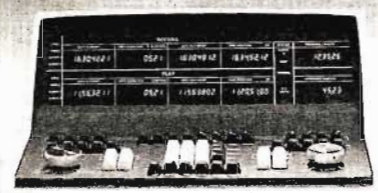

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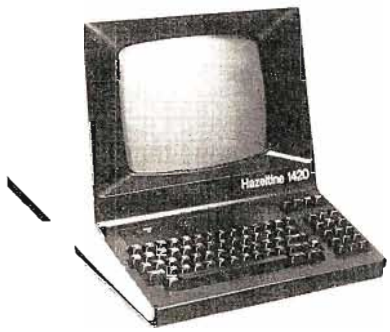
New products

Mark 2L-dBS transmitter and Mark 50A-dBS receiver, offers virtual elimination of buzz noises and high-fidelity audio recordings. The signal-to-noise ratio is increased by at least 15 dB. Another advantage is the increased dynamic range utilizing the compander method rather than the compression method.

Circle (576) on Reply Card

Computer terminal

Hazeltine has introduced the 1420 low-cost computer terminal designed for support of small business systems using data and word processing software. The unit features a typewriter-style keyboard and high intensity, blink or non-display modes. A program function key mode as well as column and field tabs are standard.



Circle (577) on Reply Card

Micro mixer

Holland Electronics offers the 401 micro mixer for ENG applications. The mixer is fully-portable and operates from internal rechargeable batteries. Standard features include transformer coupled mic inputs, transformer coupled outputs, built in switchable AGC and built in 1 kHz tone oscillator.

Circle (578) on Reply Card

Automated console

The JH-600, *MCI's* console, is an in-line audio console with each I/O module containing one complete mic channel and one complete remix channel. On the JH-600 the VCA fader assemblies have been mechanically separated from the rest of the module. It comes in two

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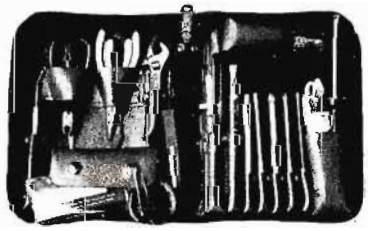

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Circle (195) on Reply Card

frame sizes, the JH-618 (18 inputs) or JH-636 (36 inputs).

Features for the automated console include differential line inputs and optional differential mic preamps.

Circle (579) on Reply Card

Microwave leak detector

Metrifast's hand-held microwave leak detector monitors unsafe radiation levels in microwave equipment which might occur through equipment damage, misuse or wear. A light-emitting diode in the center of the arrow-shaped device glows red when in contact with radiation levels above the prescribed US minimum of 5mW/cm^2 at a distance of 2 inches.

The unit, model 748, is comprised of a microwave dipole receiving antenna connected to a passive nonlinear alarm which is energized solely by radiation received by the antenna. There are no batteries or moving parts.

Circle (580) on Reply Card

Digital effects system

The three enhancement options available for the Quantel DPE 5000 digital effects system by *Micro Consultants* include Picture Reversal, Autolink and Multilink.

Picture Reversal gives the illusion of a picture reversing or producing a mirror image. Reversing the picture in succession creates a spinning effect while changing the picture size and position during spinning creates a tumbling effect.

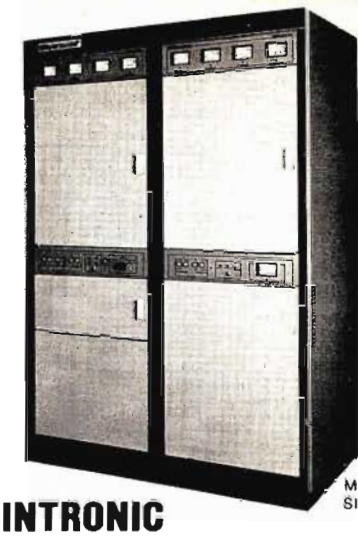
The Autolink option permits several DPE 5000 control panels to be used with one DPE 5000 effects system.

Multilink allows interlinking of up to four DPR 5000s with up to four control panels when multiple picture manipulation is required.

Circle (581) on Reply Card

Contact sleeve

Neutrik's Helicon contact sleeve is said to provide high-reliability contacts with low contact resistance on a long-term basis. High-quality phos-



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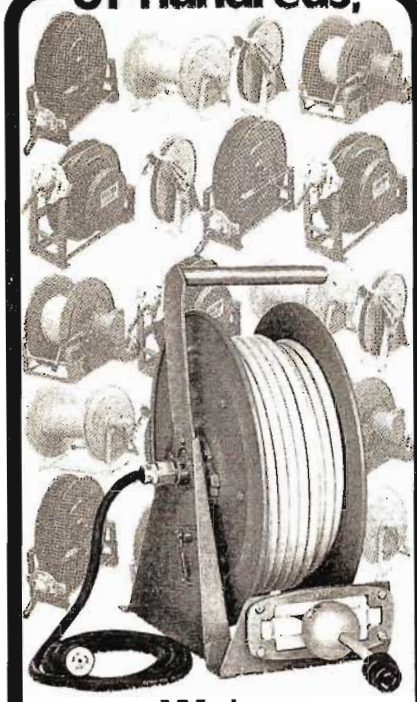

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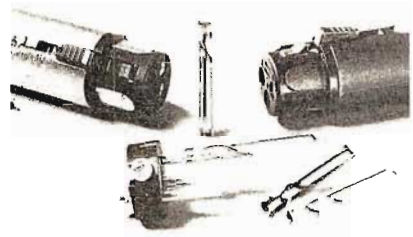
New products

phor bronze is formed into a tube with a front guiding sleeve followed by two helical spring-like fingers with contact dimples.



The helical form of these fingers provides longer spring elements than commonly used. The staggered position of the contacts produces an insertion force which is lower at the beginning of contact engagement and increases as the two connectors seat. Two-point wiping action also is provided. The shape of the wiping contacts has been designed to improve the desired self-cleaning action without undue contact pressure which might wear through the plating of the mating connector pin.

Circle (582) on Reply Card

Recording/mixdown console

Neve Electronics International has introduced the 8098 48 track recording and mixdown console which features reverb return inputs and multi-frequency line-up oscillator.

Standard features include 56 input channels, master mic/line changeover facilities, four reverberation outputs and muting positional solo facilities on all channels.

Circle (583) on Reply Card

Oscilloscope

A portable 15 MHz oscilloscope offered by *Philips Test and Measuring Instruments* features an 8x10 cm

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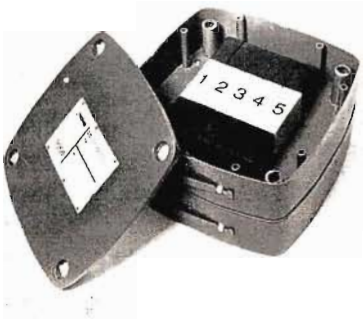
3207 provides a separate manual trigger control. Both internal and external triggering are possible with internal trigger sensitivity 0.75 div at 100 kHz.

Circle (584) on Reply Card

Shipping cases

Plastic Reel Corporation is offering the Video Vault series of



Plio-Magic shipping cases designed to hold up to 10 ¾-inch cassettes. The cases feature independent locking security on all four corners; lightweight, high-impact design; overlapping construction to keep out dirt and moisture; integral carrying handle and labelling.

Circle (585) on Reply Card

DC turntable

The Galaxy by *QRK Electronic Products* is a dc turntable which features an electronic speed control for plus or minus 10% speed variation on both 33⅓ and 45 RPM.

The turntable features instant starting without speed loss and back cueing with no motor drag.

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Coax transmission line

SWR claims that technological improvements in their coaxial trans-

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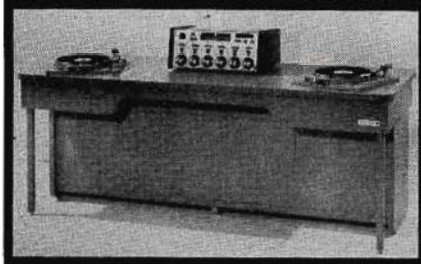

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MICRO-TRAK CORPORATION
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Colorado Magnetics

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Colorado Springs
Colorado 80901
303 / 596-0684

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	300 NAB	380 NAB	A-2	AA-3
LENGTH	100+	100+	100+	100+
Empty	1.69	1.85	1.92	–
20 sec	2.01	2.10	2.53	3.12
40 sec	2.16	2.21	2.58	3.20
70 sec	2.19	2.25	2.64	3.27
100 sec	2.25	2.32	2.73	3.38
2.5 min	2.48	2.56	2.83	3.51
3.5 min	2.59	2.67	2.96	3.66
4.5 min	2.72	2.75	3.08	3.81
5.5 min	2.89	2.96	3.21	3.97
7.5 min	3.06	3.14	3.41	4.21
10.5 min	3.48	3.56	3.73	4.61

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Table Top Cartridge Rack - Holds 48	54.00
Table Top Cartridge Rack - Holds 96	93.50
Blank It Bulk Eraser, Hand Held	59.95
Audiolab Electronics Bulk Eraser	82.00
Alignment Cartridge - Monophonic	42.00
Alignment Cartridge - Stereophonic	42.00

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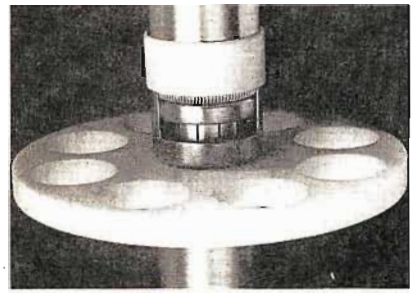
mission lines result in a 2-fold improvement in heat dissipation for some line sizes. The firm's Cool "K"



transmission lines use TE copper connectors with a thermal coupling design.

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Signal analyzer

Model WR-515B color bar Signalyst from *VIZ Test Instruments* incorporates solid-state electronics, rugged construction and compact size for bench and field servicing applications.

The device provides the signals necessary for servicing color TVs, videotape recorders, MATV, CATV and CCTV systems. Over a dozen tests are possible through three separate color bar patterns with the sixth bar marked for quick identification.

Circle (589) on Reply Card

Slide projector

Model LD-4200 lap-dissolve 35mm slide projector from *Zei-Mark* features two Ektagraphic E-2 slide

projectors (with horizontal registration) and an optical beam-splitter. An 8-inch f/5 projection lens in the optical assembly permits an image size range of 1.6-inch to 2.1-inch high. □

Circle (590) on Reply Card

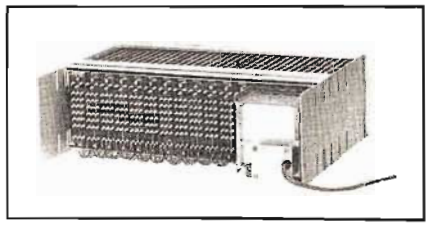
VHF Hi-BAND WIRELESS MICROPHONE SYSTEM

The HME System 22EF combines the convenience of a flat pac portable receiver with a broadcast quality wireless microphone. Special Dynamic Expansion processing increases the dynamic range up to 95 dB.

The transmitter, compatible with any electret or dynamic microphone, is powered by a 9V alkaline battery. The lightweight receiver is powered by either alkaline of NiCad batteries, ac or dc power, (polarity is reversible), and is a perfect mate for your recorder or minicam. PRICE: $1,890.00.

hme HM ELECTRONICS, INC. 6151 FAIRMOUNT AVENUE SAN DIEGO, CALIFORNIA 92120 TELEPHONE (714) 280-6050

Circle (215) on Reply Card



AUDIO DISTRIBUTION AMPLIFIER PACKAGE

The SA-200 DA, is available in two basic packages. Shown is the wiring side of the 12 card frame which contains a Dual Regulated Power Supply and rear mounted Terminal Boards for ease of installation. Provides 12 Inputs and 72 Outputs at a cost of $2,495.00. Other products include: Custom Audio Consoles, Studio Intercom Systems, Studio Monitor Systems, **SCIENTIFIC SYSTEMS, INC.** 92 Westwood Dr., Toms River, New Jersey, 08753, (201) 255-2230. Sales Office: 191 West Field Ave., Clark, New Jersey, 07066, (201) 381-1088.

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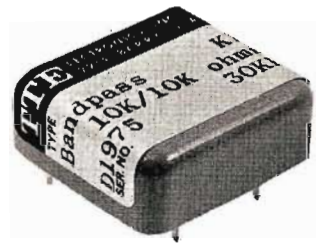

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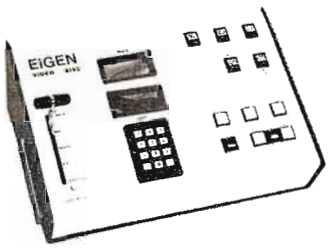
TTElectronics, Inc. 2214 Barry Ave Los Angeles, 90064, (213)478-8224

Circle (235) on Reply Card



ELECTRONIC SLIDES / SLOW—MOTION COMBINATION

Random access 600 stills, and have slo-mo capability for sports and editing. Combination controller, high-Band color, Digital TBC/DOC @ $27,000.

EIGEN VIDEO P.O. Box 1027 Grass Valley, CA 95945 916/273-1341

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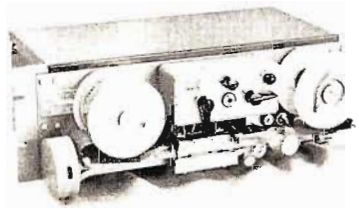

TAMPER-PROOF 24 HOUR MONITORING SYSTEM

SoundScriber Model S-124-T keeps a mistake-proof, permanent record of all programming—around the clock, every day of the year. Every broadcast minute of every program is recorded with indisputable accuracy on a time-calibrated tape—invaluable for verication or legal documentation. New Easi-Semble design allows direct rack mounting. The unit uses tape 2" in width, perfect for discarded videotape. Contact factory for direct pricing. SoundScriber, 85 Willow Street, New Haven, Conn. 06511.

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The American Heart Association

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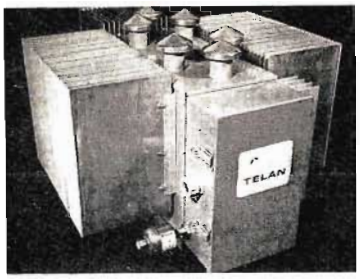

REMOTE ELECTRICAL POWER SYSTEMS (REPS)
Teledyne manufactures a family of remote electrical power systems which provide power for communication systems, navigation systems, data collection stations, railroad signals and cathodic protection. In addition to the standard thermoelectric generators a new series is now available with Factory Mutual approval for applications in hazardous locations. Thermoelectric/solar systems are also available for long term unattended operation.

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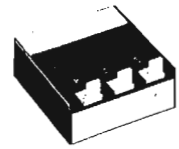
301-252-8220

Circle (219) on Reply Card

SOLID STATE TOWER FLASHERS



A new series has been added to SSAC's line of "B-Kon-Flash". The new devices with a load current rating of 300 Amperes Inrush will operate up to four beacons at 230 VAC, two beacons at 120 VAC. Also available are auxiliary units for synchronous operation of additional beacons on separate lines or for alternating flashing of beacons.

Lamp Life is increased by approximately 10 X due to Zero Voltage Switching. Device measures 2 x 2 inches and is completely encapsulated. Price in 1-9 quantity, $41.52 each, FOB Factory. For more information call John Arnold at (315) 622-1000.

SSAC Inc.
PO Box 395, Liverpool, NY 13088

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UHF WIRELESS MICROPHONE SYSTEM

The HME System 24E—newest member of the HME family—operates on 400-470 MHz. It utilizes the FM (frequency modulation) transmission method, plus special Dynamic Expansion processing that increases the dynamic range up to 95 dB.
The same superior design features of HME's professional VHF Systems are also incorporated in the System 24E. PRICE: $2,300.00.

hme
HM ELECTRONICS, INC.
6151 FAIRMOUNT AVENUE
SAN DIEGO, CALIFORNIA 92120
TELEPHONE (714) 280-6050

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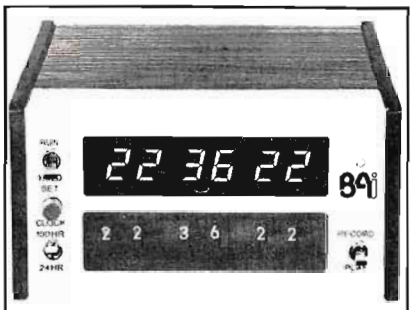

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Missed any network or off-the-air recordings lately? Then the Model 400 Clock/Timer can help! Just set the record time and recording is automatic. On time playback, too. Start time is constantly displayed along with real time. Easy setting lever-switches also make it handy in the control room.

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THE KEN SCHAFFER GROUP, INC.
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(212) 371-2335

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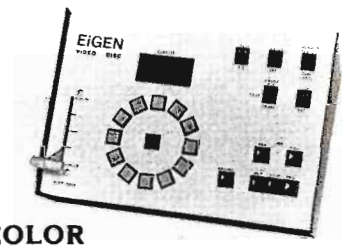

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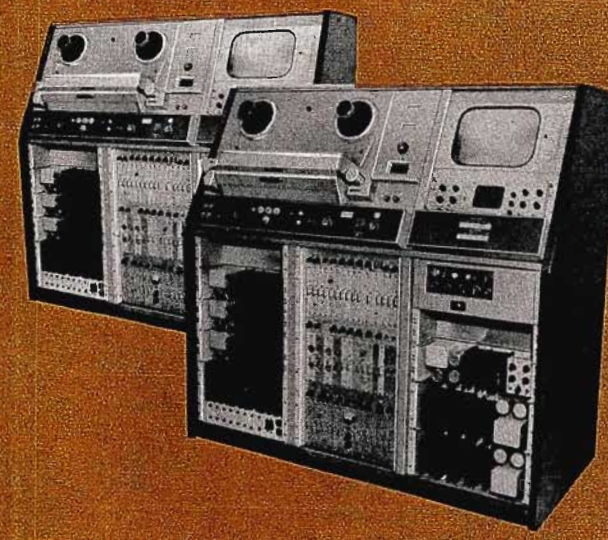

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1979 BROADCAST BUYERS' GUIDE

- *Product directory section begins on page 182.*
- *Manufacturers' addresses section begins on page 228.*
- *Dealer/distributor section begins on page 242.*
- *Edges of each section are color coded so that they can be found easily.*

Since our first edition of the Buyers' Guide 11 years ago, the broadcasting industry has grown tremendously in complexity of equipment and completeness of broadcast services. Just as the industry has responded to the use of new technologies—most notably the microprocessor in all phases of automation—the Buyers' Guide has responded by providing the most complete directory possible for engineers, managers; and purchasing agents requiring broadcasting equipment or services. Reflecting the current healthy state of our industry, this year's Buyers' Guide has nearly 800 product categories, lists more than 700 manufacturers, and contains more than 200 advertisers. It's the result of a dedicated staff effort to make it our finest tool for purchasing the industry's hardware, software and services.

Each year, **Broadcast Engineering** mails extensive questionnaire forms to suppliers around the world. They are asked to identify, by special code number, every product they currently market. In the process, scores of new products and companies are added, while lines that have been phased out—and firms that have left the field—are deleted. Once amassed and assembled, these new data are processed through a unique computer operation, programmed to "read" the code numbers and assign company names and Red Listings to appropriate product headings.

Advertisers in this issue are listed in red under each appropriate product heading. These Red Listings include the ad page location to serve as a direct reference to the product information you are seeking.

Broadcast Product Dealer/Distributors are listed separately in the section beginning on page 242, followed by the states they serve and the products/services they provide. If they are advertisers, their ad appears either on the page of their listing or on the facing page. A full explanation of this section appears on page 242.

Broadcast Product Manufacturers' Addresses begins on page 228. There, you will find a complete, alphabetized index of mailing addresses for all of the companies listed in the Product Directory. Additional information appears under the index listing for advertisers in this issue: the name and telephone number of the home office sales manager, followed by, in many cases, a roster of regional sales contacts for that firm.

Reader Service Cards are bound into this edition for your convenience. Each card is valid for a full year. By circling the appropriate numbers on the card, you can secure additional information directly from the advertiser through August 1980.

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product directory

ATS --See Automated Transmission Systems

Alarms, Carrier

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CCA Electronics Corp.
Hallikainen & Friends, Inc.
Harris Corp. Broadcast Products Div.

Alarms, Fault

B & I Electronics, Inc.
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Belar Electronics Lab., Inc.
Bird Electronic Corp.
Dranetz Engineering Labs., Inc.
Harris Corp. Broadcast Products Div.
Hughey & Phillips Inc.
Moseley Associates, Inc.
National Electrolab Ltd.
Pinzone Communications Products Inc.

Alarms, Teletype Receiver

B & I Electronics, Inc.
Moseley Associates, Inc.
Sono-Mag Corp.

Alarms, Tower Light Failure -- See Tower Light Failure Alarms

Alarm Systems, Burglar

Atlas Sound
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Heath Co.
ITI Electronics, Inc.
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Wang Voice Comm. Inc.

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Harris Corp. Broadcast Products Div.
Heath Co.
IGM Div. of Northwestern Tech.
ITI Electronics, Inc.

Amplifier Kits

DYMA Engineering, Inc.
Heath Co.
Opamp Labs, Inc.
TM Systems, Inc.

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BGW Systems Inc.
Broadcast Electronics, Inc.
Delta Electronics Inc. (Va.)
DYMA Engineering, Inc.
Elcom Engineering Co.
Eventide Clock Works Inc.
Gregg Laboratories
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Inovonics
Marti Electronics
McCurdy Radio Ind. Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Monroe Electronics, Inc.
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RCA Broadcast Systems
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Sphere Electronics
TM Systems, Inc.
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Audio Designs & Mfg.
Automated Processes, Inc.
Broadcast Electronics, Inc.
CCA Electronics Corp.
Cetec Broadcast Group
Communications, Ltd.
Delta Electronics Inc. (Va.)
DYMA Engineering, Inc.
EMT Franz VGmbH
Elcom Engineering Co.
Eventide Clock Works Inc.
Gotham Audio Corp.
Gregg Laboratories
Harris Corp. Broadcast Products Div.
Inovonics
LPB Inc.
Marti Electronics
Moseley Associates, Inc.
Rupert Neve, Inc.
Orange County Electronics Int'l., Inc.
Orban Assoc. Inc.
Pacific Recorders and Engrg. Corp.
QEI Corp.
RCA Broadcast Systems
Singer Products Co., Inc.
Sono-Mag Corp.
Sontec Electronics
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Ivie Electronics
McMartin Industries, Inc.
Micro-Trak Corp.
Moseley Associates, Inc.
Rupert Neve, Inc.
Opamp Labs, Inc.
QRK Electronic Products
RCA Broadcast Systems
Richmond Sound Design, Ltd.
Scientific Systems, Inc.
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Automated Processes, Inc.
DYMA Engineering, Inc.
Gotham Audio Corp.
MICMIX Audio Products, Inc.
Rupert Neve, Inc.
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Protech Audio Corp.
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CCA Electronics Corp.
Cetec Broadcast Group
Crown International, Inc.
DYMA Engineering, Inc.
Harris Corp. Broadcast Products Div.
Heath Co.
James B. Lansing Sound, Inc.
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Sigma Electronics, Inc.
Singer Products Co., Inc.
Spectra Sonics
Studer Revox America
Telectro Systems Corp.
Telex Communications, Inc.
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Yamaha International Corp.

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Bogen Div. Lear Siegler, Inc.
Delta Electronics Inc. (N.C.)
DYMA Engineering, Inc.
Dynair Electronics, Inc.
Gould Inc. Instruments Div.
Grass Valley Group, Inc.
Harris Corp. Broadcast Products Div.
ITI Electronics, Inc.
International Nuclear Corp.
Kaitronics Corp.
James B. Lansing Sound, Inc.
Merill Cable Equipment Corp.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Norton Associates Inc.
Opamp Labs, Inc.
Orange County Electronics Int'l., Inc.
Protech Audio Corp.
Quad-Eight Electronics
RCA Broadcast Systems
ROH Corporation
Ramko Research Inc.
Richmond Sound Design, Ltd.
Scientific-Atlanta, Inc.
Sescom, Inc.
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Dynair Electronics, Inc.
Farinon Video
Grass Valley Group, Inc.
Industrial Sciences, Inc. (ISI)
International Communications & Control Corp.
International Nuclear Corp.
Kaitronics Corp.
Leitch Video Ltd.
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Coastcom
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DYMA Engineering, Inc.
Elcom Engineering Co.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
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Marti Electronics
Roger Mayer Electronics, Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Moseley Associates, Inc.
Rupert Neve, Inc.
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QEI Corp.
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Boston Sound & Power Systems
Central Dynamics Corp.
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Gould Inc. Instruments Div.
Harris Corp. Broadcast Products Div.
Modular Audio Products Unit of Modular Devices, Inc.
Moseley Associates, Inc.
Motorola Semiconductor Products Inc.
Opamp Labs, Inc.
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Bell Audio Systems, Inc.
Bogen Div. Lear Siegler, Inc.
Bonneville Productions Div. of Bonneville Int'l. Corp.
Boston Sound & Power Systems
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Channelmatic, Inc.
Datatek Corp.
Di-Tech Inc.
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Dynasciences Div. Whittaker Corp.
Edcor
Farinon Video
Harris Corp. Broadcast Products Div.
Holland Electronics
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Ikegami Electronics (USA) Inc.
Industrial Sciences, Inc. (ISI)
International Communications & Control Corp.
International Nuclear Corp.
Johnson Electronics Inc.
LPB Inc.
Marconi Electronics Inc. Broadcast & Communication Div.
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Opamp Labs, Inc.
Pacific Recorders and Engrg. Corp.
Panasonic Company
Protech Audio Corp.
QRK Electronic Products
RCA Broadcast Systems
ROH Corporation
Radiation Devices Co., Inc.
Ramko Research Inc.
Richmond Sound Design, Ltd.
Scientific Systems, Inc.
Shintron Co. Inc.
Sigma Electronics, Inc.
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Sontec Electronics
Spectra Sonics
Telectro Systems Corp.
Telemation, A Div. of Bell & Howell
Telemet A Geotel Co.
Thomson-CSF Laboratories, Inc.
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Comprehensive Video Supply Corp.
Dage-MTI, Inc.
Datatek Corp.
Di-Tech Inc.
DYMA Engineering, Inc.
Dynair Electronics, Inc.
Dynasciences Div. Whittaker Corp.
GBC Closed Circuit TV Corp.
Grass Valley Group, Inc.
Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
Industrial Sciences, Inc. (ISI)
International Communications & Control Corp.
International Nuclear Corp.
Javelin Electronics
Leitch Video Ltd.
Lenco Inc. Electronics Div.
Marconi Electronics Inc. Broadcast & Communication Div.
Merlin Engineering Works, Inc.
Microwave Power Devices, Inc.
Panasonic Company
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Radiation Devices Co., Inc.
Rohde & Schwarz Sales Co.
Scientific-Atlanta, Inc.
Shintron Co. Inc.
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Comark Communications Industries, Inc.
The Finney Co.
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McMartin Industries, Inc.
Microwave Power Devices, Inc.
Moseley Associates, Inc.
RHG Electronics Laboratory, Inc.
Singer Products Co., Inc.
Versa Count Engineering
Wilkinson Electronics, Inc.

Amplifiers, Headphone

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American Data Corp. A North American Philips Co.
Audio & Design Recording Inc.
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Blonder-Tongue Labs.
Bogen Div. Lear Siegler, Inc.
Bonneville Productions Div. of Bonneville Int'l. Corp.
CCA Electronics Corp.
Central Dynamics Corp.
Cetec Broadcast Group
DYMA Engineering, Inc.
The Finney Co.
Harris Corp. Broadcast Products Div.
ITI Electronics, Inc.
International Communications & Control Corp.
International Nuclear Corp.
Johnson Electronics Inc.
James B. Lansing Sound, Inc.
Marti Electronics
Roger Mayer Electronics, Inc.
McMartin Industries, Inc.
Merill Cable Equipment Corp.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Monroe Electronics, Inc.
Opamp Labs, Inc.
Pacific Recorders and Engrg. Corp.
Protech Audio Corp.
QRK Electronic Products
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ROH Corporation
Ramko Research Inc.
Richmond Sound Design, Ltd.
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Sono-Mag Corp.
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TM Systems, Inc.
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RTS Systems, Inc.
Ramko Research Inc.
Richmond Sound Design, Ltd.
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Sescom, Inc.
Sontec Electronics
Special Instruments Lab, Inc. Portasound Div.
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Cezar International
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Dage-MTI, Inc.
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Industrial Sciences, Inc. (ISI)
Integrated Solid Systems Inc. GLI Brand
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McMartin Industries, Inc.
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QSC Audio Products
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Scientific Systems, Inc.
Sescom, Inc.
Sigma Electronics, Inc.
Spectra Sonics
TEAC Corp of America
TM Systems, Inc.
Telemation, A Div. of Bell & Howell
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Motorola Semiconductor Products Inc.
Opamp Labs, Inc.
Pacific Recorders and Engrg. Corp.
Protech Audio Corp.
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Belar Electronics Lab., Inc.
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Brown Electronic Labs
CCA Electronics Corp.
California Instruments
Comark Communications Industries, Inc.
Continental Electronics Mfg. Co.
Crown International, Inc.
DYMA Engineering, Inc.
Edcor
Electro Sound, Inc.
Eumig USA, Inc.
Farinon Video
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
International Nuclear Corp.
James B. Lansing Sound, Inc.
Logitek Electronic Systems, Inc.
McMartin Industries, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Moseley Associates, Inc.
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Paso Sound Products Inc.
Protech Audio Corp.
QSC Audio Products
Quad-Eight Electronics
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ROH Corporation
Ramko Research Inc.
Sansui Electronics Corp.
Scientific Systems, Inc.
Sescom, Inc.
Spectra Sonics
Studer Revox America
Superex Electronics Corp.
Technical Audio Products Corp.
Telectro Systems Corp.
Telex Communications, Inc.
Tweed Audio USA Inc.

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International Nuclear Corp.
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Lenco Inc. Electronics Div.
Marconi Electronics Inc. Broadcast & Communication Div.
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RCA Broadcast Systems
Siegel Electronics
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Dynasciences Div. Whittaker Corp.
EIMAC Div. of Varian
Grass Valley Group, Inc.
Harris Corp. Broadcast Products Div.
Industrial Sciences, Inc. (ISI)
International Nuclear Corp.
Kaitronics Corp.
Leitch Video Ltd.
Lenco Inc. Electronics Div.
Link Electronics Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Microwave Power Devices, Inc.
Panasonic Company
Panasonic Co. Video Systems Div.
RCA Broadcast Systems
RHG Electronics Laboratory, Inc.
ROH Corporation
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Shintron Co. Inc.
Sigma Electronics, Inc.
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RCA Broadcast Systems
Richmond Sound Design, Ltd.
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Ultra Audio Pixtec
Wide Band Engineering Co., Inc.
Wilkinson Electronics, Inc.

Amplifiers, RF General Purpose

AILTECH Div. Cutler-Hammer Los Angeles Operation
Keith Anderson Co.
Anderson Scientific
Blonder-Tongue Labs.
CSI Electronics, Inc.
Comark Communications Industries, Inc.
Computer Magnetics Corp.
Continental Electronics Mfg. Co.
Harris Corp. Broadcast Products Div.
International Microwave Corp.
McMartin Industries, Inc.
Merill Cable Equipment Corp.
Microwave Power Devices, Inc.
Motorola Semiconductor Products Inc.
Mu-Del Electronics, Inc.
The Narda Microwave Corporation
National Electrolab Ltd.
RHG Electronics Laboratory, Inc.
Radiation Devices Co., Inc.
Rodelco Corp.
Singer Products Co., Inc.
Television Technology Corp.
Wide Band Engineering Co., Inc.
Wilkinson Electronics, Inc.

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Harris Corp. Broadcast Products Div.
Moseley Associates, Inc.
The Narda Microwave Corporation
RCA Broadcast Systems
RHG Electronics Laboratory, Inc.
Thomson-CSF Laboratories, Inc.

Amplifiers, RF Power

Acrodyne Industries Inc.
Keith Anderson Co.
Anderson Scientific
Belar Electronics Lab., Inc.
Blonder-Tongue Labs.
CCA Electronics Corp.
CSI Electronics, Inc.
Cetec Broadcast Group
Comark Communications Industries, Inc.
Computer Magnetics Corp.
Continental Electronics Mfg. Co.
EEV, Inc.
EIMAC Div. of Varian
EMCEE Broadcast Products
English Electric Valve Co. Ltd.
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Howe-Yin Research Co. Inc.
International Microwave Corp.
Jerrold Electronics Corp.
LPB Inc.
Marconi Communication Systems Ltd.
McMartin Industries, Inc.
Microwave Power Devices, Inc.
Moseley Associates, Inc.
Motorola Semiconductor Products Inc.
Mu-Del Electronics, Inc.
National Electrolab Ltd.
Nurad, Inc.
QEI Corp.
RMC-Radio Mfg. Co.
Rohde & Schwarz Sales Co.
Scientific Radio Systems, Inc.
Singer Products Co., Inc.
Sintronic Corp.
Television Technology Corp.
Townsend Associates, Inc.
Triple Crown Electronics, Inc.
Varian Associates, Inc. Electron Device Group
Wilkinson Electronics, Inc.

Amplifiers, Sensing

Moseley Associates, Inc.
Motorola Semiconductor Products Inc.

Amplifiers, Stabilizing

Grass Valley Group, Inc.
International Nuclear Corp.
Lenco Inc. Electronics Div.
Marconi Electronics Inc. Broadcast & Communication Div.
Telemet A Geotel Co.

Amplifiers, Stereo Booster

CCA Electronics Corp.
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Roger Mayer Electronics, Inc.
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Blonder-Tongue Labs.
Broadcast Video Systems, Ltd.
CCA Electronics Corp.
Canadian General Electric Co., Ltd.
Dage-MTI, Inc.
Datatek Corp.
Delta Electronics Inc. (N.C.)
Dynair Electronics, Inc.
Dynasciences Div. Whittaker Corp.
GBC Closed Circuit TV Corp.
Grass Valley Group, Inc.
Harris Corp. Broadcast Products Div.
Howe-Yin Research Co. Inc.
International Nuclear Corp.
Javelin Electronics
Leitch Video Ltd.
Lenco Inc. Electronics Div.
Link Electronics Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Motorola Semiconductor Products Inc.
RCA Broadcast Systems
Radiation Devices Co., Inc.
Siegel Electronics
Tektronix Inc.
Telemet A Geotel Co.
Texscan Corp.
3M Co. Mincom Div.
Vamco Engineering
Varian Associates, Inc. Electron Device Group

Amplifiers, Video Sweep

Lenco Inc. Electronics Div.
Tektronix Inc.

Amplifiers, Zero Studio Delay

Grass Valley Group, Inc.
Lenco Inc. Electronics Div.

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Bald Mountain Lab
Crown International, Inc.
DYMA Engineering, Inc.
Inovonics
Leader Instruments Corp.
Potomac Instruments, Inc.
Rockland Systems Corp.
The Ken Schaffer Group, Inc.

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Analyzers, Distortion

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Sound Technology 9

Amber Electro Design, Ltd.
B & K Instruments Inc.
Barker and Williamson, Inc.
Broadcast Electronics, Inc.
Crown International, Inc.
DYMA Engineering, Inc.
Frequency Devices Inc.
Harris Corp. Broadcast Products Div.
Heath Co.
Ivie Electronics
Leader Instruments Corp.
Marconi Instruments Div. of Marconi Electronics Inc.
Potomac Instruments, Inc.
Radiometer Elec. U.S. Inc.
Rockland Systems Corp.
Rohde & Schwarz Sales Co.
Sound Technology
TM Systems, Inc.
Tektronix Inc.

Analyzers, Harmonic

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Potomac Instruments, Inc. 126, 137
Sound Technology 9

AILTECH Div. Cutler-Hammer Los Angeles Operation
Amber Electro Design, Ltd.
B & K Instruments Inc.
Barker and Williamson, Inc.
Harris Corp. Broadcast Products Div.
Ivie Electronics
Kay Elemetrics Corp.
Leader Instruments Corp.
Marconi Instruments Div. of Marconi Electronics Inc.
Potomac Instruments, Inc.
Rockland Systems Corp.
Rohde & Schwarz Sales Co.
Sound Technology
Tektronix Inc.

Analyzers, Insertion Signal

Cezar International
Marconi Instruments Div. of Marconi Electronics Inc.
Philips Test & Measuring Instruments, Inc.
Rockland Systems Corp.

Analyzers, Intermodulation

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Potomac Instruments, Inc. 126, 137
Sound Technology 9

Amber Electro Design, Ltd.
B & K Instruments Inc.
Barker and Williamson, Inc.
Crown International, Inc.
Heath Co.
Marconi Instruments Div. of Marconi Electronics Inc.
Potomac Instruments, Inc.
Rockland Systems Corp.
Rohde & Schwarz Sales Co.
Sound Technology
Tektronix Inc.
Triple Crown Electronics, Inc.

Analyzers, Power Line Disturbance

Dranetz Engineering Labs., Inc.

Analyzers, RF Network

AILTECH Div. Cutler-Hammer Los Angeles Operation
Alford Mfg. Co.
Harris Corp. PRD Electronics Div.
Rohde & Schwarz Sales Co.
Scientific-Atlanta, Inc.
Tektronix Inc.
Wide Band Engineering Co., Inc.

Analyzers, Sideband

Kahn Communications, Inc.
Marconi Instruments Div. of Marconi Electronics Inc.
Rockland Systems Corp.
Rohde & Schwarz Sales Co.
Tektronix Inc.
Telemet A Geotel Co.

Analyzers, Spectrum

AILTECH Div. Cutler-Hammer Los Angeles Operation
AVAB America Inc.
Amber Electro Design, Ltd.
Anderson Scientific
B & K Instruments Inc.
Eventide Clock Works Inc.
Harris Corp. Broadcast Products Div.
Ivie Electronics
Kahn Communications, Inc.
Kay Elemetrics Corp.
Marconi Instruments Div. of Marconi Electronics Inc.
QEI Corp.
Rockland Systems Corp.
Rohde & Schwarz Sales Co.
The Ken Schaffer Group, Inc.
Spectrum Instruments, Inc.
Tektronix Inc.
Telemet A Geotel Co.
Texscan Corp.
Track Audio, Inc. (TA)

Analyzers, Video

B & K Precision Dynascan Corp.
Colorado Video Inc.
Imero Fiorentino Associates, Inc.
Harris Corp. Broadcast Products Div.
Lenco Inc. Electronics Div.
Marconi Instruments Div. of Marconi Electronics Inc.
Rohde & Schwarz Sales Co.
Sencore Inc.
Tektronix Inc.
Telemet A Geotel Co.

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Dolphin Productions, Inc.
Echo Science Corp.
Interand Corp. Telestrator Div.
MPB Technologies Inc.
Television Equipment Associates

Antenna Alignment Systems, Microwave

Advance Industries
Gabriel Electronics, Inc.
Innovative Television Equipment, Inc.
Micro Communications, Inc.
Nurad, Inc.
Power-Optics Inc.
Scientific-Atlanta, Inc.
Texscan Corp.
Tri-Ex Tower Corp.
Varian/Beverly Micro-Link Products

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Advance Industries
Aluma Tower Co.
CCA Electronics Corp.
Cetec Broadcast Group
DHV, Inc.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Fred A. Nudd Corp.
Philadelphia Resins Corp.
Singer Products Co., Inc.
Stainless, Inc.
Suda Seisakusho Co., Ltd.
Swager Tower Corp.
Technology For Communications Int'l.
Tri-Ex Tower Corp.
Unarco-Rohn Div. of Unarco Ind., Inc.
Utility Tower Co.

Antenna and Tower Installation and Services

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Advance Industries
CCA Electronics Corp.
Cetec Broadcast Group
Fort Worth Tower Co., Inc.
Gabriel Electronics, Inc.
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Marconi Communication Systems Ltd.
Micro Communications, Inc.
Microflect Co., Inc.
Fred A. Nudd Corp.
Nurad, Inc.
Prodelin Inc.
RCA Broadcast Systems
Soll, Inc.
Stainless, Inc.
Suda Seisakusho Co., Ltd.
Swager Tower Corp.
Technology For Communications Int'l.
Tri-Ex Tower Corp.
Unarco-Rohn Div. of Unarco Ind., Inc.
Utility Tower Co.
V&B Tower Const. Co., Inc. Atlas Tower Mfg.

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Barker and Williamson, Inc.
DHV, Inc.
Dielectric Communications A Unit of General Signal
Electro Impulse, Inc.
Hy-Gain Electronics Div. of Telex Communications Inc.
North Hills Electronics, Inc.
Phelps Dodge Communications Co.
Potomac Instruments, Inc.
Scala Electronic Corp.
Technology For Comrnunications Int'l.
Wilkinson Electronics, Inc.

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Barker and Williamson, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Bird Electronic Corp.
CCA Electronics Corp.
C. S. P. Inc.
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
Electro Impulse, Inc.
Harris Corp. Broadcast Products Div.
Kappa Networks, Inc.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Maury Microwave Corp.
Micro Communications, Inc.
RCA Broadcast Systems
Rex Rheostat & Co., Inc.
Shively Laboratories, Inc.
Wilkinson Electronics, Inc.

Antenna Heater Controls

CCA Electronics Corp.
Cetec Broadcast Group
Micro-Trak Corp.

Antenna Ice Warning Systems

CCA Electronics Corp.
Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
Micro-Trak Corp.
RCA Broadcast Systems

Antenna Remote Indicators

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C. S. P. Inc. 144

CCA Electronics Corp.
C. S. P. Inc.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Nurad, Inc.
Scientific-Atlanta, Inc.

Antenna RF Current Controllers

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CCA Electronics Corp.
C. S. P. Inc.
Delta Electronics Inc. (Va.)
Harris Corp. Broadcast Products Div.

Antenna Sampling Systems

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C. S. P. Inc. 144
Delta Electronics Inc. (Va.) 107

CCA Electronics Corp.
C. S. P. Inc.
Cablewave Systems Inc.
Cetec Broadcast Group
Delta Electronics Inc. (Va.)
Elcom Engineering Co.
Geleco Electronics Ltd.
Harris Corp. Broadcast Products Div.
Moseley Associates, Inc.
Multronics, Inc.

Antenna Systems

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Alford Mfg. Co.
Andrew Corp.
Anixter-Mark
Bogner Broadcast Equipment Corp.
CCA Electronics Corp.
C. S. P. Inc.
Cablewave Systems Inc.
Cetec Broadcast Group
Continental Electronics Mfg. Co.
Delta Electronics Inc. (Va.)
Dielectric Communications A Unit of General Signal
The Finney Co.
G C Electronics Div. Wallace Murray
Gabriel Electronics, Inc.
Geleco Electronics Ltd.
Granger Associates
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Jerrold Electronics Corp.
Marconi Communication Systems Ltd.
Micro Communications, Inc.
Multronics, Inc.
Nurad, Inc.
Phelps Dodge Communications Co.

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Prodelin Inc.
RCA Broadcast Systems
Rohde & Schwarz Sales Co.
Scala Electronic Corp.
Shively Laboratories, Inc.
Singer Products Co., Inc.
Sitco Antenna Co.
Technology For Communications Int'l.

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CCA Electronics Corp.
CSI Electronics, Inc.
C. S. P. Inc.
Cetec Broadcast Group
Collins Div. Rockwell International
DHV, Inc.
Dielectric Communications A Unit of General Signal
G C Electronics Div. Wallace Murray
Geleco Electronics Ltd.
Harris Corp. Broadcast Products Div.
Maury Microwave Corp.
Micro Communications, Inc.
Multronics, Inc.
RCA Broadcast Systems
Texscan Corp.
Wilkinson Electronics, Inc.

Antenna VSWR Indicators

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Bird Electronic Corp.
CCA Electronics Corp.
CSI Electronics, Inc.
Cetec Broadcast Group
Dielectric Communications A Unit of General Signal
DYMA Engineering, Inc.
Harris Corp. Broadcast Products Div.
Micro Communications, Inc.
Moseley Associates, Inc.
Sencore Inc.
Singer Products Co., Inc.
Texscan Corp.

Antennas, Directional System

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CCA Electronics Corp. 74
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Alford Mfg. Co.
Bogner Broadcast Equipment Corp.
CCA Electronics Corp.
CSI Electronics, Inc.
C. S. P. Inc.
Cetec Broadcast Group
Collins Div. Rockwell International
Continental Electronics Mfg. Co.
DHV, Inc.
Dielectric Communications A Unit of General Signal
The Finney Co.
Gabriel Electronics, Inc.
Geleco Electronics Ltd.
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Innovative Television Equipment, Inc.
Micro Communications, Inc.
Multronics, Inc.
Nurad, Inc.
RCA Broadcast Systems
Rohde & Schwarz Sales Co.
Scala Electronic Corp.
Shively Laboratories, Inc.
Singer Products Co., Inc.
Technology For Communications Int'l.

Antennas, Receiving FM

Keith Anderson Co.
Anderson Scientific
Anixter-Mark
Belar Electronics Lab., Inc.
Catel Div. United Scientific Corp.
Communications, Ltd.
The Finney Co.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Johnson Electronics Inc.
McMartin Industries, Inc.
Micro Communications, Inc.
Rohde & Schwarz Sales Co.
Scala Electronic Corp.
Scientific-Atlanta, Inc.
Sitco Antenna Co.

Antennas, Receiving LF

Anixter-Mark
Elcom Engineering Co.
McKay Dymek Co.
Rohde & Schwarz Sales Co.
Technology For Communications Int'l.

Antennas, Receiving MF

Anixter-Mark
Belar Electronics Lab., Inc.
Elcom Engineering Co.
Hy-Gain Electronics Div. of Telex Communications Inc.
McKay Dymek Co.
Rohde & Schwarz Sales Co.
Technology For Communications Int'l.

Antennas, Receiving UHF

Keith Anderson Co.
Anderson Scientific
Anixter-Mark
Blonder-Tongue Labs.
EMCEE Broadcast Products
The Finney Co.
G C Electronics Div. Wallace Murray
Heath Co.
Hy-Gain Electronics Div. of Telex Communications Inc.
Jerrold Electronics Corp.
Micro Communications, Inc.
Nurad, Inc.
Phelps Dodge Communications Co.
Prodelin Inc.
RCA Distributor & Special Products Div.
Rohde & Schwarz Sales Co.
Scala Electronic Corp.
Scientific-Atlanta, Inc.
Singer Products Co., Inc.
Sitco Antenna Co.

Antennas, Receiving VHF

Keith Anderson Co.
Anderson Scientific
Anixter-Mark
Blonder-Tongue Labs.
Communications, Ltd.
EMCEE Broadcast Products
The Finney Co.
G C Electronics Div. Wallace Murray
Heath Co.
Hy-Gain Electronics Div. of Telex Communications Inc.
Jerrold Electronics Corp.
Micro Communications, Inc.
Nurad, Inc.
Phelps Dodge Communications Co.
Prodelin Inc.
RCA Distributor & Special Products Div.
Rohde & Schwarz Sales Co.
Scala Electronic Corp.
Scientific-Atlanta, Inc.
Sitco Antenna Co.

Antennas, Receiving Microwave

Andrew Corp.
Anixter-Mark
Bogner Broadcast Equipment Corp.
Cablewave Systems Inc.
Engineering Associates
Farinon Video
Maury Microwave Corp.
Micro Communications, Inc.
NEC America, Inc. Broadcast Equip. Div.
Nurad, Inc.
Prodelin Inc.
Scientific-Atlanta, Inc.
Singer Products Co., Inc.
TerraCom Loral Corp.

Antennas, Remote Pickup

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CCA Electronics Corp. 74

Andrew Corp.
Anixter-Mark
Belar Electronics Lab., Inc.
CCA Electronics Corp.
Cetec Broadcast Group
Farinon Video
Harris Corp. Broadcast Products Div.
McMartin Industries, Inc.
Micro Communications, Inc.
Moseley Associates, Inc.
Motorola Communications and Electronics Inc.
Nurad, Inc.
Scala Electronic Corp.
Scientific-Atlanta, Inc.

Antennas, Remote Transmitting, Radio

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Anixter-Mark
CCA Electronics Corp.
Cetec Broadcast Group
Dielectric Communications A Unit of General Signal
Farinon Video
Harris Corp. Broadcast Products Div.
Moseley Associates, Inc.
Scala Electronic Corp.
Technology For Communications Int'l.

Antennas, STL

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Andrew Corp.
Anixter-Mark
CCA Electronics Corp.
Cablewave Systems Inc.
Cetec Broadcast Group
Contel Mfg.
Dielectric Communications A Unit of General Signal
Gabriel Electronics, Inc.
Harris Corp. Broadcast Products Div.
Micro Communications, Inc.
Micro Control Associates, Inc.
Moseley Associates, Inc.
Nurad, Inc.
Prodelin Inc.
Scala Electronic Corp.
Singer Products Co., Inc.
Swager Tower Corp.
TerraCom Loral Corp.
Utility Tower Co.

Antennas, Transmitting FM

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CCA Electronics Corp. 74

Alford Mfg. Co.
Keith Anderson Co.
Anderson Scientific
CCA Electronics Corp.
Cetec Broadcast Group
Collins Div. Rockwell International
Comark Communications Industries, Inc.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Marconi Communication Systems Ltd.
McMartin Industries, Inc.
Micro Communications, Inc.
Phelps Dodge Communications Co.
RCA Broadcast Systems
Scala Electronic Corp.
Shively Laboratories, Inc.
Singer Products Co., Inc.

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CCA Electronics Corp.
Comark Communications Industries, Inc.
DHV, Inc.

Antennas, Transmitting LF

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CCA Electronics Corp.
Cetec Broadcast Group
Comark Communications Industries, Inc.
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Marconi Communication Systems Ltd.
Micro Communications, Inc.
Stainless, Inc.

Antennas, Transmitting MF

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CCA Electronics Corp. 74

CCA Electronics Corp.
Cetec Broadcast Group
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
McMartin Industries, Inc.
Shively Laboratories, Inc.

Antennas, Transmitting UHF

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Acrodyne Industries Inc.
Alford Mfg. Co.
Keith Anderson Co.
Anderson Scientific
Andrew Corp.
Anixter-Mark
Bogner Broadcast Equipment Corp.
CCA Electronics Corp.
Canadian General Electric Co., Ltd.
Cetec Broadcast Group
Comark Communications Industries, Inc.
Dielectric Communications A Unit of General Signal
EMCEE Broadcast Products
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Micro Communications, Inc.
Nurad, Inc.
Phelps Dodge Communications Co.
Prodelin Inc.
RCA Broadcast Systems
SWR Inc.
Scala Electronic Corp.
Shively Laboratories, Inc.
Sitco Antenna Co.

Antennas, Transmitting UHF/VHF, Circularly Polarized

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Alford Mfg. Co.
Anderson Scientific
Anixter-Mark
Bogner Broadcast Equipment Corp.
CCA Electronics Corp.

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Cetec Broadcast Group
Comark Communications Industries, Inc.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Nurad, Inc.
RCA Broadcast Systems
SWR Inc.

Antennas, Transmitting VHF

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Acrodyne Industries Inc.
Alford Mfg. Co.
Keith Anderson Co.
Anderson Scientific
Anixter-Mark
Bogner Broadcast Equipment Corp.
CCA Electronics Corp.
Canadian General Electric Co., Ltd.
Cetec Broadcast Group
Comark Communications Industries, Inc.
Dielectric Communications A Unit of General Signal
EMCEE Broadcast Products
The Finney Co.
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Micro Communications, Inc.
Nurad, Inc.
Phelps Dodge Communications Co.
Prodelin Inc.
RCA Broadcast Systems
Scala Electronic Corp.
Shively Laboratories, Inc.
Singer Products Co., Inc.
Sitco Antenna Co.

Antennas, Transmitting Microwave

Andrew Corp.
Anixter-Mark
Bogner Broadcast Equipment Corp.
Cablewave Systems Inc.
Farinon Video
Harris Corp. Broadcast Products Div.
Marconi Communication Systems Ltd.
Micro Communications, Inc.
Micro Control Associates, Inc.
Nurad, Inc.
Prodelin Inc.
Rohde & Schwarz Sales Co.
Scientific-Atlanta, Inc.
Singer Products Co., Inc.
TerraCom Loral Corp.
Tri-Ex Tower Corp.

Antennas, TV Earth Station

Anderson Scientific
Anixter-Mark
Collins Div. Rockwell International
Farinon Video
Fort Worth Tower Co., Inc.
Gardiner Communications Corp.
Harris Corp. Broadcast Products Div.
Hughes Aircraft Co. Microwave Communications Products
Marconi Communication Systems Ltd.
Microdyne Corp.
Nurad, Inc.
Prodelin Inc.
Scientific-Atlanta, Inc.
Tri-Ex Tower Corp.

Arms, Tone

Audio-Technica U.S., Inc.
Broadcast Electronics, Inc.
Cetec Broadcast Group
EMT Franz VGmbH
Harris Corp. Broadcast Products Div.
LPB Inc.
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Osawa & Co. (USA), Inc.
QRK Electronic Products
Russco Electronics Mfg. Inc.
Shure Brothers Inc.
Singer Products Co., Inc.
Stanton Magnetics Inc.

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AKG Acoustics Div. Philips Audio Video Systems
Allen Avionics
Altec Lansing Sound Products
Audio Designs & Mfg.
Auditronics, Inc.
Automated Processes, Inc.
Barker and Williamson, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Cetec Broadcast Group
Duncan Electronics, Inc.
DYMA Engineering, Inc.
Gerard Tech
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
ITI Electronics, Inc.
Kay Elemetrics Corp.
Kings Electronics Co., Inc.
Leader Instruments Corp.
Marconi Instruments Div. of Marconi Electronics Inc.
Orange County Electronics Int'l., Inc.
Potomac Instruments, Inc.
Protech Audio Corp.
ROH Corporation
Richmond Sound Design, Ltd.
Rohde & Schwarz Sales Co.
Sescom, Inc.
Shallco, Inc.
Spectra Sonics
Tech Laboratories Inc.
Texscan Corp.
Vidaire Electronics Mfg.
Waters Mfg. Inc.
Weinschel Engineering Co.

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CCA Electronics Corp.
Cetec Broadcast Group
Dielectric Communications A Unit of General Signal
Electro Impulse, Inc.
The Finney Co.
Gerard Tech
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Holland Electronics
ITI Electronics, Inc.
Kay Elemetrics Corp.
Kings Electronics Co., Inc.
Maury Microwave Corp.
Merill Cable Equipment Corp.
Mu-Del Electronics, Inc.
The Narda Microwave Corporation
Rohde & Schwarz Sales Co.
Shallco, Inc.
Tech Laboratories Inc.
Tektronix Inc.
Texscan Corp.
Trompeter Electronics
Waters Mfg. Inc.
Weinschel Engineering Co.

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Electro Impulse, Inc.
Gerard Tech
Harris Corp. Broadcast Products Div.
Kay Elemetrics Corp.
Maury Microwave Corp.
Merill Cable Equipment Corp.
Mu-Del Electronics, Inc.
The Narda Microwave Corporation
Rohde & Schwarz Sales Co.
Shallco, Inc.
Tech Laboratories Inc.
Tektronix Inc.
Texscan Corp.
Waters Mfg. Inc.
Weinschel Engineering Co.

Attenuators, Microwave

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COMPAC
Dielectric Communications A Unit of General Signal
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Harris Corp. PRD Electronics Div.
Kay Elemetrics Corp.
Kings Electronics Co., Inc.
Maury Microwave Corp.
Mu-Del Electronics, Inc.
The Narda Microwave Corporation
Rohde & Schwarz Sales Co.
Systron-Donner
Tech Laboratories Inc.
Tektronix Inc.
Texscan Corp.
Varian Associates, Inc. Electron Device Group
Weinschel Engineering Co.

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AVA Electronics
Anderson Scientific
Bird Electronic Corp.
COMPAC
Dielectric Communications A Unit of General Signal
Electro Impulse, Inc.
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Holland Electronics
Jerrold Electronics Corp.
Kahn Communications, Inc.
Kay Elemetrics Corp.
Kings Electronics Co., Inc.
Marconi Instruments Div. of Marconi Electronics Inc.
Merill Cable Equipment Corp.
Micro Communications, Inc.
Mu-Del Electronics, Inc.
Oak Industries, Inc.
RHG Electronics Laboratory, Inc.
Rohde & Schwarz Sales Co.
Shallco, Inc.
Systron-Donner
Tech Laboratories Inc.
Tektronix Inc.
Texscan Corp.
Triple Crown Electronics, Inc.
Vidaire Electronics Mfg.
Weinschel Engineering Co.

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Dolby Laboratories, Inc.
Orban Assoc. Inc.

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Computer Magnetics Corp.
International Electro-Magnetics
Merlin Engineering Works, Inc.
Minneapolis Magnetics
Taber Mfg. & Engr. Co.
Videomax Div. Orrox Corp.

Automated Transmission Systems (ATS)

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CCA Electronics Corp.
C. S. P. Inc.
Cetec Broadcast Group
Delta Electronics Inc. (Va.)
DYMA Engineering, Inc.
Harris Corp. Broadcast Products Div.
Moseley Associates, Inc.
PWH Electronics
Potomac Instruments, Inc.
QEI Corp.
Sharepoint Systems Inc.
Time & Frequency Tech., Inc.

Automation, Data Processing

Automation Electronics, Inc. Autotron Systems, Div.
Bic Computers
Boston Sound & Power Systems
Central Dynamics Corp.
Columbine Systems, Inc.
Computer Business Systems, Inc.
Computer Management Systems, Inc.
Cox Data Services Suite 100/Prado North
Groton Computer Inc.
Harris Corp. Broadcast Products Div.
Kaman Sciences Corp.
Marconi Communication Systems Ltd.
Moseley Associates, Inc.
PWH Electronics
Quad-Eight Electronics
Sono-Mag Corp.
Vital Industries Inc.

Automation, Equipment Control, Radio

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Autogram Corp.
Automated Broadcast Controls
The BTX Corp.
Boston Sound & Power Systems
Broadcast Electronics, Inc.

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Cetec Broadcast Group
Computer Business Systems, Inc.
Consolidated Electronic Industries
Elcom Engineering Co.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
International Communications & Control Corp.
Moseley Associates, Inc.
PWH Electronics
Sharepoint Systems Inc.
Sono-Mag Corp.
Tape-Athon Corp.

Automation, Equipment Control, TV

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Vital Industries Inc. ..... BC

American Data Corp. A North American Philips Co.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Dytek Industries, Inc.
Grass Valley Group, Inc.
Harris Corp. Broadcast Products Div.
Holland Electronics
IGM Div. of Northwestern Tech.
International Communications & Control Corp.
Kaitronics Corp.
Magna-Tech Electronic Co., Inc.
Marconi Communication Systems Ltd.
Microtime, Inc.
Moseley Associates, Inc.
PWH Electronics
RCA Broadcast Systems
Sono-Mag Corp.
Studer Revox America
Time & Frequency Tech., Inc.
Video Specialties
Videomedia
Vital Industries Inc.

Automation, Lighting Control

Berkey-Colortran Inc.
Electro Controls
Kliegl Bros. Lighting
Skirpan Lighting Control Corp.
Strand Century, Inc.
Technamics Co.
Theatre Techniques Inc.

Automation, Program Control

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American Data Corp. A North American Philips Co.
Automated Broadcast Controls
Broadcast Electronics, Inc.
Central Dynamics Corp.
Cetec Broadcast Group
Consolidated Electronic Industries
Datatron, Inc.
Dytek Industries, Inc.
Grass Valley Group, Inc.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Kaitronics Corp.
Kaman Sciences Corp.
Marconi Communication Systems Ltd.
Microprobe Electronics
Microtime, Inc.
Rupert Neve, Inc.
PWH Electronics
Quad-Eight Electronics
Sono-Mag Corp.
Tape-Athon Corp.
Technamics Co.
Tektronix Inc.
Telex Communications, Inc.
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Ward-Beck Systems, Ltd.

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Broadcast Electronics, Inc.
Central Dynamics Corp.
Cetec Broadcast Group
Consolidated Electronic Industries
Datatron, Inc.
Grass Valley Group, Inc.
Groton Computer Inc.
Hallikainen & Friends, Inc.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Microtime, Inc.
PWH Electronics
Panasonic Company
QSI Systems, Inc.
Sono-Mag Corp.
Studer Revox America
Telex Communications, Inc.
Time & Frequency Tech., Inc.
Vital Industries Inc.

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Marconi Electronics Inc. Broadcast & Communication Div.
Spindler & Sauppe, Inc.
Technamics Co.

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Adcom Communications Inc.
American Data Corp. A North American Philips Co.
Automated Broadcast Controls
Bias/Data Communications Corp.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Cetec Broadcast Group
ComTec Video Systems Mincom Div. 3M
Consolidated Electronic Industries
Data Communications Corp.
Dytek Industries, Inc.
Grass Valley Group, Inc.
IGM Div. of Northwestern Tech.
Image Video Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Microprobe Electronics
Microtime, Inc.
Panasonic Company
Richmond Sound Design, Ltd.
Sono-Mag Corp.
Technamics Co.
Vital Industries Inc.

Automation Systems, Business

Automation Electronics, Inc. Autotron Systems, Div.
Bias/Data Communications Corp.
Bic Computers
Bloomington Broadcasting
Boston Sound & Power Systems
Columbine Systems, Inc.
Computer Business Systems, Inc.
Computer Management Systems, Inc.
Groton Computer Inc.
PWH Electronics
Station Business Systems Div. Control Data Corp.

Automation, Tape Control, Cartridge

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Autogram Corp.
Automated Broadcast Controls
Broadcast Electronics, Inc.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Cetec Broadcast Group
Consolidated Electronic Industries
Delta Electronics Inc. (N.C.)
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Microprobe Electronics
RCA Broadcast Systems
Sharepoint Systems Inc.
Singer Products Co., Inc.
Sono-Mag Corp.
Tape-Athon Corp.
Telex Communications, Inc.
UMC Electronics Co. Broadcast Products Div.

Automation, Tape Control, Reel

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Aitken Communications Inc.
Autogram Corp.
Automated Broadcast Controls
The BTX Corp.
Broadcast Electronics, Inc.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Microprobe Electronics
Otari Corp.
RCA Broadcast Systems
Sharepoint Systems Inc.
Singer Products Co., Inc.
Sono-Mag Corp.
Studer Revox America
Tape-Athon Corp.
Telex Communications, Inc.

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CCA Electronics Corp.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Marconi Instruments Div. of Marconi Electronics Inc.
Moseley Associates, Inc.
PWH Electronics
Sharepoint Systems Inc.
Soll, Inc.
Sono-Mag Corp.
Time & Frequency Tech., Inc.

Automation, Video Display Terminals

Automation Electronics, Inc. Autotron Systems, Div.
Data Communications Corp.
Sharepoint Systems Inc.
Soll, Inc.
Teknekron/ARG
Time & Frequency Tech., Inc.

Automation, Videotape Machine

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Automation Techniques, Inc.
The BTX Corp.
Bosch-Fernseh Corp.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Channelmatic, Inc.
Kaitronics Corp.
Media Concepts, Inc.
Merlin Engineering Works, Inc.
Microtime, Inc.
Phasecom Corp.
RCA Broadcast Systems
Videomedia

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Anton/Bauer Inc.
Christie Electric Corp.
Cine 60, Inc.
Cinema Products Corp.
Frezzolini Electronics, Inc.
Alan Gordon Enterprises Inc.
Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
KAPCO Communications
Leedal, Inc.
Mole-Richardson Co.
Multiplier Industries Corp.
Nagra Magnetic Recorders, Inc.
North Wind Power Co.
Panasonic Company
Panasonic Co. Video Systems Div.
Sencore Inc.
Sony Corp. of America
Television Products Co. Inc.
Yardney Electric Corp.

Blowers and Fans

Amco Engineering Co.
Bud Industries, Inc.
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C. S. P. Inc.
Delta Electronics Inc. (Va.)
Harris Corp. Broadcast Products Div.
Potomac Instruments, Inc.

Buzz Tone Eliminators, Videotape Edit

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DYMA Engineering, Inc.
Harris Corp. Broadcast Products Div.
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Micro-Trak Corp.
Wallach & Associates Inc.
Winsted Corp.

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Automated Broadcast Controls
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Broadcast Electronics, Inc.
Bud Industries, Inc.
Cases Inc.
Cetec Broadcast Group
DYMA Engineering, Inc.
Emcor Products GF Business Equipment, Inc.
Enclosure Corp.
Equipto Storage Systems
Harris Corp. Broadcast Products Div.
Javelin Electronics
Laird Telemedia Inc.
MacKenzie Laboratories, Inc.
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Nurad, Inc.
Paso Sound Products Inc.
Plastic Reel Corp. of America
Quad-Eight Electronics
Research Technology, Inc.
Ruslang Corp.
Scientific-Atlanta, Inc.
Shintron Co. Inc.
Stantron Div. Wyco Metal Products
Storeel Corp.
Tektronix Inc.
Vector Electronic Co., Inc.
Winsted Corp.

Cabinets, Equipment, Custom

Advance Products Co.
Anvil Cases, Inc.
Audicon, Inc.
Bretford Mfg. Co.
C. S. P. Inc.
Centro Corp.
DYMA Engineering, Inc.
Emcor Products GF Business Equipment, Inc.
Kreonite, Inc.
Leedal, Inc.
Micro-Trak Corp.
Parsons Mfg. Corp.
Ruslang Corp.
Sound Dynamics, Inc.

Cable, Camera

Belden Corp.
Bosch-Fernseh Corp.
Boston Insulated Wire & Cable Co.
Brand-Rex Co.
Comprehensive Video Supply Corp.
GBC Closed Circuit TV Corp.
Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
Javelin Electronics
Marshall Electronics
Panasonic Co. Video Systems Div.
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Times Wire and Cable
WIDL Video

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Andrew Corp.
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Belden Corp.
Blonder-Tongue Labs.
Boston Insulated Wire & Cable Co.
Brand-Rex Co.
CCA Electronics Corp.
CCS Hatfield Communications Products
COMPAC
C. S. P. Inc.
Cablewave Systems Inc.
Cetec Broadcast Group
Comm/Scope Co.
Comprehensive Video Supply Corp.
EMT Franz VGmbH
The Finney Co.
GBC Closed Circuit TV Corp.
G C Electronics Div. Wallace Murray
Gabriel Electronics, Inc.
General Cable Corp.
Javelin Electronics
Marshall Electronics
Maury Microwave Corp.
Media Concepts, Inc.
Micro Communications, Inc.
Micro Control Associates, Inc.
Nagra Magnetic Recorders, Inc.
Neutrik
Nurad, Inc.
Phelps Dodge Communications Co.
Prodelin Inc.
SWR Inc.
Singer Products Co., Inc.
Times Fiber Communications, Inc.
Times Wire and Cable
Trompeter Electronics
WIDL Video
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General Cable Corp.
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Rank Precision Industries, Inc. (N.Y.)
Telemet A Geotel Co.
Times Fiber Communications, Inc.
Times Wire and Cable

Cable Laying Equipment

J I Case Davis Div.
Ditch Witch Div. of Charles Machine Works Inc.
Roll-A-Reel
Suda Seisakusho Co., Ltd.

Cable Locators, Underground

Aqua-Tronics, Inc.
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Alford Mfg. Co.
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Bird Electronic Corp.
Commercial Radio Monitoring Co., Inc.
National Electrolab Ltd.
Photo Research Div. of Kollmorgen Corp.
Potomac Instruments, Inc.
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Camera Carrying Stabilizers, Operator Vest Mount

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GBC Closed Circuit TV Corp.
Gruber Products Co.
Harris Corp. Broadcast Products Div.
Javelin Electronics
K & H Products, Ltd.
Lee-Ray Industries, Inc.
Sony Corp. of America
US JVC Corp. Professional Video Div.

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Comprehensive Video Supply Corp.
Davis & Sanford Co. Inc.
GBC Closed Circuit TV Corp.
Alan Gordon Enterprises Inc.
Gruber Products Co.
Harris Corp. Broadcast Products Div.
Innovative Television Equipment, Inc.
Javelin Electronics
K & H Products, Ltd.
Lee-Ray Industries, Inc.
Miller Professional Equipment, Inc.
O'Connor Eng. Labs. Inc.
Panasonic Company
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SGL Waber Electric
Television Products Co. Inc.

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Davis & Sanford Co. Inc.
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Ikegami Electronics (USA) Inc.
Innovative Television Equipment, Inc.
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Miller Professional Equipment, Inc.
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GBC Closed Circuit TV Corp.
Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Ikegami Electronics (USA) Inc.
Innovative Television Equipment, Inc.
Javelin Electronics
Marconi Communication Systems Ltd.
Panasonic Company
Philips Broadcast Equip Corp.
Power-Optics Inc.
Quick-Set Inc.
Swickegami Div. Of Spectrum Video
Tele-Cine Inc.
Telemation, A Div. of Bell & Howell
Times Fiber Communications, Inc.

Cameras, Film Chain

Bosch-Fernseh Corp.
CMX Systems & Videomax Div's. of Orrox Corp.
Cohu, Inc. Electronics Div.
Commercial Electronics, Inc.
GBC Closed Circuit TV Corp.
Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Ikegami Electronics (USA) Inc.
Marconi Communication Systems Ltd.
Philips Broadcast Equip Corp.
RCA Broadcast Systems
Sharp Electronics Corp.
Telemation, A Div. of Bell & Howell

Cameras, Film Cine

Arriflex Corp.
Canon USA, Inc. Optics Div.
Cinema Products Corp.
Eastman Kodak Co.
Frezzolini Electronics, Inc.
Alan Gordon Enterprises Inc.
Harris Corp. Broadcast Products Div.
Super 8 Sound, Inc.

Cameras, Film Still

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Durst US-Sickles Inc.
Eastman Kodak Co.

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Ikegami Electronics (USA) Inc.
International Video Corp.
Link Electronics Ltd.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
NEC America, Inc. Broadcast Equip. Div.
Panasonic Company
Panasonic Co. Video Systems Div.
Philips Broadcast Equip Corp.
RCA Broadcast Systems
Sony Corp. of America
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Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Ikegami Electronics (USA) Inc.
International Video Corp.
Link Electronics Ltd.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Media Concepts, Inc.
NEC America, Inc. Broadcast Equip. Div.
Panasonic Company
Panasonic Co. Video Systems Div.
Philips Broadcast Equip Corp.
RCA Broadcast Systems
Sharp Electronics Corp.
Sony Corp. of America
Thomson-CSF Laboratories, Inc.
Toshiba Int'l. Corp. Broadcast Electronic Systems
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CCA Electronics Corp.
C. S. P. Inc.
Cetec Broadcast Group
Comet Sales
EEV, Inc.
EEV Canada Ltd.
English Electric Valve Co. Ltd.
Harris Corp. Broadcast Products Div.
ITT Jennings
KD Components, Inc.
T T E, Inc.

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Broadcast Electronics, Inc.
Cetec Broadcast Group
Fidelipac
Harris Corp. Broadcast Products Div.
Nortronics Co., Inc. Recorder Care Div.
Taber Mfg. & Engr. Co.

Cartridge Machine Rebuilding Services

Broadcast Electronics, Inc.
Cetec Broadcast Group

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International Tapetronics Corp.
MacKenzie Laboratories, Inc.
McCurdy Radio Ind. Inc.
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RCA Broadcast Systems
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IGM Div. of Northwestern Tech.
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International Tapetronics Corp.
MacKenzie Laboratories, Inc.
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Novadyne Inc.
Pacific Recorders and Engrg. Corp.
Panasonic Company
RCA Broadcast Systems
Ramko Research Inc.
Singer Products Co., Inc.
Sono-Mag Corp.
Telex Communications, Inc.
Track Audio, Inc. (TA)
UMC Electronics Co. Broadcast Products Div.

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Ampro Broadcasting
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Broadcast Electronics, Inc.
Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
International Tapetronics Corp.
Micro-Trak Corp.
Pacific Recorders and Engrg. Corp.
RCA Broadcast Systems
Ramko Research Inc.
Singer Products Co., Inc.
Telex Communications, Inc.
Track Audio, Inc. (TA)
UMC Electronics Co. Broadcast Products Div.

Cartridge Reconditioning Services

Broadcast Electronics, Inc.
Harris Corp. Broadcast Products Div.

Cartridge Recording Services

CaVox Stereo Productions
Media Concepts, Inc.
Tape-Athon Corp.

Cartridge Reloading Services, Audio

Aristocart Div. Western Broadcasting, Ltd.
Audico, Ltd.
Broadcast Electronics, Inc.
CaVox Stereo Productions

Cartridge Reloading Services, Video

Audico, Ltd.

Cartridge Splice Finder

Ampro Broadcasting
Broadcast Electronics, Inc.
Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
International Tapetronics Corp.
RCA Broadcast Systems
UMC Electronics Co. Broadcast Products Div.

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Audico, Ltd.
Audio Magnetics Corp.
BSC Inc.
Broadcast Electronics, Inc.
Capitol Magnetic Products
Cetec Broadcast Group
Consolidated Electronic Industries
Contel Mfg.
Fidelipac
Fuji Photo Film USA, Inc. Magnetic Tape Div.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
MacKenzie Laboratories, Inc.
Maxell Corp. of America
Memorex Corp. Professional Products Group
Novadyne Inc.
Singer Products Co., Inc.
Sono-Mag Corp.
Telex Communications, Inc.
3M Co. Magnetic Audio/Video Prod. Div.
UMC Electronics Co. Broadcast Products Div.

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Broadcast Electronics, Inc.
Cetec Broadcast Group
EMT Franz VGmbH
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Neutrik
Osawa & Co. (USA), Inc.
QRK Electronic Products
Shure Brothers Inc.
Singer Products Co., Inc.
Stanton Magnetics Inc.

Cartridges, Stereo

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Audio-Technica U.S., Inc.
Broadcast Electronics, Inc.

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Cetec Broadcast Group
Fidelipac
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Micro-Trak Corp.
QRK Electronic Products
Shure Brothers Inc.
Sono-Mag Corp.
Stanton Magnetics Inc.
Telex Communications, Inc.
UMC Electronics Co. Broadcast Products Div.

Cartridges, Videotape

Ampex Corp.
Audico, Ltd.
Cinema Products Corp.
Fuji Photo Film USA, Inc. Magnetic Tape Div.
Maxell Corp. of America
Memorex Corp. Professional Products Group
Panasonic Co. Video Systems Div.
RCA Broadcast Systems
Recortec Inc.
Sony Corp. of America
3M Co. Magnetic Audio/Video Prod. Div.

Cases, Film and Tape, Carrying and Shipping

Amaray Int'l. Corp.
Anvil Cases, Inc.
Cases Inc.
Lowenthal Mfg.
Maxell Corp. of America
Neumade Products Corp.
Parsons Mfg. Corp.
Plastic Reel Corp. of America
Reliance Plastics & Packaging Div.
Research Technology, Inc.
Schuessler Case Co., Inc.
Star Case Mfg. Co. Inc.
Thermodyne International Ltd.
3M Co. Magnetic Audio/Video Prod. Div.
Univex International
Vulcan Binder & Cover
WIDL Video

Cases, Video Equipment Transit

Anvil Cases, Inc.
Cases Inc.
Comprehensive Video Supply Corp.
Ikelheimer-Ernst, Inc. Fiberbilt Photo Products
Multiplier Industries Corp.
Panasonic Co. Video Systems Div.
Parsons Mfg. Corp.
Reliance Plastics & Packaging Div.
Star Case Mfg. Co. Inc.
Thermodyne International Ltd.

Cassette Duplication Machines

Audico, Ltd.
International Audio, Inc.
Ray Jacobs Audio, Inc.
Magnefax, Inc.
Panasonic Company
Pentagon Industries, Inc.
Singer Products Co., Inc.
Sony Corp. of America
Telectro Systems Corp.
Telex Communications, Inc.

Cassette Machines, Dual Deck

Automation Techniques, Inc.
Cetec Audio
Edco Products, Inc.
Telectro Systems Corp.

Cassette Machines, Multiple Deck

Automation Techniques, Inc.
Edco Products, Inc.
Telectro Systems Corp.

Cassette Machines, Random Access

Amilon Corp.
Ampex Corp.
Automation Techniques, Inc.
Eumig USA, Inc.
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Chyron Telesystems
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EEG Enterprises, Inc.
Gray Engineering Labs
Harris Corp. Broadcast Products Div.
Interand Corp. Telestrator Div.
International Communications & Control Corp.
Kaitronics Corp.
Knox Video Products
Laird Telemedia Inc.
MPB Technologies Inc.
MSI Television
Motorola Semiconductor Products Inc.
Panasonic Company
Portac Inc.
QSI Systems, Inc.
SPI-ITT Metrix Instruments Div.
Shintron Co. Inc.
System Concepts Inc.
Tektronix Inc.
Telemation, A Div. of Bell & Howell
Thomson-CSF Laboratories, Inc.
3M Co. Mincom Div.
Time Tech Corp.
Unitel
Video Data Systems
Video Devices Co.
Weathermation, Inc.

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MSI Television
Unitel
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Tektronix Inc.
Townsend Associates, Inc.

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Marconi Communication Systems Ltd.
NEC America, Inc. Broadcast Equip. Div.
Power-Optics Inc.

Chroma Keyer-Decoders

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International Nuclear Corp.
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RCA Broadcast Systems
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Telemet A Geotel Co.
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Packaged Lighting Systems
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Fidelipac
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N.O.V.A. Corp.
Nortronics Co., Inc. Recorder Care Div.
Pentagon Industries, Inc.
RMC-Radio Mfg. Co.
Sono-Mag Corp.
Studer Revox America
TEAC Corp of America
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Heath Co.
Leitch Video Ltd.
Singer Products Co., Inc.
Sono-Mag Corp.
Soundscriber Magnetic Recording Co., Inc.
Telectro Systems Corp.
Torpey Controls & Engineering Ltd.
Vamco Engineering

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Boston Sound & Power Systems
Broadcast Aids, Inc.
Broadcast Electronics, Inc.
Cetec Broadcast Group
Channelmatic, Inc.
Datametrics Inc.
Datatron, Inc.
EECO Inc.
ESE
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Harris Corp. Broadcast Products Div.
Heath Co.
Kaitronics Corp.
Leitch Video Ltd.
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Motorola Semiconductor Products Inc.
Nationwide Electronic Systems, Inc.
OPCOA
PWH Electronics
Pacific Recorders and Engrg. Corp.
QRK Electronic Products
QSI Systems, Inc.
RMC-Radio Mfg. Co.
Ramko Research Inc.
Singer Products Co., Inc.
Systron-Donner
Telectro Systems Corp.
Torpey Controls & Engineering Ltd.
Vamco Engineering
Video Devices Co.

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Channelmatic, Inc.
Datametrics Inc.
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Harris Corp. Broadcast Products Div.
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Nationwide Electronic Systems, Inc.
PWH Electronics
QSI Systems, Inc.
RMC-Radio Mfg. Co.
Singer Products Co., Inc.
Sono-Mag Corp.
Torpey Controls & Engineering Ltd.
Video Devices Co.

Collimeters

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Color Correction Equipment

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Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Microtime, Inc.
Photo Research Div. of Kollmorgen Corp.
Power-Optics Inc.
Siegel Electronics
Tektronix Inc.
Telemation, A Div. of Bell & Howell
Television Equipment Associates
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Comark Industries Inc.
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Harris Corp. Broadcast Products Div.
Micro Communications, Inc.
Mu-Del Electronics, Inc.
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North Hills Electronics, Inc.
Shively Laboratories, Inc.

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Bayly Engineering Ltd. Member of AEG-Telefunken Group
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DYMA Engineering, Inc.
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Harris Corp. Broadcast Products Div.
International Microwave Corp.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Motorola Communications and Electronics Inc.
Motorola Communications and Electronics Inc.
Multiplier Industries Corp.
Panasonic Company
Paso Sound Products Inc.
Phelps Dodge Communications Co.
RCA Broadcast Systems
Singer Products Co., Inc.
Superex Electronics Corp.
Tri-Ex Tower Corp.

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Anderson Scientific
Atlantic Research Corp.
Avantek, Inc.
CCA Electronics Corp.
Cablewave Systems Inc.
California Microwave
Coastcom
Collins Div. Rockwell International
Comark Industries Inc.
Comsearch, Inc.
DYMA Engineering, Inc.
GTE Lenkurt, Inc.
Gabriel Electronics, Inc.
Granger Associates
Harris Corp. Broadcast Products Div.
Hughes Aircraft Co. Microwave Communications Products
Ikegami Electronics (USA) Inc.
International Microwave Corp.
Marconi Communication Systems Ltd.
Micro Control Associates, Inc.
Microflect Co., Inc.
Moseley Associates, Inc.
Motorola Communications and Electronics Inc.
Motorola Communications and Electronics Inc.
NEC America, Inc. Broadcast Equip. Div.
Nurad, Inc.
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Singer Products Co., Inc.
Tepco Corp.
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IGM Div. of Northwestern Tech.
International Microwave Corp.
Kaitronics Corp.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Moseley Associates, Inc.
Motorola Communications and Electronics Inc.
The Ken Schaffer Group, Inc.
Singer Products Co., Inc.
Telegen/Sofratev
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Times Fiber Communications, Inc.

Communication Systems, STL

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CCA Electronics Corp.
Cablewave Systems Inc.
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Micro Communications, Inc.
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Sono-Mag Corp.
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Image Video Ltd.
Industrial Sciences, Inc. (ISI)
International Nuclear Corp.
J&D International, Elec. Div. Unit E-East
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Crosspoint Latch Corp.
Dage-MTI, Inc.
DYMA Engineering, Inc.
Dytek Industries, Inc.
GBC Closed Circuit TV Corp.
Glentronix Ltd.
Grass Valley Group, Inc.
Ikegami Electronics (USA) Inc.
Image Video Ltd.
Industrial Sciences, Inc. (ISI)
International Nuclear Corp.
J&D International, Elec. Div. Unit E-East
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Digital Video Systems
Micro Consultants
Motorola Semiconductor Products Inc.
Tektronix Inc.

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AILTECH Div. Cutler-Hammer Los Angeles Operation
California Instruments
California Microwave
Catel Div. United Scientific Corp.
The Finney Co.
Marconi Electronics Inc. Broadcast & Communication Div.
Motorola Semiconductor Products Inc.
Mu-Del Electronics, Inc.
North Hills Electronics, Inc.
Oak Industries, Inc.
Philips Test & Measuring Instruments, Inc.
RHG Electronics Laboratory, Inc.
Telemet A Geotel Co.
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Hickok Elec. Inst. Co.
Kaitronics Corp.
Laird Telemedia Inc.
Lectrotech Inc.
Logitek Electronic Systems, Inc.
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Nationwide Electronic Systems, Inc.
PWH Electronics
Pacific Recorders and Engrg. Corp.
Philips Test & Measuring Instruments, Inc.
QRK Electronic Products
QSI Systems, Inc.
Ramko Research Inc.
Sharepoint Systems Inc.
Systron-Donner
Tektronix Inc.
Track Audio, Inc. (TA)
United Systems Corp.
Vamco Engineering

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B & K Precision Dynascan Corp.
Continental Specialties Corp.
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EIP Microwave
Elcom Engineering Co.
John Fluke Mfg. Co., Inc.
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Telecommunications Technology
United Systems Corp.

Couplers, Hybrid

Comark Industries Inc.
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Micro Communications, Inc.
Monroe Electronics, Inc.
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Logitek Electronic Systems, Inc.
Monroe Electronics, Inc.
Time & Frequency Tech., Inc.

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Ampro Broadcasting
Broadcast Electronics, Inc.
Cetec Broadcast Group
Fidelipac
International Tapetronics Corp.
Wang Voice Comm. Inc.

Delay Lines

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Allen Avionics
Amperex Electronic Corp. Slatersville Div.
Anders, Inc.
Audio & Design Recording Inc.
Broadcast Video Systems, Ltd.
Cablewave Systems Inc.
Central Dynamics Corp.
Corning Glass Works
Dielectric Communications A Unit of General Signal
EMT Franz VGmbH
ESC Electronics Corp.
Eventide Clock Works Inc.
Gotham Audio Corp.
Kappa Networks, Inc.
Leitch Video Ltd.
Marconi Communication Systems Ltd.
Maury Microwave Corp.
Microtime, Inc.
Neutrik
Pacific Recorders and Engrg. Corp.
Phelps Dodge Communications Co.
The Ken Schaffer Group, Inc.
Tektronix Inc.
Television Equipment Associates
Times Wire and Cable
United Recording Electronics Industries
Wang Voice Comm. Inc.

Delay Lines, Audio, Digital

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Wang Voice Comm. Inc. 50

Altec Lansing Sound Products
Audio & Design Recording Inc.
Eventide Clock Works Inc.
Kappa Networks, Inc.
Pacific Recorders and Engrg. Corp.
Quad-Eight Electronics
The Ken Schaffer Group, Inc.
URSA Major, Inc.
United Recording Electronics Industries
Wang Voice Comm. Inc.

Delay Measuring Sets, Envelope

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Asaca Corp. of America
Datatek Corp.
Dranetz Engineering Labs., Inc.
Ivie Electronics
Rohde & Schwarz Sales Co.
Tektronix Inc.
Telemet A Geotel Co.
Television Equipment Associates

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Allen Avionics
Anders, Inc.
Broadcast Video Systems, Ltd.
Central Dynamics Corp.
Corning Glass Works
ESC Electronics Corp.
Kappa Networks, Inc.
Leitch Video Ltd.
Lenco Inc. Electronics Div.
Microtime, Inc.
Telemation, A Div. of Bell & Howell
Television Equipment Associates

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Audico, Ltd.
Broadcast Electronics, Inc.
Cetec Broadcast Group
Fidelipac
G C Electronics Div. Wallace Murray
Garner Industries
Glentronix Ltd.
Harris Corp. Broadcast Products Div.
International Tapetronics Corp.
Magnasync/Moviola Corp.
Magnesonics Mfg. & Sales Co.
Microtran Co., Inc.
Nortronics Co., Inc. Recorder Care Div.
Pentagon Industries, Inc.
Sonar Radio Corp.
Soundscriber Magnetic Recording Co., Inc.
TEAC Corp of America
Taber Mfg. & Engr. Co.
UMC Electronics Co. Broadcast Products Div.
Wide Range Electronics

Demagnetizers, Limited Area Tape and Film

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R. B. Annis, Co.
Magnefax, Inc.
Magnesonics Mfg. & Sales Co.
Pentagon Industries, Inc.
Soundscriber Magnetic Recording Co., Inc.
Wide Range Electronics

Demodulators, Optical

Crosspoint Latch Corp.
Radiation Devices Co., Inc.
Telemet A Geotel Co.
Times Fiber Communications, Inc.

Demodulators, Video

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Dynair Electronics, Inc. 165

Anderson Scientific
Blonder-Tongue Labs.
Catel Div. United Scientific Corp.
Coastcom
Comark Industries Inc.
Dynair Electronics, Inc.
Electro & Optical Systems Ltd.
Glentronix Ltd.
Harris Corp. Broadcast Products Div.
Javelin Electronics
Jerrold Electronics Corp.
Kahn Communications, Inc.
Marconi Instruments Div. of Marconi Electronics Inc.
Phasecom Corp.
Philips Test & Measuring Instruments, Inc.
QSI Systems, Inc.
Rohde & Schwarz Sales Co.
Scientific-Atlanta, Inc.
Tektronix Inc.
Telemet A Geotel Co.
Times Fiber Communications, Inc.
Townsend Associates, Inc.
Videotek, Inc.

Detectors, Microwave

AILTECH Div. Cutler-Hammer Los Angeles Operation
Alford Mfg. Co.
Dielectric Communications A Unit of General Signal
EEV Canada Ltd.
Harris Corp. PRD Electronics Div.
Maury Microwave Corp.
The Narda Microwave Corporation
Systron-Donner
Tektronix Inc.
Texscan Corp.
Weinschel Engineering Co.

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Alford Mfg. Co.
Bird Electronic Corp.
Blonder-Tongue Labs.
CCA Electronics Corp.
Comark Industries Inc.
Delta Electronics Inc. (Va.)
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Heath Co.
Kaitronics Corp.
Maury Microwave Corp.
Micro Communications, Inc.
Moseley Associates, Inc.
The Narda Microwave Corporation
Potomac Instruments, Inc.
Systron-Donner
Tektronix Inc.
Telemet A Geotel Co.
Television Technology Corp.
Texscan Corp.
Townsend Associates, Inc.
Weinschel Engineering Co.
Wide Band Engineering Co., Inc.

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Bird Electronic Corp.
Dielectric Communications A Unit of General Signal
Harris Corp. PRD Electronics Div.
Maury Microwave Corp.
Micro Communications, Inc.
Moseley Associates, Inc.
Potomac Instruments, Inc.
Rohde & Schwarz Sales Co.
Texscan Corp.
Weinschel Engineering Co.

Detectors, Transmitter Quadrature Distortion

Telemet A Geotel Co.

Detectors, Video Presence

Colorado Video Inc.
Comark Industries Inc.
Di-Tech Inc.
Javelin Electronics
Lenco Inc. Electronics Div.
Sharepoint Systems Inc.
Telemet A Geotel Co.

Diagnostic Systems, Digital Logic

Continental Specialties Corp.
Pinzone Communications Products Inc.
Sharepoint Systems Inc.

Differential Phase/Gain Measuring Sets

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Datatek Corp.
Harris Corp. Broadcast Products Div.
Potomac Instruments, Inc.
Tektronix Inc.
Telemet A Geotel Co.

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BJA Systems, Inc.
Central Dynamics Corp.
Computer Labs Div. of Analog Devices, Inc.
Link Electronics Ltd.
Tektronix Inc.

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C. S. P. Inc.
Cetec Broadcast Group
Coastcom
Comark Industries Inc.
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Laird Telemedia Inc.
Micro Communications, Inc.
Mu-Del Electronics, Inc.
Multronics, Inc.
North Hills Electronics, Inc.
Nurad, Inc.
Phelps Dodge Communications Co.
SWR Inc.
Shively Laboratories, Inc.
UTE Microwave, Inc.
Varian Associates, Inc. Electron Device Group
Wide Band Engineering Co., Inc.
Wilkinson Electronics, Inc.

Discs, Video

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Arvin/Echo Science Corp.
Chyron Telesystems
Computer Magnetics Corp.
Echo Science Corp.
Eigen Video
Glentronix Ltd.
Panasonic Company
Teknekron/ARG

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BJA Systems, Inc.
Bretford Mfg. Co.
Chyron Telesystems
Gray Engineering Labs
Interand Corp. Telestrator Div.
Power-Optics Inc.
Reynolds/Leteron Co.
Tektronix Inc.
Telemation, A Div. of Bell & Howell
Thomson-CSF Laboratories, Inc.
3M Co. Mincom Div.
Video Data Systems

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Audiotronics Video Display Div.
BJA Systems, Inc.
B & K Precision Dynascan Corp.
The BTX Corp.
Cetec Broadcast Group
Cherry Electrical Products
Convergence Corp.
Delta Electronics Inc. (Va.)
EECO Inc.
EEV Canada Ltd.
ESE
G C Electronics Div. Wallace Murray
Ikegami Electronics (USA) Inc.
Javelin Electronics
Kaitronics Corp.
MPB Technologies Inc.
MSI Television
Moseley Associates, Inc.
Motorola Semiconductor Products Inc.
Nationwide Electronic Systems, Inc.
OPCOA
PWH Electronics
Pinzone Communications Products Inc.
QSI Systems, Inc.
RMC-Radio Mfg. Co.
Scientific-Atlanta, Inc.
Simplex Time Recorder Co.
TSC Development Labs.
Tektronix Inc.
Telegen/Sofratev
3M Co. Mincom Div.
Vamco Engineering
Video Data Systems

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Boston Sound & Power Systems
ESE
IGM Div. of Northwestern Tech.
Javelin Electronics
Laird Telemedia Inc.
MSI Television
Nationwide Electronic Systems, Inc.
OPCOA
PWH Electronics
RMC-Radio Mfg. Co.
3M Co. Mincom Div.
Time & Frequency Tech., Inc.
Vamco Engineering
Video Data Systems

Dividers, Frequency

Maury Microwave Corp.
Motorola Semiconductor Products Inc.
RHG Electronics Laboratory, Inc.

Dividers, Power

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Alford Mfg. Co.
Bird Electronic Corp.
COMPAC
Cetec Broadcast Group
Comark Industries Inc.
Dielectric Communications A Unit of General Signal
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Micro Communications, Inc.
Moseley Associates, Inc.
Mu-Del Electronics, Inc.
Multronics, Inc.
The Narda Microwave Corporation
North Hills Electronics, Inc.
Phelps Dodge Communications Co.
Scala Electronic Corp.
Shively Laboratories, Inc.
Tektronix Inc.
Trompeter Electronics
Weinschel Engineering Co.
Wide Band Engineering Co., Inc.

Dividers, Voltage

AILTECH Div. Cutler-Hammer Los Angeles Operation
John Fluke Mfg. Co., Inc.
ITT Jennings
Tech Laboratories Inc.

Earth Station Antennas --See Antennas, TV Earth Station

Earth Stations, Down Terminal

Anderson Scientific
California Microwave
Coastcom
Collins Div. Rockwell International
Comsearch, Inc.
Gardiner Communications Corp.
Harris Corp. Broadcast Products Div.
Hughes Aircraft Co. Microwave Communications Products
Microdyne Corp.
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
Scientific-Atlanta, Inc.
TerraCom Loral Corp.
Varian Associates, Inc. Electron Device Group
Varian/Beverly Micro-Link Products

Earth Stations, Up Terminal

California Microwave
Coastcom
Collins Div. Rockwell International
Compact Video Sales
Comsearch, Inc.
Gardiner Communications Corp.
Harris Corp. Broadcast Products Div.
Hughes Aircraft Co. Microwave Communications Products
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
Scientific-Atlanta, Inc.
Varian Associates, Inc. Electron Device Group
Varian/Beverly Micro-Link Products

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Kaitronics Corp. 12
Microtime, Inc. 13
Recortec Inc. 5
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Skotel Corp. 70

Automated Processes, Inc.
The BTX Corp.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Datametrics Inc.
Datatron, Inc.
Dynasciences Div. Whittaker Corp.
EECO Inc.
Electro & Optical Systems Ltd.
Glentronix Ltd.
Gray Engineering Labs
International Communications & Control Corp.
Kaitronics Corp.
Media Concepts, Inc.
Microtime, Inc.
Recortec Inc.
Shintron Co. Inc.
Skotel Corp.
Time Tech Corp.

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Gray Engineering Labs 21
Kaitronics Corp. 12
Microtime, Inc. 13
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The BTX Corp.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Datametrics Inc.
Datatron, Inc.
Dynasciences Div. Whittaker Corp.
EECO Inc.
ESE
Electro & Optical Systems Ltd.
Glentronix Ltd.
Gray Engineering Labs
International Communications & Control Corp.
Kaitronics Corp.
Microtime, Inc.
QSI Systems, Inc.
Skotel Corp.
Time Tech Corp.
United Media, Inc.

Editing Facilities

DYMA Engineering, Inc.
KVC, Inc.
Keeline Int'l.
Lawhed, Ltd.
Leedal, Inc.
Sharepoint Systems Inc.

Editors, Audiotape

AEG-Telefunken Magnetic Tape Recorder Dept.
Audico, Ltd.
Automated Processes, Inc.
The BTX Corp.
Broadcast Electronics, Inc.
CMX Systems & Videomax Div's. of Orrox Corp.
Datatron, Inc.
EECO Inc.
Fidelipac
Sharepoint Systems Inc.

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Kaitronics Corp. 12

Alan Gordon Enterprises Inc.
Kaitronics Corp.
Kalart Victor Corp.
Lipsner-Smith Corp.
Magnasync/Moviola Corp.
Neumade Products Corp.
Research Technology, Inc.
Super 8 Sound, Inc.

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Ampex Corp.
Audico, Ltd.
CMX Systems & Videomax Div's. of Orrox Corp.
Central Dynamics Corp.
Computer Image Video Controllers Dytek Industries, Inc.
Consolidated Video Systems
Convergence Corp.
Datatron, Inc.
Dynasciences Div. Whittaker Corp.
Dytek Industries, Inc.
EECO Inc.
E.M.S Inc.
Electro & Optical Systems Ltd.
Kaitronics Corp.
Keeline Int'l.
Lawhed, Ltd.
Mach One Digital Systems, Inc.
Nanotec
Panasonic Company
Panasonic Co. Video Systems Div.
RCA Broadcast Systems
Recortec Inc.
Sony Corp. of America
US JVC Corp. Professional Video Div.
United Media, Inc.
Vamco Engineering
Video Associates Labs
Video Devices Co.
Videomedia

Educational Courses, Broadcasting/Electronics

Cleveland Institute of Elec., Inc.
Heath Co.
Motorola Semiconductor Products Inc.

Electronic Still Store

ADDA Corp.
Ampex Corp.
Consolidated Video Systems

Enclosures, Module Card Tray

Bayly Engineering Ltd. Member of AEG-Telefunken Group
Monroe Electronics, Inc.
Orange County Electronics Int'l., Inc.
Protech Audio Corp.
ROH Corporation
Scientific-Atlanta, Inc.
Vector Electronic Co., Inc.

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Amtron Corp.
Broadcast Video Systems, Ltd.
Chyron Telesystems
Cohu, Inc. Electronics Div.
Crosspoint Latch Corp.
Glentronix Ltd.
Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
Lenco Inc. Electronics Div.
MPB Technologies Inc.
Marconi Electronics Inc. Broadcast & Communication Div.
Philips Test & Measuring Instruments, Inc.
Sony Corp. of America
Telegen/Sofratev
Telemation, A Div. of Bell & Howell
3M Co. Mincom Div.

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Lenco Inc. Electronics Div.
Sansui Electronics Corp.

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Bayly Engineering Ltd. Member of AEG-Telefunken Group
Cetec Broadcast Group
Cetec Vega
Channelmatic, Inc.
Di-Tech Inc.
Frequency Devices Inc.
Gorman Redlich Mfg. Co.
IGM Div. of Northwestern Tech.
Lampkin Lab. Inc.
Monroe Electronics, Inc.
UMC Electronics Co. Broadcast Products Div.

Encoder-Decoders, EBS

Automated Broadcast Controls
ESE
Elcom Engineering Co.
Gorman Redlich Mfg. Co.
Logitek Electronic Systems, Inc.
QSI Systems, Inc.
Time & Frequency Tech., Inc.

Enhancers, Stereo Phase

Cetec Broadcast Group
Edco Products, Inc.

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Consolidated Video Systems
Corning Glass Works
Digital Video Systems
Dynasciences Div. Whittaker Corp.
Edutron, Inc.
Yves Faroudja, Inc.
Glentronix Ltd.
Harris Corp. Broadcast Products Div.
Microtime, Inc.
Piclear, Inc.
Siegel Electronics
Telemet A Geotel Co.
Thomson-CSF Laboratories, Inc.
3M Co. Mincom Div.

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AVAB America Inc.
Altec Lansing Sound Products
Audio & Design Recording Inc.
Audio Designs & Mfg.
Auditronics, Inc.
Automated Processes, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Bell Audio Systems, Inc.
Bogen Div. Lear Siegler, Inc.
Cetec Broadcast Group
Crown International, Inc.
Gotham Audio Corp.
Heath Co.
Holland Electronics
ITI Electronics, Inc.
Integrated Solid Systems Inc. GLI Brand
International Electro-Magnetics
Kahn Communications, Inc.
Roger Mayer Electronics, Inc.
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Rupert Neve, Inc.
Opamp Labs, Inc.
Orange County Electronics Int'l., Inc.
Orban Assoc. Inc.
Panasonic Company
Protech Audio Corp.
Pulse Techniques Inc.
Quad-Eight Electronics
ROH Corporation
Ramko Research Inc.
Richmond Sound Design, Ltd.
Sansui Electronics Corp.
Sontec Electronics
Spectra Sonics
Spectrum Instruments, Inc.
Sphere Electronics
Superex Electronics Corp.
TT Electronics, Inc.
Technical Audio Products Corp.
Tweed Audio USA Inc.
United Recording Electronics Industries
Wang Voice Comm. Inc.
Ward-Beck Systems, Ltd.

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Corning Glass Works
Dynasciences Div. Whittaker Corp.
Microtime, Inc.
Thomson-CSF Laboratories, Inc.

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Broadcast Video Systems, Ltd.
Central Dynamics Corp.
Cohu, Inc. Electronics Div.
Computer Magnetics Corp.
Datatek Corp.
Di-Tech Inc.
Dynair Electronics, Inc.
ESC Electronics Corp.
Grass Valley Group, Inc.
Industrial Sciences, Inc. (ISI)
International Communications & Control Corp.
International Nuclear Corp.
Kappa Networks, Inc.
Leitch Video Ltd.
Lenco Inc. Electronics Div.
Link Electronics Ltd.
Merlin Engineering Works, Inc.
Microtime, Inc.
Telemet A Geotel Co.

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A. F. Associates, Inc.
Autodyne
Lines Video Systems
Recortec Inc.

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Exciters, AM

CCA Electronics Corp.

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CSI Electronics, Inc.
Collins Div. Rockwell International
Continental Electronics Mfg. Co.
Harris Corp. Broadcast Products Div.
Kahn Communications, Inc.
Marconi Communication Systems Ltd.
Philips Test & Measuring Instruments, Inc.
RCA Broadcast Systems
Singer Products Co., Inc.
Sintronic Corp.
Wilkinson Electronics, Inc.

Exciters, FM

Bayly Engineering Ltd. Member of AEG-Telefunken Group
CCA Electronics Corp.
CSI Electronics, Inc.
Cetec Broadcast Group
Collins Div. Rockwell International
Comark Communications Industries, Inc.
Harris Corp. Broadcast Products Div.
LPB Inc.
Marconi Communication Systems Ltd.
McMartin Industries, Inc.
NEC America, Inc. Broadcast Equip. Div.
QEI Corp.
RCA Broadcast Systems
Rohde & Schwarz Sales Co.
Singer Products Co., Inc.
Sintronic Corp.
Solid Electronics Labs
Versa Count Engineering
Wilkinson Electronics, Inc.

Exciters, SCA

CSI Electronics, Inc.
Cetec Broadcast Group
Collins Div. Rockwell International
Comark Communications Industries, Inc.
Harris Corp. Broadcast Products Div.
LPB Inc.
McMartin Industries, Inc.
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
QEI Corp.
RCA Broadcast Systems
Sharepoint Systems Inc.
Solid Electronics Labs
Versa Count Engineering
Wilkinson Electronics, Inc.

Exciters, Stereo

CSI Electronics, Inc.
Cetec Broadcast Group
Collins Div. Rockwell International
Harris Corp. Broadcast Products Div.
Kahn Communications, Inc.
LPB Inc.
Marconi Communication Systems Ltd.
McMartin Industries, Inc.
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
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RCA Broadcast Systems
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Versa Count Engineering
Wilkinson Electronics, Inc.

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Electro Controls
Kliegl Bros. Lighting
Skirpan Lighting Control Corp.
Theatre Techniques Inc.
Waters Mfg. Inc.

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Kinetronics Corp.
Lipsner-Smith Corp.
Neumade Products Corp.
Permafilm Int'l. Corp.
Piclear, Inc.
Plastic Reel Corp. of America
Research Technology, Inc.
Schuessler Case Co., Inc.

Film Inspection and Cleaning Equipment

Houston Photo Products, Inc.
Kinetronics Corp.
Lipsner-Smith Corp.
Neumade Products Corp.
Perf-Fix
Permafilm Int'l. Corp.
Plastic Reel Corp. of America
Research Technology, Inc.
Starex, Inc.

Film, Photographic

Agfa-Gevaert Inc.
Eastman Kodak Co.

Film Chain Light Level Controls

BEI Beston Electronics, Inc.
Cohu, Inc. Electronics Div.
Harris Corp. Broadcast Products Div.
Industrial Sciences, Inc. (ISI)
Laird Telemedia Inc.
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Bell & Howell Audio Visual Div.
Bosch-Fernseh Corp.
Buhl Optical Co.
CMX Systems & Videomax Div's. of Orrox Corp.
Cohu, Inc. Electronics Div.
GBC Closed Circuit TV Corp.
Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
Kalart Victor Corp.
Laird Telemedia Inc.
Marconi Communication Systems Ltd.
Marconi Electronics Inc. Broadcast & Communication Div.
Panasonic Company
Panasonic Co. Video Systems Div.
Philips Broadcast Equip Corp.
RCA Broadcast Systems
Sony Corp. of America
Telemation, A Div. of Bell & Howell
The Zei-Mark Corp.

Film Processing Chemicals, Color

Agfa-Gevaert Inc.
Eastman Kodak Co.
Philip A. Hunt Chemical Corp.

Film Processing Services

Bebell Inc.
Eastman Kodak Co.
Houston Photo Products, Inc.

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Quad-Eight Electronics
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Super 8 Sound, Inc.
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Aitken Communications Inc.
Amperex Electronic Corp. Slatersville Div.
Andersen Labs, Inc. Advanced Systems Div.
Audico, Ltd.
Audio & Design Recording Inc.
Comark Industries Inc.
Crown International, Inc.
Custom Audio Electronics
DYMA Engineering, Inc.
Frequency Devices Inc.
Gotham Audio Corp.
Kappa Networks, Inc.
Microprobe Electronics
North Hills Electronics, Inc.
Orange County Electronics Int'l., Inc.
Panasonic Company
Protech Audio Corp.
Pulse Techniques Inc.
ROH Corporation
Richmond Sound Design, Ltd.
Rockland Systems Corp.
Spectra Sonics
Spectrum Instruments, Inc.
TT Electronics, Inc.
Track Audio, Inc. (TA)
United Recording Electronics Industries
Varian Associates, Inc. Electron Device Group

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Keith Anderson Co.
Bird Electronic Corp.
Cetec Broadcast Group
Collins Div. Rockwell International
Comark Industries Inc.
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
The Finney Co.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Jerrold Electronics Corp.
Kappa Networks, Inc.
Merill Cable Equipment Corp.
Micro Communications, Inc.
Nurad, Inc.
Shively Laboratories, Inc.
TT Electronics, Inc.
Texscan Corp.
Varian/Beverly Micro-Link Products
Wide Band Engineering Co., Inc.

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Allen Avionics
Altec Lansing Sound Products
Amber Electro Design, Ltd.
Audico, Ltd.
Audio & Design Recording Inc.
Automated Broadcast Controls
Automated Processes, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Cetec Broadcast Group
Coastcom
Comark Industries Inc.
Crown International, Inc.
Custom Audio Electronics
DYMA Engineering, Inc.
ESC Electronics Corp.
Frequency Devices Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Ivie Electronics
Jerrold Electronics Corp.
Kappa Networks, Inc.
Roger Mayer Electronics, Inc.
Microprobe Electronics
Monroe Electronics, Inc.
Rupert Neve, Inc.
Orange County Electronics Int'l., Inc.
Panasonic Company
Protech Audio Corp.
Pulse Techniques Inc.
QEI Corp.
Quad-Eight Electronics
RCA Broadcast Systems
ROH Corporation
Richmond Sound Design, Ltd.
Rockland Systems Corp.
Rohde & Schwarz Sales Co.
Sescom, Inc.
Sontec Electronics
Spectra Sonics
Spectrum Instruments, Inc.
TT Electronics, Inc.
Track Audio, Inc. (TA)
Tweed Audio USA Inc.
United Recording Electronics Industries

Filters, Microwave

UTE Microwave, Inc.

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Audio & Design Recording Inc.
Blonder-Tongue Labs.
Boston Sound & Power Systems
Comark Industries Inc.
EMT Franz VGmbH
The Finney Co.
Frequency Devices Inc.
G C Electronics Div. Wallace Murray
Gotham Audio Corp.
Kahn Communications, Inc.
Kappa Networks, Inc.
Roger Mayer Electronics, Inc.
Orange County Electronics Int'l., Inc.
Panasonic Company
Pulse Techniques Inc.
Quad-Eight Electronics
Spectra Sonics
TT Electronics, Inc.
Tektronix Inc.
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Coastcom
Comark Industries Inc.
Peter W. Dahl Co.
ESC Electronics Corp.
The Finney Co.
Frequency Devices Inc.
Kappa Networks, Inc.
Maury Microwave Corp.
Roger Mayer Electronics, Inc.
Merill Cable Equipment Corp.
Mu-Del Electronics, Inc.
Multronics, Inc.
North Hills Electronics, Inc.
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QEI Corp.
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Shively Laboratories, Inc.
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Telectric Co.
Television Equipment Associates
Texscan Corp.
Varian Associates, Inc. Electron Device Group
Varian/Beverly Micro-Link Products
Wide Band Engineering Co., Inc.

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Audio & Design Recording Inc.
Automated Processes, Inc.
Kappa Networks, Inc.
Roger Mayer Electronics, Inc.
Rupert Neve, Inc.
Orange County Electronics Int'l., Inc.
Panasonic Company
Pulse Techniques Inc.
Quad-Eight Electronics
Richmond Sound Design, Ltd.
Spectrum Instruments, Inc.
TT Electronics, Inc.
URSA Major, Inc.

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Audico, Ltd.
Audio & Design Recording Inc.
Automated Processes, Inc.
Comark Industries Inc.
The Finney Co.
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Gotham Audio Corp.
Kappa Networks, Inc.
Maury Microwave Corp.
Merill Cable Equipment Corp.
Microprobe Electronics
Multronics, Inc.
North Hills Electronics, Inc.
Orange County Electronics Int'l., Inc.
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Pulse Techniques Inc.
Quad-Eight Electronics
Rockland Systems Corp.
Spectrum Instruments, Inc.
Systron-Donner
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Exact Electronics
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Harris Corp. Broadcast Products Div.
Hickok Elec. Inst. Co.
Marconi Instruments Div. of Marconi Electronics Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Opamp Labs, Inc.
Philips Test & Measuring Instruments, Inc.
Potomac Instruments, Inc.
Quad-Eight Electronics
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Dytek Industries, Inc.
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Grass Valley Group, Inc.
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Leader Instruments Corp.
Lectrotech Inc.
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Link Electronics Ltd.
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Moseley Associates, Inc.
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Sigma Electronics, Inc.
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Telemet A Geotel Co.
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Lampkin Lab. Inc.
North Wind Power Co.
Singer Products Co., Inc.

Generators, Powered (Gasoline Engine)

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Harris Corp. Broadcast Products Div.
J&D International, Elec. Div. Unit E-East
Lampkin Lab. Inc.
Onan
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Frequency Devices Inc.
Heath Co.
Hickok Elec. Inst. Co.
Ivie Electronics
Lampkin Lab. Inc.
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Modular Audio Products Unit of Modular Devices, Inc.
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Motorola Communications and Electronics Inc.
The Narda Microwave Corporation
Philips Test & Measuring Instruments, Inc.
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Texscan Corp.
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Marconi Electronics Inc. Broadcast & Communication Div.
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Echolab
GBC Closed Circuit TV Corp.
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Harris Corp. Broadcast Products Div.
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Industrial Sciences, Inc. (ISI)
International Communications & Control Corp.
Javelin Electronics
Leitch Video Ltd.
Lenco Inc. Electronics Div.
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Nagra Magnetic Recorders, Inc.
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Laird Telemedia Inc.
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Consolidated Electronic Industries
Continental Specialties Corp.
Di-Tech Inc.
Elcom Engineering Co.
Exact Electronics
Frequency Devices Inc.
Gorman Redlich Mfg. Co.
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Ivie Electronics
Motorola Communications and Electronics Inc.
Opamp Labs, Inc.
Spectra Sonics
Wang Voice Comm. Inc.

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Miller-Stephenson Chemical Co., Inc.
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Merlin Engineering Works, Inc.

Head Nest Rebuilding Services

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G C Electronics Div. Wallace Murray
Hamilton Electronics Corp.
Harris Corp. Broadcast Products Div.
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Harris Corp. Broadcast Products Div.
Heath Co.
Integrated Solid Systems Inc. GLI Brand
Micro-Trak Corp.
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R-Columbia Products Co., Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Stanton Magnetics Inc.
Studer Revox America
Superex Electronics Corp.
Television Equipment Associates
Telex Communications, Inc.
Vidaire Electronics Mfg.

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Audiosears Corp.
Burns Audiotronics, Inc.
Cetec Broadcast Group
David Clark Co., Inc.
DYMA Engineering, Inc.
Electro-Voice Inc.
Ercona Corp.
Harris Corp. Broadcast Products Div.
Micro-Trak Corp.
Miles Associates Div. Miles Products Ltd.
Neutrik
R-Columbia Products Co., Inc.
Superex Electronics Corp.
Television Equipment Associates
Telex Communications, Inc.

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Computer Magnetics Corp.
Grandy, Inc.
International Electro-Magnetics
Lipps Inc.
Norton Associates Inc.
Nortronics Co., Inc. Recorder Care Div.
Saki Magnetics, Inc.
Taber Mfg. & Engr. Co.
Vikron, Inc.

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Lipps Inc.
Nortronics Co., Inc. Recorder Care Div.

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Computer Magnetics Corp.
Ercona Corp.
Grandy, Inc.
International Electro-Magnetics
Lipps Inc.
Magna-Tech Electronic Co., Inc.
Minneapolis Magnetics
Norton Associates Inc.
Nortronics Co., Inc. Recorder Care Div.
Saki Magnetics, Inc.
Spin Physics, Inc.
Taber Mfg. & Engr. Co.
UMC Electronics Co. Broadcast Products Div.
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Grandy, Inc.
International Electro-Magnetics
Lipps Inc.
Magna-Tech Electronic Co., Inc.
Norton Associates Inc.
Nortronics Co., Inc. Recorder Care Div.
Saki Magnetics, Inc.

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CMX Systems & Videomax Div's. of Orrox Corp.
Computer Magnetics Corp.
Electro Sound, Inc.
Grandy, Inc.
International Electro-Magnetics
Lipps Inc.
Minneapolis Magnetics
Norton Associates Inc.
Saki Magnetics, Inc.
Spin Physics, Inc.
Taber Mfg. & Engr. Co.
United Research Lab Corp.

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Ampex Corp.
CMX Systems & Videomax Div's. of Orrox Corp.
Computer Magnetics Corp.
Glentronix Ltd.
Merlin Engineering Works, Inc.
RCA Broadcast Systems
Saki Magnetics, Inc.
Sound Dynamics, Inc.
Spin Physics, Inc.
Taber Mfg. & Engr. Co.
Videomagnetics, Inc.
Videomax Div. Orrox Corp.

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Ampro Broadcasting
Broadcast Electronics, Inc.
Computer Magnetics Corp.
Electro Sound, Inc.
Ercona Corp.
Glentronix Ltd.
Grandy, Inc.
International Electro-Magnetics
Lipps Inc.
Minneapolis Magnetics
Nagra Magnetic Recorders, Inc.
Norton Associates Inc.
Nortronics Co., Inc. Recorder Care Div.
Saki Magnetics, Inc.
Soundscriber Magnetic Recording Co., Inc.
Spin Physics, Inc.
Studer Revox America
Taber Mfg. & Engr. Co.
UMC Electronics Co. Broadcast Products Div.
United Research Lab Corp.
Videomagnetics, Inc.
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Cinema Products Corp.
Computer Magnetics Corp.
Electro Sound, Inc.
Ercona Corp.
Glentronix Ltd.
Gotham Audio Corp.
Grandy, Inc.
Harris Corp. Broadcast Products Div.
International Electro-Magnetics
Lipps Inc.
Magna-Tech Electronic Co., Inc.
Minneapolis Magnetics
Nagra Magnetic Recorders, Inc.
Norton Associates Inc.
Nortronics Co., Inc. Recorder Care Div.
Saki Magnetics, Inc.
Soundscriber Magnetic Recording Co., Inc.
Spin Physics, Inc.
Taber Mfg. & Engr. Co.
UMC Electronics Co. Broadcast Products Div.
Videomagnetics, Inc.
Videomax Div. Orrox Corp.
Vikron, Inc.

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Ampex Corp.
Asaca Corp. of America
Computer Magnetics Corp.
Glentronix Ltd.
Javelin Electronics
Minneapolis Magnetics
RCA Broadcast Systems
Spin Physics, Inc.
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Videomagnetics, Inc.
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North Hills Electronics, Inc.
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Telemation, A Div. of Bell & Howell

Image Repositioners, Video

Consolidated Video Systems
Digital Video Systems
Electro & Optical Systems Ltd.
NEC America, Inc. Broadcast Equip. Div.

Isolators, Electro-Optical

Motorola Semiconductor Products Inc.

Insulators, Antenna Base

Cetec Broadcast Group
Continental Electronics Mfg. Co.
Decca Austin Insulators
Harris Corp. Broadcast Products Div.
Suda Seisakusho Co., Ltd.
Utility Tower Co.

Insulators, Guy Strain

Barker and Williamson, Inc.
Cetec Broadcast Group
Continental Electronics Mfg. Co.
Decca Austin Insulators
Harris Corp. Broadcast Products Div.
Suda Seisakusho Co., Ltd.
Utility Tower Co.

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Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Cherry Electrical Products
Cherry Semiconductor
EEV Canada Ltd.
Harris Corp. Broadcast Products Div.
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Motorola Semiconductor Products Inc.
Panasonic Company
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Automated Processes, Inc.
Bogen Div. Lear Siegler, Inc.
David Clark Co., Inc.
Clear-Com Intercom Systems
Crosspoint Latch Corp.
Custom Audio Electronics
Edcor
Electro-Voice Inc.
Fisher Berkeley Corp.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Heath Co.
Holland Electronics
McMartin Industries, Inc.
N.O.V.A. Corp.
Paso Sound Products Inc.
R-Columbia Products Co., Inc.
ROH Corporation
RTS Systems, Inc.
The Ken Schaffer Group, Inc.
Sharepoint Systems Inc.
Singer Products Co., Inc.
Television Equipment Associates
Telex Communications, Inc.
Theatre Techniques Inc.
Ward-Beck Systems, Ltd.
World Video Inc.

Isocouplers

C. S. P. Inc.
Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
Moseley Associates, Inc.
Motorola Semiconductor Products Inc.
Shively Laboratories, Inc.

ITFS Systems

Alford Mfg. Co.
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Audio Designs & Mfg.
Automated Processes, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Broadcast Electronics, Inc.
Bud Industries, Inc.
C. S. P. Inc.
DYMA Engineering, Inc.
Dynatech Data Systems
Harris Corp. Broadcast Products Div.
McCurdy Radio Ind. Inc.
Potomac Instruments, Inc.
Rex Rheostat & Co., Inc.
Switchcraft Inc.
Telectric Co.
Trompeter Electronics
Union Connector Co., Inc.
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Dynair Electronics, Inc.
Grass Valley Group, Inc.
Image Video Ltd.
Industrial Sciences, Inc. (ISI)
Panasonic Company
Thomson-CSF Laboratories, Inc.
3M Co. Mincom Div.
Video Devices Co.

Kits, Amplifier --See Amplifier Kits

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Knobs, Control

Alco Electronic Products, Inc.
G C Electronics Div. Wallace Murray
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Selco Products Co.
Singer Products Co., Inc.

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Fidelipac

Lamps, Console, Gooseneck

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Sitler's Supplies, Inc.
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Leasametric
Merlin Engineering Works, Inc.
Orange County Electronics Int'l., Inc.
Pentagon Industries, Inc.
RMC-Radio Mfg. Co.
Ramko Research Inc.
Soll, Inc.
Tele-Cine Inc.
Varian Associates, Inc. Electron Device Group

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Angenieux Corp. of America
Ercona Corp.
Alan Gordon Enterprises Inc.
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Tele-Cine Inc.
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Canon USA, Inc. Optics Div.
Cinema Products Corp.
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Frezzolini Electronics, Inc.
Fujinon Optical, Inc.
Alan Gordon Enterprises Inc.
Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Javelin Electronics
Lenzar Optics Corp.
Panasonic Company
Power-Optics Inc.
Rank Precision Industries, Inc. (N.Y.)
Schneider Corp. of America
Jos. Schneider GmbH & Co. P.O. Box 947
Schudel, Inc.
Tele-Cine Inc.
3D Television Systems Inc.
VMI-Visual Methods Inc.

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Javelin Electronics
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Jos. Schneider GmbH & Co. P.O. Box 947
VMI-Visual Methods Inc.

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Buhl Optical Co.
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Frezzolini Electronics, Inc.
Fujinon Optical, Inc.
Alan Gordon Enterprises Inc.
Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Javelin Electronics
Lenzar Optics Corp.
Panasonic Company
Power-Optics Inc.
Rank Precision Industries, Inc. (N.Y.)
Schneider Corp. of America
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Berkey-Colortran Inc.
Custom Audio Electronics
Electro Controls
Electronics Diversified, Inc.
Harris Corp. Broadcast Products Div.
Janson Industries
Kliegl Bros. Lighting
Packaged Lighting Systems
Skirpan Lighting Control Corp.
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Packaged Lighting Systems
SGL Waber Electric
Sharepoint Systems Inc.
Skirpan Lighting Control Corp.
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Electronics Diversified, Inc.
Frezzolini Electronics, Inc.
GTE Sylvania Inc. Lighting Products Group
The Great American Market
Harris Corp. Broadcast Products Div.
Harwood Mfg. Co. Subs. Elgin Nat'l. Industries, Inc.
Janson Industries
Kliegl Bros. Lighting
Lowel-Light
Packaged Lighting Systems
Schudel, Inc.
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The Great American Market
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Harwood Mfg. Co. Subs. Elgin Nat'l. Industries, Inc.
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Walter S. Brewer Co., Inc.
Electro Controls
Janson Industries
Kliegl Bros. Lighting
Lowel-Light
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Harris Corp. Broadcast Products Div.
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Decca Austin Insulators
Dielectric Communications A Unit of General Signal
DYMA Engineering, Inc.
EEV Canada Ltd.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Hy-Gain Electronics Div. of Telex Communications Inc.
Lightning Elimination Assoc., Inc.
MCG Electronics Inc.
Multiplier Industries Corp.
Suda Seisakusho Co., Ltd.
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Broadcast Electronics, Inc.
Communications, Ltd.
Fidelipac
Harris Corp. Broadcast Products Div.

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Berkey-Colortran Inc.
Cine 60, Inc.
Cinema Products Corp.
Frezzolini Electronics, Inc.
Harwood Mfg. Co. Subs. Elgin Nat'l. Industries, Inc.
Kliegl Bros. Lighting
Lowel-Light
Mole-Richardson Co.
Multiplier Industries Corp.
Packaged Lighting Systems
Strand Century, Inc.

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Harris Corp. Broadcast Products Div.
Kliegl Bros. Lighting
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Mole-Richardson Co.
Packaged Lighting Systems
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Fidelipac

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Cetec Broadcast Group
Crouse Hinds Co.
Flash Technology Corp. of America
Fort Worth Tower Co., Inc.
Harris Corp. Broadcast Products Div.
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Swager Tower Corp.
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Altec Lansing Sound Products
Audio & Design Recording Inc.
Automated Processes, Inc.
Broadcast Electronics, Inc.
Cetec Broadcast Group
dbx, Inc.
EMT Franz VGmbH
Elcom Engineering Co.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Inovonics
International Communications & Control Corp.
Marti Electronics
Roger Mayer Electronics, Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Moseley Associates, Inc.
Rupert Neve, Inc.
Opamp Labs, Inc.
Orange County Electronics Int'l., Inc.
Orban Assoc. Inc.
Pacific Recorders and Engrg. Corp.
Protech Audio Corp.
QEI Corp.
RCA Broadcast Systems
ROH Corporation
Ramko Research Inc.
Spectra Sonics
Thomson-CSF Laboratories, Inc.
Track Audio, Inc. (TA)
Tweed Audio USA Inc.
United Recording Electronics Industries
Wang Voice Comm. Inc.
Ward-Beck Systems, Ltd.
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Bayly Engineering Ltd. Member of AEG-Telefunken Group
Boston Sound & Power Systems
Cetec Broadcast Group
Delta Electronics Inc. (Va.)
Dielectric Communications A Unit of General Signal
DYMA Engineering, Inc.
Harris Corp. Broadcast Products Div.
Lightning Elimination Assoc., Inc.
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Bayly Engineering Ltd. Member of AEG-Telefunken Group
Bird Electronic Corp.
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CSI Electronics, Inc.
Communications, Ltd.
Fred A. Nudd Corp.
RMC-Radio Mfg. Co.
Soll, Inc.
Utility Tower Co.

Maintenance Services, Cartridge Tape

Broadcast Electronics, Inc.
CaVox Stereo Productions

Maintenance Services, FM

Applied Video Electronics, Inc.
Atlantic Research Corp.
CSI Electronics, Inc.
Comark Industries Inc.
Communications, Ltd.
Fort Worth Tower Co., Inc.
Fred A. Nudd Corp.
RMC-Radio Mfg. Co.
Soll, Inc.
Utility Tower Co.

Maintenance Services, Microwave

Atlantic Research Corp.
Comark Industries Inc.
Farinon Video
Fort Worth Tower Co., Inc.
Gabriel Electronics, Inc.
Fred A. Nudd Corp.
Nurad, Inc.
Prodelin Inc.
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Atlantic Research Corp.
C.R.V. Systems, Inc.
Centro Corp.
Comark Industries Inc.
Fort Worth Tower Co., Inc.
Merlin Engineering Works, Inc.
Fred A. Nudd Corp.
Pleasantville Labs
Soll, Inc.
Townsend Associates, Inc.
Utility Tower Co.
Varian Associates, Inc. Electron Device Group
Video Systems Network, Inc.

MDS Equipment, 2150 MHz

Alford Mfg. Co.
Bogner Broadcast Equipment Corp.
Texscan Corp.
Varian Associates, Inc. Electron Device Group
Varian/Beverly Micro-Link Products

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Dranetz Engineering Labs., Inc.

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Hewlett-Packard Co.
Potomac Instruments, Inc.
Radiometer Elec. U.S. Inc.
TM Systems, Inc.

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Keith Anderson Co.
Anderson Scientific
C. S. P. Inc.
Cetec Broadcast Group
Engineering Associates
Harris Corp. Broadcast Products Div.
Heath Co.
Mid State Communications, Inc.
Potomac Instruments, Inc.
Rohde & Schwarz Sales Co.
SPI-ITT Metrix Instruments Div.
Sencore Inc.
TM Systems, Inc.
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AILTECH Div. Cutler-Hammer Los Angeles Operation
Keith Anderson Co.
Anderson Scientific
Avantek, Inc.
Blonder-Tongue Labs.
CCA Electronics Corp.
Engineering Associates
The Finney Co.
Harris Corp. Broadcast Products Div.
Leader Instruments Corp.
Mid State Communications, Inc.
Potomac Instruments, Inc.
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SPI-ITT Metrix Instruments Div.
Sadelco, Inc.
Sencore Inc.
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EMT Franz VGmbH
Fidelipac
Gotham Audio Corp.
Leader Instruments Corp.
Potomac Instruments, Inc.
Radiometer Elec. U.S. Inc.
Video Research Corp.

Meters, Frequency AF

AILTECH Div. Cutler-Hammer Los Angeles Operation
Amber Electro Design, Ltd.
Elcom Engineering Co.
Engineering Associates
Gotham Audio Corp.
Heath Co.
Hickok Elec. Inst. Co.
Ivie Electronics
Lampkin Lab. Inc.
Rohde & Schwarz Sales Co.
Rycom Instruments
SPI-ITT Metrix Instruments Div.
Telecommunications Technology

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B & K Precision Dynascan Corp.
Belar Electronics Lab., Inc.
C. S. P. Inc.
Data Precision Corp.
EIP Microwave
Elcom Engineering Co.
Engineering Associates
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Heath Co.
Hickok Elec. Inst. Co.
Lampkin Lab. Inc.
Rohde & Schwarz Sales Co.
Rycom Instruments
SPI-ITT Metrix Instruments Div.
Singer Products Co., Inc.
Systron-Donner

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Data Precision Corp.
Eidson Electronic Co.
Elcom Engineering Co.
Lampkin Lab. Inc.
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Alco Electronic Products, Inc.
B & K Precision Dynascan Corp.
Dranetz Engineering Labs., Inc.
Gralex Industries
Motorola Communications and Electronics Inc.
Nationwide Electronic Systems, Inc.
Selco Products Co.
Sencore Inc.

Meters, Modulation

Belar Electronics Lab., Inc.
Boonton Electronics
ESE
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Marconi Instruments Div. of Marconi Electronics Inc.
Radiometer Elec. U.S. Inc.
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Gralex Industries
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Dranetz Engineering Labs., Inc.
Gorman Redlich Mfg. Co.
Harris Corp. Broadcast Products Div.
Harris Corp. PRD Electronics Div.
Potomac Instruments, Inc.
SPI-ITT Metrix Instruments Div.
Tweed Audio USA Inc.

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Bayly Engineering Ltd. Member of AEG-Telefunken Group
Bird Electronic Corp.
Boonton Electronics
Dielectric Communications A Unit of General Signal
Dranetz Engineering Labs., Inc.
Electro Impulse, Inc.
Engineering Associates
Harris Corp. PRD Electronics Div.
Hickok Elec. Inst. Co.
Lampkin Lab. Inc.
Leader Instruments Corp.
The Narda Microwave Corporation
National Electrolab Ltd.
Rohde & Schwarz Sales Co.
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Bird Electronic Corp.
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C. S. P. Inc.
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Audio & Design Recording Inc.
Belar Electronics Lab., Inc.
ESE
G C Electronics Div. Wallace Murray
Gotham Audio Corp.
Philips Test & Measuring Instruments, Inc.
Quad-Eight Electronics
Rycom Instruments
Sadelco, Inc.
Selco Products Co.
Sencore Inc.
TEAC Corp of America
Telecommunications Technology

Meters, Standing Wave

Bird Electronic Corp.
Dielectric Communications A Unit of General Signal
G C Electronics Div. Wallace Murray
Harris Corp. PRD Electronics Div.
Hickok Elec. Inst. Co.
Micro Communications, Inc.
Rohde & Schwarz Sales Co.
SPI-ITT Metrix Instruments Div.

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Television Equipment Associates

Meters, Video Level

Philips Test & Measuring Instruments, Inc.
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Ballantine Labs, Inc.
California Instruments
Data Precision Corp.
John Fluke Mfg. Co., Inc.
G C Electronics Div. Wallace Murray
Heath Co.
Hickok Elec. Inst. Co.
Leader Instruments Corp.
Motorola Communications and Electronics Inc.
Rohde & Schwarz Sales Co.
SPI-ITT Metrix Instruments Div.
Sencore Inc.
Soar Electronics
Systron-Donner
Tektronix Inc.
Telecommunications Technology
United Systems Corp.
Vidaire Electronics Mfg.

Meters, VU

Amber Electro Design, Ltd.
Audio & Design Recording Inc.
Electro & Optical Systems Ltd.
G C Electronics Div. Wallace Murray
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
MICMIX Audio Products, Inc.
Roger Mayer Electronics, Inc.
Quad-Eight Electronics
Ramko Research Inc.
SPI-ITT Metrix Instruments Div.
Selco Products Co.
Sharepoint Systems Inc.
TEAC Corp of America
Track Audio, Inc. (TA)
Ward-Beck Systems, Ltd.

Microphone Boom Reconditioning Services

Atlas Sound
Television Products Co. Inc.

Microphone Cable Testers

Switchcraft Inc.

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Whirlwind Audio
Whirlwind Music

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DYMA Engineering, Inc.
Edcor
HM Electronics, Inc.
Harris Corp. Broadcast Products Div.
LPB Inc.
Micro-Trak Corp.
Nagra Magnetic Recorders, Inc.
Quad-Eight Electronics
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Switchcraft Inc.
Whirlwind Audio
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Altec Lansing Sound Products
Atlas Sound
BSC Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Bogen Div. Lear Siegler, Inc.
Broadcast Electronics, Inc.
Burns Audiotronics, Inc.
Cetec Broadcast Group
Edcor
G C Electronics Div. Wallace Murray
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
LPB Inc.
Neutrik
Paso Sound Products Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Strand Century, Inc.
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Television Products Co. Inc.

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Altec Lansing Sound Products
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Burns Audiotronics, Inc.
Cetec Broadcast Group
Electro-Voice Inc.
G C Electronics Div. Wallace Murray
Alan Gordon Enterprises Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Neutrik
Panasonic Company
Paso Sound Products Inc.
R-Columbia Products Co., Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Superex Electronics Corp.
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Applied Video Electronics, Inc.
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Bogen Div. Lear Siegler, Inc.
Broadcast Electronics, Inc.
Burns Audiotronics, Inc.
Cetec Broadcast Group
Edcor
Electro-Voice Inc.
GBC Closed Circuit TV Corp.
G C Electronics Div. Wallace Murray
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Neutrik
Panasonic Company
Panasonic Co. Video Systems Div.
Paso Sound Products Inc.
Sennheiser Electronic
Singer Products Co., Inc.
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Special Instruments Lab, Inc. Portasound Div.
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Broadcast Electronics, Inc.
Burns Audiotronics, Inc.
Cetec Broadcast Group
Electro-Voice Inc.
G C Electronics Div. Wallace Murray
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Neutrik
Panasonic Company
Panasonic Co. Video Systems Div.
Paso Sound Products Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Special Instruments Lab, Inc. Portasound Div.
TEAC Corp of America

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Audio-Technica U.S., Inc.
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Broadcast Electronics, Inc.
Burns Audiotronics, Inc.
Cetec Broadcast Group
DYMA Engineering, Inc.
Edcor
Electro-Voice Inc.
Ercona Corp.
G C Electronics Div. Wallace Murray
Alan Gordon Enterprises Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Neutrik
Panasonic Company
Panasonic Co. Video Systems Div.
Paso Sound Products Inc.
The Ken Schaffer Group, Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Special Instruments Lab, Inc. Portasound Div.
Studer Revox America
TEAC Corp of America
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Burns Audiotronics, Inc.
Cetec Broadcast Group
Coherent Communications
Edcor
Electro-Voice Inc.
G C Electronics Div. Wallace Murray
Alan Gordon Enterprises Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Nagra Magnetic Recorders, Inc.
Neutrik
Panasonic Co. Video Systems Div.
Paso Sound Products Inc.
The Ken Schaffer Group, Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Sony Corp. of America
Special Instruments Lab, Inc. Portasound Div.

Microphones, Parabolic and Shotgun

AKG Acoustics Div. Philips Audio Video Systems
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Burns Audiotronics, Inc.
Electro-Voice Inc.
Ercona Corp.
Gotham Audio Corp.
Neutrik
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Ercona Corp.
Alan Gordon Enterprises Inc.
HM Electronics, Inc.
Ikegami Electronics (USA) Inc.
Paso Sound Products Inc.
The Ken Schaffer Group, Inc.
Sennheiser Electronic
Singer Products Co., Inc.
Sony Corp. of America
Special Instruments Lab, Inc. Portasound Div.
Telex Communications, Inc.

Microwave Antenna Towers, ENG Van

E-N-G Corp.
Nurad, Inc.
VanLadder, Inc.
Wolf Coach Inc.

Microwave Components

UTE Microwave, Inc.

Microwave Systems, ENG

California Microwave
DYMA Engineering, Inc.
E-N-G Corp.
Farinon Video
Gabriel Electronics, Inc.
Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Hughes Aircraft Co. Microwave Communications Products
International Microwave Corp.
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
Nurad, Inc.
Prodelin Inc.
RCA Broadcast Systems
TerraCom Loral Corp.
Weinschel Engineering Co.

Microwave Systems, STL

Anderson Scientific
Cetec Broadcast Group
Comark Industries Inc.
DYMA Engineering, Inc.
Farinon Video
GTE Lenkurt, Inc.
Harris Corp. Broadcast Products Div.
Hughes Aircraft Co. Microwave Communications Products
International Microwave Corp.
Marti Electronics
Micro Communications, Inc.
Micro Control Associates, Inc.
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
Nurad, Inc.
RHG Electronics Laboratory, Inc.
Singer Products Co., Inc.
Tepco Corp.
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Bogen Div. Lear Siegler, Inc.
Broadcast Electronics, Inc.
Central Dynamics Corp.
Cetec Audio
Cetec Broadcast Group
Coherent Communications
Computer Image Video Controllers Dytek Industries, Inc.
Custom Audio Electronics
Dage-MTI, Inc.
Delta Electronics Inc. (N.C.)
DYMA Engineering, Inc.
Grass Valley Group, Inc.
HM Electronics, Inc.
Harris Corp. Broadcast Products Div.
Howe Audio Productions, Inc.
LPB Inc.
James B. Lansing Sound, Inc.
Roger Mayer Electronics, Inc.

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McCurdy Radio Ind. Inc.
McMartin Industries, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Nagra Magnetic Recorders, Inc.
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Panasonic Company
Paso Sound Products Inc.
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Quantum Audio Labs, Inc.
RHG Electronics Laboratory, Inc.
Ramko Research Inc.
Richmond Sound Design, Ltd.
Ross Video Ltd.
Russco Electronics Mfg. Inc.
Sigma System Engineering
Singer Products Co., Inc.
Sono-Mag Corp.
Sphere Electronics
Studer Revox America
Switchcraft Inc.
TEAC Corp of America
Technical Audio Products Corp.
Theatre Techniques Inc.
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Harris Corp. Broadcast Products Div.
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Jerrold Electronics Corp.
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Phasecom Corp.
Philips Test & Measuring Instruments, Inc.
Rohde & Schwarz Sales Co.
Scientific-Atlanta, Inc.
Telemet A Geotel Co.
Triple Crown Electronics, Inc.
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Varian Associates, Inc. Electron Device Group

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McKay Dymek Co.
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National Electrolab Ltd.
QEI Corp.
ROH Corporation
Singer Products Co., Inc.
Sono-Mag Corp.
Soundscriber Magnetic Recording Co., Inc.
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Comrex Corp.
Crown International, Inc.
Di-Tech Inc.
DYMA Engineering, Inc.
Electro-Voice Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
James B. Lansing Sound, Inc.
Marconi Communication Systems Ltd.
Marti Electronics
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Rupert Neve, Inc.
Orange County Electronics Int'l., Inc.
Protech Audio Corp.
ROH Corporation
Sennheiser Electronic
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Hitachi Denshi America, Ltd.
Javelin Electronics
Marconi Communication Systems Ltd.
Marconi Instruments Div. of Marconi Electronics Inc.
Panasonic Co. Video Systems Div.
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Hitachi Denshi America, Ltd.
Ikegami Electronics (USA) Inc.
Javelin Electronics
Lenco Inc. Electronics Div.
Motorola Communications and Electronics Inc.
Panasonic Company
Panasonic Co. Video Systems Div.
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Electrohome Ltd.
Harris Corp. Broadcast Products Div.
Hitachi Denshi America, Ltd.
Ikegami Electronics (USA) Inc.
Image Magnification, Inc.
Lectrotech Inc.
Lenco Inc. Electronics Div.
Panasonic Company
Panasonic Co. Video Systems Div.
Pleasantville Labs
QSI Systems, Inc.
Rohde & Schwarz Sales Co.
Sharp Electronics Corp.
Sony Corp. of America
Tektronix Inc.
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Videotek, Inc.
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Unimedia Corp.
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Electro & Optical Systems Ltd.
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Lectrotech Inc.
Lenco Inc. Electronics Div.
Marconi Communication Systems Ltd.
Rohde & Schwarz Sales Co.
Sharp Electronics Corp.
Tektronix Inc.
Ultra Audio Pixtec

Multicarrier Systems, FM

Coastcom
GTE Lenkurt, Inc.
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Sharepoint Systems Inc.

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Comark Industries Inc.
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Harris Corp. Broadcast Products Div.
Kalart Victor Corp.
Laird Telemedia Inc.
Micro Communications, Inc.
Moseley Associates, Inc.
Motorola Semiconductor Products Inc.
Mu-Del Electronics, Inc.
North Hills Electronics, Inc.
Shively Laboratories, Inc.
TT Electronics, Inc.
Tektronix Inc.
Telegen/Sofratev
Telemation, A Div. of Bell & Howell
TerraCom Loral Corp.
Thomson-CSF Laboratories, Inc.
Times Fiber Communications, Inc.
The Zei-Mark Corp.

Music, Production

Columbia Special Products
De Wolfe Music Library
Thomas Valentino Inc.

Music, Sound Effects

Columbia Special Products
De Wolfe Music Library
Thomas Valentino Inc.

Narrow Band FM Equipment

CSI Electronics, Inc.
Coastcom
Dielectric Communications A Unit of General Signal
Marti Electronics
McMartin Industries, Inc.
Motorola Communications and Electronics Inc.
Panasonic Company
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Comark Communications Industries, Inc.
Comark Industries Inc.
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
ESC Electronics Corp.
Electro Impulse, Inc.
Micro Communications, Inc.
Multronics, Inc.
North Hills Electronics, Inc.
TT Electronics, Inc.
Wide Band Engineering Co., Inc.

Networks, Mixing

Dielectric Communications A Unit of General Signal
Protech Audio Corp.
Quad-Eight Electronics
ROH Corporation
Tech Laboratories Inc.

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Collins Div. Rockwell International
Comark Industries Inc.
Continental Electronics Mfg. Co.
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Audio & Design Recording Inc.
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Consolidated Video Systems
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Dolby Laboratories, Inc.
Electro & Optical Systems Ltd.
Eventide Clock Works Inc.
Yves Faroudja, Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
Heath Co.
Inovonics
Kahn Communications, Inc.
Roger Mayer Electronics, Inc.
Micro Consultants
Microtime, Inc.
NEC America, Inc. Broadcast Equip. Div.
Orange County Electronics Int'l., Inc.
Philips Broadcast Equip Corp.
Telemation, A Div. of Bell & Howell
Thomson-CSF Laboratories, Inc.

Oscillator Transformers

Nortronics Co., Inc. Recorder Care Div.
TT Electronics, Inc.
Weinschel Engineering Co.

Oscillators, AM

Delta Electronics Inc. (Va.)
DYMA Engineering, Inc.
John Fluke Mfg. Co., Inc.
Frequency Devices Inc.
Heath Co.
International Microwave Corp.
Lampkin Lab. Inc.
Marconi Instruments Div. of Marconi Electronics Inc.
Opamp Labs, Inc.
Philips Test & Measuring Instruments, Inc.
Rohde & Schwarz Sales Co.
Singer Products Co., Inc.
Texscan Corp.

Oscillators, FM

Continental Specialties Corp.
John Fluke Mfg. Co., Inc.
Frequency Devices Inc.
Heath Co.
Marconi Instruments Div. of Marconi Electronics Inc.
Rohde & Schwarz Sales Co.
Texscan Corp.

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Altec Lansing Sound Products
Bald Mountain Lab
Channelmatic, Inc.
Continental Specialties Corp.
Frequency Devices Inc.
Gorman Redlich Mfg. Co.
Hewlett-Packard Co.
IGM Div. of Northwestern Tech.
Ionic Industries, Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Monroe Electronics, Inc.
Motorola Communications and Electronics Inc.
Rupert Neve, Inc.
Opamp Labs, Inc.
Protech Audio Corp.
Quad-Eight Electronics
Sphere Electronics
TM Systems, Inc.
Telecommunications Technology
Wang Voice Comm. Inc.
Ward-Beck Systems, Ltd.

Oscillators, TV

ATV Research
Asaca Corp. of America
Heath Co.
Lectrotech Inc.
Leitch Video Ltd.
Marconi Instruments Div. of Marconi Electronics Inc.
Rohde & Schwarz Sales Co.
Tektronix Inc.

Oscilloscope Cameras

Harris Corp. Broadcast Products Div.
Lenzar Optics Corp.
Philips Test & Measuring Instruments, Inc.
Tektronix Inc.

Oscilloscope Vector Displays

Alford Mfg. Co.
B & K Precision Dynascan Corp.
Broadcast Video Systems, Ltd.
Electro & Optical Systems Ltd.
Harris Corp. Broadcast Products Div.
Heath Co.
Lectrotech Inc.
Lenco Inc. Electronics Div.
Sencore Inc.
Tektronix Inc.
Ultra Audio Pixtec

Oscilloscopes, Dual Trace

B & K Precision Dynascan Corp.
Ballantine Labs, Inc.
Gould Inc. Instruments Div.
Harris Corp. Broadcast Products Div.
Heath Co.
Hickok Elec. Inst. Co.
Hitachi Denshi America, Ltd.
Leader Instruments Corp.
Lectrotech Inc.
Motorola Communications and Electronics Inc.
Philips Test & Measuring Instruments, Inc.
SPI-ITT Metrix Instruments Div.
Sencore Inc.
Tektronix Inc.

Oscilloscopes, Rack Type

B & K Precision Dynascan Corp.
Ballantine Labs, Inc.
California Instruments
Gould Inc. Instruments Div.
Harris Corp. Broadcast Products Div.
Hickok Elec. Inst. Co.
Leader Instruments Corp.
Lenco Inc. Electronics Div.
Philips Test & Measuring Instruments, Inc.
Tektronix Inc.

Oscilloscopes, Triggered Sweep

B & K Precision Dynascan Corp.
Ballantine Labs, Inc.
Gould Inc. Instruments Div.
Harris Corp. Broadcast Products Div.
Heath Co.
Hickok Elec. Inst. Co.
Leader Instruments Corp.
Lectrotech Inc.
Motorola Communications and Electronics Inc.
Philips Test & Measuring Instruments, Inc.
SPI-ITT Metrix Instruments Div.
Sencore Inc.
Singer Products Co., Inc.
Tektronix Inc.

Oscilloscopes, Wideband

Gould Inc. Instruments Div.
Harris Corp. Broadcast Products Div.
Heath Co.
Hickok Elec. Inst. Co.
Leader Instruments Corp.
Lectrotech Inc.
Philips Test & Measuring Instruments, Inc.
SPI-ITT Metrix Instruments Div.
Sencore Inc.
Tektronix Inc.

Oscilloscopes with Plug-ins

SPI-ITT Metrix Instruments Div.
Tektronix Inc.

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Bayly Engineering Ltd. Member of AEG-Telefunken Group
Broadcast Electronics, Inc.
Continental Specialties Corp.
Geleco Electronics Ltd.
Merlin Engineering Works, Inc.
Microtran Co., Inc.
Panasonic Company
RCA Solid State Div.
UTE Microwave, Inc.
Varian Associates, Inc. Electron Device Group
Varian/Beverly Micro-Link Products
Vector Electronic Co., Inc.

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Altec Lansing Sound Products
Audio Accessories Inc.
Audio Designs & Mfg.
Auditronics, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Berkey-Colortran Inc.
Broadcast Electronics, Inc.
CCA Electronics Corp.
Comark Industries Inc.
Dielectric Communications A Unit of General Signal
DYMA Engineering, Inc.
Dynatech Data Systems
Glentronix Ltd.
Harris Corp. Broadcast Products Div.
Kliegl Bros. Lighting
Micro Communications, Inc.
Phelps Dodge Communications Co.
Potomac Instruments, Inc.
Rex Rheostat & Co., Inc.
Shively Laboratories, Inc.
Singer Products Co., Inc.
Strand Century, Inc.
Switchcraft Inc.
TEAC Corp of America
Telectric Co.
Theatre Techniques Inc.
Trompeter Electronics
Union Connector Co., Inc.

Phase Converters, Single to Three Phase

California Instruments
Harris Corp. Broadcast Products Div.
Kay Industries, Inc.

Phase Enhancers, Stereo

EDCO Products, Inc.

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Alford Mfg. Co.
CSI Electronics, Inc.
C. S. P. Inc.
Comark Industries Inc.
Continental Electronics Mfg. Co.
Dielectric Communications A Unit of General Signal
Eventide Clock Works Inc.
Geleco Electronics Ltd.
Harris Corp. Broadcast Products Div.
Ikegami Electronics (USA) Inc.
Kahn Communications, Inc.
Multronics, Inc.
TT Electronics, Inc.

Plans, Broadcast Equipment Construction

Audicon, Inc.
Don Britton Enterprises
C. S. P. Inc.
Centro Corp.
DYMA Engineering, Inc.
Harris Corp. Broadcast Products Div.
RMC-Radio Mfg. Co.
Sharepoint Systems Inc.
Suda Seisakusho Co., Ltd.

Pointers, Video Screen

Central Dynamics Corp.
Ednalite Corp.
Industrial Sciences, Inc. (ISI)
Interand Corp. Telestrator Div.

Power Supplies, AC

AKG Acoustics Div. Philips Audio Video Systems
Altec Lansing Sound Products
Keith Anderson Co.
Anderson Scientific
B & K Precision Dynascan Corp.
California Instruments
Cetec Broadcast Group
Delta Electronics Inc. (N.C.)
Engineering Associates
The Finney Co.
John Fluke Mfg. Co., Inc.
G C Electronics Div. Wallace Murray
Heath Co.
ITI Electronics, Inc.
Jerrold Electronics Corp.
Kay Industries, Inc.
Merill Cable Equipment Corp.
Motorola Communications and Electronics Inc.
Nagra Magnetic Recorders, Inc.
Nova Electric Mfg. Co.
Opamp Labs, Inc.
Quad-Eight Electronics
Sencore Inc.
Singer Products Co., Inc.
Sorenson Co. A Unit of Raytheon Co.
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Boston Sound & Power Systems
California Instruments
Comark Communications Industries, Inc.
Computer Products Inc. Power Products Div.
Engineering Associates
Frequency Devices Inc.
G C Electronics Div. Wallace Murray
Harris Corp. PRD Electronics Div.
Heath Co.
Lectrotech Inc.
Modular Audio Products Unit of Modular Devices, Inc.
North Hills Electronics, Inc.
Opamp Labs, Inc.
Protech Audio Corp.
Sorenson Co. A Unit of Raytheon Co.
Systron-Donner
Tektronix Inc.
Ward-Beck Systems, Ltd.

Power Supplies, Standby

Computer Products Inc. Power Products Div.
Kay Industries, Inc.
Nova Electric Mfg. Co.
Tech Laboratories Inc.
Topaz Electronics

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Audio & Design Recording Inc.
Audio Designs & Mfg.
Audio Interface, Inc.
Audionics, Inc.
Autogram Corp.
Automated Processes, Inc.
BGW Systems Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
Bell Audio Systems, Inc.
Blonder-Tongue Labs.
Bogen Div. Lear Siegler, Inc.
Boston Sound & Power Systems
Broadcast Electronics, Inc.
Cetec Broadcast Group
Crown International, Inc.
Delta Electronics Inc. (N.C.)
DYMA Engineering, Inc.
Dynair Electronics, Inc.
Electro Sound, Inc.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Heath Co.
Holland Electronics
Integrated Solid Systems Inc. GLI Brand
International Communications & Control Corp.
International Nuclear Corp.
Kaitronics Corp.
James B. Lansing Sound, Inc.
Logitek Electronic Systems, Inc.
McCurdy Radio Ind. Inc.
McMartin Industries, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Motorola Semiconductor Products Inc.
Nagra Magnetic Recorders, Inc.
Rupert Neve, Inc.
Opamp Labs, Inc.
Orange County Electronics Int'l., Inc.
Panasonic Company
Paso Sound Products Inc.
Protech Audio Corp.
QRK Electronic Products
Quad-Eight Electronics
RCA Broadcast Systems
RMC-Radio Mfg. Co.
ROH Corporation
RTS Systems, Inc.
Ramko Research Inc.
Richmond Sound Design, Ltd.
Russco Electronics Mfg. Inc.

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Sescom, Inc.
Shure Brothers Inc.
Singer Products Co., Inc.
Sono-Mag Corp.
Sontec Electronics
Spectra Sonics
Sphere Electronics
Stanton Magnetics Inc.
Studer Revox America
Superex Electronics Corp.
Tape-Athon Corp.
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International Communications & Control Corp.
Roger Mayer Electronics, Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Orange County Electronics Int'l., Inc.
Protech Audio Corp.
Quad-Eight Electronics
Ramko Research Inc.
Richmond Sound Design, Ltd.
Sescom, Inc.
Singer Products Co., Inc.
Sontec Electronics
Spectra Sonics
Track Audio, Inc. (TA)
Ultra Audio Pixtec
Wang Voice Comm. Inc.

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Audio & Design Recording Inc.
Audio Designs & Mfg.
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Automated Processes, Inc.
Cetec Broadcast Group
DYMA Engineering, Inc.
Edcor
Gregg Laboratories
Harris Corp. Broadcast Products Div.
Holland Electronics
ITI Electronics, Inc.
International Communications & Control Corp.
Logitek Electronic Systems, Inc.
Roger Mayer Electronics, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Nagra Magnetic Recorders, Inc.
Opamp Labs, Inc.
Protech Audio Corp.
QRK Electronic Products
Quad-Eight Electronics
ROH Corporation
RTS Systems, Inc.
Ramko Research Inc.
Richmond Sound Design, Ltd.
Russco Electronics Mfg. Inc.
Sescom, Inc.
Sontec Electronics
Spectra Sonics
Sphere Electronics
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DYMA Engineering, Inc.
Eumig USA, Inc.
Harris Corp. Broadcast Products Div.
Heath Co.
Integrated Solid Systems Inc. GLI Brand
International Communications & Control Corp.
Logitek Electronic Systems, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Panasonic Company
Protech Audio Corp.
QRK Electronic Products
RMC-Radio Mfg. Co.
Ramko Research Inc.
Richmond Sound Design, Ltd.
Russco Electronics Mfg. Inc.
Sontec Electronics
Spectra Sonics
Wang Voice Comm. Inc.

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BGW Systems Inc.
Broadcast Electronics, Inc.
Cetec Broadcast Group
DYMA Engineering, Inc.
Gregg Laboratories
Harris Corp. Broadcast Products Div.
Integrated Solid Systems Inc. GLI Brand
International Communications & Control Corp.
LPB Inc.
Logitek Electronic Systems, Inc.
McCurdy Radio Ind. Inc.
McMartin Industries, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Rupert Neve, Inc.
Opamp Labs, Inc.
Pinzone Communications Products Inc.
Protech Audio Corp.
QRK Electronic Products
RMC-Radio Mfg. Co.
ROH Corporation
Ramko Research Inc.
Russco Electronics Mfg. Inc.
Shure Brothers Inc.
Singer Products Co., Inc.
Sontec Electronics
Spectra Sonics
Stanton Magnetics Inc.
Track Audio, Inc. (TA)
United Recording Electronics Industries
Wilkinson Electronics, Inc.

Preamplifiers, Video

Blonder-Tongue Labs.
Gardiner Communications Corp.
International Nuclear Corp.
Kaitronics Corp.
Lenco Inc. Electronics Div.
Radiation Devices Co., Inc.

Pressurization Equipment, Transmission Line

Andrew Corp.
CCA Electronics Corp.
Cablewave Systems Inc.
Cetec Broadcast Group
Dielectric Communications A Unit of General Signal
General Cable Corp.
Harris Corp. Broadcast Products Div.
Micro Communications, Inc.

Probes, Oscilloscope

B & K Precision Dynascan Corp.
Heath Co.
Hickok Elec. Inst. Co.
Leader Instruments Corp.
Lectrotech Inc.
Philips Test & Measuring Instruments, Inc.
SPI-ITT Metrix Instruments Div.
Tektronix Inc.

Processors, Electronic Still

ADDA Corp.
Echo Science Corp.

Processors, Film Color

Allen Products Co.
Houston Fearless 76
Houston Photo Products, Inc.
Jamieson Film Co.
Kreonite, Inc.
Radmar, Inc.

Processors, Silver Recovery Unit

Eastman Kodak Co.
Houston Fearless 76
Houston Photo Products, Inc.
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Dynasciences Div. Whittaker Corp.
Yves Faroudja, Inc.
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Lenco Inc. Electronics Div.
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Production Systems, AM or FM Remote or Studio

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MICMIX Audio Products, Inc.
Micro-Trak Corp.
Moseley Associates, Inc.
Orange County Electronics Int'l., Inc.
Pacific Recorders and Engrg. Corp.
Protech Audio Corp.
Sharepoint Systems Inc.
Singer Products Co., Inc.
Tangent Systems, Inc.

Programmed Music

Emil Ascher, Inc.
Broadcast Programming Int'l., Inc.
The CnB Studios
CaVox Stereo Productions
Cetec Broadcast Group
Command Productions Radio Broadcasting Services
Musicworks, Inc.
Radio Arts
Tape-Athon Corp.
Thomas Valentino Inc.

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The BTX Corp.
ESE
PWH Electronics
Tape-Athon Corp.

Programmers, Patchboard/Thumbwheel

Cherry Electrical Products
ESE
Harris Corp. Broadcast Products Div.

Projector Lamps

GTE Sylvania Inc. Lighting Products Group
Packaged Lighting Systems
Plastic Reel Corp. of America
Riluma Co. of America
Sitler's Supplies, Inc.
Strand Century, Inc.
Varian Associates, Inc. Electron Device Group

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Bell & Howell Audio Visual Div.
Dukane Corp. Audio-Visual Div.
Eastman Kodak Co.
Alan Gordon Enterprises Inc.
Harris Corp. Broadcast Products Div.
Kalart Victor Corp.
L-W International
Laird Telemedia Inc.
Optical Radiation Corp.
Radmar, Inc.
The Zei-Mark Corp.

Projectors, Film Cassette Loading

Dukane Corp. Audio-Visual Div.
Radmar, Inc.

Projectors, Film Rear

Dukane Corp. Audio-Visual Div.
Electro & Optical Systems Ltd.
Radmar, Inc.

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Eastman Kodak Co.
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Kliegl Bros. Lighting
Laird Telemedia Inc.
Mast Development Co. A-V Systems Div.
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Radmar, Inc.
Spindler & Sauppe, Inc.
The Zei-Mark Corp.

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Electrohome Ltd.
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Ikegami Electronics (USA) Inc.
Image Magnification, Inc.
Kalart Victor Corp.
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Panasonic Co. Video Systems Div.
Projection Systems, Inc.
Schudel, Inc.
Sony Corp. of America

Prompters

BEI Beston Electronics, Inc.
Q-TV
Telescript, Inc.

Proof Workbook (For FCC test requirements)

Intertec Publishing Corp.

Pulse Assignment Systems

Broadcast Video Systems, Ltd.
Central Dynamics Corp.
Kaitronics Corp.
Leitch Video Ltd.
Lenco Inc. Electronics Div.

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Collins Div. Rockwell International
DYMA Engineering, Inc.
Industrial Marketing Advisory Services, Inc.
RMC-Radio Mfg. Co.

Quadraphonic Systems

Audionics, Inc.
Belar Electronics Lab., Inc.
Catel Div. United Scientific Corp.
Cetec Audio
Heath Co.
Rupert Neve, Inc.
Spectra Sonics

Radar, Weather

Arvin/Echo Science Corp.
Echo Science Corp.
Enterprise Electronics Corp.
TSC Development Labs.
Technology Service Corp. Development Labs Div.
Varian Associates, Inc. Electron Device Group
Weathermation, Inc.
Weather Scan, Inc.

Radomes

Andrew Corp.
Cetec Broadcast Group
Collins Div. Rockwell International
Gabriel Electronics, Inc.
Harris Corp. Broadcast Products Div.
Micro Communications, Inc.
Nurad, Inc.
Shively Laboratories, Inc.

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Bogen Div. Lear Siegler, Inc.
Delta Electronics Inc. (Va.)
Elcom Engineering Co.
Heath Co.
International Microwave Corp.
Kahn Communications, Inc.
Marconi Instruments Div. of Marconi Electronics Inc.
McKay Dymek Co.
McMartin Industries, Inc.
Micro Communications, Inc.
National Electrolab Ltd.
Panasonic Company
Sansui Electronics Corp.
Singer Products Co., Inc.

Receivers, Data

Coastcom
Electrohome Ltd.
International Microwave Corp.
McMartin Industries, Inc.
Moseley Associates, Inc.
Radiation Devices Co., Inc.

Receivers, EBS

Elcom Engineering Co.
Fix Tune Solid State Electronics, Inc.
Gorman Redlich Mfg. Co.
Harris Corp. Broadcast Products Div.
Logitek Electronic Systems, Inc.
McMartin Industries, Inc.
Time & Frequency Tech., Inc.

Receivers, Earth Station

California Microwave
Gardiner Communications Corp.
Harris Corp. Broadcast Products Div.
Microdyne Corp.
TerraCom Loral Corp.

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Bell Audio Systems, Inc.
Bogen Div. Lear Siegler, Inc.
CCA Electronics Corp.
Catel Div. United Scientific Corp.
Electrohome Ltd.
Fix Tune Solid State Electronics, Inc.
GTE Lenkurt, Inc.
Heath Co.
International Microwave Corp.
Johnson Electronics Inc.
Marconi Instruments Div. of Marconi Electronics Inc.
Marti Electronics
McMartin Industries, Inc.
Micro Communications, Inc.
Panasonic Company
RHG Electronics Laboratory, Inc.
Rohde & Schwarz Sales Co.
Sansui Electronics Corp.
The Ken Schaffer Group, Inc.
Scientific Radio Systems, Inc.
Singer Products Co., Inc.
Studer Revox America
Times Fiber Communications, Inc.
Wilkinson Electronics, Inc.

Receivers, HF

Collins Div. Rockwell International
Elcom Engineering Co.
Engineering Associates
Heath Co.
Marconi Electronics Inc. Broadcast & Communication Div.
Marconi Instruments Div. of Marconi Electronics Inc.
McKay Dymek Co.
Rohde & Schwarz Sales Co.
Scientific Radio Systems, Inc.
Singer Products Co., Inc.

Receivers, Microwave

AILTECH Div. Cutler-Hammer Los Angeles Operation
Engineering Associates
Farinon Video
International Microwave Corp.
Marti Electronics
Micro Control Associates, Inc.
Microdyne Corp.
Moseley Associates, Inc.
Nurad, Inc.
RHG Electronics Laboratory, Inc.
Scientific-Atlanta, Inc.
Tepco Corp.
TerraCom Loral Corp.
Varian Associates, Inc. Electron Device Group
Varian/Beverly Micro-Link Products

Receivers, Multiplex

CCA Electronics Corp.
Coastcom
GTE Lenkurt, Inc.
Heath Co.
International Microwave Corp.
McMartin Industries, Inc.
Moseley Associates, Inc.
Singer Products Co., Inc.

Receivers, SCA

Contel Mfg.
Fix Tune Solid State Electronics, Inc.
Harris Corp. Broadcast Products Div.
Johnson Electronics Inc.
Marti Electronics
McMartin Industries, Inc.
Moseley Associates, Inc.
Singer Products Co., Inc.

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ESE
Elcom Engineering Co.

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Image Magnification, Inc.
Panasonic Company
Panasonic Co. Video Systems Div.
Pleasantville Labs
QSI Systems, Inc.
Rohde & Schwarz Sales Co.
Sharp Electronics Corp.
Sony Corp. of America

Receivers, TV Monochrome

Electrohome Ltd.
Heath Co.
Panasonic Company
Panasonic Co. Video Systems Div.
QSI Systems, Inc.
Sony Corp. of America

Receivers, 162.55 MHz Weather

Catel Div. United Scientific Corp.
Gorman Redlich Mfg. Co.
Heath Co.
Motorola Communications and Electronics Inc.
Scientific Radio Systems, Inc.
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Stanton Magnetics Inc.

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Harris Corp. Broadcast Products Div.
Inovonics
International Tapetronics Corp.
Taber Mfg. & Engr. Co.
Telectro Systems Corp.
Telex Communications, Inc.
Transist-O-Sound Inc.
United Research Lab Corp.
VIF International

Recorder Care Kits, Video

KAPCO Communications
Nortronics Co., Inc. Recorder Care Div.

Recorder Carrying Systems, Videotape Portable

Comprehensive Video Supply Corp.
Gruber Products Co.
Javelin Electronics
K & H Products, Ltd.
Panasonic Company

Recorder Drive Motor Power Supply Units

Merlin Engineering Works, Inc.

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Recorder Reconditioning, Videotape

A. F. Associates, Inc.
Applied Video Electronics, Inc.
Lawhed, Ltd.
Merlin Engineering Works, Inc.
RCA Broadcast Systems

Recorder Replacement Capstan Assembly

Triple I
United Research Lab Corp.

Recorder Replacement Electronics

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Computer Magnetics Corp.
Inovonics
Lawhed, Ltd.
Merlin Engineering Works, Inc.
Opamp Labs, Inc.
Orange County Electronics Int'l., Inc.
Sharepoint Systems Inc.
Taber Mfg. & Engr. Co.
Telex Communications, Inc.
United Research Lab Corp.
VIF International

Recorder Replacement Motors

Ampro/Scully Div. Ram Mfg. Inc.
Broadcast Electronics, Inc.
Merlin Engineering Works, Inc.
UMC Electronics Co. Broadcast Products Div.
United Research Lab Corp.

Recorder Tape Tension Controls, Audio

Inovonics

Recorder Tape Tension Controls, VTR

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Microtime, Inc.
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Recorder Velocity Error Correctors

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Digital Video Systems
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Recorder V-Lock Helical Attachments

ENG Products Corp.
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Cetec Broadcast Group
Consolidated Electronic Industries
Contel Mfg.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
International Electro-Magnetics
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Panasonic Company
RCA Broadcast Systems
Ramko Research Inc.
Telex Communications, Inc.
UMC Electronics Co. Broadcast Products Div.
Video Research Corp.

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EDCO Products, Inc.
Heath Co.
Javelin Electronics
Micro-Trak Corp.
Panasonic Company
Radmar, Inc.
Ramko Research Inc.
Super 8 Sound, Inc.
TEAC Corp of America
Telex Communications, Inc.
Video Research Corp.

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Broadcast Electronics, Inc.
Cetec Broadcast Group
Consolidated Electronic Industries
Harris Corp. Broadcast Products Div.
International Electro-Magnetics
International Tapetronics Corp.
MCI, Inc.
McCurdy Radio Ind. Inc.
Micro-Trak Corp.
Nagra Magnetic Recorders, Inc.
Rupert Neve, Inc.
Otari Corp.
Pacific Recorders and Engrg. Corp.
Panasonic Company
Ramko Research Inc.
Studer Revox America
TEAC Corp of America
Tektronix Inc.
Telectro Systems Corp.
Telex Communications, Inc.
United Research Lab Corp.
Video Research Corp.

Recorders, Camera Tape to Film

AEG-Telefunken Magnetic Tape Recorder Dept.
Flash Technology Corp. of America

Recorders, Film Magnetic Sound

Frezzolini Electronics, Inc.
Keeline Int'l.
Magnasync/Moviola Corp.
Magna-Tech Electronic Co., Inc.
Opamp Labs, Inc.
RCA Broadcast Systems
Super 8 Sound, Inc.
Wide Range Electronics

Recorders, Film Optical Sound

Opamp Labs, Inc.
RCA Broadcast Systems
Wide Range Electronics

Recorders, Magnetic Tape Logging

Amilon Corp.
B & K Instruments Inc.
Cetec Broadcast Group
EMT Franz VGmbH
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Magnasync/Moviola Corp.
Nagra Magnetic Recorders, Inc.
QSI Systems, Inc.
Singer Products Co., Inc.
Sono-Mag Corp.
Soundscriber Magnetic Recording Co., Inc.
Stancil-Hoffman Corp.
Studer Revox America
Telectro Systems Corp.
Telex Communications, Inc.
Video Research Corp.

Recorders, Paper Logging and Graphic

B & K Instruments Inc.
Broadcast Electronics, Inc.
John Fluke Mfg. Co., Inc.
Gould Inc. Instruments Div.
Harris Corp. Broadcast Products Div.
Heath Co.
Moseley Associates, Inc.
Philips Test & Measuring Instruments, Inc.
Rohde & Schwarz Sales Co.
Scientific-Atlanta, Inc.
Sono-Mag Corp.
United Recording Electronics Industries

Recorders, Program Logging

Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
QSI Systems, Inc.
Soundscriber Magnetic Recording Co., Inc.
Telectro Systems Corp.
Telex Communications, Inc.

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Javelin Electronics
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Oktel Corp.
Recortec Inc.
TEAC Corp of America

Recorders, Videotape Cartridge

Cinema Products Corp.
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Panasonic Company
Panasonic Co. Video Systems Div.
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RCA Broadcast Systems
RCA Solid State Div.
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International Video Corp.
Javelin Electronics
Marconi Electronics Inc. Broadcast & Communication Div.
NEC America, Inc. Broadcast Equip. Div.
Panasonic Co. Video Systems Div.
Philips Broadcast Equip Corp.
QSI Systems, Inc.
RCA Broadcast Systems
Recortec Inc.
Sony Corp. of America
US JVC Corp. Professional Video Div.

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A. F. Associates, Inc.
Ampex Corp.
Asaca Corp. of America
Merlin Engineering Works, Inc.
RCA Broadcast Systems
Recortec Inc.

Recording Services, Audiotape

Audio Magnetics Corp.
Command Productions Radio Broadcasting Services
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Media Concepts, Inc.
Tape-Athon Corp.
United Research Lab Corp.
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Schuessler Case Co., Inc.
Sony Corp. of America
3M Co. Magnetic Audio/Video Prod. Div.

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Fort Worth Tower Co., Inc.
Suda Seisakusho Co., Ltd.
Unarco-Rohn Div. of Unarco Ind., Inc.
Utility Tower Co.

Regulators, Voltage

Bayly Engineering Ltd. Member of AEG-Telefunken Group
California Instruments
Harris Corp. Broadcast Products Div.
Hitran Corp.
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Micro-Trak Corp.
Moseley Associates, Inc.
Motorola Communications and Electronics Inc.
Power-Optics Inc.

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Comark Industries Inc.
Continental Electronics Mfg. Co.
Delta Electronics Inc. (Va.)
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E.M.S Inc.
Electro & Optical Systems Ltd.
Hallikainen & Friends, Inc.
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
Image Magnification, Inc.
Image Video Ltd.
Kaitronics Corp.
Logitek Electronic Systems, Inc.
Marconi Communication Systems Ltd.
Marconi Instruments Div. of Marconi Electronics Inc.
Marti Electronics
McMartin Industries, Inc.
Micro Control Associates, Inc.
Monroe Electronics, Inc.
Moseley Associates, Inc.
Nurad, Inc.
PWH Electronics
Power-Optics Inc.
Protech Audio Corp.
Richmond Sound Design, Ltd.
Sharepoint Systems Inc.
Sono-Mag Corp.
Tele-Cine Inc.
Telecommunications Technology
Time & Frequency Tech., Inc.
Torpey Controls & Engineering Ltd.
Utah Scientific, Inc.
Vamco Engineering

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Gorman Redlich Mfg. Co.
Harris Corp. Broadcast Products Div.
International Microwave Corp.
Marti Electronics
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Moseley Associates, Inc.
Motorola Communications and Electronics Inc.
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Nurad, Inc.
Singer Products Co., Inc.
TerraCom Loral Corp.

Rental Equipment

Audicon, Inc.
Belden Communications, Inc.
Alan Gordon Enterprises Inc.
KVC, Inc.
Kliegl Bros. Lighting
Leasametric
One Pass Video
Plastic Reel Corp. of America
Power-Optics Inc.
RMC-Radio Mfg. Co.
Special Instruments Lab, Inc.
Portasound Div.
Tele-Cine Inc.
Video Rentals, Inc. Subs. of AF Associates

Reverberation Systems

AKG Acoustics Div. Philips Audio Video Systems
Altec Lansing Sound Products
Audicon, Inc.
DYMA Engineering, Inc.
EMT Franz VGmbH
Eventide Clock Works Inc.
Gotham Audio Corp.
Harris Corp. Broadcast Products Div.
MICMIX Audio Products, Inc.
Neutrik
Opamp Labs, Inc.
Orban Assoc. Inc.
Protech Audio Corp.
Quad-Eight Electronics
Quantum Audio Labs, Inc.
The Ken Schaffer Group, Inc.
Singer Products Co., Inc.
Technical Audio Products Corp.
URSA Major, Inc.
Wang Voice Comm. Inc.

Rewinders, Film

Kalart Victor Corp.
Magnasync/Moviola Corp.
Neumade Products Corp.
Plastic Reel Corp. of America
Research Technology, Inc.

Rewinders, Tape

Audico, Ltd.
Broadcast Electronics, Inc.
Magnesonics Mfg. & Sales Co.
Merlin Engineering Works, Inc.
Neumade Products Corp.
Pentagon Industries, Inc.
Plastic Reel Corp. of America
Ramko Research Inc.
Singer Products Co., Inc.

Safety Devices, Ladder

DHV, Inc.
Unarco-Rohn Div. of Unarco Ind., Inc.

Satellite, Program Distribution Services

Mutual Broadcasting System
RCA American Communications

Scramblers, Speech

Motorola Communications and Electronics Inc.
Panasonic Company

Screens, Projection Front

D. O. Industries
Da-Lite Screen Co., Inc.
Electrohome Ltd.
Raven Screen Corp.
Schudel, Inc.
Wilcox-Lange, Inc.

Screens, Projection Rear

Da-Lite Screen Co., Inc.
Raven Screen Corp.
Schudel, Inc.
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Cherry Electrical Products
Cherry Semiconductor
EEV Canada Ltd.
Electrolabs
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
JSH Electronics, Inc. A member co. of VSi Electronics
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Motorola Semiconductor Products Inc.
Opamp Labs, Inc.
Panasonic Company
RCA Distributor & Special Products Div.
RCA Solid State Div.
UHF Associates

Semiconductors, Rectifier General

Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
EEV Canada Ltd.
Electronic Devices, Inc.
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Motorola Semiconductor Products Inc.
RCA Distributor & Special Products Div.
Singer Products Co., Inc.
Varian Associates, Inc. Electron Device Group
Westinghouse Elec. Corp. Semiconductor Div.

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Electronic Devices, Inc.
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Motorola Semiconductor Products Inc.
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Westinghouse Elec. Corp. Semiconductor Div.
Wilkinson Electronics, Inc.

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Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
EEV Canada Ltd.
Electronic Devices, Inc.
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Motorola Semiconductor Products Inc.
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Westinghouse Elec. Corp. Semiconductor Div.

Semiconductors, Rectifier Silicon Controlled-SCR

Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
EEV Canada Ltd.
G C Electronics Div. Wallace Murray
Motorola Semiconductor Products Inc.
Panasonic Company
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Varian Associates, Inc. Electron Device Group
Westinghouse Elec. Corp. Semiconductor Div.

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Semiconductors, Thyristor

Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
EEV Canada Ltd.
G C Electronics Div. Wallace Murray
Motorola Semiconductor Products Inc.
Panasonic Company
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Westinghouse Elec. Corp. Semiconductor Div.

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Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
G C Electronics Div. Wallace Murray
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Motorola Semiconductor Products Inc.
Panasonic Company
RCA Distributor & Special Products Div.
Singer Products Co., Inc.

Semiconductors, Transistor FET

Bayly Engineering Ltd. Member of AEG-Telefunken Group
G C Electronics Div. Wallace Murray
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Motorola Semiconductor Products Inc.
Panasonic Company
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Varian Associates, Inc. Electron Device Group

Semiconductors, Transistor General

Amperex Electronic Corp. Slatersville Div.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Motorola Semiconductor Products Inc.
Panasonic Company
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Westinghouse Elec. Corp. Semiconductor Div.

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Amperex Electronic Corp. Slatersville Div.
Avantek, Inc.
Bayly Engineering Ltd. Member of AEG-Telefunken Group
EEV Canada Ltd.
G C Electronics Div. Wallace Murray
Motorola Semiconductor Products Inc.
Panasonic Company
RCA Distributor & Special Products Div.
RCA Solid State Div.
Singer Products Co., Inc.
Varian Associates, Inc. Electron Device Group

Sensors, Tone

Cetec Broadcast Group
Channelmatic, Inc.
Consolidated Electronic Industries
Frequency Devices Inc.
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Monroe Electronics, Inc.
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Micro Communications, Inc.
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MacKenzie Laboratories, Inc.
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Richmond Sound Design, Ltd.
The Ken Schaffer Group, Inc.
Spectrum Instruments, Inc.
Track Audio, Inc. (TA)
URSA Major, Inc.
Thomas Valentino Inc.

Sound Systems, Automatic Level Control

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Moseley Associates, Inc.
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McMartin Industries, Inc.
Micro-Trak Corp.
Paso Sound Products Inc.
Perma Power Electronics, Inc.
Protech Audio Corp.
Quad-Eight Electronics
Richmond Sound Design, Ltd.
The Ken Schaffer Group, Inc.
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Special Instruments Lab, Inc.
Portasound Div.
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Edcor
Electro-Voice Inc.
Heath Co.
Integrated Solid Systems Inc. GLI Brand
James B. Lansing Sound, Inc.
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Micro-Trak Corp.
Nagra Magnetic Recorders, Inc.
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Protech Audio Corp.
Quad-Eight Electronics
Richmond Sound Design, Ltd.
The Ken Schaffer Group, Inc.
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Crown International, Inc.
Delta Electronics Inc. (N.C.)
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Hartley Products Corp.
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McMartin Industries, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
Orange County Electronics Int'l., Inc.
Panasonic Company
Paso Sound Products Inc.
Protech Audio Corp.
Quad-Eight Electronics
Richmond Sound Design, Ltd.
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Electro Sound, Inc.
Electro-Voice Inc.
Hartley Products Corp.
IGM Div. of Northwestern Tech.
Integrated Solid Systems Inc. GLI Brand
James B. Lansing Sound, Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Rupert Neve, Inc.
Optical Radiation Corp.
Orange County Electronics Int'l., Inc.
Panasonic Company
Paso Sound Products Inc.
Protech Audio Corp.
Quad-Eight Electronics
Richmond Sound Design, Ltd.
The Ken Schaffer Group, Inc.
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DYMA Engineering, Inc.
Electro-Voice Inc.
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Hartley Products Corp.
Heath Co.
Integrated Solid Systems Inc. GLI Brand
Jensen Sound Laboratories Div. of Pemcor, Inc.
James B. Lansing Sound, Inc.
Micro-Trak Corp.
Orange County Electronics Int'l., Inc.
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Perma Power Electronics, Inc.
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Ramko Research Inc.
Rank Hi Fi, Inc.
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GTE Lenkurt, Inc.
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International Microwave Corp.
Marti Electronics
McMartin Industries, Inc.
Micro Communications, Inc.
Micro Control Associates, Inc.
Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
Nurad, Inc.
RCA Broadcast Systems
RHG Electronics Laboratory, Inc.
Radiation Devices Co., Inc.
Singer Products Co., Inc.
Tepco Corp.
TerraCom Loral Corp.
Time & Frequency Tech., Inc.
Varian/Beverly Micro-Link Products
Versa Count Engineering

Standard Converters, Digital

Marconi Electronics Inc. Broadcast & Communication Div.
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Link Electronics Ltd.
Orange County Electronics Int'l., Inc.
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Soll, Inc.
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Magna-Tech Electronic Co., Inc.
Roger Mayer Electronics, Inc.
McCurdy Radio Ind. Inc.
McMartin Industries, Inc.
Micro-Trak Corp.
Modular Audio Products Unit of Modular Devices, Inc.
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Panasonic Company
Protech Audio Corp.
Quad-Eight Electronics
ROH Corporation
Radiation Devices Co., Inc.
Richmond Sound Design, Ltd.
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Ultra Audio Pixtec
Ward-Beck Systems, Ltd.
Whirlwind Music

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GTE Lenkurt, Inc.
Harris Corp. Broadcast Products Div.
Johnson Electronics Inc.
Marti Electronics
McMartin Industries, Inc.
Micro Control Associates, Inc.
Moseley Associates, Inc.
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Broadcast Electronics, Inc.
Broadcast Video Systems, Ltd.
Central Dynamics Corp.
Cetec Audio
Cetec Broadcast Group
Computer Image Video Controllers
Dytek Industries, Inc.
ComTec Video Systems Mincom Div. 3M
Crosspoint Latch Corp.
DYMA Engineering, Inc.
Dynasciences Div. Whittaker Corp.
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Electro & Optical Systems Ltd.
Glentronix Ltd.
Grass Valley Group, Inc.
Ikegami Electronics (USA) Inc.
Image Video Ltd.
Industrial Sciences, Inc. (ISI)
International Nuclear Corp.
J&D International, Elec. Div. Unit E-East
Javelin Electronics
Lenco Inc. Electronics Div.
Marconi Electronics Inc. Broadcast & Communication Div.
McCurdy Radio Ind. Inc.
Rupert Neve, Inc.
Panasonic Company
Panasonic Co. Video Systems Div.
ROH Corporation
Ramko Research Inc.
Richmond Sound Design, Ltd.
Ross Video Ltd.
Shintron Co. Inc.
Sono-Mag Corp.
Sony Corp. of America
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International Nuclear Corp.
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Moseley Associates, Inc.
NEC America, Inc. Broadcast Equip. Div.
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Ramko Research Inc.
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DowKey Div. Of Kilovac Corp.
Dynatech Data Systems
Electronic Inst. & Spec.
Harris Corp. Broadcast Products Div.
ITT Jennings
Javelin Electronics
Magnecraft Electric Co.
Marshall Electronics
Micro Communications, Inc.
Multronics, Inc.
Rohde & Schwarz Sales Co.
SWR Inc.
Singer Products Co., Inc.
Soll, Inc.
Systron-Donner
Texscan Corp.
Varian Associates, Inc. Electron Device Group
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IGM Div. of Northwestern Tech.
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International Nuclear Corp.
Javelin Electronics
Leitch Video Ltd.
Lenco Inc. Electronics Div.
Marconi Electronics Inc. Broadcast & Communication Div.
McCurdy Radio Ind. Inc.
Micro Communications, Inc.
Modular Audio Products Unit of Modular Devices, Inc.
Multronics, Inc.

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Opamp Labs, Inc.
Panasonic Company
Protech Audio Corp.
ROH Corporation
Richmond Sound Design, Ltd.
Ross Video Ltd.
Sigma Electronics, Inc.
Sono-Mag Corp.
Sony Corp. of America
Tech Laboratories Inc.
Tektronix Inc.
Telecommunications Technology
Telemation, A Div. of Bell & Howell
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Compact Video Sales
Dielectric Communications A Unit of General Signal
Digital Video Systems
DYMA Engineering, Inc.
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Harris Corp. PRD Electronics Div.
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Lenco Inc. Electronics Div.
Link Electronics Ltd.
MPB Technologies Inc.
Marconi Communication Systems Ltd.
Pacific Recorders and Engrg. Corp.
QSI Systems, Inc.
The Ken Schaffer Group, Inc.
Sharepoint Systems Inc.
Soll, Inc.
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Broadcast Electronics, Inc.
Capitol Magnetic Products
Cetec Broadcast Group
Fuji Photo Film USA, Inc. Magnetic Tape Div.
Harris Corp. Broadcast Products Div.
Ray Jacobs Audio, Inc.
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Maxell Corp. of America
Memorex Corp. Professional Products Group
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Panasonic Company
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Harris Corp. Broadcast Products Div.
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Memorex Corp. Professional Products Group
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Nortronics Co., Inc. Recorder Care Div.
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Memorex Corp. Professional Products Group
Panasonic Company
Panasonic Co. Video Systems Div.
QSI Systems, Inc.
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Electro Sound, Inc.
Neumade Products Corp.
Ramko Research Inc.
Video Cassette Services, Inc.

Tape Cassette Loaders

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Audio Magnetics Corp.
Bonneville Productions Div. of Bonneville Int'l. Corp.
Fuji Photo Film USA, Inc. Magnetic Tape Div.
International Audio, Inc.
Ray Jacobs Audio, Inc.
Karex, Inc.
Mallory Distributor Prod. Co. Div. P. R. Mallory & Co. Inc.
Maxell Corp. of America
Memorex Corp. Professional Products Group
Panasonic Company
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International Audio, Inc.
Maxell Corp. of America
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Panasonic Company
Panasonic Co. Video Systems Div.
Plastic Reel Corp. of America
Recording Supply Co.
Schuessler Case Co., Inc.
Sony Corp. of America
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3M Co. Magnetic Audio/Video Prod. Div.
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N.O.V.A. Corp.
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Plastic Reel Corp. of America
TEAC Corp of America
Telectro Systems Corp.
Television Equipment Associates
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Television Equipment Associates

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Heath Co.
IGM Div. of Northwestern Tech.
International Electro-Magnetics
International Tapetronics Corp.
Nagra Magnetic Recorders, Inc.
Novadyne Inc.
Otari Corp.
Panasonic Company
Singer Products Co., Inc.
Sono-Mag Corp.
Studer Revox America
TEAC Corp of America
Tape-Athon Corp.
Telectro Systems Corp.
Telex Communications, Inc.
United Research Lab Corp.
Video Research Corp.

Tape Duplicators

Audico, Ltd.
CaVox Stereo Productions
Cetec Audio
Electro Sound, Inc.
Garner Industries
International Audio, Inc.
Ray Jacobs Audio, Inc.
KVC, Inc.
Magnefax, Inc.
Otari Corp.
Panasonic Company
Panasonic Co. Video Systems Div.
Pentagon Industries, Inc.
Recortec Inc.
Singer Products Co., Inc.
Telex Communications, Inc.
Video Research Corp.

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Micro-Trak Corp.
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Electro Sound, Inc.
Fidelipac
G C Electronics Div. Wallace Murray
Ray Jacobs Audio, Inc.
Lawhed, Ltd.
Memorex Corp. Professional Products Group
Micro-Trak Corp.
Microtran Co., Inc.
N.O.V.A. Corp.
Nagra Magnetic Recorders, Inc.
Nortronics Co., Inc. Recorder Care Div.
Panasonic Company
Pentagon Industries, Inc.
Ramko Research Inc.
Recording Supply Co.
Studer Revox America
TDK Electronics Corp.
TEAC Corp of America
Taber Mfg. & Engr. Co.
Telex Communications, Inc.
Tentel
Univex International
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Videomax Div. Orrox Corp.

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Ampro Broadcasting
Broadcast Electronics, Inc.
Cetec Broadcast Group
Harris Corp. Broadcast Products Div.
IGM Div. of Northwestern Tech.
International Tapetronics Corp.
Research Technology, Inc.
UMC Electronics Co. Broadcast Products Div.

Tape Splicers

Audico, Ltd.
Broadcast Electronics, Inc.
Electro Sound, Inc.
Fidelipac
G C Electronics Div. Wallace Murray
Harris Corp. Broadcast Products Div.
Nagy Research Products
Neumade Products Corp.
Nortronics Co., Inc. Recorder Care Div.
Plastic Reel Corp. of America
Studer Revox America

Tape Transport Reconditioning Services

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Merlin Engineering Works, Inc.
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Electro Sound, Inc.
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International Electro-Magnetics
International Tapetronics Corp.
McCurdy Radio Ind. Inc.
Merlin Engineering Works, Inc.
Nagra Magnetic Recorders, Inc.
Novadyne Inc.
Pentagon Industries, Inc.
Sono-Mag Corp.
Sound Dynamics, Inc.
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Boston Sound & Power Systems
Broadcast Electronics, Inc.
Channelmatic, Inc.
IGM Div. of Northwestern Tech.
Monroe Electronics, Inc.
Panasonic Company
Soundscriber Magnetic Recording Co., Inc.
Telectro Systems Corp.
Teltek, Inc.
Wang Voice Comm. Inc.

Telephone Tone Receivers

Bayly Engineering Ltd. Member of AEG-Telefunken Group
Cetec Vega
Channelmatic, Inc.
Frequency Devices Inc.
Monroe Electronics, Inc.
TM Systems, Inc.
Teltek, Inc.

Telephone Tone Transmitters

Bayly Engineering Ltd. Member of AEG-Telefunken Group
Cetec Vega
Channelmatic, Inc.
Frequency Devices Inc.
Monroe Electronics, Inc.
TM Systems, Inc.
Telecommunications Technology
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Glentronix Ltd.
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Test Charts, Camera

ATV Research
D and S Corley Ltd.
EEV Canada Ltd.
Glentronix Ltd.
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Lenco Inc. Electronics Div.
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D and S Corley Ltd.
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Pentagon Industries, Inc.
Standard Tape Laboratory, Inc.
TDK Electronics Corp.
TEAC Corp of America
Taber Mfg. & Engr. Co.

Testers, Demodulator/Detector

Philips Test & Measuring Instruments, Inc.
Telemet A Geotel Co.

Testers, Integrated Circuit

Continental Specialties Corp.
Heath Co.
Tektronix Inc.

Testers, Semiconductor

B & K Precision Dynascan Corp.
Datatron, Inc.
Delta Electronics Inc. (N.C.)
Heath Co.
Hickok Elec. Inst. Co.
Leader Instruments Corp.
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Heath Co.
Hickok Elec. Inst. Co.
Lectrotech Inc.
SPI-ITT Metrix Instruments Div.
Sencore Inc.
Singer Products Co., Inc.

Textbooks, Communications

Alan Gordon Enterprises Inc.
Opamp Labs, Inc.
Howard W. Sams & Co., Inc.
Ultra Audio Pixtec

Time Announcers

Cetec Broadcast Group
Consolidated Electronic Industries
Hallikainen & Friends, Inc.
Harris Corp. Broadcast Products Div.
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Philips Broadcast Equip Corp.
Power-Optics Inc.
Reynolds/Leteron Co.
Siegel Electronics
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Kline Iron & Steel Co.
Microflect Co., Inc.
Motorola Communications and Electronics Inc.
Fred A. Nudd Corp.
Stainless, Inc.
Suda Seisakusho Co., Ltd.
Swager Tower Corp.
Tri-Ex Tower Corp.
Unarco-Rohn Div. of Unarco Ind., Inc.
Up-Right Scaffolds
Utility Tower Co.
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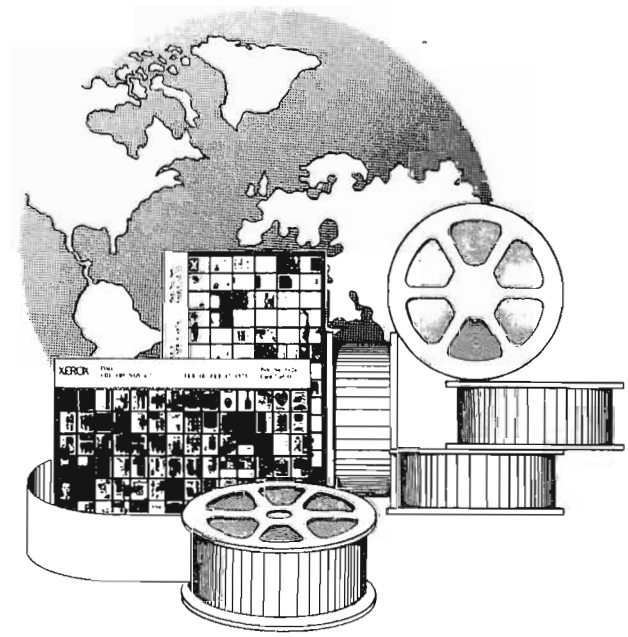

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Amperex Electronic Corp., Slatersville Div., Box 278, Slatersville, R. I. 02876

Stanley Lovitz, Nat'l. Distributive Sales Mgr. (516) 931-6200

REGIONAL SALES CONTACTS:

Amperex Electronic Corp., Northeast Region, 230 Duffy Ave., Hicksville, N.Y. 11802 (516) 931-6200 Kipp Rabbitt
Amperex Electronic Corp., South Central Region, 13773 N. Central Expy., Suite 1228, Dallas, Tex. 75243 (214) 231-3481 Merle Arnold
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Amperex Electronic Corp., South East Region, 1G, 3300 N.E. Expy., Atlanta, GA 30341 (404) 458-2519 Tony Seaton
Amperex Electronic Corp., North Central Region, 175 Scott St., Elk Grove Village, Ill. 60007 (312) 640-2522 Ralph E. Johnson
Amperex Electronic Corp., Western Region, 3000 Scott Blvd. Suite 115, Santa Clara, Calif. 95050 (408) 249-1134 Ted Marchner

Ampex Corp., 401 Broadway, Redwood City, Cal. 94063

Russ Ide-Audio/Video; Richard Antonio-Magnetic Tape (415) 367-2011

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Ampex, 2201 Lant Ave., Elk Grove Village, IL 60007 (312) 593-6000 Len Hase-Audio/Video; Bob Pellino-Magnetic Tape
Ampex, 75 Commerce Way, Hackensack, NJ 07601 (201) 489-7400 Al Slater-Audio/Video; Ed Stevenson-Magnetic Tape
Ampex, 10215 Fernwood Rd., Bethesda, MD 20034 (301) 530-8800 Frank Rush-Audio/Video; Max McCollough-Magnetic Tape
Ampex, 3135 Chestnut, Suite 101, Atlanta, GA 30340 (404) 451-7112 Paul Hansil-Audio/Video; Bob Douglass-Magnetic Tape
Ampex, 1615 Prudential Dr., Dallas, TX 75235 (214) 637-5100 Frank Naulti-Audio/Video; Jerry Nevill-Magnetic Tape
Ampex, 401 Broadway, Redwood City, CA 94063 (415) 367-2011 Holt Johnson-Magnetic Tape

Ampro Broadcasting, 850 Pennsylvania Blvd., Feasterville, Pa. 19047

Ampro/Scully Div., Ram Mfg. Inc., 826 Newtown-Yardley Rd., Newtown, PA 18940

Tom Creighton (215) 968-9000

Amtron Corp., Box 1150, Aptos, Calif. 95003

Anders, Inc., 77 Wolcott Rd., Simsbury, CT 06070

Andersen Labs, Inc., Advanced Systems Div., 1280 Blue Hills Ave., Bloomfield, CT 06002

Keith Anderson Co., Box 800, Black Hawk, SD 57718

Anderson Scientific, Box 800, Black Hawk, SD 57718

Andrew Corp., 10500 W. 153rd St., Orland Park, Ill. 60462

Angenieux Corp. of America, 1500 Ocean Ave., Bohemia, N. Y. 11716

Anixter-Mark, Box 1548, Des Plaines, IL 60018

R. B. Annis, Co., 1101 N. Delaware St., Indianapolis, IN 46202

Anton/Bauer Inc., 415 Howe Ave., Shelton, Conn. 06484

Anvil Cases, Inc., 4128 Temple City Blvd., Rosemead, Calif. 91770

Applied Video Electronics, Inc., Box 25, Brunswick, Ohio 44212

Aqua-Tronics, Inc., 17040 Southwest Shaw St., Beaverton, OR 97005

Argos Sound, 600 S. Sycamore St., Genoa, IL 60135

Aristocart Div., Western Broadcasting, Ltd., 505 Burrard St., Vancouver, B.C., Canada V7X 1M6

D. Kalmokoff (604) 522-2711

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IGM/NTI, Box 943, Bellingham, WA 98225 (206) 733-4567
David Green Associates, 21 N. Wirt, Leesburg, Va. 22075 (703) 777-8660 David Green
S. Wade, 7030 East 116th St., Nobelsville, IN 46060 (317) 849-6585 S. Wade
McCurdy Radio Industries Ltd., 108 Carnforth Rd., Toronto, Ont. M4A 2L4 Canada (416) 751-6262
Colorado Magnetics, 4620 Milkweed Lane, Colorado Springs, CO 80917
Seltech Equipment, 16 York Rd., Maidenhead, Berks. England SL6 1SF
McCurdy Radio Industries Inc., 1711 Carmen Dr., Elk Grove Village, IL 60007 (312) 640-7077
Broadcast Cart Service, 1122 E. Chevy Chase Dr., Glendale, Calif. 91205 (213) 245-7708
Syntec Electronic Distributors, 5-7 Smith St., Chatswood, N.S.W. Australia 2067
Emmons Assoc., Inc., 10700 Lyndale Ave. S., Minneapolis, Minn. 55420 (612) 881-1118 Keith Emmons
L. A. Varah, 2077 Alberta St., Vancouver, B.C. Canada (604) 873-3211
Radford Associates, 3203 Lanier Dr., Atlanta, Ga. 30319 (404) 237-6097

Arriflex Corp., One Westchester Plaza, Elmsford, N.Y. 10523

Arrow Fastener Co., Inc., 271 Mayhill St., Saddle Brook, NJ 07662

Arvin/Echo Science Corp., 485 E. Middlefield Rd., Mountain View, Calif. 94043
(415) 961-7145

Asaca Corp. of America, 1289 Rand Rd., Des Plaines, Ill. 60016

T. Shigezaki (312) 298-4380

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155-B San Lazaro Ave., Sunnyvale, CA 94086 (408) 735-7350 Richard Reilly
Dyer Electronics, 31185 Ten Mile Rd., Farmington Hills, MI 48024 (313) 478-2157 Mike Dyer

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Radford Associates, 1331 Otter Creek Rd., Nashville, TN 37215 (615) 373-0231 Ralph Hucaby
Landy Associates, 1890 E. Marton Pike, Cherry Hill, NJ, 08003 (609) 424-4660 James Landy
801 Hiway 67, P.O. Box 115, Ashippun, WI 53003 (414) 474-4112 Robert Shult
Didier/Denver, 4665 Kipling, Wheat Ridge, CO 80033 (303) 422-8600 Herb Didier

Emil Ascher, Inc., 666 Fifth Ave., New York, NY 10019

Athenia Industries, Inc., 2200 Industrial Way, Toms River, NJ 08753

Atlantic Research Corp., 5390 Cherokee Ave., Alexandria, Va. 22314

Atlas Sound, 10 Pomeroy Rd., Parsippany, N.J. 07054

Auburn Instruments, 1127 Olympic Way West, Seattle, Wash. 98119

Audico, Ltd., 219 Crossen Ave., Elk Grove Village, Ill. 60007

Audicon, Inc., 1200 Beechwood Ave., Nashville, TN 37212

Audi-Cord Corp., Box 611, Normal, Ill. 61761

Carl L. Martin (309) 452-9461

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Autogram, P.O. Box 456, Plano, TX 75074 (214) 424-8585 Ernie Ankele
Doug Cook & Associates, 2185 Trent Rd., Columbus, OH 43229 (614) 471-4114 Doug Cook
McCurdy Radio Industries Ltd., 1711 Carmen Dr., Elk Grove Village, IL 60007 (312) 640-7011 Ron Mitchell
Media-West, Inc., P.O. Box 458, Bountiful, UT 84010 (801) 295-3308 M. J. Jones
Ring Associates, Inc., P.O. Box 188, Easthampton, MA 01027 (413) 527-4430 John Ring
Oakwood Audio Labs, Ltd., 652 King Edward St., Winnipeg, Man. Canada R3H 0P2 (204) 786-6715 Ron Paley
Roscom, Inc., P.O. Box 1208, Roswell, GA 30077 (404) 992-2700 Bob Stewart
Southern Coastal Mktg. Services, 10120 Crestwood Dr., Matthews, NC 21805 (704) 847-5687 Bob Cauthen
Telesco Int'l. Corp., 1 DuPont St. S., Plainview L.I., NY 11803 (516) 433-6210 Jerry Lainer
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Freeman & Associates, 1813 El Dorado, Garland, TX 75042 (214) 272-3200 Kenneth R. Freeman

Audio Accessories Inc., 163 Water Street, Keene, N.H. 03431

Audio & Design Recording Inc., Box 786, Bremerton, WA 98310

Nigel Branwell (206) 275-5009

Audio Designs & Mfg., 16005 Sturgeon, Roseville, Mich. 48066

Murray A. Shields (313) 778-8400

Audio Interface, Inc., Box 7369, Van Nuys, CA 91409

Audio Magnetics Corp., 2602 Michelson Dr., Irvine, CA 92716

Audionics, Inc., 10950 S.W. 5th Ave., Suite 160, Beaverton, OR 97005

Audiosears Corp., 2 South St., Stamford, NY 12167

Audio-Technica U.S., Inc., 33 Shiawassee Ave., Fairlawn, OH 44313

Audiotronics Video Display Div., 530 Fifth Ave., N.W., New Brighton, MN 55112

Audio-Video Engineering Co., 65 Nancy Blvd., Merrick, N. Y. 11566

Rolf Drucker (516) 546-4239

Auditronics, Inc., 3750 Old Getwell Rd., Memphis, Tenn. 38118

Welton Jetton (901) 362-1350

Auernheimer Laboratories & Co., 4561 E. Florence Ave., Fresno, Calif. 93725

Auratone Corp., Box 698, Coronado, Calif. 92118

Autodyne, Box 13036, Orlando, FL 32859

Autogram Corp., Box 456, Plano, Tex. 75074

Automated Broadcast Controls, 1110 Taft St., Rockville, Md. 20852

Automated Processes, Inc., 790 Park Ave., Huntington, N.Y. 11743

Automatic Devices Co., 2121 South 12th St., Allentown, PA 18103

Automation Electronics, Inc., Autotron Systems, Div., 1001 South Street, Lafayette, Ind. 47905

Automation Techniques, Inc., 1846 N. 106th E Ave., Tulsa, Okla. 74116

Avantek, Inc., 3175 Bowers Ave., Santa Clara, CA 95051

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BEI Beston Electronics, Inc., Box 106A, Olathe, Kans. 66061

BGW Systems Inc., 13130 S. Yukon Ave., Hawthorne, Calif. 90250

B & I Electronics, Inc., Bldg. 128 Donaldson Center, Greenville, S. C. 29605

BJA Systems, Inc., 666 Davisville Rd., Willow Grove, Pa. 19090

B & K Instruments Inc., 5111 W. 164th St., Cleveland, Ohio 44142

B & K Precision, Dynascan Corp., 6460 W. Courtland, Chicago, Ill. 60635

BSC Inc., 2932 River Rd., River Grove, Ill. 60171

BSM Systems, 2646 East 37th Ave., Spokane, WA 99203

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Radio Service Group, Inc., 2500 Bates Rd., Montreal, Que. Canada H3S 1A6 (514) 342-4503 Jacques Bogos
Sphere Associates, 11250-14 Roger Bacon Dr., Reston, VA 22090 (703) 471-1230 Theodore Bennett
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Ballantine Labs, Inc., Box 97, Boonton, NJ 07005

Bardwell & McAlister, 7269 Santa Monica Blvd., Hollywood, Calif. 90046

Barker and Williamson, Inc., 10 Canal St., Bristol, PA 19007

Bayly Engineering Ltd., Member of AEG-Telefunken Group, 167 Hunt St., Ajax, Ont., Canada L1S 1P6

Beaveronics, Inc., 8 Haven Ave., Port Washington, NY 11050

John Busharis, V.P. Mktg. (516) 883-4414

Bebell Inc., 416 W. 45th St., New York, NY 10036

Belar Electronics Lab., Inc., Lancaster Ave. at Dorset, Devon, Pa. 19333

Arno M. Meyer (215) 687-5550

Belden Communications, Inc., 25 West 45th St., New York, NY 10036

Belden Corp., Box 1327, Richmond, Ind. 47374

Bell & Howell, Audio Visual Div., 7100 McCormick Rd., Chicago, Ill. 60645

Bell Audio Systems, Inc., 994 Freeway Dr. N., Columbus, Ohio 43229

Berkey-Colortran Inc., 1015 Chestnut St., Burbank, Cal. 91502

Marion M. Rimmer; John Gresch; Jeff Sessler (213) 843-1200

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Berkey Colortran, 25 Wood St., Toronto, Ont. Canada M5Y 2P9 (416) 595-0163 Tim Richardson

Bias/Data Communications Corp., 300 Directors Row, Suite 508, Memphis, TN 38131

Bic Computers, KWIX Radio, Box 619, Moberly, MO 65270

Bird Electronic Corp., 30303 Aurora Rd., Cleveland, Ohio 44139

Blonder-Tongue Labs., One Jake Brown Rd., Old Bridge, N.J. 08857

Bloomington Broadcasting, Box 8, Bloomington, IL 61701

Bogen Div., Lear Siegler, Inc., Box 500, Paramus, N. J. 07652

Bogner Broadcast Equipment Corp., 401 Railroad Ave., Westbury, N. Y. 11590

Bonneville Productions, Div. of Bonneville Int'l. Corp., 130 Social Hall Ave., Salt Lake City, Utah 84111

Boonton Electronics, Rt. 287 Smith Rd., Parsippany, N.J. 07054

Bosch-Fernseh Corp., 279 Midland Ave., Saddle Brook, N.J. 07662

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Boston Sound & Power Systems, 3 Fredith Rd., Weymouth, Mass. 02189

Brand-Rex Co., Box 498, Willimantic, Conn. 06226

Bretford Mfg. Co., 9715 Soreng Ave., Schiller Park, IL 60176

Walter S. Brewer Co., Inc., 5424 S. Zunis Place, Tulsa, OK 74105

Don Britton Enterprises, Drawer G, Waikiki, Hawaii 96815

Broadcast Aids, Inc., 20 Red Rose Dr., Levittown, Pa. 19056

John Bostwick (215) 547-7133

Broadcast Audio Associates, 11355 Pyrites Way, Rancho Cordova, CA 95670

Broadcast Electronics, Inc., 4100 N. 24th; Box 3606, Quincy, Ill. 62301

J.T. Malone, Sales Mgr. (217) 224-9600

Broadcast Equip. Leasing Co., 3612 Blvd. of Allies, Pittsburgh, Pa. 15213

Broadcast Programming Int'l., Inc., Box 2027, Bellevue, WA 98009

Broadcast Video Systems, Ltd., 1050 McNicoll Ave., Angincourt, Ont., Canada M1W 2L8

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Brown Electronic Labs, 1233 Somerset Dr., San Jose, CA 95132

Bud Industries, Inc., 4605 E. 355th St., Willoughby, Ohio 44094

Buhl Optical Co., 1009 Beech Ave., Pittsburgh, Pa. 15233

Irv Stapsy (412) 321-0076

Burns Audiotronics, Inc., 5-05 Burns Ave., Hicksville, NY 11801

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CCA Electronics Corp., Box 5500 Broadcast Plaza, Cherry Hill, NJ 08034

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Elecgen, 132 Rue Magasin De Letat, Port-Au-Prince Haiti
Electronics Technowave, Via Pomposa 19, Rome 00142 Italy 5406698/5404746 Mr. G. Marchioni
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E.K.W.A., 14 Mohamed Mahmound Str Bab El-Louk, Box 145, Cairo Egypt
Al-Manar Engineering, Tamhuriya St., P.O. Box 86, Baghdad Iraq 60992-28077
Tokyo Electron Labs, Inc., Meiho Bldg., 1-21 Nishi-Shinjuko, Tokyo 160 Japan 343-4431 Mr. Shozo Nakamura
Hami & Ibrahim Mango Co., Ltd., P.O. Box 14, Amman Jordan 67818-67819
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CMX Systems & Videomax, Div's. of Orrox Corp., 3303 Scott Blvd., Santa Clara, Calif. 95050

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The CnB Studios, 3415 Beresford Ave., Belmont, Calif. 94002

COMPAC, 279-D Skidmore Rd., Deer Park, NY 11729

C.R.V. Systems, Inc., 1901 Madison Ave., Huntington, W.Va. 25704

CSI Electronics, Inc., 3800 S. Congress Ave., Boynten Beach, FL 33435

C. S. P. Inc., 203 Airport Rd., Doylestown, Pa. 18901

Jim Lucy (800) 523-6010

Cablewave Systems Inc., 60 Dodge Ave., North Haven, Conn. 06473

California Instruments, 5150 Convoy St., San Diego, Cal. 92111

California Microwave, 990 Almanor Ave., Sunnyvale, CA 94086

Cambridge Products, 244 Woodland Ave., Bloomfield, CT 06002

Nancy Hollender (800) 243-8814

Canadian General Electric Co., Ltd., 396 Attwell Dr., Rexdale, Ont., Canada M9W 5C3

Canon USA, Inc., Optics Div., 10 Nevada Dr., Lake Success, N. Y. 11042

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Canon U.S.A., Inc., 140 Industrial Dr., Elmhurst, Ill. 60126 (312) 833-3070 Ken Morishima

Capitol Magnetic Products, 1750 North Vine St., Hollywood, Calif. 90028

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Capitol Magnetic Products, 6401 Gross Point Rd., Niles, IL 60648 (312) 775-7101 Dick Dunlavy
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J I Case, Davis Div., Box 9228, Wichita, Kans. 67277

Cases Inc., 1745 W. 134 St., Gardena, Calif. 90249

Catel Div., United Scientific Corp., 1400 D Stierlin Rd., Mt. View, Calif 94043

CaVox Stereo Productions, 502 S. Isis, Inglewood, Calif. 90301

Central Dynamics Corp., 331 W. Northwest Hwy., Palatine, Ill. 60067

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Central Dynamics Corp., Western Region, 15130 Ventura Blvd., Sherman Oaks, Calif. 91403 (213) 789-0574 Vince Lyons, Regional Sales Mgr.

Centro Corp., 4848 Ronson Court, San Diego, CA 92111

Cetec Audio, Box 3941, North Hollywood, Calif. 91605

Cetec Broadcast Group, 1110 Mark Ave., Carpinteria, CA 93013

Cetec Vega, 9900 Baldwin Pl., El Monte, Calif. 91731

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Beams Co., 2318 Harding Rd., Suite 14B, Des Moines, IA 50314 (515) 255-1148
Skor, 1821 University Ave., St. Paul, MN 55104 (612) 645-6461
Robert Milsk Co., 22420 Telegraph Rd., Southfield, MI 48034 (313) 354-3310
The Smith Co., 188 Brewster Rd., W. Hartford, CT 06117 (203) 523-0512

Cezar International, 491 Macara Ave. Suite 1003, Sunnyvale, CA 94086

Channelmatic, Inc., 2232 Lindsay Michelle Dr., Alpine, Calif. 92001

Cherry Electrical Products, 3600 Sunset Ave., Waukegan, IL 60085

Cherry Semiconductor, 99 Bald Hill Rd., Cranston, RI 02920

Christie Electric Corp., 3410 W. 67th St., Los Angeles, Calif. 90043

Tim Robertil (213) 750-1151

Chyron Corp., Video Products Div., 265 Bethpage/Spagnoli Rd., Melville, NY 11747

Chyron Telesystems, 265 Bethpage/-Spagnoli Rd., Melville, NY 11747

Richard P. Boyd, Dir. of Sales Mktg. (516) 249-3296

Cine 60, Inc., 630 9th Ave., New York, N.Y. 10036

Cinema Products Corp., 2037 Granville Ave., Los Angeles, Calif. 90025

Don Dunbar, Dir. of National Mrktg. (213) 478-0711

David Clark Co., Inc., 360 Franklin St., Worcester, MA 01604

Clear-Com Intercom Systems, 759 Harrison St., San Francisco, Calif. 94107

Edward Fitzgerald (415) 989-1130

Cleveland Institute of Elec., Inc., 1776 East 17th St., Cleveland, OH 44114

Coastcom, 2312 Stanwell Dr., Concord, Calif. 94520

Coherent Communications, 13733 Glenoaks Blvd., Sylmar, CA 91342

Cohu, Inc., Electronics Div., Box 623, San Diego, Cal. 92112

Al Zoller (714) 277-6700 ext. 241

REGIONAL SALES CONTACTS:

Cohu-California, Northern, 770 Welch Rd., Suite 154, Palo Alto, CA 94305 (415) 326-0280
Cohu-Northeast, 23 E. Madison Ave., Florham Par, NJ 97932 (201) 377-6636 Lawrence W. Litchfield
Cohu-Great Lakes, 27962 Sutherland Dr., Warren, MI 48093 (313) 739-5444 Virgil Davis
Cohu-Los Angeles, 2307 Orange Ave., Costa Mesa, CA 92627 (714) 631-4680 Wayne F. Kennedy
Cohu-Southeast, 4100 Aldebaran Way, Mobile, AL 36609 (205) 661-9088 Darrell M. Pahl
Arnold Barnes Associates, Inc., 1300 E. Arapaho Rd., Richardson, TX 75081 (214) 783-8400 Arnold Barnes
Bartlett Associates, Inc., 130 W. Lancaster Ave., Wayne, PA 19087 (215) 688-7325
Perspective Measurements, 8369 Vickers St., Suite D, San Diego, CA 92111 (919) 278-8931 Dick Sjoberg
Scientific Systems, Inc., P.O. Box 1696, Bailey, CO 80421 (303) 838-4615

Collins Div., Rockwell International, Mail Station 406-240, Dallas, Tex. 75207

James W. Ariana, Domestic Sls. Mgr. (214) 996-5424

REGIONAL SALES CONTACTS:

Rockwell Int'l., Collins Broadcast Products, R. R. 2, Westport, N.Y. 12993 (518) 962-4567 John Ring
Rockwell Int'l., Collins Broadcast Products, Box 16, Newton, N.J. 07860 (201) 383-8797 Keith Leach
Rockwell Int'l., Collins Broadcast Products, Rt. 2, Box 12, Glenmore Dr., Rockford, Tenn. 37853 (615) 573-9717 R. C. Evans
Rockwell Int'l., Collins Broadcast Products, 2280 Rockcreek Trail, Birmingham, Ala. 35226 (205) 823-7048 Dave Hultsman
Rockwell Int'l., Collins Broadcast Products, 38780 Hartwell, Sterling Heights, Mich. 48077 (313) 979-6320 D. W. Hill
Rockwell Int'l., Collins Broadcast Products, 200C West Branch Rd., Maple Plain, N.J. 55359 (612) 479-2633 J. L. Littlejohn
Rockwell Int'l., Collins Broadcast Products, Rt. 1, Box 217-B, Oak Grove, Mo. 64075 (816) 443-2080 J. C. Shideler
Rockwell Int'l., Collins Broadcast Products, 1200 N. Alma Rd., Richardson, Tex. 75080 (214) 259-1440, 690-5424 W. R. 'Terry' Sheffield
Rockwell Int'l., Collins Broadcast Products, 1450 W. Arroyo Dr., Yuma, Ariz. 85364 (602) 783-6380 Morris Courtright
Rockwell Int'l., Collins Broadcast Products, 1215 S.E. 73rd Ave., Portland, Ore. 97215 (503) 254-2818 T. T. Cauthers
Rockwell Int'l., Collins Broadcast Products, Box 2743, Fairbanks, Alaska 99707 (907) 452-6044 R. F. Cassady
Applied Electronics Ltd., 299 Evans Ave., Toronto, Ont. M8Z 1K2 Canada (416) 252-3761 Bob Norton
Telvicom Ltee., 822 Halpern Ave., Dorval, Que. Canada (514) 631-9089 Raymond Quesnel
Applied Electronics, Ltd., Bay #1, 4519 12th St. N.E., Calgary, Alta. Canada (403) 277-8600 Tom Cuddy

Colorado Video Inc., Box 928, Boulder, Colo. 80306

Glen Southworth (303) 444-3972

REGIONAL SALES CONTACTS:

Colorado Video, 17 Amber Rd., Chelmsford, MA 01824 (617) 256-3381 Dick Taylor

Columbia Special Products, 51 West 52nd St., Room 861, New York, NY 10019

Columbine Systems, Inc., Box 740, Golden, CO 80401

Comark Communications Industries, Inc., Box 267, Southwick, MA 01077

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Comark Industries Inc., Box 229, Southwick, MA 01077

Comet Sales, Box 4755, Springdale, Conn. 06907

Command Productions, Radio Broadcasting Services, Box 26348, San Francisco, CA 94126

Commercial Electronics, Inc., 880 Maude Ave., Mountain View, Calif. 94043

Homer Hull, Dir. Mktg. (415) 969-1910

REGIONAL SALES CONTACTS:

Commercial Electronics, Inc., P.O. Box 300, New York, NY 10013 (212) 734-7871 Harvey Ray
Commercial Electronics Inc., 611 Marlow Pl., Arlington, TX 76010 (817) 465-3432 Dave Lindsey
Emmons Associates, 10700 Lyndale Ave. S., Minneapolis, Minn. 55401 (612) 881-1118 Keith Emmons
Video Equipment Corp. of America, 7377 Convoy Court. San Diego, CA 92111 (714) 278-4400 Bill Bennett

Commercial Radio Monitoring Co., Inc., 103 S. Market, Lee's Summit, Mo. 64063

Comm/Scope Co., Rt. 1, Box 199A, Catawba, N.C. 28609

Communications Int'l., 2 Briarway, Suite B, Houston, TX 77027

Communications, Ltd., 1601 N. Bristol St., Santa Ana, Calif. 92706

Compact Video Sales, 1104 W. Chestnut St., Burbank, CA 91502

Comprehensive Video Supply Corp., 148 Veterans Dr., Northvale, NJ 07647

Computer Business Systems, Inc., 167 Moore Rd., East Weymouth, MA 02189

Computer Image Video Controllers, Dytek Industries, Inc., 2492 W. 2nd Ave., Denver, Colo. 80223

Computer Labs, Div. of Analog Devices, Inc., 505 Edwardia Dr., Greensboro, N.C. 27409

Computer Magnetics Corp., 125 W. Providencia Ave., Burbank, Calif. 91502

Computer Management Systems, Inc., 6610 N. Shadeland Ave., Indianapolis, IN 46220

Computer Products Inc., Power Products Div., 1400 N.W. 70th St., Fort Lauderdale, FL 33309

Comrex Corp., 60 Union Ave., Sudbury, Mass. 01776

Lynn E. Distler (617) 443-8811

Comsearch, Inc., 2936 Chain Bridge Rd., Oakton, VA 22124

ComTec Video Systems, Mincom Div. 3M, 3070 Leeman Ferry Rd. S.W., Huntsville, AL 35801

Conrac Div., Conrac Corp., 600 North Rimsdale Ave., Covina, Calif. 91722

Conrac Systems-East Div., 32 Fairfield Pl., West Caldwell, N.J. 07006

Consolidated Electronic Industries, 1925 N. Lynn St., Arlington, VA 22209
(703) 524-9811

Consolidated Video Systems, 1255 E. Arques Ave., Sunnyvale, Calif. 94086

Contel Mfg., 1620 W. 32nd Place, Hialeah, Fla. 33012

Continental Electronics Mfg. Co., Box 270879, Dallas, Texas 75227

Vernon Collins (214) 381-7161

Continental Specialties Corp., 70 Fulton Terr., New Haven, CT 06509

Convergence Corp., 17935 Sky Park Circle #D, Irvine, Calif. 92714

Corning Glass Works, 3900 Electronics Dr., Raleigh, N. C. 27604

Cox Data Services, Suite 100/Prado North, 5600 Roswell Rd., Atlanta, Ga. 30342

Crosspoint Latch Corp., 316 Broad Street, Summit, N.J. 07901

George Pires, Pres. (201) 273-1090

Crouse Hinds Co., Box 4999, Syracuse, N.Y. 13221

Crown International, Inc., Box 1000, Elkhart, Ind. 46515

Custom Audio Electronics, 2828 Stommel Rd., Ypsilanti, Mich. 48197

D

dbx, Inc., 71 Chapel St., Newton, Mass. 02195

DHV, Inc., Box 520, Mineral Wells, TX 76067

D. O. Industries, 317 E. Chestnut St., East Rochester, NY 14445

D and S Corley Ltd., 80 Galaxy Blvd., Rexdale, Ont., Canada M9W 4Y8

Dage-MTI, Inc., 208 Wabash St., Michigan City, Ind. 46360

Peter W. Dahl Co. Inc., 4007 Fort Blvd., El Paso, TX 79930

Peter W. Dahl (915) 566-5365

Da-Lite Screen Co., Inc., 3100 State Rd. 15 N., Warsaw, IN 46580

Data Communications Corp., 3000 Directors Row, Memphis, Tenn. 38131

Datametrics Inc., 340 Fordham Road, Wilmington, Mass. 01887

Robert Kieser (617) 658-5410

REGIONAL SALES CONTACTS:

PM Electronics, 175 Marine St., Farmingdale, NY 11735 (516) 248-4858 Paul Milazzo
Roscor Corp., 6160 W. Oakton St., Morton Grove, IL 60053 (312) 539-7700 Paul Roston
Wiltronix, Inc., 5504 Waterway, Rockville, MD 20853 (301) 460-1454 Dwight Wilcox
Sedillo Co., 125 E. Sunnyoaks Ave., Campbell, CA 95008 (408) 374-5220 Ramon Sedillo

Data Precision Corp., Electronics Ave., Danvers, MA 01923

Datatek Corp., 1166 W. Chestnut St., Union, N. J. 07083

Bob Rainey (201) 964-3656

REGIONAL SALES CONTACTS:

Broadcast Communications Devices, 5526 E. LaPalma Ave., Anaheim, CA 92807 (714) 528-9505 John Baumann
H.M. Dyer Electronics, 31185 Ten Mile Rd., Farmington Hills, MI 48204 (312) 343-4300
MARCOM, P.O. Box 66507, Scotts Valley, CA 95066 (408) 438-4273
Didier/Denver, 4665 Kipling, Wheat Ridge, CO 80033 (303) 422-6600 Herb Didier
Landy Associates, 1890 E. Marlton Pike, Cherry Hill, NJ 08003 (609) 424-4660 James E. Landy
Radford Associates, 3203 Lanier Dr., Atlanta, GA 30319 (404) 327-6097
The Gene Sudduth Co., 845 39th S.E., Paris, TX 75460 (214) 785-5764 E.T. Sudduth
Applied Electronics LTD., 299 Evans Ave., Toronto, Ont. Canada M8Z 1K2 (416) 252-3761

Datatron, Inc., Box 11427, Santa Ana, Cal. 92711

Davis & Sanford Co. Inc., 24 Pleasant St., New Rochelle, N.Y. 10802

Decca Austin Insulators, 71 Selby Road, Brampton Ont., Canada L6W 1K5

Delta Electronics Inc. (N.C.), 145 Fayette St., Winston Salem, N.C. 27101

Delta Electronics Inc. (Va.), 5730 Gen. Washington Dr., Alexandria, VA 22312

Joseph Novak (703) 354-3350

De Wolfe Music Library, 25 West 45th St., New York, NY 10036

Dielectric Communications, A Unit of General Signal, Route 121, Raymond, Me. 04071

Stanley O. Thomas (800) 341-9678

REGIONAL SALES CONTACTS:

Forbes Distrib. Co., 1416 4th Avenue, South Birmingham, AL 35234 (205) 251-4101
Tucker Bros., P.O. Box 177, Crabwell, AL 35054 (205) 525-5341
Juneau Electronics, 241 S. Franklin, Juneau, AK 99801 (907) 586-2260
Electronics Plus, 823 Fourth Street, San Raleo, CA 94901
Pacific Coast Ind, P.O. Box 932, Orangeville, CA 95662 (916) 366-3698
Western Radio & TV Supply Co., 1415 India Street, San Diego, CA 92101 (714) 239-0361
AB Electronics/Communications, 1660 W. 31st Place, Hialeah, FL 33012 (305) 887-3203
Amateur Radio Center Inc., 2805 NE 2nd Avenue, Miami, FL 33137 (305) 573-8383
BFJ Sales, Inc., Bldg. 128, Sanford Airport, P.O. Box 4000, Sanford, FL 32771 (305) 323-8510
ESL, 3560 NW 34th Street, P.O. Box 420555, Miami, FL 33142 (305) 633-3973
Hialeah Electronics Distributing, 612 E. 9th Street, Hialeah, FL 33142 (305) 887-5936
Good Electronics, 956 E. Altamonte Drive Executive Center, Altamonte Springs, FL 32701 (305) 830-7230
Nurmi Electronic Supply, 1727 Donna Road, West Palm Beach, FL 33049 (305) 686-8553
ACK Radio Supply, 555 Dearing Road NW, Atlanta, GA 30309 (404) 736-5526
Southern Distributing, 3213 Milledgeville Road, Augustus, GA 30909 (404) 736-5526
Douglas Electronics, 1118 So. Staples, Corpus Christi, TX 78404 (512) 883-5103
ZZZ Electronics, 424 Armour Circle, NE., Atlanta, GA 30324 (404) 876-0631
The Antenna Farm, 7451 Switzer, Suite #107, Shawnee, KS 66203 (913) 831-2045
Singer Electronics, P.O. Box 2941, Northern City, LA 70380 (505) 982-4488
Arva-Hudson, Inc., Box 1512, Bellevue, Wash. 98009 (206) 455-0773
Ampower, 26 Just Road, Fairfield, NJ 07006 (201) 227-7720
Future Electronics, 5647 Ferrier St., Montreal, Que. H4P 2K5 Canada (514) 731-7441
Telcom Co., 4254 Glen High Road, Winston Salem, NC 27107 (919) 784-8833
Future Electronics Corp., 44 Fasken Dr., Unit 24, Rexdale, Ont., Canada M9W 1K5 (416) 675-7820
A-1 Communications, 441 Cerrino Street, Sante Fe, NM 87501 (505) 982-4488
L.A. Varah, Ltd., 2077 Alberta St., Vancouver B.C. Canada V5Y 1C4 (604) 873-3211
Browning Electronics, 5044 S. Main Street, Akron, OH 44319 (216) 896-1902
Nivel Tecnico, SA, Medeloin 8-301, Mexico 7, D.F., Mexico (511) 17-59
Portland Radio Supplies, 1234 W. Stock Street, Portland, OR 97205 (503) 228-5103
Scopes of California, 1928A So. Anaheim Blvd., Anaheim, CA 92805 (714) 772-0335
Magestic Communications, 4091 Discount, Memphis, TN 38101 (901) 794-9494
Rush Electronics, 3145 Bluff City Hwy, Bristol, TN 37620 (615) 764-0381
G. Enterprises, 5468 S. 1900 West, Roy, UT 84067 (801) 825-7344
Cal Com Systems, Inc., 2670 Bonaventura Dr., San Jose, CA 95134 (408) 262-7200
Jan Industrial Electronics Co., 401 N. Broad St., Philadelphia, PA 19108 (215) 922-1321
Communication Wholesalers, 1741 15th Avenue, Seattle, WA 98155 (206) 364-6410
EME-3, Inc., 975 Whitmire Dr., Melbourne, FL 32935 (305) 259-2711 Karl Keck
ABC Communications Inc., 1755 15th Avenue, N.E., Seattle, WA 98155 (206) 364-8300
West Indies Sales Co., Ltd., 690 West 28th St., Hialeah, FL 33010 (305) 888-1676
EME-II, Inc., 2522 Tangelwood Rd., Decatur, GA 30033 (404) 325-0165
PLM Sales, 603 Pleasant Place, Streamwood, IL 60103 (312) 628-8000
Hurley Electronics, Inc., 1112 S. Casino Center, Las Vegas, NV 89104 (702) 384-5666
C. H. Electronic Distributing, 209 Parker Ave., Clifton, NJ 07011 (201) 478-9700
Electronic Module, 601 North Turner St., Hobbs, NM 88240 (505) 397-3022
Electronic Merchandising Enterprises, 112 Buena Vista, High Point, NC 27260 (919) 869-3335

Digital Video Systems, 716 Grodon Baker Rd., Willowdale, Ont., Canada M2H 2C9

John Lowry, Pres. (416) 499-4826

REGIONAL SALES CONTACTS:

Digital Video Systems, 999 E. Touhy Ave. Suite 240, Des Plaines, IL 60018 (312) 298-9570
Digital Video Systems, Bldg. 900 2672 Bayshore Frontage Rd., Mountain View, CA 94043 (415) 962-9080

Display Media, Inc., 120 Laura Dr., Addison, IL 60101

Ditch Witch, Div. of Charles Machine Works Inc., P.O. Box 66, Perry, Okla. 73077

Di-Tech Inc., 311 Wyandanch Ave., N. Babylon, N.Y. 11704

Dolby Laboratories, Inc., 731 Sansome St., San Francisco, Calif. 94111
(415) 392-0300

Dolphin Productions, Inc., 140 East 80th, New York, NY 10021

DowKey Div., Of Kilovac Corp., Box 4422, Santa Barbara, CA 93103

Dranetz Engineering Labs., Inc., 2385 S. Clinton Ave., South Plainfield, N. J. 07080

D'San Corp., 25-30 163rd St., Flushing, NY 11358

Dukane Corp., Audio-Visual Div., 2900 Dukane Dr., St. Charles, IL 60174

Duncan Electronics, Inc., 2865 Fairview Road, Costa Mesa, Calif. 92626

E. I. du Pont de Nemours & Co., Inc., Magnetic Products Div., Old du Pont Airport, Bldg. 1, Wilmington, Del. 19898

Durst US-Sickles Inc., Box 3396, Scottsdale, AZ 85257

DYMA Engineering, Inc., Box 1697, Taos, NM 87571

C. G. Cunningham (505) 758-2686

REGIONAL SALES CONTACTS:

DYMA, 505 1/2 Centinela, Inglewood, Calif. 90302 (213) 322-2050
DYMA, 926 Wisteria Way, Dallas, Tex. 75080 (214) 235-8236

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Dynair Electronics, Inc., 5275 Market St., San Diego, Cal. 92114

Robert A. Jacobs (714) 263-7711

Dynasciences, Div. Whittaker Corp., Township Line Road, Blue Bell, Pa. 19422

Dynatech Data Systems, 7644 Dynatech Ct., Springfield, Va. 22153

Dytek Industries, Inc., 2492 W. 2nd Ave., Denver, Colo. 80223

E

EDCO Products, Inc., 680 Bizzell Dr., Lexington, Ky. 40504

EECO Inc., 1601 E. Chestnut Ave., Santa Ana, Calif. 92701

Geo. Swetland (714) 835-6000

REGIONAL SALES CONTACTS:

Ampex Corp., Los Angeles, (213) 240-5000
Ampex Corp., Atlanta, (404) 451-7112
Ampex Corp., Chicago, (312) 593-6000
Ampex Corp., Bethesda, (301) 530-8800
Ampex Corp., Boston, (617) 890-2040
Ampex Corp., New Jersey, (201) 489-7400
Ampex Corp., New York, (201) 736-6116
Ampex Corp., Dayton, OH (513) 254-6101
Ampex Corp., Philadelphia, (215) 887-7650
Ampex Corp., Dallas, (214) 637-5100

EEG Enterprises, Inc., 82 Rome St., Farmingdale, NY 11735

EEV, Inc., 7 Westchester Plaza, Elmsford, N.Y. 10523

Tom Soldano, RF Products and Dick Betts, Imaging Devices (914) 592-6050

REGIONAL SALES CONTACTS:

EEV, Canada Ltd., 67 Westmore Dr., Rexdale, Ont. Canada M9V 3Y6 (416) 745-9494 Bob Parkes
EEV, Inc., 15 Dunwoody Park, Suite 100E, Atlanta, GA 30338 (404) 394-9201 Harry Kozicki
English Electric Valve Co. Ltd., Waterhouse Lane, Chelmsford England CM1 2QU (0245) 61777 Mark Knight
EEV, Inc., Route 1, Anna, TX 75003 (214) 837-2464 R. Knowles
EEV, Inc., 18 Indian Hill Rd., Union, KY 41091 (606) 384-4477 Richard Bossert
EEV, Inc., 3 Buckingham Rd., Natick, MA 01760 (617) 653-8300 Dan Green
EEV, Inc., 19001 40th Place N.E., Seattle, WA 98155 (206) 363-2200 D. Rose

EEV Canada Ltd., 67 Westmore Dr., Rexdale, Ont., Canada M9V 3Y6

EIMAC, Div. of Varian, 301 Industrial Way, San Carlos, Cal. 94070

EIP Microwave, 3230 Scott Blvd., Santa Clara, Calif. 95051

EMCEE Broadcast Products, Box 68, White Haven, Pa. 18661

E.M.S Inc., Box 2792, Castro Valley, CA 94546

EMT Franz VGmbH, Box 1520, D-763 Lahr, W. Germany

E-N-G Corp., 1009 C. Shary Circle, Concord, CA 94518

ENG Products Corp., Box 42, Scarborough, NY 10510

ESC Electronics Corp., 534 Bergen Blvd., Palisades Park, N. J. 07650

ESE, 142 Sierra St., El Segundo, CA 90245

R. M. Mayers (213) 674-3021

REGIONAL SALES CONTACTS:

Roscom Inc., P.O. Box 1208, Roswell, GA 30077 (404) 992-2700 Bob Stewart
David Bain Associates, Box 1014, Port Washington, N.Y. 11050 (516) 883-4818 David Bain
Audio Distributors Inc., 2344 S. Division, Grand Rapids, MI 49507 (616) 452-1596 Dave Veldsma
Dyma Engineering, P.O. Box 1697, Taos, NM 87571 (505) 758-2686 Carroll Cunningham
Comad Communications, 91 Kellield St., Rexdale, Ont. M9W 5A3 Canada (416) 245-1734 Emil Adamyk
Savco, P.O. Box 427, Richardson, TX 75080 (214) 234-1841 Nathan Hughes
Broadcast Supply West, 2711 Locust Ave., W., Tacoma, WA 98466 (206) 565-2301 Irv Law
David Green Broadcast Consultant, 21 N. Wirt St., Leesburg, Va. 22075 (703) 777-8660 David Green
Midwest Corp., Nitro, WV (304) 722-2921
Midwest Corp., Cincinnati, OH (513) 742-2300
Martin Audio, 320 W. 46th St., New York, N.Y. 10036 (212) 541-5900 Ed Tompkins
Midwest Corp., Miami, FL (305) 592-5355
Allied Broadcast Equipment, 124 S. 6th St., Richmond, Ind. 47374 (317) 962-8596 Roy Ridge
Midwest Corp., Houston, TX (713) 686-9278
Ro-Cel Electronics, 731 Voice of the Theater Bldg., Pittsburgh, Pa. 15223 (412) 781-2326 Claire Rosenberger
Midwest Corp., Clarksburg, WV (304) 623-3781
Midwest Corp., Virginia Beach, VA (804) 464-6256
Midwest Corp., Beltsville, MD (301) 937-1890
Midwest Corp., Dallas, TX (214) 741-1440

Eastman Kodak Co., 343 State St., Rochester, N.Y. 14650

Echo Science Corp., 485 E. Middlefield Rd., Mountain View, CA 94043

Echolab, 175 Bedford Rd., Burlington, MA 01803

Econco Broadcast Service Inc., Rt. 2 Box 188, Woodland, Calif. 95695

Edco Products, Inc., 680 Bizzell Dr., Lexington, Ky. 40504

Edcor, 16782 Hale Ave., Irvine, CA 92714

Ednalite Corp., 200 N. Water St., Peekskill, NY 10566

Edutron, Inc., 25 Oak St., Suite I, Roswell, GA 30075

REGIONAL SALES CONTACTS:

Signal Engr. & Sales, 720 South 23rd St., P.O. Box 10167, Birmingham, AL 35202 (205) 328-6431
Rohs Electronics, 4553 East Broadway, Tucson, AZ 85711 (602) 795-8573
Alco Paramount, 79 S. Third St., San Jose, CA 95113 (408) 297-7111
A-VIDD Electronics Co., 2210 Bellflower Blvd., Long Beach, CA 90815 (213) 598-0444
Instant Replay Equip. Co., 5520 Westlawn Ave., Los Angeles, CA 90066 (213) 870-9437
R. E. Snader & Associates, 216 E. Strawberry Dr., Mill Valley, CA 94941 (415) 383-4263
Tri-Tronics, Inc., 2921 W. Alameda Ave., Burbank, CA 91505 (213) 843-2170
Audio Video Systems, Inc., 3390 Peoria St. Ste 306, Aurora, CO 80010 (303) 341-9994
North East Video & Sound Inc., 287 Kenyon St., Stratford, CT 06497 (203) 377-1444
Midwest Telecommunications, 3331 N.W. 82nd Ave., Miami, FL 33122 (305) 592-5355
Southeast Electronics, P.O. Box 441, P.O. Box 4441, Winter Park, FL 32793 (305) 678-4592
Southeast Electronics, 1125 Rosselle St., Jacksonville, FL 32203 (904) 356-3007
Sun Video, 8100 Ulmerton Rd., Largo, FL 33541 (831) 536-9424
Tele-Research, 1237 Old Corry Field Rd., P.O. Box 4905, Warrington, FL 32507 (904) 456-1811
Visual Systems Co., 3870 N. Peachtree Rd., Atlanta, GA 30341 (404) 457-1388
EMC Corp., 2979 Ualena St., Honolulu, HI 96819 (808) 836-1138
AATronics, Inc., 3113 Rose Hill, Boise, ID 93705 (208) 343-0900
Center Video Center, 5800 W. Fullerton Ave., Chicago, IL 60639 (313) 637-1600
V-Trip, Inc., 5432 N. Second St., Rockford, IL 61111 (815) 654-9515
Centrex Audio Visual, 210 West Sixth St., Topeka, KS 66603 (913) 232-7701
Nichols Electronics, 6370 East Central Ave., Wichita, KS 67208 (316) 686-2131
Sound Electronics, 103 Arnould Blvd., Lafayette, LA. 70506 (381) 984-4090
Video Index Corp., 1622 Clio St., New Orleans, LA 70131 (504) 522-0729
Midwest Telecommunications, 4700-G Boston Way, Lanham, MD 20801 (301) 577-4903
Peirce-Phelps, 10215 Fernwood Rd., Bethesda, MD 20014 (301) 530-9580
Professional Products, 4964, Fairmont Ave., Bethesda, MD 20014 (301) 657-2141
Malco Electronics, Inc., 5 Wolcott Ave., Lawrence, MA 01843 (617) 752-2500
Professional Video Systems, 1616 Soldiers Field Rd., Brighton, MA 02135 (617) 254-2101
Cruse Communications Co., 4903B Dawn Ave., E. Lansing, MI 48823 (517) 332-3579
Century Camera, Inc., 119 North Ninth St., Minneapolis, MN 55431 (612) 340-5605
Jasper Ewing & Sons, 610 N. State St., Jackson, MS 39205 (601) 354-7844
Communitronics Corp., 1907 S. Kingshighway, St. Louis, MO 63110 (314) 771-7160
Central Missouri A/V, 1000 West Broadway, Columbia, MO 65201 (314) 874-2111
Custom Video Electronics, Local Hillsborough Rd., Cedar Hill, MO 63016 (314) 285-2287
Video Electronics, Inc., 3280 Spring Mountain Rd., Las Vegas, NE 89101
New England Wholesale Supply Inc., 57 Harvey Road, P.O. Box 76, Londonderry, NH 03053 (603) 434-0323
KLR Audio/Vis. & Camera, 2929 Monte Vista Blvd. NE. Albuquerque, NH 87106 (505) 265-3562
Adwar Video, 100 Fifth Avenue, New York, NY 10011 (212) 691-0976
Tape City, Inc., 404 Park Ave. South, New York, NY 10015 (212) 679-1606
L. Matthew Miller Assoc., 205 East 42nd St. Ste. 1316, New York, NY 10017 (212) 687-1168
Communications Sys of Albany, 6 Highland Ave., Albany, NY 12205 (518) 482-4435
Videosound, 1458 Slaterville Rd., Ithaca, NY 14850 (607) 272-2060
Kirkman Electronics, 901 W. Second St., Winston-Salem, NC 27108 (919) 722-9131
Long Engineering Co., 961 Burke St., Winston-Salem, NC 27101 (919) 725-2306
ESI Video Systems Inc., 6531 Doubletree Ave., P.O. Box 29348, Columbus, OH 43229 (614) 436-1381
Midwest Telecommunications, 1150 C West Eighth St., Cincinnati, OH 45203 (513) 651-1904
Videosonics, Inc., 821 S.E. 14th Ave., Portland, OR 97214 (503) 232-4632
Dempsey Electronics, 121 Summit Drive, Irwin, PA 15642 (412) 864-0300
Peirce-Phelps, Inc., 2000 Block N. 59th St., Philadelphia, PA 15146 (215) 879-7000
CENTEL Systems Inc., 3610 Democrat Rd., Memphis, TN 38118 (901) 365-1361

Eidson Electronic Co., Box 96, Temple, Tex. 76501

Eigen Video, Box 1027, Grass Valley, Calif. 95945

George Foster (916) 273-1341

Elcom Engineering Co., Box 10432, Santa Ana, Calif. 92711

Electro Controls, 2975 S. 300 W., Salt Lake City, Utah 84115

Electro Impulse, Inc., Box 870, Red Bank, N.J. 07701

Mark Rubin (201) 741-0404

Electro & Optical Systems Ltd., 3015 Kennedy Rd., Scarborough, Ont., Canada M1V 1E7

Electro Sound, Inc., 160 San Gabriel Dr., Sunnyvale, Calif. 94086

Electro-Voice Inc., 600 Cecil St., Buchanan, Mich. 49107

Greg Silsby (616) 695-6831

REGIONAL SALES CONTACTS:

Dick Bellew Sales, Inc., 418 Maple Hill, P.O. Box 1835, El Dorado, AR 71730 (501) 863-8325 Dick Bellew
Bi-State Marketers, Inc., 753 Bergen Blvd., Ridgefield, NJ 07657 (201) 943-5888 (9) Mort Sumberg
David H. Brothers Co., Inc., 19 Old Court Rd., Baltimore, MD 21208 (301) 764-7189 Dave Brothers
Jack Carter Associates, Inc., 10825 Burbank Blvd., P.O. Box 6035, North Hollywood, CA 91603 (213) 98-13450 Jack Carter
Centennial Marketing Ltd., 8505 E. Orchard Rd., Suite 116, Englewood, CO 80110 (303) 770-0771 Marv Squire
George M. Conneen Co., Inc., 24 South Newton Street Rd., Newton Square, PA 19073 (215) 353-2441 (2) George Conneen
The Cummings Co., 1839 Fall Meadow, Missouri City, TX 77459 (713) 437-9043 Ernie Cummings
Gemini Electronics Marketing, Ernie Cummings, 1110 N. 175th Suite 106, Seattle, WA 98133 (206) 542-1116
Marcus Johnson & Associates, 400 Brookes Drive, Suite 213, Hazelwood, MO 63042 (314) 731-4110 Marc Johnson
C. L. Pugh & Associates, Inc., 2144 Riverside Drive, Columbus, OH 43221 (614) 486-9678 Ted Magnuson
Harry J. Lang & Associates, 1371 Hillcrest Dr. #303, Anchorage, AK 99503 (907) 279-5741 Harry Lang
Riley & Petchell Sales, Inc., 25700 Plymouth Rd., Detroit, MI 48239 (313) 937-3000 Tom Petchell
Wm. M. Linz Associates, Inc., 821 Skokie Blvd., Northbrook, IL 60062 (312) 498-9600 Bill Linz
Skor, 1821 University Ave., St. Paul, MN 55104 (612) 645-6461 Gene Kurzweg
Meyer & Ross, 1485 Rollins Rd., Burlingame, CA 94010 (415) 348-6800 Mordy Foodym
The Smith Company, 599 New Park Avenue, W. Hartford, CT 06110 (203) 523-0512 George Smith
Maitland K. Smith, Inc., 2321 Fourth St. Suite 210, Tucker, GA 30084 (404) 939-3323 Bob Tyler
Sproch Sales, Inc., 3520 W. Broward Blvd., Ft. Lauderdale, FL 33312 (305) 587-3792 Elaine Sproch
Paul Stone Sales Company, Inc., 5174 N. Allisonville Rd., Indianapolis, IN 46205 (317) 257-4277 Paul Stone
Waxman-Currant Sales, Inc., 990 Kenmore Ave., Buffalo, NY 14216 (716) 873-0442 Alex Waxman

Electrohome Ltd., 809 Wellington St. N., Kitchener, Ont., Canada N2G 4J6

James Washburn (519) 744-7111

REGIONAL SALES CONTACTS:

Electrohome (U.S.A.) Ltd., 182 Wales Ave., Tonawanda, NY 14150 (716) 694-3332
Electro Visual Corp. of America, 3617 W. Macarthur Blvd., Suite 508, Santa Ana, CA 92704 (714) 545-6991

Electrolabs, Box 6721, Stanford, CT 94305

Electronic Devices, Inc., 21 Gray Oaks Ave., Yonkers, N.Y. 10710

Electronic Inst. & Spec., 42 Pleasant St., Stoneham, Mass. 02180

Electronics Diversified, Inc., 1675 N.W. 216th, Hillsboro, Ore. 97123

Luis Walsh (503) 645-5533

Emcor Products, GF Business Equipment, Inc., 1600 4th Ave. N.W., Rochester, MN 55901

Enclosure Corp., 4529 Adams Circle, Cornwell Heights, Pa. 19020

Engineering Associates, 7567 Rt. 49A East, Arcanum, Ohio 45304

English Electric Valve Co. Ltd., Waterhouse Lane, Chelmsford, Essex England CM1 2QU

Enterprise Electronics Corp., Box 1216, Enterprise, Ala. 36330

Equipto Storage Systems, 225 S. Highland, Aurora, Ill. 60507

Ercona Corp., 2492 Merrick Rd., Bellmore, NY 11710

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Eumig USA, Inc., Lake Success Business Park 225 Community Dr., Great Neck, N.Y. 10020

Eventide Clock Works Inc., 265 West 54th St., New York, N. Y. 10019

Exact Electronics, Box 347, Tillamook, OR 97141

F

Farinon Video, 1680 Bayport Ave., San Carlos, Calif. 94070

Yves Faroudja, Inc., 199 First St., Los Altos, CA 94022

Fidelipac, 109 Gaither Dr., Mt. Laurel, N.J. 08057

Arthur Constantine (609) 235-3511

The Finney Co., 34 W. Interstate St., Bedford, Ohio 44146

Imero Fiorentino Associates, Inc., 10 West 66th St., New York, N. Y. 10023

Fisher Berkeley Corp., 5800 Christie Ave., Emeryville, Cal. 94608

Fix Tune, Solid State Electronics, Inc., One W. 30th St., New York, N.Y. 10001

Flash Technology Corp. of America, 55 Lake St., Nashua, N. H. 03060

John Fluke Mfg. Co., Inc., Box 43210, Mountlake Terrace, Wash. 98043

Fort Worth Tower Co., Inc., Box 8597, Ft. Worth, Tex. 76112

Freeland Products Co., 3233 Conti St., New Orleans, La. 70119

Frequency Devices Inc., 25 Locust St., Haverhill, Mass. 01830

Frezzolini Electronics, Inc., 7 Valley St., Hawthorne, N. J. 07506

Jack Zink (201) 427-1160

REGIONAL SALES CONTACTS:

Export Agents: Cinecraft International, Inc., 11 Caesar Place, Moonachie, NJ 07074 (201) 939-0875
In Canada: Kingsway Film Equipment Ltd., 821 Kipling Ave., Toronto Ont., M8Z 5G8 Canada (416) 233-1101

Fuji Photo Film USA, Inc., Magnetic Tape Div., 350 5th Ave., 70th Floor, New York, N. Y. 10001
(212) 736-3335

Fujinon Optical, Inc., 672 White Plains Rd., Scarsdale, N.Y. 10583

G

GBC Closed Circuit TV Corp., 315 Hudson St., New York, N.Y. 10013

G C Electronics, Div. Wallace Murray, 400 S. Wyman St., Rockford, Ill. 61101

GTE Lenkurt, Inc., 1105 County Road, San Carlos, Calif. 94070

GTE Sylvania Inc., Lighting Products Group, 100 Endicott St., Danvers, Mass. 01923

Gabriel Electronics, Inc., Box 626, Scarborough, ME 04074

Gardiner Communications Corp., 1980 S. Post Oak Rd., Ste. 2040, Houston, TX 77056

Garner Industries, 4200 No. 48th St., Lincoln, Nebr. 68504

Bruce A. Alderman (402) 464-5911

Geleco Electronics Ltd., 2 Thorncliffe park Dr., Unit 28, Toronto, Ont., Canada M4H 1H2
(416) 421-5631

General Cable Corp., 500 West Putnam Ave., Greenwich, Conn. 06830

General Electric Co., ISO Div., 316 E. Ninth St., Owensboro, Ky. 42301

General Electric Co., Video Display Equip. Op., Electronics Park 6-206, Syracuse, N. Y. 13221

Jerrold P. Gunderson, Mgr. Mktg. (315) 456-2562

Gerard Tech, Box 634, Anoka, MN 55303

Gerald Gerard (612) 421-2568

The Gerstenslager Co., 1425 E. Bowman St., Wooster, Ohio 44691

A.W. Baehr (216) 262-2015

Glentronix Ltd., 160 Duncan Mill Rd., Don Mills, Ont., Canada M3B 1Z5

Alan Gordon Enterprises Inc., 1430 N. Cahuenga Blvd., Hollywood, Calif. 90028

Gorman Redlich Mfg. Co., 6 Curtis St., Athens, Ohio 45701

Gotham Audio Corp., 741 Washington St., New York, N.Y. 10014

Gould Inc., Instruments Div., 3631 Perkins Ave., Cleveland, Ohio 44114

Gralex Industries, 155 Marine St., Farmingdale, N. Y. 11735

Grandy, Inc., 1275 Bloomfield Ave., Fairfield, N.J. 07006

Granger Associates, 3101 Scott Blvd., Santa Clara, CA 95051

Grass Valley Group, Inc., P.O. Box 1114, Grass Valley, Cal. 95945

Gray Engineering Labs, 504 West Chapman Ave., Orange, Calif. 92668

Tom C. Clark (714) 997-4151

REGIONAL SALES CONTACTS:

Swiderski Electronics Inc., 1200 Greenleaf Ave., Elk Grove Village, IL 60007 (312) 364-1900 Joe Swiderski
Sonocraft Corp., 29 West 36th St., New York, NY 10018 (212) 760-9300 Bernie Palmer
Sun Video, 8100 Ulmerton Rd., Largo, FL 33514 (813) 536-9424 Carlo McDaniel
Magnetic Media Corp., 8745 E. Orchard Rd., Englewood, CO 80111 (303) 770-6340 John Kelly
Skaggs Video, P.O. Box 30658, Salt Lake City, UT 84125 (801) 487-4531 Sam Kichas

The Great American Market, Box 178, Woodland Hills, Calif. 91364

Gregg Laboratories, 2120 E. Howell, Suite 505-506, Anaheim, CA 92806

Groton Computer Inc., 19 Fort Hill Rd., Groton, CT 06340

Gruber Products Co., 5254 Jackman Rd., Toledo, Ohio 43613

H

HM Electronics, Inc., 6151 Fairmount Ave., San Diego, Calif. 92120

H.Y. Miyobira (714) 280-6050

REGIONAL SALES CONTACTS:

Rep Tech Inc., 1110 Altoga Court, Louisville, TX 75028 (214) 436-4111
A B and T Sales Corp., Jackson Creek Rd., P.O. Box 111, Grasonville, MD 21638 (301) 827-8046; 8909 N. Browning & Co., 207 S. Court St., Medina, OH 44256 (216) 723-1901
A B and T Sales Corp., 1000 Valley Forge Circle, King of Prussia, PA 19406 (215) 265-2028, 783-7220
Northern Calilornia Mkt., 1725 San Carlos Ave. #1, P.O. Box 697, San Carlos, CA 94070 (415) 592-8160
John B. Anthony Co., 992 High Ridge Rd., Stamlord, CT 06905 (203) 322-9202, (212) 585-2027
N. Browning & Co., 133 N. Jefferson St., Dayton, OH 45402 (513) 222-3946
CB Electronic Marketing, 6429 Iris Way, Arvada, CO 80004 (303) 422-0561
Bernard Darmstedter Assoc. Inc., 41 R. Oswego St., Baldwinsville, NY 13027 (315) 638-1261
Capital Communications Ind., P.O. Box 481, Olympia, WA 98507 (206) 943-5378
Technical Systems Reps, 2065 Peachtree St. Industrial Center, Suite 215, Chamblee, GA 30341 (404) 457-0426
Filmways Audio Services, 5540 Cleon Ave., North Hollywood, CA 91601 (213) 877-9711
Forristal-Young Sales Co., 7110 Oakland Ave., St. Louis, MO 63117 (314) 645-2360
Forristal-Young Sales Co., 9010 East 50 Hiway, Kansas City, MO 64133 (816) 358-6771
Forristal-Young Sales Co., 11312 Martha, Omaha, NE 68124 (402) 333-0800
Forristal-Young Sales Co., 6400 Hickman, Lot 37, Des Moines, IA 50322
Kodo Associates, Inc., 8100 Penn Ave. South, Minneapolis, MN 55431 (612) 881-1255
Riley & Petchell Sales, Inc., 25700 Plymouth Rd., Detroit, MI 48239 (313) 937-3000
Riley & Petchell Sales, Inc., 401 Chippewa, Buchanan, MI 49107 (616) 695-6365
Sproch Sales, Inc., 3520 W. Broward Blvd., Ft. Lauderdale, FL 33312 (305) 587-3792
Sproch Sales, Inc., 12 Anchor Way, Gulf Harbour, New Port Richey, FL 33552 (813) 849-6067
VF Sales, Inc., 181 Worcester Rd., Natick, MA 01760 (617) 237-6544

Hallikainen & Friends, Inc., 101 D4 Suburban Rd., San Luis Obispo, Calif. 93401

Len Filomeo (805) 541-0200

REGIONAL SALES CONTACTS:

David Green Broadcast Consultants, 21 North Wirt, Leesburg, VA 22075 (703) 777-8660 David Green
Ring Associates, Inc., P.O. Box 188, Easthampton, MA 01027 (413) 527-4430 John Ring
Sound Solutions, 7641 19 Mile Rd., Sterling Heights, MI 48078 (313) 979-6320 Dave Hill
Videomedia, 250 N. Wolfe Rd., Sunnyvale, CA 94086 (408) 733-6500 Hank Wilkes
VIF International, P.O. Box 1555, Mountain View, CA 94042 (408) 739-9740 Gordon MacKechnie

Hamilton Electronics Corp., 2003 W. Fulton St., Chicago, IL 60612

Clifford B. Hannay & Son, Inc., 402 Main St., Westerlo, N.Y. 12193

Harris Corp., Broadcast Products Div., Box 4290, Quincy, Ill. 62301

Kenneth R. Schwenk, Sls. Dir. (217) 222-8200 Ext. 3400

REGIONAL SALES CONTACTS:

Harris Corp., BPD, P.O. Box 4290, Quincy, IL 62301 (217) 222-8200 J. L. Preston, Mgr. Radio Sales, Eastern U.S.
Harris Corp., BPD, P.O. Box 4290, Quincy, IL 62301 (217) 222-8200 J. W. Ariana, Mgr. Radio Sales, Western U.S.
Harris Corp., BPD, 675 Third Ave., New York, NY 10017 (212) 986-7600 Hal Kneller
Harris Corp., BPD, P.O. Box 4290, Quincy, IL 62301 (217) 222-8200 John Delissio, VP Int'l. Sales
Harris Corp., BPD, 2600 Virginia Ave. NW, 8th Flr., Washington, D.C. 20037 (202) 342-3946 Lew Page; Kinsley Jones
Harris Corp., BPD, 7000 Regency Sqr. Blvd., Suite 200, Houston, Tex. 77036 (713) 977-2411 London T. England; Vern Killion
Harris Corp., BPD, 5839 Green Valley Circle, Suite 200, Culver City, Calif. 90230 (213) 641-5032 Tom O'Hara; Rick Stevens
Harris Systems Ltd., 212 Brunswick Blvd., Pointe-Claire, Que. H9R 1A6 Canada (514) 694-3371 Leo E. Gilbeau, Dist. Sls. Mgr.

Harris Corp., PRD Electronics Div., 6801 Jericho Turnpike, Syosset, N. Y. 11791

Hartley Products Corp., 620 Island Rd., Ramsey, N.J. 07446

Harwood Mfg. Co., Subs. Elgin Nat'l. Industries, Inc., 1800 W. Fullerton, Chicago, IL 60614

Heath Co., Benton Harbor, Mich. 49022

Hewlett-Packard Co., 1507 Page Mill Rd., Palo Alto, Calif. 94304

Hickok Elec. Inst. Co., 10514 Dupont Ave., Cleveland, Ohio 44108

Hitachi Denshi America, Ltd., 175 Crossways Park W., Woodbury, NY 11797

Mike Monk; Jack Breitenbucher-Regional Sls. Mgr. (516) 921-7200

REGIONAL SALES CONTACTS:

Atlanta:, 3610 Clearview Pkwy., Doorville, GA 30340 (404) 451-9453 Dick Wheeler
Chicago:, 1725 33rd Ave., Melrose Park, IL 60160 (312) 344-4020 Mike D'Amore
Dallas:, 14169 Proton Rd., Dallas, TX 75240 (214) 233-7623
Denver:, 3538 Peoria, Aurora, CO 80010 (303) 344-3156 Steve Sedoff
Los Angeles:, 21015 S. Figuroa, Carson, CA 90745 (213) 328-2110 Nick Pisciotta
Seattle:, 1051 Andover Park W., Tukwilla, WA 91188 (206) 575-1680 Dick Carroll

Hitran Corp., Route 31, Flemington, N.J. 08822

Holland Electronics, 970 E. 92nd St., Brooklyn, N. Y. 11236

Houston Fearless 76, 833 E. Walnut St., Carson, Calif. 90746

Houston Photo Products, Inc., 655 E. 20th St., Yuma, Ariz. 85364

Howe Audio Productions, Inc., Box 383, Boulder, CO 80306

Howe-Yin Research Co. Inc., Box 3518, Fremont, Calif. 94538

Hughes Aircraft Co., Microwave Communications Products, Box 2999, Torrance, Calif. 90509

Hughey & Phillips Inc., 3050 N. California St., Burbank, Calif. 91504

C. E. Stephens, Sales Mgr. (213) 849-1104

Philip A. Hunt Chemical Corp., Roosevelt Place, Palisades Park, N.J. 07650

Hy-Gain Electronics, Div. of Telex Communications Inc., 8601 N.E. Hiway 6, Lincoln, NE 68505

I

ITT Cannon Electric, 666 E. Dyer Rd., Santa Ana, CA 92702

IGM, Div. of Northwestern Tech., 4041 Home Rd., Bellingham, Wash. 98225

Darrell Wichers (206) 733-4567

REGIONAL SALES CONTACTS:

IGM/NTI, 1301 Fraser, Suite A-12, Bellingham, WA 98225 (206) 671-3970 Carl Peterson
IGM/NTI, 1925 Century Blvd., Suite 4, Atlanta, GA 30345 (404) 325-3726 Jim Drummond
Dyma Engineering, P.O. Box 1697, Taos, NM 87571 (505) 758-2686 Mike Ziomko
Eastern Broadcast Supply, 46 Mechanic St., Leominster, MA 01453 (617) 537-4706 Ron Dagenais

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MZB & Associates, 4203 Beltway Dr., Dallas, TX 75234 (214) 233-5535 Darryl Parker

ITI Electronics, Inc., 369 Lexington Ave., Clifton, NJ 07011

ITT Jennings, 970 McLaughlin Ave., San Jose, Cal. 95122

Ikegami Electronics (USA) Inc., 37 Brook Ave., Maywood, NJ 07607

REGIONAL SALES CONTACTS:

West Coast Office:, 19164 Van Ness Ave., Torrance, CA 90501 (213) 328-2814
Southwest Office:, 330 North Belt E., Suite 228, Houston, TX 77060 (713) 455-0100
Bennett Engineering Assoc., P.O. Box 76, Mercer Isle, WA 98040 (206) 232-3550
The Camera Mart, 456 West 55th St., New York, NY 10019 (212) 757-6977
Gray Communications Consultants Inc., 404 Sands Dr., Albany, GA 31706 (912) 883-2121
Landy Associates, 1890 E. Marlton Pike, Cherry Hill, NJ 08003 (609) 424-4660
MZB & Associates, 4203 Beltway, Dallas, TX 75234 (214) 233-5535
Midwest Telecommunications, 1150C West 8th St., Cincinnati, OH 45203 (513) 651-1904
MPCS Video Industries, 514 West 57th St., New York, NY 10019 (212) 586-3690
Peirce Phelps Inc., 2000 North 59th St., Philadelphia, PA 19131 (215) 879-7171
Roscor Co. Inc., 6160 Oaktown St., Morton Grove, IL 60053 (312) 539-7700
Skaggs Telecommunication Service, 312 Bear Cat Dr., Salt Lake City, UT 84125 (801) 487-4531
Technical Video Systems, 245 Executive Park Blvd., Winston Salem, NC 27103 (919) 768-9536
Television Engineering Corp., 519 Rudder Rd., Fenton, MO 63026 (314) 343-5605
Todd Communications, 7360 Ohmes Lane, Minneapolis, MN 55435 (612) 835-3080
Tri-Tronics Inc., 2921 W. Alameda Ave., Burbank, CA 91505 (213) 843-2170
Applied Electronics Ltd., 299 Evans Ave., Toronto, Ont. Canada M8Z 1K2 (416) 252-3761

Ikelheimer-Ernst, Inc., Fiberbilt Photo Products, 601 West 26th St., New York, NY 10001

Image Magnification, Inc., 739 Airway Circle, New Smyrna Beach, Fla. 32069

Image Video Ltd., 700 Progress Ave. #16, Scarborough, Ont., Canada M1H 2Z7

Industrial Marketing Advisory Services, Inc., 2425 Wilson Blvd., Arlington, Va. 22201

Industrial Sciences, Inc. (ISI), Box 1495, Gainesville, Fla. 32602

Richard S Hajdu (904) 373-6783

REGIONAL SALES CONTACTS:

Delcom, 6109 S. 66th E. Ave., Tulsa, OK 74145 (918) 494-9500 Sam Pate
Gray Communications, 3684 Clearview Ave., Doraville, GA 30340 (404) 455-3121 Gino Nappo
Lake Systems, 55 Chapel St., Newton, MA 02134 (617) 244-6881 Frank DeMayo
Magnetic Media, 5555 N. Lamar, Suite J-115, Austin, TX 78751 (512) 451-0138 John Harms
Midwest Telecommunications, 4700 Boston Way, Lanham, MD 20801 (301) 577-4903 E. J. Midkiff
MPCS Video Industries, 514 W. 57th St., New York, NY 10019 (212) 586-3690 Marty Frange
Pacific Video, 2600 E. Katella, Anaheim, CA 92806 (714) 634-8585 Keith Hughes
Peirce-Phelps, Inc., 2000 N. 59th St., Philadelphia, PA 19131 (215) 879-7000 Phil Ghant
Hoffman Video Systems, 800 W. Pico, Los Angeles, CA 90015 (213) 749-3311 Bill Wallace
Professional Products, 4964 Fairmont Ave., Betheda, MD 20014 (301) 657-2141 Carter Kaufman
Videosonics, 821 SE 14th Ave., Portland, OR 97214 (503) 232-4632 Bill Achatz
Roscor, 6160 W. Oakton, Morton Grove, IL 60053 Phil Roston
Video Equipment Corp., 7377 Convoy Court, San Diego, CA 92111 (714) 278-4274 Bill Bennett
Technical Industries, 6000 Peachtree Rd., Atlanta, GA 30341 (404) 455-7610 Ed Matthews
Snader and Associates, 216 E. Strawberry Dr., Mill Valley, CA 94941 (415) 383-4263 Bob Snader
Technical Video, 245 Executive Park Blvd., Winston Salem, NC 27103 (919) 768-9536 Jim Holladay
Klopf Audio Video, 3381 Successful Way, Dayton, OH 45414 (513) 236-5500 Russ Johnson

Innovative Television Equipment, Inc., P.O. Box 681, Woodland Hills, Cal. 91364

Inovonics, 503-B Vandell Way, Campbell, Calif. 95008

J. B. Wood, Pres. (408) 374-8300

REGIONAL SALES CONTACTS:

Taber Mfg. & Eng., 2081 Edison Ave., San Leandro, Calif. 94577 (415) 635-3831
Accurate Sound, 114 5th Ave., Redwood City, Calif. 94063 (415) 365-2843
Mel Audio/Video, 1122 E. Chevy Chase Dr., Glendale, Calif. 91205 (213) 245-7708
VIF International, 1151 Viscaino Ave., Sunnyvale, Calif. 94086 (408) 739-9740
Savco, Box 427, Richardson, Tex. 75080 (214) 234-1841
Inovonics, Box 1014, Port Washington, N.Y. 11050 (516) 883-4818
Joel Associates, 528 River Rd., Teaneck, N.J. 07666 (201) 836-8741
Lebow Labs, 424 Cambridge St., Allston, Mass. 02134 (617) 782-0600
Broadcast Equip. & Supply, Box 3141, Bristol, Tenn. 37620 (615) 968-7342
The Harris Co., 1779 Tiggertail Rd., Miami, Fla. 33145 (305) 854-2003
John J. Harding Ltd., 2825 Valena St., Honolulu, Hawaii 96819 (808) 841-0941
Broadcast Supply West, 2711 Locust Ave. W., Tacoma, Wash. 98466 (206) 565-2301

Integrated Solid Systems Inc., GLI Brand, 2950 Northern Blvd., Long Island City, N.Y. 11101

Interand Corp., Telestrator Div., 666 N. Lake Shore Dr., Chicago, Ill. 60611

International Audio, Inc., 2934 Malmo Dr., Arlington Hgts., IL 60005

International Communications, & Control Corp., Box 11749, Knoxville, Tenn. 37919

International Electro-Magnetics, 350 Eric Dr., Palatine, Ill. 60067

International Microwave Corp., 33 River Rd., Cos Cob, Conn. 06807

International Nuclear Corp., 608 Norris Ave., Nashville, Tenn. 37204

International Tapetronics Corp., Box 241, Bloomington, Ill. 61701

Larry Cutchens, John Schaab, Karen Ryder (309) 828-1381

International Video Corp., 453 W. Maude Ave., Sunnyvale, Calif. 94086

Intertec Publishing Corp., Box 12901, Overland Park, Ks 66212

Ionic Industries, Inc., 128 James St., Morristown, NJ 07960

Ivie Electronics, 500 West 1200 South, Orem, Utah 84057

J

J&D International, Elec. Div., Unit E-East, Interstate Industrial Park, Bellmawr, N.J. 08031

JSH Electronics, Inc., A member co. of VSI Electronics, Box 2898, Culver City, Calif. 90230

Ray Jacobs Audio, Inc., Box 9462, Long Beach, CA 90810

Jamieson Film Co., 6901 Forest Park Rd., Dallas, Texas 75235

Janson Industries, Box 6090, Canton, Ohio 44706

Javelin Electronics, 6357 Arizona Circle, Los Angeles, Calif. 90045

Jensen Sound Laboratories, Div. of Pemcor, Inc., 4136 N. United Pkwy., Schiller Park, Ill. 60176

Jensen Transformers, 1617 N. Fuller Ave., Hollywood, Calif. 90046

Deane Jensen (213) 876-0059

REGIONAL SALES CONTACTS:

Scenic Sounds Equipment, 97-99 Dean St., London England W1V 5RA 01-734-2812 David Hawkins
TOWA Engineering, No.7 Azuma Bldg. 1-9 Sakama-cho, Kanada Chiyoda-ku, Tokyo 101 Japan
Syntec Pty. Ltd., 53 Victoria Ave., Chatswood, N.S.W. 2067 Australia 406-4557 Robert Sloss

Jerrold Electronics Corp., Box 487, Hatboro, PA 19040

Johnson Electronics Inc., 62 S. Hwy. 17-92, Casselberry, Fla. 32707

K

KAPCO Communications, Box 538, Morton Grove, IL 60053

KD Components, Inc., 3016 Orange Ave., Santa Ana, CA 92707

K & H Products, Ltd., Box 246, North Bennington, Vt. 05257

KVC, Inc., 215 Lexington Ave., New York, N.Y. 10016

Kager International, 1180 S. Beverly Dr., Los Angeles, Calif. 90035

Kahn Communications, Inc., 839 Stewart Ave., Garden City, NY 11530

Kaitronics Corp., 1540 Gilbreth Rd., Burlingame, Calif. 94010

Paul Tarrodaychik, V.P., Mktg. (408) 739-4262

Kalart Victor Corp., Hultenius St., Plainville, Conn. 06062

Kaman Sciences Corp., 1500 Garden of the Gods Rd., Colorado Springs, Colo. 80907

Kappa Networks, Inc., 165 Roosevelt Ave., Carteret, N.J. 07008

Karex, Inc., 1262 Lawrence Station Rd., Sunnyvale, Calif. 94086

Kay Elemetrics Corp., 12 BE Maple Ave., Pine Brook, N.J. 07058

Kay Industries, Inc., 604 N. Hill St., South Bend, Ind. 46617

Keeline Int'l., 13 Bond St., Ealing London W5, England

Kinetronics Corp., 42 Sherwood Terr., Lake Bluff, IL 60044

Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe, N.Y. 10707

Kliegl Bros. Lighting, 32-32 48th Ave., Long Island City, N.Y. 11101

Michael F. Connell (212) 786-7474

REGIONAL SALES CONTACTS:

Parts Dept. Inc., P.O. Box 648, Bloomfield, CT 06002 (203) 243-2517
Pekelney & Landau, 25 Knickerbocker Ave., Moonachie, NJ 07074 (201) 939-0883
Arclite Systems, Inc., P.O. Box 471, Ardsley, NY 10502 (212) 220-1022
Richard E. Nicholson, 75 W. Main St., E. Bloomfield, NY 14443 (716) 657-7512
Lengemann and Vetter, Inc., 1504 Walnut Ave., Oreland, PA 19075 (215) 884-5375
The Bob Foley Co., Inc., 9609 Parallel Pkwy., Kansas City, KS 66109 (913) 299-3002
Charles Hansing Co., 4127 Beard Ave. South, Minneapolis, MN 55410 (612) 926-2244
Charlesworth-Ward-Rafferty Assoc., 10127 Manchester Rd., St. Louis, MO 63122 (314) 821-7800
Great Plains Lighting Corp., 2305 S. 33rd St., Omaha, NE 68105 (402) 348-9194
Galbraith & Kurtz, 10 N. Main St., Chagrin Falls, OH 44022 (216) 247-6866
Ed-Ward & Co., P.O. Box 09482, Milwaukee, WI 53209 (414) 461-5570
Gewin Tucker & Assoc., P.O. Box 6006, Birmingham, AL 35209 (205) 942-9322
Don Brazile Manufacturers' Agent, P.O. Box 989, North Little Rock, AR 72115 (501) 758-3488
Newman-Penter-James Co., Inc., 4790 Mendel Ct., Atlanta, GA 30336 (404) 696-1300
Richard Mix, 1120 Meigs Ave. Bldg. T-4, Jeffersonville, IN 47130 (812) 283-7901
Somar, Inc., P.O. Box 10543, Jefferson, LA 70181 (504) 733-9525
F.X. Ford & Associates, 1011 North Calvert St., Baltimore, MD 21202 (301) 837-5533
Ed C. Vaughn Co., 3 Cderonella Drive, Chapel Hill, NC 27514 (919) 383-2938
Robert Nott Co., 2712 East 5th Place, Tulsa, OK 74104 (918) 939-4541
Malcolm Mimms & Assoc., P.O. Box 90191, Nashville, TN 37209 (615) 329-3041
Architectural Lighting Assoc., 13740 Gamma Rd. Suite A, Dallas, TX 75240 (214) 387-1677
Putterman, Scharck & Assoc. Inc., P.O. Box 36508, Houston, TX 77036 (713) 664-7111
Hyltin & Assoc., 319 E. Terra Alta, San Antonio, TX 78209 (512) 828-0624
Fred Dull Assoc., P.O. Box 2082, Ashland, VA 23005 (804) 798-6777
McHugh-Rollins Associates, P.O. Box 9791, Ft. Lauderdale, FL 33310 (305) 735-5414
AARK of Alaska, 8112 East 4th Avenue, Anchorage, AK 99504 (907) 333-1736
R. C. Lurie Co., P.O. Box 10026, Phoenix, AZ 85064 (602) 267-9265
Peterson/Vine, Inc., 15230 Burbank Blvd. Suite 105, Van Nuys, CA 91141 (213) 988-8661
Harry L. Stearns, Inc., 522 N. W. 23rd St., Portland, OR 97210 (503) 227-0593
Robert Bacon, 50 East Malvern Avenue, Salt Lake City, UT 84115 (801) 484-1701
Sanborn Sales, P.O. Box 80825, Seattle, WA 98108 (206) 767-3050

Kline Iron & Steel Co., Box 1013, Columbia, S.C. 29202

Knox Video Products, 9700-B George Palmer Hwy., Lanham, MD 20801

Stan Michalski (301) 459-2106

REGIONAL SALES CONTACTS:

Wahlberg Associates, 79 Mystic St., Arlington, Mass. 02174 (617) 646-5394 Eric Wahlberg
Tichroma Tech Consultants, Ltd., 100 North Rd., White Plains, NY 10603 (617) 646-5394 Al Jones
Commercial Video Reps, 2637 N. Charles St., Baltimore, MD 21218 (301) 235-9120 Jim Fairbank
Control Assembly Corp., 1339 Sylvandell Dr., Pittsburgh, Pa. 15243 (412) 561-0293 W. E. Carter
Kodo Associates, 8100 Penn Ave. S., Minneapolis, MN 55431 (412) 561-0293 Kodo Kawamura
Marcom, 59 Mt. Herman Rd., Scott's Valley, CA 95066 (408) 438-4273 Marty Jackson
Radford Associates, 3203 Lanier Dr., Atlanta, Ga. 30319 (404) 237-6097 Lew Radford
Dawson & Associates, 84 Belknap Beach Rd., Prospect, KY 40059 (502) 228-4898 Bruce L. Dawson
H. M. Dyer Electronics, 31185 Ten Mile Rd., Farmington Hills, Mich. 48024 (313) 628-0840 Mike Dyer
Sudduth Mfg's. Representatives, 845 39th SE. Paris, Tex. 75460 (214) 785-5764 Gene Sudduth
EMC Corp., 2979 Ualena St., Honolulu, Hawaii 96819 (808) 836-1138 Dave Caldwell
Comad Communications, Ltd., 91 Kelfield St., Unit 5, Rexdale, Ont. M9W 5A3 Canada (416) 245-1734 Emil Adamyk
Lerro Electrical Corp., 3125 N. Broad St., Philadelphia, PA 19132 (215) 223-8200 Lou Lerro

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EME, 112 Buena Vista, High Point, NC 27260 (919) 869-3335 George Gold
All Media Sales, 1535 Foxhill Rd., Naperville, IL 60540 (312) 628-0840 Ray Sudlow
8812 Santa Fe Lane, Overland Park, KS 66212 (913) 831-0188 Jim Grunder
Mile High Marketing, 1813 East 98th Pl., Thornton, CO 80229 (303) 457-2058 Chuck Jones
Fleehart & Sullivan Inc., 10109 Aurora Ave. N., Seattle, WA 98133 (206) 522-1533 Earl Fleehart

Kreonite, Inc., Box 2099, Wichita, KS 67201

Kroy Industries, Graphics Div., 1728 Gervais Ave., St. Paul, MN 55109

L

LPB Inc., 28 Bacton Hill Rd., Frazer, Pa. 19355

Harry N. Larkin (215) 644-1123

REGIONAL SALES CONTACTS:

LPB West Coast Office, 20944 Sherman Way, Canoga Park, CA 91303 (213) 340-4590 Richard W. Burden
MSC Electronics, Ltd., 254 Wildcat Rd., Downsview, Ont. Canada M3J 2N5 (416) 661-4180 Dennis Hinstridge

L-W International, 6416 Variel Ave., Woodland Hills, Calif. 91367

Pat Smith (213) 348-8614

Laird Telemedia Inc., 2125 S.W. Temple, Salt Lake City, Utah 84115

Ron Hymus, Sales Mgr. (801) 487-6251

Lampkin Lab. Inc., Box 9048, Bradenton, Fla. 33506

James B. Lansing Sound, Inc., 8500 Balboa Blvd., Northridge, Calif. 91329

Ronald H. Means or Bob Taylor (213) 893-8411

REGIONAL SALES CONTACTS:

JBL, 3040 Charlevoix Dr., S.E., Grand Rapids, MI 49506 (616) 455-6270 Thomas Roseberry
JBL 55 Ames Court, Plainview, NY 11803 (516) 822-2488 William V. Watkins
JBL 1413 Leicester St., Garland, TX 75042 (214) 495-5415 Carl Cathcart

D. N. Latus & Co., Inc., Box 1720, Helena, Mont. 59601

Lawhed, Ltd., 388 Reed Rd., Broomall, Pa. 19008

Leader Instruments Corp., 151 Du-Pont St., Plainview, N.Y. 11803

Leasametric, 1164 Triton Dr., Foster City, CA 94404

Lectrotech Inc., 5810 N. Western Ave., Chicago, Ill. 60659

Leedal, Inc., 1918 S. Prairie Ave., Chicago, IL 60616

Lee-Ray Industries, Inc., 38 E. First Ave., Mesa, Ariz. 85202

Leitch Video Ltd., 705 Progress, Unit 46, Scarborough, Ont., Canada M1H 2X1

John Walter (416) 438-5060

REGIONAL SALES CONTACTS:

P.M. Electronics, Inc., 185 Hillside Ave., Williston Park, N.Y. 11596 (516) 248-4858 Paul Milazzo
Television Engineering Corp., 519 Rudder Rd., Fenton, MO 63026 (314) 343-5606 Jack Vines
Didier/Denver, 4665 Kipling, Wheat Ridge, Colo. 80033 (303) 422-6666 Herb Didier
Wiltronix Inc., 5504 Waterway, Rockville, Md., 20853 (301) 460-1454 Dwight L. Wilcox
Nortec West Ltd., 7056 B Farrell Rd. S.E., Calgary, Alta. T2H 0T2 Canada (403) 252-8141 Ron Hill
Nortec West Ltd., 325 West 5th Ave., Vancouver, B.C. V5Y 1J6 Canada (604) 872-8525 Bob Whitehouse
Broadcast Video Systems Ltd., 1050 McNicoll Ave. E., Unit 15, Agincourt, Ont. M1W 2L8 Canada (416) 497-1020 Bert Verwey
Advanced Automation Pty Ltd., 6 Dansie St., Greenslopes, Brisbane Australia 4120 (07) 397-2611 Keith Campbell
Broadcast Video Systems Inc., 1050 E. Dominquez St., Unit P, Carson, CA 90746 (213) 637-2971 John Spiker
Canamex Electronics, Station Q, P.O. Box 307, Toronto, Ont. Canada M4T 2M5 (416) 487-7327 Jorge Fernandez
Dagang Teknik Sdn. Bhd., No. 44A, Pesiaran Ampang Off., 4th Mile, Jalan Ampang, Kuala Lampur Malaysia 462629 Stanley Chen
The Gene Sudduth Co. Inc., 845 39th S.E., Paris, TX 75460 (214) 785-5764 Gene Sudduth
Kim Oh & Co., C.P.O. Box 3590, Seoul Korea 22-0337 Jeong Seon Oh
Seltech Equipment Ltd., 16 York Rd. Maidenhead, Berkshire England SL6 1SF (628) 36315 Bill Jeynes; Dave Craddock
Tresco Communications Inc., 2910 Halpern St., N., St. Laurent, Que. Canada H4S 1N7 (514) 332-3430 Claude Tresidder
Leitch Video Inc., 210 S. 8th St., Lewiston, NY 14092 (716) 754-4349 Lowell Colbus

Lenco Inc., Electronics Div., 300 N. Maryland St., Jackson, Mo. 63755

Robert N. Henson (314) 243-3147

REGIONAL SALES CONTACTS:

Lenco, Inc., Electronics Div., 13620 Littlecrest Dr., Dallas, Tex. 75234 (214) 241-0976 Lee L. Caput
Lenco, Inc., Electronics Div., 7303 Poplar Lane, Middletown, MD 21769 (301) 371-5588 Anthony R. Mattia
Lenco, Inc., Electronics Div., 1120 South 4th St., Atchison, KS 66002 (913) 367-1146 Merton L. Knold
Lenco, Inc., Electronics Div., Box 4042, Albany, GA 31706 (912) 436-4927 Thomas J. Sabiston Jr.

Lenzar Optics Corp., 1006 West 15th St., Riviera Beach, FL 33404

Lightning Elimination Assoc., Inc., 12516 Lakeland Rd., Santa Fe Springs, CA 90670

Hal Proppe (213) 944-0916

REGIONAL SALES CONTACTS:

Applied Measurements, Inc., 77 Great Road, P.O. Box 316, Acton, MA 01720 (617) 263-2766; 646-7250 (Boston)
Applied Measurements, Inc., 2349 Whitney Ave., P.O. Box 5181, Hamden, CT 06518 (203) 288-5288
Applied Measurements, Inc., RD #1, Hillside Street, North Bennington, VT 05257 (802) 442-2222
Atlas Electric Company, Inc., 633 Halekauwila Street, Honolulu, HI 96813 (808) 524-5866
Walter J Brauer & Associates, Inc., 30432 Euclid Avenue, Room 210, P.O. Box 305, Wickliffe, OH 44092 (216) 943-0601
Walter J. Brauer & Associates, Inc., P.O. Box 35, Vandalia, OH 45377 (513) 898-1224
Gordon Fixman Engineering Company, 8160 Stanford Avenue, St. Louis, MO 63130 (314) 725-5219
Leemark Engineers, P.O. Box 6175, Leawood, KS 66206 (913) 648-0124
F M Associates Limited, 5018 Mortior Avenue, P.O. Box 13705, Orlando, FL 32809 (305) 851-5710; 851-5716
F M Associates Limited, 110 Yacht Club Place, P.O. Box 996, Jupiter, FL 33458 (305) 746-2996
R. A. Mayes Company, 1445 E. Thomas Road, #218, Phoenix, AZ 85014 (602) 279-5243
R. A. Mayes Company, 256 East Casa Loma Drive, P.O. Box 456, Centerville, UT 84014 (801) 292-6781
Nomad Engineering, 6510 North Clark Street, Chicago, IL 60626 (312) 764-0403
Thibodeau Engineering, 725 South Adams, Suite L-1, Birmingham, MI 48011 (313) 642-6620
Multi-Measurements, Inc., 1 Madison Ave, Suite #06, Warminster, PA 18974 (215) 675-3082
Knox Associates, Inc., 945 Lydia Drive, P.O. Box 8065, St. Paul, MN 55113 (612) 488-5402
R. A. Mayes Company, 11910 Central S. E., P.O. Box 11999, Albuquerque, NM, 87192 (505) 292-2330; 293-8010
R. A. Mayes Company, 725 S. Central Expressway, Suite A-100, P.O. Box 1021, Richardson, TX, 75080 (214) 235-3043
R. A. Mayes Company, 1800 Commerce Street, Boulder, CO 80302 (303) 444-0782
R. A. Mayes Company, 6425 Westheimer, No. 123, Houston, TX 77057 (713) 783-3856
F M Associates Limited, 2523 Andover Drive, P.O. Box 9901, Doraville, GA 30360 (404) 451-2293
F M Associates Limited, 106 Elam Avenue, P.O. Box 156, Ramseur, NC 27316 (919) 824-2196; 824-8461
G. M. Gillett & Associates, 2507 West Viewmont Way West, P.O. Box 99035, Seattle, WA 98199 (206) 284-3344
Instrucom, Inc., 1629 K Street, N.W., Suite #500, Washington, DC 20006 (202) 223-1759
J & B Engineering Sales Company, 2420 Coliseum Boulevard, N., P.O. Box 5135, Ft. Wayne, IN 46805 (219) 483-2813
Proyeccion Dinamica Industrial S.A., Gomez Faias 56-102, Mexico 4 D. F. Mexico Miguel Cabello
Stabell Services and Company, P.O. Box 1295, Ibadan Nigeria David A Bello, Technical Director
Consolidated Trading Corporation, 1500 Rodano Street Rio Piedras, G.P.O. Box 1916, San Juan Puerto Rico 00936 Hector Hernandez
Racal Electronics (Singapore) Pte. Ltd., Room 605 Chinese Chamber of Commerce Building, Hill Street Singapore 6 39098 Kee Chin Swee, Manager
Racal Electronics South Africa Ltd., P.O. Box 1463, Pretoria 0001 Republic of South Africa 83-4141 Nanne F. Potze, Manager Agencies Division
Louis P. Schmitt Associates, P.O. Box 4862, Hilton Head, SC 29928 (803) 671-5981
Magna-Techtronics, Crows Next, N.W. W. 2065 14 Whiting Street, P.O. Box 150, Artarmon, N.S. W. 2064 Australia F. L. Lloyd, Managing Director
Southern Television Corporation Ltd., 202 Tynte Street, P.O. Box 9, North Adelaide South Australia 5006 267-0111 John Batchelor, Chief Engineer
Ilektromaegnet Bangladesh, 64 Shaheed Suhrawardy Avenue (Second Floor), Baze Kakriail, Dacca - 2 Bangladesh S. M. Abdul Hakim
Electro Equip. Rua 13 de Maio 29 - 3.0 - CJ 31, Sao Paulo Brazil Mr. A. Barbosa
Kovacic, Franjo, Mining Engineer Blatine 35/VI, Split Yugoslavia
Communications & Equipment Consultants, Ltd., 'Martlets', Chipperfield, Hertslordshire, WD4 9BS England Kings Langley 63378 London 01-488 3064 Ken M. Ward, Director, David Wallace
E. T. A. T. Euro-Trans-Atlantique-Techniques, 3, Boulevard Saint Martin, 75003, Paris France 272.37.97 Mr. Rene Salmona, Sales; Mr. Marc Kopaniak, President
Trans-A-Tec, Inc. U.S.A. F. T. A. T. Rep., 30 Main Street, Suite #17, Ashland, MA 01721 (617) 881-3852 Max Mayer
Middle East Consultants, 9, Giza Street, Giza, Cairo, Egypt, P.O. Box 181, Dokki Egypt Dr. E. Nasser, Director
C. Itoh & Company, Ltd., 555 South Flower Street, Los Angeles, CA 90071 (213) 687-0610 Mark Umei
C. Itoh & Company Ltd., Osaka Head Office, Central P.O. Box 117, Osaka Japan S. Fusejima, Deputy Manager
Patrick Trading Corporation, Gen. P.O. Box 9963, Hong Kong 5-220964; 5-225406 C. S. Hsu, General Manager
Techno Gener Limited, No. 20 Farahnaz Street Palfzi Aven. North Farah, Tehran Iran M. Bozorgzad, Managing Director, F. Nakjevani, Director of Marketing
Racom Electronics Company Ltd., 60, Pinkas Street, P.O. Box 21120, Tel Aviv 61210 Israel 443126-7-8 Dan Alon, M. Aviv, Manager Industrial Sales Dept.
M.S. C. Electronics Limited, 254 Wildcat Road, Downsview, Ont. Canada M3J 2N5 (416) 661-4180 N.D. LaFrenais President, D. Hinstridge, Mktg. Mgr. Tony Sharpe, Sales
M. S. C. Electronics Limited, 412 Oakridge Way, S.W., Calgary, Alta. T2Z 1T 4 Canada (403) 281-3111 Wilf A. Rice, Manager Western Region
M. S. C. Electronics Limited, 2356 Bachard Carijnai, Montreal, Que. J3L 4E9 Canada (514) 658-0665 Pierre Brian

Lines Video Systems, Jefferson at McDaniel, Springfield, MO 65806

Bud Lines; Cheryl McKinney; Don Ingalsbe (417) 862-5533

Link Electronics Ltd., North Way, Andover, Hants, England SP10 5AJ

Lipps Inc., 1630 Euclid St., Santa Monica, Cal. 90404

Lipsner-Smith Corp., 4700 Chase St., Lincolnwood, Ill. 60646

Logitek Electronic Systems, Inc., 3320 Bering Dr., Houston, TX 77057

L. Scott Hochberg (713) 782-4592

REGIONAL SALES CONTACTS:

10B Hillsboro, Greenfield, TN 38230 (901) 235-2943 R.W. 'Mo Mo' Moseley
Geisler Broadcast Supply, 7103 Langdon, Houston, TX 77074 (713) 988-0847 Bernie Geisler
H.M. Holzberg Associates, P.O. Box 322, Totowa, NJ 07511 (201) 256-0455 Herb Holzberg
TranSonic Ltd., 121 McMaster Ave., Ajax, Ont. Canada L1S 2E6 (416) 683-7881 Bill Jones
Theodore Pappas & Associates, 5218 W. Diversey, Chicago, IL 60639 (312) 685-2338 Ted Pappas
Guarantee Radio Supply, 1314 Iturbide St., Laredo, TX 78040 (512) 723-9422 Rick Reyes
Linrose Electronics Corp., 12526 Prima Vista, San Antonio, TX 78233 (512) 656-6501 Gordon Tobias

Lowel-Light, 421 W. 54th St., New York, N.Y. 10019

Lowenthal Mfg., 2076 N. Elston, Chicago, IL 60614

Lyon Metal Products, Inc., Box 671, Aurora, IL 60507

M

MCG Electronics Inc., 160 Brook Ave., Deer Park, N.Y. 11729

MCI, Inc., 4007 N.E. 6th Ave., Ft. Lauderdale, Fla. 33334

MICMIX Audio Products, Inc., 2995 Ladybird Lane, Dallas, Texas 75220

MPB Technologies Inc., P.O. Box 160, Ste-Anne-de-Bellevue, Que., Canada H9X 3L5

F.G.R. (Ross) Warren (514) 457-2035

MSI Television, 4788 S. State St., Salt Lake City, UT 84107

Mach One Digital Systems, Inc., 3515 Cahuenga Blvd. West, Los Angeles, CA 90068

MacKenzie Laboratories, Inc., 5507 N. Peck Road, Arcadia, Calif. 91006

Magnasync/Moviola Corp., 5539 Riverton Ave., North Hollywood, CA 91603

Magna-Tech Electronic Co., Inc., 630 Ninth Ave., New York, N.Y. 10036

Magnavox CATV Systems, Inc., 133 W. Seneca St., Manlius, NY 13104

Magnecraft Electric Co., 5575 N. Lynch Ave., Chicago, Ill. 60630

Magnefax, Inc., RFD 1, Rogers, AK 72756

Magnesonics Mfg. & Sales Co., Box 758, Ventura, CA 93001

Mallory Distributor Prod. Co., Div. P. R. Mallory & Co. Inc., Box 1284, Indianapolis, IN 46206

Marconi Communication Systems Ltd., Marconi House, Chemsford, Essex, England CM1 1PL

Marconi Electronics Inc., Broadcast & Communication Div., 100 Stonehurst Ct., Northvale, N. J. 07647

Fred Bones, A. V. Lummiss (201) 767-7250

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Marconi Instruments, Div. of Marconi Electronics Inc., 100 Stonehurst Ct., Northvale, N. J. 07647

Keith Elkins, Tony Ramsden (201) 767-7250

REGIONAL SALES CONTACTS:

L&M Associates, 511 Victor St., Saddle Brook, N.J. 07662 (201) 843-8700 Martin Silver
CEC, 1602 S. Parker Rd., Suite 102, Denver, CO 80231 (303) 751-3252 Richard Seery
S&S Associates, 4924 Hampden Lane, Bethesda, Md. 20014 (301) 654-1434 Bill Becker
Kenneth W. Meyers Co., 1242 Remington Rd., Schaunburg, Ill. 60195 (312) 882-4808 Ken Meyers
Ken Corp., 38 Montvale, Stoneham, Mass. 02180 (617) 438-5464 Sam Kenton
Lee Associates, 817 Wheeler Ave., Huntsville, Ala. 35801 (205) 533-5896 Steve Shelley
TASCO, 606 110th Ave. N.E., Suite 204, Belleview, Wash. 98004 (206) 453-1414 Helbert Bartels
BRADENCO, 11500 Stemmons Freeway, Suite 113, Dallas, Tex. 75229 (214) 243-7261 Bob Braden
Moxon Electronics, 1440 S. State College Blvd., Anaheim, Calif. 92806 (714) 635-7600 Jim Jordan
John Robinson, 817 Fifth St., Santa Monica, Calif. 90403 (213) 451-9019 John Ro
Measurement Consultants, Inc., Box 966, Scottsdale, Ariz. 85252 (602) 994-9519 Dave Memegay
PAC, 11920 Grandview Rd., Grandview, Mo. 64030 (816) 763-4155 Daryl Booth

Marshall Electronics, Box 2027, Culver City, CA 90230

Marti Electronics, Box 661, Cleburne, Tex. 76031

Mast Development Co., A-V Systems Div., 2212 E. 12th St., Davenport, IA 52803

Maury Microwave Corp., 8610 Helms Ave., Cucamonga, Calif. 91730

Maxell Corp. of America, 60 Oxford Dr., Moonachie, N. J. 07074

Roger Mayer Electronics, Inc., 225 East 57th St., New York, NY 10022

McCurdy Radio Ind. Inc., 1711 Carmen Dr, Elk Grove Village, Ill. 60007

McKay Dymek Co., Box 5000, Claremont, Calif. 91711

McMartin Industries, Inc., 4500 South 76th St., Omaha, Neb. 68127

Robert Switzer (402) 331-2000

REGIONAL SALES CONTACTS:

McMartin Industries, 3317 Barrow Hill Trail, Tallahassee, FL 32308 (904) 893-1382 Robert Beattie
McMartin Industries, 15316 Russett, Rt. 1, Pride, LA 70770 (504) 261-7507 Roland F. Coppola, Jr.
McMartin Industries, 4691 West 142nd St., Apple Valley, MN 55124 (612) 423-1489 Bill Emery
McMartin Industries, 4044 Knoll Top Court, Carmichael, CA 95608 (916) 485-2605 Richard Hanseth
McMartin Industries, 2608 Mollimar, Plano, TX 75074 (214) 596-5503 Don S. Jones
McMartin Industries, 10 Kregg Rd., Fairport, NY 14450 (716) 223-5270 Rick L. Marshall
McMartin Industries, 914 S. Lynn, Champaign, IL 61820 (217) 356-5436 John Tollefson
McMartin Industries, 2944 Carnaby St., Indianapolis, IN 46229 (317) 897-1933 Richard J Sawicki
McMartin Industries, 13516 N.E. 89th Pl., Kirkland, WA 98033 (206) 823-1500 John Schneider

Media Concepts, Inc., 559 49th St. S., St. Petersburg, FL 33707

Memorex Corp., Professional Products Group, 1200 Memorex Drive, Santa Clara, Cal. 95052

Merill Cable Equipment Corp., Box 13741, Phoenix, Ariz. 85002

Merlin Engineering Works, Inc., 1880 Embarcadero, Palo Alto, Calif. 94303

Micro Communications, Inc., Box 4365, Grenier Field, Manchester, N.H. 03108

Micro Consultants, Box 50810, Palo Alto, Calif. 94303

Micro Control Associates, Inc., Box 13250, Arlington, Texas 76013

Micro-Trak Corp., 620 Race St., Holyoke, Mass. 01040

William Stacy, Pres. (413) 536-3551

Microdyne Corp., Box 7213, Ocala, FL 32672

Microflect Co., Inc., 3575 25th St. S.E., Salem, OR 97302

Microprobe Electronics, John Hancock Center, Suite 1532A, 875 N. Michigan Ave., Chicago, IL 60611

Microtime, Inc., 1280 Blue Hills Ave., Bloomfield, Conn. 06002

Daniel J. Sofie (203) 242-0761

REGIONAL SALES CONTACTS:

Microtime, Inc., Clearwater, FL 33516 (813) 535-5990 William E. Baird
Microtime, Inc., Newport Beach, CA 92633 (714) 645-3767 Gary P. Johnston

Microtran Co., Inc., Box 236, Valley Stream, N.Y. 11582

Microwave Power Devices, Inc., Adams Court, Plainview, NY 11803

Mid State Communications, Inc., 174 S. 1st Ave., Beech Grove, IN 46107

Miles Associates, Div. Miles Products Ltd., 240 Birmingham St., Toronto, Ont., Canada M8V 2C8

Millard Metal Service Center, Inc., Box 'O', Braintree, Mass. 02184

Miller Professional Equipment, Inc., 10816 Burbank Blvd., North Hollywood, CA 91601

Miller-Stephenson Chemical Co., Inc., George Washington Hwy., Danbury, Conn. 06810

Minneapolis Magnetics, 3104 W. Lake St., Minneapolis, MN 55416

Modular Audio Products, Unit of Modular Devices, Inc., 50 Orville Dr., Bohemia, N. Y. 11716

Julius Brick (516) 567-9620

REGIONAL SALES CONTACTS:

Richard S. Pass Associates, 9003 Eastview Rd., Philadelphia, PA 19152 (215) 464-9444 Richard Pass
Bencsik Associates, 1311 N.E. 13th Ave., Ocala, FL 32670 (904) 732-9775 Bill Bencsik
Pine Sales Corp., 570 Yonkers Ave., Yonkers, NY 10704 (914) 423-4747 Paul Pusecker
N.E.R.E.M., 64 Whittier Rd., Wakefield, MA 01880 (617) 245-4426 Owen Cook
Gra-Mar Inc., 3165 McCrory Pl., Orlando, FL 32814 (305) 894-3351 Neal Imhoof

Mole-Richardson Co., 937 N. Sycamore Ave., Hollywood, CA 90038

Monroe Electronics, Inc., 212 Housel Ave., Lyndonville, N.Y. 14098

Moseley Associates, Inc., 111 Castilian Drive, Goleta, Cal. 93017

Mark G. Fehlig (805) 968-9621

Motorola Communications and Electronics Inc., 2122 N. Palmer Dr., Schaumburg, IL 60195

Motorola, Communications and Electronics Inc., 1301 E. Algonquin Rd., Schaumburg, Ill. 60196

Motorola Semiconductor Products Inc., Box 20912, Phoenix, Ariz. 85036

Mu-Del Electronics, Inc., 2426 Linden Lane, Silver Spring, Md. 20910

Multiplex Display Fixture Co., 1555 Larkin Williams Rd., Fenton, MO 63026

Multiplier Industries Corp., 464 South 10th Ave., Mt. Vernon, NY 10550

Multronics, Inc., 730 W. McNab Rd., Ft. Lauderdale, FL 33309

Musicworks, Inc., 6238 La Pas Trail, Indianapolis, IN 46268

Mutual Broadcasting System, 1755 S. Jefferson Davis Hwy., Arlington, VA 22202

N

NEC America, Inc., Broadcast Equip. Div., 130 Martin Lane, Elk Grove Village, Ill. 60007

Robert L. Cuwin (312) 640-3792

REGIONAL SALES CONTACTS:

MZB & Associates, 4203 Beltway Dr., Dallas, TX 75234 (214) 233-5535 Darryl Parker
Marcom, P.O. Box 66507, Scotts Valley, CA 95066 (408) 438-4273 Martin Jackson
EME, 112 Buena Vista, High Point, NC 27260 (919) 869-3335 George Gold
Professional Video Systems, Inc., 1616 Soldiers Field Rd., Boston, MA 02135 (617) 254-2101 Sergio Marino
R & H Associates, P.O. Box 364, Safety Harbor, FL 33572 (813) 726-8650 Frank Fitzhenry
RIA, Inc., 50 East Malvern, Salt Lake City, UT 84100 (801) 486-8822 Bob Bacon

N.O.V.A. Corp., 5801 Uplander Way, Culver City, CA 90230

Kim Forrest (213) 641-2046

N.T.I. America, Inc., 1680 N. Vine St., Los Angeles, CA 90028

Nagra Magnetic Recorders, Inc., 19 W. 44th St., Room 715, New York, N.Y. 10036

Nagy Research Products, Box 289, McLean, Va. 22101

Nanotec, 414 Hilmen Pl., Solana Beach, CA 92075

The Narda Microwave Corporation, 75 Commercial St., Plainview, N.Y. 11803

National Electrolab Ltd., 1536 Columbia St., North Vancouver, BC, Canada V7J 1A4

Nationwide Electronic Systems, Inc., 1536 Brandy Pkwy., Streamwood, IL 60103

Neumade Products Corp., 720 White Plains Rd., Scarsdale, N.Y. 10583

Neutrik, 91 McKee Dr., Mahwah, N.J. 07430

Rupert Neve, Inc., Berkshire Industrial Park, Bethel, CT 06801

North Hills Electronics, Inc., Alexander Pl., Glen Cove, N.Y. 11542

North Wind Power Co., Box 315, Warren, Vt. 05674

Norton Associates Inc., 10 Ditomas Court, Copaigue, N.Y. 11726

Nortronics Co., Inc., Recorder Care Div., 8101 Tenth Ave. N., Minneapolis, Minn. 55427

Nova Electric Mfg. Co., 263 Hillside Ave., Nutley, NJ 07110

Novadyne Inc., 11702 Trask Ave., Garden Grove, CA 92643

Fred A. Nudd Corp., Box 1743 Rt. 104, Ontario, N. Y. 14519

Nurad, Inc., 2165 Druid Park Dr., Baltimore, Md. 21211

O

OPCOA, 330 Talmadge Rd., Edison, NJ 08817

Oak Industries, Inc., Crystal Lake, Ill. 60014

O'Connor Eng. Labs. Inc., 100 Kalmus Drive, Costa Mesa, Calif. 92626

(714) 979-3993

Oktel Corp., 490 Division St., Campbell, Calif. 95008

Onan, 1400 73rd Avenue NE, Minneapolis, Minn. 55432

One Pass Video, 900 Third St., San Francisco, CA 94107

Opamp Labs, Inc., 1033 N. Sycamore Ave., Los Angeles, Calif. 90038

B. Losmandy (213) 934-3566

Optical Radiation Corp., 6352 N. Irwindale Ave., Azusa, CA 91702

Orange County Electronics Int'l., Inc., 534 Berry St., Winnipeg, Man., Canada R3H 0R9

(204) 774-3413

REGIONAL SALES CONTACTS:

Parasound Inc., 680 Beach St. Suite 414, San Francisco, CA 94109 (415) 673-4544

Orban Assoc. Inc., 645 Bryant St., San Francisco, Calif. 94107

Jesse Maxenchs-Broadcast; Mark Mougel-Pro/Audio (415) 957-1067

Osawa & Co. (USA), Inc., 521 Fifth Ave., New York, N.Y. 10017

Otari Corp., 981 Industrial Rd., San Carlos, Calif. 94070

Steve Krampf, Michael Bernard (415) 593-1648

P

PWH Electronics, Box 435, Toronto, Ont. Canada M6H 4E3

Pacific Recorders and Eng. Corp., 11100 Roselle St., San Diego, CA 92121

Packaged Lighting Systems, Box 285 - Grant St., Walden, N.Y. 12586

Paladin Corp., 31332 Via Colinas, Westlake, CA 91361

E. L. Jones, Pres. (213) 991-4970

REGIONAL SALES CONTACTS:

Yukon Radio Electronic Inc., 3222 Commercial Dr., Anchorage, AK 99510
Powell Electronics, Inc., 800 Arcadia Dr., Huntsville, AL 35807 (205) 539-2731
Dalis Electronic Supply, 917 N. 7th St., Phoenix, AZ 85006 (602) 258-8151
Inland Electronic Supply Co., 3380 E. Ajo Way, Tucson, AZ 85713 (602) 889-5301
Scottsdale Tool & Supply, 15 N. 40th Place, Phoenix, AZ 85034
Carlton-Bates Co., 69th & Scott Hamilton Dr., Little Rock, AR 72209 (501) 562-9100
Martin Wholesale Radio Supply, 1207 West Kings Highway, Paragould, AR 72405
Brill Electronics, P.O. Box 1378, Oakland, CA 94604 (415) 834-5888
Waltronic Sales, 3350 Scott Blvd. Bldg. 4, Santa Clara, CA 95051 (408) 727-1200
Zack Electronics, 1444 Market St., San Francisco, CA 94102 (415) 626-1444

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Powell Electronics Inc., 722 E. Evelyn Ave., Sunnyvale, CA 94086 (415) 739-4321
Force Electronics, 343 S. Hindry Ave., Inglewood, CA 90301 (213) 776-1324
Acacia Sales, 16591 Milliken, Irvine, CA 92714 (714) 549-0954
Wassco, 410 S. Douglas St., El Segundo, CA 90245
Wassco, 9373 Activity Rd. Suite O, San Diego, CA 92126
WASSCO, 3001 Redhill Ave. Bldg. 1 Suite 103, Costa Mesa, CA 92626
Integrated Electronics Co., 436 E. 58th St., Denver, CO 80216 (303) 534-6121
Electronic Equipment Co., 4027 N.W. 24th St., Miami, FL 33142 (305) 871-3500
E S L Electronics Inc., 3560 N.W. 34th St., Miami, FL 33142
KSM Electronics, 2207 N.W. 29th St., Oakland Park, FL 33311 (305) 739-5880
Powell Electronics Inc., 1744 N.W. 69th Ave., Miami, FL 33166 (305) 592-3260
Ack Radio Supply, 554 Deering Road N.W., Atlanta, GA 30309 (404) 351-6240
Communications Dist. Corp., 120 Collins Industrial Blvd., Athens, GA 30603
AMFAC Distribution Co. Ltd., 694 Auahi St., Honolulu, HI 96810
Electrical Equipment Co. Ltd., 832 Queen St., Honolulu, HI
Industrial Elecronics Inc., 646 Queen St., Honolulu, HI 96810
ADMOR Distributors Corp., 330 Cooke St., Honolulu, HI 96811 (808) 537-4501
Joseph Electronics Inc., 8830 N. Milwaukee Ave., Niles, IL (312) 297-4200
The EMF Company, Inc., 6135 W. Belmont Ave., Chicago, IL 60634 (312) 889-8323
York Radio & Television, 590 N. Broadway, Decatur, IL 62525 (217) 424-0880
H. F. Wilson Engineering Co., P.O. Box 2938, Glen Ellyn, IL 60137 (312) 469-8473
Graham Electronics, 133 So. Pennsylvania St., P.O. Box 1726, Indianapolis, IN 46202 (317) 634-8202
C.W.Y. Electronics, 405 N. Earl Ave., Lalayette, IN 47904
Elex Mart Inc., 910 7th St., Bedford, IN 47421
Hutch & Son, Inc., 300 N. Main St., Evansville, IN 47711
Iowa Radio Supply Co., 719 Center Point Rd. N.E., Cedar Rapids, IA 52402
Radio Supply Co. Inc., 131 S. Laura, P.O. Box 1220, Wichita, KS 67211 (316) 267-5216
Electronic Parts & Supplies, Inc., 7214 Washington Ave., New Orleans, LA 70125 (504) 482-3126
Shuler Supply Co., 2504 Tulane Ave., New Orleans, LA 70119
Powell Electronic, Inc., Beltsville, MD 20705 (301) 937-4030
Hubs Material Co., 387 Washington St., Boston, MA 02108
Kaulman Co. Inc., 110 Second St., Cambridge, MA 02141 (617) 491-5500
A-Line Tools, Inc., 67 So. Broadway, Lawrence, MA 01842 (617) 686-0922
Show-Me Electronics, Inc., Highway 72 East, P.O. Box 639, Rolla, MO 65401 (314) 364-3896
Van Sickle, 2014 S. 7th St., St. Louis, MO 63104 (314) 621-5000
Walters Radio Supply, Inc., 3627-35 Main St., Kansas City, MO 64111 (816) 531-7015
Electronics Supply Co., Inc., 4100 Main St., Kansas City, MO 64111
Bernstein-Applebee Co., 3199 Mercier, Kansas City, MO 64111 (816) 756-2525
Glacier State Electric Supply, 112 First Ave. S., Great Falls, MT 59403 (406) 761-4220
Electronic Serv. & Distributors, 27 So. Wilson, Bozeman, MT 59715 (406) 587-4466
Scott Elecgronic Supply Corp., 4040 Adams, Lincoln, NE 68504 (402) 466-8221
EPE Corp., P.O. Box 5238, Manchester, NH 03108 (603) 669-9181
The Drop Shop Ltd. Inc., 116 Locust St., Roselle, NJ 07203
Walker Radio Co., 102 Granite Avenue N.W., Albuquerque, NM 87125 (505) 247-2288
Morrison's Radio Supply, 331 Center St., Ashtabula, OH 44004
Trice Electronics, 4701 N. Stiles, Oklahoma City, OK 73105 (405) 524-4411
Platt Electric Supply Co., 1305 N.W. Davis, Potland, OR 97209
Oregon Ham Sales, 409 W. First Ave., Albany, OR 97321 (503) 926-4591
Norval Electronics, 3625 S. W. Hall Blvd., Beaverton, OR 97005
Powell Electronics, S. Island Rd., P.O. Box 8765, Philadelphia, PA 19101 (215) 365-1900
Aztec Wire & Cable Co., 2572 Industry Lane, Norristown, PA 19403 (215) 539-8200
Dixie Electronics Inc., 1900 Barnwell St., P.O. Box 408, Columbia, SC 29202 (803) 779-5332
Gourley Distributing, 400 N. Main Ave., Sioux Falls, SD 57102
Bluff City Electronics, P.O. Box 418, Memphis, TN 38101 (901) 345-9500
MAAD, 3781 Premier Cove, Memphis, TX 38101 (901) 362-8600
Randolph and Rice, 1213 McGavock St., Nashville, TN 37202
Wholesale Electronic Supply, 2809 Ross Ave., Dallas, TX 75210 (214) 824-3001
K.A. Electronic Sales, 1220 Majesty Dr., Dallas, TX 75247 (214) 634-7870
Allied Electronics, 401 E. 8th St., Ft. Worth, TX 76102 (817) 336-5401
M Electronic Distributing, 1414 Fredericksburg Rd., San Antonio, TX 78201 (512) 736-2481
Space Radio Sup. Co. of Houston, 3550 East T. C. Jester, Houston, TX 77018
Powell Electronics Inc., 2860 Walnut Hill Lane, Suite 114, Dallas, TX 75229 (214) 350-4186
Anixter Pruzan, 18435 Olympic Ave. S., Seattle, WA 98188
Radar Electric, 168 Western Ave. W., Seattle, WA 98119 (206) 282-2511
AMFAC Electric Supply, 3420 E. Ferry Ave., Spokane, WA 99220
Brock Electronics Ltd., 65 Vulcan St., Rexdale, Ontario Canada M9W 1L5 (416) 247-6261

Panasonic Company, One Panasonic Way, Secaucus, N.J. 07094

Panasonic Co., Video Systems Div., One Panasonic Way, Secaucus, N.J. 07094

Alvin Barshop, Gen. Mgr. (201) 348-7683

REGIONAL SALES CONTACTS:

Panasonic Co., Video Systems Div., Northeast Area, 50 Meadowlands Pkwy., Secaucus, N.J. 07094 (201) 348-7627 Michael Dollacker, Regional Sls. Mgr.
Panasonic Co., Video Systems Div., Southeast Area, #3 Meca Way, Norcross, Ga. 30093 (404) 923-9700 Leroy Wright, Regional Sls. Mgr.
Panasonic Co., Video Systems Div., Midwest Area, 425 E. Algonquin Rd., Arlington Htgs., Ill. 60005 (312) 364-7936 Frank Sameshima, Regional Mgr.
Panasonic Co., Video Systems Div., Southwest Area, 1825 Walnut Hill Lane, Irving, Tex. 75062 (214) 258-2828 Terry Conner, Regional Sls. Mgr.
Panasonic West, Inc., 8383 Wilshire Blvd., Beverly Hills, CA 70211 (213) 655-1111 Bob Karadizian, Regional Sls. Mgr.

Parsons Mfg. Corp., 1055 O'Brien Dr., Menlo Park, CA 94025

Paso Sound Products Inc., 14 First St., Pelham, N.Y. 10803

Pentagon Industries, Inc., 4751 N. Olcott Ave., Chicago, Ill. 60656

Perf-Fix, Box 3524, Santa Monica, CA 90403

Permafilm Int'l. Corp., 305 East 46th St., New York, NY 10017

Perma Power Electronics, Inc., 5615 Howard Ave., Chicago, IL 60648

Phasecom Corp., 6365 Arizona Circle, Los Angeles, CA 90045

Phelps Dodge Communications Co., Rt. 79, Marlboro, N.J. 07746

Philadelphia Resins Corp., 20 Commerce Dr., Montgomeryville, Pa. 18936

(215) 855-8450

REGIONAL SALES CONTACTS:

Philadelphia Resins Corp., 3030 Bridgeway, Sausalito, CA 94965 (415) 332-4670 George T. Kollock
Philadelphia Resins Corp., 148 Wisconsin Ave., Suite 208, Waukesha, WI 53186 (414) 542-8088 Eric A. Dow
The Heckerman Corp., 814 W. Hyde Park Blvd., Inglewood, Calif. 90302 (213) 678-2264 Fred Heckerman
Sea-Land Industries, 2301 Dock St., Tacoma, WA 98402 (206) 572-7010 Jim Sims
Breit's Tower Service, Dinner Key Marina, Miami, Fla. 33133 (305) 858-3143 Charles E. Breit

Philips Broadcast Equip Corp., 91 McKee Dr., Mahwah, N. J. 07430

William E. Amos, V.P. Mktg. (201) 529-3800

REGIONAL SALES CONTACTS:

Philips Broadcast Equip. Corp., Northeast Region, 91 McKee Dr., Mahwah, N.J. 07430 (201) 529-3800 Joseph Nigro
Philips Broadcast Equip. Corp., 3300 Northeast Expy., Suite 1G, Atlanta, Ga. 30341 (404) 458-0171 Jim Sims
Philips Broadcast Equip. Corp., 15611 Fish Point Rd., Prior Lake, MN 55372 (612) 447-6036 Jeffrey Clarine
Philips Broadcast Equip. Corp., Central Region, Norelco House, 7530 Frontage Rd., Skokie, Ill. 60077 (312) 679-8600 Harry Gladwin
Philips Broadcast Equip. Corp., Northwestern Region, 3760 Cahuenga Blvd., North Hollywood, Calif. 91604 (213) 766-8185 Jerry Kraus and Michael Hartt
Philips Broadcast Equip. Corp., Southwestern Region, #1 E. Woodglen, Woodlands, Copper Canyon, Tex.

Philips Test & Measuring Instruments, Inc., 85 McKee Dr., Mahwah, N. J. 07430

Photo Research, Div. of Kollmorgen Corp., 3000 N. Hollywood Way, Burbank, Cal. 91505

Piclear, Inc., 180 E. Prospect Ave., Mamaroneck, NY 10546

Richard Sassenberg (914) 698-0258

Pinzone Communications Products Inc., 10142 Fairmount Rd., Newbury, Ohio 44065

Plastic Reel Corp. of America, 46 Passaic St., Wood Ridge, NJ 07075

Pleasantville Labs, 1622 A Belmont St. N.W., Washington, DC 20009

Porta-Pattern Telecommunications Industries Ltd., 6822 Santa Monica Blvd., Los Angeles, CA 90038

Portac Inc., 108 Aero Camino, Goleta, CA 93017

Potomac Instruments, Inc., 932 Philadelphia Ave., Silver Spring, Md. 20910

David G. Harry (301) 589-2662

Power-Optics Inc., 1055 W. Germantown Pike, Fairview Village, Pa. 19409

Prodelin Inc., Box 131, Hightstown, N.J. 08520

Projection Systems, Inc., 517 Van Houten Ave., Passaic, NJ 07055

Protech Audio Corp., Box 638, Lake Ronkonkoma, NY 11779

Pulse Techniques Inc., 1411 Palisade Ave., Teaneck, N.J. 07666

E. R. Shenk (201) 837-2575

Q

QEI Corp., Rt. 73, Kresson, N. J. 08053

QRK Electronic Products, 1568 N. Sierra Vista, Fresno, Calif. 93703

QSC Audio Products, 1926 Placentia Ave., Costa Mesa, CA 92627

QSI Systems, Inc., 993 Watertown St., West Newton, Mass. 02165

Q-TV, 33 West 60th St., New York, N.Y. 10023

Quad-Eight Electronics, 11929 Vose St., North Hollywood, Calif. 91605

Quam-Nichols Co., 234 E. Marquette Rd., Chicago, IL 60637

Quantum Audio Labs, Inc., 1905 Riverside Dr., Glendale, Calif. 91201

John Pritchett (213) 841-0970

REGIONAL SALES CONTACTS:

Coast Recording Equip. Supply, 6114 Santa Monica Blvd., Hollywood, CA 90038 (213) 462-6058 Jerry Cubbage
Allied Broadcast, P.O. Box 786, Richmond, IN 47374 (317) 962-8596 Roy Ridge
Audio Visual Services, 5484 Jetport Industrial Blvd., Tampa, FL 33614 (813) 884-1461 Charles Baxley
Dimension Five, Inc., 24 North 3rd St., Womelsdorf, PA 19567 (215) 589-5312 Charles Moore
Marcom, P.O. Box 66507, Scotts Valley, CA 95066 (408) 438-4273 Marty Jackson
Lake Systems, 55 Chapel St., Newton, MA 02160 (617) 244-6881 Howard Mullinack
Puget Sound Audio, 5105 North 46th St., Tacoma, WA 98407 (206) 759-4701 Rob Denbrook
Reflection Audio, 1018B Central Ave., Charlotte, NC 28204 (704) 375-1053 Cal Walker

Quick-Set Inc., 3650 Woodhead Drive, Northbrook, Ill. 60062

R

R-Columbia Products Co., Inc., 2008 St. Johns Ave., Highland Park, IL 60035

RCA American Communications, 201 Centennial Ave., Piscataway, NJ 08854

RCA Broadcast Systems, Front and Cooper Streets, Camden, N.J. 08102

RCA Distributor & Special Products Div., 2000 Clements Bridge Rd., Deptford, N.J. 08096

RCA Electro Optics and Devices, New Holland Ave., Lancaster, Pa. 17604

RCA Power Tube Marketing, Lancaster, Pa. 17604

RCA Solid State Div., Rt. 202, Somerville, N.J. 08876

RHG Electronics Laboratory, Inc., 161 E. Industry Court, Deer Park, NY 11729

RMC-Radio Mfg. Co., 4700 S.W. 75th Ave., Miami, FL 33155

ROH Corporation, 4313 N.E. Expressway, Atlanta, GA 30340

RTS Systems, Inc., 1104 W. Chestnut St., Burbank, CA 91502

Ronald A. Fuller (213) 843-7022

REGIONAL SALES CONTACTS:

Filmways Audio Services, 5540 Cleon Ave., No. Hollywood, CA 91601 (213) 877-9711 Sales Desk
The Camera Mart, 456 West 55th St., New York, NY 10019 (212) 757-6977 Sales Desk
Industrial Audio/Visual, 2617 Bissonet, Houston, TX 77005 (713) 524-1956 Sales Desk
Ria Corp., 50 E. Malvern Ave., Salt Lake City, UT 84115 (801) 486-8822 Sales Desk
Omega Video Associates, 14326 Isis Ave., Lawndale, CA 90260 (213) 679-9021 Sales Desk
Klopl Audio/Video, 3381 Successful Way, Dayton, OH 45414 (513) 236-5500 Sales Desk
Sound Genesis, 2001 Bryant St., San Francisco, CA 94110 (415) 285-8900 Sales Desk
K.T. Electronics, 3306 Lime Ave., Long Beach, CA 90807 (213) 424-0979 Sales Desk

Radiation Devices Co., Inc., Box 8450, Baltimore, Md. 21234

Radio Arts, 210 N. Pass Ave., Suite 104, Burbank, CA 91505

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Radiometer Elec. U.S. Inc., 811 Sharon Dr., Cleveland, OH 44145

Radmar, Inc., 1282 Old Skokie Rd., Highland Park, IL 60035

Ramko Research Inc., 11355 'A' Folsom Blvd., Rancho Cordova, Calif. 95670

Jack M. Ducart (916) 635-3600

REGIONAL SALES CONTACTS:

Comex Corp., Dulles Int'l. Airport, P.O. Box 17011, Washington, DC 20041 (703) 471-4215 Jack Rickel
Electrex Co., 18680 N.E. 2nd Ave., Miami, FL 33179 (305) 945-6483 Ben Ostrovsky
Repelect, 8406 North Blvd., Tampa, FL 33604 (813) 227-5051 John Govreau
Broadcast Services, Inc., 2877 Kalakaua Ave., Honolulu, HI 96815 (808) 521-6311 Alan Roycroft
MZB & Associates, 440 N. Foster Dr., Baton Rouge, LA 70806 (504) 926-8287
Neff Communications, 9721 Singleton Dr., Bethesda, MD 20034 (301) 530-6080 Jack Neff
Telesco Int'l. Corp., 1 DuPont St. S., Plainview, NY 11803 (516) 433-6210 Jerry Lanier
Doug Cook & Associates, 2185 Trent Rd., Columbus, OH 43229 (614) 471-7311 Doug Cook
M.Z.B. & Associates, 3035 E. Skelly Dr., Suite 240, Tulsa, OK 74105 (918) 743-6673 Don Muttoni
G.E. Direct Marketing, 7 May St., East Doncaster, Victoria Australia 3109 (03) 842-5249 Claude Grech
Thomas A. Hill Broadcast Consultant, 1300 Hill Rd., Boise, ID 83702 (208) 342-6902 Thomas Hill
Champagne Sales Co., 3645 Crooks Rd., Troy, MI 48084 (313) 649-4428 Bob Champagne
Doug Cook & Associates, 1701 East 12th St., Apt. 9W, West Tower, Cleveland, OH 44114 (216) 621-4129 Bob Groome
Oakwood Audio Labs Ltd., 652 King Edward St., Winnipeg, Man. Canada R2H 0P2 (204) 775-8231 Ron Paley
Oakwood Audio Labs Ltd., 10874 97th St., Edmonton, Alta Canada T5H 2M5 (403) 424-2186
Oakwood Audio Labs Ltd., 12-1638 Pandosy St., Kelowna, B.C. Canada V1Y 1P5 (604) 763-5222
M.Z.B. & Associates, 16502 N. Chase Dr., Suite E, Houston, TX 77060 (713) 448-0881
M.Z.B. & Associates, 4203 Beltway, Dallas, TX 75240 (214) 233-5535 Darryl Parker
Repelect, P.O. Box 7102, Tampa, FL 33603 (813) 227-5051 John Govreau
Roscom, Inc., P.O. Box 1208, Roswell, GA 30077 (404) 992-2700 Bob Stewart
Southern Coastal Marketing Svc., Inc., 10120 Crestwood Dr., Matthews, NC 28105 (704) 847-5687 Bob Cauthen

Rank Hi Fi, Inc., 20 Bushes Lane, Elmwood Park, N.J. 07407

Rank Precision Industries, Inc. (N.Y.), 260 No. Rte. 303, West Nyack, N. Y. 10994

Raven Screen Corp., 124 East 124th St., New York, N.Y. 10035

Recording Supply Co., 1233 Rand Rd., Des Plaines, Ill. 60616

Ray Kaiser (213) 297-0955

Recortec Inc., 777 Palomar Ave., Sunnyvale, Calif. 94086

Sidney B. McCollum (408) 735-8821

Reliance Plastics & Packaging Div., 108-18 Queens Blvd., Forest Hills, NY 11375

Research Technology, Inc., 4700 Chase, Lincolnwood, Ill. 60646

Rex Rheostat & Co., Inc., 149 Babylon Turnpike, Roosevelt, N. Y. 11575

Reynolds/Leteron Co., 13425 Wyandotte St., North Hollywood, Calif. 91605

Rhoades National Corp., Box 817, Hendersonville, Tenn. 37075

Richmond Sound Design, Ltd., 1234 W. 6th Ave., Vancouver, B.C., Canada V6H 1A5

Riluma Co. of America, Box 366, Pacific Palisades, CA 90272

Rockland Systems Corp., Rockleigh Industrial Park, Rockleigh, NJ 07647

Rodelco Corp., 356 A Comac Road, Deer Park, N.Y. 11729

Rohde & Schwarz Sales Co., 14 Gloria Lane, Fairfield, N.J. 07006

Roll-A-Reel, 7881 Reading Rd., Cincinnati, Ohio 45237

Ross Video Ltd., 9 Iroquois Plaza, Iroquois, Ont., Canada K0E 1K0

Ruslang Corp., 247 Ash St., Bridgeport, Conn. 06605

Russco Electronics Mfg. Inc., 5690 E. Shields, Fresno, Calif. 93727

Russell C. Friend, Barbara Gaudin (209) 291-5591

Rycom Instruments, 9351 E. 59th St., Raytown, Mo. 64133

S

SGL Waber Electric, 300 Harvard Ave., Westville, N. J. 08093

SPI-ITT, Metrix Instruments Div., P.O. Box 30, 74010 Annecy, France

SSAC Inc., Box 395, Liverpool, N.Y. 13088

David Lawrie (315) 622-1000

REGIONAL SALES CONTACTS:

Antenna & Tower Specialist, 4310 S. Barns, Oklahoma City, OK 73119 (405) 685-2314 Mark Wagstoff
Broadcast Equip. & Supply, P.O. Box 3141, Bristol, TN 37620 (615) 878-2531 Cliff Droke
Communications Facilities, P.O. Box 98, Lexington Park, MN 20653 (301) 862-1777 Samuel Leach
Lauderdale Electric Labs, 16 S.W. 13th St., Ft. Lauderdale, FL 33315 (305) 764-7755 Irene Linne
U.S. Tower Service, 677 S. Lawn Lane, Rockville, MD 20850 Norm Jeweler

SWR Inc., Box 215, Goffstown, N.H. 03045

Sadelco, Inc., 75 W. Forest Ave., Englewood, NJ 07631

Saki Magnetics, Inc., 5770 Uplander Way, Culver City, CA 90230

F. F. Boyer, Sales Mgr. (213) 649-5983

Howard W. Sams & Co., Inc., 4300 West 62nd St., Indianapolis, Ind. 46268

Sansui Electronics Corp., 1250 Valley Brook Ave., Lyndhurst, NJ 07071

Scala Electronic Corp., Box 4580, Medford, OR 97501

The Ken Schaffer Group, Inc., 10 East 49th St., New York, N.Y. 10017

Barbara Sarubbi (212) 371-2335

Schneider Corp. of America, 185 Willis Ave., Mineola, N. Y. 11501

Jos. Schneider GmbH & Co., P.O. Box 947, D-6550 Bad Kreuznach, West Germany

REGIONAL SALES CONTACTS:

Tele-Cine Inc., 5434 Merrick Rd., Massapequa, NY 11758 (516) 798-2828

Schudel, Inc., 6973 Consolidated Way, San Diego, CA 92121

Schuessler Case Co., Inc., Box 39066, Chicago, IL 60639

Scientific-Atlanta, Inc., 3845 Pleasantdale Rd., Atlanta, Ga. 30340

Scientific Radio Systems, Inc., 367 Orchard St., Rochester, N.Y. 14606

Scientific Systems, Inc., 92 Westwood Dr., Toms River, NJ 08753

Douglas Fisk (201) 255-2230

REGIONAL SALES CONTACTS:

191 W. Field Ave., Clark, NJ 07066 (201) 381-1088 William MacGuire

Selco Products Co., 7580 Stage Rd., Buena Park, CA 90621

Sencore Inc., 3200 Sencore Drive, Sioux Falls, S. D. 57107

Sennheiser Electronic, 10 West 37th St., New York, N. Y. 10018

Sescom, Inc., 1111 Las Vegas Blvd. N., Las Vegas, NV 89101

Franklin J. Miller (800) 634-3457; (702) 384-0993

Setcom Corp., 1400 Stierlin Rd., Mountain View, CA 94043

Shallco, Inc., Hwy. 301 South, P.O. Box 1089, Smithfield, N.C. 27577

Sharepoint Systems Inc., 402 Tenth Ave., Haddon Heights, NJ 08035

Sharp Electronics Corp., 10 Keystone Place, Paramus, N.J. 07652

Shintron Co. Inc., 144 Rogers St., Cambridge, Mass. 02142

Eckhard Konkel, Peter Choi (617) 491-8700

Shively Laboratories, Inc., Route 302, Raymond, Me. 04071

Shure Brothers Inc., 222 Hartrey Ave., Evanston, Ill. 60204

Siegel Electronics, Box 33421, San Diego, CA 92103

Sigma Electronics, Inc., 1830 State St., East Petersburg, Pa. 17520

(717) 569-2681

Sigma System Engineering, Fukuda-2 Bldg.,2-57-9, Higashi-Ikebukuro, Toshima-ku, Tokyo, Japan

Simplex Time Recorder Co., Simplex Plaza, Gardner, MA 01441

Mark Kenyon (617) 632-2500

Singer Products Co., Inc., 875 Merrick Ave., Westbury, NY 11590

Sintronic Corp., 212 Welsh Pool Rd., Lionville, Pa. 19353

T. R. Humphrey, VP, Marketing; Joe Novik (215) 363-0444

Sitco Antenna Co., Box 20456, Portland, Ore. 97220

Sitler's Supplies, Inc., Box 10B, 702 E. Washington, Washington, Iowa 52353

Wm C. Sitler (319) 653-2123

Skirpan Lighting Control Corp., 61-03 32nd Avenue, Woodside, N.Y. 11377

Skotel Corp., 1445 Provencher, Brossard, Que. Canada J4W 1Z3

Stephen Scott (514) 676-1813

Smith-Victor Corp., 301 N. Colfax St., Griffith, IN 46319

Warren R. Smith Co., 110 E. Point Pleasant Ave., Ocean Gate, NJ 08740

(201) 267-6795

Soar Electronics, 200 13th Ave., Ronkonkoma, NY 11779

Solid Electronics Labs, 49 Fairfield Rd., Havertown, PA 19083

Soll, Inc., 401 East 74th St., New York, N.Y., 10021

Sonar Radio Corp., 3000 Stirling Rd., Hollywood, FL 33021

Sono-Mag Corp., 1005 W. Washington St., Bloomington, Ill. 61701

Sontec Electronics, 10120 Marble Ct., Cockeysville, MD 21030

Sony Corp. of America, 9 W. 57th St., New York, N.Y. 10019

Phil Stack, Video Products (212) 371-5800

REGIONAL SALES CONTACTS:

Sony Corp. of America, West, 700 W. Artesia Blvd., Compton, Calif. 90222 (213) 537-4300 Bob Mueller
Sony Corp. of America, Eastern, 47-47 Van Dam St., L.I.C., N.Y. 11101 (212) 361-8600 Roy Raymond
Sony Corp. of America, Northwestern, 230 W. Hill Place, Brisbane, Calif. 94005 (415) 467-4900 Joe Baylogh, Regional Mgr.
Sony Corp. of America, Southwestern, 9004 Ambassador Row, Dallas, Texas 75247 (214) 631-3431 Bill Hanlow, video
Sony Corp. of America, Southeastern, 2300 Peachford Rd., Atlanta, Ga. 30338 (404) 451-7501 Phil Hart, Regional Mgr.
Sony Corp. of America, North Central, 22791 Heslip Dr., Novi, Mich. 48050 (313) 348-3500 George Currie
Sony Corp. of America, Midwest, 6801 W. Jarvis St., Niles, Ill. 60648 (312) 792-3600 Jerry Brinacombe

Sorenson Co., A Unit of Raytheon Co., 676 Island Pond Rd., Manchester, NH 03103

Sound Dynamics, Inc., Box 32055, San Jose, CA 95152

Soundscriber Magnetic Recording Co., Inc., 85 Willow St., New Haven, CT 06511

Lawrence Acampora (203) 624-5179

REGIONAL SALES CONTACTS:

Richards Recording Systems, Inc., 177 Essex St., Lynfield, MA 01940 (617) 232-8300 Richard Duremus
Sound Systems Lab, 43 Cerro Crest Dr., Cararillo, CA 93010 (805) 482-5081 John Russ

Two Way Service Co., Inc., 1428 Wayne Ave., Cleveland, OH 44170 (216) 221-2235 Phil Way

Hudson's Audio Center, 7611 Memaul Ave. NE, Albuquerque, NM 87110 (505) 296-6978 Jim Hudson

Sound Technology, 1400 Dell Ave., Campbell, Calif. 95008

Michael S. Hogue (408) 378-6540

REGIONAL SALES CONTACTS:

R. A. Albrecht & Co., 4379 Orion Rd., Rochester, Mich. 48063 (313) 652-2520 Dick Albrecht
Fidelicom, Box 80644, Chamblee, Ga. 30341 (404) 458-3616 Mort Lieberman
Henry Joncas Co., 12058 Lake City Way N.E., Seattle, Wash. 98125 (206) 363-9200 Henry Joncas
Kodo Associates, Inc., 8100 Penn Ave. S., Minneapolis, Minn. 55431 (612) 881-1255 Kodo Kawamura

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Charles Lucas Sales Co., 4424 Mintway, Dallas, Tex. 75236 (214) 330-8181 Charles Lucas
Maish Sales, 500 S. Madison St., Box 548, Mulberry, Ind. 46058 (317) 296-2322 Charles Maish
William Menezes & Associates, Box 7070, Overland Park, Kans. 66207 (913) 649-2680 Bill Menezes
Partridge Electronic Sales, Box 21205, Salt Lake City, Utah 84121 (801) 943-0127 Clark Partridge
Elmark Co., 2559 Huntingdon Pike, Huntingdon Valley, Pa. 19006 (205) 947-0750 Mark Pitkow
Repelect, 3706 Ola Ave., Box 7102, Tampa, Fla. 33603 (813) 227-5051 John Govreau
The Irving W. Rose Group, 3333 Commercial Ave., Northbrook, Ill. 60062 (312) 291-2260 Irving Rose
Shea Sales, 552 Prospect St., Maplewood, N.J. 07070 (201) 762-2382 Tom Shea

Special Instruments Lab, Inc., Portasound Div., 312 W. Vine Ave., Knoxville, TN 37901

Spectra Sonics, 3750 Airport Rd., Ogden, Utah 84403

Spectrum Instruments, Inc., Box 97, Hartsdale, NY 10530

Sphere Electronics, 20201A Prairie, Chatsworth, Calif. 91311

Spin Physics, Inc., 3099 Science Park Rd., San Diego, Calif. 92121

Gene Long; David Franssens-Video Product Mgr. (714) 453-5410

REGIONAL SALES CONTACTS:
Spin Physics, Inc., 1313 Northridge, Carrollton, Tex. 75006 (214) 245-1816 LeRoy Koonsman
Spin Physics, Inc., 1969 Scott Lane, Los Altos, Calif. 94022 (415) 961-7794 Ken Thompson
Spin Physics, Inc., 1286 Camino Palomera, Santa Barbara, Calif. 93111 (805) 964-3316 Ed Gehle
Spin Physics, Inc., 420 Kisconko Turn, Oxon Hill, MD 20022 (301) 839-3218 R. Kent White, Reg. Mgr.

Spindler & Sauppe, Inc., 13034 Saticoy St., North Hollywood, Cal. 91605

Stainless, Inc., Third & Montgomery Sts., North Wales, Pa. 19454

Jess C. Rodriguez (215) 699-3770

Stancil-Hoffman Corp., 921 N. Highland, Hollywood, Calif. 90038

Standard Tape Laboratory, Inc., 26120 Eden Landing Rd. #5, Hayward, Calif. 94545
(415) 786-3546

Stanton Magnetics Inc., Terminal Drive, Plainview, N.Y. 11803

Pete Bidwell, Prof. Prod. Mgr. Jim Fox, V.P. Prof. Prod. W. O. Stanton, Pres. (516) 681-0200

Stantron Div., Wyco Metal Products, 6914 Beck Ave., North Hollywood, Calif. 91605

Star Case Mfg. Co. Inc., 15525 South 70th Court, Orland Park, IL 60462

Starex, Inc., Box 248, Kearney, NJ 07032

Station Business Systems, Div. Control Data Corp., 600 W. Putnam Ave., Greenwich, CT 06830

Storeel Corp., Box 80523, Atlanta, Ga. 30341

Ruth E. Schaeffer (404) 458-3280

Strand Century, Inc., 20 Bushes Lane, Elmwood Park, N. J. 07407

Studer Revox America, 1819 Broadway, Nashville, Tenn. 37203

Barry Evans; Bruno Hochstrasser (615) 329-9576

REGIONAL SALES CONTACTS:
Studer Revox America, Inc., 155 Avenue of the Americas, New York, N.Y. 10013 (212) 255-4462 Frederick C. Layn
111 S. Drive Tower Lake, Barrington, IL 60010 (312) 381-4559 Brian Tucker
Studer Revox America, Inc., 14046 Burbank Blvd., Van Nuys, Calif. 91401 (213) 780-4234 William Van Doren
Rep-Tech, Inc., 1110 Altoga Ct., 40109, Lewisville, TX 75028 (214) 436-4111 Bobb Partridge
McCurdy Industries, 1711 Carmen Dr., Elk Grove Village, IL 60007 (312) 640-7077 Ron Mitchell
Harris Corp., P.O. Box 4290, Quincy, IL 62301 (217) 222-8200 N.L. Jochem

Suda Seisakusho Co., Ltd., Nikko-Bldg. 6-14-13 Ginza, Chuo-Ku, Tokyo, Japan 104

Super 8 Sound, Inc., 95 Harvey St., Cambridge, Mass. 02140

Superex Electronics Corp., 151 Ludlow St., Yonkers, N.Y. 10705

Swager Tower Corp., Box 656, Fremont, Ind. 46737

Swickegami Div., Of Spectrum Video, Burbank, CA 91502

Switchcraft Inc., 5555 N. Elston Ave., Chicago, Ill. 60630

Dean Cochrane (312) 792-2700

REGIONAL SALES CONTACTS:
Cartwright and Bean, 2400 Bob Wallace Avenue; Suite #201, Huntsville, AL 35805 (205) 533-3509
Howe & Howe, P.O. Box 10497, Phoenix, AR 85064 (602) 264-7971
David H. Ross Company, 1095 Industrial Rd., San Carlos, CA 94070 (415) 591-4411
Paul F. Wiley Company, 1632 Silverlake Blvd., Los Angeles, CA 90026 (213) 663-8028
Gordon Moss Electronics, Inc., 2231 Federal Blvd., Denver, CO 80211 (303) 455-7205
Anderson Sales Associates, Inc., 133 Mansfield Avenue, Waterbury, CT 06705 (203) 753-2487
Cartwright and Bean, 200 East Marks Street, Orlando, FL 32803 (305) 422-4531
Cartwright and Bean, 1241 N. W. 75th Terrace, Plantation, FL 33313 (305) 791-3989
Cartwright and Bean, 90 W. Wieuca Square, Suite #155, P.O. BOx 52846, Atlanta, GA 30342 (404) 255-5262
Dougherty Enterprises, P.O. Box 3497, Honolulu, HI 96811 (808) 847-4144
Bob Burns & Associates, 6645 N. Oliphant, Chicago, IL 60631 (312) 775-1233
Marketing Engineers, Inc., 2511 E. 46th St., Suite #N3, Indianapolis, IN 46205 (317) 546-1523
Thomas L. Dowell & Associates, Inc., 524 34th Street, West Des Moines, IA 50265 (515) 225-1620
Thomas L. Dowell & Associates, Inc., 7201 Metcalf, Overland, KS 66204 (913) 236-8200
Cartwright and Bean, 617 W. Judge Perez Drive, P.O. Box 1188, Chalmette, LA 70043 (504) 279-4598
Anderson Sales Associates, Inc., 160 State Street, Boston, MA 02109 (617) 227-2980
R. C. Merchant & Co., Inc., 18411 W. McNichols Rd., Detroit, MI 48219 (313) 535-6000
Mel Fostar Technical Sales, Inc., 7389 Bush Lake Rd., Edina, MN 55435 (601) 981-1368
Cartwright and Bean, 5250 Galaxy Drive, Suite #J, P.O. Box 37370, Jackson, MS 39207 (601) 981-1368
Thomas L. Dowell & Associates, Inc., 8755 Big Bend Blvd., P.O. Box 23967, St. Louis, MO 63119 (314) 968-4234
Masin-Esco, Inc., 132 W. Greenbrook Road, North Caldwell, NJ 07006 (201) 226-2550
Trinkle Sales Inc., 1010 Haddonfield-Berlin Road, Cherry Hill, NJ 08002 (609) 795-4200; (215) 922-2080
Gordon Moss Electronics, Inc., 418 Louisiana S.E. Suite #8, Albuquerque, NM 87108 (505) 821-6101
Masin-Esco, Inc., 333 Jackson Avenue, Syosset, NY 11791 (516) 364-0310
Mar-Com Associates, 2002 Teall Avenue, Syracuse, NY 13206 (315) 437-2843
Cartwright and Bean, 625 Harwyn Drive, Charlotte, NC 28215 (704) 333-6457
Bear Marketing, 3623 Brecksville Road, Richfield, OH 44286 (216) 659-3131
Cartwright and Bean, 560 South Cooper Street, P.O. Box 4760, Memphis, TN 38104 (901) 276-4442
J. Y. Schoonmaker Co., Inc., 10710 Sand Hill Rd., P.O. Box 38150, Dallas, TX 75238 (214) 349-1650 Houston (713) 926-9510
Comtec, 1715 114th Avenue, S.E., Suite #116, Bellevue, WA 98004 (206) 453-1188
Atlas Electronics Ltd., 50 Wingold Avenue, Toronto, Ont Canada M6B 1P7 (416) 781-6174
Jose Arturo Fernandez, P.O. Box 415, Hato Rey Puerto Rico (809) 767-3588

System Concepts Inc., 395 Ironwood Dr., Salt Lake City, Utah 84115

Systron-Donner, 1 Systron Dr., Concord, Calif. 94518

T

TDK Electronics Corp., 755 Eastgate Blvd., Garden City, N. Y. 11530
(516) 746-0880

TEAC Corp of America, 7733 Telegraph Rd., Montebello, Cal. 90640

TM Systems, Inc., 25 Allen St., Bridgeport, Conn. 06604

TSC Development Labs., 2217 Purdue Ave., Los Angeles, Calif. 90064

TT Electronics, Inc., 2212 S. Barry Ave., Los Angeles, Calif. 90064

S. J. Sodaro (213) 478-8224

T T E, Inc., 2214 S. Barry Ave., Los Angeles, CA 90064

Taber Mfg. & Engr. Co., 2081 Edison Ave., San Leandro, Cal. 94577

Robert H. Kearns, Mkt. Mgr. (415) 635-3831

Tangent Systems, Inc., 2810 South 24th St., Phoenix, AZ 85034

Tape-Athon Corp., Box 814, Inglewood, Cal. 90301

Taylor Instrument, Consumer Prod. Div. Sybron Corp., Arden, N.C. 28704

Tech Laboratories Inc., Bergen & Edsall Blvds., Palisades Park, N.J. 07650

Kenton Garrison, Sales Mgr. (201) 944-2221

REGIONAL SALES CONTACTS:
Held & Mollard, 3995 E. Bayshore Dr., Palo Alto, Calif. 94303 (415) 965-9321
Spectrum Assoc., 1823 E. 17th St., Santa Ana, Calif. 92701 (213) 323-0603
NBS Assoc., Main St., New Preston, Conn. 06777 (203) 868-0501
Grady Duckett Sales, Box 29067, Atlanta, Ga. 30358 (404) 451-3529
Crimson Eng. Co., Box 286, Glenview, Ill. 60025 (312) 724-1780
W. S. Worington Associates, Box 313, Riderwood, MD 21139 (301) 823-8759 W. S. Worington
Norwood Scroggs Co., 2221 Arbor Hills Rd., Jackson, Mich. 49201 (517) 750-1170
Quantum Sales, 7710 Computer Ave., Minneapolis, Minn. 55435 (612) 831-8583
Bob Cameron, Inc., 2352 Linwood Ave., Ft. Lee, N.J. 07024 (201) 461-2595
Floyd W. Churchill, Box 43, Haddonfield, N.J. 08033 (609) 429-7871
Net Sales, Box 7485, Rochester, N.Y. 14615 (716) 467-4538
L. K. Haner Assoc., Box 101, Commack, N.Y. 11725 (516) 864-2220
A. C. Wahl & Assoc., Box 15220, Cincinnati, Ohio 42515 (513) 761-5500
SPS Electronics, 12025 N.W. Thompson Rd., Portland, Ore. 97229 (503) 645-3769
Waggoner-Verhill Assoc., 3550 Laketon Rd., Pittsburgh, Pa. 15235 (412) 241-5202
Southwest Elect., Inc., 9226 Markville Dr., Dallas, Tex. 75243 (214) 690-9881
Southwest Elect., Inc., Box 35353, Houston, Tex. 77035 (713) 729-1670
Solid State Engr., Box 355, Sta. NDG, Montreal, Que. Canada (514) 481-3313

Technamics Co., 2232 Gardner Station, St. Louis, MO 63109

Technical Audio Products Corp., 3810 148th Ave. N.E., Redmond, WA 98052

Technology For Communications Int'l., 1625 Stierlin Rd., Mountain View, CA 94043

Technology Service Corp., Development Labs Div., 2217 Purdue Ave., Los Angeles, CA 90064

Teknekron/ARG, 2121 Allston Way, Berkeley, Calif. 94704

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

Tele-Cine Inc., 5434 Merrick Rd., Massapequa, N.Y. 11758

Telecommunications Technology, 555 Del Rey Ave., Sunnyvale, Calif. 94086

Telectric Co., 1218 Venice Blvd., Los Angeles, CA 90006

Telectro Systems Corp., 96-18 43rd AVe., Corona, NY 11368

Teledyne Energy Systems, 110 W. Timonium Rd., Timonium, Md. 21093

Paul I. Bessert (301) 252-8220

REGIONAL SALES CONTACTS:
Warren H. Davis Co., 1810 Fair Oaks Ave., Pasadena, Calif. 91030 (213) 680-1166 Warren H. Davis
C. T. Carlberg & Assoc., 3177, Albuquerque, N.M. 87110 (505) 265-1579 Carl Carlberg
The Cunningham Co., 4400 Spring Valley Rd. #101, Dallas, Texas 75240 (214) 233-4303 Mike O'Shaughnessy
Charles T. Morgan Co., Inc., 500 Maple St., Hathorne, Mass. 01937 (617) 774-3215 Steve Lunn
Davis Associates, 123, Littleton, Colo. 80120 (303) 795-1400 Donald Davis
The Cunningham Co., 9440 Old Katy Road, Ste. 100, Houston, Texas 77055 (713) 461-4197 John Cunningham
Communications Engineering, Inc., 3350 Mt. View Dr., Anchorage, AK 99504 (907) 272-3591 Lloyd Morris
Mechron Engineering Products Ltd., 2437 Kaladar Ave., Ottawa Ont. Canada K1V 8B9 (613) 733-3855 Ron Whiting
Simson-Maxwell, 1380 West 6th Ave., Vancouver BC Canada V6H 1A7 (604) 736-5431 Wilf Arffman
Alster Communications, P.O. Box 9048, Boise, ID 83707 (208) 362-1272 Russ Elsworth
Alster Communications, 1603 N. Lincoln, Kennewick, WA 99336 (509) 735-2232 Bill Holesworth
Electro Pacific, 727 Industrial Rd., San Carlos, CA 94070 (415) 592-3114 Bob Tokarski
Mid-South Sales Co., Inc., P.O. Box 692, Slidell, LA 70459 (504) 641-7480 Harry Hammet

Telegen/Sofratev, 800 Welch Rd., Suite 354, Palo Alto, CA 94304

Telemation, A Div. of Bell & Howell, Box 15068, Salt Lake City, Utah 84115

Telemet, A Geotel Co., 185 Dixon Ave., Amityville, N.Y. 11701

Joseph F. Cali (516) 842-2300

REGIONAL SALES CONTACTS:
Telemet a Div. of Geotel, Inc., Easthill RFD #3, Brewstr, N.Y. 10509 (914) 279-3231 R. Griffiths
Telemet a Div. of Geotel, Inc., (214) 387-1389 William Culbertson

Telescript, Inc., 20 Insley St., Demarest, N. J. 07627

Television Equipment Associates, Box 260, South Salem, N.Y. 10590

Bill Pegler (914) 763-8893

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Television Products Co. Inc., 9016 Aviation Blvd., Inglewood, Calif. 90301
(213) 776-3276

Television Technology Corp., 5970 W. 60th Ave., Arvada, Co. 80003
Gregory L. Morton (303) 423-1652

Telex Communications, Inc., 9600 Aldrich Ave. S., Minneapolis, Minn. 55420
Don Mereen, Mktg. Dir. (612) 884-4051

REGIONAL SALES CONTACTS:
Clark R. Gibb Co., 11100 Bren Rd. W., Minnetonka, Minn. 55343 (612) 932-3950 Clark R. Gibb
LCA Sales, 76 Main St., Tuckahoe, NY 10707 (914) 961-4700
William M. Linz Associates, Inc., 821 Skokie Blvd., Northbrook, IL 60062 (312) 498-9600 Wm. Linz
Robert Milsk Co., 2511 East 46th St., Suite Q-4, Indianapolis, IN 46205 (317) 546-5468
Kimian Sales, Inc., 1804 Sycamore St., Atlantic, IA 50022 (712) 243-1626 Bob Willms
David H. Brothers Co., Inc., 19 Old Court Rd., Baltimore, Md. 21208 (301) 764-7189 David Brothers
Fleehart and Sullivan, Inc., 10109 Aurora Ave. N., Seattle, Wash. 98133 (206) 522-1533 Earl W. Fleehart
Imtech Inc., 6862 Engle Rd., Cleveland, Ohio 44130 (216) 826-3400 Jim Eales
Koessler Sales Co., Inc., 2010 W. Burbank Blvd., Burbank, Calif. 91506 (213) 849-5716 Ace Ranslem
Wm. M. Linz Associates, Inc., 821 Skokie Blvd., Northbrooke, Ill. 60062 (312) 498-9600 William M. Linz
Moulthrop Sales, Inc., 7080 Commerce Dr., Pleasanton, Calif. 94566 (415) 846-0550 David Grubbs
Michael Scott Co., Inc., 20 Walnut St., Wellesley Hills, Mass. 02181 (617) 235-0102 Michael Scott
McLoud & Raymond Co., 1562 S. Parker Rd., Suite 336, Denver, Colo. 80222 (303) 751-5305 W. Clif McLoud
Lewis and Dunnigan Co., Inc., 104 Jamesville Rd., Syracuse, NY 13214 (315) 446-5522 Richard Dunning
J. Y. Schoonmaker Co., Inc., 10710 Sand Hill Rd., Dallas, Tex. 75238 (214) 349-1650 E. Jess Spoonts
Shalco Inc., 23716 Woodward Ave., Pleasant Ridge, MI 48069 (313) 547-4771 Carl Ludwig
Technical System Reps, 2065 Peachtree Ind. Ct., Suite 215, Chamblee, Ga. 30341 (404) 457-0426 Norman R. Schneider
Telak Electronics Ltd., 100 Midwest Rd., Scarborough, Ont. M1P 3B1 Canada (416) 752-8575 Murray Balcom
World Wide Products, Inc., 10818 N.W. 6th Ct., Box 279, Miami, Fla. 33168 (305) 754-5475 Jerry Zeidman

Teltek, Inc., 1015 S.W. 117th St., Seattle, WA 98146

Tentel, 50 Curtner Ave., Campbell, Calif. 95008
Wayne B. Graham (408) 377-6588

Tepco Corp., Box 680, Rapid City, S. D. 57709

TerraCom, Loral Corp., 9020 Balboa Ave., San Diego, Calif. 92123

Texas Electronics, Box 7225, Dallas, Tex. 75209
Sam Eason (214) 631-2490

Texscan Corp., 2446 N. Shadeland, Indianapolis, Ind. 46219

Theatre Techniques Inc., 60 Connolly Parkway, Hamden, Conn. 06514

Thermodyne International Ltd., 12600 Yukon Ave., Hawthorne, Calif. 90250

Thomson-CSF Laboratories, Inc., 37 Brownhouse Rd., Stamford, Conn. 06902

3D Television Systems Inc., 4382 Lankershim Blvd., N. Hollywood, CA 91602

3M Co., Magnetic Audio/Video Prod. Div., 3M Center, St. Paul, Minn. 55101
Joe Leon, Sales (612) 733-7732

REGIONAL SALES CONTACTS:
3M-Magnetic A/V Products, 320 Shaw Rd., So. San Francisco, CA 94080 (415) 761-1155 Ernie Heisser
3M Co., Southwestern, 2121 Santa Anna Ave., Dallas, TX 75228 (214) 324-8100 Ralph Henderon
3M-Magnetic A/V Products, 6023 S. Garlield Ave., Los Angeles, CA 90040 (213) 726-6300 Larry Drohman
3M-Magnetic A/V Products, 15 Henderson Dr., West Caldwell, NJ 07006 (201) 575-2000 Pete VanDeventer
3M-Magnetic A/V Products, 950 N. Kings Hiway, Cherry Hill, NJ 08034 (609) 667-7062 Mike Beetem
3M-Magnetic A/V Products, 2860 Bankers Industrial Dr., Atlanta, GA 30360 (404) 447-7000 Chuck Kendall
3M-Magnetic A/V Products, 6850 Harlem Ave., Bedford Park, Chicago, IL 60501 (312) 496-6500 Dan Trasatt

3M Co., Mincom Div., 3M Center, St. Paul, Minn. 55101
Bob Landingham, Sales & Mktg. Mgr. (612) 733-0803

Time & Frequency Tech., Inc., 3090 Oakmead Village Dr., Santa Clara, Cal. 95051
Frank Stolten, Western Region Sls. Mgr., William Wollenbarger, Eastern Region Sls. Mgr. (408) 246-6365

REGIONAL SALES CONTACTS:
BCD, Inc., 1400 Coleman Ave., Suite H14, Santa Clara, Calif. 95051 (408) 984-6614 Earl Meltaffey
BCD, Inc., 2990 E. La Jolla St., Anaheim, Calif. 92806 (714) 630-8150 John Baumann
Didier/Denver, 4665 Kipling, Wheat Ridge, Colo. 80033 (303) 422-6666 Herb Didier
Martin, Zienkosky, Browne & Assoc., 4203 Beltway Dr., Dallas, Tex. 75234 (214) 233-5535 Darryl Parker
Emmons Associates, 10700 Lyndale Ave. S., Minneapolis, Minn. 55420 (612) 881-1118 Keith Emmons
Dyer Electronics, 31185 Ten Mile Rd., Farmington Hills, Mich. 48024 (313) 478-2157 Mike Dyer
Electronic Merchandising Ent., Inc., 112 Buena Vista, High Point, N.C. 27260 (919) 869-3335 George Gold
Repelect, Box 7102, Tampa, Fla. 33603 (813) 227-5051 John Govreau
Holzberg Associates, Box 322, Totowa, N.J. 07512 (201) 256-0455 Herb Holzberg
MARCOM, P.O. Box 66507, Scotts Valley, CA 95066 (408) 438-4273
MSC Electronics Ltd., 254 Wild Cat Rd., Downsview, Ont. Canada M3J 2N5 (416) 661-4180 Anthony Sharpe

Time Tech Corp., 625 W. Katella Ave. #35, Orange, Calif. 92667

Times Fiber Communications, Inc., 358 Hall Ave., Wallingford, CT 06492

Times Wire and Cable, 358 Hall Avenue, Wallingford, Conn. 06492

Topaz Electronics, 3855 Ruffin Rd., San Diego, CA 92123

Torpey Controls & Engineering Ltd., 70 Milner Ave. Unit 5, Scarborough, Ont., Canada M1S 3P8

Toshiba Int'l. Corp., Broadcast Electronic Systems, 292 Gibralter Dr., Sunnyvale, CA 94086

Townsend Associates, Inc., Box 1122, Westfield, Mass. 01085

Track Audio, Inc. (TA), 33753 9th S, Federal Way, Wash. 98003

Tracor Inc., 6500 Tracor Lane, Austin, TX 78721

Transit-O-Sound Inc., 728 Yosemite Dr., Indianapolis, IN 46217

Transtector Systems Div., Konic International Corp., Box 11159, Zephyr Cove, NV 89448

Tri-Ex Tower Corp., 7172 Rasmussen Ave., Visalia, CA 93277

Triple Crown Electronics, Inc., 42 Racine Rd., Rexdale, Ont., Canada M9W 2Z3

Triple I, 4605 N. Stiles, Oklahoma City, OK 73154

Trompeter Electronics, 8936 Comanche Ave., Chatsworth, Cal. 91311
(213) 882-1020

Tweed Audio USA Inc., 4545-E. Industrial 5E, Simi Valley, CA 93063

U

UHF Associates, 90 Transport Ave. #4, Rohnert Park, CA 94928

UMC Electronics Co., Broadcast Products Div., 460 Sackett Point Rd., North Haven, Conn. 06473

UNI-SET Div., Kniff Woodcraft Corp., 449 Ave. A, Rochester, NY 14621

URSA Major, Inc., Box 18, Belmont, MA 02178

US JVC Corp., Professional Video Div., 58-75 Queens Midtown Exp., Maspeth, N.Y. 11378
Stephen Martin, East Coast Regional Sls. Mgr. (212) 476-8300

REGIONAL SALES CONTACTS:
US JVC Corp., 2250 Lively Blvd., Elk Grove Village, IL 60007 (312) 364-9300 Chuck Bocan
US JVC Corp., 1011 W. Artesia Blvd., Compton, CA 90220 (213) 537-6020 Don Thorkelson
US JVC Corp., 3400 South Loop E., Houston, TX 77021 (713) 741-3741 Ed Spalding

UTE Microwave, Inc., 3500 Sunset Ave., Asbury Park, NJ 07712

Ultra Audio Pixtec, Box 921, Beverly Hills, Cal. 90213
L. D. Mazzini (213) 276-2726

REGIONAL SALES CONTACTS:
Valenti Associates, 16 Saddle Club Rd., Lexington, MA 02173 (617) 861-0089 Fran Valenti
Adwar Video, 100 5th Ave., New York, NY 10011 (212) 691-0976 John Burris
Robert Slye Electronics, 3415 N. Washington Blvd., Arlington, VA 22201 (703) 525-7272 Robert Slye
Columbia Video, 1805 St. Johns Ave., Highland Park, IL 60035 (312) 433-6010 Gene Kahn
Signal Engineering, P.O. Box 10167, Birmingham, AL 35202 (205) 328-6431 Wm. D. Coe
Klopf Audio-Video, 3381 Successful Way, Dayton, OH 45414 (513) 236-5500 Ralph Johnson
Central Video, 3806 Woodland Park, N., Seattle, WA 98103 (206) 632-8900 Gene Hafford
Gray Communications, The 6000 Bldg., Suite 2508, Chatanooga, TN 37411 (615) 894-6860 George Cudabac

Unarco-Rohn Div., of Unarco Ind., Inc., Box 2000, Peoria, Ill. 61656

Unimedia Corp., 22525 Kingston Ln., Auburn, Calif. 95603

Union Connector Co., Inc., Box H, Roosevelt, N. Y. 11575

United Media, Inc., 1571-D Parkway Loop, Tustin, CA 92680
Robert J. Ricci (714) 731-3011

United Recording Electronics Industries, 8460 San Fernando Rd., Sun Valley, Calif. 91352

United Research Lab Corp., 681 Fifth Ave., New York, NY 10022

United Systems Corp., 918 Woodley Rd., Dayton, OH 45403

Unitel, 80 Rue d'Arcueil, 94250 Gentilly, France

Univex International, Box 2000, Monument, CO 80132

Up-Right Scaffolds, 1013 Pardee St., Berkeley, Cal. 94710

Utah Scientific, Inc., 2276 South 2700 West, Salt Lake City, Utah 84119
Lyle O. Keys (801) 973-6840

Utility Tower Co., Box 12369, Oklahoma City, OK 73157

V

V&B Tower Const. Co., Inc., Atlas Tower Mfg., Box 972, Vinita, OK 74301

VIF International, Box 1555, Mountain View, CA 94042
Gordon MacKenchnie (408) 739-9740

VMI-Visual Methods Inc., Box 644, Westwood, NJ 07675

Vacuum Tube Industries, 35 Pequit St., Canton, Mass. 02021
Eugene Tosti (617) 828-1650

Valad Electric Heating Corp., 160 Wildey St., Tarrytown, N.Y. 10591

Thomas Valentino Inc., 151 West 46th St., New York, N.Y. 10036

Vamco Engineering, 11104-C E. 56th St., Tulsa, Okla. 74145

VanLadder, Inc., Box 709, Spencer, Iowa 51301

Van San Corp., 16735 E. Johnson Dr., City of Industry, CA 91745

Varian Associates, Inc., Electron Device Group, 611 Hansen Way, Palo Alto, Calif. 94303

Varian/Beverly, Micro-Link Products, 8 Salem Rd., Beverly, Mass. 01915

Vector Electronic Co., Inc., 12460 Gladstone Ave., Sylmar, Calif. 91342

Versa Count Engineering, 553 Lively Blvd., Elk Grove Village, Ill. 60007

Vidaire Electronics Mfg., 150 Buffalo Ave., Freeport, NY 11520

Video Associates Labs, 2304 Hancock Dr. #1-F, Austin, TX 78756

Video Cassette Services, Inc., 711 West 17th St., J6, Costa Mesa, CA 92627

Video Data Systems, 40 Oser Ave., Hauppauge, N.Y. 11787
Steve Seiden (516) 231-4400

REGIONAL SALES CONTACTS:
Video Data Systems, Lakeway Apts., Room 111, Greenville, TX 75401 (214) 454-8985 Debra Dunegan
Video Data Systems, 54 Harvard Rd., Fair Haven, NJ 07701 (201) 747-5122 Tony Keator
Video Data Systems, 3835 Willowbrook Dr., Douglasville, GA 30135 (404) 942-8669 Dave Allen
Video Data Systems, 5435 Dunbarton Dr., Salt Lake City, UT 84117 (801) 266-5054 Bob Hall
Video Data Systems, R.R. 1, Box 235, Lodi, WI 53555 (608) 592-3272 Vern Bertrand

Video Devices Co., 3304 Silver Oak Lane, Vista, Calif. 92083

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Video Rentals, Inc., Subs. of AF Associates, 100 Stonehurst Court, Northvale, NJ 07647

Video Research Corp., Interstate Industrial Park, Riviera Beach, Fla. 33404

Video Specialties, Box 136, Solana Beach, CA 92075

Video Systems Network, Inc., 12530 Beatrice St., Los Angeles, CA 90066

Mac Brainard (800) 421-6521; (213) 871-0677

The Video Tape Co., 10545 Burbank Blvd., North Hollywood, Calif. 91601

Videomagnetics, Inc., 155 San Lazaro Ave., Sunnyvale, Calif. 94086

Videomax Div., Orrox Corp., 3303 Scott Blvd., Santa Clara, Calif. 95050

William E. Fitts (408) 988-2000

REGIONAL SALES CONTACTS:

Videomax, Western Regional Manager, Box 3052, Manhattan Beach, Calif. 90266 (213) 980-7927 Rick Murphy
Videomax Corp., P.O. Box 341, Tucker, GA 30084 (404) 992-4490 James H. Drummond
Videomax Corp., 800 Riverside Dr., New York, NY 10032 (212) 947-8031 Roy Holmes

Videomedia, 250 North Wolfe Rd., Sunnyvale, Calif. 94086

(408) 733-6500

REGIONAL SALES CONTACTS:

Todd Communications, 2211 S. Washington, Grand Forks, ND 58201 (701) 746-1268 Randy Terwillegar
Video Masters, 1820 Wyandotte St., Kansas City, MO 64108 (816) 474-8530 Paul Dark
Video Systems Network, 12530 Beatrice St., Los Angeles, CA 90066 (213) 390-7575 Robert Luckenbach
Swiderski Electronics, 1200 Greenleaf Ave., Elk Grove Village, IL 60007 (312) 364-1900 Joseph M. Swiderski III
Northwest Electronics, Inc., East 730 First Ave., Spokane, WA 99220 (509) 535-7652 Richard O. Jones
Teletape Video, 76 Brewer St., London England W1R 3PH Ian Crammond
Midwest Telecommunications, 5200 Mitchelldale, Suite F28, Houston, TX 77092 (713) 686-9278 George Bates
Midwest Telecommunications, 15046 Beltway Dr., Dallas, TX, 75240 (214) 387-2755 Ron Crockett
Midwest Telecommunications, 4410 Westerville Rd., Columbus, OH 43229 Fred Higbie
RIA Corp., 2536 E. Campus Dr., Salt Lake City, UT 84121 (801) 468-8822 Robert Bacon
Technical Video Systems, 245 Executive Park Blvd., Winston Salem, NC 27103 (919) 768-9536 Jimmy Holladay
Todd Communications, 1122 Queens Way W., Nekoosa, WI 54457 Harold Dougherty
Todd Communications, 7360 Ohms Lane, Minneapolis, MN 55435 (612) 835-3080 John Klindworth
Todd Communications, 120 South 41st. Omaha, NE 68131 Gordon Berry
BCB Electronics Sales Ltd., 98 Healey Rd., Bolton, Ont. Canada L0P 1A0 (416) 857-0790 Robert Cook
Cruse Communications, 4903 'B' Dawn Ave., E. Lansing, MI 48823 (517) 332-3579 William Cruse
Dyma Engineering, P.O. Box 1697, Taos, NM 87571 (505) 758-2686 Carroll Cunningham
Midwest Telecommunications, 4700 'G' Boston Way, Lanham, MD 20801 (301) 577-4903 Elijah Midkiff
Midwest Telecommunications, 300 First Ave. South, Nitro, WV 25143 (304) 722-2921 Chuck Sizemore
Midwest Telecommunications, 1395 Air Rail Ave., Virginia Beach, VA 23455 (804) 464-6256 Kevin Zmarthie
Midwest Telecommunications, 1804 Cargo Ct., Louisville, KY 40299 (502) 491-2888 Jerry Willingham
Midwest Telecommunications, 1150 'C' West 8th St., Cincinnati, OH 45203 (513) 651-1904 David Barnes

Videotek, Inc., 125 N. York St., Pottstown, Pa. 19464

Vikron, Inc., Box 737, St. Croix Falls, WI 54024

Viscount Industries Ltd., 105 East 69th, Vancouver, B.C., Canada V5X 2W9

Ray Renning (604) 327-9446

REGIONAL SALES CONTACTS:

Columbia Telecommunications Inc., 2241 W. Burnside, Portland, OR 97210 (503) 223-4546
Audio Video Craft, 7710 Melrose Ave., Los Angeles, CA 90046 (213) 655-3511
Tri-Tronics Inc., 2921 W. Alameda Ave., Burbank, CA 91505 (800) 232-2141, (213) 843-2170
Vestige Video, 520 N.W. Doulas, Burleson, TX 76028 (817) 295-5072
MISSCO, 4155 Industrial Dr., P.O. Box 1059, Jackson, MS 39205 (601) 948-8600
Communitronics Corp., 1907 S. Kingshighway, St. Louis, MO 63110 (314) 771-7160
Seneca Communications, 112 Killewald Ave., Tonowanda, NY 14150 (716) 693-8444
Tele-measurements Inc., 145 Main Ave., Clifton, NJ 07014 (201) 473-8822

Vital Industries Inc., 3700 NE 53rd Ave., Gainesville, Fla. 32601

Christopher Donoyan (904) 378-1581

REGIONAL SALES CONTACTS:

Vital Industries, Inc., Midwest Div., 2644 N. 7th St., Terre Haute, Ind. 47804 (812) 466-3212 Morrell Beavers
Vital Industries, Inc., Northeast Div., 34 Autumn Lane, Hicksville, N.Y. 11801 (516) 735-0055 Robert McAll
Vital Industries, Inc., Southwest Div., Box 912, Arlington, Tex. 76010 (817) 261-6855 Gordon Peters
Vital Industries, Inc., Southeast Div., Fox Hill Rd., Lynchburg, Va. 24503 (804) 384-7001 Eric King
Vital Industries, Inc., West Coast Div., 7960 West Beverly Blvd., Los Angeles, Calif. 90048 (213) 653-9438 Barry Holland

Vulcan Binder & Cover, Box 29, Vincent, AL 35178

W

WIDL Video, 5245 W. Diversey, Chicago, IL 60639

Wallach & Associates Inc., Box 18167, Cleveland, OH 44118

Wang Voice Comm. Inc., Executive Dr., Hudson, NH 03051

E. Boiger (603) 889-8550

Ward-Beck Systems, Ltd., 841 Progress Ave., Scarborough, Ont., Canada M1H 2X4

Waters Mfg. Inc., Longfellow Center, Wayland, Mass. 01778

Donald A. Russell (617) 358-2777

REGIONAL SALES CONTACTS:

Bierhaus Sales, Inc., 1013 E. 31st St., La-Grange Park, Ill. 60525 (312) 354-5100
Eltron, 7024 N. Barbados Pl., Phoenix, Ariz. 85021 (602) 997-1042
INH Component Sales, 160 Winchcombe Dr., Dayton, Ohio 45459 (513) 434-8808
Barry Sales Inc., 709 Lingco Dr. Suite 105, Richardson, TX 75081 (214) 234-0255
Dynatech, Inc., 5600 S. Syracuse Circle, Suite 308, Englewood, Colo. 80110 (303) 773-2830
Ozark Electronic Marketing, Inc., 2573 Woodson Rd., St. Louis, Mo. 63114 (314) 423-7200
Avionics Liaison Corp., Boeing Field 6770 Perimeter Rd. S., Seattle, WA 98108 (206) 767-3870
Peterson & Wolf, Box 35556, Edina, Minn. 55435 (612) 941-5400
Sales Engineers Ltd., 7580 Stage Rd., Buena Park, Calif. 90621 (714) 521-8673
Sir Associates, 442 Marrett Rd., Box 24, Lexington, Mass. 02173 (617) 862-1812
Sonny Simberkoff Assoc., Inc., 71 Valley St., South Orange, N.J. 07079 (201) 763-7900
R. P. Urban & Associates, 1119 Burton St. S.E., Grand Rapids, Mich. 49510 (616) 245-0511
The Woodworth Co., Box 2165, Redwood City, Calif. 94061 (415) 365-0252

Weathermation, Inc., 190 N. State St., Suite 328, Chicago, IL 60601

Weather Scan, Inc., Loop 132 & Hwy. 79, Olney, TX 76374

Weinschel Engineering Co., 1 Weinschel Ln., Gaithersburg, Md. 20760

Western Electronic Products Co., 107 Los Molinos, San Clemente, Calif. 92672

Westinghouse Elec. Corp., Semiconductor Div., Youngwood, PA 15697

Westinghouse, Ind. & Govt't Tube Div., Westinghouse Circle, Horseheads, N.Y. 14845

Whirlwind Audio, Box 1981, Rochester, N.Y. 14603

Whirlwind Music, Box 1075, Rochester, N.Y. 14603

Wide Band Engineering Co., Inc., Box 21652, Phoenix, Ariz. 85036

Wide Range Electronics, 2119 Schuetz Rd., St. Louis, Mo. 63141

Otto Rauhut; Arthur Brigham (314) 567-5366

Wilcox-Lange, Inc., 3925 N. Pulaski Rd., Chicago, IL 60641

Wilkinson Electronics, Inc., Box 738, Trainer, PA 19013

(215) 497-5100

REGIONAL SALES CONTACTS:

Dyma Engineering, Box 1697, Taos, N.M. 87571 (505) 758-2686 Carroll Cunningham
Lebow Labs, Inc., 424 Cambridge St., Allston, MA 02134 (617) 782-0600 James Ritteman
S.A.V.C.O., Box 427, Richardson, Tex. 75080 (214) 234-1841 Nathan Hughes
Broadcast Consultants Corp., 21 N. Wirt St., Leesburg, Va. 22075 (703) 777-8660 David Green
Electronic Industries, Inc., 19 E. Irving Ave., Oshkosh, Wis. 54901 (414) 235-8930 Bud Tedlie

Winsted Corp., 8127 Pleasant Ave. So., Minneapolis, Minn. 55420

Jerry Hoska (612) 888-1957

Wolf Coach Inc., 200 Bartlett St., Northboro, Mass. 01532

World Video Inc., Box 117, Boyertown, Pa. 19512

John A. Taylor III (215) 367-6055

REGIONAL SALES CONTACTS:

Associated Systems, P.O. Box 333, Londonderry, NH 03053 (603) 434-0731 Churchill S. Miller
Langbaum Associates, Inc., 52 Johnson's Lane, New City, NY 10956 (914) 634-1141 Art Langbaum
Wiltronix, Inc., 5504 Waterway, Rockville, MD 20853 (301) 460-1454 Dwight Wilcox
Radford Associates, 3203 Lanier Dr., Atlanta, GA 30319 (404) 237-6097 Lew Radford
Radford Associates, 1331 Otter Creek Rd., Nashville, TN 37215 (615) 373-0231 Ralph Hucaby
Sight & Sound, P.O. Box 1644, Louisville, KY 40201 (502) 584-5535 Steve Cisler
Didier/Denver, 4665 Kipling, Wheat Ridge, CO 80033 (303) 422-6666 Herb Didier
Dyma Engineering, Inc., Rt. 1, Box 51, Taos, NM 87571 (505) 758-2686 Mr. Carroll Cunningham
83 Russel Rd., Garden City, Garden City, L.I., NY 11530 (516) 248-4858 Paul Milazzo
System Associates, 5801 Uplander Way, Culver City, CA 90230 (213) 641-2042 Billy Seidel
Comad Communications Ltd., 91 Kelfield St., Unit 5, Rexdale, Ont. Canada M9W 5A3 (416) 245-1734 Emil Adamyk

Y

Yamaha International Corp., 6600 Orangethorpe Ave., Buena Park, Calif. 90622

Yardney Electric Corp., 82 Mechanic St., Pawcatuck, CT 06379

Winslow E. Ryan (203) 599-1100

Z

The Zei-Mark Corp., Box 182, Brookfield Center, Conn. 06805

Product Listings Begin on Page 181

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broadcast product dealer/distributors

For your added convenience, **Broadcast Engineering** has designed this NEW Broadcast Product Dealer/Distributors section to provide close-to-home purchasing assistance. Use it, in conjunction with other sections in the 1979 Buyers' Guide, to plan new facilities, and equipment expansion or upgrading. For broadcast product dealer/distributors, this directory identifies: address and telephone, products handled and territory served.

Listings are arranged alphabetically by location. Firms listed do not include all dealer/distributors serving an area, but only those who returned **BE**'s listing form.

Both a typical dealer/distributor listing, and the geographical area and product classification code keys are included on this page to assist you. We think you will find this new section, in addition to the updated Product Directory and Broadcast Product Manufacturers' Addresses section, makes this issue the most useful and comprehensive purchasing aid for the broadcast industry.

Typical listing

(1) **Jones Broadcast Sales,**
2912 W. 10 St.,
(2) Kansas City, Mo. 64105
(816-842-1234)
(3) IA, KS, MO, OK, 1, 2, 5, 7, 9

(1) firm name, street address
(2) city, state, zip code, telephone
(3) geographical area served and products handled (see code keys)

This firm covers Iowa, Kansas, Missouri and Oklahoma, and sells audio equipment, video equipment, tape, film equipment, and service and repair.

Key to geographical area code

AK	Alaska	KS	Kansas	NV	Nevada	WI	Wisconsin
AL	Alabama	KY	Kentucky	NY	New York	WV	West Virginia
AR	Arkansas	LA	Louisiana	OH	Ohio	WY	Wyoming
AZ	Arizona	MA	Massachusetts	OK	Oklahoma		
CA	California	MD	Maryland	OR	Oregon		(Abbreviations
CO	Colorado	ME	Maine	PA	Pennsylvania		for Canadian provinces)
CT	Connecticut	MI	Michigan	PR	Puerto Rico	ALTA	Alberta
DC	District of Columbia	MN	Minnesota	RI	Rhode Island	BC	British Columbia
DE	Delaware	MO	Missouri	SC	South Carolina	MAN	Manitoba
FL	Florida	MS	Mississippi	SD	South Dakota	NB	New Brunswick
GA	Georgia	MT	Montana	TN	Tennessee	NF	Newfoundland
GU	Guam	NC	North Carolina	TX	Texas	NS	Nova Scotia
HI	Hawaii	ND	North Dakota	UT	Utah	ONT	Ontario
IA	Iowa	NE	Nebraska	VA	Virginia	PEI	Prince Edward Island
ID	Idaho	NH	New Hampshire	VI	Virgin Islands	QUE	Quebec
IL	Illinois	NJ	New Jersey	VT	Vermont	SASK	Saskatchewan
IN	Indiana	NM	New Mexico	WA	Washington	YUK	Yukon Territory

Key to product numerical code

1 AUDIO EQUIPMENT (including recorders, microphones, mixers, consoles, cart machines, turntables, processing devices, etc.)
2 VIDEO EQUIPMENT (including cameras, videotape recorders, production switchers, monitors, lights, etc.)
3 TEST AND MEASUREMENT EQUIPMENT (audio and video)
4 TRANSMITTERS, ANTENNAS AND TRANSMISSION SYSTEMS (including towers, ATS, STL, MDS, etc.)
5 TAPE (including video and audio recording tape, etc.)
6 VACUUM TUBES (including video camera, transmitter, TWT, etc.)
7 FILM EQUIPMENT (including cine cameras, processing equipment, film projectors, etc.)
8 VANS AND ACCESSORIES
9 SERVICE AND REPAIR
10 SYSTEM DESIGN (including studio installation, etc.)
11 USED EQUIPMENT (including leasing, rent, etc.)

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ALABAMA

Matec, Inc., (Maze TV Equip. Corp.), Box 6968, Birmingham, AL 35210 (205-956-2200) U.S.A. & Latin America 11

Signal Engineering & Sales, Inc., 720 South 23rd St.; Drawer 10167, Birmingham, AL 35202 (205-328-6431) AL, FL, GA, MS, TN 2, 4, 8, 9, 10, 11

Leeco Mid-South, Inc., 817 Wheeler Ave., Huntsville, AL 35801 (205-533-5896 AL, FL, GA, LA, MS, TN 3
See advertisement on this page

ARIZONA

Fisher-Burke Professional Audio, Box 2468, Phoenix, AZ 85003 (602-257-0225) U.S.A. 1, 3, 5, 10
See advertisement on this page

Jensen Tools & Alloys, 1230 S. Priest Dr., Tempe, AZ 85281 (602-968-6241) U.S.A. 9
See advertisement on page 175

CALIFORNIA

Broadcast Communications Devices, Inc., 2990 E. LaJolla St., Anaheim, CA 92806 (714-630-8150); (213-628-9590) AZ, CA, NV, NM, OR, WA 1, 2, 3, 4, 5, 10

Martel Electronics Inc., 970 E. Orangethorpe #A, Anaheim, CA 92801 (714-871-7102) U.S.A. 1, 9

Optek, 2290 E. LaJolla St., Anaheim, CA 92806 (714-630-8280) AK, AZ, CA, CO, HI, NV, OR, WA 2, 4

Kenneth R. Meades, Box 3831, Beverly Hills, CA 90212 (213-627-6981) CA 1, 9, 10

Walter Odemer Co., 1516 W. Magnolia Blvd., Burbank, CA 91506 (213-846-2819) U.S.A. 1

Richard W. Burden Associates, 20944 Sherman Way, Canoga Park, CA 91303 (213-340-4590) AZ, CA, ID, NV, OR, UT, WA 1, 3, 4, 9, 10

Broadcast Video Systems, Inc., 1050 E. Dominguez, Unit D, Carson, CA 90746 (213-637-2971) AZ, CA, NV, OR, WA 2, 3

System Associates, 5801 Uplander Way, Culver City, CA 90230 (213-641-2042) U.S.A. and Canada 5,11; AZ, CA, NV 2,5,11

Studio Film & Tape Inc., 6670 Santa Monica Blvd., Hollywood, CA 90038 (213-466-8101) U.S.A. and Canada 3, 5

Ray Jacobs Audio, Inc., 2739 Signal Parkway, Long Beach, CA 90806 (213-595-6811) USA - mail order 5

Kallman Associates, Inc., 2525 Hyperion Ave., Los Angeles, CA 90027 (213-660-4900) AZ, CA, NV 2, 10

Video Systems Network, Inc., 12530 Beatrice St., Los Angeles, CA 90066 (213-871-0677) North America 1, 2, 3, 5, 6, 7, 8, 9, 10, 11

Westlake Audio, 6311 Wilshire Blvd., Los Angeles, CA 90048 (213-655-0303) Worldwide 1, 3, 5, 10
See advertisement on page 71

Cara Int'l. Ltd., Box 9339, Marina Del Rey, CA 90291 (213-821-7898) U.S.A. 1
See advertisement on this page

VIF International, Box 1555, Mountain View, CA 94042 (408-739-9740) Worldwide 1

Broadcast Cartridge Service, Box 1790, N. Hollywood, CA 91604 (213-245-7708) U.S.A. 5

Surcom Associates, 305 Wisconsin Ave., Oceanside, CA 92054 (714-722-6162) Worldwide 4
See advertisement on this page and 165

Accurate Sound Co., 114 Fifth Ave., Redwood City, CA 94063 (415-365-2843) U.S.A. and Canada 1, 5, 10, 11

Network Recording Products, 4429 Morena Blvd., San Diego, CA 92117 (714-272-2011) U.S.A. 1, 5

Schudel, Inc., 6973 Consolidated Way, San Diego, CA 92121 (714)-578-1770) Worldwide 2

Sound Genesis, 2001 Bryant St., San Francisco, CA 94110 (415-285-8900) AK, CA, HI, ID, MT, NV, OR, WA 1, 3, 5, 9, 10, 11

Sound Dynamics, Inc., Box 32055, San Jose, CA 95152 (408) 926-3588) CA, OR, WA 1, 4, 9

David Lint Associates, Inc., 3350 Scott Blvd., Bldg. #5, Santa Clara, CA 95051 (408-984-0964) AZ, CA, NV, OR, WA 1, 4, 5

Videotape Products, Inc., Box 1077; 919 Broadway, Santa Monica, CA 90406 (213-451-1604) Worldwide 5

Davis Electronics Co., Box 128, Sierra Madre, CA 91024 (213-355-6909) CA, HI 4, 9

Broadcast Marketing Associates, (Formerly United Media), 155 B San Lazaro Ave., Sunnyvale, CA 94086 (408-736-3600) AK, CA, HI, ID, NV, OR, WA 1, 2, 3, 5, 7, 8, 10, 11

Sound Investment Enterprises, Box 4139, Thousand Oaks, CA 91359 CA 1

COLORADO

Colorado Magnetics, Box 713, Colorado Springs, CO 80901 (303-596-0684) AZ, CA, CO, ID, KS, MO, NE, NV, NM, TX, UT, WY 5
See advertisement on page 177

Didier/Denver, Inc., 4665 Kipling, Wheat Ridge, CO 80033 (303-422-6666) CO, ID, KS, MT, NE, NM, ND, SD, UT, WY 1, 2, 3, 4, 6, 10

CONNECTICUT

Redding Radio, Div. of SJ Industries Inc., Box 344, Fairfield, CT 06430 North America 1, 3, 5

Denson Electronic Corp., Box 85, Rockville, CT 06066 U.S.A. and Canada 2
See advertisement on page 114

DISTRICT OF COLUMBIA

Comex Corp., Box 17011, Dulles Int'l. Airport, Washington, DC 20041 (703-471-4215) South America 2
See advertisement on page 172

FLORIDA

Doug Holland Associates, 9035 S.W. 9th St., Boca Raton, FL 33433 (305-428-7120) FL, GA, IL, IN, IA, KY, LA, MD, MI, NE, NJ, NY, NC, OH, PA, SC, TN, TX, VT, VI, VA, WV, WI 1, 4, 5, 9, 10, 11

Pro Audio General Store, Inc., 1378 NW 100th Ave., Coral Springs, FL 33065 (305-752-0330) AL, FL, GA, LA, MS, NC, SC 1, 5

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Marina del Rey, CA 90291
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Area Representatives

San Francisco
Brian Trankle & Associates
(415) 344-1133

Nashville
Technicon, Inc.
(615) 822-3524

Chicago
Pro Audio Sales
(312) 381-4559

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Leader Instr.
Power Instr.
Micrometric's
Ivey Elec.

817 Wheeler Ave.
Huntsville, AL 35801
Phone: 205/533-5896

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(See page 242 for key to listings)

B.A.A. Int'l., Box 5882, Ft. Lauderdale, FL 33310 (305-522-1000 or 485-4111) U.S.A. and Int'l. 1, 3, 4, 5, 6, 11
See advertisement on page 174

Lauderdale Electronic Labs, 16 S.W. 13th St., Ft. Lauderdale, FL 33315 (305-764-7755) U.S.A. and Canada 1, 3, 5

Image Devices Inc., Box 610606; 1825 N.E. 149th St., Miami, FL 33181 (305-945-1111; 800-327-5181) AL, AR, FL, GA, KY, LA, MS, NC, OK, PR, SC, TN, VA, ONT, QUE 1, 2, 3, 5, 7, 8, 9, 10, 11

Lita Broadcasting Distributors, Box 440752, Miami, FL 33144 (305-358-2836) U.S.A. 1,3,5,6,9,10
See advertisement on this page

Stage Equipment & Lighting, Inc., 12231 N.E. 13th Court, Miami, FL 33161 (305-891-2010) AL, FL, GA, Caribbean, Central & South America 2, 9, 10

Autodyne, Box 13036, Orlando, FL 32859 (305-855-6868) Worldwide 1, 2, 3, 5, 7, 9, 10, 11

Media Concepts, Inc., 559 49th St. S., St. Petersburg, FL 33707 (813-321-2122 or 821-2122) U.S.A. and Int'l. 1, 2, 5, 9, 10

Audio Visual Services, 5484 Jet Port Industrial Blvd., Tampa, FL 33614 (813-884-1461) U.S.A 1, 5, 7, 9, 10, 11

Gray Communications, 5401 Southern Comfort Blvd., Tampa, FL 33614 (813-885-1411) FL, PR 1, 2, 8, 9, 10, 11

GEORGIA

Siboney Audio Visual Products, Inc., 1760 Tully Circle, N.E., Atlanta, GA 30329 (404-329-9200) AL, GA, TN, TX 1, 2, 5, 7, 9, 10, 11

Quality Media Corp., Box 7008, Columbus, GA 31908 (800-241-7878; in GA 404-324-1271) U.S.A. and Canada 3
See advertisement on page 51

C. Harrison Associates, 6290 McDonough Dr., Suite E, Norcross, GA 30093 AL, FL, GA, MS, NC, SC, TN 2, 4

ILLINOIS

Newark Electronics, 500 N. Pulaski Rd., Chicago, IL 60624 (312-638-4411) Worldwide 1, 3, 6

WIDL Video, 5245 W. Diversey, Chicago, IL 60639 (312-622-9606) Worldwide 1, 3, 5, 8

Columbia Video Systems, The Columbia Bldg., Laurel & 2nd, Highland Park, IL 60035 (312-433-6010) IL, IN, IA, MI, WI 2, 3, 5, 7, 10

Roscor Corp., 6160 Oakton, Morton Grove, IL 60053 (312-966-3010 or 539-7700) IL, IA, KY, MI, OH, WI 1, 2, 3, 5, 8, 9, 10, 11

Joseph Electronics, 8830 Milwaukee Ave., Niles, IL 60648 (312-297-4200) IL, IN, WI, Nat'l. Mail Order 1, 2, 3, 4, 5, 6, 7

MTI Teleprograms Inc., 4825 N. Scott St., Suite 23, Schiller Park, IL 60176 (312-671-1565) Worldwide 7

INDIANA

Jon Powell Associates, Inc., 3500 DePauw Blvd., Suite 3000; Box 68635, Indianapolis, IN 46268 (317-844-5060) IN 1, 2, 5, 7, 12

Allied Broadcast Equipment, 635 South E St., Richmond, IN 47374 (317-962-8596) U.S.A., Canada, Central America, Great Britain and Philippine Islands 1, 3, 4, 5, 6, 9, 10, 11
See advertisement on page 82

KANSAS

Business Communications, 1140 Cambridge Circle Dr., Kansas City, KS 66103 (913-342-4000) IA, KS, MO 11

Radio Supply Co., Inc., VTR Div., 131 Laura, Wichita, KS 67211 (316-267-5213) KS, OK 1, 2, 3, 5, 6, 9

KENTUCKY

Bruce L. Dawson & Associates, Box 115, Prospect, KY 40059 KY, Southern OH 2

MARYLAND

Neff Communications, Inc., 9721 Singleton Dr., Bethesda, MD 20034 (301-530-6080) DE, DC, MD, NJ, PA, VA, WV 1, 3, 5

Peirce-Phelps, Inc., 10215 Fernwood Dr., Bethesda, MD 20034 (301-530-9580) DC, MD, VA 1, 2, 3, 5, 7, 8, 9, 10, 11

Midwest Corporation, Communications Division, 4700-G Boston Way (Washington D.C.), Lanham, MD 20801 (301-577-4903) North America 1, 2, 4, 5, 8, 9, 10

NUS Corp., 4 Research Place, Rockville, MD 20850 (301-948-7010) DE, DC, FL, GA, MD, NJ, NY, NC, OH, PA, SC, VA, WV 11

Wiltronix, Inc., 5504 Waterway, Rockville, MD 20853 (301-460-1454) DE, DC, KY, MD, PA, VA, WV 1, 2, 3, 10

Music Sound Distributors, 7C Aylesbury Rd., Timonium, MD 21093 (301-252-9081) U.S.A. and Canada 1, 2, 5
See advertisement on this page and 121

MASSACHUSETTS

Lebow Labs Inc., 424 Cambridge St., Allston, MA 02134 (617-782-0600) CT, ME, MA, NH, NY, RI, VT 1, 2, 3, 5. 10

Wahlberg Associates, 79 Mystic St., Arlington, MA 02174 (617-646-5394) CT, ME, MA, NH, NY, RI, VT 2

M. P. Video, Inc., 45 Kenneth St., Newton, MA 02161 (617-965-5405) CT, ME, MA, NH, RI 1, 2, 3, 5, 9, 10, 11

QSI Systems, Inc., 993 Watertown St., West Newton, MA 02165 (617-969-7118) U.S.A. 2, 3, 5

MICHIGAN

Thalner Electronic Labs, 7235 Jackson Rd., Ann Arbor, MI 48103 (313-761-4506; Area (313) ONLY 800-552-5275) MI, OH 1, 2, 3, 4, 5, 6, 9, 10, 11

Audio Distributor Inc., 2342 S. Division Ave., Grand Rapids, MI 49507 (616-452-1596) IN, MI, OH 1, 3, 4, 5, 10, 11

O'Hara Associates, 36500 Weideman, Mt. Clemens, MI 48043 (313-791-7140) MI 3

MINNESOTA

Emmons Associates, Inc., 10700 Lyndale Ave. S., Minneapolis, MN 55420 (612-881-1118) IA, MN, ND, SD, WI 1, 2, 9

Todd Communiations Inc., 7360 Ohms Lane, Minneapolis, MN 55435 (612-835-3080) IA, MN, NE, ND, SD, WI 1, 2, 3, 4, 5, 7, 9, 10, 11

T. R. Pitts Co., 458 W. Sanborn St.; Box 57, Winona, MN 55987 (507-452-2629) All - MD, MN, SD, WI; Parts of - IL, IA, ME, MI 1, 2, 3, 4, 5, 8, 9, 10

MISSOURI

Television Engineering Corp., 519 Rudder Rd., Fenton, MO 63026 (314-343-5605) IL, IA, KS, MI, MN, MS, MO, NE, OH, TN 1, 2, 5, 7, 8, 9, 10

NEBRASKA

ATV Research, 13th & Broadway, Dakota City, NE 68731 (402-987-3771) Worldwide 2, 3

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NEW JERSEY

Landy Associates, 1890 E. Marlton Pike, Cherry Hill, NJ 08003 (609-424-4660) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT 1, 2, 3, 5, 7, 10, 11

Tele-Measurements Inc., 145 Main Ave., Clifton, NJ 07014 (201-473-8822; 212-581-9020) CT, DE, MD, NJ, NY, PA 1, 2, 3, 4, 8, 9, 10, 11

Auscom Associates, 30-16 Broadway, Rte. 4, Fairlawn, NJ 07452 (201-796-0600) CT, NJ, NY, PA 1, 2, 3, 5, 6, 9, 10, 11

Thor Electronics Corp., 321 Pennsylvania Ave., Linden, NJ 07036 (201-486-3300) Worldwide 6

Cinecraft Int'l., Inc. Export Agents, 11 Caesar Place, Moonachie, NJ 07074 (201-939-0875) Worldwide 1, 7, 9, 11

Dimension 3 Recording Co., Box 326, New Milford, NJ 07646 (201-265-5599) USA and Canada 5

Comprehensive Video Supply Corp., 148 Veterans Dr., Northvale, NJ 07647 (800-526-0242; NJ only 201-767-7990) Worldwide 1, 2, 3, 5, 7, 9

L&M Associates, 511 Victor St., Saddle Brook, NJ 07662 (201-843-8700) CT, NJ, NY, PA 3

H. M. Holzberg Associates, Inc., Box 322, Totowa, NJ 07511 (201-256-0455) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT 1, 2, 3, 4, 5, 7, 8, 10
See advertisement on this page

NEW MEXICO

DYMA Engineering, Inc., Box 1697, Taos, NM 87571 (505-758-2686 or 8686) AZ, CA, CO, KS, NV, NM, OK, TX, UT 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

NEW YORK

Ceco Communications Inc., 2115 Avenue X, Brooklyn, NY 11235 (212-646-6300) Worldwide 6
See advertisement on page 179

Temtron Electronics Ltd., 15 Main St., East Rockaway, NY 11518 (516-599-6400; 800-645-2300) U.S.A. 5, 6
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Jules Racine & Co., Inc., 85 Executive Blvd., Elmsford, NY 10523 (914-592-4760) U.S.A. 3

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Adwar Video Corp., 100 Fifth Ave., New York, NY 10011 (212-691-0976) Worldwide 1, 2, 3, 5, 6, 9, 10, 11

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Jenel Corp., Consulting & Engineering, 1675 York Ave., New York, NY 10028 (212-722-2478) U.S.A. 10

C. M. Levit Electronics, 200 Park Ave. S., New York, NY 10003 (212-777-5517) Worldwide 6

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Val-Tronics, Inc., Penn Park Bldg., Pittston, PA 18640 (717-655-5937) U.S.A. 1, 3, 4, 5, 6
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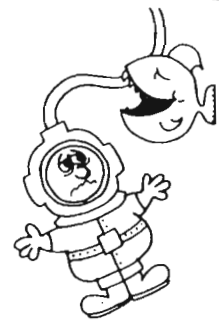

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Oral Roberts University has used RCA TK-44B camera for sale. New tubes, Schneider 11X1 TV7 zoom lens, ITE cam head, 100 ft. TV 81 cable, remote control, Houston Fearless PD-8 pedestal. 40K. Write ORU Director of Engineering, P.O. Box 3286, Tulsa, OK 74101 or phone 918-492-5535. 9-79-1t

TKP-45 W/MINI PACK CCU, Canon 10:1 zoom lens, carrying cases, & all accessories. Low hours. Excellent shape. Ross Bagwell, Sr., Cinetel Productions, 2 Forest Court, Knoxville, TN 37919, (615) 584-2232/584-0171. 9-79-1t

RCA VTY MODIFICATIONS KITS for TR4/22/50/60/61/70. Splicer (single-frame), TEP Interface, Time Code Edit Interface Kit, Audio Splice Timing Mod (Audio Insert Editor), Wideband Audio Amplifiers, most mod kits, some modules available. LAWHED, LTD., 388 Reed Road, Broomall, Pa. 19008, (215) 543-7600. 4-78-tf

REMOTE VIDEOTAPING UNITS: 20' — $125,000.00; 40' — $350,000.00. LATEST NETWORK EQUIPMENT, RCA VTRs, AMPEX CAMERAS, AMERICAN DATA, etc. M. Grosvenor, 3200-L S. Barrington Ave., Los Angeles, CA 90066, (213) 397-5922. 9-79-1t

GENERAL RADIO 1606-A—$1200.00. Delta OIB-1—$500.00. 1-208-746-2256. 9-79-1t

FOR SALE: ONE RCA FIELD INTENSITY METER, type WX2D, frequency 540 to 1600. Call 916-233-2713 or write to P.O. Box 1650, Alturas, CA 96101. 8-79-2t

USED FIDELIPAC TAPE CARTRIDGES: $35.00 per hundred as is. New pressure pads, $28.00 per hundred. Freight prepaid, check with order. Cart Mart, Box 3066, Fort Worth, Texas 76105, (817) 536-6437. 8-79-3t

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EQUIPMENT FOR SALE (CONT.)

ASACA 7000 BROADCAST TV Camera Outfit, complete. Used only for demo. Original value $39,000. Four outfits available. No reasonable offer refused, or will trade for film equipment. Nixon, Box 38248, Hollywood, CA 90038. 9-79-1t

SONY BVU-50 VTR's (New). Convergence ECS-1B Editing System with TT-6, PC-3, 3-VO-2860, 2-9 B&W Monitors and Cases. Mr. Schlansky, (212) 594-8700. 9-79-1t

RAZOR BLADES, Tape Editing, Single Edge, RALTEC, 25884 Highland Road, Cleveland, Ohio 44143. 9-79-3t

AUTOMATION EQUIPMENT made available by format change. Schafer system CU8-T, three SCM Model 250 carousels, Schafer audio clock TM-8, and Schafer 25 Hz generator TRU-8. Also, cart recorder SCM590. Contact John Bennett, Chief Engineer, WLIX, 138 W. Main St., Bay Shore, NY 11706, (516) 666-2200. 8-79-2t

SAVE .. SAVE .. SAVE .. SAVE .. SALE .. SALE .. SALE .. SALE! WE HAVE A SALE ON DA'a. 3602-4 VIDEO or AUDIO, each unit has 4 inputs and 24 outputs. 2.75" X 19" rack mount. FULL BROADCAST SPECS. Send CK. or PO# ... VIDEO 3602-VDA-4, AUDIO 3602-ADA-4, $395.00 each. Free catalog on request. TELE-TEC, 8688 ROYAL DRIVE, NOBLESVILLE, INDIANA 46060. 9-79-6t

MAJOR NEW YORK PRODUCTION FACILITY offering the following items for sale: **COMPUTER IMAGE 2081** video and audio switcher, 6 inputs plus black, chroma key, softedge, full complement wipes, down stream keyer, auto dissolve for video and audio follow breakaway, background generator, additive or non-additive mix. Had been interfaced with CMX-340 system. Used approximately 1 year—$15,000.00. **NORELCO PCP-90** portable 3 tube, 1" Plumbicon camera, Canon 6:1 lens, relay optic for C mount lenses, scan reverse switch, genlocks without base station, color bar generator, low noise preamps, lambda power supply. Used approximately 5 years—$10,000.00. **(2) PSI GASP COMPRESSORS** w/holding tanks—$300.00 ea. **NEW RECORTEC CLEANER** w/audio cue slicing package—$9,000.00. For further information call: Walter Hamilton, (212) 759-0822. 9-79-1t

2" - 3" - 4" COPPER STRAP #10 wire, BCA, (404) 487-9559. 9-79-tfn

GE PE-400 COLOR CAMERAS—Pedestals, Scopes, Racks, Like New. ea. $14,000
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GE PE-240 FILM CAMERA—Automatic Gain & Blanking $8,000
GE 12KW UHF TRANSMITTER—With Channel 14 Antenna. $18,000
RCA TK-27A FILM CAMERA—Good Condition, TP 15 Available. $12,000
RCA TP-66 PROJECTORS—Optical & Magnetic Sound. ea. $10,000
RCA TP-6 PROJECTORS—"Oldie But Goodie" ea. $1,500
COLLINS MW408D MICROWAVES—7GHZ, Audio Channel, 2 Available. ea. $4,500
RCA TR-50 VTR's = CAVEC and DOC, 1 with editor. ea. $22,500
RCA TR-4 VTR's—Hi-Band, New Heads. ea. $16,000
AMPEX VPR 7800 VTR's—1" Format, 5 available ea. $1,000
AMPEX 1200A VTR's—Loaded with Options ea. $24,000
RCA TT-10AL VHF TELEVISION TRANSMITTER—Low Band, Spares $8,000
We will buy your used TV equipment. To buy or sell, call Toll Free 800-241-7878, Bill Kitchen, Quality Media Corporation. In GA call 404-324-1271. 9-79-tfn

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AM FIELD INTENSITY METER WX-2D, (Nems Clarke). (303) 759-1327. 9-79-2t

SCULLY 280 ADD-ONS—Accepts a pair of Dolby 361s or any 19" x 3½" electronic panel. Only $49.95 FOB Bridgeport. Send check with order. **Rus Lang Corporation,** 247 Ash St., Bridgeport, CT 06605, Telephone: (203) 384-1266. 9-79-1t

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FOR SALE: Class C FM with 100,000 watts serving a major southwest market, $1,500,000. Write Broadcast Engineering, Dept. 472, P.O. Box 12901, Overland Park, KS 66212. 9-79-1t

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AUDIO PRODUCTS ENGINEER—We are seeking an audio equipment engineer who is an agressive and innovative designer. One who has designed consoles or components for consoles used in recording and broadcasting applications. If you are this creative and product oriented individual looking for a rewarding career we would like to talk to you. Please reply including your accomplishments and salary history to: MODULAR AUDIO PRODUCTS, INC., 50 Orville Drive, Bohemia, N.Y. 11716. 9-79-1t

NONBROADCAST TELEVISION TECHNICIAN—University of Illinois seeking maintenance technician for small format television equipment. Starting $13,270, raises to $17,035 over two years, plus annual increases. Two years electronics study, two years electronic maintenance required. Contact: Don Swift, Personnel Services, University of Ill., Champaign, IL 61820, (217) 333-3109. Affirmative Action, Equal Opportunity Employer. 8-79-3t

COLUMBUS, OHIO: TV maintenance engineers. Television production company; new equipment. Send resume and requirements to: Qube, 1201 Olentangy River Road, Columbus, Ohio, 43212. Attention: Studio Operations. 9-79-1t

DIRECTOR OF ENGINEERING—1st phone, minimum five years experience, studio and remote work, microwave and satellite experience helpful. Looking for top professional to build this aspect of our company. Reply: MCML, 890 Constitution Blvd., New Kensington, PA 15068. 9-79-2t

TV MAINTENANCE ENGINEER, AND EDITOR/TECHNICAL DIRECTOR NEEDED. Philadelphia's oldest and largest independent teleproduction facility. Maintenance Engineer, for RCA cameras and quad VTR's on six camera mobile van. Editor/Technical Director, experienced with Grass Valley switchers and CMX Editor in studio. E. J. Stewart, Inc., 388 Reed Road, Broomall, PA 19008, (215) 543-7600. 8-79-2t

CHIEF ENGINEER, group owned 5kw DA-2, Duluth, MN. Must have good electronics background and FCC First Class. Send salary requirements and Resume to Steven Terhaar, Box 2983, Fargo, ND 58108. 9-79-1t

HELP WANTED (CONT.)

ELECTRONIC TECHNICIANS for maintenance positions in National Operation. Some positions available in major cities. Applicant should have experience on 1" and ¾" format. Digital background a plus. Send resume and salary requirements to: Gene Wright, 1018 West Peachtree St., Atlanta, GA 30309. No phone calls, please. 9-79-3t

TV TECHNICIAN—Experience in maintenance and operation of portable color cameras and ¾" cassette recorders. 1st class FCC license and technical school training or equivalent. Send resumes and salary requirements to: WQED-Harrisburg, HR Box 226, Main Capitol Building, Harrisburg, PA 17120. An Equal Opportunity Employer. 9-79-1t

TECHNICAL MANAGER (PART-TIME): Television Production Center at Northern Arizona University needs a part-time Technical Manager to maintain and modify technical facilities as needed, engage in technical planning, supervise technical personnel, and act as liaison between technical and production personnel. B.S. in Engineering and FACC First Class License required. Maximum salary: $10,240. Position open Fall semester 1979. Please send resume to Charles H. Aurand, Dean, College of Creative Arts, Northern Arizona University, Box 5755, Flagstaff, AZ 86011. Northern Arizona University is an Affirmative Action/Equal Opportunity/Section 504 employer. Northern Arizona University adheres to the requirements of Title IX and does not discriminate on the basis of sex in the educational programs or activities which it operates. 9-79-1t

PRODUCER/DIRECTOR: Immediate opening for qualified individual with B.A. in Communications, Radio-T.V., Journalism or related field and 3-5 years of "hands-on" production experience directing production crews. The setting is the King Faisal Specialist Hospital and Research Centre in Riyadh, the capital of Saudi Arabia. The Hospital is a 250 bed referral medical center with over 2000 employees from all over the world. 24-month married-status contract, salary and bonus $30,000 + housing, vacations, transportation, etc. Interested, qualified candidates should submit a resume with current salary to: Pershing P. Stahlman, Hospital Corporation International, One Park Plaza, Nashville, Tennessee 37203. 1-800-251-2561, 1-800-342-2110 In Tenn. AN EQUAL OPPORTUNITY EMPLOYER. 9-79-1t

TV MAINTENANCE ENGINEER: Wanted immediately for prominent public station. Minimum two years technical training, 1 year TV broadcast equipment maintenance experience plus 1st Class FCC. Send resume to WXXI Personnel Dept., P.O. Box 21, Rochester, NY 14501. EOE. 9-79-1t

CHIEF ENGINEER: TV/RADIO unit of Illinois Information Service. Immediate opening. Requires Associate Degree in electronics or equivalent. Two plus years experience in operation, production, maintenance of helical VTR's, ENG cameras, editing systems, audio systems, studio and field production. Salary dependent on qualifications (minimum $15,000). State coded position/A.A.-E.O.E. Resume to: Woody Mosgers, IIS, 201 W. Monroe, Springfield, Illinois 62706. Call 217/782-4880. 9-79-1t

CHIEF ENGINEER for South Florida group owned TV station. Must be a hands-on man knowledgeable in RCA equipment and SONG ENG. Resume to Box Dept. 468, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 8-79-tfn

ASSISTANT CHIEF ENGINEER for South Florida group owned TV station. Must be a hands-on man knowledgeable in RCA and SONY ENG. Resume to Dept. 469, Broadcast Engineering P.O. Box 12901, Overland Park, KS 66212. 8-79-tfn

TELEVISION BROADCAST TECHNICIAN: Baltimore television station has an opening for a technician. Must have FCC 1st class license and technical school education. Fringe benefits include medical and life insurance and pension plan. Salary to $22,900 depending on experience. Send resume to: Chief Engineer, WMAR-TV, 6400 York Road, Baltimore, Maryland 21212. E.O.E. M/F. 9-79-tfn

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OPERATING TECHNICIAN for Washington, D.C. area production company. Must be familiar with audio pickup and recording techniques and have a good working knowledge of television audio systems. Reply Dept. 465, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 8-79-3t

TV BROADCAST TECHNICIANS. Established public television station moving to new color facility. West Virginia University and WWVU-TV has vacancies for persons experienced in master control operations, production and maintenance including all phases of transmitter and/or microwave transmitting/receiving maintenance. Send resume of qualifications and salary history to: Jack Podeszwa, Personnel Officer, West Virginia University, Morgantown, WV 26506. An Equal Opportunity/Affirmative Action Employer M/F. 8-79-2t

CHIEF ENGINEER NEEDED FOR NEW 100,000 WATT PUBLIC STATION. Will be responsible for all technical aspects of operation including, maintenance on transmitter, microwave, studio equipment and automation system. Will assure compliance with all F.C.C. requirements. 1st phone, B.A. in electronics and two years full-time experience required. Additional experience may substitute for degree. Experience in remote recording technique involving high quality music performance very helpful. One month vacation. Send resume to David M. Horning, General Manager, KHCC-FM, 1300 North Plum, Hutchinson, Kansas 67501. 9-79-1t

INDUSTRIAL VIDEO ENGINEER: Large Dallas based insurance company with in-house color TV studio, post production facilities, national ¾" video network, in fully equipped multi-media learning center needs chief engineer with 3 to 5 years experience in industrial or broadcast TV. Must have thorough knowledge of 3-tube color cameras & ¾" editing systems, & be willing to become part of field & studio production team. Company has excellent benefits including flexible work hours. Send resume with salary requirements to P.O. Box 2699, Dallas, TX 75221, attention: Staffing Director. Equal Opportunity Employer M/F. 9-79-1t

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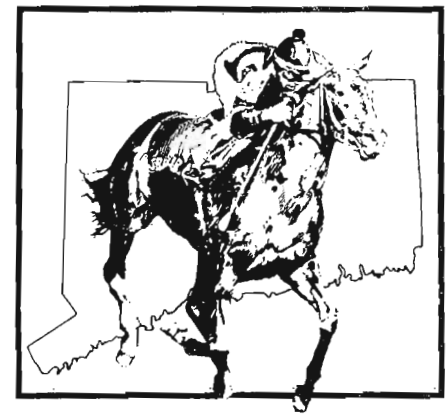

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Candidate must have experience with the maintenance and calibration of switchers, professional video recorders, monitors and test equipment.

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PRODUCTION OPERATOR/MAINTENANCE ENGINEER: Indianapolis based production facility expanding. Desires experienced operator/maintenance engineer with 1st phone to operate 1", 2" tape machines, computer editor and multi channel audio mixer. Strong maintenance background in digital circuitry a must. No phone calls. Send resume and salary requirements to: Telematrix Productions, 5635 West 80th Street, Indianapolis, IN 46268, Attention: Tom Parrish. 9-79-2t

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FIELD SERVICE ENGINEERS—We are seeking individuals to install and maintain computer controlled video tape editing equipment. Must be familiar with digital and microprocessor based equipment and video tape recorders. Must have Associate Degree or equivalent in Electronics. Customer relations experience a definite plus. Our company offers a good starting salary and an excellent fringe benefit program. For immediate consideration, send resume with recent salary history to Gary Rosenzweig: Datatron, Inc., 1662 Reynolds Avenue, Irvine, CA 92714. 9-79-1t

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ASSISTANT CHIEF: WTRY/WHSH Albany, New York seeks an individual experienced in studio and transmitter maintenance and construction. Directional experience helpful. Contact Norm Avery, WTRY Rd., Schenectady, NY 12309. 9-79-2t

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HELP WANTED (CONT.)

WANTED

Immediate opening for Television Studio Engineer. Minimum 3 years active broadcast studio maintenance and operation required. Associate Degree or equal in electronics and first class radio-telephone license required. Send resume to:

Personnel Department
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STUDIO ENGINEER for local TV station. Studio equipment operation experience required. Send resume, Personnel Office, 3 Constitution Plaza, Hartford, CT 06115. WE ARE AN EQUAL OPPORTUNITY EMPLOYER! 9-79-1t

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CHIEF ENGINEER wanted for TV-Radio Station in the midsouth. Write Broadcast Engineering, Dept. 471, P.O. Box 12901, Overland Park, KS 66212. 9-79-1t

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BROADCAST ENGINEERING SUPERVISOR: Maintenance of UHF/cc Public TV production facility, oversight of technical staff, operations. Send resume, references, salary required. Manager, WTVP-TV, 1501 W. Bradley Avenue, Peoria, IL 61625. An equal opportunity employer. 9-79-1t

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HELP WANTED—TECHNICAL. ASSISTANT CHIEF ENGINEER FOR TELEVISION. Immediate opening. Progressive medium market station seeks experienced assistant chief engineer with knowledge of ACR-25, RCA TK-46/76/28C and Sony E.N.G. RCA Transmitter experience also helpful. Pleasant surroundings in energy developmental area. Contact Jack Davis, Chief Engineer, KFYR TV, Box 1738, Bismarck, ND 58501. (701) 223-0900. 9-79-1t

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CHIEF ENGINEER: Los Angeles remote recording facility requires maintenance and operations engineer with 3 years minimum experience in VTR's, camera switchers, etc. Send resume to: TransVideo Productions, 1028 N. La Brea, Hollywood, CA 90038. 9-79-1t

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MAINTENANCE SUPERVISOR for large Washington, D.C. area production company. Technical school plus minimum 5 years experience. Must be familiar with all types of studio broadcast equipment. Reply Dept. 464, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 8-79-3t

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FIELD ENGINEER: Secure employment opportunity with good benefits; fully equipped van provided for travel. Requirements: FCC 1st class; minimum two years experience with and skill in maintenance of TV electronic equipment; knowledge of computerized control system desirable. Send resume to: James Potter, Indiana Higher Education Telecommunication System, 1100 W. Michigan, Inpls., IN 46202 EER/AA employer. 9-79-1t

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MAINTENANCE ENGINEER for Los Angeles Television/Teleproduction facility. A strong background in studio maintenance with 3 to 5 years experience, first class license and the desire and ability for a challenging position. Salary 20K plus. Submit resume to Win Korabell, Director of Engineering, KCOP Television, Inc., 915 North La Brea Avenue, Hollywood, California 90038. Affirmative Action/Equal Opportunity Employer. 9-79-1t

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WANTED— A Chief Engineer to one of America's leading television stations. Top pay for top man. Must be able to handle personnel and know his stuff technically. Station heavy in remotes, ENG and studio production. We are looking for a leader who can create a healthy atmosphere and maintain a sharp operation. EOE/MF. Write Broadcast Engineering, Dept. 470, P.O. Box 12901, Overland Park, KS 66212. 9-79-1t

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