

August, 1971/75 cents

Broadcast Engineering®

the technical journal of the broadcast-communications industry



A HOWARD W. SAMS PUBLICATION

BB-69
CHESTER A. SIGORIST
1107 CATHEDRAL STREET
LEBANON, PA. 17042

1971

REFERENCE ISSUE

buyers guide section
professional organizations section

Teledyne announces the introduction of their new Color Telefilm Recorder that transfers color tape to color film with remarkable quality.



Teledyne Camera Systems' CTR-2 Color Telefilm Recorder.

Extraordinary quality and practical economy from the outset.

Teledyne has developed the first broadcast quality Color Telefilm Recorder. They knew that excellence was mandatory. A piece of equipment that wouldn't deliver sharp, clear, color-balanced 16mm film transfers would not stand up to your criteria. So, the system was perfected and then it was introduced.

Engineering bottom line.

Primary heart of the system is the camera (DBM-64B) which uses compressed air to pull down and stabilize the film in less time than the television vertical blanking period. Result is full

frame recording without mid-field splice or shutter bar.

System works for operator not the other way around.

Human engineering, ease of operation, and maintenance maximizes productivity. All components are immediately accessible. Test points on the printed circuit cards used with the built-in waveform monitor allow operation, adjustment, and trouble shooting without a separate oscilloscope. Slanted camera optical path is very convenient for magazine loading.

It almost had to be Teledyne.

You expect innovation from pioneers. Because the camera came first, from Teledyne, the system's development was only an extension. That camera revolutionized tape to film transfer and is clearly the industry's standard.

Partial list of nomenclature that makes the point.

DBM-64B Camera. Conrac RHM-19 Display. Tektronic 528 Waveform Monitor. Modified Tektronic 602 "X-Y" Display. CBS Labs Mark II Image Enhancer. Rank Decoder. Maurer "F" Prime or Auricon "Modulite" Variable Area Recording Galvanometers. Teledyne CK-120 Magnetic Recording System. And so on.

Giant step for the state of the art.

Video tape production and 16mm broadcast and dupe transmission are now a quality reality. To learn more about this capability and making it available to your operation, contact Teledyne Camera Systems at 131 North Fifth Avenue in Arcadia, California 91006. Telephone (213) 359-6691. They'll send you a reel sample.

 **TELEDYNE CAMERA SYSTEMS**

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The Performer

COHU'S NEW BROADCAST COLOR FILM CAMERA THAT OUTPERFORMS ALL OTHERS

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- ★ **New Optical System Design** — 60% minimum transmission, flare and ghosting virtually eliminated
- ★ **FET Preamplifiers** — 50 db minimum signal-to-noise ratio
- ★ **Triple Action Automatics** — Sensitivity, white level and black level for hands-off operation

Base price includes image enhancer, color encoder, remote setup panel, remote control panel, setup monitor and waveform monitor.

Select the Broadcast
Color Film Camera
that gives you...

Superlative
Performance / Moderate
Price

COHU
ELECTRONICS, INC.
SAN DIEGO DIVISION

For complete details, contact Cohu's TV Sales Department, Box 623,
San Diego, California 92112. Telephone 714-277-6700, TWX 910-335-1244.

Circle Number 4 on Reader Reply Card

Broadcast Engineering

The technical journal of the broadcast-communications industry

in this issue...

36 Association Roundup. Pertinent information on membership requirements and association background for most of the major broadcast-communications groups.

49 D-1 Broadcast Directory. A listing of more than 500 manufacturers in over 300 categories. Includes equipment and materials used by broadcast stations, closed circuit operations, film and sound studios.

D-25 Broadcast Manufacturers Address List. A list of major industry manufacturer addresses for those who answered our questionnaires.

D-31 Cable TV Directory. List of equipment designed for use in cable operations.

D-32 Cable Manufacturers Address List. Addresses of manufacturers listed in the Cable TV Directory section.

ABOUT THE COVER

Our fourth annual buyer's guide has been computerized. This will mean more categories and a more up to date listing.

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BROADCAST ENGINEERING



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Circle Number 5 on Reader Reply Card

DIRECT CURRENT FROM D. C.

August, 1971

By Howard T. Head

NCTA Proposes Special CATV Receivers

The National Cable Television Association (NCTA) has petitioned the Commission to change the rules governing television broadcast receivers to provide for special receivers intended primarily for cable reception. Characterizing cable television expansion as being "thwarted by inadequate television receivers", NCTA has asked for improvements in virtually all aspects of receiver performance.

Areas in which "improvements" are proposed include greatly increased input shielding, with a standard tuner input of 75 ohms unbalanced (a 300 ohm balanced input would be permitted as an option), reduced local oscillator radiation, cable-only receivers without tuners (a plug-in module might be employed for off-air reception), increased tuning stability, improved rejection of adjacent-channel and other interfering signals, and requirements for field modification of all receivers produced since July 1, 1965. No estimates of increased costs are included in the NCTA proposal, although some idea of the cost picture becomes apparent when it is realized that over 93 million television receivers are in use in the U.S. today compared with less than 3000 cable systems. At the recent NCTA Convention, Magnavox displayed a sample receiver featuring special cable input and varactor tuning, which would be substantially more expensive than the standard receiver.

New Land Mobile/UHF TV Sharing Rules in Effect

The Commission has adopted detailed rules governing the sharing of UHF television Channels 14-20, inclusive, with the land mobile radio services. An earlier decision (see July, 1970 D.C.) made two of the lower seven UHF TV channels available in each of the top 10 metropolitan areas.

In four of these top ten metropolitan areas, the Commission has temporarily delayed the effectiveness of the new rules. Sharing of the Chicago channels is being suspended pending operation of the new prototype Chicago Regency Frequency Spectrum Management Center (see April 1971 D.C.), while UHF sharing at Los Angeles must be coordinated with Mexico and at Cleveland and Detroit with Canada. Canada's Canadian Radio Technical Planning Board (CRTPB) has established a committee to examine all aspects of sharing of the 470-960 MHz band in Canada.

(Continued on page 6)

Now showing...the ^{New} Reliables

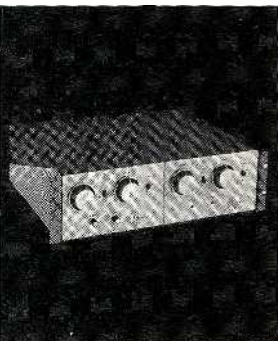
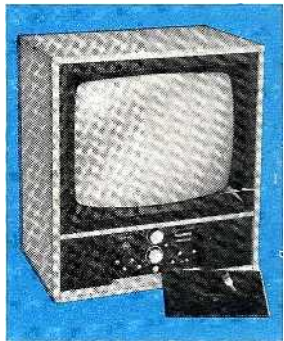
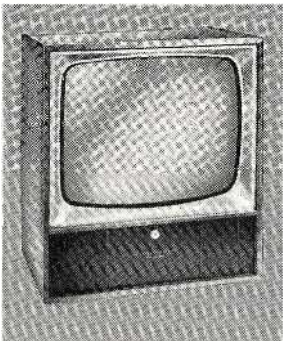
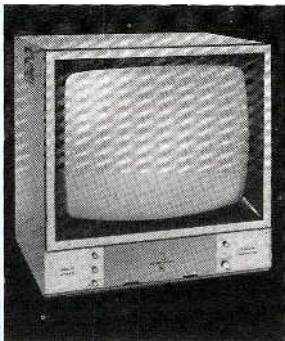
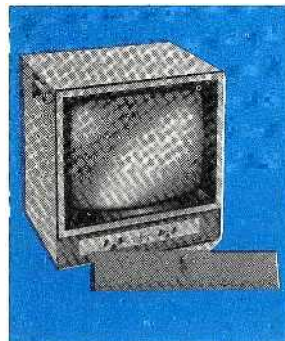
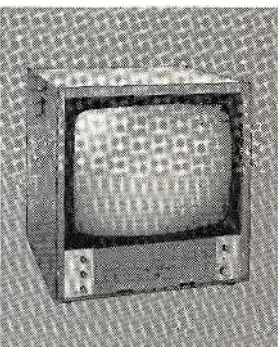
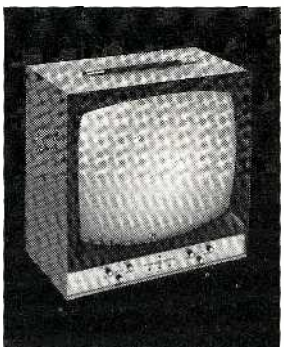
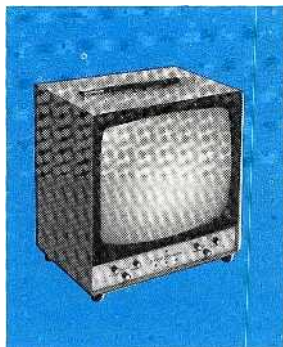
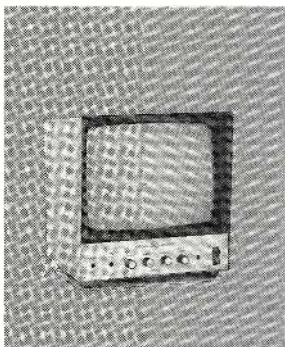
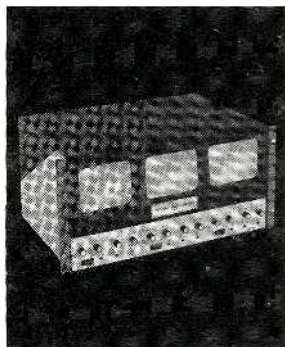
Five inch monochrome assembly features three 5" units in rackmount configuration. Small size requires less rack space than similar units and permits monitoring of 3 separate video signals. High quality, all-purpose monitors with Setchell Carlson UNIT-IZED® plug-in circuit modules.

New 10" monochrome video monitors offer horizontal resolution of 640 lines or better plus 100% solid-state circuitry for long-life reliability. Unit is available in rackmount or in attractive metal cabinet. A 12" model is also available.

In addition to 640-line resolution, the 16" monochrome monitors have all major operating controls located on the front panel for ease of operation. Front-panel screwdriver adjustments for vertical linearity, vertical height, and focus provide protection against accidental misadjustment.

Nineteen inch monochrome video monitors offer traditional Setchell Carlson quality, including exclusive UNIT-IZED® plug-in circuit modules for easy maintenance. Horizontal resolution is 640 lines or better. Available in rackmount or attractive cabinet models.

Professional quality 19" color video monitors offer broadcast quality at a modest price. Horizontal resolution is 300 lines (color) and all set-up controls are located behind a hinged front panel to prevent accidental misadjustment. Also available in 25" model.



The 23" monochrome video monitor offers excellent picture quality and attractive styling at a modest cost. Circuitry is 100% solid-state and the horizontal resolution is rated at 640 lines or better. Monitor has a variety of applications due to multitude of professional-quality features.

Regulated circuitry in the 25" color monitor provides extremely stable operation and prevents raster size or brightness deviations due to line voltage fluctuations. Horizontal resolution is 300 lines (color). Set-up and operating controls are front-mounted for ease of operation.

"Educator" Monitor/Receiver, 23" monochrome model, is designed specifically for educational and training applications. Controls are front-located. Tamper-proof control compartment door with lock is optional. Horizontal resolution is 600 lines or better with video signal input. Also available in 25" color model.

The Color "Educator" is a 25" model offering big-screen, sparkling color — 300-line (color) resolution — plus big-room audio. Designed specifically for educational and training applications, the "Educator" series Monitor/Receivers offer the utmost in reliability, flexibility, and ease of operation.

Setchell Carlson's solid-state UHF/VHF television receiver and RF demodulator provides a high-quality composite video signal and separate audio signal, assuring excellent monochrome and color picture quality. It is ideal for video recording and as a signal source for video monitors.

The quality and reliability of Setchell Carlson products is legendary. SC Electronics pioneered the concept of modular circuit construction. Every Setchell Carlson product features this concept in our UNIT-IZED® plug-in circuit modules, assuring operating dependability and maximum ease of maintenance. One hundred percent solid-state circuitry means maximum stability, long-life, low power drain, and a minimum of heat. Every feature in a Setchell Carlson product is meticulously designed to give you outstanding performance at a modest cost.

For many years, people involved in many different facets of broadcasting, closed circuit television, medical training, industrial TV applications, custom remote installations, and in the field of education have been able to depend on Setchell Carlson quality and reliability. It has become a tradition. We know that whatever your application, you will find a product to fit your need in the Setchell Carlson line.

Let your SC Electronics dealer give you a showing of . . . The new Reliables. Or, write to us for more information. Remember SETCHELL CARLSON, where quality is a tradition.



SC ELECTRONICS, INC.
A SUBSIDIARY OF AUDIOTRONICS CORPORATION
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Circle Number 6 on Reader Reply Card

Lifting of AM Freeze To Be Delayed

Because of emphasis on non-technical problems which the Commission considers to have higher priority, look for any action to lift the pending "freeze" on applications for new and improved AM facilities to be delayed until this fall or later. An increasing work load and a shrinking Commission staff is resulting in longer and longer delays in the resolution of many pending engineering matters.

One of the key moves considered necessary to prepare for a lifting of the AM freeze was the adoption of new standard rules for applying tolerances (MEOV) to directional antenna patterns. The FCC rules went into effect earlier this year (see January, 1971 D.C.). In the meantime, this problem is also under study by Canada's Department of Communications (DOC), which must take a step similar to that already taken by the FCC if full use is to be made of the capabilities of modern high-speed electronic computers.

Basic Outline of FCC Cable Policy Becomes Clearer

By the time these words are in print, the Commission is expected to have adopted final CATV regulations governing carriage and non-duplication of local signals and the importation and distribution of distant signals by CATV systems. Although the details are not final as of this writing, FCC Chairman Dean Burch in a speech at the recent NCTA Convention made it plain that the Commission has no desire to authorize the expansion of cable systems for the sole purpose of permitting increased carriage of distant signals for their own sake.

Chairman Burch made it clear that the Commission's guiding principles were to avoid undermining the broadcast system, to improve reception and to make possible greater programming diversity.

Short Circuits

The U.S. Weather Bureau is testing a tornado warning system which relies on expected storm noise on TV Ch. 2 to brighten the TV receiver kinescope . . . No "random" EBS message was transmitted during the second quarter of this year, and plans for future random messages are indefinite pending a completion of an investigation of the NORAD incident of Feb. 20, 1971 . . . The Commission has adopted new rules permitting ETV service for municipal training purposes in the ITFS band . . . The use of 550 kHz on the roads to Los Angeles International Airport will be tested for a two-year period on a developmental basis; 570 kHz is in regular use in Los Angeles . . . Canada is urgently planning expansion of its television system, especially in the northern parts of the country, to reach some 600,000 English-speaking Canadians and 400,000 French-speaking Canadians who do not get any television service in their own language.

GET THE WORLD'S BEST RADIO SOUND WITH THE WORLD'S BEST EQUIPMENT

NEW - MODERN - SOLID STATE DEVICES FROM WILKINSON

SG-1E STEREO GENERATOR	Separation to 60 db, Noise -70 db
FME-10 DIRECT FM EXCITER	¼ db, 30Hz - 350KHz, Distortion ¼%
LGC-2 LIMITER GAIN CONTROL AMP.	Instant Limiting & Noiseless Gain Control
LA-2C STEREO LIMITER AMPLIFIER	Instant Limiting — Distortion Free Output
LGC-2 STEREO GAIN CONTROL AMP.	Smooth Gain Control — No Noise Operation
MA-2 MONITOR AMPLIFIERS	10 Watts of Perfect Audio
DA-5 DISTRIBUTION AMPLIFIERS	5 Channels of Perfect Audio
SCG-1 SUBCARRIER GENERATOR	Low Noise — Perfect Response
FMR-1 FM RELAY RECEIVER	½ Microvolt Sensitivity 30 db Quieting
TAC-1C MONAURAL CONSOLE	8-Vertical Attenuators — 22 Inputs
TACS-2 STEREO CONSOLE	10 Rotary Faders — 48 Inputs
RA3 REMOTE AMPLIFIER	3 Channels — Chargeable Batteries
TRF-1A AM RF AMPLIFIER	1MV Input, Stable 2W Out
TAMF-1 AM FREQUENCY MONITOR	Absolute Stability ± ¼ Hz/Per Month
TAMM-1 AM MODULATION MONITOR	Precise, Reliable, Low Cost
4-N-1 FIELD INTENSITY METER	Null Detector + Std. Generator
S1A AC LINE SURGE PROTECTOR	Protects Against Lightning and Surges
DIRECT REPLACEMENT SILICONS	Rectifiers to Replace Tubes
FM TRANSMITTERS —	Using the World's Best Exciter and Variable Capacitive Tuning. No Sliding Contacts — 10W, 18W, 250W, 1KW, 2.5KW, 5KW, 7.5KW, 10KW, 20KW.
AM TRANSMITTERS —	Solid State Exciters and Modulator Drivers, Single Cabinet Construction — Absolute Accessibility, 250W, 500W, 1KW, 3KW, 5KW, 10KW.

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Automating Common Sense

Dear Editor:

I was very pleased to see your article on automation in the June issue of **Broadcast Engineering**.

We are total automation here at WHLF, which includes our AM operation, plus FM stereo. Our total investment in the automation field approaches \$55,000.

I'm sure that we have encountered many of the same problems that have plagued others. As you pointed out in your article, our main source of headaches has been operator errors. Some of the errors are of a minor nature, "in the opinion of operating personnel", but the point that is hardest to get across to operators is "think". Before you make any change in the programming set-up, realize the system's capability. When you go beyond this capability everything comes to a "screeching halt" and everyone screams for the engineer, vowing that the system has gone completely haywire.

One thing automation will not tolerate is tampering around with by personnel unfamiliar with it. We have placed the programming of automation strictly in the hands of our program director and it is surprising how much this has cut down on our problems. The fewer personnel operating a system of this complexity, the better. It all falls back to the old cliché "Too many cooks spoil the broth".

We have also had our share of technical problems. The main source of trouble was a loss of transistors due to power line spikes in electrical storms. To remedy this situation we installed Thyrite protectors on our AC lines, and to date our transistor loss has amounted to zero. Of course, headaches are greatly reduced by a good preventive maintenance schedule, such as burnishing relays and keeping all tape program and tone heads clean.

This takes a small amount of

time, but pays off by not having dead air due to one missed tone. If approached with a common sense attitude, I believe automation can brighten any station's sound. After all, automation doesn't have a brain. It depends on the brain of its operator.

K. Wayne Long, CE
WHLF AM/FM
South Boston, Va.

Technical Training For CATV Technicians

Dear Editor:

I would like to make certain comments relating to your February, 1970, article entitled "Training Programs Needed for CATV."

In the article, Mr. Sands indicates study should be limited to those areas directly related to the technicians' job requirements. This is indeed a sound philosophy, one which we have found to be particularly successful in our own training programs. In the majority of instances the materials presented in "technical training programs" consists of 60 percent need-to-know information, 30 percent nice-to-know information and 10 percent totally unrelated information. The trick, of course, is to have the educational and industrial expertise needed to filter out and pass on to the trainees the desired related material.

With regard to "Who Pays the Bills", it might be apropos to indicate that in establishing several training programs for various electronics related industries, it has been our experience that in many instances State and Federal findings can be secured to assist in the implementation of such training programs.

Finally, I can only offer the opinion that the CATV industry has a great challenge before it regarding the training of qualified

(Continued on page 10)

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BROADCAST ENGINEERING

STUDIO MONITOR AMPLIFIERS

by

Crown

D40



compact

delivers 40w RMS/channel at 4Ω
takes 1 3/4" rack space, weighs 8 1/2 lbs.
IM distortion less than 0.3% from
1/10w to 30w at 8Ω
S/N 100dB below 30w output
price - \$229 rack mount

D150



universal

delivers 150w RMS both channels 8Ω
IM distortion less than 0.1% from
1/10w to 75w at 8Ω
S/N 100dB below 75w output
takes 5 1/4" rack space, weighs 20 lbs.
price - \$429 rack mount

DC300



power

delivers 300w RMS/channel at 4Ω
IM distortion less than 0.1% from
1/10w to 150w at 8Ω
S/N 100dB below 150w output at 8Ω
Lab Standard performance and
reliability
price - \$685 rack mount

All Crown amplifiers are warranted 3 years for parts and labor. They are 100% American-made to professional quality standards. All are fully protected against shorts, mismatch and open circuits. Construction is industrial grade for years of continuous operation.

Crown

BOX 1000, ELKHART, INDIANA 46514, U.S.A.

Why is Norelco the magic word in television?

Probably the single most important factor is the spectacularly successful performance of the most wanted, most used—and of course, most imitated—Norelco 3-Plumbicon* PC-70 color camera.

But beyond that, discerning TV practitioners have found Norelco systems the direct route to excellence in an exciting variety of applications. In schools and universities, Norelco systems are extending the teacher's reach, with live and taped instruction. Coupled with microscopes on the one hand and telescopes on the other, Norelco cameras are showing us the invisible, and transporting us to the distant.

At the Fernbank Science Center Observatory, a tiny Norelco monochrome camera helped NBC show the Moon's surface to the world during a lunar landing.

In California, a midget Norelco camera provided continuous coverage of a front-page trial for overflow journalists outside the courtroom.

In dimly lit Mission Control, a Norelco color camera was eyes for the Earth's population, peering over the space team's shoulders.

Norelco cameras multiply men's senses by monitoring

heavily trafficked highways, bridges and tunnels. They help the night nurse guard precious lives in the nursery and intensive care. They stand sentinel over doorways and corridors, stockrooms, warehouses and parking areas—even in utter darkness. They keep an eye on priceless paintings, and they are the vital link in a great hospital's "tele-diagnosis" system.

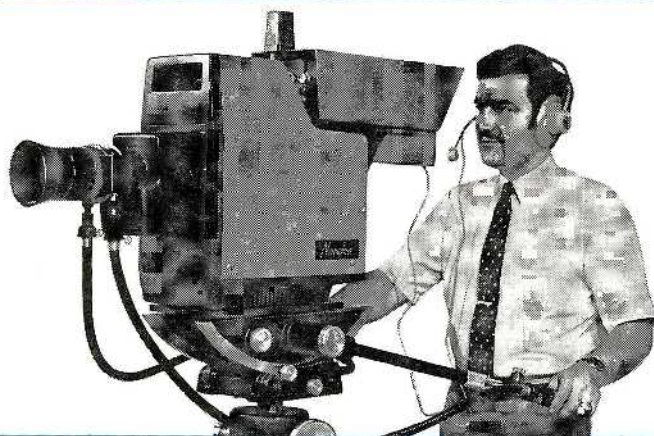
The self-same monochrome camera that captures the Moon through a Fernbank telescope is showing a golfer the error of his ways at the club. And the self-same color camera that brings you Walter Cronkite is helping teach tomorrow's doctors and dentists at the University of Texas Medical Branch.

Reliability—Performance—Professionalism.

In television, the magic word is Norelco. The way we strive to serve our customers is the best indicator of how dearly we value our reputation.

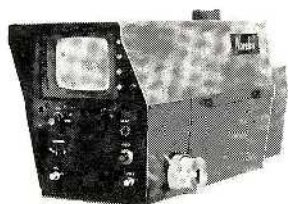
These cameras are only part of our full line of Norelco color and monochrome origination systems. We can help you most if you describe your particular needs or goals.

High-performance Norelco viewfinder cameras for a variety of purposes

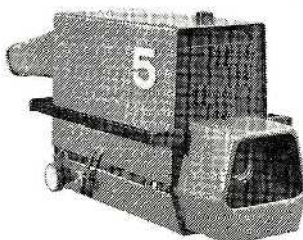


Norelco color at economy prices!

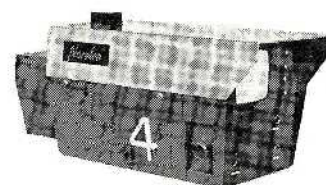
The LDH-1 Norelco Compact Color Camera is an unusually stable, 3-Plumbicon* (or Vidicon) camera that brings faithful live and film color within easy reach of cable, educational and business TV. The real thing, it comprises the major design advantages of the PC-70.



VF-150 Vidicon camera is an adaptation of the fully automatic Norelco Mini-Compact. An extremely simple-to-operate self-contained camera, it has a 5" viewfinder and features perfect interlaced scanning.



LDH-0200, is the top-of-the-line monochrome camera, has the 1" separate-mesh Plumbicon tube (or Vidicon), solid-state plug-in circuitry, 6½" viewfinder. Optimum performance for studio, field and laboratory. 10:1 Angenieux zoom lens.



VF-250 monochrome viewfinder camera provides a choice of Plumbicon or Vidicon sensor, various zoom lenses, 5" viewfinder. Transistorized circuitry. Remarkably versatile and reliable.



*Reg. TM N. V. Philips of Holland

Circle Number 9 on Reader Reply Card

One Philips Parkway
Montvale, N.J. 07645 (201) 391-1000

(Continued from page 8)

technicians. I can only hope that the industry as a whole will recognize this challenge and actively set about implementing a solution to the problem.

Angelo J. Bulone
Mgr. Marketing & Planning
RCA Institutes, Inc.
New York, N.Y.

On Taking Serious Look At College Training

Dear Editor:

I was very happy to see carrier-current stations receive some acknowledgement from the June issue of **BE** in the Direct Current section.

For over three years I have been involved in Campus Radio at the University of North Carolina at Chapel Hill. I was most fortunate to participate in the founding of the all-campus radio at North Carolina and honored to be its first station manager. It has been my experience that college radio, though not always required to obey all commercial regulations, has always worked to adhere to all rules as set

down by the FCC.

As do commercial stations, we were determined to give students quality radio, without the dirty language and third-grade programming. But most important, I strongly feel that the station at North Carolina gave students the basic understanding and knowledge of radio communication, so that, when they entered the industry after graduation, they possessed many of the skills that commercial stations, in the past, had to teach.

I hope the industry and the FCC will look at the accomplishments of college radio more seriously. It is helping to produce quality and talent which, I believe, the industry is always in search of.

George P. Doyle
Univ. of N.C.
Chapel Hill, N.C.

High Modulation

Dear Editor:

I would like to compliment your fine magazine for airing the comments of the broadcasters regarding the issue of Positive Modulation;

however, perhaps many chiefs who feel that the rules about positives should be left status quo should voice their opinion by supporting those manufacturers who are taking issue with the FCC and by letter to the Commission as well.

In your June issue Mr. Reaves brought out a good point, the issue of signal-to-noise ratio. It seems to me that the AM broadcaster is facing a continuing battle with those generators of "Electro-magnetic Pollution"—like neon signs, overhead high voltage cables, etc. Granted, the AGC in the average radio is effected by the RF field; however, the position of the radio owners volume control knob is determined by the level of modulation . . . the more modulation the better the signal to noise ratio . . . period!

We are blessed here in the southern Puget Sound region of Washington state with some of the most rotten ground, and whereas with the urban sprawl and all, we need all we can have in the area of Field and Modulation.

It seems to me that the FCC should be protecting the AM broad-

(Continued on page 12)

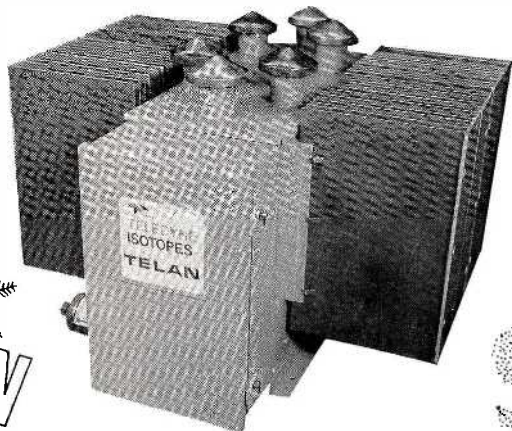
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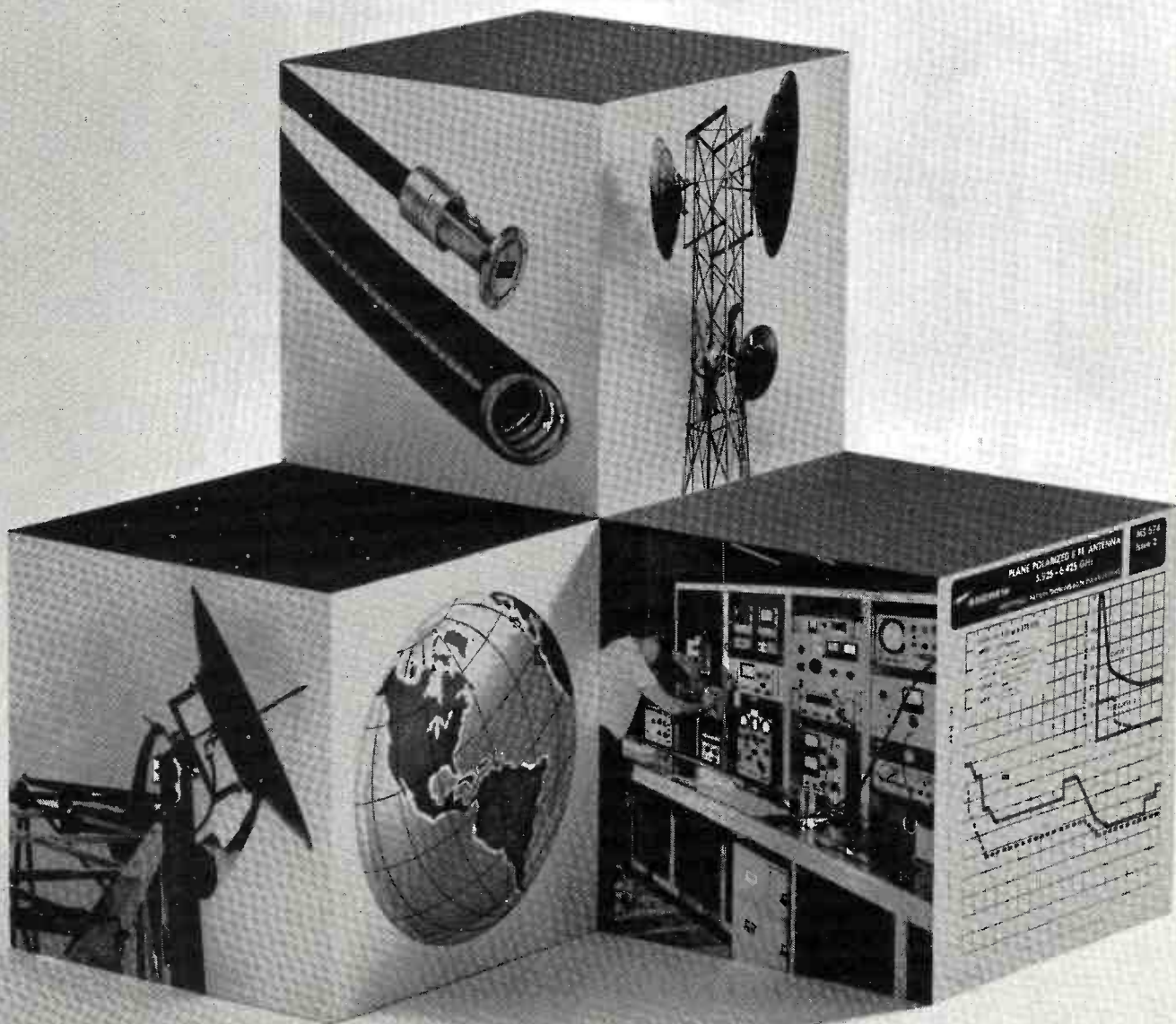
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(Continued from page 10)

caster and not working against him. There are rules, now on the books that cover any and all objections that anyone might have to high positive modulation all the FCC has to do is enforce these and all will be happy, but to chastise an equipment manufacturer for making equipment "like they used to" is nothing short of stupid.

Clay Freinwald, CE
KMO
Tacoma, Washington

WWV Is Possible Aid In Emergencies

Dear Editor:

In light of the EAN error transmitted on February 20, 1971, and its effect on the Emergency Broadcast Systems plans and procedures, I would like to suggest the following: (1) All stations monitor WWV the National Bureau of Standards on one of their frequencies, with a reliable receiver such as The Simex Time Standard (page 12, May issue of **BE**); (2) Use WWV radio for the National Calling or

Alert signal source, to be activated only by the President or someone he designates. (One or all of their frequencies could be used.); (3) Move the alarm to the control room from the teletype room; (4) Have tests scheduled (at random) with proper entries to be made in the station logs; and (5) Make it a fail-safe system, so that when activated it will automatically shut down the transmitter to which it is connected.

Bennie H. Mineer
WKKS Radio
Vanceburg, Kentucky

Degrading Titles?

Dear Editor:

In regard to the "Engineer-Technician" controversy which has been raised in recent issues of **BE** I would like to offer the following.

On the basis of the apparently endless hue and cry which has been loudly voiced by the broadcast "engineers" who have written so frequently, the "engineer-technician" question has obviously hit a nerve. By the general tone of their letters,

the term "technician" engenders a retort which indicates an incipient inferiority complex. Let me say right now that the term "technician" does not indicate inferiority but, as a matter of fact, just the opposite. When it is modified by the word "electronic", apparently to some it indicates a TV Service tube changer.

Let's face it, there are all types of technicians, differentiated by specialized knowledge or training, such as electronic technicians, dental technicians, etc. On the other hand, the term "engineer" is probably as abused as any word in our language, what with Sanitary Engineers (refuse collectors), Flooring Engineers (carpet layers), etc. Also, the word "specialist" is also coming into vogue as one of the abused terms.

Although, I have had to struggle through six years of college training to earn the right to be called an Electronic Engineer, others with no formal training or college background seem to feel that it's their right also; I don't necessarily agree. I guess this aspect really depends

(Continued on page 14)

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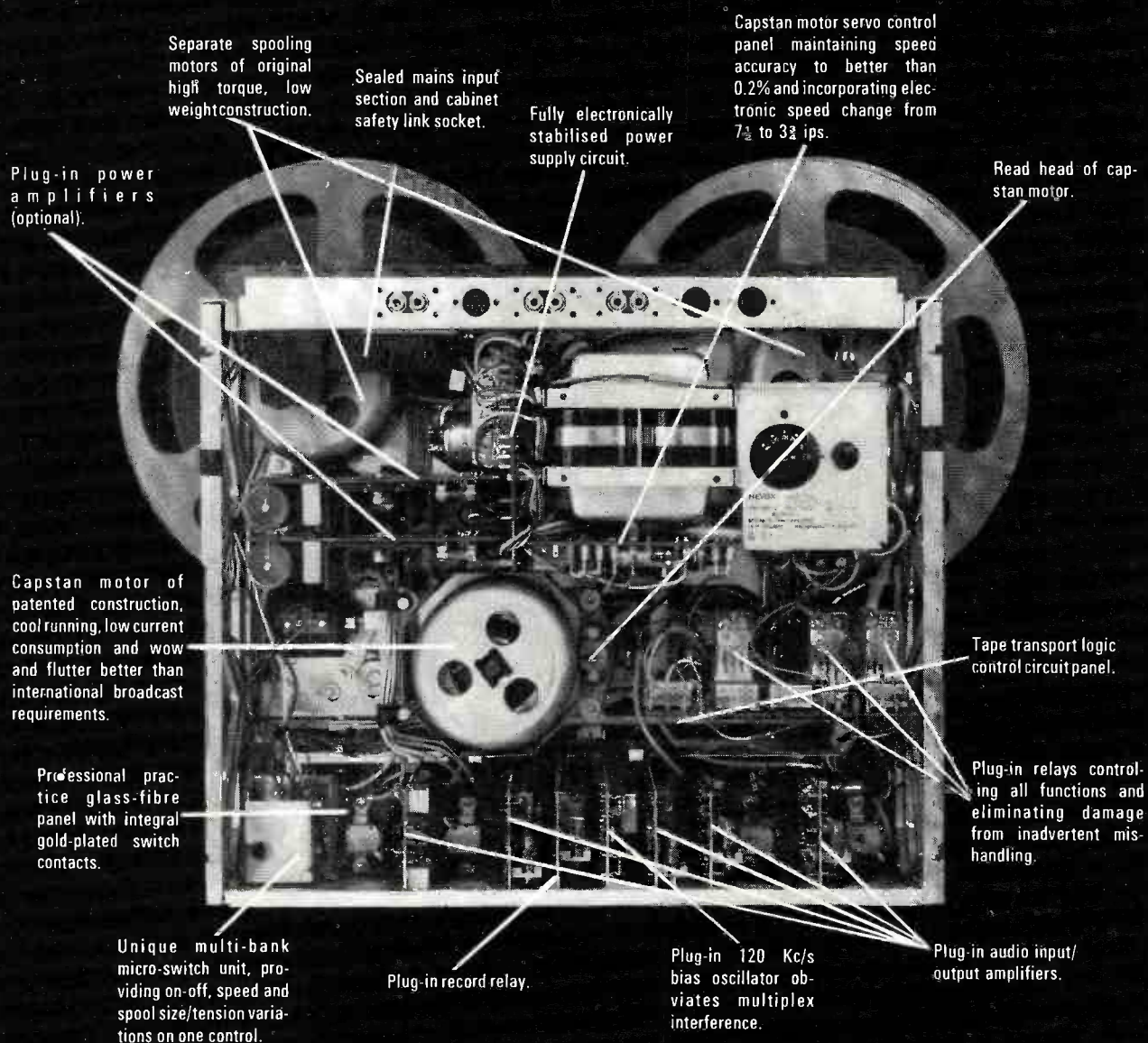
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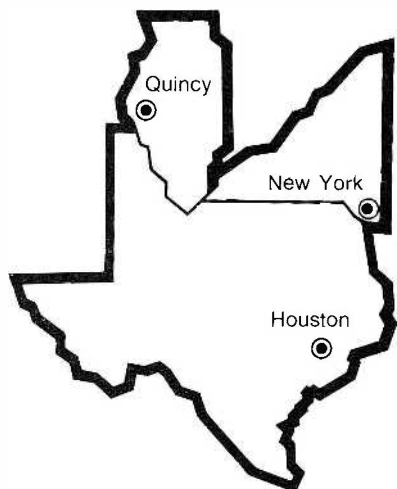
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Circle Number 14 on Reader Reply Card

(Continued from page 12)

on the on-the-job apprenticeship which took place and the length of time involved. I don't mean to say that this OJT is equivalent to a formal college education, because it isn't. It may be adequate, however, in certain narrow ranges of application.

"A specialist in the technical details of a subject" is the definition of the term "technician". In that sense, an Engineer is a specialized type of technician, and it is meant to downgrade neither one.

I know this letter will tend to light the fire under some of the touchy **BE** readers, but I feel that the more rational ones will see what I mean.

L. H. Garner
Consulting Engineer
Torrance, Calif.

Strong Stand On License Schools

Dear Editor:

I've followed the discussion in your past issues regarding "cram-courses" or "cheat schools" and

the comments in your March, 1971, issue have prompted me to add my two cents.

It does seem unlikely that the FCC will outlaw such schools as such action would most likely be fought as being in restraint of trade. I agree wholeheartedly with the editor in that having the license is no guarantee of employment. I have a personal policy of not hiring these "graduates" no matter how good an air sound they have and would urge other conscientious broadcasters to make their own similar policies. The Commission could do its part by taking a sterner look at violations directly attributable to engineering practices. A few revoked first-class tickets would make owners take a second look at the "cheap labor" flooding the market.

Granted, there are many applications now where a first ticket is required by the FCC, but in practice can be handled by a third. But my gripe is with ownership who hires a 90-day wonder for a position of engineering responsibility at \$90 a week. If you've ever taken over a station that has previously been under the control of one of these fellows, you know what a mess this can be.

I am also in favor of mandatory re-testing for license renewal in order to weed out some of the incompetents who now hold tickets, but have no interest in keeping up with the state-of-the-art or Rule changes; either keep up or get out!

As just a final statement which might be of help to engineers having trouble getting needed help from management, I have found the following quite useful in getting results. If ownership refuses, after you submit a signed memorandum, to upgrade equipment or give you enough money to keep your operation within specs, you'll find that a call to the FCC regional office is all it takes to get an inspection. It's remarkable how quickly a notice of violation will get results from tight owners.

Walker G. Bennett, III
Chief Engineer—WJZZ-FM
Bridgeport, Conn.

See
Broadcast Directory
On Page 49

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INDUSTRY NEWS

Cable Growth, Future Outlined By Burch

FCC Chairman Dean Burch outlined Commission views on the "Growth and Future Evolution" of cable television in a statement before the Communications Subcommittee of the Senate Commerce Committee.

Describing his statement as an interim report on continuing deliberations, Chairman Burch commented that the Commission was not laying a "finished package on the table," but rather was offering a "series of possible decisions, our best thinking so far but subject to refinement."

Suspensions Confirmed

The following are highlights from Chairman Burch's statement:

Guiding principles. "In formulating new cable proposals, we are being guided by the following principal policy considerations: (1) We are determined to devise a formula that will not undermine the existing broadcast system . . . (2) We want to open the way for cable to bring needed television to underserved areas, to improve reception, and to make possible greater diversity of television programming . . . (3) In this way, we would also allow cable to bring new and diverse services into the home . . . (4) We intend to fashion cable policies that have the effect of promoting both UHF and educational broadcasting.

"We are aware that we have neither the experience nor the hard data to justify wholesale revamping of the communications market. What we seek, therefore, are sound and realistic first steps—to open up cable, to obtain experience thereby, and then to proceed in the same measured and balanced way.

"... the Commission fully recognizes that the continued economic good health of those who create program material is crucial to the growth of both broadcasting and cable. But we have also come to the conclusion that the Commission cannot shape copyright policies—that such matters are wholly within the purview of the Congress and the courts. We earnestly hope that the Congress will enact an appropriate copyright law . . . We do intend to reexamine the copyright problem in no more than two years' time, however, should it develop that the Congress has not acted, that there have been no clarifying court developments, and that there appear to be substantial and adverse public interest effects.

Distant Signals

"Distant signals in the smaller markets (below 100). We begin here by defining a 'minimum service' concept—the very least that every American home is entitled to. We contemplate allowing cable systems in these smaller markets a 3-1 carriage: that is, the system must carry all local signals (Grade B contour) and sufficient distant imports to make up a comple-

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Cable Growth, Future

(Continued from page 17)

ment of three networks and one independent. We feel that this formula would allow cable to provide a basic, needed service. Yet it limits the number of signals so that over-the-air broadcasters in these sparsely-populated areas will not be swamped with too many distant signals.

"Such an approach seems to us to be sound and workable. And, significantly, the 3-1 approach has the support of the broadcast industry . . . Cable systems must of course carry all local educational signals and, where such a signal is not available locally, it may be brought in. Indeed, if the local educators have no objection, we propose that the cable system may carry a number of such signals, without regard to the nature of the market.

"If a signal is being viewed significantly off-the-air in a community, we feel that it should also be available to cable subscribers in that community.

"**Distant signals in the top markets (1-50, 51-100)** . . . we are considering a formula that (1) would insure that cable could provide an adequate minimum service in light of the nature of the market and (2) would permit the importation of the least number of distant signals needed to get cable off dead center—yet would make its success dependent also on the provision of new services unique to cable technology . . . These are the formulas under consideration: **Markets 1-50.** Cable may carry distant signals sufficient to provide 3-3 service (3 networks, 3 independent signals) but in any event may carry two additional signals. **Markets 51-100.** Cable may carry distant signals sufficient to provide 3-2 service but in any event may carry two additional signals.

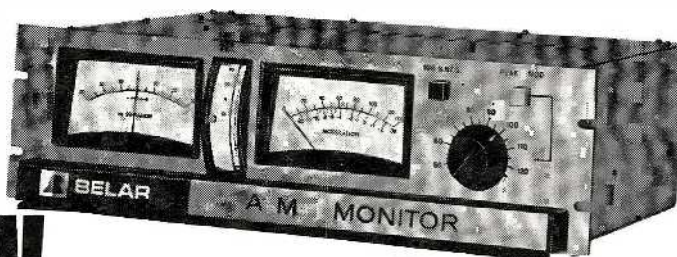
" . . . this seems to us a reasonable compromise. We would not permit any area to be flooded with distant signals. There would be a minimum of needed service and, at the same time, the minimum needed to permit cable's development. Broadcasting would not be undermined. Yet we would have taken a significant step to encourage cable. As to leapfrogging requirements, we are considering a number of possibilities. We might promote UHF through the requirement that half of the distant signals brought in must be UHF, unless there is a showing of impracticability. We are also considering whether to require that at least one distant signal be of an in-state nature, if such a signal is available . . . The first critical question to be faced is the effect of the proposals the Commission is considering on the ability of these UHF stations to operate profitably . . . Our own study of the matter so far has persuaded us that it would be wrong to halt cable development on the basis of conjectures as to its impact on UHF stations. In the broadest sense, the public interest would not be served thereby.

"As to similar arguments concerning cable's impact on VHF in the smaller markets, it is our judgment—considering such factors as cable's rate of penetration and the growth of broadcast revenues—that the approach we propose will not undermine these stations in their ability to serve the public interest . . . We intend to obtain early and continuing reports from

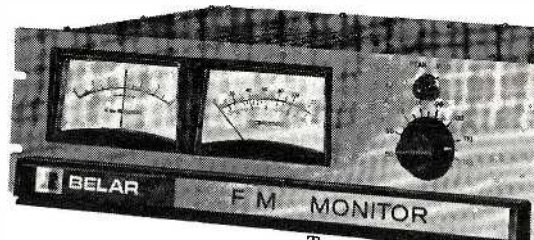
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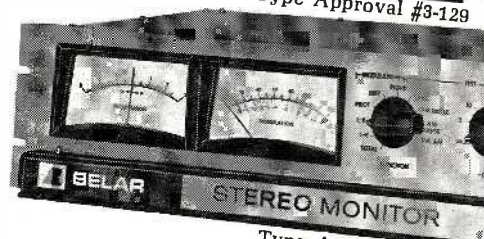
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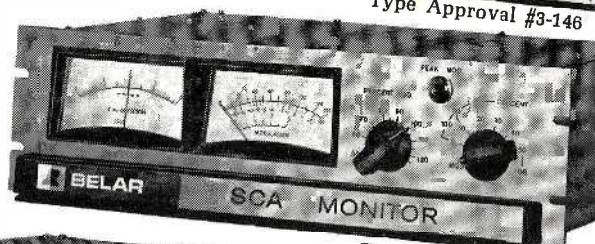
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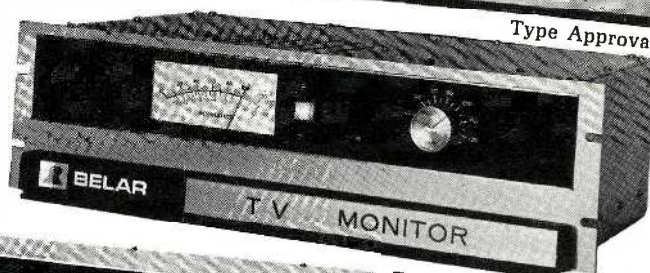
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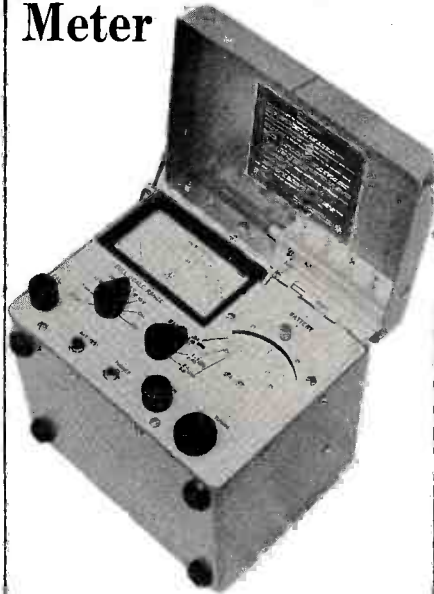
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Update On FCC Actions

Station Construction Rules Are Amended

Rules specifying the length of time permitted for constructing new standard broadcast, FM and television broadcast stations following grant of construction permits have been amended by the Commission to include other broadcast and auxiliary broadcast services. The action amends Section 1.598(b) of the rules and is effective immediately.

The Commission adopted revised rules on June 3, 1970, extending the time within which a TV station must be constructed to 18 months and the time within which to construct AM and FM stations to 12 months (Docket 18763).

In revising the rule the Commission explained it had inadvertently excluded other broadcast services and auxiliaries. The present Commission action amends the rules to provide a uniform 12-month construction period for new standard broadcast, FM broadcast, international broadcast, television or FM translator or booster, broadcast aux-

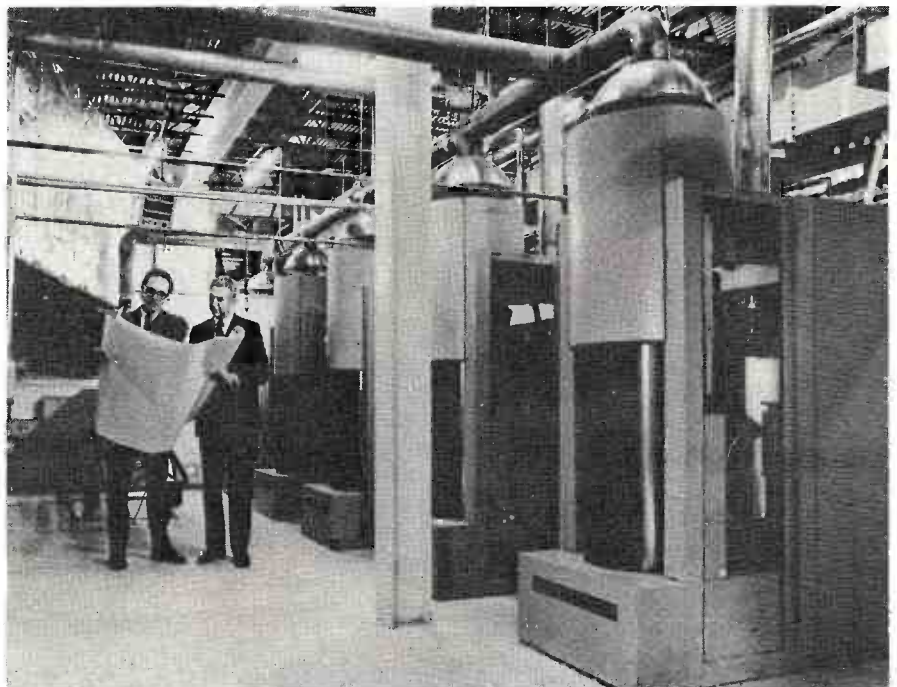
iliary and Instructional Television Fixed station. The construction period for television stations remains 18 months.

The rules became effective July 13, 1971.

Commission Extends Renewal Comments Time

In response to a joint petition by several broadcasters for additional time to file comments in Dockets 19153 (Formulation of Rules and Policies Relating to the Renewal of Broadcast Licenses) and 19154 (Formulation of Policies Relating to the Broadcast Renewal Applicant, Stemming from the Comparative Hearing Process) the FCC has extended the time for filing comments and replies in both proceedings.

The time for filing comments in Docket 19153 was extended to August 2, 1971, with the date for reply comments extended to October 1, 1971. In Docket 19154, the date for comments was extended to September 2, 1971, with

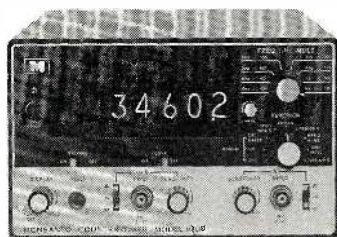


Milton Grant, VP-General Manager of WDCA-TV, and Don Doughty (left) inspect their new Gates UHF transmitter that currently is highest power on the air.

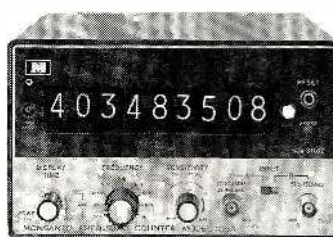
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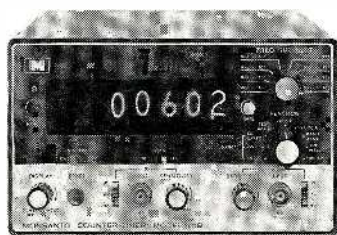
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For standard broadcast
Freq. range: 5 Hz-40 MHz
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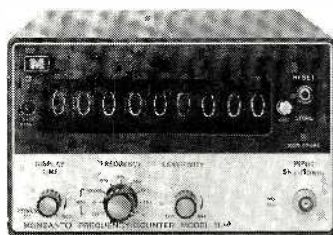
Model 105A (FCC No. 3-185)
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BCD output
Price: 7-digit, \$1550



Model 101B (FCC No. 3-174)
For standard broadcast
Freq. range: 5 Hz-50 MHz
5 or 7-digit display
BCD output
Price: 5-digit, \$695



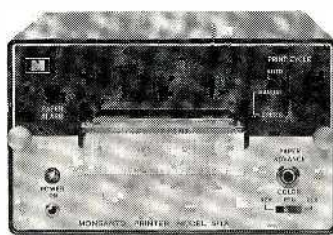
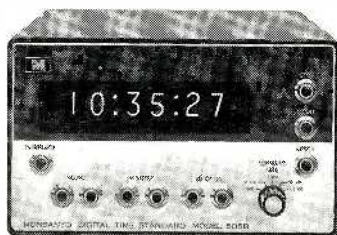
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reply comments now due October 4, 1971.

The requests for time extensions were based on the grounds that the proceedings are a far-ranging inquiry with many facets requiring careful consideration by all interested parties if the public interest is to be served and that filings in several other major rule-making proceedings are due around the same time.

The Commission said that because of the recent decision issued by the United States Court of Appeals for the District of Columbia Circuit, involving Docket 19154 (**Citizens Communications Center v. FCC**), it would grant the two months extension of time requested by the petitioners in that proceeding.

Broadcast

Buyer's

Guide

Begins on page 49D-1

Commission Statement Backs Comsat

An FCC policy statement, governing the use of satellite facilities for the handling of transiting traffic, does not automatically preclude the Communications Satellite Corporation (Comsat) from filing a tariff covering costs of service for obtaining and providing units of satellite utilization for United States communications carriers, the FCC has ruled.

The Commission opinion was in response to a Comsat request for reconsideration and clarification of an FCC opinion and policy statement of May 18, 1970. In that action the Commission had said that Comsat, in furnishing the space segment required in connection with United States satellites circuits transiting foreign earth station, would be performing only ministerial duties for which no meaningful charge could be made.

Comsat stated that, to the extent that INTELSAT (the international satellite consortium) adopts an ar-

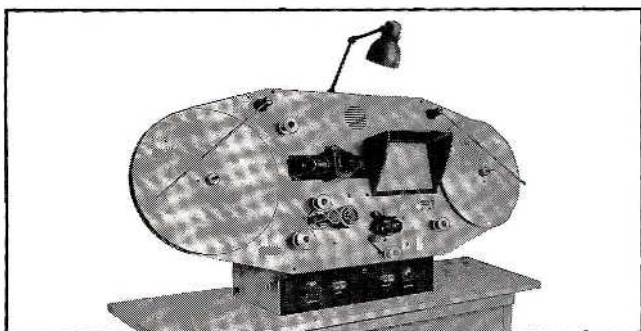
range allotting units of satellite utilization to the end-user countries, Comsat would be entitled to voting rights and an investment share in the global system based on usage of the system, including usage representing transiting circuits. Comsat said that it would expend capital and incur operating costs under such an arrangement and should be allowed to charge for its service.

Comsat's position was opposed by various international communications common carriers.

In clarifying its previous policy statement, the Commission noted that while it had said in that statement that terrestrial carriers should be authorized to obtain facilities for handling their traffic by satellite directly from the earth station owners at transit points, rather than obtaining them from Comsat, it recognized that there may be circumstances under which Comsat would supply the space segment to United States carriers.

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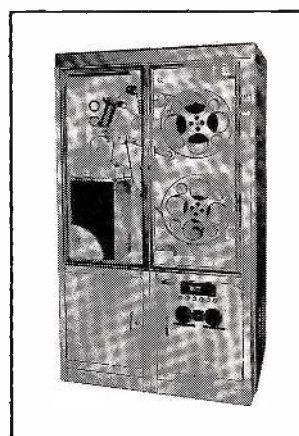
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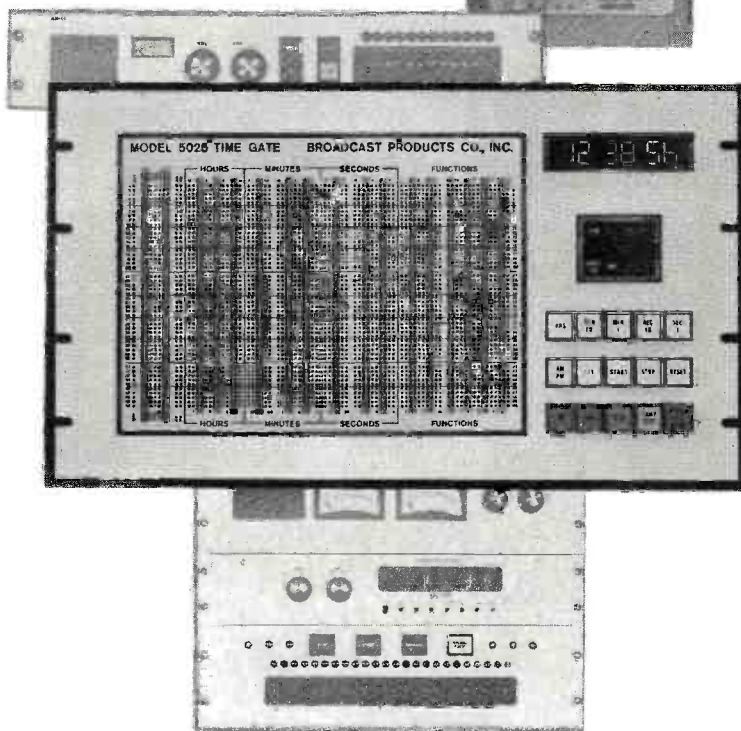


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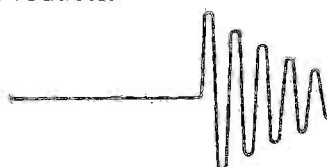
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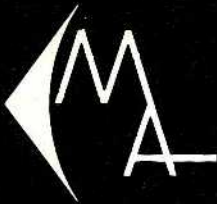
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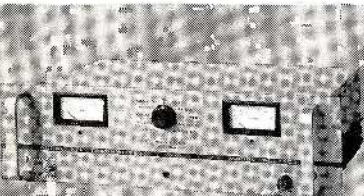
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New FCC Rules Will Permit Extensive Television Services

New rules to establish a new class of educational television service to transmit instructional and cultural material to multiple receiving locations on channels in the 2500-2690 MHz frequency band have been adopted by the FCC (Docket 14744). The new rules became effective July 16, 1971.

In amendments of Parts 2, 74, 81, 87, 89, 91 and 93 of the rules, the Commission allocated twenty-eight channels (Groups A-G, Section 74.902 plus the corresponding response frequencies listed in Section 74.939) to the Instructional Television Fixed Services (ITFS) on an exclusive basis, and allocated three two-way channels (Group H, as defined by Section 74.902 and their response channels) to the Public Safety Services (Part 89) on a primary basis and to other operational fixed stations on a secondary basis.

Special Municipal Needs

In assigning the three two-way channels to the Public Safety Services, the Commission said that this will meet the needs of county and municipal governments to provide specialized training for agencies such as police and fire departments which cannot afford to contract their training requirements to educational institutions or to establish non-profit organizations which are eligible to use ITFS frequencies under Section 74.932 of the rules.

Stations which are now operating out of band will be permitted to continue to operate on a coequal "grandfathered" basis. While such stations will be considered for renewal or modification on expiration of their present license terms, expansion of existing systems on frequencies not allocated for the particular class of station will not be permitted.

From 1949 to 1963, the 2500-2690 MHz band had been allocated to the Fixed Service for assignment to Operational Fixed and the International Control stations on a shared basis. In 1963, the band was made available for ITFS purposes because of the need for short-

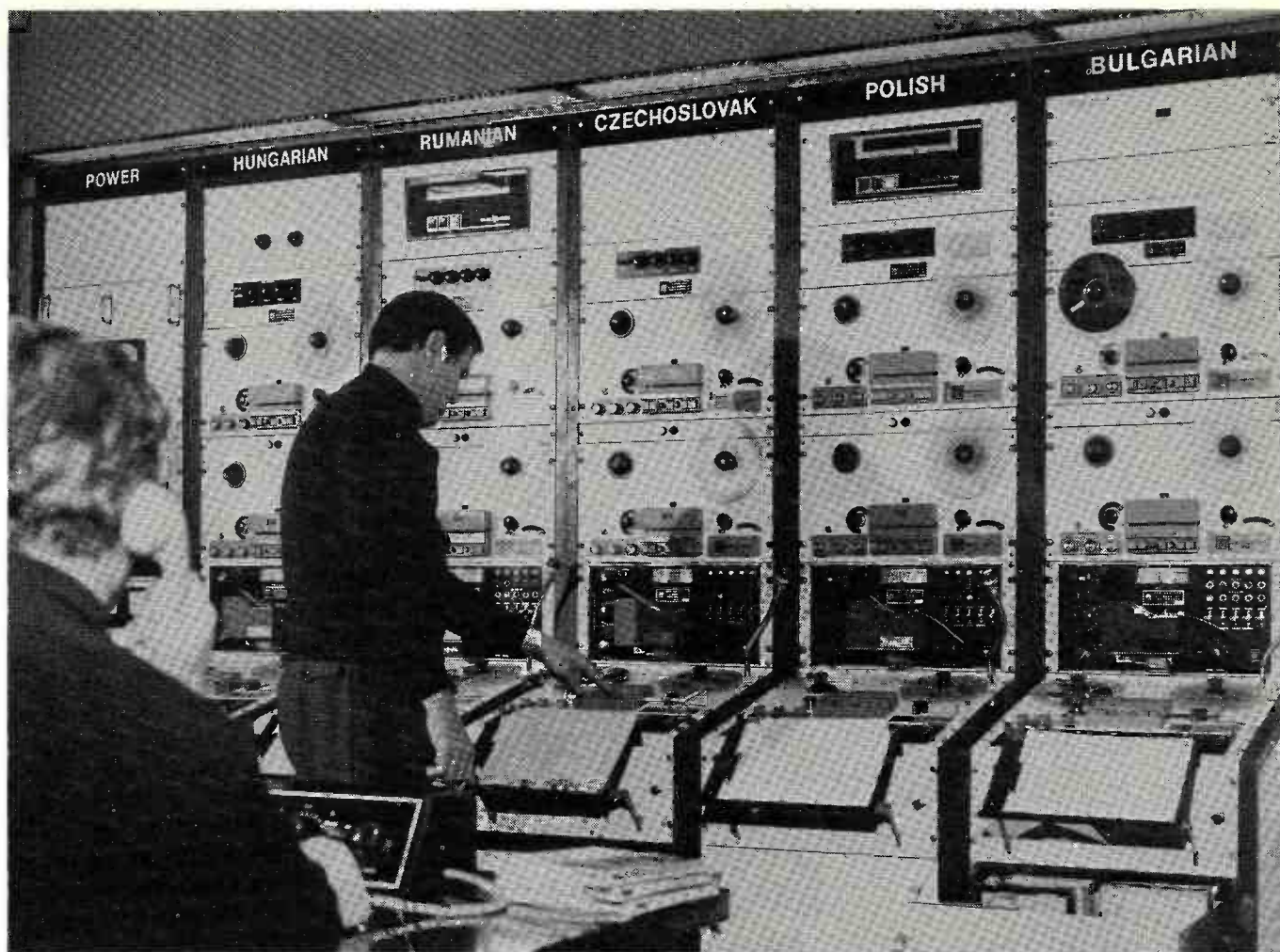
range dissemination of instructional material by educational TV interests, the relatively light usage being made by the operational fixed service, and to provide manufacturers with incentive to develop equipment operating in a specific band with the ability to provide up to thirty-one 6 MHz TV channels in the band.

Funding History Slows Progress

A review was to have been undertaken in 1966 to determine the extent to which educational interests had been able to use the band but the Commission delayed the review because of the problems encountered by the educational interests in preparing, funding and implementing the new "tool" as well as in developing the operational expertise. On June 17, 1970, the Commission adopted a Further Notice of Proposed Rule Making in order to make that review and to determine how many of the thirty-one channels derived from the 2500-2690 MHz band should be allocated to the ITFS and to the Operational Fixed service. Approximately 150 comments were filed with the responses coming from private citizens, public and parochial high schools, colleges, and industry and user groups.

Watching For Developments

Pointing out that while the proceeding was limited to determining whether the thirty-one channels derived from the 2500-2690 MHz band were required for educational purposes exclusively or could be divided equitably with the Operational Fixed television services, the Commission said that formation of a policy on educational communication may be needed because of the emphasis being placed on education at all levels, coupled with the development of new technology and methods of transmission. The Commission said it will continue to monitor the developing educational communication needs and will consider initiating rule making "as appropriate."



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RFE designed and built the master control system and had to meet unique engineering requirements with the best possible equipment. That's why they chose Magnecord.

Magnecords are used to program simultaneously in five languages, beamed to five separate countries. Each language has a bank of rugged, reliable Magnecords for consistently high performance under the most demanding conditions.

Magnecord die-cast mainplate assures permanent mechanical alignment. Program timing accuracy is held constant by the hysteresis synchronous capstan drive. And, each reel has its own heavy duty permanent split capacitor motor.

RFE can't afford to take any chances with its equipment. When field proven dependability and professional quality are available, why settle for anything less? Select Magnecord. Made in the U.S. by Telex.

WWV Adds Voice Storm Warnings

As reported in the July issue of **Broadcast Engineering**, WWV has been making changes in their time and information signals. Perhaps as important as anything that could be heard over WWV and WWVH is their new hurricane and storm warning broadcasts.

The following is a notice from the National Weather Service, Silver Spring, Md.

"This is in answer to the many letters we have received asking that announcements of severe weather be included on the schedule of the time signal stations, WWV and WWVH. We appreciate your interest and hope that the service described below will help you in your future high seas voyages.

"The National Weather Service and the National Bureau of Standards have explored for some time the use of the time signal stations for this purpose. The new broadcast format of WWV and WWVH,

planned for July, 1971, is more amenable to the inclusion of storm warnings than is the existing one. We, therefore, in cooperation with the Bureau of Standards, plan to implement an hourly program of broadcasting storm and hurricane warnings over WWV and WWVH about August 1, 1971. The warnings will cover the areas for which the U.S. has warning responsibilities under international agreements.

"Between the 16th and 17th minutes after each hour, around the clock, WWV will carry a voice broadcast listing hurricanes and major storms in the western North Atlantic. Frequencies are 2.5, 5, 10, 15, 20, and 25 kHz.

"WWVH will list hurricanes and major storms in the eastern and central North Pacific between the 49th and 50th minute after each hour on 2.5, 5, 10, 15, and 20 MHz.

"The format allows about 42

seconds for the weather broadcast, which limits the information concerning each of the severe weather areas. The list of hurricane and storm centers should, however, enable a mariner to quickly note one that would be of concern to him. In such a case he should check one of the regular marine broadcasts for more details. An example of the planned broadcast is:

"WEATHER WARNINGS
NORTH ATLANTIC 1200 GMT
TUESDAY . . . HURRICANE
DONNA INTENSIFYING 24
NORTH 60 WEST MOVING
NORTHEAST 20 KNOTS WINDS
75 KNOTS . . . TROPICAL
STORM EVE 17 NORTH 50
WEST MOVING WEST 10
KNOTS WINDS 50 KNOTS . . .
STORM 65 NORTH 35 WEST
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Don't lose your head

Loose oxide dust can do in a tape head all too soon. It's rough on tape, too.

MS-200 Magnetic Tape Head Cleaner* is an efficient antidote for oxide dust. Even the valve on the can is designed to deliver a wet spray to flush away oxide build-up on heads and stray particles embedded in tape. Can be applied while tape is running.

Write for data and prices.



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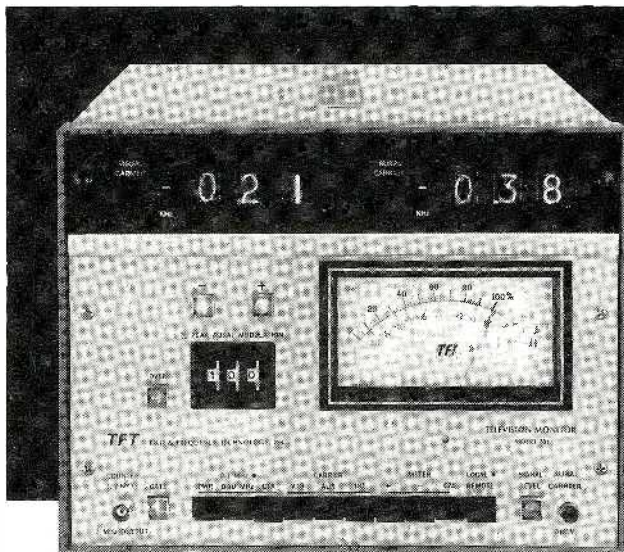
Also Chicago and Los Angeles
Distributors: London, Paris, Hamburg and Milan

*Patented

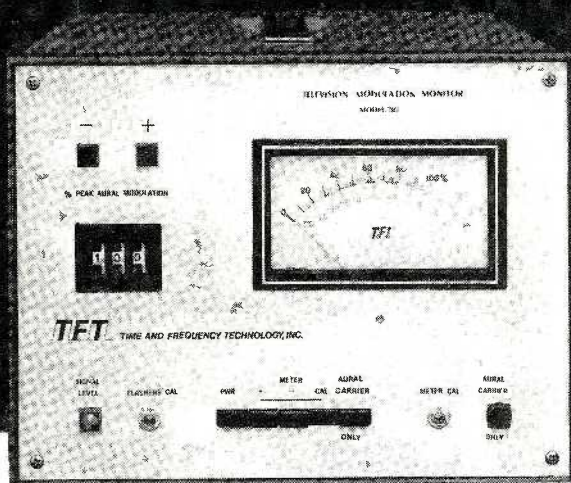
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UHF and VHF TV monitors optimized for remote operations

TFT monitors give you off-the-air monitoring of channels 2 through 69, without the need for an RF amplifier. This substantially reduces interference problems caused by the intermodulation products of undesirable signals.



Model 701 Frequency and Aural Modulation



Model 702 Aural Modulation Only

Model 701 Frequency and Aural Modulation

Monitors visual and aural frequency and per cent aural modulation off-the-air—250 μ V sensitivity. Digital readout of frequency errors with 1 Hz resolution. Internal time base has stability of 1 PPM/year. Can operate with external rubidium standard or TFT's special, super-stable time base. Portable or rack mount. Usable as 6-digit precision frequency counter to 10 MHz input. FCC Type Approval 3-187.

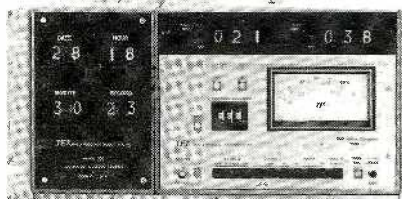
Model 702 Aural Modulation Only

Monitors per cent aural modulation—250 μ V sensitivity.

Ideal for stations which need to add remote aural monitoring capability to existing frequency monitoring equipment. FCC Type Approval 3-189.

Other 701 and 702 Features

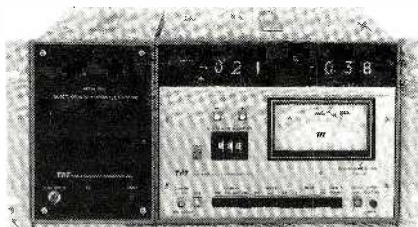
- Demodulation of aural modulation from inter-carrier.
- Exclusive "aural carrier only" switch for detecting inter-carrier noise.
- Digitally-settable flashers display plus and minus peaks simultaneously.
- Built-in aural modulation calibrator.
- Provision for SCA output.



Model 705 Automatic Logging Adapter and Digital Clock

Mounts next to 701. Converts Visual Carrier and Inter-Carrier measurements into digital or analog codes. Also provides digital clock showing day, hours, minutes and seconds. Outputs can operate slave clocks and automatic logging equipment.

Three other versions available: Model 705A with built-in, ultra-stable quartz oscillator frequency standard; Model 705B (automatic logging adapter only); and Model 705C (digital clock only).



Model 703 Super-Stable Time Base

Gives Model 701 frequency stability of 1×10^{-9} /day. When used with TFT WWVB Receiver, enables 701 to monitor transmitters operating with precise offset.

NOTE: Although FCC Approval applies only to monitors directly connected to a transmitter, it's the only approval you need to use TFT monitors in remote control operations. No modifications are required.

Model 704 Remote Panel

Duplicates Modulation Meter and Peak Modulation lamps of Model 701 and 702. FCC Type Approved when used with 701 or 702. Has 50 feet of cable.

Model 710 WWVB Receiver

Mounts next to Model 701. Used to calibrate internal frequency standard against WWVB. Can also be used as general purpose frequency calibration source.

Model 712 Tracking Audio Oscillator/Distortion Analyzer

Generates audio signals and measures distortion simultaneously. With 701 or 702, provides total system for measuring aural transmitters. Can also be used as independent audio generator and distortion analyzer.

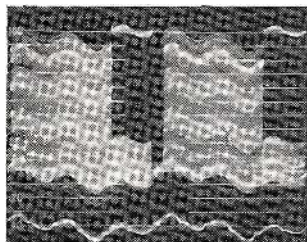
For complete specifications on TFT's optimized remote monitors, and/or a demonstration, call or write:

TFT TIME AND FREQUENCY TECHNOLOGY, INC.
2950 SCOTT BLVD., SANTA CLARA, CA 95050 (408) 246-6365

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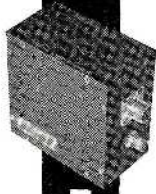
**STOP
GROUND-LOOP
HUM!**

**VIDEO
HUM STOP COIL
HSC-1**



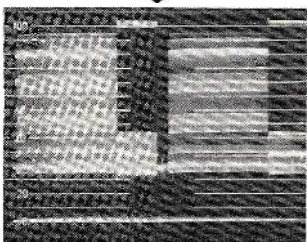
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City State..... Zip.....

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SCANNING THE CATV SCOPE

Sensible Service Expansion Can Be Introduced Today

The Bell System companies provide radio paging, mobile telephone and marine telephone services and leased circuits in addition to landline telephone service. The CATV operator is seldom in a position to provide landline telephone service. But, unless the FCC steps in to forbid it, a CATV system operator can provide services in addition to piping television programs from the head end to television receivers.

Once set up to maintain an electronic cable television system, it is easier and less costly to expand into other services. A CATV system operator is in the telecommunications services business and, as the Bell System does, he should cover as many bases as he can, profitably.

The most logical area is in services that can be offered through the one-way cable television plant. These services include subscription music, wake-up and other alerting services. A subscription music firm depends upon leased telephone lines or the SCA channel of an FM broadcast station. Since the CATV operator has an existing cable plant that can serve the entire community, why not either lease an audio channel to a subscription music firm or go into the subscription music business himself?

All that is required at the head end is an FM channel modulator, an SCA modulator and a long-play automatic audio tape player. At each background music subscriber location is required an FM receiver (preferably fixed-tuned), an SCA demodulator, an audio amplifier and one or more loudspeakers.

The cost can be further reduced by operating the FM modulator outside of the 88-108 MHz band so that the program can't be inter-

cepted by the public except with modified FM receivers. In that case, the fixed-tuned FM receivers would be equipped with a crystal for the subscription music channel—no SCA demodulators would be required.

The CATV system operator can make a monthly charge for the subscription music service and can either sell or lease the subscriber location equipment—at a profit. Prospective subscribers include restaurants, industrial plants, bus terminals and airports (for waiting rooms), supermarkets, hotels, motels and hospitals.

Wake-up Service

Wake-up and other alerting services may seem far out. But telephone answering services apparently find it profitable. To provide alerting services, head end equipment requirements include an RF modulator and a tone encoder which can be either manually operated or automatically programmed. At each subscriber location, a fixed-tuned radio receiver with a built-in tone decoder are required.

The RF modulator can operate on one of the land mobile radio channels in the 72-76 MHz or 150-174 MHz band, within the bandpass of most CATV systems. Receivers with built-in tone decoders are available. They are designed for intercepting tone-coded signals from a radio base station. They can be fed through a CATV cable instead of a local antenna.

The subscriber rents the receiver from the CATV operator and states the hours and days on which he wants to be alerted. A human operator pushes buttons on the encoder panel to alert each subscriber individually, at the specified times. The

It puts the best signal out there because we put only the best in here.

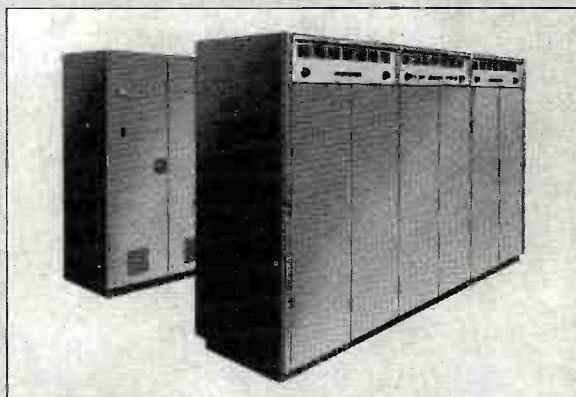
Introducing the most advanced VHF transmitter ever made. It's RCA's new 50kW TT-50FH. And it puts out the best color-television signal in the business.

Why? For one thing, the TT-50FH gives you solid state diode modulation at carrier frequency and our sideband shaping takes place at the output, so you get greater assurance of spectral purity than you do from any other transmitter.

Also, the TT-50FH has only two tuned visual amplifier stages, so it's easy to maintain. The fewer stages you have, the fewer adjustments you have to make, and there's less chance for trouble.

The design is reliability itself. The circuits are all solid state up to the IPA. There are only three tubes in each transmitter. Only two tube types. And the control logic is solid state. That's more solid state than any other transmitter.

If you're planning unattended operation, the TT-50FH is designed for it, with provisions for automatic logging and remote control. It's the only highband VHF transmitter specifically designed as a twin system, which fulfills the FCC's requirements for remote operation



with once-a-week inspection.

It all adds up to superior performance. The TT-50FH performance specs are 100 percent better than the previous generation transmitter.

We've been the leader in TV transmitters since television began. Now we have something new for you. The most advanced transmitter on the market. Ready for remote control. The most reliable design. The best performance. The best signal. All the best.

The TT-50FH. By RCA.

RCA

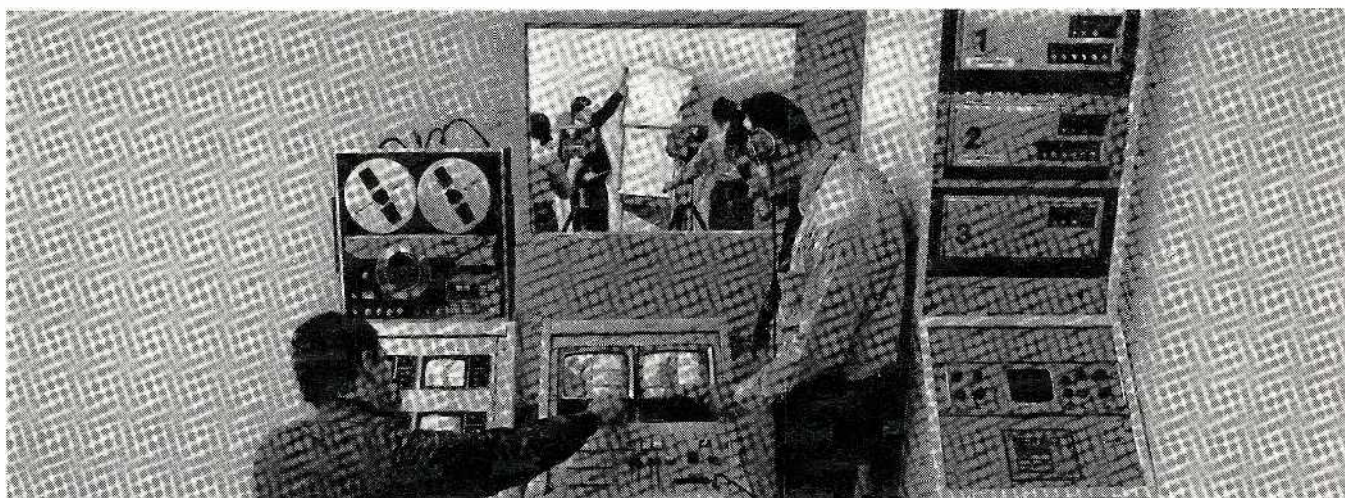
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With features like capstan servo electronic editing and an all-new rotary erase head, the EV-320F allows you to tape your material from other tapes, or off-the-air; or live camera... and insert them into your pre-recorded tapes with perfect synchronization.

Just think. You can add... or delete your scenes... as *you* require... and get professional results. Without taking a course in electronics! A unique ADD feature lets you assemble new scenes onto your tapes without losing sync sequence. And with two audio channels at your disposal, you can add sound on one track... independently... without affecting the audio portion of the other track.

You'll find the EV-320F a ready and willing performer, thanks to the Sony-designed tape transport and electronics systems. They've been field-tested to the most rigid specifications to assure you of optimum results. Each and every time.

And when you're ready for color... so is the EV-320F. Just add the optional Sony Color Pack

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Reliable... proven in the field... the Sony EV-320F is ready to prove that it's the *better* 1-inch machine. We'll be happy to prove it to you... just mail the coupon today.

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alert signal can be an audible beep tone and a latched-up lamp, or a beep followed by a voice announcement.

This would require the presence of an operator at the head end at the required times. On the other hand, the operator could be at the in-town CATV system office and the tone encoder can be at that location. In that case, a leased telephone circuit is required from the office to the head end for connecting the encoder to the RF modulator.

To avoid employment of an alert-system operator, an automatic programmer can be used which will signal the required subscribers at the required times.

Signaling Off-duty Policemen, Firemen

Another form of alerting service is used for signaling volunteer and off-duty policemen and firemen, etc. Ordinarily, such personnel have an alerting receiver in their homes which sounds a beep and latches-up its indicator lamp when its individual or group tone-code is intercepted from a base station. If served

through CATV cable, the base station would not be required. The cable system operator can provide this service on a flat monthly or annual basis. The receivers could be purchased by the participants or the public safety agency, or leased by the CATV operator.

Once in the alerting service business via cable, a natural expansion would be into the area of radio paging, one of the fields that is expected to boom. A base station and encoder are required. Each subscriber buys or rents a pocket paging receiver and pays a monthly fee for paging service.

The receiver can be a beep-only type which alerts the wearer to phone a designated place or person. Or, it can be of the beep-plus-voice type which beeps when signaled and then reproduces the voice message transmitted by the base station.

To ensure that all messages are received, one large organization numbers the voice messages transmitted to each person. For example, if the paging receiver wearer receives Message 42 and later receives Message 44 without having heard Message 43, he calls in by

telephone to get Message 43.

A radio paging system can be designed to cover only a small community or an entire county. The paging system can be used by the CATV company to signal its own personnel as well as for serving paying subscribers.

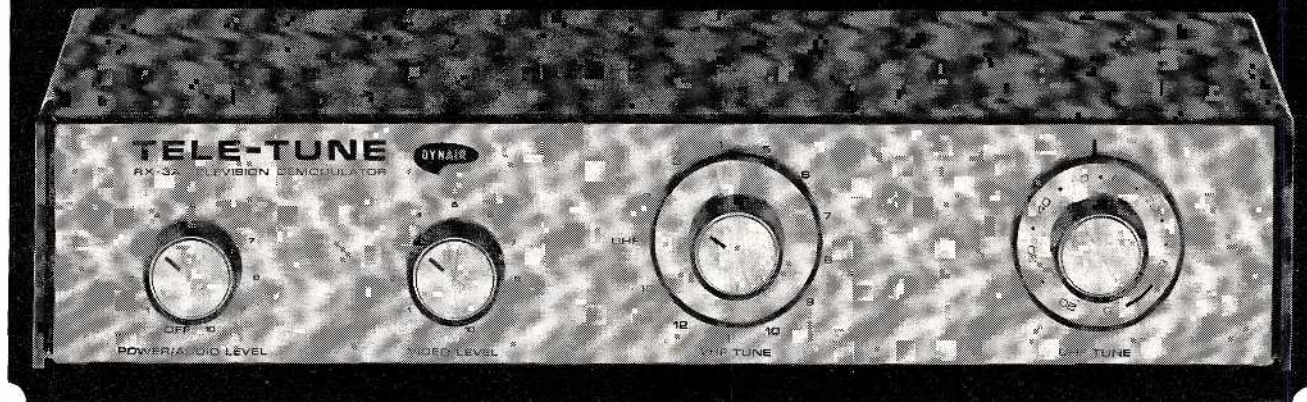
Mobile Telephone

From radio paging, the logical next step would be expansion into the mobile telephone service field. In addition to the Bell System, General System and independent telephone companies, hundreds of so-called "radio common carrier" (RCC) companies provide telephone service to vehicles. Needed is a base station, selective calling encoder and a radio-telephone interface unit (phone patch). Subscribers either buy their own mobile telephones or lease them from the system operator and pay him a monthly service fee plus varying amounts for calls made.

Messages can be transmitted to any mobile unit and the occupant of any mobile unit can place and receive telephone calls via the RCC base station.

Several radio channels are available for both paging and two-way

NOW... a solid-state TV tuner for only \$550.00.



Ideal for general monitoring applications, the TELE-TUNE offers solid-state reliability and professional performance at a price you can afford. When used with a quality video monitor, it will provide color or monochrome performance superior to that of commercial TV receivers. It can also be used to select broadcast TV channels for viewing on an RF distribution system. In such cases, the output of the TELE-TUNE is remodulated on the desired closed-circuit channel by a DYNA-MOD modulator.

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service to radio common carrier that are "not" in the landline telephone business. The FCC plans to allocate additional channels to such non-telephone company common carriers.

A CATV system operator serving an area near navigable waters can also apply for authority to provide Marine Telephone Service. Required is a base station, with or without selective calling capability, and a radio-telephone interface unit. The subscribers usually buy their own VHF/FM marine radio transceivers for use on ship-to-shop and ship-to-shore navigation, operations and safety channels, and for utilizing Marine Telephone Service. Charges for calls placed through a Public Coast Station are billed to the caller or called party.

Expansion into the radio paging, mobile telephone, and/or marine telephone services business should present few technical difficulties for the CATV operator. The head end usually makes an excellent base station or satellite receiver site.

Before expanding into the subscription music, alerting, paging, mobile telephone and/or marine telephone service business, a market survey should be conducted to determine the number of prospective subscribers and to evaluate the strengths and weaknesses of competitors if any exist.

Licensing

No FCC license is required for providing alerting services via cable. An FCC license for a base station is required for engaging in the paging and mobile and marine telephone service fields. Such services are covered by Part 21, FCC Rules and Regulations. All applicants are not granted licenses since it must be proved that such a service would be in the public interest. And, if such service is already available in the area, it must be shown that the existing service is inadequate and that there is need for competition. In short, an FCC common carrier license is a franchise.

The potential and profitability of any of these services depends mainly on the amount of effort expended on developing the market if a significant market potential truly exists in the area.

Any of the service areas discussed here can be entered on a

limited scale initially and then expanded as demand develops. The CATV system operator, like the telephone companies, need not restrict his activities to one specific field. The return on plant investment can be increased by utilizing more

of its potential. And, expansion into the radio common carrier areas makes sense when the CATV operator already has the technical personnel and base station site (head end) and is located in an untapped market area.

NCTA Petitions FCC For Compatible TV Sets

The National Cable Television Association has asked the FCC to establish major new rules and standards which would require television sets to be compatible for connection to cable television distribution systems.

In a petition for rulemaking submitted to the FCC, the association asked the Commission to institute a proceeding "looking toward the adoption of rules in which detented or electronic tuning selects with equal ease from a complement of 20, 40 or 60 channels."

NCTA noted that the FCC is currently considering rules which might require all CATV systems to have a minimum channel capacity. To the extent that this minimum channel requirement exceeds the 12 standard VHF allocations, serious CATV/television receiver compatibility problems exist, the association argued.

While the cable distribution system has the capacity to expand the number of television channels and thus create the mechanism for increased diversity of program choice to the American public, NCTA maintained, cable TV is thwarted by inadequate television receivers.

The trade association noted that for technical reasons it is impractical to distribute RF signals by cable at UHF frequencies.

Among other current television receiver problems the association cited were receiver channel capacity, direct pick-up interference, and adjacent channel rejection. In an appendix to its petition, NCTA offered solutions to these problems.

NCTA also proposed receiver performance standards with respect to antenna terminal impedance, local oscillator voltage, tuning accuracy and stability, and a channel readout mechanism.

Commenting on the FCC's pro-

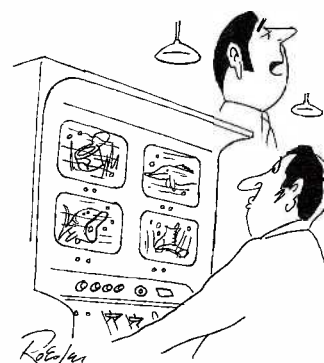
posed minimum channel requirement, NCTA pointed out that there is a quantum jump in going from a 12-channel system to just a 13-channel system.

"The problem is not inherent in the cable system which in most cases has the capability to carry excess channels in mid-band, sub-band, or super-band. To be viewable at the terminal location, the channel must be converted to one of the standard Table of Allocation assignments. For practical purposes this is limited to the 12 VHF channel assignments."

"The point at issue," NCTA maintained, "is to what extent is the cable industry expected to provide a technical umbrella under which receiver shortcomings are to be mitigated."

The association noted that various solutions to the compatibility problem have been tried. But, it added, "in general they all suffer from the fault of adding more equipment at the subscriber terminal that must in turn be operated by the subscriber adding to the already complex problem of operating a color television receiver."

NCTA also maintained that the FCC does have the statutory authority to adopt the proposed rules.



"WHAT MAKES YOU THINK THE DAM HAS BURST?"

NCTA Releases Cable Industry Survey Figures

Almost 100 more cable television systems have the capability to originate local programs than two years ago, according to a new National Cable Television Association survey of the CATV industry's program origination practices.

Of the 1206 respondents to the latest survey, approximately 35 percent (422) indicated they had the capability to originate programming with either live, film or video tape equipment. This compares to 329 who indicated the same capability last year (a 29 percent increase).

In addition, more than one half of the respondents (780) provided automated originations, primarily a weather channel (751) and 99 provided news ticker service.

Of the 422 systems with the program origination capability, 284 cablecast on a regularly scheduled basis.

Respondents to the survey originated local programming on an average of 16 hours a week. Although most cablecast in black and white, at least 160 can originate programs in color.

Commercial advertising is accepted by 428 systems with most (375 systems) accepting advertisements on automated channels. The average cost for display cards on weather channels is \$22 per week and \$52 per month. Of the 244 systems which commercial advertising in conjunction with their program originations, the average charge is \$15 per minute or \$88 per hour-long program.

Of the 422 systems with program origination capability, 399 have video tape recorders of which 160 are color; 433 have cameras of which 75 are color; 229 have slide projectors and 200 have 16 mm film chains.

Respondents to the survey totaled 44 percent of the 2705 cable television systems in existence. Approximately 95 percent of the 366 larger systems (those with 3500 or more subscribers) responded to the survey.

August, 1971

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**Revolutionary design
performs
five operations
without changing
attachments**



THE NEW DITCH WITCH V30C "COMBO" will trench, backfill, backhoe, do vibratory plowing and horizontal boring operations without changing attachments! You have the capability of all five operations with one basic machine. No other trencher on the market can offer all these combined features. Digging chain and vibratory plow are mounted at the rear of the machine; backhoe, backfill blade and boring unit are mounted at the front. The operator instantly can select the required job function. This 30-HP model offers all this, plus the proven Ditch Witch design advantages of hydraulic travel speed independent of mechanically-selective digging chain speeds, four-wheel drive, directional power steering and unmatched operator convenience and safety. Trench to depths of 42" at 6" widths; plow in material to diameters of 1 1/4" to depths of 24".



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1971 Association Review

Audio Engineers

The Audio Engineering Society is the only professional society devoted exclusively to audio technology. Its members include leading engineers, scientists and other authorities in audio in this country and abroad. AES influence and position in the field of audio is world-wide.

Prior to the organization of the Audio Engineering Society, the need for a technical organization devoted exclusively to the profession of audio engineering was definitely asserting itself. Audio, as a distinct and separate branch of the profession of communication engineering, had come of age. It was not merely asking recognition, since this had been virtually accomplished. It was seeking a forum for discussion and interchange of ideas.

The Beginning

As an indication of the general feeling, a letter from Frank E. Sherry, Jr. was published in **Audio Engineering** magazine. It recognized the need for and suggested the organization of an audio group. This letter, entirely unsolicited, brought forth many replies of agreement.

At this time, C. J. LeBel, a professional engineer of notable standing, discussing the situation with his friends and associates, was inspired to test the case. He interviewed many audio engineers in the New York area, and made an open bid for support of a new society in the letter columns of **Audio Engineering** magazine. The general approbations and encouragement he received constituted the real beginnings of the Society.

A meeting of interested audio engineers was called for January 8, 1948 at the Hotel Sheraton, New

York City. A steering committee was appointed: C. J. LeBel, John D. Colvin, C. G. McProud, Norman C. Pickering, Chester A. Rackey.

In February, the formal organization meeting was held at the RCA Victor studios at 155 East 24th Street, New York City. A gratifying and unexpectedly large turnout, 137 persons, assembled at this meeting.

Membership in the Audio Engineering Society steadily increased from 722 in October, 1948, to 1,000 in 1952, 2,000 in 1957, 3,000 in 1965, and now it is over 4,000.

The first West Coast Convention was held in 1954. Two Conventions have been held annually since that time. The Spring Convention is held on the West Coast and the Fall Convention in New York City. Exhibits have been a part of these Conventions for a number of years.

AES Journal

The Audio Engineering Society started to publish its own Journal in January, 1953. Started as a quarterly, it contains engineering studies and reports from audio authorities in the United States and abroad.

The AES serves members, industry and the public by stimulating and directing advances in this vital technology. It makes new developments promptly and widely known through semiannual technical sessions and through the **AES Journal**, a professional publication.

Conventions

AES conventions include a full program of technical sessions for the presentation and discussion of papers describing current research and developments in audio. Exhibits of professional equipment from manufacturers here and from other countries give AES members a first-hand look at the latest products for audio application.

Membership

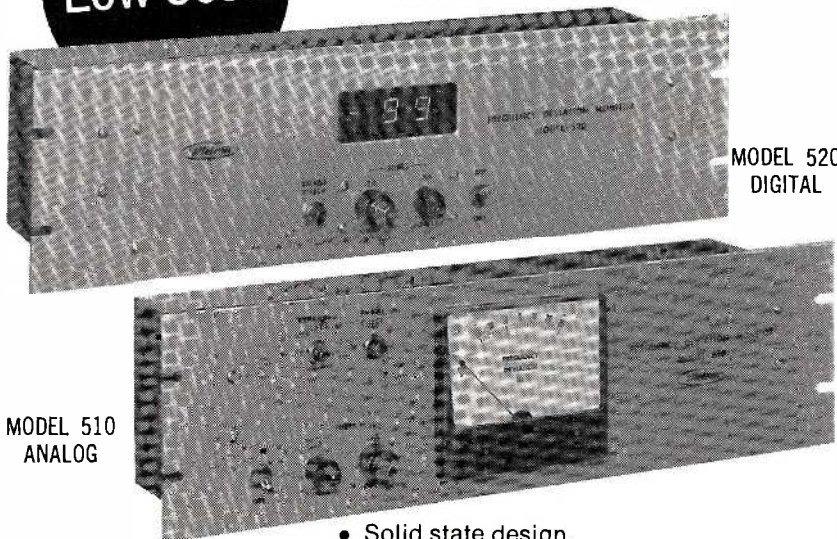
Honorary Memberships and Fellowships are given for past contributions to the profession.

Qualifications for membership in the Audio Engineering Society are as follows:

A **Member** may be any person

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Something even better!**

the
LITTLESHOT
an innovative new condenser microphone
with the best virtues of cardioid and shotgun

and the
BIGSHOT
worthy successor to the
famous MKH 805

You did it. You and your fellow professionals. Made our MKH 805 shotgun condenser microphone the industry standard.

While we're not particularly surprised, we are grateful. Grateful you appreciate our MKH 805's unusually wide, flat response, extreme directionality and high overload resistance. Grateful you appreciate its ruggedness, compactness and light weight. And most of all, we're grateful you use it so widely, both in studio and field-recording, that it's become the most talked-about microphone success story in decades.

But the MKH 805 shotgun microphone was a hard act to follow, especially since we don't bring out new products for change's sake. Now, however, we are pleased to bring you our new MKH 415 and 815—the "littleshot" and the "bigshot"—two remarkable microphones representing a third generation of Sennheiser condenser microphone design.

the littleshot

Not too long ago, we discovered our shotgun microphone being used for applications beyond our original intentions. Because of its small diameter and longer-than-normal size, reporters used it for interviews at normal miking distances. And because of its flat response and high directionality, studios often used it to pick up performers and to actually "close-mike" instruments from a distance, due to its lack of proximity effect, and "pop" reduction.

"Why not," we reasoned, "create a new condenser microphone especially for these diverse applications, where extreme directionality is not required?" The MKH 415, "the littleshot" is the result.

Using an improved combination of pressure-gradient and interference principles, the MKH 415 is truly a remarkable microphone. Directionally speaking, it behaves as a super-cardioid below 2 kHz; at higher frequencies, it exhibits a beam-type (or baseball-bat) pattern. Besides reducing leakage, this design provides higher on-axis conversion efficiency, with two more benefits.

First, pops and wind-noise are reduced, even without its accessory windscreen and shockmount. But even more important in many applications, is the MKH 415's virtually total freedom from proximity effect, which, coupled with its unusually flat response, makes possible "close-miking" of singers and instruments without need for bass attenuators. Beyond these features, the extremely wide response, low ambient noise, high output and overload resistance characteristic of all Sennheiser microphones have also been retained.

Physically, the MKH 415's 10" length provides reporters and other outdoor users with the added "reach" they seek, while performers will find the design less fatiguing to use and more aesthetically pleasing, since they need not hide their faces to project their sound.

the bigshot

In the MKH 815, all the good things that made its predecessor's reputation in filmmaking and broadcasting have been retained. And another advantage has been added: through an improvement in the microphone's interference design, by increasing the number of slots along the microphone's sides (to reduce the area of individual ports), the MKH 815 has additional resistance to pops and wind noise. Thus, in many situations formerly requiring additional precautions, the MKH 815's accessory windscreen and shockmount will not be required.

more encores

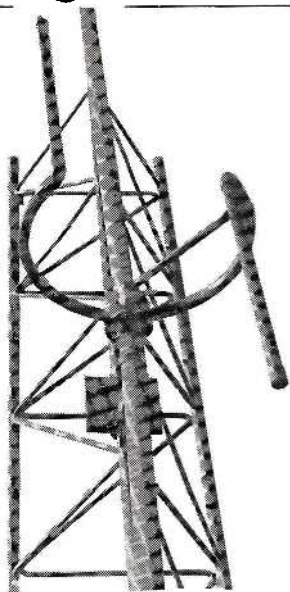
Besides the amazing new "littleshot" and the improved "bigshot," there are many more new things on the way from Sennheiser. While we'll be talking about them in the future, you can find out about them now by requesting the second edition of our Micro-Revue—which contains a good deal of useful audio information besides. Please write or call:



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active in audio engineering who has an academic degree, or its equivalent in scientific or professional experience in the field of audio engineering and its allied arts, and who is familiar with the application of engineering principles and data in that field.

An **Associate** may be any person interested in the objectives of the Audio Engineering Society.

A **Student** may be any student interested in audio engineering and enrolled in a recognized school, college or university.

At the present time the scope of the Society's concern, while still including the areas delineated at the time of its organization 20 years ago, has expanded in order to keep pace with new technological developments in audio and in order to better meet the Society's responsibility to the engineering community and to society at large.

The membership of the Society includes engineers, scientists, administrators, and technicians involved in research, development, design or operation of all forms of audio apparatus and systems; executives, sales engineers, and technical personnel involved in the production, marketing and installation of audio equipment; and educators who use audio apparatus in teaching or who teach acoustics, electronics, or other sciences basic to audio engineering, sound reproduction and allied fields.

The AES serves its membership by offering opportunities for the exchange of technical information, for self-improvement and for professional recognition. The vigorous and progressive state of audio technology at this time will surely be matched by the growth and contributions of the Society during the next two decades of its existence.

For further information on AES membership, write to: Audio Engineering Society, Room 428, 60 East 42nd Street, New York City, 10017.

Canadian Cable TV

The Canadian Cable Television Association (CCTV) was organized to help reflect the community of interests shared by the Canadian public, the television broadcasters, Canadian program producers, the supplier industries and the cable television companies.

The 177 active member companies of the CCTV serve more than 1,000,000 cable television subscribers, which represents greater than 85 percent of the cable viewing population in Canada. In addition, the Association has 52 trade and associate members.

The Association's 15th annual convention was held May 27, 1971. A new Board of Directors and Officers were elected. W. Edwin Jarman was re-elected chairman.

Because of the diversity in both size and geographic location, among member companies, differences naturally exist on some issues. Certain member companies will be submitting briefs directly to the Canadian Radio-Television Commission to identify important points of view in different localities. The Association welcomes this communication.

Where The CCTV Stands

The Canadian Cable Television Association supports the principle of integration of cable television in the Canadian broadcasting system. They also believe that cable subscribers are entitled to high quality signals. In the case of local broadcast stations, the broadcaster should cooperate in the accomplishment of this objective by providing a signal feed to the cable system, where practical.

Local program origination should be encouraged where feasible, but should not be the subject of formal regulation. The CCTV sees advertising as a means of supporting community programming.

The Association is considering the establishment of a national programming cooperative to facilitate the exchange and acquisition of Canadian programs for carriage by cable systems.

Cable-Broadcaster Cooperation

Cooperation between cable systems and broadcasters should be strongly encouraged. Many of the ideas that have been advanced such as programming of closed circuit channels as a joint venture and arrangements to re-run Canadian programs with advertising included (which should count towards fulfillment of the broadcaster's Canadian content quota) could be mutually financially helpful, thereby assisting the production of Canadian programming.

Plant Ownership

The Association strongly believes

THE NO PROBLEM COMMUNICATION PATCHING SYSTEM

If you've considered changing to miniature communication patching system components but haven't done it, you're probably worried about what might go wrong. The wrong circuitry. The wrong patching combinations. The wrong terminating values. The wrong panels.

Stop worrying. We created our NO PROBLEM line of "tini-telephone" Patching System Components to prevent problems, not cause them. We started from the ground up to provide every miniature component and accessory you need to make sure that switching over to a miniature patching system has a happy ending.

NO PROBLEM with circuits. We make 2- and 3-conductor single jacks, twin-jacks, even triple-jacks for special monitoring. All with either solder-lug or wire wrap terminals. Circuits? We have all types you've been using in a standard system.

NO PROBLEM with versatility. We make more types of miniature jack panels than anyone else. Two row, twin row, three row and triple-type row panels holding from 96 or 156 single jacks to 48 triple-jacks per panel. All 19" wide.

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NO PROBLEM with patching. Our experience with telephone patch cords taught us which are the most wanted types. At Switchcraft, you can select from 2- and 3-conductor molded patch cords or attachable types with either vinyl jacket or nylon braided cable. 3- and 5-conductor twin-phone plug patch cords are also available in molded or attachable types.

NO PROBLEM with compatibility. You can interconnect our new "tini-telephone" miniature panels with older, larger types. Switchcraft makes 2- and 3-conductor adapters for fast, simple interconnecting.

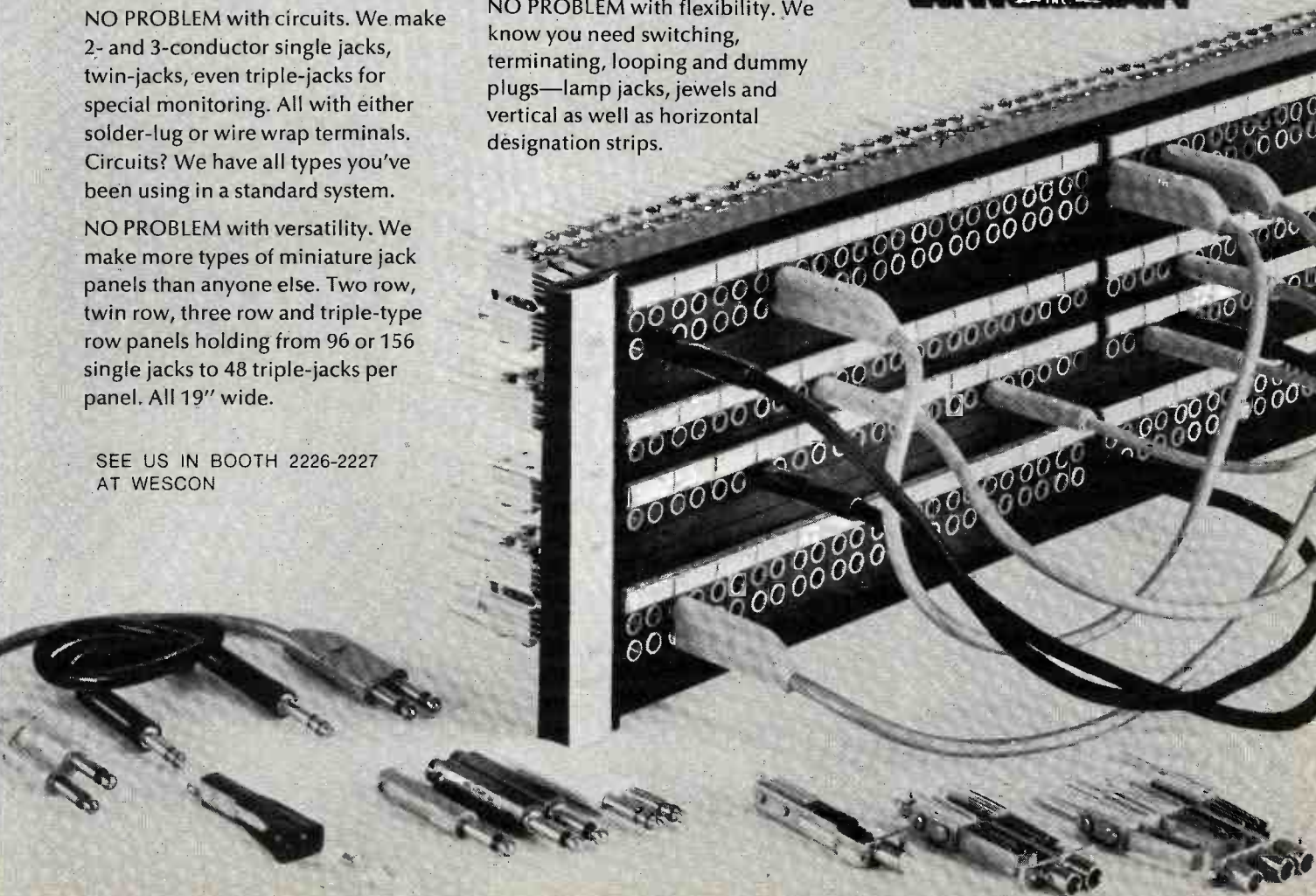
NO PROBLEM with flexibility. We know you need switching, terminating, looping and dummy plugs—lamp jacks, jewels and vertical as well as horizontal designation strips.

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If you're building new patch bays or retro-fitting your communication or data terminal systems, look into our "tini-telephone" patching system components before you leap into problems. Send for our catalog or call. NO PROBLEM. Switchcraft, Inc., 5535 N. Elston Ave., Chicago, Ill. 60630. 312/792-2700.

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The Top Turntable



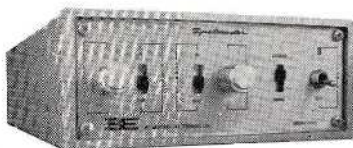
... is Spotmaster's new Studio Pro B, offering instant start and the tightest cue potential in the industry. Heavy duty hysteresis motor drives a 6½ lb. machined aluminum platter in a solid-cast aluminum chassis for inaudible rumble, lowest wow and flutter. Indicator lights tell speed (33 or 45) at a glance, and speeds can be changed with platter in motion. Detachable mounting plate (accepts any tonearm), integral 45 spindle and neutral cue position are other features ... all for just \$198.00.

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Complete line of Gray professional arms and all broadcast quality phono cartridges also available at competitive prices.

And the Best Turntable Preamp



... is our new Model TT-22, all solid state, modular, stereo equalized and completely self-contained. Features separate balance/level controls, high output (+8dbm), phone jack ... plus switchable and removable rumble and scratch filters. Both stereo and mono models are available, starting at \$121.50. Our time-tested TT-20B mono preamp and PR-4C power supply (will power up to 4 preamps) are also available, providing top performance at economy prices.

...all from Spotmaster

PLUS a complete range of accessories for both turntable and cartridge tape operation. Write for details.

BROADCAST ELECTRONICS, INC.

A Filmways Company

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that, in the public interest, cable companies should have the opportunity to fully own and control their own intra-city communications plant. The CRTC should state that, in general, future cable plant should be owned by the operator. The government should direct telephone companies to permit attachment to telephone company poles, etc. for such purposes.

These are just a few of the views of the CCTV. If you would like more information write to: Canadian Cable Television Association, 1010 St. Catherine Street West, Suite 1004, Montreal 110, Canada.

IEEE

The Institute of Electrical and Electronics Engineers, Inc. is one of the largest engineering societies in the world today. It was started in 1884 by a small group of engineers and has spread across the world. Today there are more than 160,000 members.

The purposes of the organization are scientific and educational, directed toward the theory and practice of electrical engineering, electronics, radio, allied branches of engineering or the related arts and sciences.

Throughout the year the many sections of the IEEE hold many meetings, conferences and symposiums for the purpose of keeping all members informed on the latest innovations, experiments and possible future directions.

While many groups have split into specific interest areas, they remain aligned with the IEEE. And this includes the Canadian broadcasters. The call for papers is out now for the International Electronics Conference Oct. 4-6. The conference is sponsored by the Canadian Region. (For information on the conference write to: Conference Office, 1819 Yonge Street, Toronto 7, Ontario, Canada.)

Benefits of IEEE Membership

As a member of a local IEEE Section, you may attend and participate in meetings where matter of particular technical interest in the locality are discussed by people who know them best. At these meetings you will meet and exchange views with people who share your interests. You may join one or more of

the IEEE Groups or Societies, which provides the opportunity to broaden knowledge in your specialty field.

There is the opportunity for personal contributions, to serve on IEEE Committees to learn what others are doing, and to contribute your own knowledge to the profession.

Meetings

In addition to the local Section meetings, the IEEE sponsors a large number and variety of other meetings, symposia and conferences to meet the interests of all its members.

The world's largest technical meeting, the IEEE International Convention and Exposition, is held in New York City every March. The four-day program draws engineers and scientists from all parts of the world to learn about and discuss the latest developments in electrical and electronics engineering. Complementing the technical sessions is an exhibition of technological products by hundreds of manufacturers.

Special annual meetings sponsored by IEEE Regions and Sections at a location geographically convenient provide a smaller scale equivalent to the International Convention and Exposition.

Also, throughout the year, IEEE Groups and Societies sponsor or co-sponsor with other organizations many major conferences in areas of special interest. These meetings provide the most up-to-date coverage available on their specific subjects.

As an IEEE member, you will know about the conferences and their programs in advance and can attend at a reduced member rate.

Spectrum

IEEE Spectrum is a monthly magazine which contains technical articles on the limitless variety of subjects of interest and importance to its diverse readership. Since **Spectrum** is the general or "core" publication of the IEEE, its articles are written so as to be meaningful to a wide audience of electrical and electronics engineers and scientists.

IEEE Broadcast

Symposium

Sept. 23, 24 At The Washington Hilton Washington, D. C.

SCALA ANTENNAS...

WITH ENGINEERED-IN HIGH PERFORMANCE

The Paraslot is a typical example of Scala's design and fabrication philosophy. There are no elements outside to offer wind resistance, or to collect ice or snow; all exposed parts are made of anodized aluminum or stainless steel; precision-machined slots are covered watertight with laminated plastic sheet held in position with adhesive—and additionally secured with an aluminum extrusion fastened to the antenna body with stainless steel machine screws; it features an exclusive patented parallel feed system which tracks temperature variances so precisely that energy phase to the slots remains within 1° under extreme temperature changes . . . these are some of the many features which make the Paraslot stand out among omni-directional TV broadcast antennas.

Scala's VHF Color Log series is another instance of high-performance, functionally designed, well-built antennas. Their center mounts permit use of larger active regions, so that only two Color Logs cover VHF channels 2-13. Also, not restricted by the weight limitation of end-mounting, Color Logs use laminated construction, which our 20 years' experience has proven essential to overcome the fatigue problems of aluminum and to take full advantage of its light weight. Look into the complete line of performance-engineered precision antennas, accessories, and mounting hardware in the 40-1000 MHz range available from Scala Radio.

YAGIS—medium priced, highest gain per size antennas for a wide range of applications.

VHF YAGI—Model CA5-150: 40-225 MHz, for general communications. Models HDCA-5 & HDCA-10: channels 2-13, high gain VHF TV applications.

FM YAGI—Models HDCA-5 & HDCA-10: 88-108 MHz, high gain 5 and 10 element yagis for the FM band, 6 MHz bandwidth.

UHF YAGI—Model CA5-450: 225-1000 MHz, for general communications. Model RA5-450: 400-1000 MHz, completely protected in a Fibreglas radome housing, for all weather communications.

COLOR LOGS—Broadband, directional antennas with high front-to-back ratio and low side lobes. Ideal for co-channel and multi-path rejection.

VHF COLOR LOG—Model CL-26: channels 2-6; Model CL-713: channels 7-13, VHF TV applications.

FM COLOR LOG—Model CLFM, one model covers the 88-108 MHz FM band.

UHF COLOR LOG—Model CL-1483: channels 14-83, UHF TV applications; precision silver-plated elements enclosed within a Fibreglas radome housing.

PARAFLECTOR—A parabolic section in one plane with exclusive dipole feed; it is lightweight, has low wind resistance and is extremely durable. Model PR-450U: 350-1000 MHz, general communications and TV applications.

MINIFLECTOR—A parabolic cylindrical reflector with a unique dielectric phaser dipole feed. Model MF-960: 940-960 MHz, communications, STL and telemetry applications.

PARASLOT—A high gain, rugged slotted cylinder antenna. Model SL-8: channels 14-83, UHF TV broadcast applications.

FM OMNI-DIRECTIONAL—Balun fed, quadrature phased, crossed dipole array. Model FMO, one model covers the 88-108 MHz FM band.

GROUND PLANE—Model GP-150: 40-170 MHz, ideal for non-directional all-weather communications.

COLLINEAR ARRAY—Omni-directional, rugged parallel fed collinear array. Model OG-4: 150-170 MHz; Model OG-6: 450-470 MHz. A useful optional feature available: vertical downtilt.

POWER DIVIDERS—Allow division of transmitter power to two or more antennas in the proportion needed.

Phasing and stacking harnesses, inter-connecting cables, and fastening hardware are made to your specifications.

Special arrays are custom designed to achieve maximum gain or to provide optimum solution to co-channel, multi-path and other radiation problems.

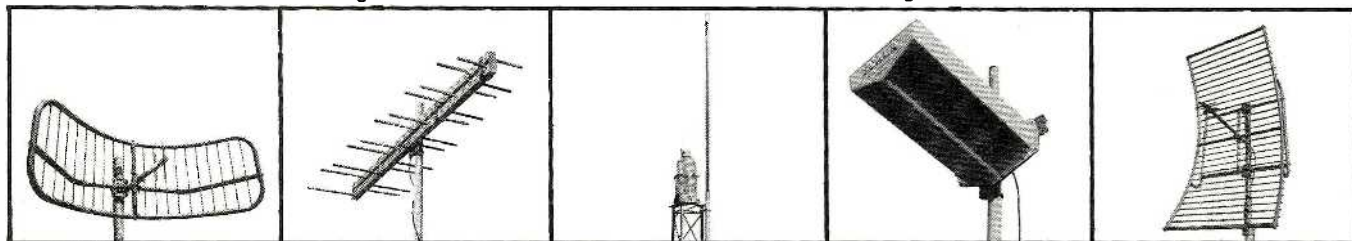
Miniflector

Color Log VHF Antenna

Paraslot

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Articles range from those reporting on new developments and reporting the state of the art in specific fields, to those which have primarily a tutorial content. Regular news sections give information about the IEEE and the activities of its units and members as well as other news of the profession and the industry. Also included are abstracts of papers appearing in other IEEE publications, book reviews, and letters to the editor.

Membership

Interest in electrical/electronics engineering is the basic requirement for membership in the IEEE. The grade of membership to which you will be admitted, depends on the extent of your involvement in, and contribution to the field of electrical/electronics engineering.

The grade of **Fellow** is conferred only upon a person of outstanding and extraordinary qualifications and experience in the fields of electrical and electronics engineering, related arts and sciences, or allied branches of engineering. It is an unusual professional distinction that must be earned, not applied for.

Senior Member is the highest grade for which application can be made and requires experience or attainment reflecting professional maturity.

Member Grade is open to those who have demonstrated professional competence in the fields of electrical or electronics engineering, related arts and sciences, or allied branches of engineering.

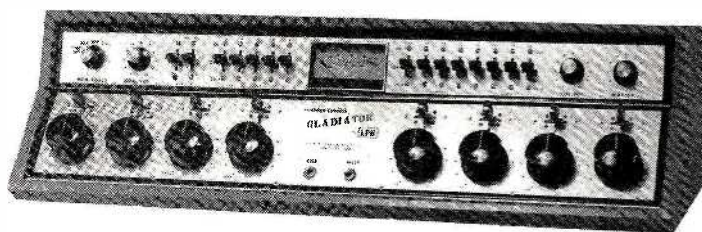
Associate membership is offered to those with engineering interests who are capable of rendering service to IEEE and the profession.

Student membership privileges are extended to registered students enrolled in electrical engineering or related courses.

The IEEE membership offers you professional and personal advantages. If you are interested in becoming a member or would like more information write to: The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, N.Y. 10017.

**Buyer's Guide on Page
49 D-1**

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Collegiate Broadcasting

The Intercollegiate Broadcasting System (IBS) is the trade association of collegiate and educational radio stations in the United States, Canada, and overseas. The System has members east to Holland and west to Australia.

IBS was founded in 1939 by 13 college radio stations to act as a trade association, assisting the stations in obtaining national advertising, representing them to the FCC and furnishing information to other schools interested in educational radio or constructing campus stations. The System is a non-profit Rhode Island corporation.

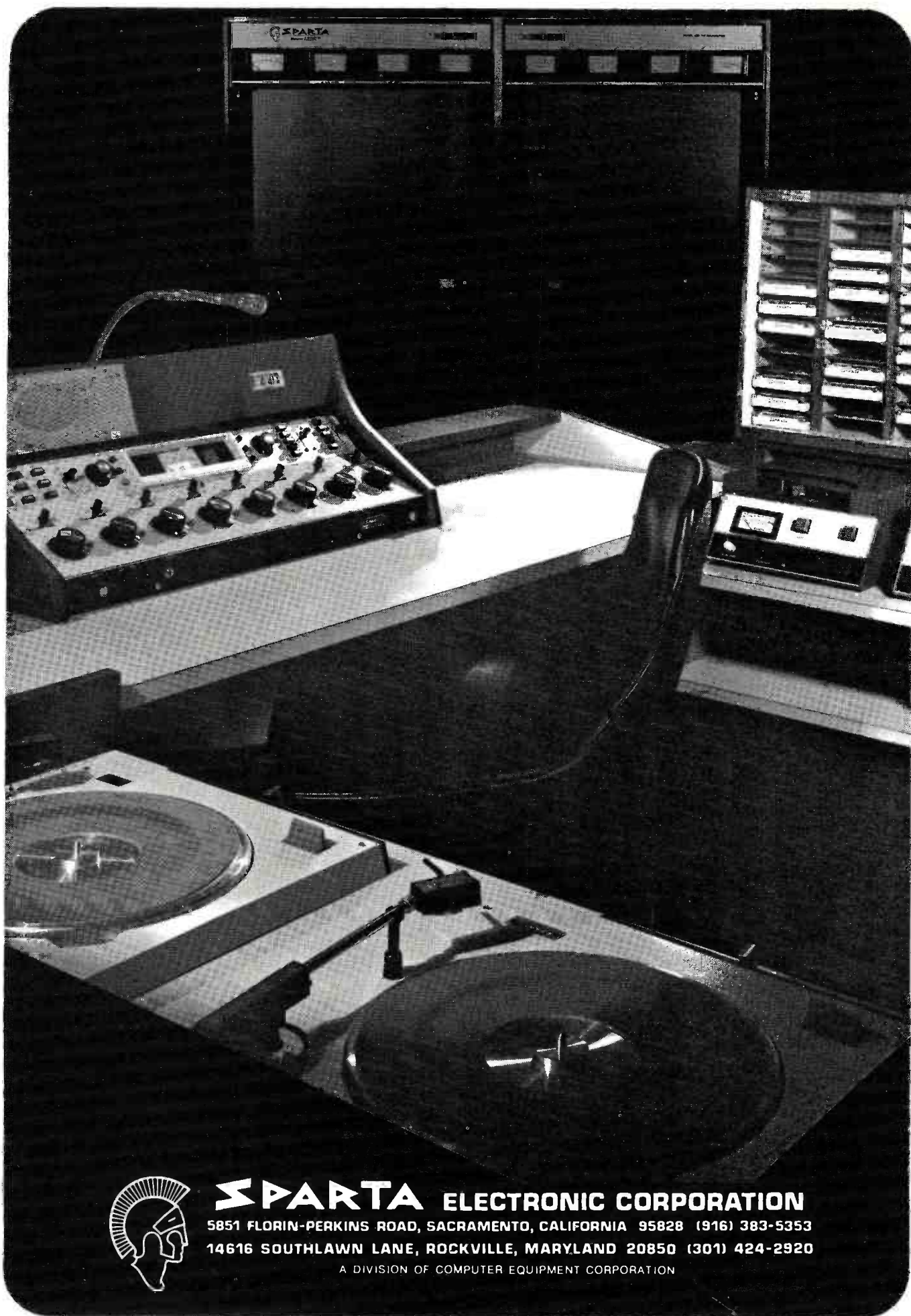
There were high points in activity and membership in 1948 and 1955, and during these periods IBS member stations enjoyed many augmented services, including particularly increased national advertising revenue and many fine IBS-produced program series.

Until the more recent past, however, IBS membership never grew very large, because the number of college and university stations cooperating in the media beyond the local station's bounds was small. Before 1963 the record membership was 1955's 105 member stations. Since then IBS has grown to over 350 members, representing a 400 percent increase in the past 4 years.

Although these statistics are impressive, the real story of IBS growth is in the area of its services to the industry. These include the availability of IBS printed forms, the College Radio Placement Service (an annual poll of commercial stations on their requirements and qualifications for summer positions), a programming service, Iota Beta Sigma national honorary, an annual National Convention, **College Radio** magazine (published monthly during the academic year), and FCC representation . . . especially Call Letter reservation. The System strives to expand both the depth and the scope of its programs and services . . . instituting new services and improving existing ones.

IBS Services

Two services of particular interest to new stations are the IBS gen-



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eral, technical and sales consultation service, and the **IBS Master Handbook**. The **MH** is a complete manual of station operation encompassing programming, sales, technical, and administrative information. Since IBS's inception, a prime effort has been to furnish stations with technical data and assistance. The System has technical requirements (as well as other codes) for Voting membership, and a significant portion of the **MH** is devoted to engineering information.

IBS has also developed a regional activity and runs periodic regional conferences. Regions publish newsletters, run programming exchanges, regional sales offices, and even news networks.

A recent addition to IBS services is being instituted by the Record Company Relation Department. The RCRD is publishing a weekly IBS Charts & Review section as a feature of **College Radio** magazine. In addition, the RCRD will furnish to Record Manufacturer's promotional

offices data on IBS member stations.

Membership

Industry Affiliate membership is another new facet of IBS. As a result of a complete revision of IBS organizational structure and By-Laws two years ago, the System offers Affiliate membership to firms in the industry wishing to cooperate with our membership. Three classes of Industry Affiliate membership are offered.

As outlined in the By-Laws, a broadcast group related to an institution of higher or secondary education, or an organization whose purpose coincides in whole or in part with that of the System is eligible for membership. IBS does not offer individual membership. Station dues are \$45 per year.

Conferences in IBS's 14 regions are held once a year, and a National Convention is held each spring.

Further information on the IBS may be obtained by writing to: Intercollegiate Broadcasting System, Bethlehem, Pa.

NAB

In each decade of broadcasting history there have been any number of challenges for owners, managers and engineers. Some challenges nudge the state-of-the-art slowly uphill. Others threaten the existence of stations.

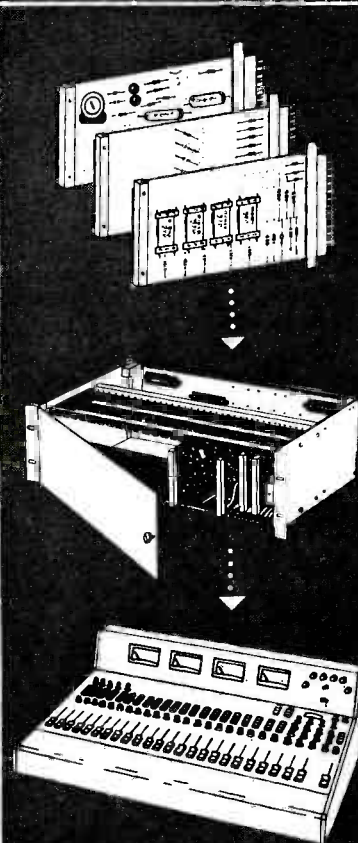
While you can't always agree with the National Association of Broadcasters, you must recognize that without their concerted efforts over the years there might not be any sound business reason for being an owner today.

The voice of broadcasting constantly thunders out of Washington when the NAB's Vince Wasilewski spots another derailing FCC proposal. Trouble is, not enough of the broadcasters themselves make their individual voices heard.

The NAB started in a modest enough way with a handful of members, back in 1922. A non-profit organization, its goal was "to foster and promote the development of the arts of aural and visual broadcasting in all its forms: to protect its members in every lawful and proper manner from injustices and unjust exactions; to do all things necessary and proper to encourage and promote customs and practices

(Continued on page 72)

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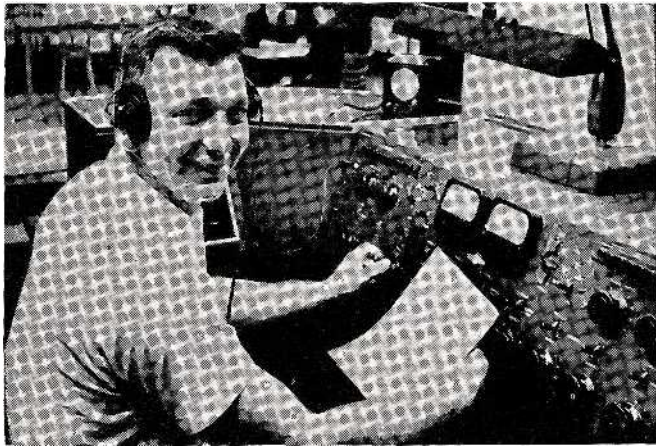
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INDUSTRY CALENDAR

AUGUST

- 20-21 ABA summer convention at the Arlington hotel in Hot Springs.
- 22-25 The 54th annual meeting of the Association for Education in Journalism will be held at the Univ. of South Carolina, Columbia. The meeting concurrently with AEJ is American Assoc. of Schools and Departments of Journalism and the American Society of Journalism School Administrators.
- 24-27 Western Electronic Show and Convention will be held at San Francisco's Civic Auditorium.

SEPTEMBER

- 9-11 The annual fall convention of the Louisiana Association of Broadcasters will be held at the Monteleone hotel in New Orleans.
- 15-17 The Michigan Association of Broadcasters fall convention will be in Hidden Valley.
- 23-25 The fall Broadcast Technical Symposium will be held at the Washington Hilton hotel in Washington, D.C.
- 23-25 Minnesota Association of Broadcasters meeting—location to be announced.
- 23-25 The annual broadcasting symposium sponsored by Group on Broadcasting, Institute of Electrical and Electronic Engineers will be held at the Washington Hilton hotel in Washington.
- 26-28 The Nebraska Association of Broadcasters will hold their meeting at the Village motel in Lincoln.
- 27-29 The 11th annual conference sponsored by the Institute of Broadcasting Financial Management will be at the Regency Hyatt House, Atlanta.

28-

- Oct. 2 The Radio-Television News Directors Association will hold their annual national conference and workshops at the Statler Hilton hotel in Boston.

OCTOBER

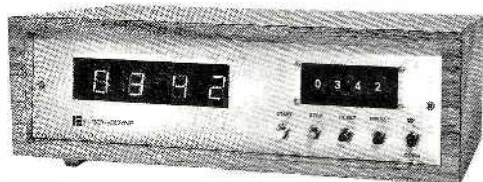
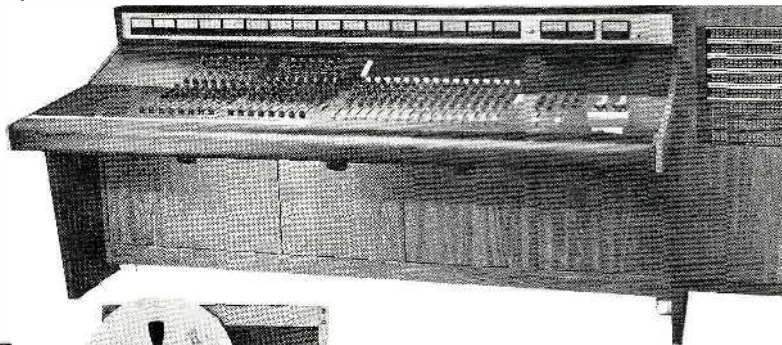
- 3- 8 The 110th Technical Conference and Equipment Exhibit of the SMPTE will be held at the Queen Elizabeth hotel in Montreal, Canada.
- 6- 8 The Tennessee Association of Broadcasters will hold their meeting at the Sheraton hotel in Nashville.
- 7- 9 The Massachusetts Association of Broadcasters meeting will be held at the Sheraton-Hyannis hotel in Hyannis.
- 14-15 The National Association of Broadcasters first fall conference will be held at the Regency Hyatt House in Atlanta.
- 17 The Japan electronics show, Electronics Industries Association of Japan, will be held at the International Trade Fairgrounds, Osaka, Japan.
- 17-19 The North Carolina Association of Broadcasters meeting will be held at Grove Park Inn in Asheville.
- 17-20 The National Association of Educational Broadcasters will hold their annual convention at the Fontainebleau hotel in Miami Beach.

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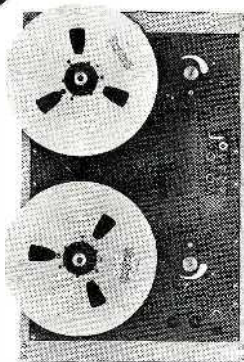
Well-known performers — each a technical and creative specialist in electronics. Result — the range and quality that makes for success. We can help you get it all together, from the smallest switch or component to complete custom recording studio systems.

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ELECTRODYNE'S DIGITAL STOPWATCH DC1000 — Here in one package are all the features wanted for precision timing of minutes and seconds at a moderate cost. It will count forward or backward and stop at 00:00. Can be preset to a selected number and count up or down from there. All integrated circuit logic; no moving parts. Remote control and dress cabinet are optional features. Engineered and tested to guarantee unfailing reliability.

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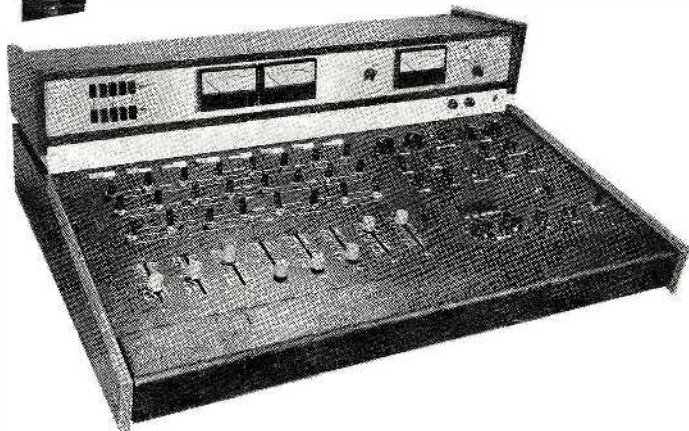


THE LANGEVIN TR-100 SERIES TAPE TRANSPORT is designed and built to provide the professional broadcaster with a highly reliable, long play, bi-directional, tape playback unit. The transport uses a dual-speed, hysterisises-synchronous capstan motor, resulting in low wow and flutter characteristics. Automatic reversing is accomplished through foil contacts on either end of the tape. Cut-off arms are provided adjacent to both tape reels, and a connector on the rear panel is also provided for remote control of the unit.



THE LIMITER/COMPRESSOR AM-7A by LANGEVIN is a high quality gain reduction and peak limiting device for use with speech or music inputs. It may limit only, or limit in combination with compression. It features fast attack time and release time with low distortion. It has a three-position de-essing circuit. A stereo system may be provided by connecting 2 units in parallel using the stereo sync terminals provided. It is designed to accept low level inputs and is self-powered.

LANGEVIN'S BC-8A BROADCASTER CONSOLE features 24 inputs (8 Full Stereo and 8 NEMO), stepless faders, separate program and audition outputs, solid-state modular plug-ins, 2 power supplies with switching for fail-safe operation, stereo/mono input selector keys, separate cue amplifier and lobby feed amplifiers, 5-position monitor select switch and amplifiers, equalizers for Program, Audition and Monaural outputs. There is a choice of microphone input preamplifiers and separate monaural outputs switchable between Simulcast and Independent inputs.



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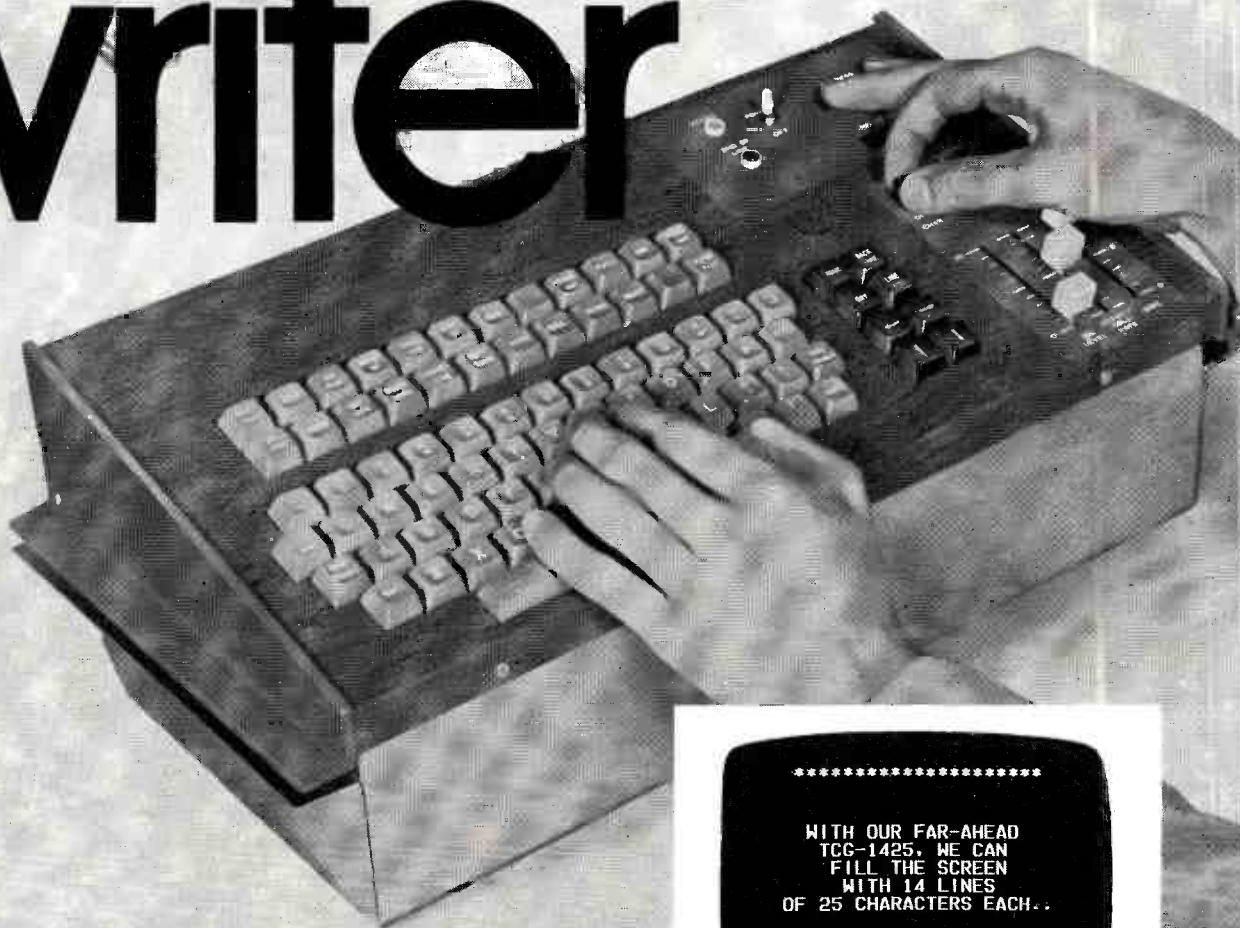
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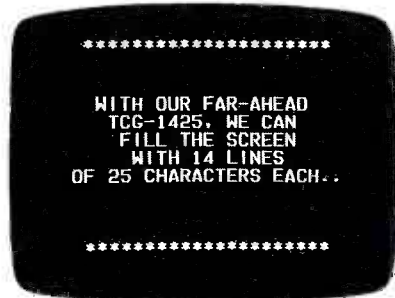


TeleMation's new TCG-1425 Character Generator

Our versatile TCG-1425 puts more edit-ability at your fingertips than any other character generator. Designed *specifically* for use in broadcast and teleproduction, it gives you a choice of two keyboard-selectable sources (output is automatically synchronous), as well as partial and full-page alphanumeric display, and the industry's two biggest handfuls of editing and control features.

The easy-to-use keyboard encourages you to become an overnight virtuoso. Display editing functions include copy up/copy down, hop left/hop right, snake up/snake down, automatic line and page centering, and open line/close line (for making corrections without resetting full lines). For control flexibility, the TCG-1425 gives you one-line horizontal crawl, line-by-line horizontal wipe, vertical wipe, vertical roll and flash. Edging, shadowing and matting are also available.

The display itself is a clear improvement. You command up to 14 lines of 25 characters each—plus a handy fif-



teenth line for composition preview—and an internal memory for a one-line, 560-character crawl. Characters are more legible because of our high-resolution*11x12 line matrix format.

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1971 Broadcast Buyer's Guide

Broadcast Engineering's Reference Issue joins the Computer Age!

With this 1971 annual issue, the Broadcast Industry Buyer's Guide and the Manufacturer's Address sections have been prepared for you by computer. We have taken this step so that we may continue to provide you with the most complete and latest information on products and services. Now that we can add and delete listings by computer we will be able to keep pace with the changes taking place in the industry. Not only will you have a better directory with this issue, you will continue to see improvements in the years to come.

Our only limitation is that we send questionnaires to all active manufacturers in the field. Some either fail to receive their listing notice or forget to send it in. The

result is about 500 manufacturers in well over 300 categories.

For CATV categories not listed in this section, see the CATV Buyer's Guide. It includes products especially designed for CATV use.

Red Listings

For the first time we are including red listings. A red listing under a category signifies that the manufacturer has an ad in this issue describing that product or service. In this way you will be able to immediately refer to specs and descriptions in categories of interest to you. Addresses of all manufacturers in this portion of the Guide are listed in the Manufacturers Address section.

Reader Service Card In This Issue Good For One Year

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Broadcast Recorders
Diversified Consultants
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Rust Corp.
Singer Products Co., Inc.
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Alarm, Signal

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Conrac Corp. Cramer Div.
Delta Electronics Inc. (N.C.)
Diversified Consultants
Electronic Designers Inc.
Engineering Assoc.
Humphrey Electronics Inc.
Moseley Assoc. Inc.
Rust Corp.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Trepac Corp. America

Amplifier, AF, AGC

ALTEC
Arbor Systems Inc.
Belar Electronics Lab., Inc.
CBS Labs
CCA Electronics
C Cor Electronics
Collins Radio Company Broadcasting
Marketing,
David Clark Co., Inc.
Edison Electronics Div. McGraw-Edison
Company
Fairchild Sound Equip. Co.
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Marti Electronics
McCurdy Radio Ind. Inc.
Melcor Electronics Corp.
Quad-Eight Electronics
RCA Broadcast Equipment
Communications Systems Div.
Rupert Neve & Co. Ltd.
Tape-Athon Corp.
Television Equipment Assoc.
Total Technology
Visual Communication Products Oper.
General Electric Co.
Ward Electronic Indus.
Wilkinson Elect. Inc.

Amplifier, AF, Compressing

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CBS Labs
CCA Electronics
Collins Radio Company Broadcasting
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Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Electrodyne Div. of MCA Technology,
Inc.
Fairchild Sound Equip. Co.
Gately Electronics
Gates Division of Harris-Intertype
Langevin An MCA Technology
Company
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Magnatech Co.
Marti Electronics
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McMartin Industries Inc.
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Phillips Broadcast Equipment Corp.
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Precision Elect. Inc.
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RCA Broadcast Equipment
Communications Systems Div.
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Rupert Neve & Co. Ltd.
Shure Brothers Inc.
Singer Products Co., Inc.
Spectra Sonics
TelComp Division Television and
Computer Corp.
Telex Communications Division
Tri-Tronics
Ultra Audio Products
Universal Audio Inc.
Visual Communication Products Oper.
General Electric Co.
Ward Electronic Indus.

Rupert Neve & Co. Ltd.
Singer Products Co., Inc.
Spectra Sonics
Spotmaster Broadcast Electronics
Television Equipment Assoc.
Total Technology
Ultra Audio Products
Universal Audio Inc.
Ward Electronic Indus.
Wilkinson Elect. Inc.

Amplifier, AF, General Purpose

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Allied Electronics Subs. of Tandy
Corp.
ALTEC
American Geloso Electronics
Amperex Corp.
Arbor Systems Inc.
Bauer (See Sparta)
Belar Electronics Lab., Inc.
Bell P/A Prod. Corp.
B & K Instruments Inc.
Bradford Information Systems
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Electro-Voice Inc.
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Amplifier, AF, Peak Limiting, AM

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Tele Measurements Inc.
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Amplifier, AF, Peak Limiting, FM

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Wilkinson Elect. Inc. 7

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Amplifier, AF, Remote

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Bauer (See Sparta)
Broadcast Electronics
Central Dynamics Corp.
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Marketing,
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Gately Electronics
Gates Division of Harris-Intertype
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Amplifier, AF, Reverberation

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Bauer (See Sparta)
Broadcast Recorders
Collins Radio Company Broadcasting
Marketing,
Crown International
Eico Elect. Inst. Co., Inc.
Electronic Designers Inc.
Electro-Voice Inc.
Fairchild Sound Equip. Co.
Gately Electronics
Gates Division of Harris-Intertype
Gray Research & Dev.
Heath Co.
Koss Corp.
Precision Elect. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Revco Corporation
Schultz Inc., Albert
Singer Products Co., Inc.
Superscope Inc.
Tele Measurements Inc.
Telex Communications Division
Tri-Tronics
Wilkinson Elect. Inc.

Amplifier, Bridging

Ameco Inc.
American Data Corp.
Anaconda Electronics
Arbor Systems Inc.
Atlantic Research
Audio Designs & Mfg.
CATV Equipment Co.
C Cor Electronics
Collins Radio Company Broadcasting
Marketing,
Computer Image Corp.
Delta Electronics Inc. (N.C.)
Delta Electronics Inc. (Va.)
Denrad Mfg. Co. Inc.
Dynair Electronics, Inc.
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Interntl. Nuclear Corp.
JFD Electronics Co. Systems Division
Katona Electronics Co.
Langevin An MCA Technology
Company
McMartin Industries Inc.
RCA Broadcast Equipment
Communications Systems Div.
Rust Corp.
Singer Products Co., Inc.
Spectra Sonics
Spencer-Kennedy Labs., Inc.
TelComp Division Television and
Computer Corp.
Ultra Audio Products
Universal Audio Inc.
Vikoa Inc.
Ward Electronic Indus.
Wilkinson Elect. Inc.

Amplifier, Clamping

Alma Engineering Inc.
American Data Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Bell & Howell Consumer Products
Group
Dynair Electronics, Inc.
Grass Valley Group, Inc.
Interntl. Nuclear Corp.
Marconi Electronics Inc.
Melcor Electronics Corp.
Raytheon Co.
RCA Broadcast Equipment
Communications Systems Div.
Riker Information Systems Inc.
Teletel Co.

Broadcast Buyer's Guide Section

Videon Corp.
Vital Industries

Amplifier, DC

American Data Corp.
Bauer (See Sparta)
Crown International
GE Electronic Components Sales Dept.
Hewlett Packard Co.
Honeywell Inc. Test Instruments Div.
Langevin An MCA Technology Company
Lectronic Res. Labs. Inc.
Melcor Electronics Corp.
Moseley Assoc. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Rust Corp.
Videon Corp.

Amplifier, Distribution

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Alcor Inc.
Alma Engineering Inc.
Ameco Inc.
American Data Corp.
Anaconda Electronics
Applied Elect. Mechanics
Atlantic Research
Audio Designs & Mfg.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Bell P/A Prod. Corp.
Blonder-Tongue Labs.
Bradford Information Systems
Broadcast Electronics
Broadcast Prod. Co. Inc. Bcst. Division
Canoga Elect. Co.
CATV Equipment Co.
C Cor Electronics
Central Dynamics Corp.
Cleveland Electronics, Inc.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Collins Radio Company Broadcasting
Marketing,
Delta Electronics Inc. (N.C.)
Delta Electronics Inc. (Va.)
Dynair Electronics, Inc.
Dynamics Corp.
Electrodyne Div. of MCA Technology, Inc.
Fairchild Sound Equip. Co.
Gately Electronics
GBC CCTV
Grass Valley Group, Inc.
Internatl. Nuclear Corp.
Javelin Electronics Co.
Jerrold Electronics Corp. CATV Systems Div.
Kaiser CATV Division Kaiser Aerospace & Electronics Corp.
Katona Electronics Co.
Langevin An MCA Technology Company
Low Power Broadcast Co.
Marconi Electronics Inc.
McCurdy Radio Ind. Inc.
Melcor Electronics Corp.
North Amer. Philips
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Pruzan Co.
RCA Broadcast Equipment
Communications Systems Div.
Riker Information Systems Inc.
Rohde & Schwarz Sales
Sarkes Tarzian Inc. Broadcast Equipment Div.
Shibaden Corp. of America
Shintron Co. Inc.
Singer Products Co., Inc.
Spectra Sonics
Spencer-Kennedy Labs., Inc.
Spotmaster Broadcast Electronics
TeleMaton, Inc.
Telemet Co.
TV Cable Supply Co.

Videon Corp.
Visual Communication Products Oper.
General Electric Co.
Vital Industries
Ward Electronic Indus.
Wilkinson Elect. Inc.

Amplifier, Keying

American Data Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Central Dynamics Corp.
Grass Valley Group, Inc.
RCA Broadcast Equipment
Communications Systems Div.
Riker Information Systems Inc.
Shintron Co. Inc.
Video Devices Co.
Videon Corp.

Amplifier, Line

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Wilkinson Elect. Inc.

Amplifier, Masking

CBS Labs
RCA Broadcast Equipment
Communications Systems Div.
Riker Information Systems Inc.
Tele Measurements Inc.
Videon Corp.

Amplifier, Monitor

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Wilkinson Elect. Inc. 7

Crown International
Wilkinson Elect. Inc.

Amplifier, Pulse

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American Data Corp. 61
Acrodyne Industries
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American Data Corp.
Applied Elect. Mechanics
Applied Video Electronics, Inc.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
C Cor Electronics
Central Dynamics Corp.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Dynair Electronics, Inc.
Dynamics Corp.
GE Electronic Components Sales Dept.
Grass Valley Group, Inc.
Hewlett Packard Co.
Internatl. Nuclear Corp.
Kay Elemetrics Corp.
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Richmond Hill Laboratories Inc.
Riker Information Systems Inc.
Sarkes Tarzian Inc. Broadcast Equipment Div.
TeleMaton, Inc.
Tele Measurements Inc.
Telemet Co.
Videon Corp.
Viscount Video Systems Ltd.
Ward Electronic Indus.

Amplifier, RF, General Purpose

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National Electrolab Assoc. Ltd. 68
Ameco Inc.

American Electronics Lab., Inc.
Belar Electronics Lab., Inc.
Blonder-Tongue Labs.
CCA Electronics
C Cor Electronics
Collins Radio Company Broadcasting
Marketing,
ENTRON INC.
GE Electronic Components Sales Dept.
Hewlett Packard Co.
Integral Data Devices Inc.
Katona Electronics Co.
Kay Elemetrics Corp.
Lectronic Res. Labs. Inc.
McMartin Industries Inc.
Microwave Assoc. Inc.
National Electrolab Assoc. Ltd.
RCA Broadcast Equipment
Communications Systems Div.
RHG Elect Labs, Inc.
Rodelco
Rust Corp.
Singer Co., The Los Angeles Operation
Singer Products Co., Inc.
Soladyne International
Television Technology Corp.
TV Cable Supply Co.
Vikoa Inc.
Wilkinson Elect. Inc.

Amplifier, RF, Peak Limiting

Belar Electronics Lab., Inc.
Gates Division of Harris-Intertype
Magnatech Co.
Microwave Assoc. Inc.
RHG Elect Labs, Inc.

Amplifier, RF, Power

American Electronics Lab., Inc.
Bauer (See Sparta)
Belar Electronics Lab., Inc.
CCA Electronics
C Cor Electronics
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs. of Resalab, Inc.
Eimac Div. Varian Associates
Electronics, Missiles & Communications
Gates Division of Harris-Intertype
Hewlett Packard Co.
Kay Elemetrics Corp.
Lectronic Res. Labs. Inc.
Low Power Broadcast Co.
Microdot Inc.
Microwave Assoc. Inc.
National Electrolab Assoc. Ltd.
RCA Broadcast Equipment
Communications Systems Div.
RHG Elect Labs, Inc.
Singer Products Co., Inc.
Television Technology Corp.
Visual Communication Products Oper.
General Electric Co.
Wilkinson Elect. Inc.

Amplifier, Remote

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Wilkinson Elect. Inc. 7
Wilkinson Elect. Inc.

Amplifier, Sensing

Applied Elect. Mechanics
Broadcast Prod. Co. Inc. Bcst. Division
CYBRIX CORPORATION
Riker Information Systems Inc.
Tele Measurements Inc.
Ward Electronic Indus.

Amplifier, Stabilizing

American Data Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Central Dynamics Corp.
Dynamics Corp.
General Radio Co.

Grass Valley Group, Inc.
Internatl. Nuclear Corp.
Marconi Electronics Inc.
Mincom Div. 3M Co.
RCA Broadcast Equipment
Communications Systems Div.
Riker Information Systems Inc.
Telemet Co.
Videon Corp.
Vital Industries
Ward Electronic Indus.

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Wilkinson Elect. Inc.

Amplifier, Stereo Limiter

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Wilkinson Elect. Inc. 7

Wilkinson Elect. Inc.

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American Data Corp. 61

Acrodyne Industries
Alcor Inc.
Alma Engineering Inc.
American Data Corp.
American Pamcor
Andersen Labs Inc.
Applied Elect. Mechanics
Applied Video Electronics, Inc.
AVA Elect. & Machine Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Blonder-Tongue Labs.
Cascade Electronics
Catal Corp., The
C Cor Electronics
Central Dynamics Corp.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Delta Electronics Inc. (N.C.)
Dynair Electronics, Inc.
Dynamics Corp.
Fung Engineering Co.
GBC CCTV
Grass Valley Group, Inc.
Ikegami Co. Ltd.
Integral Data Devices Inc.
Internatl. Nuclear Corp.
JFD Electronics Co. Systems Division
Kay Elemetrics Corp.
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Raytheon Co.
RCA Broadcast Equipment
Communications Systems Div.
Richmond Hill Laboratories Inc.
Riker Information Systems Inc.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Shintron Co. Inc.
Singer Products Co., Inc.
Spencer-Kennedy Labs., Inc.
TELE-CLINE INC.
Videon Corp.
Viscount Video Systems Ltd.
Visual Communication Products Oper.
General Electric Co.
Visual Educom Inc.
Vital Industries
Ward Electronic Indus.

Amplifier, Video, Sweep

Applied Video Electronics, Inc.
C Cor Electronics
Kay Elemetrics Corp.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
RCA Broadcast Equipment
Communications Systems Div.
SIMEX/COAST NAVIGATION SCHOOL

Analyzers, Distortion

Atlantic Research
B & K Dynascan Corp.
Barker & Williamson, Inc.
Collins Radio Company Broadcasting Marketing
General Radio Co.
Heath co.
Hewlett Packard Co.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Rank Precision Ind. Broadcast Div.
RCA Broadcast Equipment Communications Systems Div.
Shibaden Corp. of America
Tektronix Inc.
Television Equipment Assoc.
Time & Frequency Tech., Inc.

Analyzers, Harmonic

General Radio Co.
Hewlett Packard Co.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Microm Inc.
RCA Broadcast Equipment Communications Systems Div.
Rohde & Schwarz Sales
Tektronix Inc.

Analyzers, Intermodulation

Crown International
Heath co.
Marconi Electronics Inc.
Rohde & Schwarz Sales
Tektronix Inc.

Analyzers, Noise

B & K Dynascan Corp.
General Microwave Corp.
Shibaden Corp. of America

Analyzers, Sideband

B & K Instruments Inc.
Central Dynamics Corp.
Dynair Electronics, Inc.
Marconi Electronics Inc.
Marconi Instruments
RCA Broadcast Equipment Communications Systems Div.
Rohde & Schwarz Sales
Singer Co., The Los Angeles Operation
Ward Electronic Indus.

Analyzers, Spectrum

Anaconda Electronics
B & K Dynascan Corp.
General Radio Co.
Heath co.
Hewlett Packard Co.
Jerrold Electronics Corp. CATV Systems Div.
Kay Elemetrics Corp.
Marconi Electronics Inc.
Marconi Instruments
RCA Broadcast Equipment Communications Systems Div.
Rohde & Schwarz Sales
Singer Co., The Los Angeles Operation
Spencer-Kennedy Labs., Inc.
Tektronix Inc.
Texscan Corp.

Analyzers, Video

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American Data Corp. 61

American Data Corp.
B & K Dynascan Corp.
Central Dynamics Corp.
Colorado Video Inc.
RCA Broadcast Equipment Communications Systems Div.

Rohde & Schwarz Sales
Shibaden Corp. of America
Spencer-Kennedy Labs., Inc.
Tektronix Inc.

Antenna, Dummy Load

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Bird Electronic Corp. 81

Bird Electronic Corp.

Antennas, Receiving, LF

Andrews Towers Inc.
Delta Electronics Inc. (Va.)
Honeywell Inc. Test Instruments Div.
Singer Co., The Los Angeles Operation
TACO Technical Appliance Corp. A General Instrument Co.

Antennas, Receiving, MF

Delta Electronics Inc. (Va.)
Gulf Telephone & Electronics
Singer Co., The Los Angeles Operation
Singer Products Co., Inc.
TACO Technical Appliance Corp. A General Instrument Co.
Wilkinson Elect. Inc.

Antennas, Receiving, VHF

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Scala Radio Corp. 41

Ameco Inc.
American Electronics Lab., Inc.
American Pamcor
Andrew Corp.
CATV Equipment Co.
Columbia Electronic Cbl. Electronics, Missiles & Communications
G.C. Electronics
Honeywell Inc. Test Instruments Div.
Jerrold Electronics Corp. CATV Systems Div.
Lectronic Res. Labs. Inc.
McMartin Industries Inc.
Phelps Dodge Communications Co. Div. Phelps Dodge Copper Products Corp.
Prodfin Inc.
Pruzan Co.
Quad-Eight Electronics
R. F. Systems
Riker Communications Inc.
Rohde & Schwarz Sales
Scala Radio Corp.
Singer Co., The Los Angeles Operation
Singer Products Co., Inc.
Sitco Antenna Co.
TACO Technical Appliance Corp. A General Instrument Co.
TV Cable Supply Co.
Wilkinson Elect. Inc.

Antennas, Receiving, UHF

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Scala Radio Corp. 41

Ameco Inc.
American Electronics Lab., Inc.
American Pamcor
Andrew Corp.
Columbia Electronic Cbl. Electronics, Missiles & Communications
G.C. Electronics
Honeywell Inc. Test Instruments Div.
Jerrold Electronics Corp. CATV Systems Div.
Lectronic Res. Labs. Inc.
Phelps Dodge Communications Co. Div. Phelps Dodge Copper Products Corp.
Prodfin Inc.
R. F. Systems
Riker Communications Inc.

Rohde & Schwarz Sales
Scala Radio Corp.
Singer Co., The Los Angeles Operation
Sitco Antenna Co.
TACO Technical Appliance Corp. A General Instrument Co.
TV Cable Supply Co.

Antennas, Receiving, Microwave

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Scala Radio Corp. 41

Andrew Corp.
Lectronic Res. Labs. Inc.
Narda Microwave Corp., The Prodfin Inc.
Rank Precision Ind. Broadcast Div.
R. F. Systems
Scala Radio Corp.
Singer Co., The Los Angeles Operation
TACO Technical Appliance Corp. A General Instrument Co.

Antennas, Remote Indicator

Potomac Instruments, Inc.

Antennas, Remote Pickup

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Scala Radio Corp. 41

Andrew Corp.
Andrews Towers Inc.
Gates Division of Harris-Intertype
Phelps Dodge Communications Co.
Phelps Dodge Communications Co. Div. Phelps Dodge Copper Products Corp.
R. F. Systems
Scala Radio Corp.
TACO Technical Appliance Corp. A General Instrument Co.

Antennas, Transmitting, FM

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Jampro Antenna Co. 38
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Jampro Antenna Co.
Scala Radio Corp.

Antennas, Transmitting, LF

Andrews Towers Inc.
Continental Electronics Mfg. Co. Subs. of Resalab, Inc.
Delta Electronics Inc. (Va.)
Jampro Antenna Co.
TACO Technical Appliance Corp. A General Instrument Co.

Antennas, Transmitting, MF

Andrews Towers Inc.
Collins Radio Company Broadcasting Marketing
Continental Electronics Mfg. Co. Subs. of Resalab, Inc.
Delta Electronics Inc. (Va.)
Gates Division of Harris-Intertype
Gulf Telephone & Electronics
Jampro Antenna Co.
RCA Broadcast Equipment Communications Systems Div.
Singer Products Co., Inc.
TACO Technical Appliance Corp. A General Instrument Co.
Wilkinson Elect. Inc.

Antennas, Transmitting, VHF

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Scala Radio Corp. 41

Alford Mfg. Co.
Ampex Corp.
Andrew Corp.

CCA Electronics
Collins Radio Company Broadcasting Marketing
Electronics, Missiles & Communications
Gates Division of Harris-Intertype
Jampro Antenna Co.
Lectronic Res. Labs. Inc.
Micro Communications, Inc.
Permadyne Electronics Corp.
Phelps Dodge Communications Co. Div. Phelps Dodge Copper Products Corp.
Prodfin Inc.
RCA Broadcast Equipment Communications Systems Div.
R. F. Systems
Rohde & Schwarz Sales
Scala Radio Corp.
Singer Products Co., Inc.
Sitco Antenna Co.
TACO Technical Appliance Corp. A General Instrument Co.
Visual Communication Products Oper. General Electric Co.
Wilkinson Elect. Inc.

Antennas, Transmitting, UHF

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Scala Radio Corp. 41

Alford Mfg. Co.
Ampex Corp.
Andrew Corp.
Collins Radio Company Broadcasting Marketing
Electronics, Missiles & Communications
Gates Division of Harris-Intertype
Jampro Antenna Co.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.
Micro Communications, Inc.
Phelps Dodge Communications Co. Div. Phelps Dodge Copper Products Corp.
Prodfin Inc.
RCA Broadcast Equipment Communications Systems Div.
R. F. Systems
Rohde & Schwarz Sales
Scala Radio Corp.
Sitco Antenna Co.
TACO Technical Appliance Corp. A General Instrument Co.
Television Technology Corp.
Visual Communication Products Oper. General Electric Co.

Antennas, Transmitting, Microwave

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Andrew Corp.
Collins Radio Company Broadcasting Marketing
Gates Division of Harris-Intertype
Lectronic Res. Labs. Inc.
Microwave Assoc. Inc.
Prodfin Inc.
Rank Precision Ind. Broadcast Div.
R. F. Systems
Scala Radio Corp.
TACO Technical Appliance Corp. A General Instrument Co.

Antenna Systems

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Scala Radio Corp. 41

Admiral Corporation
Ameco Inc.
Andrew Corp.
Andrews Towers Inc.
AVA Elect. & Machine Corp.
Collins Radio Company Broadcasting Marketing

Broadcast Buyer's Guide Section

Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Delta Electronics Inc. (Va.)
ENTRON INC.
Gates Division of Harris-Intertype
Gulf Telephone & Electronics
Humphrey Electronics Inc.
Mastertone Co.
Micro Communications, Inc.
Microwave Assoc. Inc.
Multronics, Inc.
Phelps Dodge Communications Co.
Div. Phelps Dodge Copper Products
Corp.
Prodfin Inc.
RCA Broadcast Equipment
Communications Systems Div.
R. F. Systems
Riker Communications Inc.
Scala Radio Corp.
Singer Products Co., Inc.
Sitco Antenna Co.
Soll, Inc., Joseph M.
TACO Technical Appliance Corp. A
General Instrument Co.
Tri-Ex Tower Corp.
TV Cable Supply Co.
Visual Communication Products Oper.
General Electric Co.

Antenna, VSWR Indicator

CCA Electronics
Collins Radio Company Broadcasting
Marketing
Delta Electronics Inc. (Va.)
Gates Division of Harris-Intertype
Lectronic Res. Labs. Inc.
Micro Communications, Inc.
Narda Microwave Corp., The

Arms, Tone

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Broadcast Electronics 40
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Broadcast Electronics
CCA Electronics
Collins Radio Company Broadcasting
Marketing
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Gates Division of Harris-Intertype
Gray Research & Dev.
Low Power Broadcast Co.
Pruzan Co.
RCA Broadcast Equipment
Communications Systems Div.
Schultz Inc., Albert
Shure Brothers Inc.
Singer Products Co., Inc.
Spotmaster Broadcast Electronics

Attenuators, Audio

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Tech Laboratories Inc. 85

ALTEC
Arbor Systems Inc.
Atlantic Research
Audio Designs & Mfg.
Collins Radio Company Broadcasting
Marketing
Edison Electronics Div. McGraw-Edison
Company
Fairchild Sound Equip. Co.
General Radio Co.
Gotham Audio Corp.
Jensen Mfg. Div. The Muter Co.
Kay Elemetrics Corp.
Langevin An MCA Technology
Company
Leader Instruments Corp.
Marconi Instruments
Ohmite Mfg. Co.
Quad-Eight Electronics
Sennheiser Electronics
Shallco, Incorporated
Tech Laboratories Inc.
Texscan Corp.

TRW Electronic Supply Co. Div. of
TRW

Attenuators, Fixed

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Tech Laboratories Inc. 85

Collins Radio Company Broadcasting
Marketing
Edison Electronics Div. McGraw-Edison
Company
Jerrold Electronics Corp. CATV
Systems Div.
Kay Elemetrics Corp.
Langevin An MCA Technology
Company
Lectronic Res. Labs. Inc.
Narda Microwave Corp., The
RCA Broadcast Equipment
Communications Systems Div.
Riker Communications Inc.
Shallco, Incorporated
Singer Co., The Los Angeles Operation
Tech Laboratories Inc.
Texscan Corp.
Trompeter Electronics
TV Cable Supply Co.

Attenuators, Impedance Matching

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Tech Laboratories Inc. 85

Barker & Williamson, Inc.
Bell P/A Prod. Corp.
Collins Radio Company Broadcasting
Marketing
Kay Elemetrics Corp.
Ohmite Mfg. Co.
RCA Broadcast Equipment
Communications Systems Div.
Shallco, Incorporated
Tech Laboratories Inc.
Texscan Corp.

Attenuators, Microwave

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Tech Laboratories Inc. 85

American Electronics Lab., Inc.
Bell P/A Prod. Corp.
General Microwave Corp.
General Radio Co.
Hewlett Packard Co.
Kay Elemetrics Corp.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Narda Microwave Corp., The
Rank Precision Ind. Broadcast Div.
Rohde & Schwarz Sales
Singer Co., The Los Angeles Operation
Tech Laboratories Inc.
Texscan Corp.

Attenuators, RF

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Tech Laboratories Inc. 85

Ameco Inc.
American Electronics Lab., Inc.
Anaconda Electronics
AVA Elect. & Machine Corp.
Bird Electronic Corp.
Cascade Electronics
CATV Equipment Co.
Edison Electronics Div. McGraw-Edison
Company
ENTRON INC.
General Microwave Corp.
General Radio Co.
Hewlett Packard Co.
Jerrold Electronics Corp. CATV
Systems Div.
Kay Elemetrics Corp.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.

Marconi Instruments
Narda Microwave Corp., The
Riker Communications Inc.
Rohde & Schwarz Sales
Shallco, Incorporated
Singer Co., The Los Angeles Operation
Tech Laboratories Inc.
Texscan Corp.
TV Cable Supply Co.

Automation, Camera Control

Ameco Inc.
Bristol Div. of Acco
Cunningham Corp. Subs. of Gleason
Works
Fernseh GmbH c/o Robert Bosch
Corp.
Power-Optics Inc.
Rank Precision Ind. Broadcast Div.
Trepac Corp. America

Automation, Equipment Control

Bauer (See Sparta)
Broadcast Recorders
CCA Electronics
Central Dynamics Corp.
CMX Systems
CYBRIX CORPORATION
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Interntl. Good Music Inc.
Power-Optics Inc.
STEP Corporation
Tape-Athon Corp.
Trepac Corp. America
Visual Communication Products Oper.
General Electric Co.

Automation, Lighting Control

GE Electronic Components Sales Dept.
Rank Precision Ind. Broadcast Div.

Automation, Program Control

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Alto-Fonic Programming Inc.
Ameco Inc.
Arbor Systems Inc.
Broadcast Products Inc.
CCA Electronics
Central Dynamics Corp.
Collins Radio Company Broadcasting
Marketing
CYBRIX CORPORATION
Dataron Inc.
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Interntl. Good Music Inc.
Jerrold Electronics Corp. CATV
Systems Div.
Riker Information Systems Inc.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Schafer Electronics
Schafer International
Sparta Electronic Corp. (East)
STEP Corporation
Systems Marketing Corp.
Tape-Athon Corp.
Trepac Corp. America
Ultimation Systems
Visual Communication Products Oper.
General Electric Co.

Automation, Program Logging

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**CYBRIX
CORPORATION** 78

Aitken Comm. Inc.
Alto-Fonic Programming Inc.
Ampex Corp.
Broadcast Products Inc.
CCA Electronics
Central Dynamics Corp.
Collins Radio Company Broadcasting
Marketing
CYBRIX CORPORATION
Dataron Inc.
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Interntl. Good Music Inc.
Schafer Electronics
Schafer International
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
STEP Corporation
Tape-Athon Corp.
Ultimation Systems
Visual Communication Products Oper.
General Electric Co.

Automation, Projector

Grass Valley Group, Inc.
Hokushin Elect. Co.
Marconi Electronics Inc.
Spindler & Sappe, Inc.

Automation, Switching

American Data Corp.
Atlantic Research
Broadcast Products Inc.
Broadcast Recorders
Central Dynamics Corp.
Chrono-Log Corp.
CMX Systems
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Cunningham Corp. Subs. of Gleason
Works
CYBRIX CORPORATION
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Interntl. Good Music Inc.
Jerrold Electronics Corp. CATV
Systems Div.
Marconi Electronics Inc.
Schafer Electronics
STEP Corporation
Tech Laboratories Inc.
Trepac Corp. America
Visual Communication Products Oper.
General Electric Co.
Ward Electronic Indus.

Automation, Tape Control Cart

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Aitken Comm. Inc. 76

Aitken Comm. Inc.
Alto-Fonic Programming Inc.
Ampex Corp.
Broadcast Products Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
CYBRIX CORPORATION
Delta Electronics Inc. (N.C.)
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Schafer Electronics
Sparta Electronic Corp.
Sparta Electronic Corp. (East)

Automation, Tape Control Reel

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Aitken Comm. Inc. 76

Aitken Comm. Inc.
Aito-Fonic Programming Inc.
Broadcast Products Inc.
CCA Electronics
Central Dynamics Corp.
CMX Systems
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
CYBRIX CORPORATION
Gates Division of Harris-Intertype
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Schafer Electronics
Scully Recording Instruments Co.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tape-Athon Corp.
VIF International

Automation, Transmitter, Logging

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Time & Frequency Tech., Inc. 27

Moseley Assoc. Inc.
Time & Frequency Tech., Inc.

Blowers and Fans

Collins Radio Company Broadcasting
Marketing,
Dynacool Mfg. Co., Inc.

Bridge, Common Point

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Delta Electronics Inc. (Va.) 77

Collins Radio Company Broadcasting
Marketing,
Delta Electronics Inc. (Va.)

Cable, Coaxial, Flexible

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Andrew Corp. 11

Anaconda Electronics
Andrew Corp.
A-Tel-A-Matic
Bauer (See Sparta)
Belden Corp.
Boston Insulated Wire & Cable Co.
Brand-Rex Company
CATV Equipment Co.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Collins Radio Company Broadcasting
Marketing,
Columbia Electronic Cbl.
Comm-Scope Corp.
Gates Division of Harris-Intertype
G.C. Electronics
General Cable Corp.
Gulf Telephone & Electronics
Industrial Wire Products Div. Essex
International, Inc.
Jampro Antenna Co.
Javelin Electronics Co.
Jerrold Electronics Corp. CATV
Systems Div.
Lectronic Res. Labs. Inc.
Mastertone Co.
Phelps Dodge Communications Co.
Phelps Dodge Communications Co.
Div. Phelps Dodge Copper Products
Corp.
Prodfin Inc.
RCA Broadcast Equipment
Communications Systems Div.

Rome Cable Div. Cyprus Mines Co.
Saxton Prod. Inc.
Singer Products Co., Inc.
Soll, Inc., Joseph M.
Spencer-Kennedy Labs., Inc.
Times Wire and Cable Sub. of Insilco
Corp.
TV Cable Supply Co.
Vikoa Inc.

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Andrew Corp.
A-Tel-A-Matic
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CATV Equipment Co.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Collins Radio Company Broadcasting
Marketing,
Comm-Scope Corp.
Gates Division of Harris-Intertype
General Cable Corp.
Gulf Telephone & Electronics
Industrial Wire Products Div. Essex
International, Inc.
Jampro Antenna Co.
Jerrold Electronics Corp. CATV
Systems Div.
Micro Communications, Inc.
Phelps Dodge Communications Co.
Phelps Dodge Communications Co.
Div. Phelps Dodge Copper Products
Corp.
Prodfin Inc.
RCA Broadcast Equipment
Communications Systems Div.
Rome Cable Div. Cyprus Mines Co.
Soll, Inc., Joseph M.
TACO Technical Appliance Corp. A
General Instrument Co.
Television Equipment Assoc.
TV Cable Supply Co.

Cable, Direct Burial

A-Tel-A-Matic
Bauer (See Sparta)
Brand-Rex Company
CATV Equipment Co.
Collins Radio Company Broadcasting
Marketing,
Columbia Electronic Cbl.
Comm-Scope Corp.
General Cable Corp.
Gulf Telephone & Electronics
Industrial Wire Products Div. Essex
International, Inc.
Jerrold Electronics Corp. CATV
Systems Div.
Phelps Dodge Communications Co.
Phelps Dodge Communications Co.
Div. Phelps Dodge Copper Products
Corp.
Rome Cable Div. Cyprus Mines Co.
Singer Products Co., Inc.
Spencer-Kennedy Labs., Inc.
Times Wire and Cable Sub. of Insilco
Corp.
TV Cable Supply Co.
Vikoa Inc.

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Works, Inc.

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Amphenol Corp.
A-Tel-A-Matic
Bauer (See Sparta)

Belden Corp.
Birnbach Co. Inc.
Brand-Rex Company
Collins Radio Company Broadcasting
Marketing,
Columbia Electronic Cbl.
Comm-Scope Corp.
Electrodyn Div. of MCA Technology,
Inc.
Gates Division of Harris-Intertype
G.C. Electronics
General Cable Corp.
Gotham Audio Corp.
Gulf Telephone & Electronics
Industrial Wire Products Div. Essex
International, Inc.
Mastertone Co.
Nortronics Co., Inc.
RCA Broadcast Equipment
Communications Systems Div.
Saxton Prod. Inc.
Singer Products Co., Inc.
Vikoa Inc.

Calibration Service, Instrument

American Electronics Lab., Inc.
B & K Dynascan Corp.
Bird Electronic Corp.
B & K Instruments Inc.
Comm. Radio Monitoring
Eidson Electronic Co.
Honeywell Inc. Test Instruments Div.
INSTRUMENT LABORATORIES
National Electrolab Assoc. Ltd.
Potomac Instruments, Inc.
Simpson Electric Co.

Camera, Mounting Equipment

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Ameco Inc.
Behrends, Inc.
Burke & James
Cosmicar Optical Co., Ltd.
Cunningham Corp. Subs. of Gleason
Works
Diamond Power Specialty Corp.
F&B/Ceco Industries, Inc.
GBC CCTV
General Microwave Corp.
H F Photo Systems Div. Technology
Inc. (formerly: CinTel Corp.)
Innovative Television Equipment, Inc.
Javelin Electronics Co.
Jerrold Electronics Corp. CATV
Systems Div.
Listec TV Equip. Corp.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Power-Optics Inc.
Precision Lab. Precision Cine Eqpm.
Quick-Set Inc.
RCA Broadcast Equipment
Communications Systems Div.
Riker Communications Inc.
Shibaden Corp. of America
Sylvania Comm. Electronic
TELE-CLINE INC.
Teledyne Camera Systems
TeleMation, Inc.
Telequip Corp.
Television Equipment Assoc.
Vikoa Inc.
Zoomar Inc.

Camera, Remote (Control Equipment)

Bristol Div. of Acco
Cunningham Corp. Subs. of Gleason
Works
Diamond Power Specialty Corp.
F&B/Ceco Industries, Inc.
GBC CCTV
Ikegami Co. Ltd.
Jerrold Electronics Corp. CATV
Systems Div.
Listec TV Equip. Corp.
Moseley Assoc. Inc.

Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Power-Optics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Shibaden Corp. of America
Sylvania Comm. Electronic
TELE-CLINE INC.
TeleMation, Inc.
Tele Measurements Inc.
Tracor Ind. Inst. Div.
Trepac Corp. America

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Behrends, Inc.
Canon USA, Inc.
Cohu Electronics Inc. San Diego Div.
Eastman Kodak Co.
Fairchild Industrial
F&B/Ceco Industries, Inc.
GAF Corp.
North Amer. Philips
Paillard Incorporated
Precision Lab. Precision Cine Eqpm.
RCA Broadcast Equipment
Communications Systems Div.
Teledyne Camera Systems
TeleMation, Inc.
Tyler R. H. Co., CATV Div.

Cameras, Film, Still

Burke & James
Eastman Kodak Co.
GAF Corp.
North Amer. Philips
Paillard Incorporated
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RCA Broadcast Equipment
Communications Systems Div.
Tyler R. H. Co., CATV Div.

Cameras, Image Motion Compensation

Dynasciences Corp.
GBC CCTV
GPL Div. Singer Gen.

Cameras, TV, B&W Portable Broadcast

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CATV Equipment Co.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Denson Electronic Corp.
Fernseh GmbH c/o Robert Bosch
Corp.
International Video
K'SON Corporation
Lerro Electrical Corp.
MTI Div KMS Industries
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of
America
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Riker Information Systems Inc.
Sony Corp. of America
TeleMation, Inc.
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.
Visual Communication Products Oper.
General Electric Co.

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Ameco Inc.
Ampex Corp.
CHESTER ELECTRONIC LABS., INC.
GTE Information Systems Inc.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Denson Electronic Corp.
Fernseh GmbH c/o Robert Bosch Corp.
GBC CCTV
GPL Div. Singer Gen.
International Video
K'SON Corporation
Lerro Electrical Corp.
Marconi Electronics Inc.
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of America
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Sony Corp. of America
TeleMation, Inc.
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.
Visual Communication Products Oper.
General Electric Co.
Visual Educom Inc.

Cameras, TV, Color Portable Broadcast

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Ampex Corp.
Commercial Elect.
Fernseh GmbH c/o Robert Bosch Corp.
GBC CCTV
GPL Div. Singer Gen.
International Video
Lerro Electrical Corp.
Mincom Div. 3M Co.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
TeleMation, Inc.
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.
Visual Communication Products Oper.
General Electric Co.

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Marconi Electronics Inc.
Mincom Div. 3M Co.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Soll, Inc., Joseph M.
TeleMation, Inc.
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.

Visual Communication Products Oper.
General Electric Co.
Visual Electronics Corp. 356 W. 40th

Cameras, TV Remote Control Broadcast

Commercial Elect.
Fernseh GmbH c/o Robert Bosch Corp.
International Video
Lerro Electrical Corp.
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
TeleMation, Inc.
Tele Measurements Inc.
Visual Communication Products Oper.
General Electric Co.

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Admiral Corporation
Ameco Inc.
A-Tel-A-Matic
ATV Research
Audiotronics Corp.
CATV Equipment Co.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Colorado Video Inc.
Concord Elect. Corp.
Denson Electronic Corp.
Diamond Power Speciality Corp.
GBC CCTV
GPL Div. Singer Gen.
Gulf Telephone & Electronics
International Video
Javelin Electronics Co.
Jerold Electronics Corp. CATV Systems Div.
K'SON Corporation
Lerro Electrical Corp.
Link Division The Singer Company
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of America
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Riker Communications Inc.
Riker Information Systems Inc.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Sony Corp. of America
TeleMation, Inc.
Tele Measurements Inc.
Teltron, Inc.
Tyler R. H. Co., CATV Div.
Visual Communication Products Oper.
General Electric Co.
Visual Educom Inc.
Westinghouse Elec. Co. Electric Tube Div.
Westinghouse Electric Corp.

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Ameco Inc.
Ampex Corp.
Audiotronics Corp.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Commercial Elect.
Denson Electronic Corp.
Fernseh GmbH c/o Robert Bosch Corp.
GBC CCTV
GPL Div. Singer Gen.
International Video
Javelin Electronics Co.
K'SON Corporation
Lerro Electrical Corp.

Link Division The Singer Company
Mincom Div. 3M Co.
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of America
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Sony Corp. of America
TeleMation, Inc.
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.
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General Electric Co.
Westinghouse Elec. Co. Electric Tube Div.

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Afga-Gevaert Inc.
Allied Electronics Subs. of Tandy Corp.
Ampro Corp.
Audio Devices, Inc.
Broadcast Electronics
Broadcast Products Inc.
CCA Electronics
Cine Sonic Sound Inc.
Collins Radio Company Broadcasting Marketing.
Gates Division of Harris-Intertype
Interntl. Good Music Inc.
Interntl. Tapetronics Corp.
Joa Cartridge Service
Lerro Electrical Corp.
MaCarta
Magnatech Co.
Magnetic Prod. Div. 3M Company
Marathon Broadcast Equip.
Mastertone Co.
RCA Broadcast Equipment Communications Systems Div.
Schultz Inc., Albert
Scovill Div. Auricord
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Spotmaster Broadcast Electronics
Tapecaster
Telepro industries
Telex Communications Division

Cartridges, Phono

Bourns Inc.
Broadcast Electronics
CCA Electronics
Collins Radio Company Broadcasting Marketing.
Electro-Voice Inc.
Schultz Inc., Albert
Shure Brothers Inc.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Stanton Magnetics Inc.

Cartridges, Recording Services

Interntl. Good Music Inc.
Schultz Inc., Albert
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Color Correction Equipment

Ball Bros. Research Corp. Ball Bros. Research Corp. Miratel Division
CBS Labs
Fernseh GmbH c/o Robert Bosch Corp.
Lerro Electrical Corp.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Rank Cintel Rank Precision Industries LTD, Broadcast Division
Rank Precision Ind. Broadcast Div.
Riker Communications Inc.
Television Equipment Assoc.

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Gates Division of Harris-Intertype
Interntl. Good Music Inc.
Interntl. Tapetronics Corp.
Joa Cartridge Service
MacKenzie Labs., Inc.
McCurdy Radio Ind. Inc.
Schafer Electronics
Schultz Inc., Albert
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Spotmaster Broadcast Electronics
Television Equipment Assoc.
Telex Communications Division
Tri-Tronics
Visual Electronics Corp. 356 W. 40th

Cartridge Machine, Dual Deck

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Alto-Fonic Programming Inc.
Broadcast Products Inc.
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Cine Sonic Sound Inc.
Collins Radio Company Broadcasting Marketing.
Interntl. Tapetronics Corp.
Joa Cartridge Service
MacKenzie Labs., Inc.
McCurdy Radio Ind. Inc.
Schafer Electronics
Schultz Inc., Albert
Singer Products Co., Inc.
Sono-Mag. Corp.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Spotmaster Broadcast Electronics
Systems Marketing Corp.
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Visual Electronics Corp. 356 W. 40th

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CCA Electronics
Cine Sonic Sound Inc.

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Interntl. Tapetronics Corp.
Joa Cartridge Service
MacKenzie Labs., Inc.
Schultz Inc., Albert
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
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Television Equipment Assoc.
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Cine Sonic Sound Inc.
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Schafer Electronics
Singer Products Co., Inc.
Sono-Mag. Corp.
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Sparta Electronic Corp. (East)
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Marathon Broadcast Equip.

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CBS Labs
Central Dynamics Corp.
Cooke Engineering Co.
Datavision, Inc.
Electronic Engineering Co. of California
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Television Presentations, Inc.
Video Devices Co.
VIF International
Visual Electronics Corp. 356 W. 40th

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Broadcast Products Inc.
Bulova American Time Products
Chrono-Log Corp.
Cooke Engineering Co.
CYBRIX CORPORATION
Dataron Inc.
Electrodyne Div. of MCA Technology, Inc.
Interntl. Good Music Inc.
Langevin An MCA Technology Company
Logiconcepts, Inc.
MCA Technology, Inc.
Racine & Co., Inc., Jules
Riker Information Systems Inc.
Sono-Mag. Corp.
Systems Marketing Corp.
TelComp Division Television and Computer Corp.
Time & Frequency Tech., Inc.
Video Devices Co.
Visual Electronics Corp. 356 W. 40th

Communication Systems, Land Mobile

American Geloso Electronics
Andrew Corp.
Andrews Towers Inc.
Atlantic Research
CCA Electronics
General Electric Co. Mobile Radio Dept.
Miles Reproducer Co.
Phelps Dodge Communications Co.
Scintrex Inc. Communications Div.
Singer Products Co., Inc.

Communication Systems, Microwave

Acrodyne Industries
Alcor Inc.
Andrew Corp.
Andrews Towers Inc.
GTE Lenkurt Incorporated
Moseley Assoc. Inc.
Phelps Dodge Communications Co.
Raytheon Co.
RHG Elect Labs, Inc.
Soladyne International
Tele Measurements Inc.
Varian Solid State Div. Micro-Link Products

Communication Systems, Multiplex

Catel Corp., The
GTE Lenkurt Incorporated
Moseley Assoc. Inc.
Raytheon Co.
Singer Products Co., Inc.

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Andrews Towers Inc.
Bauer (See Sparta)
CCA Electronics
Comm-Scope Corp.
David Clark Co., Inc.
GTE Lenkurt Incorporated
Microwave Assoc. Inc.
Moseley Assoc. Inc.
Phelps Dodge Communications Co.
RHG Elect Labs, Inc.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Singer Products Co., Inc.
Soladyne International

Tele Measurements Inc.
Trepac Corp. America
Varian Solid State Div. Micro-Link Products

Communication Systems, Teleprinter

Atlantic Research
Broadcast Products Inc.
CYBRIX CORPORATION
GTE Lenkurt Incorporated
Humphrey Electronics Inc.
Singer Products Co., Inc.
Trepac Corp. America

Computer Equipment

Central Dynamics Corp.
Compu/Net, Inc.
CYBRIX CORPORATION
Data Disc Inc.
Datavision, Inc.
Grass Valley Group, Inc.
Hewlett Packard Co.
Humphrey Electronics Inc.
Raytheon Co.
Schafer Electronics
STEP Corporation
Visual Communication Products Oper.
General Electric Co.

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Arbor Systems Inc.
Audio Designs & Mfg.
Broadcast Recorders
CCA Electronics
Collins Radio Company Broadcasting Marketing.
Contel Mfg. Div. of Continental Electronic Wholesale Corp.
Delta Electronics Inc. (Va.)
Electrodyne Div. of MCA Technology, Inc.

Fairchild Sound Equip. Co.
Gately Electronics
Gates Division of Harris-Intertype
Gotham Audio Corp.
Granger Assoc.
Ikegami Co. Ltd.
Interntl. Good Music Inc.
Langevin An MCA Technology Company
Low Power Broadcast Co.
MCA Technology, Inc.
McCurdy Radio Ind. Inc.
McMartin Industries Inc.
Orbit Radio and Video
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Rupert Neve & Co. Ltd.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Spectra Sonics
Spotmaster Broadcast Electronics
TelComp Division Television and Computer Corp.
Telectro Systems Corp.
Tele Measurements Inc.
Tri-Tronics
Ultra Audio Products
United Radio Supply Inc.
Universal Audio Inc.
Visual Communication Products Oper.
General Electric Co.
Visual Electronics Corp. 356 W. 40th

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Wilkinson Elect. Inc.

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Fairchild Sound Equip. Co.
Gately Electronics
Gates Division of Harris-Intertype
Gotham Audio Corp.
Ikegami Co. Ltd.
Langevin An MCA Technology Company
Low Power Broadcast Co.
MCA Technology, Inc.
McCurdy Radio Ind. Inc.
McMartin Industries Inc.
Orbit Radio and Video
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Rupert Neve & Co. Ltd.
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Sparta Electronic Corp. (East)
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Central Dynamics Corp.
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Electrodyne Div. of MCA Technology, Inc.
Fairchild Sound Equip. Co.
Gately Electronics
Gates Division of Harris-Intertype
Gotham Audio Corp.
Langevin An MCA Technology Company
Low Power Broadcast Co.
McCurdy Radio Ind. Inc.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Rupert Neve & Co. Ltd.
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Sparta Electronic Corp.
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 Arbor Systems Inc.
 Audio Designs & Mfg.
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 Broadcast Recorders
 CCA Electronics
 Central Dynamics Corp.
 Collins Radio Company Broadcasting Marketing,
 Elektromesstechnik E M T Wilhelm
 Franz G M B H
 Electrodyne Div. of MCA Technology, Inc.
 Fairchild Sound Equip. Co.
 Gately Electronics
 Gates Division of Harris-Intertype
 Gotham Audio Corp.
 Interntl. Good Music Inc.
 Lang Electronics Inc.
 Langevin An MCA Technology Company
 Low Power Broadcast Co.
 McCurdy Radio Ind. Inc.
 McMartin Industries Inc.
 Nemo Recording Labs
 North Amer. Philips
 Orbit Radio and Video
 Philips Broadcast Equipment Corp.
 Audio-Video Systems Div.
 Philips Broadcast Equipment Corp.
 Subs. North American Philips Corp.
 Quad-Eight Electronics
 Rupert Neve & Co. Ltd.
 Singer Products Co., Inc.
 Sparta Electronic Corp.
 Sparta Electronic Corp. (East)
 Spectra Sonics
 TelComp Division Television and Computer Corp.
 Telectro Systems Corp.
 Television Equipment Assoc.
 Ultra Audio Products
 United Radio Supply Inc.
 Visual Communication Products Oper.
 General Electric Co.
 Ward Electronic Indus.
 Wilkinson Elect. Inc.

Console, Audio, TV

Alcor Inc.
 Ancha Electronics Inc.
 Audio Designs & Mfg.
 Bradford Information Systems
 Broadcast Recorders
 Central Dynamics Corp.
 Collins Radio Company Broadcasting Marketing,
 Delta Electronics Inc. (Va.)
 Electrodyne Div. of MCA Technology, Inc.
 Fairchild Sound Equip. Co.
 Gately Electronics
 Gates Division of Harris-Intertype
 GBC CCTV
 Gotham Audio Corp.
 GPL Div. Singer Gen.
 Ikegami Co. Ltd.
 Interntl. Good Music Inc.
 Interntl. Nuclear Corp.
 Lang Electronics Inc.
 Langevin An MCA Technology Company
 Marconi Electronics Inc.
 McCurdy Radio Ind. Inc.
 McMartin Industries Inc.
 Orbit Radio and Video
 Philips Broadcast Equipment Corp.
 Subs. North American Philips Corp.

Rank Precision Ind. Broadcast Div.
 RCA Broadcast Equipment
 Communications Systems Div.
 Rupert Neve & Co. Ltd.
 Sarks Tarzian Inc. Broadcast Equipment Div.
 Shibaden Corp. of America
 Singer Products Co., Inc.
 Sparta Electronic Corp.
 Sparta Electronic Corp. (East)
 Spectra Sonics
 Spotmaster Broadcast Electronics
 TelComp Division Television and Computer Corp.
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 Wilkinson Elect. Inc.

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 Ampex Corp.
 Audiotronics Corp.
 Ball Bros. Research Corp. Ball Bros.
 Research Corp. Miratel Division
 Central Dynamics Corp.
 Commercial Elect.
 GBC CCTV
 Interntl. Nuclear Corp.
 Jerrold Electronics Corp. CATV Systems Div.
 Lerro Electrical Corp.
 Link Division The Singer Company
 Philips Broadcast Equipment Corp.
 Subs. North American Philips Corp.
 Richmond Hill Laboratories Inc.
 Riker Information Systems Inc.
 Sarks Tarzian Inc. Broadcast Equipment Div.
 Shibaden Corp. of America
 Shintron Co. Inc.
 Tyler R. H. Co., CATV Div.
 Viscount Video Systems Ltd.
 Ward Electronic Indus.

Console, Video, Studio

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 Ball Bros. Research Corp. Ball Bros.
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 Central Dynamics Corp.
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 GTE Information Systems Inc.
 Concord Elect. Corp.
 GBC CCTV
 GPL Div. Singer Gen.
 Grass Valley Group, Inc.
 Interntl. Nuclear Corp.
 Jerrold Electronics Corp. CATV Systems Div.
 Marconi Electronics Inc.
 Mobile Color, Inc.
 Philips Broadcast Equipment Corp.
 Subs. North American Philips Corp.
 Rank Precision Ind. Broadcast Div.
 RCA Broadcast Equipment
 Communications Systems Div.

Richmond Hill Laboratories Inc.
 Riker Communications Inc.
 Riker Information Systems Inc.
 Sarks Tarzian Inc. Broadcast Equipment Div.
 Shibaden Corp. of America
 Singer Products Co., Inc.
 Sylvania Comm. Electronic
 Tyler R. H. Co., CATV Div.
 Universal Audio Inc.
 Viscount Video Systems Ltd.
 Visual Communication Products Oper.
 General Electric Co.
 Ward Electronic Indus.

Converters

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AEL Communications Corp., Subs. 33

AEL Communications Corp., Subs.
 American Electronics Labs., Inc.
 Andersen Labs Inc.
 Berkey-Colortran Inc.
 Bristol Div. of Acco
 Canoga Elect. Co.
 Catel Corp., The
 CATV Equipment Co.
 C Cor Electronics
 GE Electronic Components Sales Dept.
 Honeywell Inc. Test Instruments Div.
 Jerrold Electronics Corp. CATV Systems Div.
 K'SON Corporation
 Lectronic Res. Labs. Inc.
 Riker Communications Inc.
 TV Cable Supply Co.
 Varian Solid State Div. Micro-Link Products
 Westinghouse Electric Corp.

Counters, Frequency

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Monsanto Company 21

Collins Radio Company Broadcasting Marketing,
 Engineering Assoc.
 GE Electronic Components Sales Dept.
 General Radio Co.
 Heath co.
 Hewlett Packard Co.
 Hickok Elect. Instrument
 Honeywell Inc. Test Instruments Div.
 Humphrey Electronics Inc.
 ITT-METRIX
 Kay Elemetrics Corp.
 Leader Instruments Corp.
 Lectronic Res. Labs. Inc.
 Marconi Instruments
 McMartin Industries Inc.
 Monsanto Company
 N. E. Electronics Corp.
 Simpson Electric Co.
 Tektronix Inc.
 Time & Frequency Tech., Inc.

Decoder, Four Channel Stereo

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Electro-Voice Inc. Cover 3

Electro-Voice Inc.

Delay Lines

Allen Avionics Inc.
 Andersen Labs Inc.
 Cook Electric Co.
 Dynasciences Corp.
 Edison Electronics Div. McGraw-Edison Company
 General Microwave Corp.
 Gotham Audio Corp.
 Kappa Networks
 Lectronic Res. Labs. Inc.
 Phelps Dodge Communications Co.
 Television Equipment Assoc.
 Times Wire and Cable Sub. of Insilco Corp.

Demagnetizers, Bulk Tape

Bauer (See Sparta)
 Behrends, Inc.
 G.C. Electronics
 Hewlett Packard Co.
 Minnesota Mining & Mfg. Co.
 Orbit Radio and Video
 Scully Recording Instruments Co.
 Shalco, Incorporated
 Spotmaster Broadcast Electronics
 Tri-Tronics

Demodulators

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Dynair Electronics, Inc. 32
SC Electronics, Inc. 5

Ameco Inc.
 Belar Electronics Lab., Inc.
 Collins Radio Company Broadcasting Marketing,
 Dynair Electronics, Inc.
 Fung Engineering Co.
 Jerrold Electronics Corp. CATV Systems Div.
 Kahn Research Lab. Inc.
 RHG Elect Labs, Inc.
 Rohde & Schwarz Sales
 SC Electronics, Inc. Subs. of
 Audiotronics Corp.
 Telemet Co.
 Ward Electronic Indus.

Detectors, RF

Alford Mfg. Co.
 Bauer (See Sparta)
 Bird Electronic Corp.
 Blonder-Tongue Labs.
 General Microwave Corp.
 Jerrold Electronics Corp. CATV Systems Div.
 Kay Elemetrics Corp.
 Lectronic Res. Labs. Inc.
 Microwave Assoc. Inc.
 Narda Microwave Corp., The
 Solitron Devices Inc.
 Television Technology Corp.
 Telonic Instruments
 Texscan Corp.
 Thomson-CSF Electron Tubes
 TV Cable Supply Co.

Detectors, Microwave

American Electronics Lab., Inc.
 GE Electronic Components Sales Dept.
 General Microwave Corp.
 General Radio Co.
 Hewlett Packard Co.
 Lectronic Res. Labs. Inc.
 Microlab
 Microwave Assoc. Inc.
 Narda Microwave Corp., The
 Solitron Devices Inc.
 Sylvania Semiconductor
 Texscan Corp.
 Thomson-CSF Electron Tubes

Detectors, Standing Wave

Bird Electronic Corp.
 Collins Radio Company Broadcasting Marketing,
 General Microwave Corp.
 Lectronic Res. Labs. Inc.
 Micro Communications, Inc.
 Narda Microwave Corp., The
 R. F. Systems
 Rohde & Schwarz Sales
 Texscan Corp.

Diplexers

Alford Mfg. Co.
 Bauer (See Sparta)
 Collins Radio Company Broadcasting Marketing,
 Ikegami Co. Ltd.
 Integral Data Devices Inc.
 Jampro Antenna Co.

Broadcast Buyer's Guide Section

Micro Communications, Inc.
Microlab
Microwave Assoc. Inc.
Multronics, Inc.
Narda Microwave Corp., The
Phelps Dodge Communications Co.
Wilkinson Elect. Inc.

Display Equipment-TV

Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
CBS Labs
Central Dynamics Corp.
Colorado Video Inc.
Data Disc Inc.
Datavision, Inc.
Display Systems Corp.
General Television Ntwk.
GPL Div. Singer Gen.
Marconi Electronics Inc.
Photo Research Div. of Kollmorgen
Corp.
Rank Precision Ind. Broadcast Div.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Shintron Co. Inc.
Sylvania Comm. Electronic
Television Presentations, Inc.
Westinghouse Elec. Co. Electric Tube
Div.
Wilson Corp., H.

Dividers, Frequency

AVA Elect. & Machine Corp.
Bulova American Time Products
Collins Radio Company Broadcasting
Marketing,
GE Electronic Components Sales Dept.
Hartley Prod. Corp.
Microlab
Total Technology

Dividers, Power

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Alford Mfg. Co.
Bird Electronic Corp.
Collins Radio Company Broadcasting
Marketing,
ENTRON INC.
Hickok Elect. Instrument
Jampro Antenna Co.
Lectronic Res. Labs. Inc.
Micro Communications, Inc.
Microlab
Microwave Assoc. Inc.
Moseley Assoc. Inc.
Multronics, Inc.
Narda Microwave Corp., The
Phelps Dodge Communications Co.
Div. Phelps Dodge Copper Products
Corp.
Scala Radio Corp.
Trompeter Electronics

Dividers, Voltage

Collins Radio Company Broadcasting
Marketing,
Edison Electronics Div. McGraw-Edison
Company
ENTRON INC.
GE Electronic Components Sales Dept.
General Radio Co.
Hickok Elect. Instrument
ITT Jennings
Lectronic Res. Labs. Inc.
Shallco, Incorporated
Tech Laboratories Inc.

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Liberty Industries

Edit Code Generator

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Electronic Engineering Co. of California

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Behrends, Inc.
Nemo Recording Labs

Editors, Film

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Behrends, Inc.
Burke & James
CMX Systems
F&B/Ceco Industries, Inc.
Harwald Company
Kalart Victor Corp.
Lipsner Smith Corp.
Mauer Electronics
Neumade Prod. Corp.
Precision Lab. Precision Cine Eqpm't.

Editors, Video Tape

Ampex Corp.
Central Dynamics Corp.
CMX Systems
Dataron Inc.
Dynasciences Corp.
Electronic Engineering Co. of California
GBC CCTV
Gotham Audio Corp.
RCA Broadcast Equipment
Communications Systems Div.
Shibaden Corp. of America
TELE-CLINE INC.
Video Devices Co.

Encoder, Color Video

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American Data Corp. 61

American Data Corp.

Encoder, Four Channel Stereo

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Electro-Voice Inc.

Enhancers, TV Image

CBS Labs
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Colorado Video Inc.
Dynasciences Corp.
Fernseh GmbH c/o Robert Bosch
Corp.
Gen. Electrodynamics
Grass Valley Group, Inc.
Lerro Electrical Corp.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Shintron Co. Inc.
Tele Measurements Inc.

Equalizers, Audio Emphasis

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Audio Designs & Mfg.
B & K Dynascan Corp.
CBS Labs
Collins Radio Company Broadcasting
Marketing,
Electrodyne Div. of MCA Technology,
Inc.
Fairchild Sound Equip. Co.
Gately Electronics
Gotham Audio Corp.
Gray Research & Dev.
Lang Electronics Inc.
Langevin An MCA Technology
Company
MCA Technology, Inc.
McCurdy Radio Ind. Inc.
Melcor Electronics Corp.
Plessey Electronics Corp.
Pulse Techniques Inc.
Quad-Eight Electronics
Shallco, Incorporated
Spectra Sonics
TT Electronics Inc.
Ultra Audio Products

Equalizers, Vertical Aperature

CBS Labs
Dynasciences Corp.
Grass Valley Group, Inc.

Erasers, Magnetic (See Heads and Demagnetizers)

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Broadcast Electronics 85

Bauer (See Sparta)
Broadcast Electronics
Brush Instruments Div. Gould Inc.
Collins Radio Company Broadcasting
Marketing,
Duotone Co. Inc.
Gates Division of Harris-Intertype
Intern'tl. Tapetronics Corp.
Joa Cartridge Service
MINNEAPOLIS MAGNETICS, INC.
Nortronics Co., Inc.
Precision Lab. Precision Cine Eqpm't.
Recortec Inc.
Schultz Inc., Albert
Shallco, Incorporated
Spotmaster Broadcast Electronics
Tri-Tronics

Exciters, FM

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Wilkinson Elect. Inc. 7

American Electronics Lab., Inc.
Belar Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Fung Engineering Co.
Gates Division of Harris-Intertype
Granger Assoc.
Magnetic Prod. Div. 3M Company
RHG Elect Labs, Inc.
Rohde & Schwarz Sales
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Wilkinson Elect. Inc.

Film, Photographic

Afga-Gevaert Inc.
Eastman Kodak Co.
F&B/Ceco Industries, Inc.
GAF Corp.

Film, Processing Service

Eastman Kodak Co.
Jamieson Film Co.
Lipsner Smith Corp.
Photo Lab Inc.
Treise Engineering

Filters, Antenna

Ameco Inc.
Barker & Williamson, Inc.
Bird Electronic Corp.
ENTRON INC.
G.C. Electronics
Jampro Antenna Co.
Micro Communications, Inc.
R. F. Systems
TT Electronics Inc.

Film Chain System

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Ameco Inc.
Ampex Corp.
Blonder-Tongue Labs.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Diamond Power Speciality Corp.
Fernseh GmbH c/o Robert Bosch
Corp.
Kalart Victor Corp.
Lerro Electrical Corp.
Link Division The Singer Company
L-W Photo Inc.
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Rank Cintel Rank Precision Industries
LTD, Broadcast Division
Raytheon Co.
RCA Broadcast Equipment
Communications Systems Div.
Russco Electronics Mfg.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Shibaden Corp. of America
Soll, Inc., Joseph M.
Sylvania Electric Prods., Inc.
TELE-CLINE INC.
TeleMation, Inc.
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.
Visual Communication Products Oper.
General Electric Co.

Generator, Burst

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American Data Corp.

Generator, Video Carrier

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Tracor Ind. Inst. Div.

Generators, FM, Subcarrier

American Electronics Lab., Inc.
Catel Corp., The
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Data Pulse
Edison Electronics Div. McGraw-Edison
Company
Gates Division of Harris-Intertype
Hickok Elect. Instrument
Leader Instruments Corp.
Marti Electronics
McMartin Industries Inc.
Moseley Assoc. Inc.
Rohde & Schwarz Sales
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)

Broadcast Buyer's Guide Section

Wilkinson Elect. Inc.

Generators, Power, Electric Motor

GE Electronic Components Sales Dept.
Singer Products Co., Inc.

Generators, Power, Gasoline Engine

F&B/Ceco Industries, Inc.
Gates Division of Harris-Intertype
Mole Richardson Co.
Singer Products Co., Inc.
TV Cable Supply Co.

Generators, Signal, AF

B & K Dynascan Corp.
Barker & Williamson, Inc.
CYBRIX CORPORATION
Delta Electronics Inc. (N.C.)
Eico Elect. Inst. Co., Inc.
General Radio Co.
Gibbs Mfg. & Research Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
ITT-METRIX
Kay Elemetrics Corp.
Leader Instruments Corp.
Electronic Res. Labs. Inc.
Marconi Electronics Inc.
Microdot Inc.
N. E. Electronics Corp.
Rohde & Schwarz Sales
Texscan Corp.

Generators, Color Bar

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American Data Corp. 61

American Data Corp.
Applied Elect. Mechanics
B & K Dynascan Corp.
Cohu Electronics, Inc.
Eico Elect. Inst. Co., Inc.
Engineering Assoc.
Fernseh GmbH c/o Robert Bosch Corp.
Heath co.
Hickok Elect. Instrument
Internatl. Nuclear Corp.
ITT-METRIX
Leader Instruments Corp.
Lectrotech Inc.
Marconi Electronics Inc.
Marconi Instruments
Mincom Div. 3M Co.
RCA Broadcast Equipment
Communications Systems Div.
RCA Electronic Comp.
Riker Information Systems Inc.
Shibaden Corp. of America
TeleMation, Inc.
Tele Measurements Inc.
Telemet Co.
Videon Corp.
Ward Electronic Indus.

Generators, Signal, Dot Bar

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American Data Corp. 61

American Data Corp.
Colorado Video Inc.
Eico Elect. Inst. Co., Inc.
Fernseh GmbH c/o Robert Bosch Corp.
Heath co.
Hickok Elect. Instrument
ITT-METRIX
Leader Instruments Corp.
Lectrotech Inc.
Marconi Electronics Inc.
Marconi Instruments
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Electronic Comp.

Riker Information Systems Inc.
Sencore Inc.
Shibaden Corp. of America
Tektronix Inc.
TeleMation, Inc.
Tele Measurements Inc.
Telemet Co.
Videon Corp.
Ward Electronic Indus.

Generators, Signal Marker

B & K Dynascan Corp.
Blonder-Tongue Labs.
Eico Elect. Inst. Co., Inc.
ITT-METRIX
Kay Elemetrics Corp.
Leader Instruments Corp.
Lectrotech Inc.
Marconi Instruments
RCA Electronic Comp.
Shibaden Corp. of America
Tektronix Inc.

Generators, Signal Pulse

Canoga Elect. Co.
Data Pulse
Delta Electronics Inc. (Va.)
Dranetz Engineering Labs., Inc.
Edison Electronics Div. McGraw-Edison Company
F&B/Ceco Industries, Inc.
Fernseh GmbH c/o Robert Bosch Corp.
Hewlett Packard Co.
Hickok Elect. Instrument
Honeywell Inc. Test Instruments Div.
Kay Elemetrics Corp.
Electronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Microdot Inc.
Narda Microwave Corp., The
Spencer-Kennedy Labs., Inc.
Tektronix Inc.
Ward Electronic Indus.

Generators, Signal, RF

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Delta Electronics Inc. (Va.) 77

Blonder-Tongue Labs.
Canoga Elect. Co.
Collins Radio Company Broadcasting
Marketing
Delta Electronics Inc. (Va.)
Eico Elect. Inst. Co., Inc.
Engineering Assoc.
General Radio Co.
Gibbs Mfg. & Research Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
ITT-METRIX
Kay Elemetrics Corp.
Lampkin Lab. Inc.
Leader Instruments Corp.
Electronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Microdot Inc.
Narda Microwave Corp., The
RCA Electronic Comp.
Rohde & Schwarz Sales
Shibaden Corp. of America
Singer Co., The Los Angeles Operation
Spencer-Kennedy Labs., Inc.
Texscan Corp.

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American Data Corp. 61

Ameco Inc.
American Data Corp.
Applied Elect. Mechanics
B & K Dynascan Corp.

Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Central Dynamics Corp.
Cleveland Electronics, Inc.
Colorado Video Inc.
Dynair Electronics, Inc.
Grass Valley Group, Inc.
Internatl. Nuclear Corp.
Leader Instruments Corp.
Lerro Electrical Corp.
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Richmond Hill Laboratories Inc.
Riker Information Systems Inc.
Shibaden Corp. of America
Shintron Co. Inc.
TeleMation, Inc.
Tele Measurements Inc.
Telemet Co.
TELESTRATOR Industries
Total Technology
Universal Audio Inc.
Videon Corp.
Viscount Video Systems Ltd.
Ward Electronic Indus.

Generators, Signal, Square Wave

B & K Dynascan Corp.
Central Dynamics Corp.
Data Pulse
Edison Electronics Div. McGraw-Edison Company
Eico Elect. Inst. Co., Inc.
General Radio Co.
Gibbs Mfg. & Research Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
Leader Instruments Corp.
Marconi Instruments
Microdot Inc.
Shibaden Corp. of America
Tektronix Inc.
TeleMation, Inc.
Tele Measurements Inc.
Telemet Co.

Generators, Signal, TV Synchronizing

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American Data Corp. 61

American Data Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Central Dynamics Corp.
Chrono-Log Corp.
Cleveland Electronics, Inc.
Cohu Electronics, Inc.
Colorado Video Inc.
Concord Elect. Corp.
Dynair Electronics, Inc.
Dynamics Corp.
Electronic Designers Inc.
Fernseh GmbH c/o Robert Bosch Corp.
Gen. Electrodynamics
GPL Div. Singer Gen.
Grass Valley Group, Inc.
Ikegami Co. Ltd.
Internatl. Nuclear Corp.
Lerro Electrical Corp.
Marconi Electronics Inc.
Marconi Instruments
MTI Div KMS Industries
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RCA Broadcast Equipment
Communications Systems Div.
Richmond Hill Laboratories Inc.
Riker Information Systems Inc.
Rohde & Schwarz Sales
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Shibaden Corp. of America
Shintron Co. Inc.
Sylvania Comm. Electronic
Tektronix Inc.
TeleMation, Inc.
Tele Measurements Inc.

Texscan Corp.
Tracor Ind. Inst. Div.
Videon Corp.
Visual Educom Inc.
Ward Electronic Indus.

Generators, Signal, VITS

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American Data Corp. 61

American Data Corp.
Electronic Designers Inc.
Marconi Electronics Inc.
Marconi Instruments
Richmond Hill Laboratories Inc.
Riker Information Systems Inc.
Rohde & Schwarz Sales
Tektronix Inc.
TeleMation, Inc.
Tele Measurements Inc.
Telemet Co.
Videon Corp.
Ward Electronic Indus.

Generator, Staircase

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American Data Corp.

Generator, Stereo

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Wilkinson Elect. Inc.

Generators, Thermoelectric

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Teddyne Isotopes

Heads, Erase, Magnetic

Brush Instruments Div. Gould Inc.
Collins Radio Company Broadcasting
Marketing
Electrodyne Div. of MCA Technology, Inc.
Joa Cartridge Service
Lipps Inc.
Magnusonic Devices Inc.
Michigan Magnetics
MINNEAPOLIS MAGNETICS, INC.
Norton Assoc. Inc.
Nortronics Co., Inc.
Precision Lab. Precision Cine Eqpmnt.
Recordex Corporation
Recortec Inc.
Schultz Inc., Albert
Taber Mfg. & Engr. Co.
Tapecaster

Heads, Recording, Magnetic

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MINNEAPOLIS MAGNETICS, INC. 56
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Brush Instruments Div. Gould Inc.
Collins Radio Company Broadcasting
Marketing
Electrodyne Div. of MCA Technology, Inc.
Joa Cartridge Service
Lipps Inc.
Magnusonic Devices Inc.
Michigan Magnetics
MINNEAPOLIS MAGNETICS, INC.
Norton Assoc. Inc.
Nortronics Co., Inc.
Recordex Corporation
Taber Mfg. & Engr. Co.
Tapecaster

Heater, Antenna Control

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Gray Research & Dev.

Heaters, Station, Van

Precision Lab. Precision Cine Eqpmnt.
Valad Elect Heating Corp.

Headphones

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Revox Corporation 78

American Gelo Electronics
Duton Co. Inc.
Eidson Electronic Co.
F&B/Ceco Industries, Inc.
G.C. Electronics
Gotham Audio Corp.
Heath co.
Jensen Mfg. Div. The Muter Co.
Koss Corp
North Amer. Philips
Revox Corporation
Sennheiser Electronics
Singer Products Co., Inc.
Stanton Magnetics Inc.
Superscope Inc.
Television Equipment Assoc.
Telex Communications Division

Hum Stop Coil, Video

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Audio-Video Engineering Co. 28

Audio-Video Engineering Co.

Integrated Circuits (Also See Semiconductors)

American Electronics Lab., Inc.
Ampex Corp.
A-Tel-A-Matic
Collins Radio Company Broadcasting
Marketing.
GE Electronic Components Sales Dept.
Hewlett Packard Co.
Humphrey Electronics Inc.
Melcor Electronics Corp.
Microlab
Motorola Semiconduct Motorola Inc.
Plessey Electronics Corp.
Raytheon Co.
RCA Electronic Comp.
Texas Instrument Semiconductor
Comp. Div.
Thor Electronics Corp.
Visual Communication Products Oper.
General Electric Co.

Industrial TV (Also See TV, Closed Circuit)

Aicor Inc.
Alma Engineering Inc.
American Data Corp.
Anaconda Electronics
ATV Research
Audiotronics Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Berkey-Colortran Inc.
Blonder-Tongue Labs.
Bradford Information Systems
Canoga Elect. Co.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Colorado Video Inc.
Concord Elect. Corp.
Dynair Electronics, Inc.
Fernseh GmbH c/o Robert Bosch
Corp.
GBC CCTV
General Electric Co. Mobile Radio
Dept.

Gen. Electrodynamics
GPL Div. Singer Gen.
Gulf Telephone & Electronics
Ikegami Co. Ltd.
Internatl. Nuclear Corp.
Janson Industries
Javelin Electronics Co.
Katona Electronics Co.
K' SON Corporation
Lerro Electrical Corp.
Link Division The Singer Company
MTI Div KMS Industries
Orbit Radio and Video
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of
America
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RCA Broadcast Equipment
Communications Systems Div.
Riker Information Systems Inc.
Rust Corp.
SC Electronics, Inc. Subs. of
Audiotronics Corp.
Shibaden Corp. of America
Shintron Co. Inc.
Sylvania Comm. Electronic
Tektronix Inc.
TeleMation, Inc.
Tele Measurements Inc.
Television Presentations, Inc.
Vikoa Inc.
Visual Communication Products Oper.
General Electric Co.
Visual Educom Inc.
Westinghouse Electric Corp.
Zoomar Inc.

Jack Panel Assemblies

ALTEC
A-Tel-A-Matic
Audio Accessories Inc.
AVA Elect. & Machine Corp.
Collins Radio Company Broadcasting
Marketing.
Cooke Engineering Co.
Delta Electronics Inc. (Va.)
Gates Division of Harris-Intertype
Gulf Telephone & Electronics
Lelectron Res. Labs. Inc.
McCurdy Radio Ind. Inc.
Potomac Instruments, Inc.
RCA Broadcast Equipment
Communications Systems Div.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Switchcraft Inc.
Trompeter Electronics

Kits

Allied Electronics Subs. of Tandy
Corp.
ATV Research
Bardwell McAlister Inc.
Eico Elect. Inst. Co., Inc.
Electronic Engineering Co. of California
Engineering Assoc.
G.C. Electronics
Heath co.
Hollingsworth Solderless Terminal Co.
Lelectron Res. Labs. Inc.
Mole Richardson Co.
TRW Electronic Supply Co. Div. of
TRW
Upson Tools Inc.
Vaco Products Co.

Lenses, Optical, Fixed

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Angenieux Corp. of America
Arriflex Corp. of America
A-Tel-A-Matic
ATV Research
Audiotronics Corp.
Behrends, Inc.
Burke & James
Canon USA, Inc.

Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Concord Elect. Corp.
Cosmicar Optical Co., Ltd.
Cunningham Corp. Subs. of Gleason
Works
Denson Electronic Corp.
F&B/Ceco Industries, Inc.
GBC CCTV
Javelin Electronics Co.
Jerrold Electronics Corp. CATV
Systems Div.
Lerro Electrical Corp.
Rank Precision Industries
Rank Precision Ind. Broadcast Div.
RCA Broadcast Equipment
Communications Systems Div.
Shibaden Corp. of America
TELE-CLINE INC.
Teledyne Camera Systems
Visual Educom Inc.
Zoomar Inc.

Lenses, Optical, Zoom

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Angenieux Corp. of America 53

Amperex Corp.
Angenieux Corp. of America
Arriflex Corp. of America
Audiotronics Corp.
Behrends, Inc.
Burke & James
Canon USA, Inc.
Cofu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Concord Elect. Corp.
Cosmicar Optical Co., Ltd.
Cunningham Corp. Subs. of Gleason
Works
Denson Electronic Corp.
F&B/Ceco Industries, Inc.
GBC CCTV
Javelin Electronics Co.
Jerrold Electronics Corp. CATV
Systems Div.
Lerro Electrical Corp.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Rank Precision Industries
Rank Precision Ind. Broadcast Div.
RCA Broadcast Equipment
Communications Systems Div.
Shibaden Corp. of America
TELE-CLINE INC.
Teledyne Camera Systems
Television Equipment Assoc.
Visual Educom Inc.
Zoomar Inc.

Lighting, TV Controls

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Behrends, Inc.
Berkey-Colortran Inc.
Burke & James
Century Strand, Inc.
F&B/Ceco Industries, Inc.
Janson Industries
Kliegl Bros. Lighting
Lerro Electrical Corp.
Mole Richardson Co.
RCA Broadcast Equipment
Communications Systems Div.
Skirpan Lighting Control Corp.
Tele Measurements Inc.
Ultra Audio Products
Utility Tower Co.

Lighting, TV, Systems

Audiotronics Corp.
Bardwell McAlister Inc.
Behrends, Inc.
Berkey-Colortran Inc.
Burke & James
Century Strand, Inc.
F&B/Ceco Industries, Inc.

Janson Industries
Kliegl Bros. Lighting
Lerro Electrical Corp.
Lighting Products GTE Sylvania, Inc.
Mole Richardson Co.
RCA Broadcast Equipment
Communications Systems Div.
Skirpan Lighting Control Corp.
Tele Measurements Inc.
Telequip Corp.
Utility Tower Co.

Lightning Arresters

Andrews Towers Inc.
AVA Elect. & Machine Corp.
Collins Radio Company Broadcasting
Marketing.
G.C. Electronics
GE Electronic Components Sales Dept.
Jerrold Electronics Corp. CATV
Systems Div.
Joslyn Electronic Sys.
Siemens Corporation
Utility Tower Co.
Vikoa Inc.

Lights, Tower Control

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Hughey & Phillips Inc. 72

Hughey & Phillips Inc.

Lights, Tower, Obstruction

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Hughey & Phillips Inc. 72

Andrews Towers Inc.
Bauer (See Sparta)
Collins Radio Company Broadcasting
Marketing.
Electronic Lights Inc.
Fort Worth Tower Co., Inc.
Gates Division of Harris-Intertype
Harwood Mfg. Co.
Hughey & Phillips Inc.
Rohn Mfg. Co.
Utility Tower Co.

Line Surge Protector

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Wilkinson Elect. Inc. 7

Wilkinson Elect. Inc.

Line Taps, CATV

American Technology Co.

Load Resister, Coaxial

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Bird Electronic Corp. 86

Bird Electronic Corp.

Maintenance Services, Cartridge Tape

Broadcast Prod. Co. Inc. Bcst. Division
Collins Radio Company Broadcasting
Marketing.
Internatl. Tapetronics Corp.
Joa Cartridge Service
Liberty Industries
Marathon Broadcast Equip.
RCA Service Co.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)

Maintenance Services, FM

American Electronics Lab., Inc.
Collins Radio Company Broadcasting
Marketing.
Fort Worth Tower Co., Inc.
Liberty Industries

RCA Service Co.
Soll, Inc., Joseph M.
Taber Mfg. & Engr. Co.
Utility Tower Co.

Maintenance Services, Microwave

American Electronics Lab., Inc.
Collins Radio Company Broadcasting Marketing,
Fort Worth Tower Co., Inc.
Liberty Industries
Microwave Assoc. Inc.
Raytheon Co.
RCA Service Co.
Utility Tower Co.
Varian Solid State Div. Micro-Link Products

Maintenance Services, TV

Alcor Inc.
Angenieux Corp. of America
Fort Worth Tower Co., Inc.
GBC CCTV
Liberty Industries
R. F. Systems
Sarkes Tarzian Inc. Broadcast Equipment Div.
Soll, Inc., Joseph M.
Taber Mfg. & Engr. Co.
Tele Measurements Inc.
Utility Tower Co.
Visual Communication Products Oper. General Electric Co.

Meter, Distortion

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Time & Frequency Tech., Inc. 27

Time & Frequency Tech., Inc.

Meters, Field Strength, AM & FM

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Potomac Instruments, Inc. 62

Solar Electronics Co. 20

Wilkinson Elect. Inc. 7

Bauer (See Sparta)
Collins Radio Company Broadcasting Marketing,
Defense Electronics
Delta Electronics Inc. (Va.)
Engineering Assoc.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Low Power Broadcast Co.
McMartin Industries Inc.
Narda Microwave Corp., The
Potomac Instruments, Inc.
Rohde & Schwarz Sales
Singer Co., The Los Angeles Operation
Solar Electronics Co.
Wilkinson Elect. Inc.

Meters, Field Strength, TV, UHF

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Potomac Instruments, Inc. 62

Ameco Inc.
Blonder-Tongue Labs.
CATV Equipment Co.
Defense Electronics
Edison Electronics Div. McGraw-Edison Company
Engineering Assoc.
Jerrold Electronics Corp. CATV Systems Div.
JFD Electronics Co. Systems Division
Katona Electronics Co.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.

Potomac Instruments, Inc.
Riker Communications Inc.
Rohde & Schwarz Sales
Sencore Inc.
Singer Co., The Los Angeles Operation
TV Cable Supply Co.
Vikoa Inc.
Ward Electronic Indus.

Meters, Flutter & WOW

Gotham Audio Corp.
Kay Elemetrics Corp.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Micom Inc.

Meters, Frequency

Belar Electronics Lab., Inc.
Cascade Electronics
CCA Electronics
Collins Radio Company Broadcasting Marketing,
Edison Electronics Div. McGraw-Edison Company
Engineering Assoc.
GE Electronic Components Sales Dept.
General Microwave Corp.
General Radio Co.
Hewlett Packard Co.
Hickok Elect. Instrument
ITT-METRIX
Lampkin Lab. Inc.
Lectronic Res. Labs. Inc.
McMartin Industries Inc.
Microlab
Narda Microwave Corp., The
Simpson Electric Co.
Singer Co., The Los Angeles Operation
Time & Frequency Tech., Inc.

Meters, Frequency Calibrating

Hewlett Packard Co.
Hickok Elect. Instrument
Lampkin Lab. Inc.
Lectronic Res. Labs. Inc.
Microlab
Narda Microwave Corp., The
R. F. Systems
Singer Co., The Los Angeles Operation
Varian Solid State Div. Micro-Link Products

Meters, Phase Angle

Collins Radio Company Broadcasting Marketing,
Dranetz Engineering Labs., Inc.
GE Electronic Components Sales Dept.
Lectronic Res. Labs. Inc.
Rohde & Schwarz Sales
Singer Co., The Los Angeles Operation

Meters, Power

Bird Electronic Corp.
Boonton Electronics
CCA Electronics
Collins Radio Company Broadcasting Marketing,
Dranetz Engineering Labs., Inc.
Edison Electronics Div. McGraw-Edison Company
Engineering Assoc.
General Microwave Corp.
Hewlett Packard Co.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Narda Microwave Corp., The
National Electrolab Assoc. Ltd.
Rohde & Schwarz Sales
Simpson Electric Co.
Varian Solid State Div. Micro-Link Products

Meters, Standing Wave

Bird Electronic Corp.
CCA Electronics

Collins Radio Company Broadcasting Marketing,
Delta Electronics Inc. (Va.)
General Microwave Corp.
General Radio Co.
Hewlett Packard Co.
ITT-METRIX
Lectronic Res. Labs. Inc.
Narda Microwave Corp., The
Rohde & Schwarz Sales

Microphone Stand & Boom

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Shure Brothers Inc. Cover 4

AKG Division North Amer. Philips Corp.
ALTEC
Alto-Fonic Programming Inc.
American Gelsolo Electronics
ATLAS Sound
Bauer (See Sparta)
Behrends, Inc.
CATV Equipment Co.
CCA Electronics
Century Strand, Inc.
Collins Radio Company Broadcasting Marketing,
Crown International
Custom Craft Designs
Electro-Voice Inc.
F&B/Ceco Industries, Inc.
Gately Electronics
Gates Division of Harris-Intertype
G.C. Electronics
Gotham Audio Corp.
Jerrold Electronics Corp. CATV Systems Div.
Mole Richardson Co.
North Amer. Philips
Philips Broadcast Equipment Corp. Subs. North American Philips Corp.
Primo Co. Ltd.
RCA Broadcast Equipment Communications Systems Div.
RCA Service Co.
Revox Corporation
Schultz Inc., Albert
Sennheiser Electronics
Shure Brothers Inc.
Singer Products Co., Inc.
Sony/Superscope
Tele Measurements Inc.
Television Equipment Assoc.
Turner Division Conrac Corporation
Tyler R. H. Co., CATV Div.
Zoomar Inc.

Microphones, Boom

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Sennheiser Electronics 37

Shure Brothers Inc. Cover 4

AKG Division North Amer. Philips Corp.
Bauer (See Sparta)
Behrends, Inc.
CATV Equipment Co.
Collins Radio Company Broadcasting Marketing,
Denson Electronic Corp.
Electro-Voice Inc.
Gately Electronics
Gates Division of Harris-Intertype
G.C. Electronics
Gotham Audio Corp.
Langevin An MCA Technology Company
Philips Broadcast Equipment Corp. Subs. North American Philips Corp.
RCA Electronic Comp.
Revox Corporation
Schultz Inc., Albert
Sennheiser Electronics
Shure Brothers Inc.
Singer Products Co., Inc.
Sony/Superscope
Tele Measurements Inc.
Television Equipment Assoc.
(Trusonic) ACS Inc.
Turner Division Conrac Corporation

Microphones, Desk

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Shure Brothers Inc. Cover 4

AKG Division North Amer. Philips Corp.
Allied Electronics Subs. of Tandy Corp.
American Gelsolo Electronics
Audiotronics Corp.
Bauer (See Sparta)
Behrends, Inc.
CATV Equipment Co.
CCA Electronics
Collins Radio Company Broadcasting Marketing,
Electro-Voice Inc.
Gately Electronics
Gates Division of Harris-Intertype
G.C. Electronics
Gotham Audio Corp.
Langevin An MCA Technology Company
Mastertone Co.
Philips Broadcast Equipment Corp. Subs. North American Philips Corp.
Revox Corporation
Schultz Inc., Albert
Sennheiser Electronics
Shure Brothers Inc.
Singer Products Co., Inc.
Sony/Superscope
TEAC Corp of America
Tele Measurements Inc.
Television Equipment Assoc.
(Trusonic) ACS Inc.
Turner Division Conrac Corporation
Tyler R. H. Co., CATV Div.

Microphones, Floor

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Revox Corporation 76

Sennheiser Electronics 37

Shure Brothers Inc. Cover 4

AKG Division North Amer. Philips Corp.
Allied Electronics Subs. of Tandy Corp.
American Gelsolo Electronics
Bauer (See Sparta)
Behrends, Inc.
CATV Equipment Co.
CCA Electronics
Collins Radio Company Broadcasting Marketing,
Electro-Voice Inc.
Gately Electronics
Gates Division of Harris-Intertype
Gotham Audio Corp.
Langevin An MCA Technology Company
Mastertone Co.
Philips Broadcast Equipment Corp. Subs. North American Philips Corp.
RCA Electronic Comp.
Revox Corporation
Schultz Inc., Albert
Sennheiser Electronics
Shure Brothers Inc.
Sony/Superscope
Tele Measurements Inc.
Television Equipment Assoc.
(Trusonic) ACS Inc.
Turner Division Conrac Corporation
Tyler R. H. Co., CATV Div.
Wilkinson Elect. Inc.

Microphones, Hand Held

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Revox Corporation 76

Sennheiser Electronics 37

Shure Brothers Inc. Cover 4

AKG Division North Amer. Philips Corp.
Allied Electronics Subs. of Tandy Corp.
American Gelsolo Electronics

Broadcast Buyer's Guide Section

Audiotronics Corp.
Bauer (See Sparta)
Behrends, Inc.
CATV Equipment Co.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Electro-Voice Inc.
Gately Electronics
Gates Division of Harris-Intertype
G.C. Electronics
Gotham Audio Corp.
Langevin An MCA Technology
Company
Mastertone Co.
Miles Reproducer Co.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Revox Corporation
Schultz Inc., Albert
Sennheiser Electronics
Shure Brothers Inc.
Singer Products Co., Inc.
Sony/Superscope
TEAC Corp of America
Tele Measurements Inc.
Television Equipment Assoc.
(Trusonic) ACS Inc.
Turner Division Conrac Corporation
Tyler R. H. Co., CATV Div.

Microphones, Lavalier

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Shure Brothers Inc...... Cover 4

AKG Division North Amer. Philips
Corp.
Allied Electronics Subs. of Tandy
Corp.
American Gelo Electronics
Audiotronics Corp.
Bauer (See Sparta)
CATV Equipment Co.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Electro-Voice Inc.
Gately Electronics
G.C. Electronics
Gotham Audio Corp.
Langevin An MCA Technology
Company
Lerro Electrical Corp.
Mastertone Co.
Miles Reproducer Co.
North Amer. Philips
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Electronic Comp.
Revox Corporation
Schultz Inc., Albert
Sennheiser Electronics
Shure Brothers Inc.
Singer Products Co., Inc.
Sony/Superscope
Tele Measurements Inc.
Television Equipment Assoc.
(Trusonic) ACS Inc.
Turner Division Conrac Corporation
Tyler R. H. Co., CATV Div.

Microphones, Wireless

American Gelo Electronics
CHESTER ELECTRONIC LABS., INC.
GTE Information Systems Inc.
Gates Division of Harris-Intertype
North Amer. Electronics
Orbit Radio and Video
RCA Broadcast Equipment
Communications Systems Div.
Sennheiser Electronics
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tele Measurements Inc.
(Trusonic) ACS Inc.

Microwave Systems, STL

Andrew Corp.
Coastcom Division

Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Katona Electronics Co.
Microwave Assoc. Inc.
Moseley Assoc. Inc.
Narda Microwave Corp., The
North Amer. Electronics
RCA Broadcast Equipment
Communications Systems Div.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
TeleMation, Inc.
Tele Measurements Inc.
Varian Solid State Div. Micro-Link
Products

Microwave Systems, 2500 MHz

Andrew Corp.
CHESTER ELECTRONIC LABS., INC.
GTE Information Systems Inc.
Collins Radio Company Broadcasting
Marketing,
Katona Electronics Co.
Microlab
Microwave Assoc. Inc.
North Amer. Electronics
RCA Broadcast Equipment
Communications Systems Div.
TeleMation, Inc.
Varian Solid State Div. Micro-Link
Products

Mixers (See Also Consoles)

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Lang Electronics Inc...... 73

ALTEC
American Gelo Electronics
CHESTER ELECTRONIC LABS., INC.
GTE Information Systems Inc.
Collins Radio Company Broadcasting
Marketing,
Delta Electronics Inc. (N.C.)
Electrodyne Div. of MCA Technology,
Inc.
Gately Electronics
Gates Division of Harris-Intertype
Gotham Audio Corp.
Lang Electronics Inc.
Melcor Electronics Corp.
North Amer. Electronics
Orbit Radio and Video
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Superscope Inc.
TeleMation, Inc.
Tele Measurements Inc.

Modulators, TV

Ameco Inc.
Catel Corp., The
CHESTER ELECTRONIC LABS., INC.
GTE Information Systems Inc.
Dynair Electronics, Inc.
Katona Electronics Co.
North Amer. Electronics
RCA Broadcast Equipment
Communications Systems Div.
Tele Measurements Inc.
Varian Solid State Div. Micro-Link
Products

Monitors, AM Systems

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Belar Electronics Lab.,
Inc...... 19

Belar Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype

McMartin Industries Inc.
Melcor Electronics Corp.
Metron Instruments
Moseley Assoc. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tele Measurements Inc.
Time & Frequency Tech., Inc.
Wilkinson Elect. Inc.

Monitors, FM Systems

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Belar Electronics Lab.,
Inc...... 19

Belar Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Hewlett Packard Co.
Karg Laboratories, Inc.
McMartin Industries Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tele Measurements Inc.
Time & Frequency Tech., Inc.

Monitors, FM Systems, SCA

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Belar Electronics Lab.,
Inc...... 19

Belar Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Karg Laboratories, Inc.
McMartin Industries Inc.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tele Measurements Inc.

Monitors, Frequency

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Belar Electronics Lab.,
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Metron Instruments..... 36
Time & Frequency
Tech., Inc...... 27
Wilkinson Elect. Inc...... 7

Belar Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
General Microwave Corp.
Lampkin Lab. Inc.
McMartin Industries Inc.
Metron Instruments
Narda Microwave Corp., The
RCA Broadcast Equipment
Communications Systems Div.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Time & Frequency Tech., Inc.
Wilkinson Elect. Inc.

Monitors, Modulation

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Belar Electronics Lab.,
Inc...... 19
Time & Frequency
Tech., Inc...... 27
Wilkinson Elect. Inc...... 7

Belar Electronics Lab., Inc.

CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
General Microwave Corp.
Lampkin Lab. Inc.
McMartin Industries Inc.
Metron Instruments
Moseley Assoc. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tele Measurements Inc.
Time & Frequency Tech., Inc.
Wilkinson Elect. Inc.

Monitors, Phase

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Potomac Instruments,
Inc...... 63

Belar Electronics Lab., Inc.
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Gotham Audio Corp.
Potomac Instruments, Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)

Monitors, Power

Bird Electronic Corp.
General Microwave Corp.
Melcor Electronics Corp.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)

Monitors, Stereo

See Adv. Page

Belar Electronics Lab.,
Inc...... 19

Belar Electronics Lab., Inc.

Monitors, Video

Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Concord Elect. Corp.
Conrac Corp. Cramer Div.
Conrac Div. Conrac Corp.
GPL Div. Singer Gen.
Javelin Electronics Co.
Link Division The Singer Company
North Amer. Electronics
Orbit Radio and Video
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of
America
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Rank Cintel Rank Precision Industries
LTD, Broadcast Division
Rank Precision Ind. Broadcast Div.
Sony Corp. of America
Tektronix Inc.
TeleMation, Inc.
Tele Measurements Inc.

Monitors, Waveform

Calif. Instruments Co.
Hewlett Packard Co.
North Amer. Electronics
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Tektronix Inc.
Tele Measurements Inc.

Multiplexers

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Scott Buttner 83

Alford Mfg. Co.
GPL Div. Singer Gen.

Broadcast Buyer's Guide Section

Microlab
North Amer. Electronics
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Scott Buttner
TeleMation, Inc.
Tele Measurements Inc.

Narrow Band FM Equipment

Singer Products Co., Inc.

Networks, Matching, Audio

ALTEC
Collins Radio Company Broadcasting
Marketing,
Gately Electronics
Gates Division of Harris-Intertype
Tele Measurements Inc.
TT Electronics Inc.

Networks, Matching, RF

Alford Mfg. Co.
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
Narda Microwave Corp., The
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
TT Electronics Inc.

Networks, Phasing

ALTEC
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Tele Measurements Inc.
TT Electronics Inc.

Ohmmeters

Allied Electronics Subs. of Tandy
Corp.
Calif. Instruments Co.
Collins Radio Company Broadcasting
Marketing,
Edison Electronics Div. McGraw-Edison
Company
General Radio Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrum...it
Honeywell Inc. Test Instruments Div.
Industrial Devices Inc.
ITT-METRIX
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
RCA Electronic Comp.
Simpson Electric Co.
Triplet Corporation

Oscillators, AM

Arbor Systems Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Engineering Assoc.
Gibbs Mfg. & Research Co.
Heath co.
Kay Elemetrics Corp.
Leader Instruments Corp.
Singer Products Co., Inc.
Television Equipment Assoc.
Trepac Corp. America

Oscillators, FM

Belar Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Heath co.

Kay Elemetrics Corp.
Leader Instruments Corp.
Marconi Electronics Inc.
Microwave Assoc. Inc.
Singer Co., The Los Angeles Operation
Singer Products Co., Inc.

Oscillators, TV

Heath co.
Kay Elemetrics Corp.
Lectrotech Inc.
Riker Communications Inc.
Tektronix Inc.

Oscilloscope Camera

Polaroid

Oscilloscopes, Dual Trace

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Hickok Elect. Instrument..... 81

B & K Dynascan Corp.
Eico Elect. Inst. Co., Inc.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
ITT-METRIX
Kikusui Elect. Corp.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Marconi Electronics Inc.
Marconi Instruments
Tektronix Inc.

Oscilloscopes, Rack Type

Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Fernseh GmbH c/o Robert Bosch
Corp.
Hewlett Packard Co.
Hickok Elect. Instrument
ITT-METRIX
Kikusui Elect. Corp.
Lectronic Res. Labs. Inc.
Tektronix Inc.

Oscilloscopes, Triggered Sweep

B & K Dynascan Corp.
Eico Elect. Inst. Co., Inc.
Heath co.
Hewlett Packard Co.
ITT-METRIX
Kikusui Elect. Corp.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Lectrotech Inc.
RCA Electronic Comp.
Tektronix Inc.

Oscilloscopes, Wideband

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Hickok Elect. Instrument..... 81

B & K Dynascan Corp.
Edison Electronics Div. McGraw-Edison
Company
Eico Elect. Inst. Co., Inc.
Hewlett Packard Co.
Hickok Elect. Instrument
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Lectrotech Inc.
Mercury Electronics
RCA Electronic Comp.
Tektronix Inc.

Oscilloscopes, With Plug-ins

Hewlett Packard Co.
ITT-METRIX
Kikusui Elect. Corp.
Lectronic Res. Labs. Inc.
Tektronix Inc.

Patch Panel

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Switchcraft Inc. 39

Switchcraft Inc.

Phasing Units (See Networks Phasing)

American Electronics Lab., Inc.
A-Tel-A-Matic
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Fernseh GmbH c/o Robert Bosch
Corp.
Gates Division of Harris-Intertype
Multronics, Inc.
Scala Radio Corp.
Videon Corp.
Wilkinson Elect. Inc.

Photographic Processing Chemicals, B&W

Hunt Chemical Corp., Philip A.

Photographic Processing Chemicals, Color

Hunt Chemical Corp., Philip A.

Power Supplies, AC

Advanced High Voltage Co.
ALTEC
Ameco Inc.
American Data Corp.
Anaconda Electronics
Behrends, Inc.
Bulova American Time Products
Calif. Instruments Co.
Cascade Electronics
Collins Radio Company Broadcasting
Marketing,
Delta Electronics Inc. (N.C.)
Edison Electronics Div. McGraw-Edison
Company
Eico Elect. Inst. Co., Inc.
Electrodyne Div. of MCA Technology,
Inc.
Engineering Assoc.
Essex Wire Co. RBM Div.
F&B/Ceco Industries, Inc.
Fisher Berkeley Corp.
GE Electronic Components Sales Dept.
Heath co.
Honeywell Inc. Test Instruments Div.
Ikegami Co. Ltd.
Lectronic Res. Labs. Inc.
Melcor Electronics Corp.
Mole Richardson Co.
Pruzan Co.
Raytheon Co.
Teltron, Inc.
Wilkinson Elect. Inc.

Power Supplies, Precision

Advanced High Voltage Co.
ALTEC
American Data Corp.
Atlantic Research
Bristol Div. of Acco
Bulova American Time Products
Collins Radio Company Broadcasting
Marketing,
Engineering Assoc.
Heath co.
Hewlett Packard Co.
ITT-METRIX
Lectronic Res. Labs. Inc.
Lectrotech Inc.
Precision Lab. Precision Cine Eqpm.
Raytheon Co.
Spectra Sonics
Wilkinson Elect. Inc.

Preamplifiers, Audio

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American Data Corp. 61
Broadcast Electronics 40

Acrodyne Industries
Alcor Inc.
ALTEC
American Data Corp.
American Gelsolo Electronics
Arbor Systems Inc.
Audio Designs & Mfg.
Bauer (See Sparta)
Bell P/A Prod. Corp.
Bradford Information Systems
Broadcast Electronics
Broadcast Recorders
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Crown International
David Clark Co., Inc.
Delta Electronics Inc. (N.C.)
Delta Electronics Inc. (Va.)
Denrad Mfg. Co. Inc.
Dynair Electronics, Inc.
Edison Electronics Div. McGraw-Edison
Company
Electrodyne Div. of MCA Technology,
Inc.
Fairchild Sound Equip. Co.
Fairchild Electronics
Gates Division of Harris-Intertype
Gray Research & Dev.
Internatl. Nuclear Corp.
Koss Corp
Lang Electronics Inc.
Langevin An MCA Technology
Company
Leader Instruments Corp.
Low Power Broadcast Co.
Mart Electronics
McCurdy Radio Ind. Inc.
McMartin Industries Inc.
Melcor Electronics Corp.
North Amer. Philips
Orbit Radio and Video
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Precision Elect. Inc.
Precision Lab. Precision Cine Eqpm.
QRK Electronic Prod.
Quad-Eight Electronics
RHG Elect Labs, Inc.
Russco Electronics Mfg.
Schafer Electronics
Schultz Inc., Albert
Shure Brothers Inc.
Spectra Sonics
Superscope Inc.
Tape-Athon Corp.
Telex Communications Division
Universal Audio Inc.
VIF International
Visual Communication Products Oper.
General Electric Co.
Ward Electronic Indus.
Wilkinson Elect. Inc.

Preamplifiers, Video

Acrodyne Industries
Ameco Inc.
AMF Electrical Products Development
Division
Internatl. Nuclear Corp.
Kay Elemetrics Corp.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RHG Elect Labs, Inc.
Shintron Co. Inc.
Tele Measurements Inc.
TV Cable Supply Co.
Ward Electronic Indus.

Pressurization Equipment, Transmission Line

Andrew Corp.
Bauer (See Sparta)
Collins Radio Company Broadcasting
Marketing,

Phelps Dodge Communications Co.
Proffin Inc.
Soll, Inc., Joseph M.

Probes, Oscilloscopes

Arbor Systems Inc.
Eico Elect. Inst. Co., Inc.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
ITT-METRIX
Leader Instruments Corp.
Lectrotech Inc.
Marconi Electronics Inc.
Mercury Electronics
Sencore Inc.
Tektronix Inc.
Texscan Corp.

Processors, Film, B & W

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H F Photo Systems Div..... 55

Fairchild Industrial
F&B/Ceco Industries, Inc.
Filmline Corp.
H F Photo Systems Div. Technology
Inc. (formerly: CinTel Corp.)
Precision Lab. Precision Cine Eqpmt.
Treise Engineering

Processors, Film, Color

See Adv. Page

H F Photo Systems Div..... 55

ABTO, Inc.
F&B/Ceco Industries, Inc.
Filmline Corp.
H F Photo Systems Div. Technology
Inc. (formerly: CinTel Corp.)
Innovative Television Equipment, Inc.
Jamieson Film Co.
Photo-Pic Systems
Precision Lab. Precision Cine Eqpmt.
Treise Engineering

Processors, Silver Recovery Units

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H F Photo Systems Div..... 55

H F Photo Systems Div. Technology
Inc. (formerly: CinTel Corp.)

Projectors, Film

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L-W Photo Inc..... 66

Arriflex Corp. of America
Behrends, Inc.
Christie Electric Corp.
Eastman Kodak Co.
F&B/Ceco Industries, Inc.
GAF Corp.
Kalart Victor Corp.
Lipsner Smith Corp.
Listec TV Equip. Corp.
L-W Photo Inc.
Magna-Tech Electronic Co., Inc.
Paillard Incorporated
Palmer Films, Inc., W. A.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Precision Lab. Precision Cine Eqpmt.
RCA Broadcast Equipment
Communications Systems Div.
TELE-CLINE INC.
Telesync Corp.
Tyler R. H. Co., CATV Div.

Projectors, Film, Cassette Loading

Hokushin Elect. Co.
Listec TV Equip. Corp.
Telesync Corp.

Projectors, Film, Rear

Behrends, Inc.
Christie Electric Corp.
Fairchild Industrial
F&B/Ceco Industries, Inc.
Kalart Victor Corp.
Telepro Industries
Wilson Corp., H.

Projectors, Slide

Christie Electric Corp.
Eastman Kodak Co.
F&B/Ceco Industries, Inc.
GAF Corp.
Gray Research & Dev.
Harwald Company
Kalart Victor Corp.
Listec TV Equip. Corp.
RCA Broadcast Equipment
Communications Systems Div.
Spindler & Sauppe, Inc.
Telepro Industries
Telesync Corp.
Tyler R. H. Co., CATV Div.

Projectors, Video Test Slide

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Photo Research 75

Photo Research Div. of Kollmorgen
Corp.

Projectors, TV, Large Screen

F&B/Ceco Industries, Inc.
GBC CCTV
General Television Ntwk.
GPL Div. Singer Gen.
Hokushin Elect. Co.
Janson Industries
Kalart Victor Corp.
Tele Measurements Inc.
Telepro Industries
Telesync Corp.

Radar, Weather

Canoga Elect. Co.
Gen. Electrodynamics
Raytheon Co.

Radomes

Advance Industries
Andrew Corp.
Jampro Antenna Co.
Proffin Inc.
Scala Radio Corp.

Receivers, AM

Bell P/A Prod. Corp.
Cooke Engineering Co.
Electro-Voice Inc.
Gates Division of Harris-Intertype
Heath co.
Humphrey Electronics Inc.
Kahn Research Lab. Inc.
Moseley Assoc. Inc.
North Amer. Philips
Precision Elect. Inc.
RHG Elect Labs, Inc.
Rohde & Schwarz Sales
Schultz Inc., Albert
Singer Products Co., Inc.
Wilkinson Elect. Inc.

Receivers, FM

Allied Electronics Subs. of Tandy
Corp.
Ameco Inc.

Bell P/A Prod. Corp.
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Cooke Engineering Co.
Eico Elect. Inst. Co., Inc.
Electro-Voice Inc.
Gates Division of Harris-Intertype
GTE Lenkurt Incorporated
Heath co.
Humphrey Electronics Inc.
Lelectron Res. Labs. Inc.
Marti Electronics
McMartin Industries Inc.
North Amer. Philips
Precision Elect. Inc.
Revox Corporation
RHG Elect Labs, Inc.
Rohde & Schwarz Sales
Schultz Inc., Albert
Singer Products Co., Inc.
Wilkinson Elect. Inc.

Receivers, HF

Allied Electronics Subs. of Tandy
Corp.
American Electronics Lab., Inc.
Collins Radio Company Broadcasting
Marketing.
Cooke Engineering Co.
Engineering Assoc.
Karg Laboratories, Inc.
Marconi Electronics Inc.
Marconi Instruments
Narda Microwave Corp., The
RHG Elect Labs, Inc.
Rohde & Schwarz Sales
Singer Products Co., Inc.

Receivers, Multiplex

Belar Electronics Lab., Inc.
Eico Elect. Inst. Co., Inc.
Electro-Voice Inc.
Gotham Audio Corp.
GTE Lenkurt Incorporated
Heath co.
Johnson Electronics, Inc.
Karg Laboratories, Inc.
McMartin Industries Inc.
RHG Elect Labs, Inc.
Schultz Inc., Albert
Singer Products Co., Inc.
Superscope Inc.

Receivers, SCA

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Permadyne Electronics Corp. 64,65

Belar Electronics Lab., Inc.
Bell P/A Prod. Corp.
Eico Elect. Inst. Co., Inc.
Karg Laboratories, Inc.
Marti Electronics
McMartin Industries Inc.
Permadyne Electronics Corp.
Singer Products Co., Inc.
Wilkinson Elect. Inc.

Receivers, Time Signals

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SIMEX/COAST NAVIGATION SCHOOL 14 Time & Frequency Tech., Inc. 27

Lelectron Res. Labs. Inc.
SIMEX/COAST NAVIGATION SCHOOL
Singer Products Co., Inc.
Time & Frequency Tech., Inc.

Receivers, TV, Color

Admiral Corporation
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Cohu Electronics Inc. San Diego Div.

Cohu Electronics, Inc.
Concord Elect. Corp.
Fernseh GmbH c/o Robert Bosch
Corp.
Heath co.
Javelin Electronics Co.
Jerrold Electronics Corp. CATV
Systems Div.
Lerro Electrical Corp.
Link Division The Singer Company
SC Electronics, Inc. Subs. of
Audiotronics Corp.
Soll, Inc., Joseph M.
Sylvania Comm. Electronic
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.

Receivers, TV, Monochrome

Admiral Corporation
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Concord Elect. Corp.
Fernseh GmbH c/o Robert Bosch
Corp.
Heath co.
Lerro Electrical Corp.
Link Division The Singer Company
Nemo Recording Labs
Rank Precision Ind. Broadcast Div.
SC Electronics, Inc. Subs. of
Audiotronics Corp.
Sony Corp. of America
Sylvania Comm. Electronic
Tyler R. H. Co., CATV Div.

Recording Services, Videotape to Film

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WTTW Recording Serv. 18

WTTW Recording Serv.

Recorders, Cassette

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CYBRIX CORPORATION 78

CYBRIX CORPORATION

Recorders, Disc, Magnetic

CMX Systems
Colorado Video Inc.
Data Disc Inc.
Data Memory Inc.
Gotham Audio Corp.
Peripheral Data Machines, Inc. (PER
DATA)
Schultz Inc., Albert
Telectro Systems Corp.

Recorders, Film, Light

Magna-Tech Electronic Co., Inc.
Mincom Div. 3M Co.

Recorders, Film, Magnetic

Behrends, Inc.
Langevin An MCA Technology
Company
Magna-Tech Electronic Co., Inc.
Magnetic Prod. Div. 3M Company
Precision Lab. Precision Cine Eqpmt.
TELE-CLINE INC.
Telectro Systems Corp.

Recorders, Logging, Magnetic

Alto-Fonic Programming Inc.
Ampex Corp.
Broadcast Products Inc.
CCA Electronics
Javelin Electronics Co.
Lang Electronics Inc.
Metrotech Inc.

Miles Reproducer Co.
Nagra Magnetic Recorders, Inc.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Richmond Hill Laboratories Inc.
Scovill Div. Auricord
Scully Recording Instruments Co.
Tape-Athon Corp.
Telectro Systems Corp.

Recorders, Tape, Audio

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Telex Communications Division 25

Accurate Sound Company
Alcor Inc.
Allied Electronics Subs. of Tandy Corp.
Alto-Fonic Programming Inc.
American Geloso Electronics
Ampex Corp.
Arriflex Corp. of America
Audiotronics Corp.
Behrends, Inc.
Bell & Howell Consumer Products Group
Broadcast Electronics
Broadcast Products Inc.
CCA Electronics
Cine Sonic Sound Inc.
Collins Radio Company Broadcasting Marketing.
Concord Elect. Corp.
Crown International
Denson Electronic Corp.
Electrodyne Div. of MCA Technology, Inc.
Gates Division of Harris-Intertype
General Radio Co.
Gotham Audio Corp.
Interntl. Good Music Inc.
Lang Electronics Inc.
Langevin An MCA Technology Company
MacKenzie Labs., Inc.
Magnatech Co.
Magna-Tech Electronic Co., Inc.
Metrotech Inc.
Miles Reproducer Co.
Nagra Magnetic Recorders, Inc.
Nemo Recording Labs
North Amer. Philips
Orbit Radio and Video
Peripheral Data Machines, Inc. (PER DATA)
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Broadcast Equipment Communications Systems Div.
Recordex Corporation
Revox Corporation
Roberts Div. of Rhees Mfg. Co.
Ryder Magnetics Sales
Schafer Electronics
Schultz Inc., Albert
Scovill Div. Auricord
Scully Recording Instruments Co.
Singer Products Co., Inc.
Sono-Mag. Corp.
Sony/Superscope
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Superscope Inc.
Systems Marketing Corp.
Taber Mfg. & Engr. Co.
Tandberg of America Inc.
Tape-Athon Corp.
TEAC Corp of America
Telectro Systems Corp.
Telex Communications Division
ViF International

Recorders, Tape, Audio, Cartridge

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Interntl. Tapetronics Corp. 75

Alto-Fonic Programming Inc.
Ampex Corp.
Audiotronics Corp.
Bell & Howell Consumer Products Group
Broadcast Electronics
Broadcast Prod. Co. Inc. Bcst. Division
Broadcast Products Inc.
CCA Electronics
Collins Radio Company Broadcasting Marketing.
Concord Elect. Corp.
Gates Division of Harris-Intertype
Interntl. Good Music Inc.
Interntl. Tapetronics Corp.
Joa Cartridge Service
Lang Electronics Inc.
MacCarta
Nemo Recording Labs
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Recordex Corporation
Roberts Div. of Rhees Mfg. Co.
Schafer Electronics
Schultz Inc., Albert
Scovill Div. Auricord
Scully Recording Instruments Co.
Singer Products Co., Inc.
Sony/Superscope
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Spotmaster Broadcast Electronics
Superscope Inc.
Tandberg of America Inc.
Tapecaster
Telectro Systems Corp.
Television Equipment Assoc.
Telex Communications Division

Recorders, Camera, Tape to Film

See Adv. Page

Palmer Films, Inc., W. A. 60
Teledyne Camera Systems Cover 2

Palmer Films, Inc., W. A.
Teledyne Camera Systems

Recorders, Replacement Motor

Bauer (See Sparta)
Broadcast Products Inc.
Magnatech Co.
Minarik Elect.
Telectro Systems Corp.

Recorders, Magnetic Tape, Logging

Alto-Fonic Programming Inc.
Ampex Corp.
Bauer (See Sparta)
Broadcast Products Inc.
CCA Electronics
Collins Radio Company Broadcasting Marketing.
Crown International
Gates Division of Harris-Intertype
Honeywell Inc. Test Instruments Div.
Magnatech Co.
Metrotech Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Schafer Electronics
Scovill Div. Auricord
Singer Products Co., Inc.
Tape-Athon Corp.
Telectro Systems Corp.
Telex Communications Division

Recorders, Magnetic Tape, Video

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Javelin Electronics Co. 76
Sony Corp. of America 30-31

Akai America, Ltd.
Ampex Corp.
Audiotronics Corp.
CATV Equipment Co.
Concord Elect. Corp.
Diamond Power Speciality Corp.
Fernseh GmbH c/o Robert Bosch Corp.
GBC CCTV
General Television Ntwk.
GPL Div. Singer Gen.
Ikegami Co. Ltd.
International Video
Javelin Electronics Co.
Lerro Electrical Corp.
Mincom Div. 3M Co.
Panasonic, VTR/CCTV Dept.
Matsushita Electric Corp. of America
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Broadcast Equipment Communications Systems Div.
Scully Recording Instruments Co.
Sony Corp. of America
Telectro Systems Corp.
Tyler R. H. Co., CATV Div.
Visual Educom Inc.

Remote Control Systems

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Moseley Assoc. Inc. 24
Systems Marketing Corp. 81

Alcor Inc.
Alto-Fonic Programming Inc.
Bauer (See Sparta)
Bristol Div. of Acco
CCA Electronics
Central Dynamics Corp.
CMX Systems
Collins Radio Company Broadcasting Marketing.
Cunningham Corp. Subs. of Gleason Works
Engineering Assoc.
Gates Division of Harris-Intertype
GE Electronic Components Sales Dept.
Humphrey Electronics Inc.
Magna-Tech Electronic Co., Inc.
Marti Electronics
Miles Reproducer Co.
Moseley Assoc. Inc.
National Electrolab Assoc. Ltd.
Potomac Instruments, Inc.
RCA Broadcast Equipment Communications Systems Div.
Richmond Hill Laboratories Inc.
Rust Corp.
Sono-Mag. Corp.
Systems Marketing Corp.
Trepac Corp. America
Varian Solid State Div. Micro-Link Products

Recorders, Paper Logging and Graphic

B & K Dynascan Corp.
Bristol Div. of Acco
GE Electronic Components Sales Dept.
General Radio Co.
Heath co.
Hickok Elect. Instrument
Lelectron Res. Labs. Inc.
Moseley Assoc. Inc.
Rust Corp.
Rustrak Instrument Gulton Ind. Inc.
Simpson Electric Co.

Recorders, Video, Kinescope

Ampex Corp.

Fernseh GmbH c/o Robert Bosch Corp.
Mincom Div. 3M Co.
Palmer Films, Inc., W. A.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Broadcast Equipment Communications Systems Div.
Shibaden Corp. of America
Sony/Superscope
Tele Measurements Inc.

Recording Service, Audio, Tape

Accurate Sound Company
Alto-Fonic Programming Inc.
Audio Magnetics Corp.
Cine Sonic Sound Inc.
Duotone Co. Inc.
Interntl. Good Music Inc.
Nemo Recording Labs
Orbit Radio and Video
Recordex Corporation
Schafer Electronics
Ultra Audio Products

Reel, Cable & Mike

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Hannay Reels, Clifford B. Hannay & Son Inc.
Industrial Electric Reel

Reflectors, Passive

Advance Industries
Andrews Towers Inc.
Collins Radio Company Broadcasting Marketing.
Fort Worth Tower Co., Inc.
Microelect Co. Inc.
Rohn Mfg. Co.
Utility Tower Co.

Regulators, Voltage

Arbor Systems Inc.
B & K Dynascan Corp.
Calif. Instruments Co.
Central Transformer
Collins Radio Company Broadcasting Marketing.
GE Electronic Components Sales Dept.
General Radio Co.
Lelectron Res. Labs. Inc.
Total Technology

Rewinders, Film

Behrends, Inc.
F&B/Ceco Industries, Inc.
Harwald Company
Kalart Victor Corp.
Mauer Electronics
Neumade Prod. Corp.
Precision Lab. Precision Cine Eqpmt.
RCA Broadcast Equipment Communications Systems Div.

Rewinders, Tape

Bell Sound Studios A & B Duplicators Div.
Broadcast Products Inc.
Collins Radio Company Broadcasting Marketing.
Marathon Broadcast Equip.
Neumade Prod. Corp.
Recordex Corporation
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Television Equipment Assoc.
Telex Communications Division

Scramblers, Speech

Collins Radio Company Broadcasting Marketing,
Kahn Research Lab. Inc.
Karg Laboratories, Inc.
Singer Products Co., Inc.
Trepac Corp. America

Screens, Projection, Front

Behrends, Inc.
F&B/Ceco Industries, Inc.
Raven Screen Corp.
Spindler & Sauppe, Inc.
Tele Measurements Inc.

Screens, Projection, Rear

Behrends, Inc.
F&B/Ceco Industries, Inc.
Raven Screen Corp.
Tele Measurements Inc.
Wilson Corp., H.

Semiconductor, Rectifiers, General

Amperex Corp.
Collins Radio Company Broadcasting Marketing,
GE Electronic Components Sales Dept.
Heintz and Kaufman Ltd.
Motorola Semiconduct Motorola Inc.
RCA Electronic Comp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Singer Products Co., Inc.
Sylvania Semiconductor
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.

Semiconductor, Rectifiers, High Voltage

Amperex Corp.
Collins Radio Company Broadcasting Marketing,
Heintz and Kaufman Ltd.
Motorola Semiconduct Motorola Inc.
RCA Electronic Comp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Singer Products Co., Inc.
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.
Wilkinson Elect. Inc.

Semiconductor, Rectifiers, Power

Amperex Corp.
Collins Radio Company Broadcasting Marketing,
GE Electronic Components Sales Dept.
Heintz and Kaufman Ltd.
Motorola Semiconduct Motorola Inc.
RCA Electronic Comp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Singer Products Co., Inc.
Sylvania Semiconductor
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.
Wilkinson Elect. Inc.

Semiconductor, Rectifiers, Silicon Controlled-SCR

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Wilkinson Elect. Inc. 7

Amperex Corp.
Collins Radio Company Broadcasting Marketing,
GE Electronic Components Sales Dept.
Heintz and Kaufman Ltd.
Kliegl Bros. Lighting
Motorola Semiconduct Motorola Inc.
RCA Electronic Comp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Singer Products Co., Inc.
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.
Wilkinson Elect. Inc.

Semiconductors, Thyristors

GE Electronic Components Sales Dept.
Heintz and Kaufman Ltd.
Kliegl Bros. Lighting
Motorola Semiconduct Motorola Inc.
RCA Electronic Comp.
Singer Products Co., Inc.
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
Westinghouse Electric Corp.

Semiconductors, Transistors, AF

Heintz and Kaufman Ltd.
Motorola Semiconduct Motorola Inc.
Raytheon Co.
RCA Electronic Comp.
Singer Products Co., Inc.
Sylvania Semiconductor
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.

Semiconductors, Transistors, FET

Amperex Corp.
Heintz and Kaufman Ltd.
Motorola Semiconduct Motorola Inc.
Plessey Electronics Corp.
RCA Electronic Comp.
Singer Products Co., Inc.
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.

Semiconductor, Transistors, General

CATV Equipment Co.
GE Electronic Components Sales Dept.
Motorola Semiconduct Motorola Inc.
Raytheon Co.
RCA Electronic Comp.
Singer Products Co., Inc.
Sylvania Semiconductor
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
Total Technology
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.

Semiconductor, Transistors, RF

Heintz and Kaufman Ltd.
Hewlett Packard Co.
Motorola Semiconduct Motorola Inc.
Raytheon Co.
RCA Electronic Comp.
Singer Products Co., Inc.
Solitron Devices Inc.
Sylvania Semiconductor
Texas Instrument Semiconductor Comp. Div.
Thor Electronics Corp.
TRW Electronic Supply Co. Div. of TRW
Westinghouse Electric Corp.

Shifters, Phase, Microwave

Andersen Labs Inc.
Collins Radio Company Broadcasting Marketing,
General Radio Co.
Hewlett Packard Co.
Micro Communications, Inc.
Microlab
Microwave Assoc. Inc.
Narda Microwave Corp., The
Rank Precision Ind. Broadcast Div.
Raytheon Co.

Sound Systems, Outdoor

Alcor Inc.
ALTEC
American Geloso Electronics
Ancha Electronics Inc.
Applied Elect. Mechanics
Audio Distributor Inc.
Bell P/A Prod. Corp.
Electrodyne Div. of MCA Technology, Inc.
Electro-Voice Inc.
Gately Electronics
Jensen Mfg. Div. The Muter Co.
Langevin An MCA Technology Company
McMartin Industries Inc.
North Amer. Philips
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Q-TV Sales & Distributing Corp.
Shure Brothers Inc.
Spectra Sonics
Ultra Audio Products

Sound Systems, Portable

Alcor Inc.
Allied Electronics Subs. of Tandy Corp.
ALTEC
American Geloso Electronics
Ancha Electronics Inc.
Applied Elect. Mechanics
Audio Distributor Inc.
Audiotronics Corp.
CCA Electronics
Custom Craft Designs
Electrodyne Div. of MCA Technology, Inc.
Electro-Voice Inc.
Gately Electronics
Jensen Mfg. Div. The Muter Co.
Langevin An MCA Technology Company
McMartin Industries Inc.
North Amer. Philips
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Q-TV Sales & Distributing Corp.
Roberts Div. of Rhee Mfg. Co.
Shure Brothers Inc.
Singer Products Co., Inc.
Spectra Sonics
Tape-Athon Corp.
Ultra Audio Products

Sound Systems, Studio

Alcor Inc.
Ancha Electronics Inc.
Behrends, Inc.
CCA Electronics

Cleveland Electronics, Inc.
Delta Electronics Inc. (N.C.)
Gately Electronics
Gotham Audio Corp.
Jensen Mfg. Div. The Muter Co.
Langevin An MCA Technology Company
Magna-Tech Electronic Co., Inc.
Melcor Electronics Corp.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Shure Brothers Inc.
Singer Products Co., Inc.
Spectra Sonics
(Trusonic) ACS Inc.
Visual Electronics Corp. 356 W. 40th

Sound Systems, Theater

Alcor Inc.
ALTEC
American Geloso Electronics
Ancha Electronics Inc.
Audio Distributor Inc.
Behrends, Inc.
Delta Electronics Inc. (N.C.)
Electrodyne Div. of MCA Technology, Inc.
Electro-Voice Inc.
Gately Electronics
Jensen Mfg. Div. The Muter Co.
Langevin An MCA Technology Company
McMartin Industries Inc.
Melcor Electronics Corp.
North Amer. Philips
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Q-TV Sales & Distributing Corp.
Shure Brothers Inc.
Spectra Sonics
(Trusonic) ACS Inc.
Universal Audio Inc.

Speakers

Alcor Inc.
Allied Electronics Subs. of Tandy Corp.
ALTEC
American Geloso Electronics
Ancha Electronics Inc.
ATLAS Sound
Audiotronics Corp.
Bauer (See Sparta)
Behrends, Inc.
Cleveland Electronic Speaker Div.
Collins Radio Company Broadcasting Marketing,
Electrodyne Div. of MCA Technology, Inc.
Electro-Voice Inc.
G.C. Electronics
Gotham Audio Corp.
Hartley Prod. Corp.
Jensen Mfg. Div. The Muter Co.
Koss Corp.
Langevin An MCA Technology Company
North Amer. Philips
Oaktron Industries Inc.
Philips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Schultz Inc., Albert
Singer Products Co., Inc.
Spectra Sonics
Superscope Inc.
Tandberg of America Inc.
TEAC Corp of America
Tele Measurements Inc.
(Trusonic) ACS Inc.

STL Equipment

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Moseley Assoc. Inc. 24

Alto-Fonic Programming Inc.
Andrews Towers Inc.
Bauer (See Sparta)
CCA Electronics
Coastcom Division

Broadcast Buyer's Guide Section

Collins Radio Company Broadcasting Marketing.
David Clark Co., Inc.
Dynair Electronics, Inc.
Gates Division of Harris-Intertype
GTE Lenkurt Incorporated
Marti Electronics
Microwave Assoc. Inc.
Moseley Assoc. Inc.
RCA Electronic Comp.
RHG Elect Labs, Inc.
Richmond Hill Laboratories Inc.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Scala Radio Corp.
Singer Products Co., Inc.
Tektronix Inc.
Trepac Corp. America
Varian Solid State Div. Micro-Link Products
Visual Communication Products Oper. General Electric Co.

Station Cabinets, Consoles and Racks

Borg-Warner Corp. Ingersoll Prods. Div.
Broadcast Recorders
Duotone Co. Inc.
Enclosure Corp.
Grinnan Fixture Co.

Switchers

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Alma Engineering Inc.
American Data Corp.
Ampex Corp.
Audio Designs & Mfg.
Ball Bros. Research Corp. Ball Bros. Research Corp. Miratel Division
Broadcast Recorders
Central Dynamics Corp.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Cunningham Corp. Subs. of Gleason Works
Dynair Electronics, Inc.
Essex Wire Co. RBM Div.
Fung Engineering Co.
Grass Valley Group, Inc.
Humphrey Electronics Inc.
Interntl. Good Music Inc.
Interntl. Nuclear Corp.
Javelin Electronics Co.
Kapco Enterprises
Kay Elemetrics Corp.
Lerro Electrical Corp.
Marconi Electronics Inc.
McCurdy Radio Ind. Inc.
Mincom Div. 3M Co.
Richmond Hill Laboratories Inc.
Riker Information Systems Inc.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Shintron Co. Inc.
Sparta Electronic Corp.
TeleMation, Inc.
Total Technology
Videon Corp.
Vikoa Inc.
Viscount Video Systems Ltd.
Visual Educom Inc.
Vital Industries
Ward Electronic Indus.

Switches, Coaxial

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American Data Corp. 61

Alford Mfg. Co.
American Data Corp.
American Electronics Lab., Inc.
Andrew Corp.
A-Tel-A-Matic

Bauer (See Sparta)
Bird Electronic Corp.
Blonder-Tongue Labs.
CATV Equipment Co.
Collins Radio Company Broadcasting Marketing.
CYBRIX CORPORATION
Delta Electronics Inc. (Va.)
Electronic Inst. & Spec.
Fung Engineering Co.
General Microwave Corp.
Integral Data Devices Inc.
ITT Jennings
Jampro Antenna Co.
Kay Elemetrics Corp.
Lectronic Res. Labs. Inc.
Magnecraft Electric Co.
Matrix Systems Corp.
Micro Communications, Inc.
Microlab
Narda Microwave Corp., The
Profin Inc.
Singer Products Co., Inc.
Soll, Inc., Joseph M.
Telonic Instruments
Texscan Corp.
Trompeter Electronics
TRW Electronic Supply Co. Div. of TRW
TV Cable Supply Co.

Switches, Crossbar

See Adv. Page

American Data Corp. 61

American Data Corp.
Andrew Corp.
Collins Radio Company Broadcasting Marketing.
Cunningham Corp. Subs. of Gleason Works
CYBRIX CORPORATION
Delta Electronics Inc. (Va.)
Dynair Electronics, Inc.
Fernseh GmbH c/o Robert Bosch Corp.
Grass Valley Group, Inc.
Integral Data Devices Inc.
Interntl. Nuclear Corp.
Marconi Electronics Inc.
Rust Corp.
Tape-Athon Corp.
Trompeter Electronics
Viscount Video Systems Ltd.
Vital Industries

Switching Systems

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American Data Corp. 61

Alcor Inc.
Alma Engineering Inc.
American Data Corp.
Ampex Corp.
Andrew Corp.
Arbor Systems Inc.
Atlantic Research
Ball Bros. Research Corp. Ball Bros. Research Corp. Miratel Division
Bradford Information Systems
Broadcast Recorders
Canoga Elect. Co.
Central Dynamics Corp.
Cleveland Electronics, Inc.
CMX Systems
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Collins Radio Company Broadcasting Marketing.
Cunningham Corp. Subs. of Gleason Works
CYBRIX CORPORATION
Delta Electronics Inc. (Va.)
Dynair Electronics, Inc.
Fernseh GmbH c/o Robert Bosch Corp.
Grass Valley Group, Inc.
Integral Data Devices Inc.
Interntl. Good Music Inc.
Interntl. Nuclear Corp.
International Video

ITT General Controls
Javelin Electronics Co.
Marconi Electronics Inc.
Matrix Systems Corp.
McCurdy Radio Ind. Inc.
Mobile Color, Inc.
Multronics, Inc.
Q-TV Sales & Distributing Corp.
Richmond Hill Laboratories Inc.
Rust Corp.
Sarkes Tarzian Inc. Broadcast Equipment Div.
Soll, Inc., Joseph M.
Switchcraft Inc.
TeleMation, Inc.
Telemet Co.
Trompeter Electronics
Videon Corp.
Vikoa Inc.
Viscount Video Systems Ltd.
Visual Electronics Corp. 356 W. 40th
Vital Industries
Ward Electronic Indus.

Tape Cleaning Machine

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Lipsner Smith Corp.

Tape, Decks, Magnetic

Accurate Sound Company
Alto-Fonic Programming Inc.
Ampex Corp.
Broadcast Electronics
Broadcast Products Inc.
CCA Electronics
Cine Sonic Sound Inc.
Collins Radio Company Broadcasting Marketing.
Crown International
Electrodyne Div. of MCA Technology, Inc.
Gates Division of Harris-intertype
Gotham Audio Corp.
Interntl. Good Music Inc.
Interntl. Tapetronics Corp.
Lang Electronics Inc.
Langevin An MCA Technology Company
Magnatech Co.
Philips Broadcast Equipment Corp. Subs. North American Philips Corp.
Q-TV Sales & Distributing Corp.
Recordex Corporation
Revox Corporation
Roberts Div. of Rhee's Mfg. Co.
Schafer Electronics
Schultz Inc., Albert
Scully Recording Instruments Co.
Singer Products Co., Inc.
Sparta Electronic Corp.
Superscope Inc.
Tandberg of America Inc.
Tape-Athon Corp.
TEAC Corp of America
Tele Measurements Inc.
Telex Communications Division
VIF International

Tape Duplicators

Alcor Inc.
Ampex Corp.
Audiotronics Corp.
Behrends, Inc.
Bell Sound Studios A & B Duplicators Div.
Crown International
Electrodyne Div. of MCA Technology, Inc.
Joa Cartridge Service
Lang Electronics Inc.
Langevin An MCA Technology Company
Orbit Radio and Video
Philips Broadcast Equipment Corp.
Audio-Video Systems Div.
Philips Broadcast Equipment Corp. Subs. North American Philips Corp.

Recordex Corporation
Recortec Inc.
Schultz Inc., Albert
Telectro Systems Corp.
Television Equipment Assoc.
Telex Communications Division

Tape, Magnetic Recording, Audio

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Nortronics Co., Inc. 54

Allied Electronics Subs. of Tandy Corp.
Alto-Fonic Programming Inc.
American Gelooso Electronics
Ampex Corp.
Audio Devices, Inc.
Audio Magnetics Corp.
Bauer (See Sparta)
Behrends, Inc.
Bell & Howell Consumer Products Group
Broadcast Electronics
Broadcast Products Inc.
Cine Sonic Sound Inc.
Collins Radio Company Broadcasting Marketing.
Crown International
Duotone Co. Inc.
Eastman Kodak Co.
Elektromesstechnik E M T Wilhelm Franz G M B H
Joa Cartridge Service
Magnatech Co.
Magnetic Prod. Div. 3M Company
Miles Reproducer Co.
Nortronics Co., Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Q-TV Sales & Distributing Corp.
Recordex Corporation
Ryder Magnetics Sales
Sarkes Tarzian Inc. Broadcast Equipment Div.
Schafer Electronics
Schultz Inc., Albert
Singer Products Co., Inc.
Superscope Inc.
Tape-Athon Corp.
Tele Measurements Inc.
Transco Products International

Tape, Magnetic Recording, Audio Cartridges

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Allied Electronics Subs. of Tandy Corp.
Alto-Fonic Programming Inc.
American Gelooso Electronics
Audio Devices, Inc.
Bell & Howell Consumer Products Group
Birmingham Tape Cartridge Co.
Broadcast Electronics
Broadcast Prod. Co. Inc. Bcst. Division
Broadcast Products Inc.
Cine Sonic Sound Inc.
Collins Radio Company Broadcasting Marketing.
Gates Division of Harris-Intertype
Interntl. Good Music Inc.
Interntl. Tapetronics Corp.
Joa Cartridge Service
Magnetic Prod. Div. 3M Company
Marathon Broadcast Equip.
Mastertone Co.
Nemo Recording Labs
Nortronics Co., Inc.
Peripheral Data Machines, Inc. (PER DATA)
Q-TV Sales & Distributing Corp.
Recordex Corporation
Schafer Electronics
Schultz Inc., Albert
Singer Products Co., Inc.
Sparta Electronic Corp.

Sparta Electronic Corp. (East)
Spotmaster Broadcast Electronics
Superscope Inc.
Tapecaster
Telepro Industries
Transco Products International
Visual Electronics Corp. 356 W. 40th

Tape, Magnetic Recording, Computer

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Nortronics Co., Inc. 54

Arbor Systems Inc.
Audio Devices, Inc.
CYBRIX CORPORATION
Magnetic Prod. Div. 3M Company
Memorex Corp.
Nortronics Co., Inc.
Tape-Athon Corp.

Tape, Magnetic Recording, Test

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Nortronics Co., Inc. 54

Ampex Corp.
Audio Devices, Inc.
Interntl. Tapetronics Corp.
Nortronics Co., Inc.
RCA Broadcast Equipment
Communications Systems Div.
Recordex Corporation
Schultz Inc., Albert
Taber Mfg. & Engr. Co.
VIF International

Tape, Magnetic Recording, Video

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Magnetic Prod. Div. 16-17

Audio Devices, Inc.
Audio Magnetics Corp.
Audiotronics Corp.
Computer Image Corp.
Concord Elect. Corp.
GBC CCTV
Lerro Electrical Corp.
Magnetic Prod. Div. 3M Company
Memorex Corp.
Mincom Div. 3M Co.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RCA Broadcast Equipment
Communications Systems Div.
Recordex Corporation
Shibaden Corp. of America
Sony Corp. of America
Tele Measurements Inc.
Tyler R. H. Co., CATV Div.

Tape Rack, Cartridge

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Broadcast Electronics 52
Sparta Electronic Corp. 43

Broadcast Electronics
Sparta Electronic Corp.

Tape, Recording, Logging

Alto-Fonic Programming Inc.
Audio Devices, Inc.
Bauer (See Sparta)
Broadcast Products Inc.
Cine Sonic Sound Inc.
Magnetic Prod. Div. 3M Company
Metrotech Inc.
Richmond Hill Laboratories Inc.
Schafer Electronics
Singer Products Co., Inc.
Tape-Athon Corp.
TELE-CLINE INC.

Tape Transport

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Langevin 47
MCA Technology, Inc. 47
Radio Mfg. Co. 82

Langevin An MCA Technology
Company
MCA Technology, Inc.
Radio Mfg. Co.

Teletype Alarm Receiver

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Audio Engineering Co. 80

Audio Engineering Co.

Test Slides, Video

D AND S CORLEY LIMITED
Marconi Electronics Inc.
Tele Measurements Inc.
Television Equipment Assoc.

Testers, Semiconductor

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Ramko Research 78

American Electronics Lab., Inc.
Collins Radio Company Broadcasting
Marketing,
Delta Electronics Inc. (N.C.)
Delta Electronics Inc. (Va.)
Eico Elect. Inst. Co., Inc.
General Microwave Corp.
Heath co.
Hickok Elect. Instrument
ITT-METRIX
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Lectrotech Inc.
Ramko Research
Rohde & Schwarz Sales
Sencore Inc.
Tektronix Inc.
Triplet Corporation

Testers, Vacuum Tube

Allied Electronics Subs. of Tandy
Corp.
Eico Elect. Inst. Co., Inc.
Hickok Elect. Instrument
ITT-METRIX
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
Lectrotech Inc.
RCA Electronic Comp.
Sencore Inc.
Singer Products Co., Inc.

Tool Kits

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Jensen Tools & Alloys 74

Channellock, Inc.
Greenlee Tool Co.
Jensen Tools & Alloys
Western Electronic Prods. Co.
Xcelite

Towers, Antenna

Advance Industries
Andrews Towers Inc.
Bauer (See Sparta)
Collins Radio Company Broadcasting
Marketing,
Dresser Crane Hoist and Tower Div.
E Z Way Prod. Inc.
Fort Worth Tower Co., Inc.
Gates Division of Harris-Intertype
G.C. Electronics
Gulf Telephone & Electronics
Jampro Antenna Co.
Kline Iron & Steel Co.

Mastertone Co.
Microelect Co. Inc.
R. F. Systems
Rohn Mfg. Co.
Stainless, Incorporated
Swager Tower Corp.
TACO Technical Appliance Corp. A
General Instrument Co.
Tri-Ex Tower Corp.
Up Right Scaffolds
Utility Tower Co.

Towers, Antenna, Receiving

Ameco Inc.
Andrews Towers Inc.
Antenna Products Co. Div. APC
Industries, Inc.
Dresser Crane Hoist and Tower Div.
E Z Way Prod. Inc.
Gulf Telephone & Electronics
Microelect Co. Inc.
R. F. Systems
Rohn Mfg. Co.
Singer Products Co., Inc.
Stainless, Incorporated
Swager Tower Corp.
TACO Technical Appliance Corp. A
General Instrument Co.
TV Cable Supply Co.
Up Right Scaffolds
Utility Tower Co.

Towers, Antenna, Transmitting, AM

Advance Industries
Alto-Fonic Programming Inc.
Andrews Towers Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Dresser Crane Hoist and Tower Div.
E Z Way Prod. Inc.
Fort Worth Tower Co., Inc.
Gates Division of Harris-Intertype
Jampro Antenna Co.
Kline Iron & Steel Co.
Microelect Co. Inc.
RCA Broadcast Equipment
Communications Systems Div.
R. F. Systems
Rohn Mfg. Co.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Stainless, Incorporated
Swager Tower Corp.
TACO Technical Appliance Corp. A
General Instrument Co.
Tri-Ex Tower Corp.
United State Towers
Up Right Scaffolds
Utility Tower Co.
Wilkinson Elect. Inc.

Towers, Antenna, Transmitting, FM

Advance Industries
Alto-Fonic Programming Inc.
Andrews Towers Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Dresser Crane Hoist and Tower Div.
E Z Way Prod. Inc.
Fort Worth Tower Co., Inc.
Gates Division of Harris-Intertype
Jampro Antenna Co.
Kline Iron & Steel Co.
Microelect Co. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Rohn Mfg. Co.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Stainless, Incorporated
Swager Tower Corp.
TACO Technical Appliance Corp. A
General Instrument Co.
United State Towers

Up Right Scaffolds
Utility Tower Co.

Towers, Antenna, Transmitting, TV

Advance Industries
Andrews Towers Inc.
Dresser Crane Hoist and Tower Div.
E Z Way Prod. Inc.
Fort Worth Tower Co., Inc.
Jampro Antenna Co.
Kline Iron & Steel Co.
Microelect Co. Inc.
RCA Broadcast Equipment
Communications Systems Div.
R. F. Systems
Rohn Mfg. Co.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Stainless, Incorporated
Swager Tower Corp.
TACO Technical Appliance Corp. A
General Instrument Co.
United State Towers
Up Right Scaffolds
Utility Tower Co.

Translator Systems

Acrodyne Industries
Ampex Corp.
Collins Radio Company Broadcasting
Marketing,
Electronics, Missiles &
Communications
Ikegami Co. Ltd.
Jampro Antenna Co.
RCA Broadcast Equipment
Communications Systems Div.
R. F. Systems
Rodelco
Rohde & Schwarz Sales
Singer Products Co., Inc.
Television Technology Corp.

Transmission Lines

Alto-Fonic Programming Inc.
Ameco Inc.
Andrew Corp.
Collins Radio Company Broadcasting
Marketing,
Columbia Electronic Cbl.
Gates Division of Harris-Intertype
Jampro Antenna Co.
Lectronic Res. Labs. Inc.
Micro Communications, Inc.
Narda Microwave Corp., The
Phelps Dodge Communications Co.
Phelps Dodge Communications Co.
Div. Phelps Dodge Copper Products
Corp.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Soll, Inc., Joseph M.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Surface Construction
Wilkinson Elect. Inc.

Transmission Test Sets

Atlantic Research
GTE Lenkurt Incorporated
Hewlett Packard Co.
Lectronic Res. Labs. Inc.
Narda Microwave Corp., The
N. E. Electronics Corp.
Phelps Dodge Communications Co.
Riker Communications Inc.
TeleMation, Inc.
United Recording
Universal Audio Inc.

Transmitter Kits

Gates Division of Harris-Intertype
Heath co.

Broadcast Buyer's Guide Section

Transmitter, AM, Carrier

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Sparta Electronic Corp. 43

Bristol Div. of Acco
CCA Electronics
GTE Lenkurt Incorporated
Low Power Broadcast Co.
Singer Products Co., Inc.
Sparta Electronic Corp.

Transmitters, AM, Low Power

ALTEC
American Electronics Lab., Inc.
Bauer (See Sparta)
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
Low Power Broadcast Co.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 250 Watts

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Wilkinson Elect. Inc. 7

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 500 Watts

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 1 kw

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 5 kw

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CCA Electronics 67

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.

Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 10 kw

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CCA Electronics 67
Wilkinson Elect. Inc. 7

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 25 kw

American Electronics Lab., Inc.
CCA Electronics
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, 50 kw

American Electronics Lab., Inc.
Bauer (See Sparta)
CCA Electronics
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Visual Communication Products Oper.
General Electric Co.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, AM, over 50 kw

American Electronics Lab., Inc.
Bauer (See Sparta)
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
Marconi Electronics Inc.

Transmitters, AM, to order

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Gates 14

American Electronics Lab., Inc.
Bauer (See Sparta)
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Continental Electronics Mfg. Co. Subs.
of Resalab, Inc.
Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Wilkinson Elect. Inc.

Transmitters, FM

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American Electronics Lab., Inc.
Bristol Div. of Acco
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
GTE Lenkurt Incorporated
Marconi Electronics Inc.
Miles Reproducer Co.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Soll, Inc., Joseph M.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 10 Watts

American Electronics Lab., Inc.
Ampex Corp.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Gates Division of Harris-Intertype
GTE Lenkurt Incorporated
Marti Electronics
Moseley Assoc. Inc.
Rohde & Schwarz Sales
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 50 Watts

CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Moseley Assoc. Inc.
Rohde & Schwarz Sales
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 100 Watts

CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Gates Division of Harris-Intertype
Marti Electronics
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 250 Watts

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Wilkinson Elect. Inc. 7

Wilkinson Elect. Inc.

Transmitters TV, 500 Watts

CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 1 kw

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Fung Engineering Co.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 3 kw

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 5 kw

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 7.5 kw

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 10 kw

American Electronics Lab., Inc.
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 15 kw

Bauer (See Sparta)
CCA Electronics
Collins Radio Company Broadcasting
Marketing,
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 20 kw

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Wilkinson Elect. Inc. 7
CCA Electronics

Broadcast Buyer's Guide Section

Collins Radio Company Broadcasting Marketing,
Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 40 kw

CCA Electronics
Collins Radio Company Broadcasting Marketing,
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th
Wilkinson Elect. Inc.

Transmitters, FM, 50 kw

CCA Electronics
Gates Division of Harris-Intertype
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Visual Electronics Corp. 356 W. 40th

Transmitters, FM, 100 kw

CCA Electronics
Gates Division of Harris-Intertype
Singer Products Co., Inc.

Transmitters, FM, to order

CCA Electronics
Collins Radio Company Broadcasting Marketing,
Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.
Singer Products Co., Inc.
Wilkinson Elect. Inc.

Transmitters, TV

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Gates 14

Ampex Corp.
Gates Division of Harris-Intertype
Ikegami Co. Ltd.
Janson Industries
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Soll, Inc., Joseph M.
Television Technology Corp.
Varian Solid State Div. Micro-Link
Products
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 1 watt

Dynair Electronics, Inc.
Electronics, Missiles &
Communications
Fung Engineering Co.
Gates Division of Harris-Intertype
GTE Lenkurt Incorporated
Rohde & Schwarz Sales
Television Technology Corp.
Varian Solid State Div. Micro-Link
Products

Transmitters, TV, 10 watts

Electronics, Missiles &
Communications
Gates Division of Harris-Intertype
GTE Lenkurt Incorporated
Marconi Electronics Inc.
Rodelco
Television Technology Corp.
Varian Solid State Div. Micro-Link
Products

Transmitters, TV, 20 watts

Electronics, Missiles &
Communications
Gates Division of Harris-Intertype
Rodelco
Television Technology Corp.

Transmitters, TV, 60 watts

Electronics, Missiles &
Communications
Gates Division of Harris-Intertype
Rodelco
Television Technology Corp.

Transmitters, TV, 100 watts

Benco Television Associates
Electronics, Missiles &
Communications
Gates Division of Harris-Intertype
Rodelco
Television Technology Corp.

Transmitters, TV, 500 watts

Electronics, Missiles &
Communications
Gates Division of Harris-Intertype
Marconi Electronics Inc.

Transmitters, TV, 1 kw

Electronics, Missiles &
Communications
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 2 kw

Gates Division of Harris-Intertype

Transmitters, TV, 5 kw

Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 6 kw

Gates Division of Harris-Intertype
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 10 kw

Ampex Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Broadcast Equipment
Communications Systems Div.

Transmitters, TV, 11 kw

Gates Division of Harris-Intertype
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 12 kw

Gates Division of Harris-Intertype
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.

RCA Broadcast Equipment
Communications Systems Div.

Transmitters, TV, 15 kw

Ampex Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 25 kw

Ampex Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Subs. North American Philips Corp.
RCA Broadcast Equipment
Communications Systems Div.

Transmitters, TV, 30 kw

Ampex Corp.
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RCA Broadcast Equipment
Communications Systems Div.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 35 kw

Marconi Electronics Inc.

Transmitters, TV, 50 kw

Ampex Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
RCA Broadcast Equipment
Communications Systems Div.

Transmitters, TV, 55 kw

Ampex Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
RCA Broadcast Equipment
Communications Systems Div.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, 100 kw

Ampex Corp.
Gates Division of Harris-Intertype
Marconi Electronics Inc.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, Specify Power

Gates Division of Harris-Intertype
RCA Broadcast Equipment
Communications Systems Div.
Visual Communication Products Oper.
General Electric Co.

Transmitters, TV, to order

Gates Division of Harris-Intertype
Miles Reproducer Co.
RCA Broadcast Equipment
Communications Systems Div.
Shibaden Corp. of America

Turntables, Phonograph

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Broadcast Electronics 40
CCA Electronics 67
Gates 14
Sparta Electronic Corp. 43
Broadcast Electronics

Broadcast Products Inc.
CCA Electronics
Collins Radio Company Broadcasting Marketing,
Contel Mfg. Div. of Continental
Electronic Wholesale Corp.
Gates Division of Harris-Intertype
Gotham Audio Corp.
Gray Research & Dev.
Koss Corp.
Low Power Broadcast Co.
Mastertone Co.
McCurdy Radio Ind. Inc.
QRK Electronic Prod.
RCA Broadcast Equipment
Communications Systems Div.
Russco Electronics Mfg.
Schultz Inc., Albert
Singer Products Co., Inc.
Sparta Electronic Corp.
Sparta Electronic Corp. (East)
Spotmaster Broadcast Electronics
Superscope Inc.
Tri-Tronics

TV Systems, Closed Circuit

Admiral Corporation
Alcor Inc.
American Data Corp.
Anaconda Electronics
A-Tel-A-Matic
ATV Research
Audiotronics Corp.
AVA Elect. & Machine Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Berkey-Colortran Inc.
Canoga Elect. Co.
Catel Corp., The
CHESTER ELECTRONIC LABS., INC.
GTE Information Systems Inc.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Colorado Video Inc.
Concord Elect. Corp.
Cunningham Corp. Subs. of Gleason
Works
Davis & Sanford Co. Inc.
Delta Electronics Inc. (N.C.)
Denson Electronic Corp.
Dynair Electronics, Inc.
F&B/Ceco Industries, Inc.
Fernseh GmbH c/o Robert Bosch
Corp.
GBC CCTV
Gen. Electrodynamics
Gulf Telephone & Electronics
Internatl. Nuclear Corp.
International Video
Janson Industries
Jerrold Electronics Corp. CATV
Systems Div.
Kaiser Cox Corp.
Katona Electronics Co.
K'SON Corporation
Lerro Electrical Corp.
Link Division The Singer Company
Marconi Electronics Inc.
Mincom Div. 3M Co.
MTI Div KMS Industries
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Rank Precision Ind. Broadcast Div.
RCA Broadcast Equipment
Communications Systems Div.
Riker Communications Inc.
Sarkes Tarzian Inc. Broadcast
Equipment Div.
Soll, Inc., Joseph M.
Surface Construction
Sylvania Comm. Electronic
Tektronix Inc.
TeleMaton, Inc.
Tele Measurements Inc.
Telequip Corp.
Television Presentations, Inc.
Teltron, Inc.
TV Cable Supply Co.
Varian Solid State Div. Micro-Link
Products
Vikoa Inc.
Visual Communication Products Oper.
General Electric Co.

Visual Educom Inc.
Visual Electronics Corp. 356 W. 40th
Westinghouse Elec. Co. Electric Tube
Div.
Westinghouse Electric Corp.

Vacuum Tubes, Camera, Image-Orthicon

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Teltron, Inc. 84

Amperex Corp.
Fernseh GmbH c/o Robert Bosch
Corp.
GE Electronic Components Sales Dept.
G.E. Pickup Tube Operation
Heintz and Kaufman Ltd.
Lerro Electrical Corp.
Shibaden Corp. of America
Tele Measurements Inc.
Teltron, Inc.
Thor Electronics Corp.
Visual Communication Products Oper.
General Electric Co.

Vacuum Tubes, Camera, Plumbicon

Amperex Corp.
Gen. Electrodynamics
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North Amer. Philips
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Tele Measurements Inc.
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Vacuum Tubes, Camera, Vidicon

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Amperex Corp.
A-Tel-A-Matic
ATV Research
Audiotronics Corp.
GBC CCTV
GE Electronic Components Sales Dept.
Gen. Electrodynamics
G.E. Pickup Tube Operation
Heintz and Kaufman Ltd.
ITT Electron Tube Div.
Javelin Electronics Co.
Lerro Electrical Corp.
North Amer. Philips
Phillips Broadcast Equipment Corp.
Audio-Video Systems Div.
Siemens Corporation
Teltron, Inc.
Thomson-CSF Electron Tubes
Thor Electronics Corp.
Visual Communication Products Oper.
General Electric Co.
Westinghouse Elec. Co. Electric Tube
Div.

Vacuum Tubes, Cathode Ray, Oscilloscope

Heintz and Kaufman Ltd.
Lectronic Res. Labs. Inc.
Lerro Electrical Corp.
Thomson-CSF Electron Tubes
Thor Electronics Corp.

Vacuum Tubes, Cathode Ray, TV, Color

Amperex Corp.
GE Electronic Components Sales Dept.
Lerro Electrical Corp.
RCA Electronic Comp.
Thomson-CSF Electron Tubes
Thor Electronics Corp.
Westinghouse Elec. Co. Electric Tube
Div.

Vacuum Tubes, Cathode Ray, TV, Monochrome

Amperex Corp.
Ball Bros. Research Corp. Ball Bros.
Research Corp. Miratel Division
Fernseh GmbH c/o Robert Bosch
Corp.
Lerro Electrical Corp.
RCA Electronic Comp.
Thor Electronics Corp.
Westinghouse Elec. Co. Electric Tube
Div.

Vacuum Tubes, Transmitting

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Amperex Corp.
Collins Radio Company Broadcasting
Marketing,
Eimac Div. Varian Associates
Gates Division of Harris-Intertype
GE Electronic Components Sales Dept.
ITT Electron Tube Div.
Joa Cartridge Service
Lectronic Res. Labs. Inc.
Raytheon Co.
RCA Electronic Comp.
Singer Products Co., Inc.
Thomson-CSF Electron Tubes
Thor Electronics Corp.
Varian Solid State Div. Micro-Link
Products

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Econco Broadcast Service Inc.
Freeland Products Co.

Voltmeters, AC

Allied Electronics Subs. of Tandy
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B & K Dynascan Corp.
Boonton Electronics
Bristol Div. of Acco
Calif. Instruments Co.
Eico Elect. Inst. Co., Inc.
GE Electronic Components Sales Dept.
General Radio Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
Honeywell Inc. Test Instruments Div.
Industrial Devices Inc.
Interntl. Instrument Inc.
ITT-METRIX
Kikusui Elect. Corp.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
RCA Broadcast Equipment
Communications Systems Div.
RCA Electronic Comp.
Simpson Electric Co.
Singer Co., The Los Angeles Operation
Triplet Corporation

Voltmeters, DC

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Boonton Electronics
Bristol Div. of Acco
Calif. Instruments Co.
Cohu Electronics Inc. San Diego Div.
Cohu Electronics, Inc.
Eico Elect. Inst. Co., Inc.
GE Electronic Components Sales Dept.
General Microwave Corp.
General Radio Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
Honeywell Inc. Test Instruments Div.
Industrial Devices Inc.

Interntl. Instrument Inc.
ITT-METRIX
Kikusui Elect. Corp.
Lectronic Res. Labs. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Simpson Electric Co.
Triplet Corporation

Voltmeters, FET

B & K Dynascan Corp.
Eico Elect. Inst. Co., Inc.
General Radio Co.
Heath co.
Hickok Elect. Instrument
ITT Jennings
Leader Instruments Corp.
RCA Broadcast Equipment
Communications Systems Div.
Sencore Inc.
Simpson Electric Co.
Triplet Corporation

Voltmeters, Vacuum Tube

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Boonton Electronics
Edison Electronics Div. McGraw-Edison
Company
Eico Elect. Inst. Co., Inc.
General Radio Co.
Heath co.
Hewlett Packard Co.
Hickok Elect. Instrument
INSTRUMENT LABORATORIES
ITT-METRIX
Kikusui Elect. Corp.
Leader Instruments Corp.
Lectronic Res. Labs. Inc.
RCA Broadcast Equipment
Communications Systems Div.
Simpson Electric Co.
Triplet Corporation

Wattmeters

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Bird Electronic Corp..... 50

Bird Electronic Corp.
Boonton Electronics
Eico Elect. Inst. Co., Inc.
GE Electronic Components Sales Dept.
General Microwave Corp.
Lectronic Res. Labs. Inc.
Micro Communications, Inc.
RCA Broadcast Equipment
Communications Systems Div.
Rohde & Schwarz Sales
Simpson Electric Co.
Singer Products Co., Inc.
Triplet Corporation

Waveguides

Andrew Corp.
Collins Radio Company Broadcasting
Marketing,
Lectronic Res. Labs. Inc.
Micro Communications, Inc.
Narda Microwave Corp., The
Rank Precision Ind. Broadcast Div.
RCA Broadcast Equipment
Communications Systems Div.

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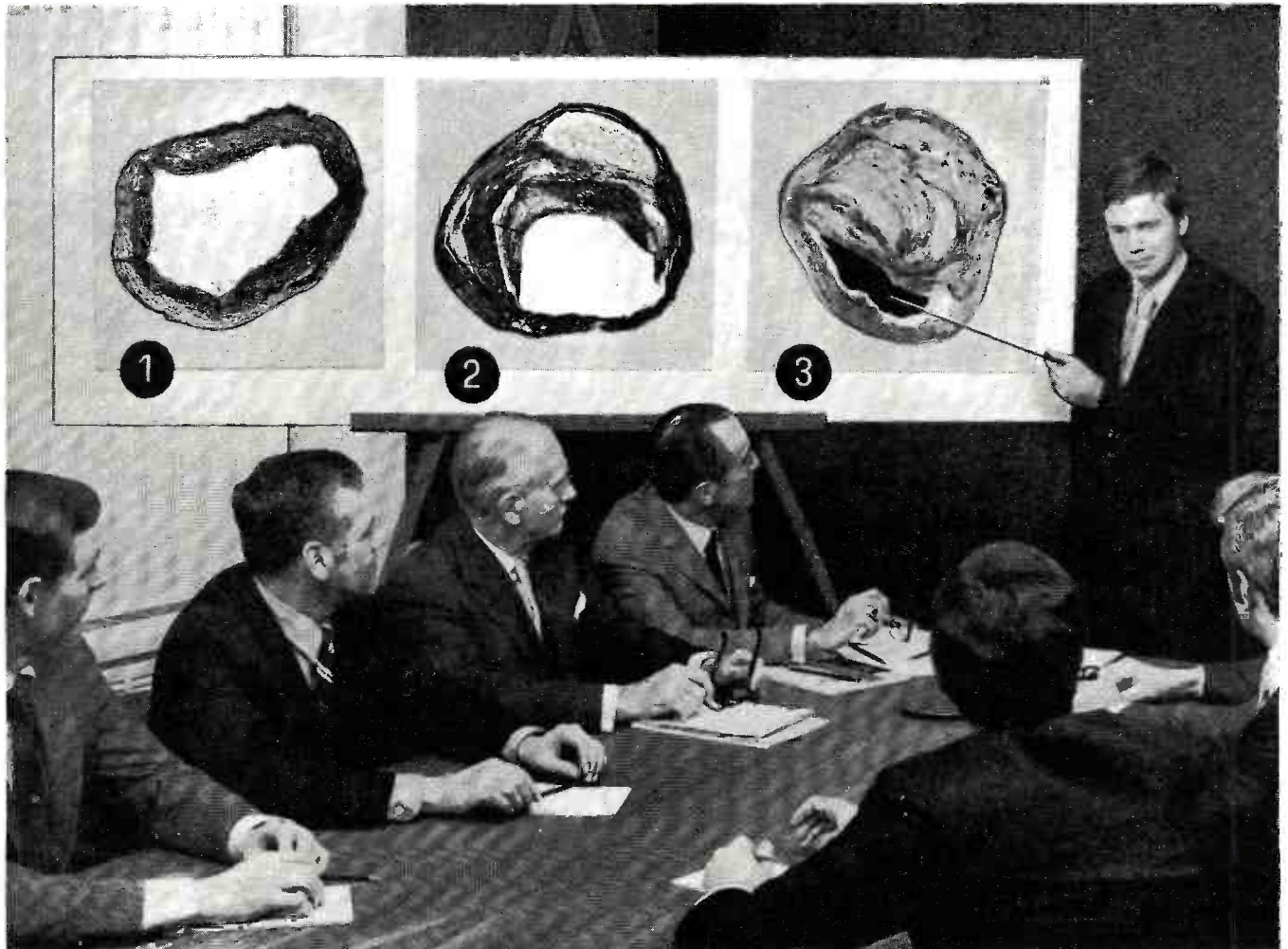
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Gen. Electrodynamics 4430 Forest Lane Garland Tex. 75040
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General Radio Co. 300 Baker Ave. Concord Mass. 01742
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Hollingsworth Solderless Terminal Co. Nutt & French Creek Rds. Phoenixville Pa. 19460
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Hughey & Phillips Inc. 3050 N. California St. Burbank Cal. 91505
Humphrey Electronics Inc. Box 10383 Raleigh N.C. 27603
Hunt Chemical Corp., Philip A. Roosevelt Place Palisades Park N.J. 07650

J

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Janson Industries Box 985 Canton Ohio 44701
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Jensen Tools & Alloys 4117 N. 44th St. Phoenix Ariz. 85018
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JFD Electronics Co. Systems Division 15th Ave. at 62nd Street Brooklyn N.Y. 11219
Joa Cartridge Service Box 3087 Philadelphia Pa. 19150
Johnson Electronics, Inc. P.O. Box 7 Casselberry Fla. 32707
Joslyn Electronic Sys. Box 817 Goleta Cal. 93017

K

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Kaiser CATV Division Kaiser Aerospace & Electronics Corp. 2216 West Peoria Ave. Phoenix Ariz. 85020
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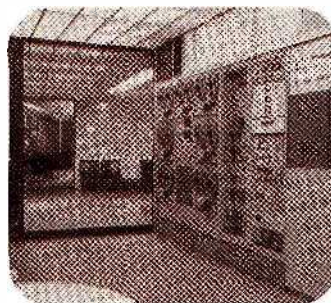
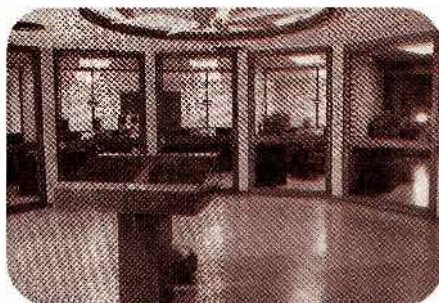
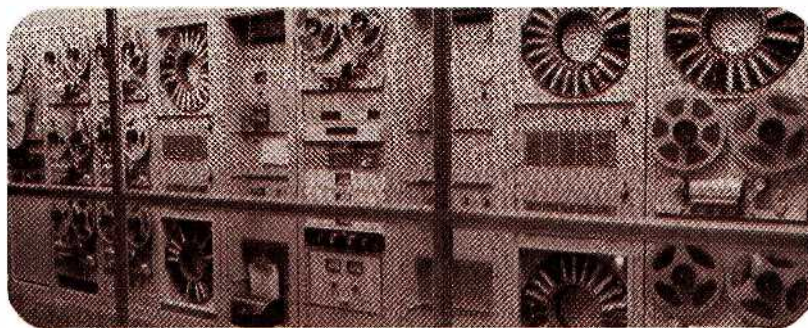
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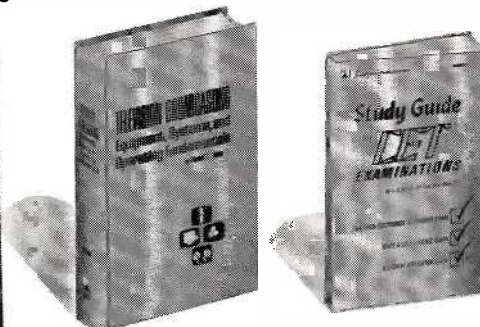
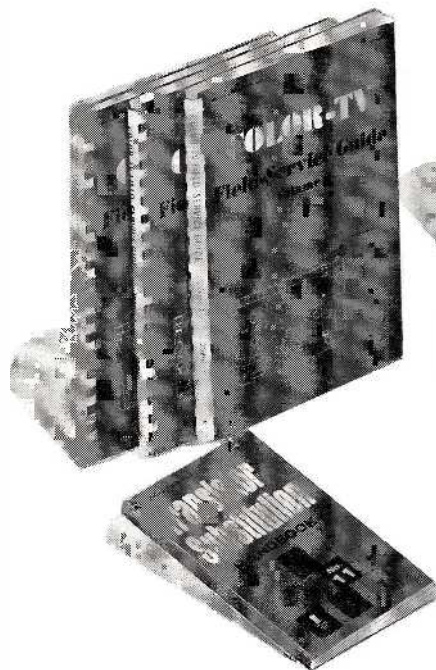
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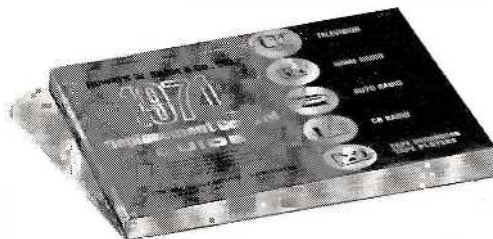
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Red listings are for manufacturers who advertised in this issue. The red listing in any category will refer you only to advertisements of equipment listed in that category.

Immediately following the cable equipment section and the broadcast-communications product sections are comprehensive lists of equipment manufacturers.

The following categories are for equipments especially designed for use in cable operations. The more general categories of communications equipment are listed under the Guide heading Broadcast-communication Product Directory. Cameras, recorders, switchers and a wide line of other support equipment are in that section.

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Anixter-Pruzan
Blonder-Tongue
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Electronic Indust. Engineering, Inc.
Entron, Inc.
Jerrold Electronics Corp.
Kaiser CATV
Sylvania Electric Products, Inc.

Amplifiers, Combination

AEL Communications Corp.
AMECO, Inc.
Anaconda Electronics
Cascade Electronics Ltd.
CAS Manufacturing Co.
Electronic Indust. Engineering, Inc.
Entron, Inc.
Fairchild MOD
Jerrold Electronics Corp.
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Sylvania Electric Products, Inc.
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Amplifiers, Strip

Anixter-Pruzan

Blonder-Tongue
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Entron, Inc.
JFD Systems
Winegard Company

Amplifiers, Trunk

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AMECO, Inc.
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Antenna Baluns

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Antennas FM

Cush Craft Corp.
Jerrold Electronics Corp.
JFD Systems
Jampro
RF Systems, Inc.
Sitco
TACO Division
Winegard Company

Antennas VHF-UHF

Scala Radio Corp. See page 41.
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Anixter-Pruzan
Cush Craft Corp.
Hy-Gain
Jerrold Electronics Corp.
JFD Systems Division
RCA
RF Systems
Scala Radio

Scientific-Atlanta, Inc.
Sitco
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F&B/Ceco of California
RCA
Shure Brothers Inc.
Sparta Electronic Corp.
Tape-Athon Corp.
Telemation, Inc.

Automatic Programming Equipment

Grass Valley Group. See page 3.

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CAS Manufacturing Co.
The Catel Corporation
CBS Laboratories
Data Disc, Inc.
Data Technology Corp.
Kaar Electronics
Metrotech
Odetics Video Systems, Inc.
Sparta Electronic Corp.
Tape-Athon Corp.
Tapecaster TCM
Telemation, Inc.
Television Presentations, Inc.
R. H. Tyler Company
Vikoa, Inc.

Cable Burial Equipment

Ditchwitch. See page 35.

Cleveland Trencher Div.
Davis Manufacturing
Ditch Witch
Channel Preamps
Anaconda Electronics
Anixter-Pruzan
Blonder-Tongue

C-Cor Electronics, Inc.
Delta Electronics Ltd.
Entron, Inc.
Jerrold Electronics Corp.
JFD Systems
Scientific-Atlanta, Inc.
Winegard Company

Converters

AEL Communication Corp.
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Blonder-Tongue
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Entron, Inc.
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Tomco Communications Inc.

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Dynair Electronics Inc. See page 32.
SC Electronics. See page 5.

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Jerrold Electronics Corp.
Rohde & Schwarz Sales
Scientific-Atlanta, Inc.
Telemet

Drop Cables

Alpha Wire
Anixter-Pruzan
Belden Corp.
Phelps Dodge Comm. Co.
Plastoid Corporation
Texas Instruments Inc.
Times Wire & Cable Co.
Vikoa, Inc.

FM Processing Equipment

Anixter-Pruzan
The Catel Corporation
Jerrold Electronics Corp.

Generators, Carrier
Tracor. See page 70.

AEL Communications Corp.
AMECO, Inc.
Anaconda Electronics
Anixter-Pruzan
Benco
Blonder-Tongue
Entron, Inc.
Jerrold Electronics Corp.
Kaiser CATV
Vikoa, Inc.

Head-End Controls

AMECO, Inc.
Blonder-Tongue
CAS Manufacturing Co.
Davco Electronics Corp.
Dynair Electronics, Inc.
Entron, Inc.
Jerrold Electronics Corp.
Rust Corporation
Scientific-Atlanta, Inc.
Vikoa, Inc.

Modulators

Anaconda Electronics
Anixter-Pruzan
Blonder-Tongue
CAS Manufacturing Co.
The Catel Corporation
Dynair Electronics, Inc.
Electronic Indust. Engineering, Inc.
Fung Engineering Co.
Jerrold Electronics Corp.
Scientific-Atlanta, Inc.

Non-Duplication Switchers

Anaconda Electronics
Essex Electronic Systems
Jerrold Electronics Corp.
3M Company, Mincom Div.
Rust Corporation
Telemation, Inc.

Power Couplers

AMECO, Inc.
Cascade Electronics Ltd.
Delta Electronics Ltd.
Entron, Inc.
Essex Electronic Systems
JFD Systems
Kaiser CATV
Sylvania Electric Products, Inc.
Vikoa Inc.

Splitters

AMECO, Inc.
American Pamcor, Inc.
Anaconda Electronics
Anixter-Pruzan
Benco
Blonder-Tongue
Cascade Electronics Ltd.
CAS Manufacturing Co.
Delta Electronics Ltd.
Entron, Inc.
Jerrold Electronics Corp.
JFD Systems
Kaiser CATV
Sylvania Electric Products, Inc.
Vikoa, Inc.

Splitting & Mixing Networks

Advanced Research Corp.

Anaconda Electronics
AMECO, Inc.
Anixter-Pruzan
Benco
Blonder-Tongue
Cama Electronics Inc.
CAS Manufacturing Co.
C-Cor Electronics, Inc.
Delta Electronics Ltd.
Entron, Inc.
Jerrold Electronics Corp.
JFD Systems
Matrix Systems Corp.
Scientific-Atlanta, Inc.
Winegard Company

Towers

Hughey & Phillips Inc. See page 72.

Andrews Towers
Advance Industries, Inc.
E-Z Way Products, Inc.
Fort Worth Tower Co.
Hughey & Phillips, Inc.
Rohn Manufacturing Co.
Stainless, Inc.
Swager Tower Corp.
Utility Tower Co.

Trunk & Feeder Cables

Anaconda Electronics
Anixter-Pruzan
Brand-Rex Company
CAS Manufacturing Co.
General Cable Corp.
Kaiser CATV
Phelps Dodge Comm. Company
Plastoid Corporation

Prodelin Inc.
Texas Instruments Inc.
Times Wire & Cable Co.
Vikoa, Inc.

Video Equip. & Accessories

Alma Engineering
American Data Corp.
Applied Digital Data Systems, Inc.
Ball Brothers Research Corp.
CAS Manufacturing Co.
The Catel Corporation
CBS Laboratories
Cohu Electronics Inc.
Color-Tel Corporation
Diamond Power
Dynair Electronics, Inc.
Dynamics Corporation,
Scientific Systems Div.
Eastman Kodak Co.
F&B/Ceco of California
GBC CCTV Corp.
Kalart Victor Corp.
Kanco Enterprises, Inc.
K'SON Corp.
Memorex Corporation
3M Company, Magnetic Products Div.
3M Company, Mincom Division
Odetics Inc.
Panasonic
Phillips Broadcast Equip. Corp.
Riker Video
Shibaden Corp. of America
Telemation, Inc.
Telemet
Terado Corp.
Tracor, Inc.
Viscount Video Systems Ltd.
Visual Electronics Corp.

CATV Address List

A

Advance Industries, Inc.
2301 Bridgeport Drive
Sioux City, Iowa 51102

Advanced Research Corp.
715 Miami Circle, N.E.
Atlanta, Ga. 30324

AEL Communications Corp.
P.O. Box 507
Lansdale, Pa. 19556

Alma Engineering
7990 Dagget Street
San Diego, Calif. 92111

Alpha Wire
711 Lidgerwood Ave.
Elizabeth, N.J. 07207

Altec Lansing
1515 S. Manchester Ave.
Anaheim, Calif. 92803

AMECO, Inc.
2960 Grand Ave.
P.O. Box 13741
Phoenix, Ariz. 85002

American Data Corp.
4306 Governors Drive, S.W.
Huntsville, Ala. 35805

American Pamcor, Inc.
P.O. Box 1775
Paoli, Pa. 19301

Anaconda Electronics
305 N. Muller St.
Anaheim, Calif. 92803

Andrews Tower, Inc.
1420 Layton Ave.
Ft. Worth, Tex. 76117

Anixter-Pruzan
1963 1st Ave. S.
Seattle, Wash. 98134

Applied Digital Data Systems, Inc.
100 Marcus Blvd.
Hauppauge, N.Y. 11787

B

Ball Brothers Research Corp.
1950 33rd St.
Boulder, Colo. 80302

Belden Corp.
Richmond, Ind. 47374

Benco
37 Taber Road
Rexdale, Ontario
Canada

B & K Instruments
5111 W. 164th Street
Cleveland, Ohio 44142

Blonder-Tongue
One Jake Brown Road
Old Bridge, N.J. 08857

Brand-Rex Company
P.O. Box 498
Willimantic, Conn. 06226

C

Cama Electronics Inc.
30 Commerce Drive
Farmingdale, N.Y. 11735

Cascade Electronics Ltd.
1111 C Street
Bellingham, Wash. 98225

CAS Manufacturing Co.
P.O. Box 47066
Dallas, Tex. 75247

The Catel Corporation
1030 W. Evelyn Ave.
Sunnyvale, Calif. 94086

CBS Laboratories
227 High Ridge Rd.
Stamford, Conn. 06905

C-Cor Electronics, Inc.
60 Decibel Road
State College, Pa. 16801

Cleveland Trencher Div.
20100 St. Clair Ave.
Cleveland, Ohio 44117

Cohu Electronics Inc.
Box 623
San Diego, Calif. 92112

Color-Tel Corporation
13720 Riverside Drive
Sherman Oaks, Calif. 91403

Conrac Division
600 N. Rimsdale Ave.
Covina, Calif. 91722

Cush Craft Corp.
621 Hayward St.
Manchester, N.J. 03103

D

Data Disc, Inc.
1275 California Ave.
Palo Alto, Calif. 94304

Data Technology Corp.
1050 E. Meadow Circle
Palo Alto, Calif. 94304

Davco Electronic Corp.
P.O. Box 861
Batesville, Ark. 72501

Davis Manufacturing
1500 South McLean Blvd.
P.O. Box 1801
Wichita, Kans. 67213

Delta Electronics Ltd.
70 Ronson Drive
Rexdale, Ontario
Canada

Diamond Power
P.O. Box 415
East Main Pike
Lancaster, Ohio 43130

Ditch Witch
P.O. Box 66
Perry, Okla. 73077

Dynair Electronics, Inc.
6360 Federal Blvd.
San Diego, Calif. 92114

Dynasciences Corporation,
Scientific Systems Division
Township Line Road
Blue Bell, Pa. 19422

E
Eastman Kodak Co.
343 State St.
Rochester, N.Y. 14650

Electronic Indust. Engineering, Inc.
7355 Fulton Ave.
N. Hollywood, Calif. 91605

Electro-Voice, Inc.
600 Cecil Street
Buchanan, Mich. 49107

Entron, Inc.
2141 Industrial Pkwy.
Silver Spring, Md. 20904

Essex Electronics Systems
6235 S. Harlem Ave.
Chicago, Ill. 60638

E-Z Way Products, Inc.
13155 Nebraska Ave.
P.O. Box 17196
Tampa, Fla. 33612

F
Fairchild MOD
423 National Ave.
Mountain View, Calif. 95111

F&B/Ceco of California
7051 Santa Monica Blvd.
Hollywood, Calif. 90038

Fort Worth Tower Co.
5201 Bridge Street
Fort Worth, Tex. 76112

Fung Engineering Company
111 Glenn Way
Belmont, Calif. 94002

G
GBC Closed Circuit TV Corp.
74 Fifth Ave.
New York, N.Y. 10003

General Cable Corp.
730 Third Ave.
New York, N.Y. 10017

H
Hughey & Phillips, Inc.
3050 N. California
Burbank, Calif. 91505

Hy-Gain Electronics Corp.
R.R. 3
Lincoln, Neb. 68505

J
Jampro
6939 Power Inn Road
Sacramento, Calif. 95828

Jerrold Electronics Corp.
401 Walnut Street
Philadelphia, Pa. 19105

JFD Systems
142 Central Ave.
Clark, N.J. 07066

K
Kaar Electronics
232 Wescott Drive
Rahway, N.J. 07065

Kaiser CATV
2216 West Peoria Ave.
Phoenix, Ariz. 85020

Kalart Victor Corp.
Hultenius Street
Plainville, Conn. 06062

Kapco Enterprises, Inc.
947 Janesville Ave.
Fort Atkinson, Wisc. 53538

K'SON Corp.
743 Dunn Way
Placentia, Calif. 92670

M
Matrix Systems Corp.
9201 Gazette Ave.
Chatsworth, Calif. 91311

Memorex Corporation
1200 Memorex Drive
Santa Clara, Calif. 95052

Metrotech
670 National Ave.
Mountain View, Calif. 94040

3M Company, Magnetic Products Div
3M Center
St. Paul, Minn. 55101

3M Company, Mincom Division
300 S. Lewis Road
Carmarillo, Calif. 93010

O
Odetics Video Systems, Inc.
397 N. Anaheim Blvd.
Orange, Calif. 92668

P
Panasonic
Pam Am Bldg.
200 Park Ave.
New York, N.Y. 10117

Phelps Dodge Comm. Co.
60 Dodge Ave.
North Haven, Conn. 06473

Philips Broadcast Equip. Corp.
One Philips Drive
Montvale, N.J. 07645

Plastoid Corporation
42-61 24th Street
L.I.C., N.Y. 11101

Prodelin Inc.
P.O. Box 131
Hightstown N.J. 08520

R
RCA
Front & Cooper Sts.
Building 15-7
Camden, N.J. 08102

RF Systems, Inc.
155 King Street
Cohasset, Mass. 02025

Riker Video
142 Central Ave.
Clark, N.J. 07066

Rohde & Schwarz Sales
111 Lexington Ave.
Passaic, N.J. 07055

Rohn Manufacturing Co.
P.O. Box 2000
Peoria, Ill. 61601

Rust Corporation
168 Tremont St.
Everett, Mass. 02149

S
Scala Radio
1970 Republic Ave.
San Leandro, Calif. 94577

Scientific-Atlanta, Inc.
Box 13654
Atlanta, Ga. 30324

Shibaden Corp. of America
58-25 Brooklyn-Queens Exwy.
Woodside, N.Y. 11377

Shure Brothers, Inc.
222 Hartrey Ave.
Evanston, Ill. 60204

Sitco
10330 N.E. Marx St.
Portland, Ore. 97220

Sparta Electronic Corp.
5851 Florin-Perkins Rd.
Sacramento, Calif. 95828

Stainless, Inc.
3rd Street
North Wales, Pa. 19454

Swager Tower Corp.
P.O. Box 498
Fremont, Ind. 46737

Sylvania Electric Products, Inc.
Johnston Street
Seneca Falls, N.Y. 13148

T
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Sherburne, N.Y. 13460

Tape-Athlon Corp.
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12326 Wilkins Ave.
Rockville, Md. 20851

Telemation, Inc.
P.O. Box 15068
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Telemet
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Amityville, N.Y. 11701

Television Presentations, Inc.
43 W. 61st Street
New York, N.Y. 10023

Terado Corp.
1068 Raymond Ave.
St. Paul, Minn. 55108

Texas Instruments Inc.
34 Forest Street
Attleboro, Mass. 02703

Times Wire & Cable Co.
358 Hall Ave.
Wallingford, Conn. 06492

Tomco Communications Inc.
2239 Old Middlefield Way
Mountain View, Calif. 94040

Tracor, Inc.
6500 Tracor Lane
Austin, Tex. 78721

R. H. Tyler Company
1404 15th Street
Wellington, Tex. 79095

U
Utility Tower Co.
3200 Northwest 38th
P.O. Box 12027
Oklahoma City, Okla. 73112

V
Vikoa, Inc.
400 Ninth Street
Hoboken, N.J. 07030

Viscount Video Systems Ltd.
105 E. 69th Street
Vancouver 15, British Columbia
Canada

Visual Electronics Corp.
356 W. 40th Street
New York, N.Y. 10018

W
Winegard Company
3000 Kirkwood
Burlington, Iowa 52601

ENGINEER'S EXCHANGE

Eliminate Record Sticking

Few things are more annoying or sound so bad on the air as sticking records. Hopefully the operator is at the turntable when a record sticks. I'm sure we have all had a "panic-run" to the control room at the most inopportune times to unstick a record merrily tracking around in the same groove.

Needless to say, good record cleaning and handling procedures will eliminate most of these "emergencies." Every control position should have a bottle of record cleaning fluid and a special silicone cloth and it should be used often. Frequent cleaning will eliminate sticking and result in a cleaner on-

air sound.

However, even though all this precaution is well and good, what do you do when a record sticks on the air. Most operators fade down the offending record and manually push the pickup in a couple of grooves (usually too far). Others gently push the pickup without fading down. In any event the procedure is usually done crudely and is quite obvious to the listener. In the panic the operator is just as likely to skate the pickup into the next cut or off the record entirely!

We keep an aerosol can of Freon right next to the turntables in each

control room. When a record sticks, a quick spray ahead of the pickup almost always washes away the foreign matter within one revolution. Freon in this aerosol form is an excellent wash for tape heads also as many videotape engineers have found. It can be sprayed on while tape is traveling over the heads, as it is totally harmless to the tape.

Of course, after you have unstuck the record you should thoroughly clean it to remove all traces of the foreign matter. A skilled operator can unstick records so fast with this system that what was once a major catastrophe on the air is now hardly audible.

James P. Somich
Consulting Engineer
P.O. Box 731
Avalon, Ca. 90704

Frequency Counter Good Alignment Tool

Recently we acquired a Heathkit frequency counter. We have used it already in testing various pieces of studio equipment such as reel to reel tape machines, cartridge machines, and turntables.

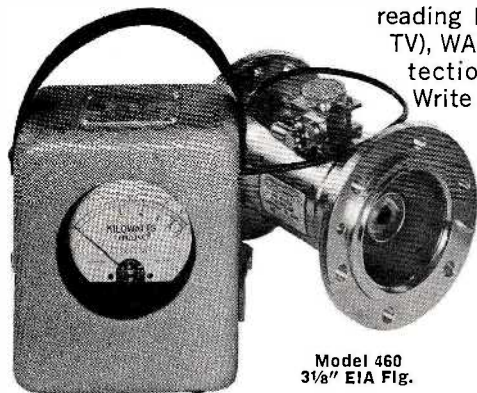
In checking tape speed on reel to reel machines we took a commercially recorded frequency response and head-alignment tape. By connecting the frequency counter to the output of the tape machine, and playing a tone of known frequency, we were able to accurately measure the speed of the tape machine. We could then make any adjustments of the tape machine as were deemed necessary.

In testing cartridge machines the procedure was basically the same; however, for convenience we merely connected the frequency counter to the output of the audio console. We adjusted the pinch roller pressure to give us the least wow and flutter by adjusting for a minimum frequency shift on the counter. This improved the air sound of our commercials and pleased our salesmen and clients.

Turntables, as we all know, are a constant source of improper speed and wow. By using the frequency counter and test records we were able to more accurately determine the speed than by using strobe. It

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BIRD THRULINE® High Power Directional Wattmeters are the standard of the industry for accurate high-power measurement of CW, AM, FM and TV signals. Forward or reflected power indication during normal system operation is selected by rotating the Plug-In Element. Many variations are available, such as dual-element Line Sections, instruments for reading Peak Envelope Power (as in TV), WATTCHEER Control Units for protection from VSWR damage, etc. Write for catalog.



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50 or 51.5 ohms, flanged or not
POWER RANGES:
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was much quicker and we were assured that the speed measurement was correct.

Since we have our studios located at the transmitter, it was found that due to the high RF field we were unable to use the counter with the transmitter running. Therefore, we had to make our measurements and adjustments when the transmitter was down for maintenance.

By using a frequency counter, we have found a simple and accurate way of making speed measurements of our audio equipment and improving our air sound.

Don Wilson, CE
KUDL, AM-FM
Fairway, Kansas

KID-TV Solves Tape Disposal Problem

A problem faced at most video tape facilities is how to dispose of worn out video tape without throwing away tape reels or spending a lot of operator time removing the tape.

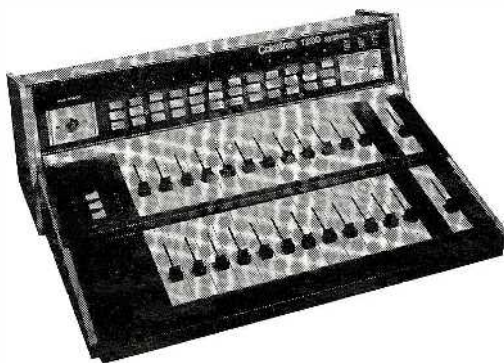
The method we have used quite successfully at KID is to keep an old one hour tape reel on hand which has had one side removed. When we need to change the tape on a reel, we just wind the old tape onto this reel. Each time we add a piece of tape to this reel, we remove any gummed tape that was used to hold the tape from unwinding. We wind the tape around itself until it grips. You end up with a reel full of short pieces of tape that are not stuck together. When this reel is full, you can push the junk tape off the reel into the trash.

You will find that about one half inch of tape will not want to slide off the hub. If you have a small but deep trash can, turn the reel over so the open side is down and place it on the can. The tape will unwind itself.

D. Khalil Jones
KID-TV
Idaho Falls, Idaho

**Broadcast
Buyer's Guide
Begin On Page
49D-1**

You Can't Beat the System!



Colortran's Dimmer System, It's the best on the market. Here's why!

Take the problem of dimmer interference in your audio/video system. Through new developments in filtering and a new slow turn-on cycle we've dramatically improved performance in this area. No more interference in microphones, quiets singing lamp filaments.

Consider curve consistency and shaping. Available with either square law or linear voltage curves, excellent curve consistency is achieved through extremely rigid quality control and high quality electronic components. (SCRs in our dimmers have a lifetime warranty.) Curve shaping is done once, precisely and correctly at the factory. No drift to worry about after that . . . ever!

That's how we like to do everything here at Colortran, once . . . right. Our Lighting Control systems are no exception. They're designed to take advantage of the most modern low-cost manufacturing methods. That, combined with quality electronic components of current manufacture in printed circuits with integrated component packages, insures a stable, trouble free long life and built in ease of servicing. It all adds up to long term savings for you.

Available in 3, 6, and 12 KW capacities, 120 or 240 volts, 50 or 60 Hertz. All UL approved.

Colortran lighting control systems are the most reliable and outstanding performers on the market today.

So . . . for the system that can't be beat — go Colortran.

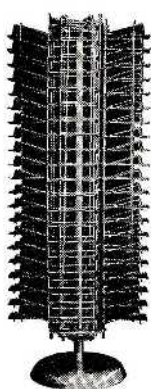
For more information, write for illustrated brochure.

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- Free standing
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Associations

(Continued from page 44)

which will strengthen and maintain the broadcasting industry to the end that it may best serve the public."

Association activities center on this aim, and today NAB has among its members over 3,800 radio and television stations throughout the 50 states.

Growing Pains

The National Association of Broadcasters grew out of a need to deal with the growing pains of this fledgling communications industry. The pioneers who organized it, along with the late Eugene F. McDonald, Jr. as the first president, concerned themselves with bringing order out of a chaotic situation which existed at the time. The chaos resulted from the undisciplined use of air waves. Without adequate channels or frequency separations, radio was becoming a barrage of sounds in the night, and appeared unlikely to be able to fulfill its role as a great medium of mass communication. Laws pertaining to radio were adequate because they were designed to cope only with the problems of safety of life at sea and

ship-to-shore communication. With the enactment of the Radio Act of 1927—which was the beginning of the American system of broadcasting as we know it today—a way was devised to apportion the radio spectrum through station licensing but still avoid government control of a station's business operations or its programming.

Structure

The Association's Board of Directors is composed of representative radio and television broadcasters who are elected by their fellow members. This Joint Board has its own chairman, and is subdivided into a Radio and a Television Board, each with its own chairman. Members of the NAB set the policy and make the decisions on industry-wide matters through the Board. The NAB also has an extensive committee structure, enabling it to utilize the specialized knowledge of its members in considering industry problems and in offering recommendations to the Board of Directors.

Function of NAB

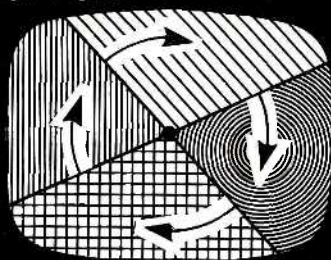
The function of the National Association of Broadcasters is to represent the industry before Congress, at the White House and before administrative agencies. It has been the channel through which the industry has been moved to alert the public to the effectiveness of radio and television, both as informational and entertainment media and as a means to help move the nation's goods and services. In this latter function it proves to be a very important source in stimulating and boosting the national economy.

Another vital function of the NAB is to oppose schemes to convert the American system of broadcasting from a powerful means of free communication into a medium of special interest enjoyed by a privileged few who can pay for their programs. In its stand against pay television, the Association has had the general support of the public and the leaders throughout the country.

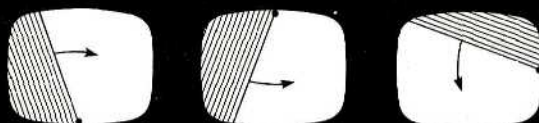
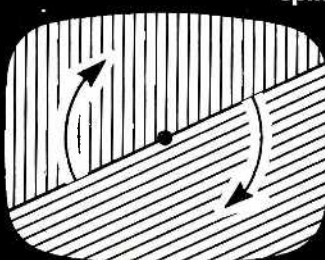
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Bloomington, Indiana 47401

**Broadcast
Buyer's Guide
On Page 49 D-1**

individual, firm or corporation which operates a radio broadcast station in the United States or its dependencies. Such eligibility is subject to the approval of the Radio Board. Each station or network merits one subscription.

Subscriber fees are in accordance with the existing schedule at a given time, and under such conditions as are determined from time to time by the Radio Board.

The purpose of the Television Code is "cooperatively to maintain a level of television programming which gives full consideration to the educational, informational, cultural, economic, moral and entertainment needs of the American public to the end that more and more people will be better served."

Goals Achieved

The NAB also has been instrumental in promoting various activities leading to the betterment of the communications industry. Some of these are:

1. Instituting voluntary codes for radio and television which provide broadcasters with guideposts in determining acceptable programming and advertising practices.
2. Upholding the American system of broadcasting, free from government censorship.
3. Combatting discriminatory legislation proposals.
4. Obtaining more liberal acceptance of radio and television coverage of public proceedings.
5. Improving the industry's relationship with public service groups.
6. Achieving fair labor relations laws and wage-hour regulations.
7. Improving the efficiency of broadcasting operations by gaining authorization by the FCC for remote control for radio and television stations, drafting engineering and recording standards universally acceptable by the broadcasting industry, and introducing simplified program and engineering logs which meet FCC requirements.

Conventions

Since 1923 the Association has held annual spring conventions attended by top management of the

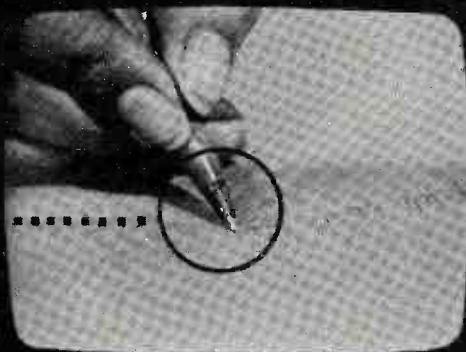
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FULL
SCREEN

THIS.

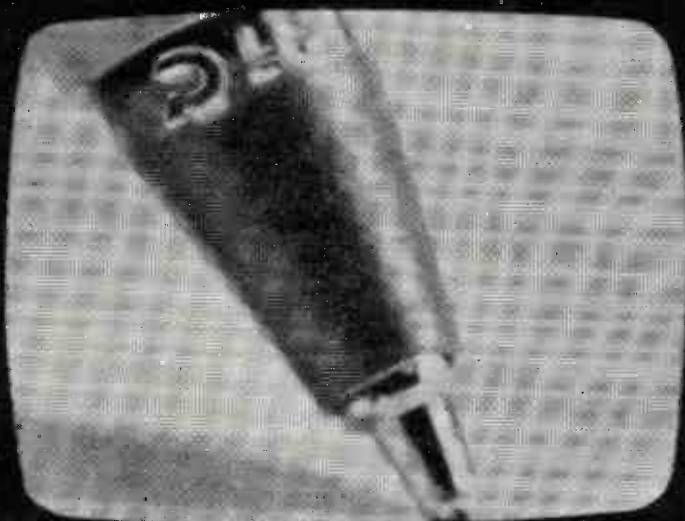
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Camera Configurations available for the 15X lens demonstration:

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| ☐ Ampex BC-230 | ☐ Philips PC-60/70/LDK3 | ☐ Marconi Mark VIII |
| ☐ R.C.A. TK 44A | ☐ Philips PC-100/LDK-5 | ☐ Other _____ |
| ☐ Fernseh KCU 40 | ☐ G.E. PE-250/350/400 | |

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My operation requires a lens with a ☐ Wide Angle ☐ High Aperture ☐ Close Focusing
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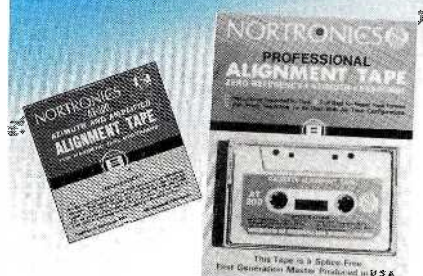
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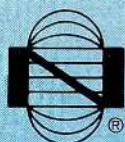
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industry. Later additions to the convention are the Broadcast Engineering Conference and the exposition of broadcast equipment. Each fall six conferences are held throughout the country for management and for those station executives who will move into managerial positions in the future.

Radio and Television Codes

Both the radio and television codes were designed after many months of patient and time-consuming efforts by NAB committees. The Television Code Review Board, of nine outstanding broadcasters from station and networks, and the Radio Code Board, consisting of 11 leading station and network executives, supervise respectively, the Television and Radio Codes.

The purpose of the Radio Code is "cooperatively to establish and maintain a level of radio programming which gives full consideration to the educational, informational, cultural, economic, moral and entertainment needs of the American public to the end that more and more people will be better served."

Composed of eleven members, the Radio Code Board is authorized and directed "to recommend to the Radio Board amendments to the Radio Code; to consider in its discretion any appeal from any decision made by the Code Authority Director with respect to any matter which has arisen under the Code, and to suspend, reverse, or modify any such decision; to prefer formal charges, looking toward the suspension or revocation of the subscription and/or Visual Symbols, to the Radio Code by a subscriber; to be available to the Code Authority Director for consultation on any and all matters affecting the Radio Code."

The Chairman and members of the Code Board are appointed by the President of NAB, subject to confirmation by the Radio Board, and may include no more than two members as representatives of subscribing nationwide radio networks. All Code Board members are selected from subscribers to the Radio Code.

Subscribers who are eligible consist of any individual, firm or corporation engaged in the operation of a TV broadcast station or network, holding a construction per-

mit for a television broadcast station in the United States or its dependencies. Subscribers are subject to approval by the Television Board of Directors. Again—one subscription is given for each station and/or network.

Affiliate subscribers are composed of individuals, firms or corporations engaged in the production or distribution, lease or sales of recorded programs for television presentation, subject to approval of the Television Code Review Board, which is a committee of not more than nine members, all of whom are subscribers to the Television Code. Appointed by the Television Board, they may include one member from each of the subscribing nationwide television networks. Meetings shall be at least twice a year on a date determined by the Chairman.

The National Association of Broadcasters also accepts associate members in fields allied to broadcasting.

Further information on the NAB may be obtained from its Washington headquarters at 1812 K Street, N.W. Washington, D.C. 20006.

Educational Broadcasters

The National Association of Educational Broadcasters has reflected the predictions of government surveys: their portion of the communications industry is growing more rapidly than any other.

Trouble is, the national association name often does not fit its membership. There are those who want to be known as Public Broadcasters, and they are better known now that "Sesame Street" and "Misterogers" have made their way into millions of homes across the country.



"THIS IS QUITE A LETTER OF INTRODUCTION, MR. BAKER."

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But the membership also includes over-the-air educational radio, campus limited radio, Instructional TV Fixed Station, Closed Circuit, Instructional TV and on and on.

With this diverse membership and through the leadership of William Harley, the NAEB has grown into one of the largest associations in the broadcast-communications field. In fact, while some refer to it as the "little NAB," the national conventions would lead you to believe that there are none larger.

The convention this year will be held in October in Miami Beach.

The need for strong, local community-based programming in public broadcasting, the crucial role that educational broadcasters must play in the educational structure of American life and the ability to change are all points President Harley will stress in the '70's. Harley warns that "if distasteful realities are what community involvement yields, then that is the arena in which we must operate."

Harley emphasizes that educational broadcasting can be a major instrument for the people's participation in the conduct of their affairs. "Such participation," he says, "can range all the way from the initial efforts to understanding problems, trends, and issues through efforts to identify and define alternative approaches and solutions. Every educational radio and television facility must be educational, public and community-oriented. To expect less of ourselves is unprofessional. To do less is to fail."

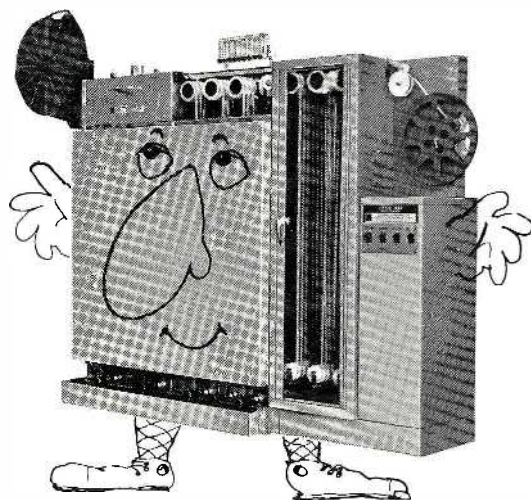
And it was just last year when FCC Chairman Dean Burch told an NAEB convention audience, "Do not strive to compete with the commercial broadcasters for the maximum audience. Do your own thing. Don't play a numbers game." Meanwhile, just as CPB President John W. Macy, Jr. has warned, the educational, public broadcasting future is restricted mostly by funding. This condition is bound to improve, but that end is not yet in sight.

Information on the NAEB membership qualifications may be obtained by writing to: National Association of Educational Broadcasters, 1346 Connecticut Avenue, N.W., Washington, D.C. 20036.

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NAFMB

The National Association of FM Broadcasters (NAFMB) was formed by a group of independent FM broadcasters to deal with special problems of the FM broadcast industry. It is a non-profit organization devoted to the promotion and development of FM radio.

The Association has been involved in projects related to the FM industry such as—support for the Federal Communication Commission's separate programming policy for combined AM and FM operations; launched campaign for car radios; set in motion "all-channel" legislation which would require that all radio sets sold in the U.S. be capable of FM reception. These are merely a few of the efforts being initiated under the leadership and the active interest of NAFMB members.

The Association offers continuing services of research, program information, promotion, engineering, management and FCC liaison specifically related to the FM industry.

Membership

To qualify as an **Active Member** you must be an individual, partnership, firm, corporation who is a licensee of a commercial frequency modulation broadcasting station or holds a construction permit for such a station.

Associate Members are individuals, partnerships, firms, corporations or persons otherwise engaged in a business or profession connected with frequency modulation broadcasting.

Special Associate Memberships are for persons connected with Non-commercial FM Broadcast stations.

Monthly dues are based upon gross income. Gross income is defined as all income resulting from air time sales on the main FM carrier.

"Major" Armstrong Awards Program

The "Major" Armstrong Awards for FM Broadcasting are awards for excellence and originality in creating and presenting superior FM programs. Each year, four in-

dividual awards of \$500 each, plus a bronze plaque, are made to commercial stations for excellence in four programming categories—Music/News/Public or Community Service/Educational Programming. Four additional awards in the same categories are presented to non-commercial FM stations.

The 1971 "Major" Armstrong Awards will be presented during the 1972 NAFMB convention. For information on these awards you can write to Executive Secretary of the Armstrong Awards Program, Kenneth K. Goldstein, School of Engineering and Applied Science, Columbia University, New York, N.Y. 10027.

For Information on the NAFMB

You may obtain more information on the NAFMB by writing to the National Association of FM Broadcasters, 420 Madison Ave., New York, N.Y. 10017.

Broadcast Buyer's Guide On Page 49 D-1

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NCTA

Back in the 1920's there was quite a stir over a new, strange device called a radio (crystal radio, if you prefer). And as time went on that fledgling industry grew into a giant.

Cable television was on the scene long before it gained any recognition. But it grew . . . and grew. It was represented by an association called the National Cable Television Association.

But when CATV finally burst into full bloom, the prophets were quick to speak of wired cities and blue sky industry predictions too numerous to mention here. Suddenly, many were struck by the extra far-sighted potential of cable, especially broadband two-way cable. Everyone wanted into the act.

With the waters muddled, with directions tangled, with a shortage of technical help, and a multitude of new demands upon them, the cable operators turned even more continuously to their national association.

It is possible that without the NCTA the industry might coast a bit further. It's possible, but not probable.

Every year the word is either "promise" or "potential". The final equation seems impossible to solve mainly because of the excessive number of unknowns.

Whatever your opinion of the NCTA, if you really care to advance the industry, becoming a member is essential.

For more information on the NCTA, write to: National Cable Television Association, Inc., 918 Sixteenth Street, N.W., Washington, D.C. 20006 or call 202-466-8111.

SBE

The Society of Broadcast Engineers has never been a numbers group. Rather, its membership includes many of the innovators of the broadcast-communications engineering community. The SBE's Ben Wolfe won this year's NAB engineering award. The list goes on to Al Chismark, Lou Wetzel, Bob Flanders and a host of others who are contributing to the field.

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

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

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



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



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



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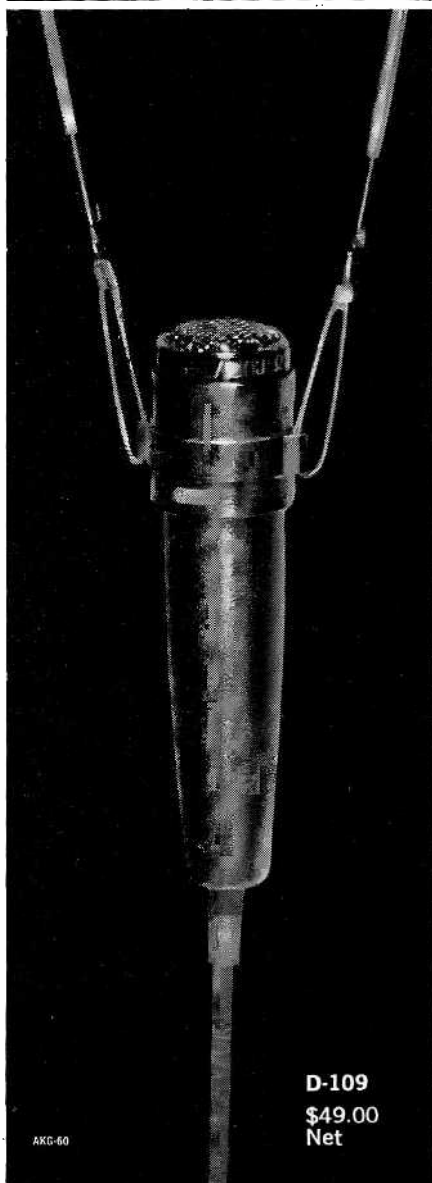
EECO

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In 1963 the Institute of Broadcast Engineers was formed. It was conceived mostly because no other professional society served the professional interests of the broadcast engineer, exclusively.

It was one year later, during the 1964 NAB convention, that the Society held its first general meeting. And it was at this time that the name was changed to the Society of Broadcast Engineers. A year later the Society was incorporated in Washington, D.C. as a nonprofit organization. In the following years, the national meeting has always immediately preceded the opening of the NAB convention.

Since its beginning, the SBE objectives have been to: Provide a forum for exchange of professional discussion of mutual broadcast engineering problems; to provide for and to maintain professional recognition of members; to group together broadcast engineers generally in a body to assist in the professional education, and to raise the technical standards of broadcast engineers and to advance the broadcast technician and novice; and to

encourage a continuing interest in the broadcast engineering field by students of technical and engineering courses on broadcasting.

Membership

Because the SBE doesn't come on as strong as some national organizations, membership has not grown by leaps and bounds. Yet every time you count them up, it's growing. More than 1,600 members at this time.

The grades of membership are: Student, Associate, Charter, Member, Senior Member and Fellow. Qualifications for Member grade are at least a First Class Phone License or equivalent and adequate experience.

Details for membership are included in the "Constitution and Bylaws" and may be received by writing to: The Society of Broadcast Engineers, P.O. Box 88123, Indianapolis, Ind. 46208. A subscription to the society journal is included in the membership fee.

Current president of the SBE is Bob Flanders, chief engineer of WFBM-TV, Indianapolis.

Society Of Motion Picture And Television Engineers

The SMPTE (Society of Motion Picture and Television Engineers) is a non-profit organization of people concerned with the engineering aspects of motion pictures, television, instrumentation, high-speed photography and the allied arts and sciences.

The membership includes engineers, scientists, technicians and executives in motion pictures, television, instrumentation and high-speed photography, educators and students, and workers in many allied fields.

The objectives of the Society are: (1) To provide an organization and a climate in which persons of like interests can meet, exchange ideas, and present technical papers for the advancement of, and education within, the sphere of interest of the Society; (2) To provide a technical journal for the publication of papers and the maintenance of a record of progress; and (3) To foster the advancement of engineering technology and to sponsor lectures, exhibitions and conferences designed to advance

the theory and practice of engineering within the scope of the Society.

The Society of Motion Picture Engineers was founded in 1916, and in 1950 "Television" was added to its name to recognize the expanding segment of its activities.

In 1948 an engineering committee on high-speed photography was organized in the Society to foster scientific development and to encourage better dissemination of knowledge in this field. This program has expanded to encompass numerous aspects of photo-instrumentation, including photography and pictorial communication for missiles, satellites and space vehicles.

From 24 members in 1916, the Society has grown today to about 8000 members. Although the majority of its members live in the United States and in Canada, nearly 800 are located in over 60 other countries throughout the world.

SMPTE Journal

The Journal of the SMPTE is sent to all members monthly. It con-

tains technical articles keyed to the interests of Society members, new product information and industry news.

Over the years, the **SMPTE Journal** and its predecessor, the **Transactions of the SMPTE**, have become the principal technical and historical reference of the industry. **Journal** papers of special interest or importance are reprinted and made available from Society headquarters.

From time to time, reports and manuscripts by the engineering committees are published as special bound volumes, such as: *Control Techniques in Film Processing*; *Elements of Color in Professional Motion Pictures*; *Proceedings of the Fifth International Congress on High-Speed Photography*; *Principles of Color Sensitometry*; *Special Effects in Motion Pictures*; and *Motion-Picture Projection and Theatre Presentation Manual*. A list of available publications may be obtained by writing to SMPTE Headquarters.

Engineering Committees

Engineering committees are established to study and develop information relating to current technological problems, to define terminology, to develop standards and to recommend practices. Some of the committees include: Color, 16mm and 8mm Motion Pictures, Sound, Television, Video Tape Recording and Standards.

SMPTE develops and maintains American National Standards and SMPTE Recommended Practices on motion pictures, television and videotape recording.

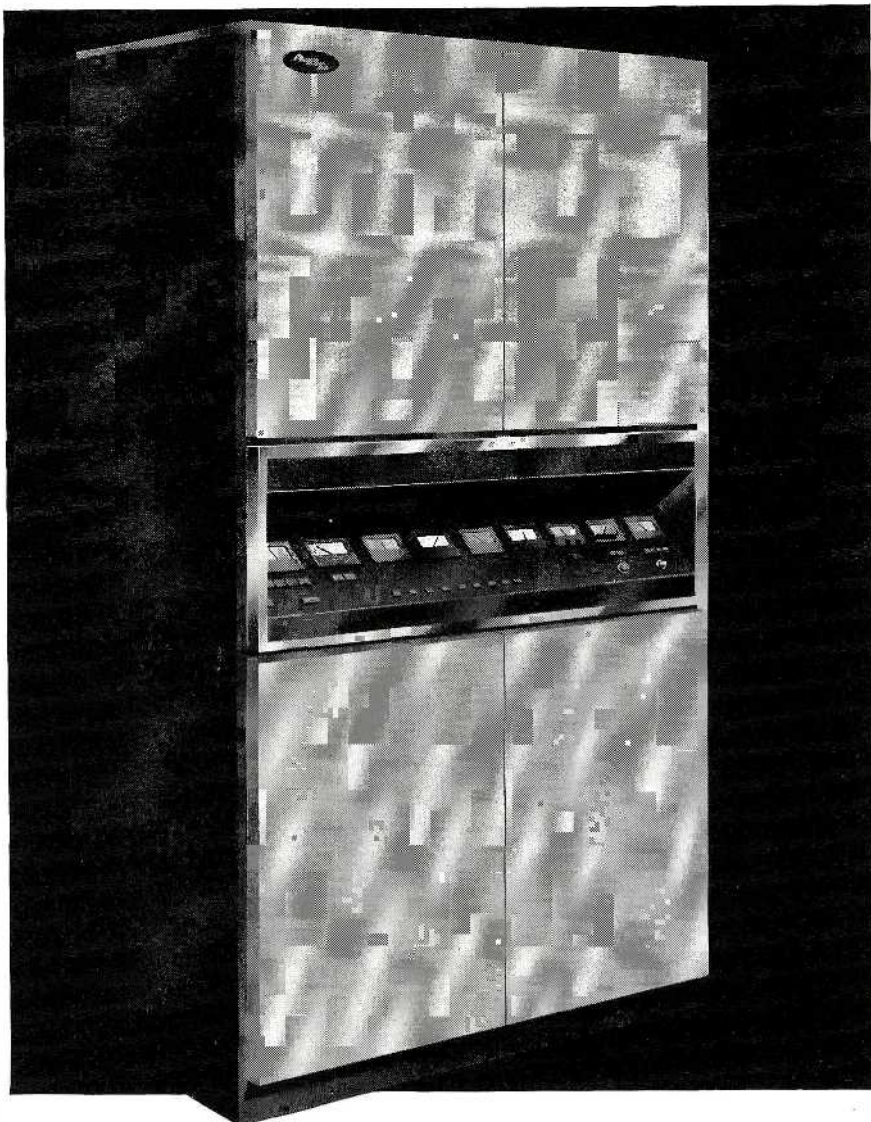
Grades of Personal Membership

Active: Open to qualified individuals upon application approved by the admissions committee.

Qualifications: Minimum age, 25; three years' experience in responsible positions relating to technical, engineering, or scientific activities in motion pictures, television or allied arts, or as executive supervisor directly responsible for such activity; or three years experience teaching a major course in motion pictures, television or allied subjects in a school of recognized standing; or comparable contributions to the advancement of engineering or science in motion pictures, television or allied arts.

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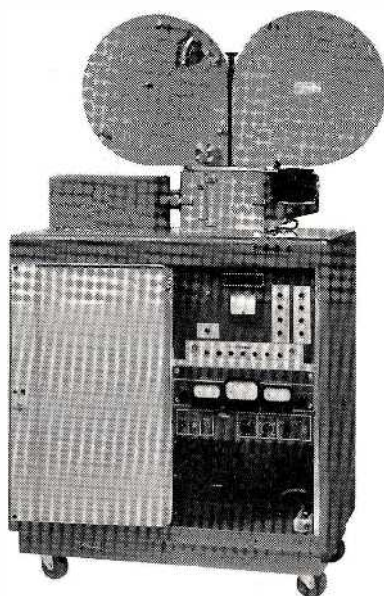
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Associate: Open to qualified individuals upon application approved by the Membership Secretary.

Qualifications: Minimum age, 18; interest in the study of technical and engineering aspects of motion pictures, television or related arts and sciences.

Sponsor: One member, or two individuals from motion picture or television industries as references.

Dues: \$20.00 per year.

Student: Open to qualified individuals upon application approved by the Membership Secretary.

Qualifications: Registration for at least a half-time program as a student in a college, university or other recognized educational institution who evidences interest in the study of the technology of the motion-picture, television or related arts and sciences.

Sponsor: One SMPTE member or reference from a staff member of applicant's college department, who need not necessarily be a member of the Society.

Dues: \$5.00 per year.

Fellow: By selection.

Qualifications: Minimum age, 30; individuals in the Active grade who have by proficiency and contributions attained an outstanding rank among engineers or executives in motion pictures, television or related industries. Upon approval by the Board of Governors, based upon recommendation of Fellow Membership Committee.

Dues: \$25.00 per year.

Life: Open to qualified Active and Fellow members upon written application approved by the Executive Committee.

Qualifications: Minimum age, 60. An Active or Fellow member who: has retired from active business life; has been an Active or Fellow for a total of 20 years; and who has at least 5 years of continuous Active or Fellow membership immediately prior to application. Qualified applicants who hold the grade of Fellow will be named as Life Fellows. Qualified Active members will be named Life Members.

Dues: None

Honorary: By selection.

Qualifications: An individual who has performed eminent service in the advancement of engineering in motion pictures, television or allied arts and sciences. Upon recommendation of the Honorary Member-

ship Committee, and approval of the Board of Governors.

Dues: None

Sustaining Members

Sustaining memberships are available to individuals, firms or corporations who subscribe substantially to the financial support of the Society. Names of sustaining members are published each month in the **Journal**. The Society's Directory includes a descriptive listing of each of the sustaining members.

The Queen Elizabeth Hotel in Montreal, will be the site of the October 3-8 SMPTE Technical conference.

For Information on the SMPTE

If you are interested in becoming a member of the SMPTE or would like more information write to: Executive Secretary, Society of Motion Picture and Television Engineers, 9 East 41st Street, New York, N.Y. 10017.

Technical Conference Will Be In October

The 110th Technical Conference and Equipment Exhibit of the Society of Motion Picture and Television Engineers (SMPTE) will be held at the Queen Elizabeth Hotel in Montreal, Canada, October 3-8, according to an announcement by SMPTE Conference Vice-President Harry Teitelbaum.

The SMPTE, which has a large membership outside the USA, particularly in Canada, periodically holds one of its semi-annual conferences in Canada. The SMPTE last met in Canada in November, 1965, in Montreal.

The Conference will feature technical sessions starting Monday, October 4, and running through Friday, October 8. SMPTE's Editorial Vice-President R. E. Putman has announced that the Program Chairman for the Monday through Wednesday sessions is Leslie H. Holmes, Canadian Broadcasting Corp., Ottawa. On Thursday and Friday of Conference week, the program will be taken up with the Symposium on Video Cartridge, Cassette and Disc Player Systems. The Program Chairman for the Symposium segment is Stanley F. Quinn, Canadian Broadcasting Corp. Development Dept., Montreal.

One of the highlights of the Conference will be the Equipment Exhibit which will feature the latest professional equipment in film and TV. Exhibit Chairman is J. L. Vandette, Canadian Broadcasting Corp., Montreal and Associate Chairman is Pat Dickey, Anglo Photo Ltd., St. Laurent.

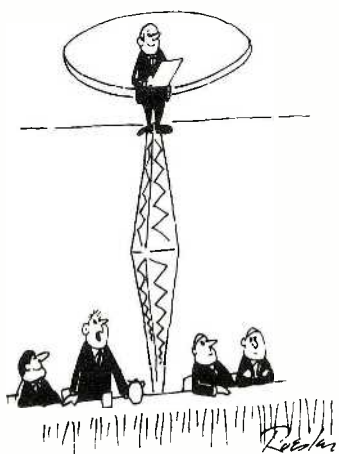
A two-day symposium on Video Cartridge, Cassette and Disc Player Systems will be held on Thursday and Friday October 7 and 8 at the Queen Elizabeth Hotel in Montreal.

The Symposium will be on the last two days of the 110th SMPTE Technical Conference program. The Conference, which will also feature a concurrent Equipment Exhibit, will run October 3-8 at the Queen Elizabeth.

Program Chairman for the Symposium is Stanley F. Quinn, Canadian Broadcasting Corp. Development Dept., Montreal. According to Quinn, the Symposium will examine the new technology of video player systems and consider its likely impact on education, industry and the home.

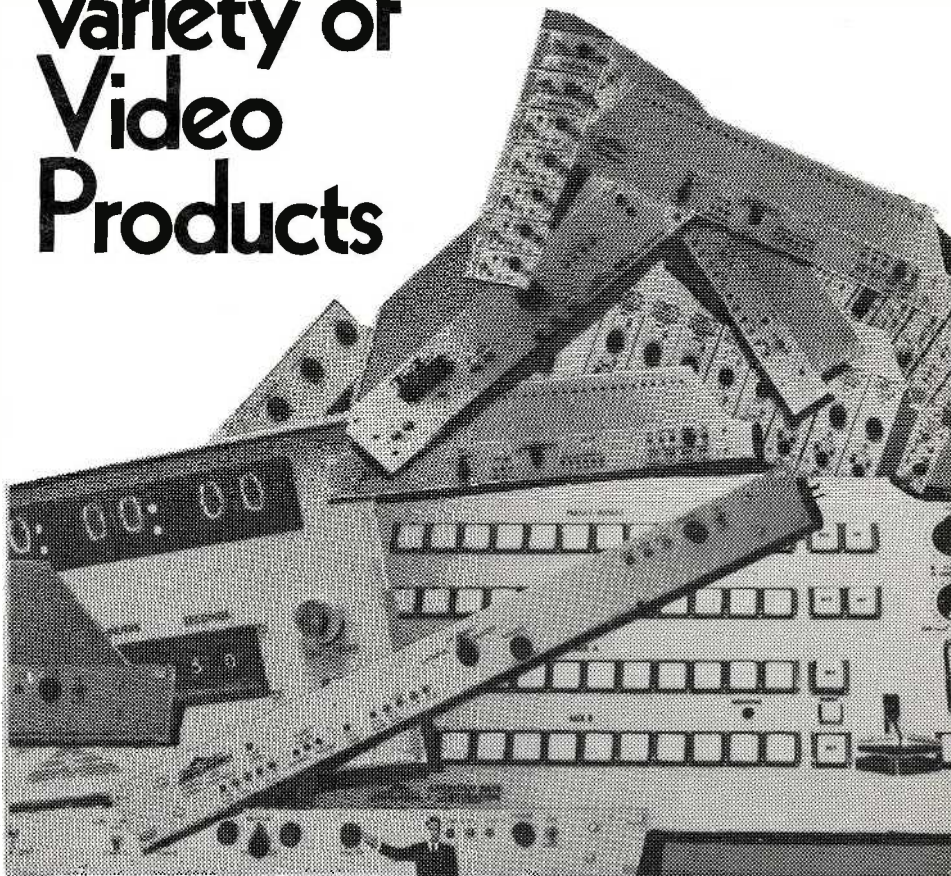
The Symposium will have four sessions: 1. Perspective Session, exploring the social and economic aspects from various viewpoints; 2. Utilization Session, describing plans and expressing views of prospective users; 3 and 4. Technical Sessions, presenting advances in the new technology with accompanying demonstrations.

Quinn said the Symposium will enable all interested parties to listen to and discuss trends, techniques and prospects on an international level.



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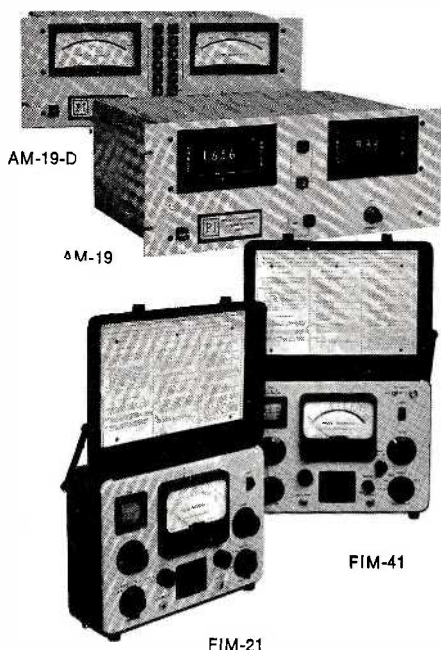
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FIM-41 Field Strength Meter. 540 KHz to 4.8 MHz This lightweight unit measures AM broadcast harmonics to -80db. Exceptionally stable over a wide temperature range, it includes the same features as the Model FIM-21. Exceptionally easy to use, it is particularly well suited for transmitter 'proof-of-performance' reporting as defined by FCC Rule 73.47(a)(5).

AM-19 Antenna Monitor The basic instrument for measuring phase and loop current ratio, the AM-19 can monitor up to 12 towers and accommodate DA-1, DA-2 and DA-3 patterns. Phase meter resolution is 0.5 degrees. Loop current accuracy is $\pm 1.5\%$ with a 0.5% resolution.

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UN Panel Urges Use Of Satellite Communications

A portable ground system that uses lasers to record and transmit reconnaissance pictures from Saigon to Washington in minutes via satellite could significantly enhance the United Nations' peacekeeping powers and also enable member nations to provide early warning signs of impending natural disasters.

The use of such a system and other advanced communications technology for peaceful purposes is proposed by a National Policy Panel of the United Nations Association and the United States of America (UNA-USA), chaired by Robert R. Nathan, President of Robert R. Nathan Associates, Inc., in its official report released May 10. The Panel charges that the present UN communications system is antiquated and inefficient. The Panel urges that the UN be granted the use of satellite communication's systems for peacekeeping, and disaster warning and relief.

The high-energy laser system, known as Compass Link, was conceived and developed for the U.S. Air Force by CBS Laboratories, a division of Columbia Broadcasting System, Inc. Compass Link has been in use for more than two years in Vietnam to relay extremely high-resolution pictures to Washington for viewing by Government policy-makers.

These new developments underline the importance of improving UN communications, according to Cyrus R. Vance, former Under-Secretary for Defense who later was involved in the 1967 Cyprus peacekeeping effort. He said: "I believe that it is essential and urgent for the United Nations to have a reliable communications system which provides rapid and reliable communications between UN Headquarters and principal field peacekeeping missions, and prompt and effective contact between major centers of decision-making in the development field."

The Panel report states that space communication systems using portable earth stations—some

small enough to mount atop a truck—can guarantee the immediacy and mobility which are so crucial in peacekeeping. The report also cites the Compass Link system noting that satellites have an important junction in the sophisticated new surveillance systems now used by the more technologically advanced UN member nations.

The satellite transmission system used in Vietnam combines entirely new optical and electronics techniques to relay high-resolution aerial photographs to Washington, which are vastly superior to the best quality pictures shown on home television sets, according to Dr. Peter C. Goldmark, CBS Laboratories President and a member of the UNA-USA National Policy Panel.

Within minutes after photographs have been returned to ground stations in Vietnam, by reconnaissance aircraft, they are scanned by precisely controlled laser beams. Each visual image is converted to video signals. The signals are then fed to a communication link, which bounces them off the U.S. Defense Satellite Network to Washington at the speed of light. A similar receiving and recording station there reconstructs the photographs in their original quality for immediate inspection.

Because of the laser-scanning technique involved, no photographic resolution is lost between recording and transmission from the original film taken in Vietnam.

The system's performance in Vietnam demonstrates the feasibility of transferring high-quality visual information rapidly between any two points on earth, Goldmark said. This ability, he added, opens a whole new range of applications to make UN peacekeeping more effective.

Systematic aerial reconnaissance of critical areas in a particular nation, where a natural disaster requires massive assistance or evacuation of people, is another likely peacekeeping possibility. A Compass Link system could pinpoint

where emergency assistance aircraft can land or takeoff.

Medical experts could provide information in visual form for clinical diagnosis and patient care. During an epidemic, existence of a rare disease or accidents, medical consultation through pictures of patients transmitted simultaneously to and from points around the globe could offer aid otherwise not available.

The Compass Link system, which was conceived by John Manniello, Vice President of Government Operations for CBS Laboratories, is able to transmit high-quality photographs, maps and other visual information in black-and-white or color.

Filing Dates On Applications

The processing sections of Part 1 (Sections 1.571 through 1.574) of FCC rules have been amended to allow the Commission to act within 15 days from the date an application is accepted for filing rather than the former time period of 15 days after applications for modification of facilities have been tendered for filing.

The Commission will now have discretionary right to advise an applicant, within 15 days from the date an application is accepted for filing, that his application is considered to be one for a major change.

The Commission noted that it had received an increasing number of petitions after the expiration of the 15-day period specified in the rules requesting it to consider a given application as one for a major change in facilities. Sometimes it is unaware that an application presents circumstances warranting its consideration as a major change until more than 15 days have passed following tender, the FCC said.

When an application is considered a major change under the amended rules, it is subject to the publication requirements and fee schedules of Section 1.580 and 1.1111, respectively, the Commission said.

The amended rules apply to processing of AM, TV, FM, noncom-

mercial educational FM broadcast applications, and international broadcast applications.

The changes in the rules became effective July 13, 1971.

Transmission Line Measurement Paper Available From IEEE

A special task group working in the field of radio-frequency impedance measurements has developed a new **IEEE Standards Report on State-of-the-Art Measuring Unbalanced Transmission-Line Impedance (IEEE Std 314-1971)**. The standards, sponsored by the IEEE Instrumentation and Measurements Groups, has been arranged into tables according to levels of accuracy ranging from the highest levels available within a country (in the U.S.A., the National Bureau of Standards) to that of the instruments used by the consumer.

Included are descriptions of reference standards, recommended interlaboratory standards, recommended conditions of calibrations, and recommended calibration procedures for measuring instruments. Frequencies considered range from 50 megahertz to 16 gigahertz.

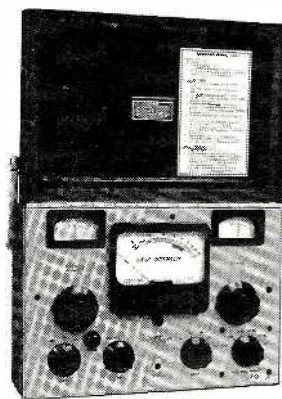
Copies of IEEE Std 314-1971 are \$3.00 each. They may be ordered from the Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, New York 10017.

Broadcast Buyer's Guide On Page 49 D-1

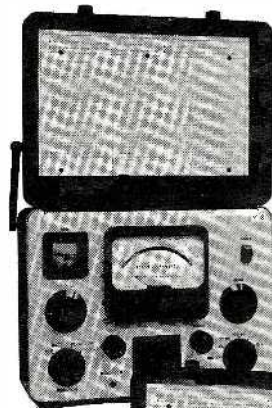


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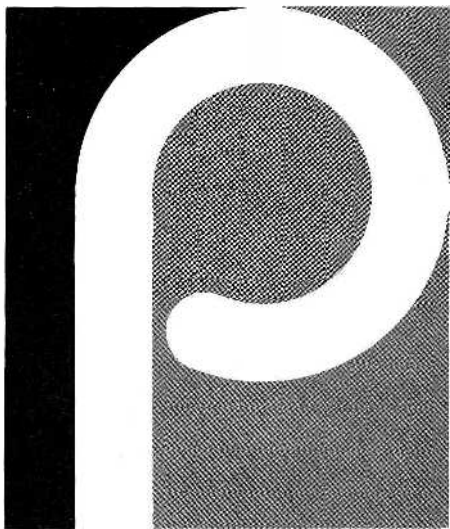


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NEW PRODUCTS

(Use circle number on reader service card for further information)

BE Errata Notice

Central Dynamics was omitted from the list of automation equipment manufacturers in the June issue of **BE**. We want to point out here that Central Dynamics is not only a top-of-the-line automation manufacturer (currently over a half million in backlog orders), they also gave our automation editor assistance with the June special by providing background information that contributed significantly to the success of that effort.

Although Central Dynamics is well known in the industry, we want to correct the error and briefly describe their lines . . . namely, switching systems, automation systems, and VTR editing systems. Headliners include the new PEC-102 VTR editing system that features a CRT editing display, mini computer control and SMPTE time code; the VSP-850 production switcher with two mix/eff busses, p/v key bus and 32 wipes. Other products handled by Central Dynamics include Ward-Beck systems and Marconi test equipment.

Their offices are located in Pointe Claire, Montreal 730, Quebec and Northvale, N.J. 07647.

Audio Console

Langevin, a division of **MCA Technology**, has introduced a stereo audio control console called "The Broadcaster," model BC-8A.

The BC-8A Broadcaster console was primarily developed for use by the emerging radio station featuring FM stereo broadcasting, with or without AM transmitters.

The moderately sized console has 8 full-stereo input mixing channels; left and right stereo output channels; an optional separate monaural output channel; a stereo audition

output; two stereo monitor outputs with muting; and on-the-air lamp relays.

It also features a cueing amplifier; a talkback switch; stereo headphones; and two power supplies, either of which is capable of handling the power requirements of the console.

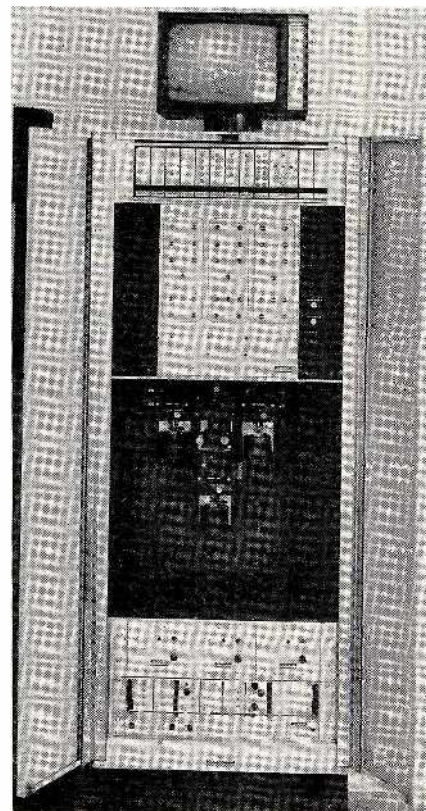
It has a suggested list price of \$3,550 without options and \$3,975 with options.

Circle Number 135 on Reader Reply Card

Color Film Camera

A broadcast color film camera with automatic control of luminance and black levels has been introduced by **Cohu Electronics, Inc.**

Major features of the Model 1500 camera are: Three separate mesh vidicons for high resolution with



low retubing costs; Image enhancer extracts detail signal from green channel for horizontal and vertical aperture correction; Instant paint control for rapid colorimetry adjustments; New optical system design, 60% minimum transmission, flare and ghosting virtually eliminated; FET preamplifiers, 50 dB minimum signal-to-noise ratio; Triple action automatics, sensitivity, white level and black level for hands-off operation.

The automatic sensitivity circuit maintains picture white level constant at 100% video level and automatically resets to intermediate sensitivity on black film leader.

Automatic white level circuit maintains peak video level despite changes in black level, gamma or shading.

Automatic black level circuitry maintains desired contrast and provides adjustable threshold for scenes that do not contain black information.

Base price includes image enhancer, color encoder, remote set up panel, remote control panel, setup monitor and waveform monitor.

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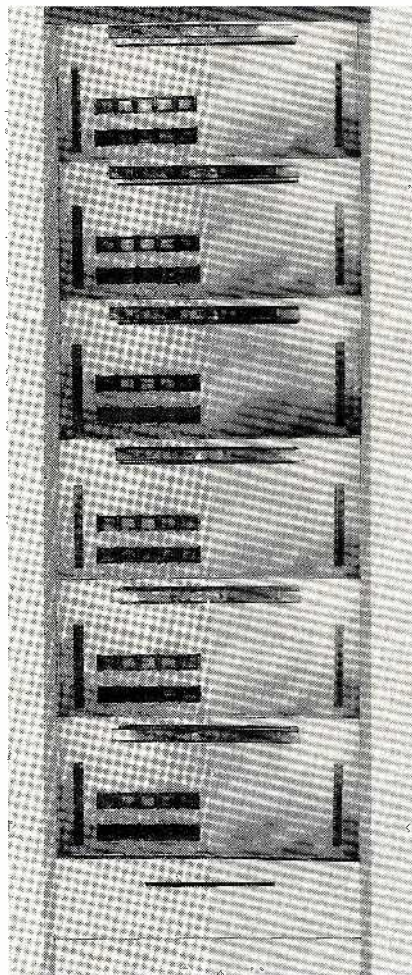
Automation System

Radio Manufacturing Co., RMC is now listing their System 70 station automation that features a new cartridge approach.

System 70 is completely automatic, and the manufacturer claims 99% of all operator errors will be eliminated because the operator never handles the tape after the cartridge is loaded. Units can be reloaded in less than 5 seconds with

a cartridge loaded on a standard 10½-inch NAB reel.

These units are self-threading, self-cueing and self-rewinding. They can recue the cart in the machine or completely rewind that cart for reloading with another cart.



The system will completely recover from electrical power failures regardless of mode of operation. Features automatic advance to next selection if unit was playing at time of failure, thus eliminating starting in the middle of a selection when automatic control recycles to the deck.

Uses solid state logic control system for each deck and offers many other automatic features.

Circle Number 137 on Reader Reply Card

CATV Distribution Amplifier

GTE Sylvania Incorporated has introduced a modular distribution amplifier station which can be used in CATV systems as a line extender or economy trunk amplifier.

Sylvania says the modular construction of the unit permits it to

(Continued on page 66)



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There *ought* to be, and now there *is*—with Permadyne's new solid-state SCA receiver.

Permadyne's receiver makes it easy, economical—and immediately *profitable*—to extend your background music service to the new growth areas your present signal doesn't reach—before your competition does.

No changes in your present transmission equipment are required to achieve this longer reach.

To make this profitable investment simply mail this coupon or your purchase order to Permadyne. Or call Gerry Lundt at (312) 525-5559 for fast answers to any questions you may have. Do it today. Your new markets are waiting, and your competition won't.

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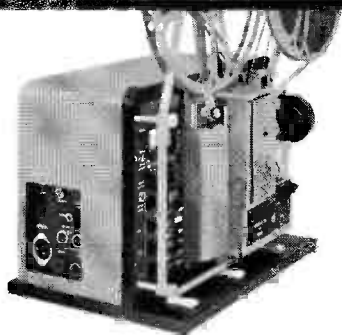
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(Continued from page 65)

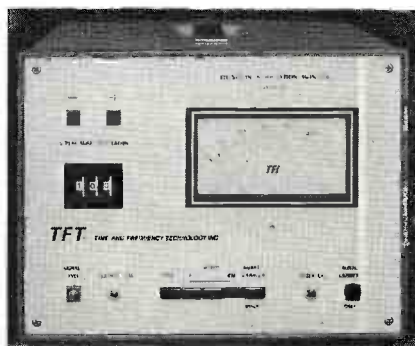
be used in either of two ways, depending upon the baseplate and modules selected. In the line extender configuration, it functions as a push-pull or single-ended amplifier with choice of manual, dual pilot control, or tilt-compensated total automatic control operation.

As a trunk amplifier, the station features manual or dual pilot automatic operation. In either application, bi-directional transmission is available as an option. The unit can also be used for trunk terminating distribution or as an intermediate bridge.

Circle Number 138 on Reader Reply Card

TV Aural Modulation Monitor

The Time and Frequency, Inc. Model 702, TV Aural Modulation Monitor has been type approved by the FCC bearing Type Approval #3-189. Model 702 provides the built-in sensitivity and selectivity and is optimized for off-the-air monitoring of aural modulation without using an external RF Amplifier.



State-of-the-art front end design substantially reduces interference caused by intermodulation products of undesirable signals. In addition, it has a built-in aural modulation calibrator and dual peak flashers displaying positive and negative peaks simultaneously. Peak flasher lights reference is digitally settable by thumb wheel switch. An optional SCA demodulator is available and accessory equipment includes a remote meter panel and peak flashers. Delivery in 45-60 days.

Circle Number 139 on Reader Reply Card

**Broadcast
Buyer's Guide
On Page 49 D-1**

Program Timer

Cooke Engineering Company announces a new product for the Broadcast Industry; the Model 728 Program Timer.



The Program Timer can be an important part of any production facility where time segments must be instantly and accurately determined. The unit reads out plus-or-minus minutes and seconds on nixie tubes. The timing count can be started at any predetermined time-reading and held at any time, thus holding to a minimum "false starts" and lost time.

Power source is 115/120 Volts,

50/60 Hz. Mounting is via standard rack—19" wide, 3½" high. Also available for desk mounting. Weight is 10 lbs. An optional remote control panel for desk mounting is available with the program timer.

Circle Number 140 on Reader Reply Card

Pro Cassette Alignment

Nortronics Company, Inc., designer and manufacturer of tape heads for magnetic recording, has announced the development of a new Professional Cassette Alignment Tape. Each test tape is a splice-free, first generation master which provides zero reference, azimuth alignment and frequency response tests in a single cassette.

The zero reference signal is a 30-second tone at 333 Hz $\pm 5\%$. Azimuth alignment is achieved with a 60-second, 6.3 KHz tone 20 dB below zero reference—which follows

(Continued on page 68)

Weather Cablecast

The Catel Corporation has added the FMW-2000 Weathermod to its line of specialty products for FM applications in coaxial cable systems. This new product combines a VHF-FM receiver and an FM modulator to add weather broadcasts to CATV and MATV systems.

The National Oceanic and Atmospheric Administration currently provides continuous transmission of weather observations, forecasts and storm warnings in most major marine centers, and plans to serve additional areas in the future. Cable operators can carry these broadcasts on their systems as a public service.

The radio weather broadcasts, which are usually on 162.55 MHz or 162.40 MHz are converted by the Weathermod to any frequency

in the FM band from 88 to 108 MHz. Also, Audio output is provided to add the broadcasts to the aural frequency of a CATV weather channel. Input jacks facilitate the addition of a microphone or music source to the system.

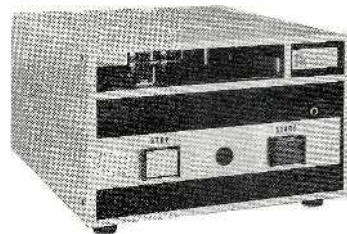
The new Catel product is fully solid state, using silicon transistors, integrated circuits and FET field effect transistors. The receiver sensitivity is 0.5 μV for 20 dB quieting and adjacent channel rejection is 80 dB. The use of crystal controlled circuitry insure a stability of 0.005%. The output is 45 dB, continuously variable, and the spurious beats are 60 dB below the output level.

The Weathermod is designed for 117 VAC operation and requires 3½" of vertical space in a standard 19" relay rack.



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the zero reference signal. Finally, a series of 10-second tones ranging from 3.15 Hz to 10 KHz are provided for measuring frequency response at $\pm 0.5\%$ of DIN Standard frequencies. Full instructions are also recorded on the tape.

Designated Nortronics Model AT-200, the new professional test tape features a speed accuracy of $\pm 0.01\%$ at $1\frac{1}{8}$ IPS (4.75 mm); Frequency accuracy of $\pm 0.05\%$; tone level accuracy of ± 1.2 dB;

and distortion of less than $\pm 0.6\%$.

The Nortronics AT-200 uses a full reel of tape to ensure proper tape tension. Each tape is tested on a Precision Torque Analyzer, Model MTM-220, produced by Minnitech Labs, a division of Nortronics. The full-track recording may be used with all track configurations. AT-200 tapes are available from all franchised Nortronics distributors throughout the world.

Circle Number 142 on Reader Reply Card

C Band FM-TV Link

A new, frequency agile, air-to-ground microwave FM-TV link, featuring plug-in frequency selection, has been announced by RHG Electronics Laboratory, Inc., designers and manufacturers of microwave transmitters, receivers, and components.

The relay link employs an airborne transmitter with switch selected plug-in modules to cover any three frequencies in the range of 4.4 to 5.0 GHz without tuning. All solid state modular construction combined with approved shock and vibration mounts meet applicable MIL standards. A tunable rack

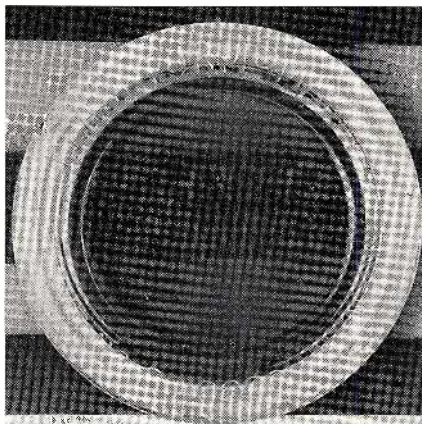
mounted receiver provides the ground-base portion of the links. The entire link conforms to the applicable MIL-E-5400 specifications. Pre- and de-emphasis compatibility with 525 and 875 lines, as well as an audio subcarrier channel has also been incorporated into the link.

The RHG C-band link is compatible with standard cameras, monitors, video/data recorders and other associated instrumentation. Typical uses are found in reconnaissance, surveillance, and high speed data transmission.

Circle Number 145 on Reader Reply Card

Magnetic Tape Viewer

A new magnetic tape viewer from 3M Company is designed to provide a simple, fast means of viewing recorded signals on magnetic tape, without the use of chemicals.



The Plastiform brand magnetic tape viewer is simply placed on the tape to view recorded signals for head alignment, track placement, pulse definition, interblock spacing and drop out areas in computer and instrumentation work, according to 3M.

The instrument also can be used to help determine, record or reproduce problems in malfunctioning systems, 3M said. That is, a signal will be visible if the record mode is operating properly; and if the reproducer mode is functioning it should play back the signals which are visible in the magnetic viewer.

In addition, the viewer can be used to synchronize the audio track on a video recorder, to examine the pattern of recorded sound in audible range applications and even to determine whether tools, heads or guides are magnetized, said 3M.

Resolution of the tape viewer is sharp at the 800 b.p.i. level and

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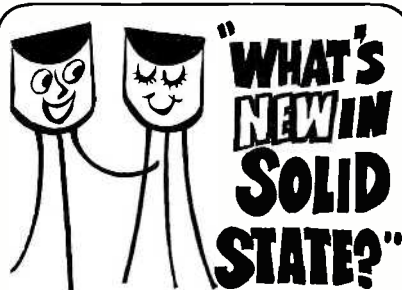
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gross flaw detection is possible up to 3200 f.c.i.

The disc-shaped viewer, measuring 1¾ inches in diameter, consists of finely divided magnetic material

suspended in a solution. When the viewer is placed on magnetic tape, the magnetic field pattern forms a clear image.

Circle Number 143 on Reader Reply Card

Frequency Counter Kit

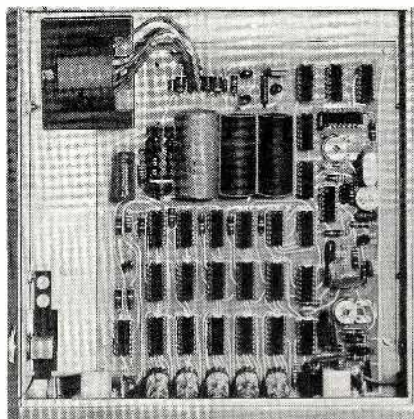
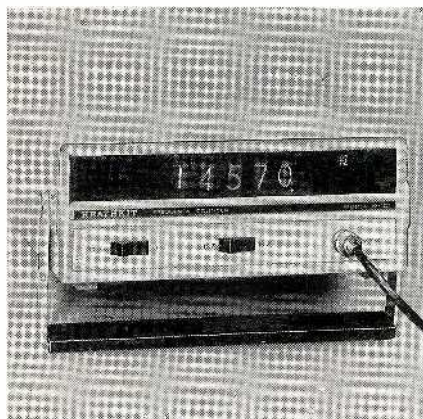
One of the fastest growing areas today is the test equipment field. And the reason for the growth is the recent overhauling the field has been getting from solid state.

While not a Cadillac line, **Heath** has consistently developed good learner and professional test equipment kits. Their latest development is a IB-101 15 MHz Frequency Counter. **BE** built and tested one and found that it has a number of applications in engineering, R&D

put impedance, computer-type circuitry, no divider chain adjustment, temperature-compensated crystal time base oscillator, and all this can be built in about five hours.

A dual primary power transformer allows stable operation. No special instruments are required for accurate calibration. The kit lists for \$199.95.

The companion unit, the IB-102, is a frequency scaler that works with the IB-101 to allow frequency counting up to 175 MHz.



labs, service shops, and where accurate frequency measurements are important.

The IB-101 uses 26 IC's, a dual gate MOSFET, 7 silicon transistors, four diodes and two zeners in a neat compact arrangement that allows fast assembly.

Unit features include 1 Hz to 15 MHz counting, automatic trigger level, five digit readout in Hz and KHz positions with overrange indicator, accepts inputs from just under 100 mV to 200 Volts, high in-

Circle Number 144 on Reader Reply Card

Tester, Troubleshooter

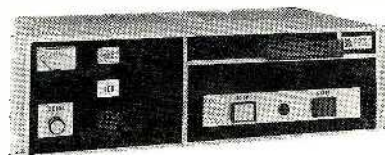
The **Ramco** TT-7 is a new concept for testing transistors and diodes and troubleshooting solid state equipment. It provides dynamic go/no-go indication of semiconductor status in circuit or out. No clip leads to attach and no meter to watch, thus providing single-handed, eyes on work testing. Special probe conforms to all transistor configurations and styles without adjustments. The

TT-7 also enables the user to determine type of transistor (NPN or PNP) and unscrambles lead configuration on unmarked units.

Although the unit is simple in nature it has proven itself to be an effective instrument for troubleshooting. It is completely safe for even the most delicate semiconductors no matter how incorrectly applied. Unit price is \$16.95.

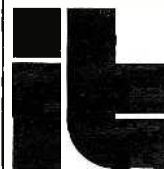
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- Hi-Speed Cue Option
- Monophonic or Stereophonic

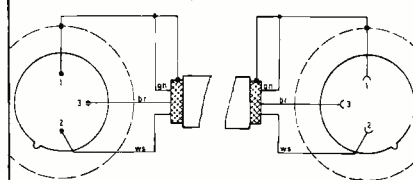


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A "simple" microphone extension cable isn't so simple. Not if it's going to match today's phase accuracy and continuity requirements!

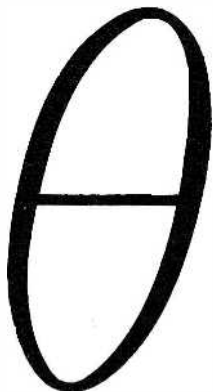
At Gotham, we start with double RF shielded, 3-conductor cables made to Neumann's tight specifications. And we attach Switchcraft "Q-G" (XLR compatible) connectors with a special technique, so the connector shell is grounded.

Our price? Practically what you'd pay for cable and plugs alone. Ten feet, \$7.50. Twenty-five feet, \$10.50. Fifty feet, \$16. One hundred feet, \$27.

Order through your Neumann Microphone Dealer. Or from Gotham directly.

GOTHAM
AUDIO CORPORATION

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(212) 265-4111
1710 N. LaBrea Ave., Hollywood, CA 90046
(213) 874-4444



PROBLEMS?

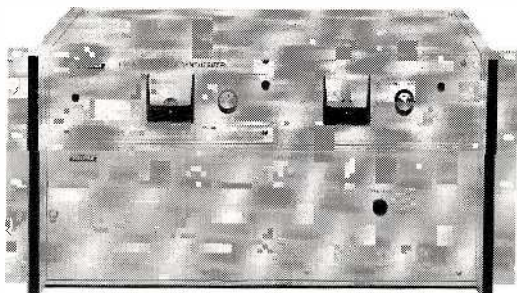
TRY THE NEW
FIDELIPAC
MODEL 350
ADJUSTABLE
PHASE
CARTRIDGE

A Subsidiary
of El-Tronics, Inc.



Circle Number 70 on Reader Reply Card

the Tracor 6500 Carrier Generator System



stops "grade B" coverage loss

Co-channel interference is essentially eliminated adding solid audience to your coverage.

With a TRACOR 6500 Carrier Generator System driving each transmitter, co-channel carriers are held so constant (within 0.05 Hz) that visibility of the beat pattern is reduced 16 db. The inherent stability of atomic frequency standards also eliminates the need

for constant adjustment . . . making the 6500 ideal for remote-site operations.

For more information, contact TRACOR, manufacturers of the 6500, Carrier stabilization systems, sub carrier sync systems, and video failure alarms.



Industrial Instruments Division
6500 Tracor Lane, Austin, Texas 78721, AC 512/926-2800

Circle Number 71 on Reader Reply Card

Cable Security System

At the National Cable Television Convention last month in Washington, D.C., **Scientific-Atlanta, Inc.** demonstrated SECURITY-ALERT, a new home and industrial security monitoring system.

SECURITY-ALERT uses a CATV or MATV cable distribution system to report the occurrence of intrusion, fire, or other alarms to a computerized central monitoring station where the location, type of alarm, and time of occurrence are recorded. Status of five sensor inputs at over 8,100 locations can be monitored each five seconds with this system.

The system can be modified to allow the cable operator to control functions in the customer's home. For example, a customer's CATV service could be remotely connected or disconnected from the Central Station. SECURITY-ALERT is designed to be used with either a single cable, two-way plan, or an existing one-way system with second return cable. Since the signal transmitted in the reverse direction is at a low frequency, inexpensive cable can be used with low cost amplifiers spaced at intervals of one mile or more.

Circle Number 146 on Reader Reply Card

Broadcast Cassette System

The first professional cassette system designed specifically for the broadcasting industry has recently been introduced by **Gates**, a division of Harris-Intertype Corporation.

Gates says the Cassette playback and recorder has features that will improve station efficiency:—60 minutes of broadcast material on one small tape;—100 individual items can be recorded on a single cassette;—high speed automatic cueing;—one message may be erased without disturbing other taped material; and—minimum rack space 5¼" or may be desk mounted.

These broadcast-quality type transports are available in playback only or record-playback combination models, in monaural or stereo. All units are equipped with slide-out chassis for easy maintenance.

Illuminated front panel pushbuttons on the record amplifier and playback simplify control of the cassette. Record, auxiliary tone and stop buttons plus the VU meter and audio level control buttons are on

get your share of the Latin American broadcast market.

There's a lot more to the story. And we'd be happy to give you more information about this unique medium and the dynamic market it serves. Just circle the Reader Service number or write directly to:



Radio y Televisión

The technical journal of the Latin American broadcasting industry.

1014 WYANDOTTE STREET

KANSAS CITY, MISSOURI 64105

the record amplifier. Pushbuttons for rewind forward fast, stop and play are on the playback panel. A socket on the rear chassis is provided for complete remote control.

The playback has a professional three-motor transport with a synchronous capstan drive motor and

a solenoid-operated capstan drive assembly including a cut position for safe monitoring of the tape in fast forward or rewind modes.

All pre-amps, amplifiers, oscillators and logic modules are solid-state plug-in units.

Circle Number 147 on Reader Reply Card

Miniature Jack Panels

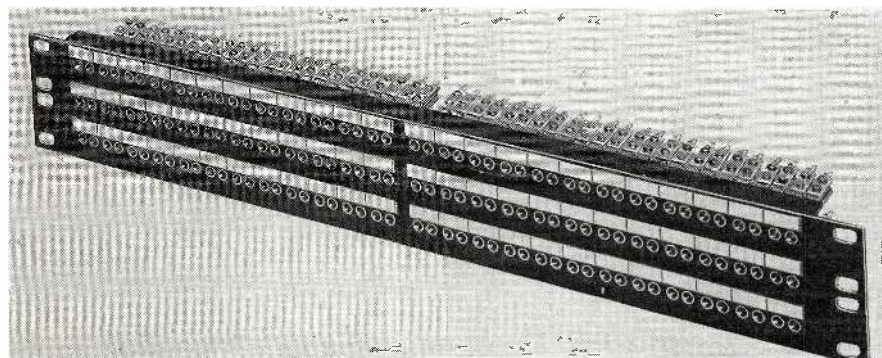
New space-saving "tini-telephone" Jack Panels for high density interconnections have been announced by **Switchcraft, Inc.**, Chicago.

Series A1600, B1600, and C1600 Jack Panels offer increased jack field density, accommodating up to 156 phone jacks in a miniature panel. They are part of Switchcraft's line of "tini-telephone" Patching System Components designed primarily for voice frequency interconnections in such applications as

telephone central offices, testing and patch panels, computer and data processing equipment, multiplex gear, and commercial and industrial patching and control uses.

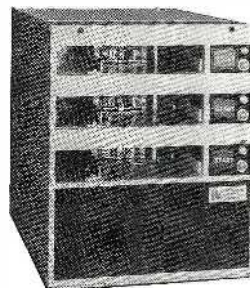
Series A1600: New inserts permit mounting of "TT-Jax" or "Wtt-Jax" phone jacks on a standard 1 3/4 by 19-inch panel. The Series includes panel frame, panel inserts, and designation strips. Four inserts each have 26 openings spaced on 5/16-inch centers for a total of 104 panel openings.

Circle Number 148 on Reader Reply Card



(New Products Continued on page 72)

THREE FOR THE PRICE OF TWO



3D SERIES REPRODUCERS 3D-0001 \$1395

- Three Rugged Cartridge Machines in One Small Package
- 450 RPM Common-Capstan, Direct-Drive Motor
- Independent control and Audio for Each Deck

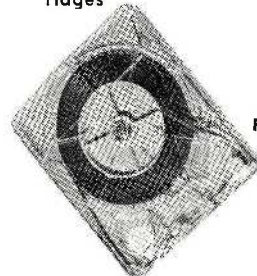


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Just send your worn cartridges to us
Our individual professional reconditioning
Assures you of properly serviced cartridges



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—JOA will inspect, service and reload your cartridges with ANY LENGTH tape

NO MINIMUM—NO EXTRA CHARGE FOR—

- (a) FOAM TEFLON-FACED PRESSURE PADS
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All cartridges PRETESTED under actual broadcast conditions—48-hour Processing
20 or more cartridges SHIPPED PRE-PAID

Need NEW CARTRIDGES fast? JOA will ship immediately from stock any size Fidelipac, precision manufactured NAB cartridge.

JOA—the cartridge service of authority—serving the broadcast industry.
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To Meet All
Federal Regulations*

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& INSIST**

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Hughey & Phillips

The leader in tower
obstruction lighting
and control systems.

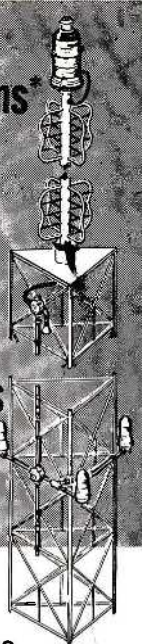
* FCC — FAA and Nat'l. Elec.
Code Regulations



**300MM BEACONS
SINGLE AND DOUBLE
OBSTRUCTION LIGHTS**



**APPROVED
by the FAA**



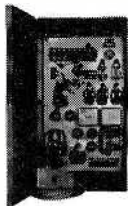
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Circle Number 74 on Reader Reply Card

Video Processing System

Dynasciences Corp., Video Products, has introduced their Video Processing Amplifier 6000 series. This System was primarily developed for color and helical scan systems; where distortion is encountered. Major applications are in CATV, ETV, CCTV, and Broadcast Systems.

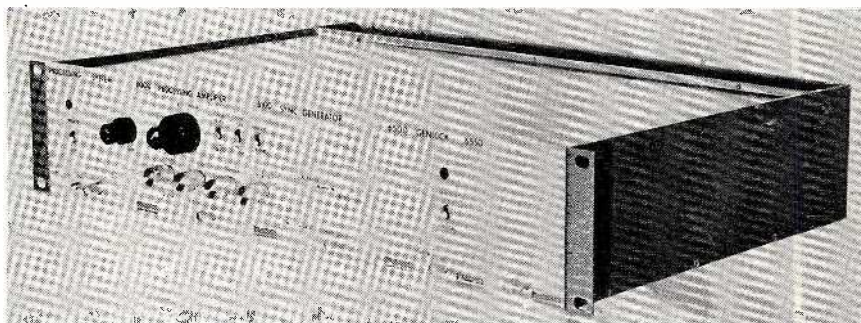
The Dynasciences Video Processing Amplifier now offers full video processing in one, easy to operate unit. It was designed to be operator controlled to restore video signal to the correct level, remove hum, restore proper vertical interval in helical scan signals, black and white overshoots are clipped from the luminance signal without affecting chrominance.

The Model 6500 Sync Generator

provides the System with new sync pulses, blanking and burst. However, at the user's option, the sync pulses, blanking and burst may be regenerated by the Model 6100 Processing Amplifier, since it contains circuitry which restores the sync pulses on the input video to the correct shape and level.

The Video Processing Amplifier 6000 Series allows the operator to control video gain, pedestal, sync level, chroma level, and burst phase. In addition to color and helical scan systems, the unit operates equally well in monochrome or Quadraplex systems.

The complete solid-state Processing system includes the Model 6100 Processing Amplifier, Model 6500 Sync Generator, genlock and power supply units.



Circle Number 149 on Reader Reply Card

Oscilloscope

Raytheon Company has announced the formation of Raytheon Instruments Operation to sell and service a line of cathode ray oscilloscopes.

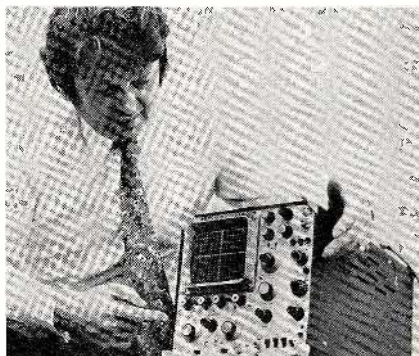
The oscilloscopes are produced by A. C. Cossor, Ltd., Raytheon's wholly-owned British subsidiary. Cossor, a pioneer in the oscilloscope field, has been supplying high reliability scopes, primarily for the European market, for more than 25 years.

The Model CDU-150 is a 35 MHz dual trace portable unit with

delayed sweep, a 10 nanosecond rise time, and 5 mv/cm sensitivity over the entire bandwidth. In standardized use throughout the British armed forces, it meets military specifications and has been assigned a NATO stock number. In the United States, a basic ordering agreement has been negotiated between the company and the General Services Administration for purchase of the CDU-150 by government agencies. Screen size is 8 by 10 centimeters. The compact scope measures 10 inches square by 16 inches deep and weighs 28 pounds. It is offered at \$1,495, F.O.B. Bedford, Mass.

The Model CDU-110C is a 20 MHz dual trace unit with a 20 nanosecond rise time. It employs a 6 by 10 centimeter display tube. It is offered at \$1,200.

Circle Number 150 on Reader Reply Card



**Broadcast
Buyer's Guide
On Page 49 D-1**

1 Year Waiver For Access Rule

The "prime-time access" rule, Section 73.658(k), adopted in May 1970, becomes effective in most respects October 1, 1971, and limits to three hours per evening between 7 and 11 PM (or 6 to 10 PM in the Central time zone) the amount of programs which stations in the top 50 markets may present from one or more of the three national television networks (ABC, CBS and NBC).

In adopting the rule, it was recognized that some stations present an hour of local news at 6 PM or 5 PM in the Central time zone) followed by the network news at 7 (6 in the Central zone), and that the network news would thus count against the three hours permitted if the rule applies in these situations. It was also noted that stations could avoid impact from the rule by presenting the network news at 6:30, "bracketed" by a half-hour of local news before and after, but that there is no public-interest reason to require stations to adopt such a format, even though it is used by some stations. Accordingly, it was stated that waivers in these situations would be appropriate.

It has been requested that the Commission indicate by a Public Notice that a blanket waiver would be granted in these situations, without stations having to burden both themselves and the Commission by the filing of individual requests. It has also been requested, by NBC, that waiver be granted in the above circumstances to it in connection with three of its owned stations, those in New York, Los Angeles and Chicago. Both of these requests appear appropriate.

Accordingly, the Commission hereby gives notice that the provisions of Section 73.658(k) will not apply to stations in the top 50 markets with respect to a half-hour of network news carried starting at 7 PM (or 6 PM in the Central time zone), if: (1) the station actually devotes the previous hour of broadcast (except for commercial announcements) to locally originated news and/or public affairs programs; and (2) the licensee notifies the Chief of the Broadcast Bureau,

Federal Communications Commission, Washington, D.C. 20554, on or before September 15, 1971, that it will operate under this waiver of the Rules. The waiver is granted only through September 30, 1972.

Free Emergency Book Is Now Available

Brand new, just published, 20-page book about automated emergency systems for handling power failures:

"All About Automated Emergency Systems for Handling Power Failures" tells why the need for emergency power has grown; why it will become even more essential as the demand for electricity increases; where emergency power is needed; why it must be operated automatically; what makes an automatic system reliable—plus typical installation diagrams and other pertinent information to help you get all the benefits from emergency power.

The book is available free from Automatic Switch Co., Florham Park, N.J. 07932.

Broadcast Buyer's Guide On Page 49 D-1

Records Inspection Rules Are Amended

Section 0.461(a) of Commission rules has been amended to clarify procedures that apply to inspection of Commission records. The amendment became effective June 16, 1971.

The three categories of Commission records consist of those records routinely available for public inspection (Section 0.453 and 0.455 of the rules); those not routinely available for public inspection and those withheld on the request of the party submitting them (Sections 0.457 and 0.459); and the Commission's general correspondence files (Section 0.456) and records not listed in the rules.

In the future, persons wishing to inspect records in the second and third categories will be required to file a request consisting of an

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- 450 RPM, Direct-Drive Motor
- Monophonic, 1 KHz Cue
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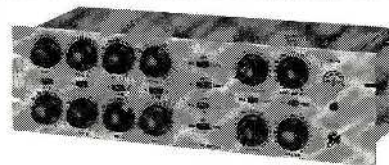


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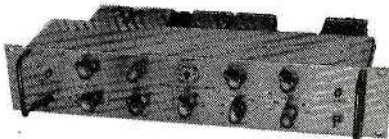
Quality & Flexibility ...Look to Lang!



LANG MIXERS

LMX-2: Mono Mixer with reverb and 10 switchable inputs.

LMX-3: Stereo Mixer with reverb and 8 switchable inputs.



LANG EQUALIZERS

PEQ-2: Solid-state Program Equalizer (rack mount).

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PEQ-4: Midrange solid-state Program Equalizer and Dip Filter.

FULL LINE OF RECORDERS & ACCESSORIES

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14 E. 39th St., N.Y. 10016

For all your audio needs look to Lang!

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original and one copy which specifically identifies the materials to be inspected. If the records belong in the second category, the request must also contain a statement of the reasons for inspection and the facts supporting this request. In the case of materials in the third category, no statement need accompany the request.

The Commission, however, said that it reserved the right to require submission of a statement of reasons prior to action on a request if it determines that the material in question may lawfully be withheld from inspection.

FREE CATALOG

HARD-TO-FIND PRECISION TOOLS

Lists over 1700 hard-to-find tools used by electronic technicians, instrument mechanics, engineers, and scientists. Included are many types of pliers, tweezers, wrenches, soldering irons, wire strippers, relay tools, watchmakers tools, drills, precision grinders, files, optical equipment, lighting, vacuum systems, tool cases, and tool kits. Included also are a solder section and four pages of useful "Tool Tips" with valuable data on fasteners, color coding, drill and metal gauges, insulation facts, and tool selection. Write today for your free copy!

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TECHNICAL DATA

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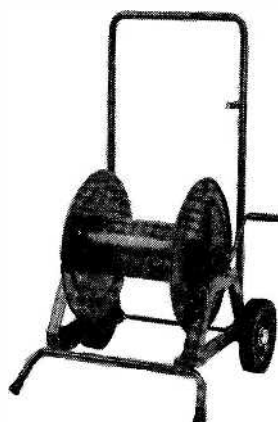
100. AEL COMM. CORP.—AELCC's new Capability brochure is now available. The attractive brochure sets forth the distinctive qualities of AELCC in 5 areas: (1) Its Capability Credentials may be simply stated as complete in-house research and production facilities. (2) AELCC offers extensive CATV expertise . . . having designed and constructed all types of CATV systems . . . using its own installation crews in communities large and small. AELCC prepares surveys and estimates, provides complete turnkey construction and field engineering assistance. (3) Exclusive amplifier design, based on stringent specifications and manufacturing techniques. (4) Key Personnel—the directing

staff of AELCC, represents a treasure house of scientific and practical experience, laboratory as well as field experience. (5) AELCC is dedicated to the "Wired Nation Concept."

101. AMPEX CORP.—An attractive, eight-page color brochure describing the Ampex AVR-1 "third generation" color broadcast videotape recorder is now available. The brochure explains its features and their use and providing performance specifications.

102. ASTRO SEAL, INC.—A new four-page, full-color brochure describing their wide range of high quality glass to metal hermetic seals

Portable Cable Reel



Handle up to 600 feet of 1/2" O.D. cable on this low-cost reel on wheels. Solid steel construction for years of service. Easy crank rewinding. Adjustable drag and brake control. Steel disc wheels with rubber tires.

Send for complete catalog of standard and custom-built reels to handle cable for broadcast equipment.



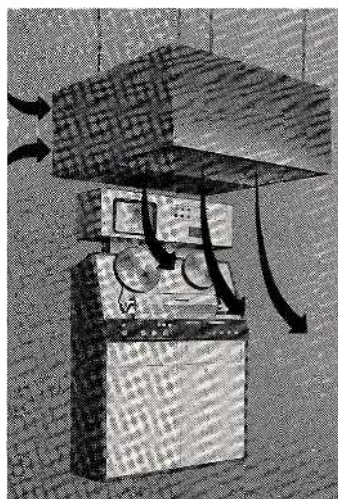
HANNAY REELS

CLIFFORD B. HANNAY & SON, INC., WESTERLO, NEW YORK 12193

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ELIMINATE AIRBORNE DUST PROBLEMS ON VTR EQUIPMENT

New ISOLAIR Unit by Liberty



This unit provides a laminar downflow of the cleanest possible air at the critical video head area. Excessive wear and damage by airborne contaminants are virtually eliminated, extending head life by 100% or more and insuring better overall VTR performance. The elimination of this dust problem by use of the Isolair results in great savings of time and money.

Also, the surrounding area in which an Isolair unit is operating benefits by a progressively reduced level of airborne particulate matter.

Chief engineers who have used the Isolair unit have attested to the multiple advantages provided by this low-cost VTR accessory.

- Meets Federal Standard 209a, Class 100.
- Easily installed and maintained.
- Requires no additional floor space.
- Eliminates need for any other dust control equipment.



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LIBERTY INDUSTRIES, INC.

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is now available. Whether a new design or component duplication with guaranteed interchangeability, Astro Seal offers components for all types of applications from general electronic industry use to custom requirements in highly specialized fields.

Several applications are illustrated to show the variety and scope of the company's capabilities. Details are outlined for such components as connectors, single terminal feed-thrus, ordinance detonators, relay bases, stamped and coined parts, and multi-pin headers.

103. BELDEN CORP.—The new electronic wire and cable catalog features 134 new products for the instrumentation, communications and data processing fields. The 60-page catalog gives performance characteristics, and line drawings show physical configurations of each cable type. All new items in catalog No. 871 are starred, with the Belden part number printed in white on black background. A handy cable-finder chart lists cables by conductor size, numbers, and shield type. Color coding charts are included for multiple-conductor cables, IPCEA color-coded multiple-conductor cables, and multi-paired audio and data processing cables.

104. BIRD ELECTRONIC CORP.—The new 4-page Short Form Catalog SF-71 lists over 80% more Coaxial Load Resistors, Absorption Wattmeters, Directional Wattmeters, RF Attenuators, Calorimeters and Coax Switches stocked by Bird Electronic Corp. Listed for the first time is the new model 3122 Monitor/RF Wattmeter with three measurement parameters displayed on one meter at once, as well as transmitter Monitor/Alarms and panel-mounted Wattmeters. In addition to basic performance specifications and prices, SF-71 also describes related custom-built accessories—such as coaxial filters—and the new Self-cooled 20 kW RF Terminating Systems.

105. BRAND-REX COMPANY—A bulletin on the Brand-Rex high voltage lead wires is now available. The bulletin includes dimensions and voltage ratings for Brand-

Rex wires. It explains and diagrams the construction of the wire, including the conductor, flame-retardant polyethylene insulation and PVC jacket.

106. CALMONT ENGINEERING AND ELECTRONICS—Subsidiary of Varadyne, Inc. A new data sheet describing their multi-conductor cable capability is now available. The data sheet describes the complete Varadyne multi-conductor cable production capability and lists the various types of conductors, primary insulations, jackets and shields available.

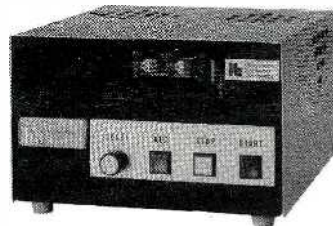
107. COMMUNICATIONS TRANSISTOR CORP.—A bulletin has been published that is a discussion of Comm. Transistor Corp's approach to the design and fabrication of RF and microwave communications transistors. The brochure includes sections on Chip Design, Chip Process, Packaging, Reliability Studies, including approach to reliability studies and failure mechanisms.

108. C. P. CLARE & CO.—A new eight-page engineering data sheet for the recently introduced MRB series of MicroClareed® miniature dry reed relays is now available. It comes complete with design and engineering specifications including life and environmental data for all of the 60 part numbers in the new series. The Data Sheet #963, contains both static and operating parameters, such as nominal coil voltages, coil resistances, must operate and must release voltages, as well as contact ratings, contact resistances, operate time, mechanical dimensions and schematics.

109. ELCO—Revised and expanded, the 1971 edition of the Input/Output Rack-And-Panel Connector Guide describes a wide range of low-cost rack-and-panel connectors. These rectangular, miniature, modular, and appliance connectors range in size from 2 to 140 contacts, with current ratings of 3 to 20 amperes. An illustrated connector index, which shows the basic characteristics of each connector, permits immediate identification of

(Continued on page 76)

PREMIUM FEATURES- ECONOMY PRICE



ENCORE RECORDER/REPRODUCER \$495

- Precision Head Assembly
- Fully Automatic Pressure Roller, Air-Damped
- 450 RPM Direct-Drive Motor
- Full Remote Control
- Monophonic, 1 KHz Cue



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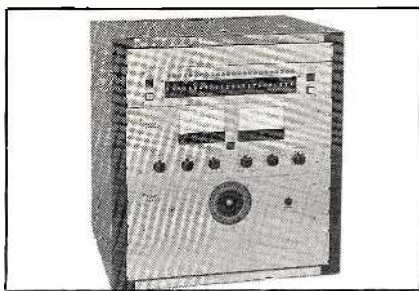
SPECTRA® TV OPTOLINER T.M.

PROJECTS A UNIFORM, HIGH RESOLUTION ILLUMINATED PATTERN DIRECTLY ON SENSOR FACEPLATE. TEST AND EVALUATE — LINEARITY — RESOLUTION — DISTORTION — LUMINOUS SENSITIVITY — REGISTRATION — AND CONTRAST.

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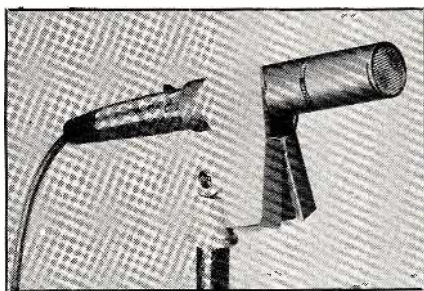
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WE'VE COME A LONG WAY . . .

since the first unit in 1959. Still not complicated—new Integrated Circuit logic on plug-in cards (spares supplied) controlling up to ten machines—provisions for expansion. Available with Random Access Carousel Control (not shown). The first six pages of the Instruction Manual tell the story. Yours for the asking! **AITKEN COMMUNICATIONS, INC.**, 701 S. 10th Street, Taft, California, Telephone (805) 765-5403.

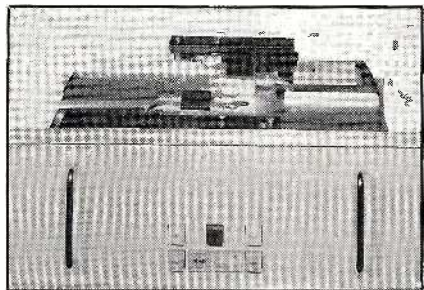
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BEYER M.101N DYNAMIC MICROPHONE

The M.101N is an extremely small omnidirectional microphone weighing under four ounces. It is completely impervious to hand holding noise and has an absolutely flat frequency curve. Ideal for modern music applications it accepts speech modulated voltages up to two volts. It is particularly popular for piano and bass drum recording and can also be used as an ultra-sensitive talk-back microphone. Frequency response 40 - 20000 Hz $\pm$ 2.5 db. \$80.00. **REVOX CORPORATION**, 155 Michael Drive, Syosset, N.Y. 11791. (516) 364 1900.

Circle Number 82 on Reader Reply Card



DUAL PLAYBACK UNITS

Two independent cartridge playbacks in 7" panel unit. Plays all NAB cartridge sizes. Plug in solid state electronics, common capstan motor, premium heads, remote control facilities, NAB standard control tones. **SYSTEMS MARKETING CORPORATION**, Dept. BE, Bloomington, Illinois.

Circle Number 83 on Reader Reply Card

(Continued from page 75)

the connector best suited for the application. Other sections of the guide cover connector installation tools, contact materials and plating, insulator materials (diallyl phthalate, polycarbonate, and nylon), and crimp characteristics of the contacts.

110. OAK ELECTRO/NETICS

—An eight-page technical bulletin which provides complete design information for using Multidex "standard" rotary switches in thousands of design variations for commercial, industrial and military applications, is now available. Multidex rotary switches, introduced only last year, incorporate the most desirable features and options in the company's broad switch line. They are "universal" in that they replace older Oak types H, MF, RK, L, LK, GK and EK. Physically, the new Multidex units are smaller while providing more electrical contacts (to 32 and 36 positions) at no additional cost.

111. PANDUIT CORP.—A new eight-page brochure describing the recently expanded line of PAN-TY one-piece cable ties, clamps, push mount ties, marker ties, and lashing ties is now available. The brochure details the eleven cable ties, five cable clamps, four marker ties and two new push mount ties, all of which are self-locking (tool or hand applied). Included are two new self-locking, hand applied lashing ties. Also described are three releasable, hand applied cable ties, including

two new lashing ties for bundles up to 6" diameter. The brochure includes complete information on cable tie sizes, tensile strengths, applicable harness tying and military standards.

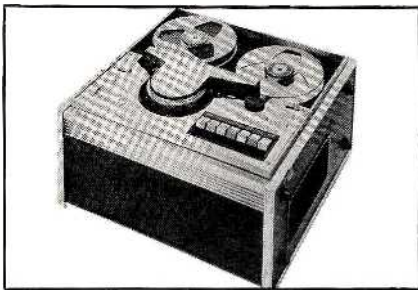
112. PHELPS DODGE COMM.

CO.—New literature, available from Phelps Dodge, describes the company's capability in broadcast installations. Products offered are described as Cufil air dielectric and Cuflex foam dielectric coaxial cables, rigid transmission line, plus connectors and mounting accessories for both coax and rigid line. An unusual feature of the literature is the diagrammatic representation of a typical broadcast installation.

113. RAYTHEON COMPANY

—A brochure describing the wide range of interactive display systems designed, developed, and produced by Raytheon is now available. The brochure covers display systems for such applications as command and control, message processing and communications, information retrieval, status reporting and monitoring. The text cites examples of displays produced for such programs as Apollo, AN/TPN-19, SAM-D, and the Federal Aviation Administration's new en route air traffic control system. Additionally, advanced-design developmental types—plasma panel, waterfall, and enlargeable TV raster displays—are covered along with information about supporting technologies.

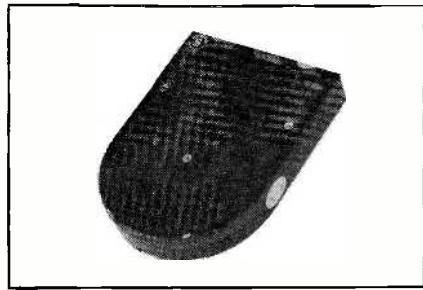
(Continued on page 78)



JAVELIN MODEL X-400 VIDEO TAPE RECORDER

Exclusive 5-mode operation. Two speeds, 4 rotary heads for true slow motion with continuous field. Real time 1 hour, lapse time 7 to 12 hours. Expand or condense time. Stop action, single frame advance. Assemble or insert edit, audio edit and re-record. 4 MHz double-sided FM video signal. Video/audio AGC, many other features. Compatible with all EIAJ 1/2" VTR's. **JAVELIN ELECTRONICS CO.**, 5556 W. Washington Blvd., Los Angeles, California 90016.

Circle Number 84 on Reader Reply Card



MARATHON

First Cartridge Designed for Stereo

Marathon's Model 300S guarantees minimum phase shift between left and right channels. Any timing: 7 seconds to 12 minutes. End your stereo phase problems now. Contact us for information! **MARATHON BROADCAST EQUIPMENT SALES CORP.**, 57 N. Putnam St., Danvers, MA 01923, Area Code 617-774-6066. **RIGGINS ELECTRONIC SALES**, 2331 San Anselmo, Long Beach, California, Area Code 213-596-6247.

Circle Number 85 on Reader Reply Card

Communications Association Directory

The following is a list of addresses and presidents/chairmen of some of the major active national associations and professional societies. Since each of these annually strive to keep their membership informed on their specific slice of the state-of-the-art, we recommend that interested parties contact these groups for further information on membership qualification and fees. Some, such as the Audio Engineering Society and the Society of Motion Picture and Television Engineers, publish technical journals at regularly scheduled intervals.

American Cinema Editors Inc.

Frederick Y. Smith, Pres.
422 South Western Ave.
Los Angeles, Calif. 90005

Armed Forces Communications and Electronics Assn.

Benjamin H. Oliver, Jr., Pres.
1725 I St., N.W.
Washington, D.C. 20006

Assn. For Broadcast Engineering Standards Inc.

George Comte, Pres.
1130 17th Street, N.W.
Washington, D.C. 20036

Assn. of Motion Picture Television Producers Inc.

Jack Valenti, Pres.
8480 Beverly Blvd.
Hollywood, Calif. 90048

Audio Engineering Society

George W. Bartlett, Pres.
60 E. 42nd St.
New York, N.Y. 10017

Broadcast Pioneers

Charles H. Tower, Pres.
589 5th Ave.
New York, N.Y. 10017

Canadian Assn. of Broadcasters

R. Crepault, Pres.
P.O. Box 627 Station "B"
Ottawa, Canada

Canadian Cable Television Association

W. E. Jarman, Chmn.
1010 St. Catherine W.
Suite 1004
Montreal 110, Canada

Catholic Broadcasters Assn.

Richard J. Walsh, Pres.
405 Lexington Ave.
Room 4500
New York, N.Y. 10017



1 Model OIB-1 Operating Impedance Bridge measures "in circuit" impedance of networks, transmission lines and antennas. Accuracy $\pm 5\% \pm 1 \text{ Ohm}$. 5 kW Power rating-VSWR 3:1.



2 Model CPB-1 Common Point Bridge measures resistance to $\pm 2\% \pm 1 \text{ Ohm}$ and reactance to $\pm 5\% \pm 1 \text{ Ohm}$ at full power.



3 Model RG-1 Receiver/Generator combines a high output power signal generator with a shielded receiver for use with Model OIB-1 or any other impedance bridge.

THE DELTA TRIO

for optimum
monitoring
of your
antenna
system

With this "Delta Trio", you can either "spot check", or continuously and accurately monitor actual "on-the-air" operating impedance of transmission lines, networks and antenna systems to maintain a "clean signal" at peak operating efficiency.

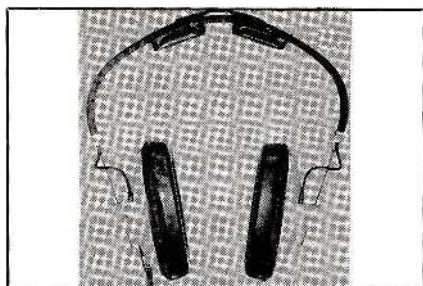
If you're operating with a directional antenna, there's real value in being able to keep the radiating system in close adjustment at all times...continuously verify common point impedance to insure full power output...plus locating and correcting any antenna problems—fast!

Complete details and application data are available without obligation—just write or call Bill Cottles, DELTA ELECTRONICS, INC., 4206 Wheeler Avenue, Alexandria, Va. 22304 (703) 751-3133.

DELTA ELECTRONICS



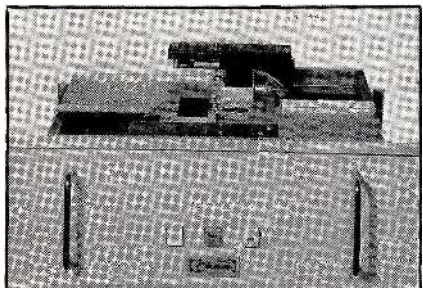
Exporter: DELTA ELECTRONICS, INC.
International Division, 154 E Boston Post RD
Mamaroneck, N. Y. 10543, Telex 1 37327, Art Rocks
Circle Number 86 on Reader Reply Card



BEYER DT100 HEADPHONE

The all modular built DT100 headphone is probably the first to be designed specifically for rough tough studio usage. Due to its built-in capsules, leads, headband, cushions, etc. it need never go back to the manufacturer for repair making it the most popular headphone in Europe for studio applications, particularly with its forgiving power handling capabilities! Available with or without microphone in 50, 100, 200, 400, 1000 and 2000 ohms plus other impedances to special order. \$57.50. **REVOX CORPORATION**, 155 Michael Drive, Syosset, N.Y. 11791. (516) 364 1900.

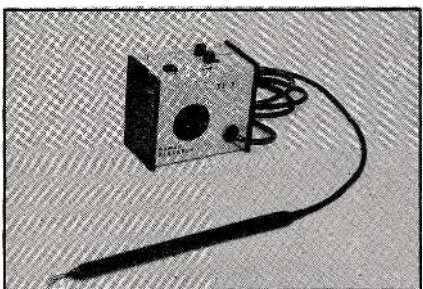
Circle Number 87 on Reader Reply Card



TIME ANNOUNCERS

Automatic time of day announcements provided by Model 581 Dual Cartridge Unit. Self contained synchronous clock keeps tape announcements synchronized with real time. NAB standard Cue and Auxiliary tones. **SYSTEMS MARKETING CORPORATION**, Dept. BE, Bloomington, Ill.

Circle Number 88 on Reader Reply Card



NEW SEMICONDUCTOR TESTER & TROUBLESHOOTER

Transistor and diode testing dynamically, in/out of circuit without clip leads to attach or meters to watch. New unique probe and indicating system make this unit great for both testing semiconductors and troubleshooting solid state equipment. Checks all transistors and diodes from flea power to high power. Completely safe for even the most delicate devices. \$16.95. **RAMKO RESEARCH**, 2552 "E" Albatross/P. O. Box 6031, Sacramento, California 95860.

Circle Number 89 on Reader Reply Card

(Continued from page 76)

114. RCA SOLID STATE DIVISION—The "RCA Power Transistor Directory", Publication No. PTD-187B describes the RCA power transistor product line, which is composed of more than 200 device types. Product matrices include up-to-date information on the latest commercial devices, as well as preliminary data on developmental units. An expanded index lists all of the newer type numbers, the older germanium types, and the developmental devices.

115. RCA SOLID STATE DIV.—The construction and operation of a light source with sub-nanosecond rise time, invaluable for photodetector response measurements, are described in a four-page application note. "Laser-Diode Sub-Nanosecond Rise-Time Source of Radiant Flux for Photodetector Testing," Application Note AN-4553, describes the use of an injection laser to provide a square-wave light output with rise time of less than 200 picoseconds. This step-function output offers significant advantages over the delta-function emission from spark gaps and mode-locked lasers. The seven figures in the Note show the assembly of the laser source, a circuit for driving the source, the photographs of wave shapes. An inherent 2-nanosecond delay between the current and light pulses is illustrated and explained, and measurement of the rise time of radiant flux is described.

116. RELIANCE MERCHANT

**AVAILABLE
LATE
FALL 71**

FIRST PRACTICAL CARTRIDGE SPLICE FINDER

Marathon Model 1500 Automatic Splice Finder, locates splices blindfold! Just insert any cartridge and push the start button. Cartridge stops automatically, with the splice in the capstan window! No more eyestrain, the 1500 does it for you! Contact us for further information! **MARATHON BROADCAST EQUIPMENT SALES CORP.**, 57 N. Putnam St., Danvers, MA 01923, Area Code 617-774-6066. **RIGGINS ELECTRONIC SALES**, 2331 San Anselme, Long Beach, California, Area Code 213-596-6247.

Circle Number 90 on Reader Reply Card

DIZING CO.—A 56-page bulletin describing a diversified listing of commercial and military type electronic components is now available. Wide coverage is given to capacitors, coaxial cable and connectors, fuseholders, lamps, numerical readouts, potentiometers, resistors, rheostats, semiconductors, switches, trimming potentiometers, tube sockets and shields.

117. SWITCHCRAFT INC.—A new 1971 Short Form Catalog containing more than 4000 product listings, any one of which can be located in only a few seconds through a unique numerical-alphabetical index is now available. The new indexing concept is of particular importance to representatives and distributors of Switchcraft products, because they can locate essential information regarding any Switchcraft product including prices, while talking with buyers on the telephone. The entire operation takes less than 10 seconds. The numerical-alphabetical index shows the page number, column, and line number location of every product in the catalog. They are listed numerically and then alphabetically so that a catalog user can rapidly find the number, jot down its location in the catalog, and then turn directly to the spot.

118. SWITCHCRAFT INC.—Bulletin No. 544 describes Switchcraft's new Momentary Common Release capability at any station to

(Continued on page 85)



TELL IT LIKE IT IS— IN PLAIN ENGLISH!

Use a Cybrix Automated "Real Time" Log System that speaks the same language you do. Try our new easy-to-read automatic logging. Contact us for more information. We'll respond immediately in REAL ENGLISH. **CYBRIX CORPORATION**, 5633 Topanga Canyon Blvd., Woodland Hills, Calif. 91364 (213) 883-2111.

Circle Number 91 on Reader Reply Card

BROADCAST ENGINEERING

**The Educational Television and
Radio Association of Canada**

Alan Robertson, Chmn.
297 Victoria St.
Toronto 2, Canada

Institute of Broadcasting Management

Allan Dickey, Chmn.
Box 4891
Washington, D.C. 20008

**Institute of Electrical and Electronics
Engineering Inc.**

Donald G. Fink, Gen. Mgr.
345 East 47th St.
New York, N.Y. 10017

Inter-American Assn. of Broadcasters

Herbert E. Evans, Pres.
Ingraham Building
Suite 925
25 S. E. 2nd Ave.
Miami, Fla. 33131

Intercollegiate Broadcasting System

George F. Eustis, Jr., Pres.
Box 592
Vails Gate, N.Y. 12584

International Frequency Registration Bd.

International Telecommunication Union
Place des Nations
1211 Geneva, Switzerland

International Radio & Television Foundation

Maurie Webster, Pres.
420 Lexington Ave.
New York, N.Y. 10017

International Radio & Television Society

Max E. Buck, Pres.
420 Lexington Ave.
New York, N.Y. 10017

Joint Council on Edu. Telecommunications

Frank W. Norwood, Exec. Sec.
1126 Sixteenth St., N.W.
Washington, D.C. 20036

Motion Picture Assn. of America

Jack J. Valenti, Pres.
1600 Eye St., N.W.
Washington, D.C. 20006

National Association of Broadcasters

Vincent T. Wasilewski, Pres.
1771 N Street, N.W.
Washington, D.C. 20036

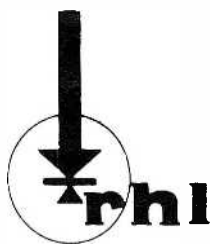
National Assn. of Educational Broadcasters

William G. Harley, Pres.
1346 Connecticut Ave.
Washington, D.C. 20036

ANY WAY YOU STACK THEM UP...

Quality

\$12,730⁰⁰
up

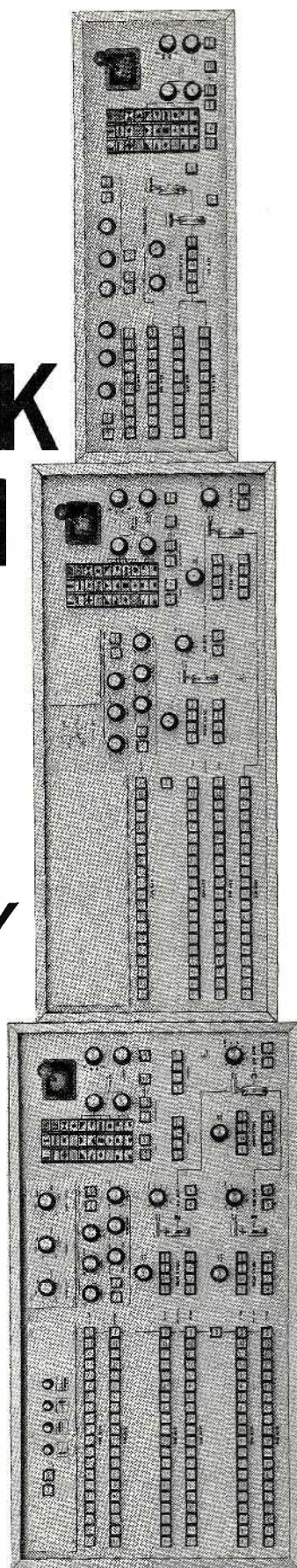


RICHMOND HILL LABORATORIES, INC.

142 Central Ave., Clark, N.J. 07066

(201) 381-5955 Telex 01-38245

Circle Number 92 on Reader Reply Card



National Assn. of FM Broadcasters

Lynn A. Christian, Chmn.
Suite 803
New York, N.Y. 10017

National Assn. of Television and Radio Announcers

Alvin Dixon, Pres.
1408 S. Michigan Ave.
Chicago, Ill. 60605

National Assn. of Television Program Executives Inc.

Herb Victor, Pres.
248 E. Liberty St.
Lancaster, Pa. 17602

National Broadcasters Club

Arthur Stambler, Pres.
1737 DeSales St., N.W.
Washington, D.C. 20036

National Cable Television Assn.

Donald V. Taverner, Pres.
918 16th Street, N.W.
Washington, D.C. 20006

National Religious Broadcasters

Dr. Eugene R. Bertermann, Pres.
Box 308
Madison, N.J. 07940

Society of Broadcast Engineers Inc.

Robert Flanders, Pres.
1330 N. Meridian
Indianapolis, Ind. 46202

Society of Motion Picture & Television Engineers

9 East 41st St.
New York, N.Y. 10017

Television Pioneers

W. D. Rogers, Pres.
Box 1475
Lubbock, Tex. 79408

Cable Future (Continued from page 18)

representative communities, and broadcasters are free of course to submit such reports at any time. If the reports were to show the need for remedial action, we could and should take such action, and promptly.

"Sports . . . We . . . propose a rule, applicable in the top 100 markets, that cable may carry all sports events on local signals (including all signals meeting the significant viewing test), but that in other respects, it would be required to observe national sports telecasting policies.

Two-way Capacity

"Minimal channel, two-way capacity: technical standards. One of our main purposes in allowing cable to develop is to provide the means for new and diverse services unique to cable. It follows, then, that along with making distant signals available, we should act to require a channel capacity that will insure the availability of channels that can be used, on a free or rental basis, by government for educational, instructional, and civic purposes, and by private interests for a variety of commercial purposes . . . We therefore propose that for each broadcast signal carried, the cable system must provide a non-broadcast channel. This seems to us a reasonable way to obtain the necessary minimum channel capacity and yet gear it to particular community needs.

"Similarly, we are contemplating requiring that there be built into the system the capacity for two-way non-voice communication. This is now feasible at little additional cost, and its availability is essential for many of cable's public services. Such two-way communication, even if rudimentary in nature, can be useful in a host of ways—for surveys, marketing services, burglar alarm devices, educational feed-back, to name a few. Finally, we also are in the process of formulating technical standards to insure adequate quality of service for all cable subscribers.

"Federal-State Relationship. This is a most difficult area. On the one hand, it has been urged that the Federal Government should take over the whole cable area on a licensing basis. We believe that we have the legal authority to proceed in this fashion, but we

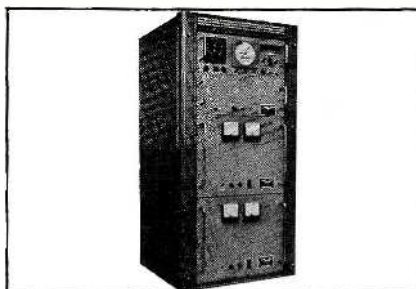


MARATHON

First Complete Cartridge Line

Any timing, any size: 7 seconds to 32 minutes, available in the most advanced cartridge design ever! Also three indispensable maintenance tools: Torque Tester, Speed Tester, Head Cleaner. Contact us for information! **MARATHON BROADCAST EQUIPMENT SALES CORP.**, 57 N. Putnam St., Danvers, MA 01923. Area Code 617-774-6066. **RIGGINS ELECTRONIC SALES**, 2331 San Anselme, Long Beach, California, Area Code 213-596-6247.

Circle Number 93 on Reader Reply Card



TIME-OF DAY FLEXIBILITY

Here's a modular frequency stabilized system that can be designed to control from one to 500 clocks. Signal outputs available to synch a station or a network. Learn more about how a Bulova T-O-D System can keep your air time accurate, avoid late cues and costly make-goods. Write for complete information. **BULOVA/AMERICAN TIME PRODUCTS**, 61-20 Woodside Ave., Woodside, N.Y. 11377 (212) 335-6000.

Circle Number 94 on Reader Reply Card



TELETYPE ALARM RECEIVER

The type TT101 teletype alarm receiver detects the 5 bell and 10 bell bulletin and EBS signals sent over the news service wires, and provides power to operate external devices such as lamps, relays and Sonalerts. This 3 3/4 x 6 1/4 x 2 inch unit uses solid state circuitry, has no relays or steppers, and requires no maintenance or adjustment. Price is \$70.00. **AUDIO ENGINEERING CO.**, 4112 Oak Lane, Gary, Indiana.

Circle Number 95 on Reader Reply Card

certainly do not believe that it would be wise to do so. We simply do not have the staff and resources to hold comparative hearings in each community, decide who is the best applicant and what portion of a large community he should operate in, and so on. Clearly there must be a partnership here, with the Federal Government specifying national policies and, where appropriate, laying down guide lines to be applied by the local entity, be it a state or municipal agency."

Broadcast Buyer's Guide Begins On Page 49D-1

Operational Totals For Communications Industry

AM Radio	4336
FM Radio	2230
Educational FM	458
UHF TV (Commercial)	182
VHF TV (Commercial)	512
UHF TV (Educational)	113
VHF TV (Educational)	85
CATV Total Systems	2573
Total Communities Served	4440
Franchises Not Yet Operating	2362
Applications Pending	2601

UHF Channel Sharing Adopted

Rules implementing the sharing of UHF TV channels 14 through 20, in the 470-512 MHz band, by land mobile radio stations and UHF broadcasters in the ten largest urbanized areas in the United States have been adopted by the Commission (Docket 18261).

The action amends Parts 21, 89, 91 and 93 of the rules. It was initiated in an FCC rule making notice, released January 28, 1971, that proposed the assignment for land mobile use of specific frequencies in the 470-512 MHz band and rules to govern their use. The Commission adopted rules on May 20, 1970, allocating various pairs of UHF channels between 14 and 20, within 50 miles of the center of each of the ten largest urbanized areas, for land mobile use.

The present Commission action divides each television channel into

120 land mobile channels, each to be made up of two 25 kHz frequencies—one for base station use and one for mobile unit use—for a total of 240 land mobile channels. All eligible land mobile users would have access to both television channels.

The new rules provide for 3 MHz separation between base and mobile channels and permit mobile stations to use base station frequencies.

Departing from the traditional system of allocating frequencies by "blocks", the Commission allocated the new frequencies in eight "pools" to be shared by users with the most functional and operational compatibility. Twenty-four pairs of frequencies were reserved for future allocation in two pools of six pairs within each 6 MHz channel. These reserved frequencies are to be made

available to meet requirements that develop as the other frequencies are placed in use.

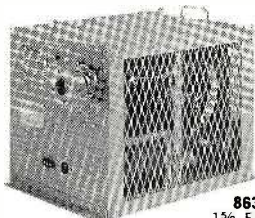
The Commission adopted frequency assignment criteria including separations between co-channel base stations of 40 miles or more and channel loading standards of 50 units for a Public Safety Pool, 90 units for a Business and Taxicab Pool and 70 units for all other pools. The new rules express channel loading standards as a ratio of one vehicular mobile unit to four hand-carried transmitter receivers.

It was decided that none of the 470-512 MHz channels will be made available exclusively for special uses such as one-way paging, tone signaling and other specialized purposes.

The Commission invited industry groups to coordinate the assignment of frequencies for each of the

MODULOAD™ Self-Cooled Load Systems

10-20
kW



8636

1 1/2 EIA FI.

No external water supply is needed for the new 10kW Self-Cooling MODULOAD™ RF Load Resistor Module. In a scant three cubic feet of space, the integral heat-exchanger permits continuous 10kW dissipation in 5° to 45°C ambients (–20° to +20°C with anti-freeze).

MODEL	POWER	FREQUENCY	CONN.	PRICE
8632	10kW	0-1.4GHz	3 1/2 EIA FI.	\$2350
8641/2	20kW	0-1.3GHz	3 1/2 EIA FI.	3300

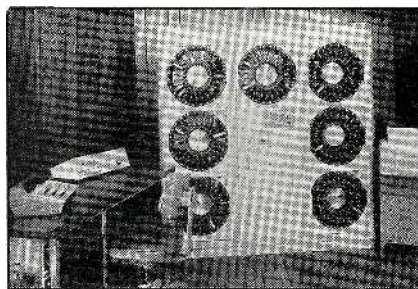
BIRD ELECTRONIC CORPORATION

* QUALITY INSTRUMENTS FOR RF POWER MEASUREMENT



30303 AURORA ROAD
CLEVELAND (OLON) OHIO 44139

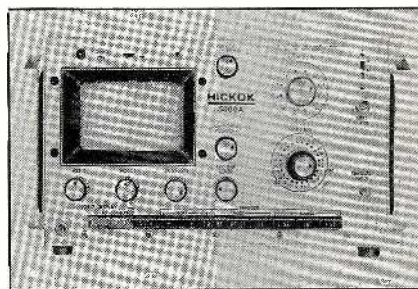
Circle Number 96 on Reader Reply Card



AUTOMATION SYSTEMS

Digital Computer Programming DP-1 System. Digicard "600" Programming System. Alpha-Numeric Logging Equipment. Digital Logging Equipment. Remote Control of Switchers. Remote Control of Random Access. **SYSTEMS MARKETING CORPORATION, Dept. BE, Bloomington, Illinois.**

Circle Number 97 on Reader Reply Card



500A OSCILLOSCOPE

Hickok 5000A offers quality performance while saving you money. The value-priced 25-MHz oscilloscope has stable triggering beyond 50 MHz, 10-mV sensitivity, built-in delay line. Also, 4-screen width horizontal and 5-screen height vertical deflection with 3% accuracy. Rugged, reliable design in lightweight, compact package. All this performance for only \$595. Hickok Electrical Instrument Company, Cleveland, Ohio 44108. Call collect: (216) 541-8060.

Circle Number 98 on Reader Reply Card

eight service pools, except in the case of Domestic Radio Services, where coordination is not needed. Authority was delegated to the Chief of the FCC Safety and Special Radio Services Bureau to recognize the committees that will be chosen as official coordinating bodies.

Assignments in the Cleveland and Detroit areas have been postponed until negotiations are completed with Canada concerning the allocations of Channels 14 and 15 at Cleveland and Channels 15 and 16 at Detroit, the Commission noted. Assignments in the Los Angeles area were also postponed until negotiations with Mexico on the allocation of Channels 14 and 20 at Los Angeles are concluded.

The availability of Channel 16 for land mobile use in Boston is subject to the outcome of a separate Commission proceeding requiring Channel 16 of Rhode Island, Inc., permittee of television station WNET-TV, Providence, Rhode Island, to show cause why its construction permit for WNET-TV should not be modified to specify Channel 64 instead of Channel 16.

In the Chicago area, in addition to the reserve pools, assignment of a number of the allocated frequencies, about 45 percent, will be deferred until the Commission's regional program for Chicago is implemented. But if a demand for these frequencies develops before that time, they will be released as needed.

In the Domestic Public Radio Service, the new frequencies will not be restricted to existing licensees, as originally proposed, but

will be available to all qualified applicants.

The amended rules become effective August 17, 1971.

FCC Proposes 70 Position Tuner

Rules to permit use of a 70 position non-memory UHF detent tuning system pending development of a system more nearly comparable with VHF tuning have been proposed by the Commission.

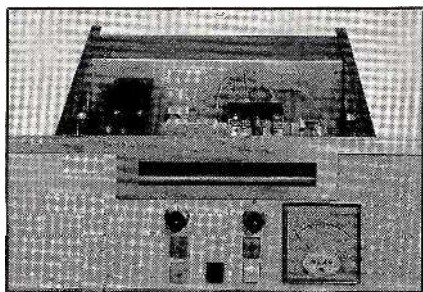
The proposal would amend Section 15.68 (requiring comparable UHF tuning) by addition of a Note authorizing use of a 70-position system, provided maximum variation from correct frequency does not exceed ± 3 MHz and numerical read-out is provided for each of the 70 UHF channel numbers or, if all (VHF and UHF) channel numbers are at all times visible on the face of the receiver, numerical read-out is provided for at least every other UHF channel, with marks to indicate those channels not displayed numerically. Receivers utilizing such a 70-position UHF detent tuning system for color reception would also have to be AFC (automatic fine tuning) equipped.

On March 15, 1971, a Public Notice requesting comments on a request for a ruling that receiver manufacturers may use such a tuning device to meet comparable tuning requirements was issued. The comments received "predominantly favor use of a 70-position system,"

the Commission said. It said three UHF broadcasters "strongly oppose" use of the system because it fails to provide full comparability with VHF tuning systems. The Commission rejected the broadcasters' position since fully comparable UHF tuning systems are not now available.

The Commission said that, on the basis of information furnished by Sarkes Tarzian, the 70-position system includes: 70 detent positions, one for each UHF channel; numerical display of the precise UHF channel selected at each position; and maximum variation from correct frequency of ± 3 MHz ($\frac{1}{2}$ channel). Detent and read-out mechanisms require almost no space within the receiver so that the system can be used in all receivers, regardless of size; and the added cost is said to be less than one third of the cost of any UHF memory tuning system now available.

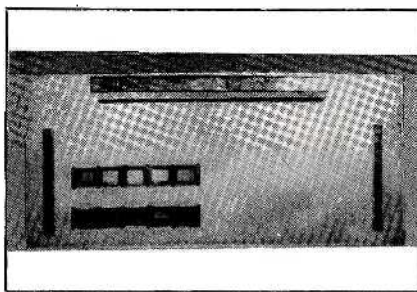
Broadcast Buyer's Guide Begins On Page 49 D-1



RECORD CENTER UNITS

Record Centers feature ease of operation, simplified routine maintenance, and complete reliability. Silicon transistor reliability and advanced-design circuitry provides exceptional performance of both record and playback functions in one economical unit! **SYSTEMS MARKETING CORPORATION**, Dept. BE, Bloomington, Illinois.

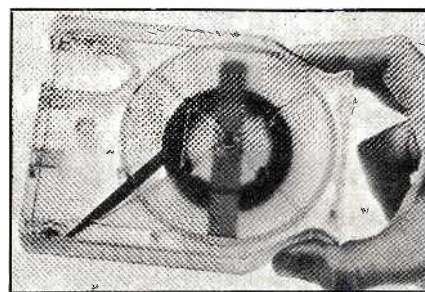
Circle Number 99 on Reader Reply Card



THE SYSTEM 70

The World's first automation tape transport system. ★ Cartridge loaded. ★ Self-threading, cueing, and rewinding. ★ Completely automatic. ★ Replaces all present music recording studio type reel-to-reel tape transports for total automation. Also the famous AR-1 auto-restart for instant recovery from power failures for your Shafer 800. Still only \$59.00. **RADIO MFG. CO.**, 4350 SW 60 place, Miami, Fla. 33155. (305) 665-7000.

Circle Number 121 on Reader Reply Card



T A P E X

High Performance Tape Cartridge. 100% longer tape life — Less head wear and maintenance — Instant cueing — Flutter-free performance — Precise alignment and tracking — Easier Handling — No pressure pads — No braking system — Four years of successful use by selected stations. Write for brochure and price sheet. **Mastertone Company**, 8101 University Blvd., Des Moines, Iowa 50311.

Circle Number 122 on Reader Reply Card

FCC Does Not Object To Repeal of Equal Opportunity Provision

FCC Chairman Dean Burch told the Subcommittee on Communications and Power in late June that the Commission does not object to repeal of the equal opportunities provision of the Communications Act (Section 315) with regard to election campaigns for the office of President and Vice President of the United States. He said that repeals of this provision would leave political broadcasts subject to the fairness doctrine.

Chairman Burch presented the views of the Commission on a number of bills on political broadcasting.

Chairman Burch said, "We have previously supported a further suspension of the equal opportunities provision for the offices of President and Vice President. The Commission does not object to repeal of the provision with respect to those offices.

"Repeal of this provision would leave political broadcasts subject to the fairness doctrine. The Commission last year stated as part of the fairness doctrine that comparable time must be sold to spokesmen or supporters of candidate B if during a campaign candidate A's spokesmen or supporters are sold time in which they discuss their candidate or the campaign issues or criticize candidate B or his position on the campaign issues. If

section 315 were repealed for Presidential and Vice Presidential elections, that standard of fairness could well encompass the major party candidates.

"We support the general concept of time being made available to candidates at reasonably reduced rates. The concept of lowest unit charge would be quite variable in application by broadcasting stations because of the many kinds of rates and combination packages available. Nevertheless, the lowest

unit rate requirement is one way of reducing direct costs for broadcasts by candidates and at the same time allowing each station to provide reduced charges according to its own rate schedule. The Commission believes the exact formula for the reduction of rates is a matter for congressional policy."

Burch added, "Whether there should be limits (on total expenditures for campaign advertising) and the basis for establishing them are policy judgments for the Congress.

NAB Opposes Ad Substitution

The National Association of Broadcasters has urged the Federal Communications Commission to reject a proposal by a market research firm to test a substitution of commercials in television signals picked up by a cable TV system.

NAB said the plan advanced by AdTel, Ltd., as a market research project in Harrisburg, Pa., is intended "purely for direct private gain" and has a "potential for injury to the television licensee's ability to operate in the public interest."

AdTel has asked for temporary authority to make "cut-ins" on signals the CATV picks up from WGAL-TV, Lancaster, Pa., and WTPA-TV, Harrisburg, to eliminate the stations' commercials and substitute those of its clients.

NAB endorsed arguments by

WGAL and WTPA that CATV systems, under Commission rules, are merely "passive" carriers of broadcast signals and that signals they pick up are to be carried without alteration or degradation.

It emphasized that FCC has placed on broadcasters the "sober and broad duty" to operate in the public interest and holds them responsible for the presentation of commercial matter. AdTel's "altered" signal, it added, would include substitute commercials the stations had neither seen nor approved and "any harm or annoyance caused the public . . . would be attributed to the station whose signal was being carried."

Noting that AdTel's description of its commercial substitution procedure "is highly scanty" at best, the NAB filing said:

"We understand that because



SPECIAL SERVICE MULTIPLEX

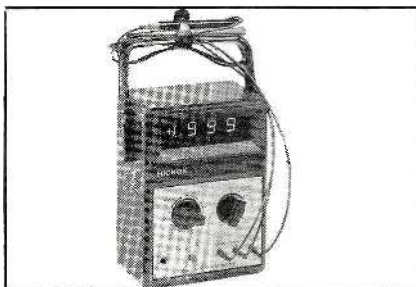
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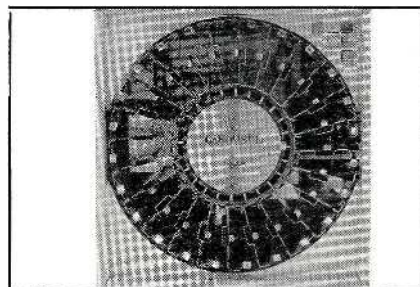
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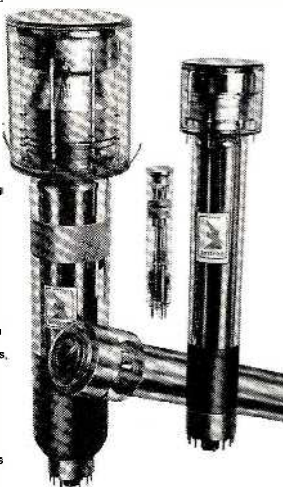
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their operation works only by video cues, they must permit the station's own commercial to commence and then 'bump off' the original commercial to carry the substituted material. If this is true, the annoyance caused the viewer by starting to watch one commercial only to have it interrupted by another must be considerable. And in view of the delay in 'cutting in' its substitute commercials, we can only assume that there is an accompanying delay in returning to the originating station's program material."

NAB described as of no significance, "rather grandiose and totally unsubstantiated" AdTel's claim that it faces possible bankruptcy if not permitted to make the commercial substitutions in the WGAL-WTPA signals.

NAB Engineering Group Meets For First Time

The National Association of Broadcaster's newly appointed Engineering Advisory Committee has met for the first time to review technical problems with which the industry is concerned.

Among the items discussed were actions pending before the Federal Communications Commission, including those relating to the coding of commercial and program material; new coverage contours for FM radio and television stations; and new test signals and remote control for television.

The committee also named chairmen of two of the three standing subcommittees: William B. Honeycutt, KDFW-TV, Dallas, Texas to head the automatic transmitters subcommittee and Albert H. Chis-

mark, the Meredith Corporation, Syracuse, N.Y., to chair the tower icing subcommittee. A yet-to-be-named representative from CBS will head the unit on aural modulation.

The ten-member Engineering Advisory Committee, appointed by NAB President Vincent T. Wasilewski for two year terms, includes: Chairman Benjamin Wolfe, Post-Newsweek Stations, Washington, D.C.; Walter G. Alliss, Jr., KCRG-AM-TV, Cedar Rapids, Iowa; Albert H. Chismark, Meredith Corporation, Syracuse, N.Y.; Eugene R. Hill, Kaiser Broadcasting Corporation, Oakland, California; Leslie S. Learned, Mutual Broadcasting System, New York City; Richard T. Monroe, Westinghouse Broadcasting Company, New York City; James D. Parker, CBS Television Network, New York City; Royce LaVerne Pointer, American Broadcasting Company, New York City; Lindsey G. Riddle, WDSU-TV, New Orleans, Louisiana; and William H. Trevarthen, National Broadcasting Company, New York City.



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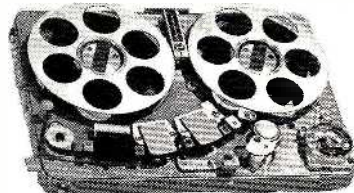
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(Continued from page 78)

its family of DW "Multi-Switch" switches, Series 65000, 66000, 67-000, 70000, and 71000. These multiple-station pushbutton switches can now be specified—up to 12 stations in a row—to combine interlock, all-lock or push-lock/push-release mechanical functions with a Momentary Common Release at any desired location on the switch frame. Depressing the Common Release pushbutton restores to normal all previously depressed stations. DW "Multi-Switch" switches with the new feature are available on special order at no additional cost.

152. SWITCHCRAFT—A new product bulletin describing the seven series of Switchcraft lever switches which meet all requirements for Underwriters Laboratories listing is now available. The new bulletin covers the following series of lever switches in UL listed versions: "Lev-R" Switch Series 3000, 12000, 13000, and 28000; "Telever" Switch Series 6000 and 16000, and "LT Switch" Series 41000. These switches, which have been completely proven through years of industrial use, are now available on special order to meet switching requirements calling for UL listed devices. Introduction of the UL Series has provided savings in time and money to equipment manufacturers, especially computer and peripheral, normally required in obtaining UL qualification on the switches.

153. TDK ELECTRONICS CORP.—An illustrated, information-packed booklet for owners of cassette recorders, "The TDK Guide to Cassettes," is now available. The practical and useful booklet includes such topics as: advantages of the cassette method of recording, range of applications, choice of tape quality and running time with reference to application, what to look for when buying cassettes, how to judge quality, the care of cassettes and cassette recorders, do's and don'ts' choice of microphones, repair of cassettes in the event of accidents, indexing the cassette library and storage. There is also a section delineating the characteristics and features of TDK Super Dynamic (SD) tape.

154. TECH LABORATORIES, INC.—A detailed review of the characteristics and uses of attenuators, and a description of the types of pots, pads, ladders, mixers, faders, gain controls, and other types of signal level control circuits that can be supplied are present in a 24-page catalog. Specifications and ordering information plus circuit diagrams and dimensional drawings also are included. Standard circuit elements are differentiated as to function and use: stepping or step-type: balanced or unbalanced: T, H, and L pads; Pi networks; and Ladder circuits, a variation of the Pi circuit. Special controls, available on a custom-make basis, also are available, and complete specifications and ordering information are provided.

155. TELEDYNE SEMICONDUCTOR—A preliminary data sheet on Teledyne's new series of monolithic dual N-channel field effect transistors is now available. The data sheet outlines the minimum-maximum ratings for Teledyne's SU2365-SU2369 and SU2365A-SU2369A dual FETs. Designed for use as a general purpose differential amplifier, each device features a closely matched transconductance (g) of 5 and 10%, a low differential drift of 10-40mV/°C, a closely matched gate source voltage of from 5-20mV, a low gate leakage current of 20 and 100pA, and a high guaranteed common mode rejection ratio (CMRR) of 74-90 dB.

156. TELEDYNE SEMICONDUCTOR—A new application note, "Designing With Analog Gates," which shows how hybrid analog gates can be used to obtain extreme isolation between a control or switching signal and information being gated is now available. Illustrated with several schematic diagrams, this eight-page guide covers AC and DC swing, interfacing with TTL, and the use of referral resistors. In addition, the note also gives several applications for analog gates.

157. TELEX COMMUNICATIONS DIV.—A new catalog for

(Continued on page 86)



TECH LABS, INC., ATTENUATORS SINCE 1935

This 24 page catalog has complete data for selection of your audio or RF attenuators. Including circuit diagrams, types and uses, current-voltage ratio tables, etc.

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(Continued from page 85)

the Telex broadcast and industrial line of professional magnetic tape equipment is now available. The comprehensive catalog covers the complete line of recorder/reproducers, reel and cartridge transports, amplifiers, preamplifiers and accessories. The 20-page, two-color brochure gives product information, specifications and ordering information.

158. THE CORPORATION—A 12-page specification guide describing electronic laminates is now available. The brochure is intended as an aid in specifying copper- or other metal-clad continuous-roll laminates for the printed circuit and flexible cable industry. In many cases these laminates are recognized as a major breakthrough in the printed circuit and flexible-cable industry because, for the first time, outstanding bonding agents such as epoxy adhesives and TEFLON FEP, which ordinarily require long high temperature curing cycles, are continuously laminated.

159. CERO ELECTRONICS, INC.—A new 16-page, two-color catalog containing complete technical data and ordering information

on Vero's line of Verorack 3 card frame systems and accessories is now available.

160. VISUAL EDUCOM INC.—A new two-page catalog describes the DAGE PRC-600 Film Chain, a rugged, easy-to-operate film chain for video presentation of 16mm sound movies. Complete technical description and electrical/mechanical specifications are given.

161. WESTINGHOUSE ELECTRIC CORP.—The new 16-page Westinghouse Semiconductor Condensed Catalog describes the industry's widest variety of power semiconductor components. Devices described range from the highest voltage thyristors, rectifiers and transistors commercially available to power control and rectifier assemblies, prewired and mounted on heat sinks. The semiconductor lines described include rectifiers rated from 1 to 1000 amperes, 50 to 3000 volts; rectifier assemblies rated from 2 to 2000 amperes, 50 volts to 200 kilovolts; silicon controlled rectifiers, rated 16 to 850 amperes, 25 to 2000 volts; and transistors rated from 4 to 250 amperes, 30 to 375 volts, 25 to 625 watts. In addition to basic specifications, the new catalog also provides dimensioned drawings of standard package types, provides basic introductions to each product line, and lists Westinghouse semiconductor manufacturing facilities sales offices and industrial distributors by location. A summary page lists key users advantages including advance manufacturing techniques for improved devices, guaranteed shipment and low-cost inventory maintenance.

162. WESTINGHOUSE ELECTRIC CORP.—A new design engineering-oriented catalog and cross reference provides comprehensive information on Gold-Line Assemblies for power rectification and control applications. Detailed technical data is presented covering the more than 115 Gold-Line Assemblies available. Westinghouse Gold-Line Assemblies are subsystems composed of silicon controlled rectifiers (SCR's), diodes and heat sinks already wired and mounted in standard-circuit configurations. The new

Gold-Line Assembly catalog begins with an introductory section on how to select an assembly by circuit function, circuit configuration, current and voltage ratings and physical configuration (type of mounting, assembly shape and size). The catalog introduction also covers using the reference sections and briefly summarizes the features of Gold-Line Assemblies including guaranteed ratings, compact size, lightweight and availability of complete applications information and assistance. The three main sections in the 32-page catalog are divided according to circuit function: rectifier assemblies, half control assemblies and full control assemblies. Each of these sections begins with a matrix summarizing the Gold-Line products according to circuit configuration, output wave shape and value as a multiple of input, current ranges available and general package configuration. Each listing in the matrices also carries a reference page number. Once a designer has selected a specific type of assembly and rating range from the matrix's listings, he can turn to the reference page and get specific information about individual assemblies in the range selected.

163. WOLLENSAK INC.—High-efficiency multipaler coating capability of Wollensak is explained in their new nine-page brochure. A neutral density absorbing filter with greatly reduced surface reflection is discussed, along with other coatings adaptable to a wide range of applications.

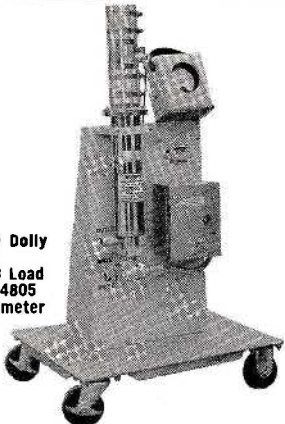
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RCA Transmission line, 6 inch, 75 ohm, 875 ft. with 2 elbows. 1-Raytheon KTR-1000G microwave STL with cable and positioner. 1-Translator, EMC 100 watt, with channel 73 slot ant. 1-RCA TRU-30-J antenna cut for channel 20. (make offer). Tom Morse, WDCA-TV, 5202 River Rd., Washington, D.C. 20016. 7-71-2t

RCA BTF-5D FM transmitter in excellent condition. Presently in operation and tuned to 92.5 MHz. WFAH, 393 Smyth Ave., Alliance, Ohio 44601. 7-71-2t

Gates M6095 Exciter—Excellent Condition—Currently on air—\$900. Gates M6146 Stereo Gen. for this exciter—\$850.00. Gates M6095 Exciter—Good Condition—\$800.00. 425 Watt Pwr. Amp. for M6095 Exciter—Similar to Gates BFE-50C—Used about 1 YR.—\$700.00. Western Electric 5A Freq. and Modulation Monitor—\$400.00. Will sell separately or as packages. All units tuned and tested to your frequency. All prices FOB Atlanta. WREK Box 32743, Atlanta, Ga. 30332. 404-872-7373. 7-71-2t

EQUIPMENT FOR SALE. KWWL-TV, Waterloo, Iowa, has converted its VTR machines to high band and has available three rebuilt RCA low band, air bearing Head Wheel Panels, Type MI-40790-BZ. These units contain the new Alfecon II pole tip material, are in their original, factory-sealed cases, and are fully warranted by RCA. They are available for \$600 each with a used head wheel as a trade in or for \$1100 each without trade in. Contact: E. M. Tink, Director of Engineering, KWWL-TV, East Fourth and Franklin Streets, Waterloo, Iowa 50703. 7-71-2t

Equipment for Sale (Contd.)

ONE STOP for all your professional audio requirements. Bottom line oriented. F. T. C. Brewer Company, P. O. Box 8057, Pensacola, Florida 32505. 7-71-tf

"B&W portable production unit. 3—vidicon cameras (2—viewfinders), assorted lens. 2—9" rack monitors. 1—11" rack monitor and 1—19" VTR receiver. 1—6 input rack switcher/feeder, Altec 5 channel rack mike mixer and an intercom unit. 3—headsets, 2 mikes and all cables. Sony 3600 E.I.A.J.-1 VTR with 2-reels of tape. Rack equipment in 2 portable cases. All in A-1 condition, \$2500.00. Tom Gilchrist early morning and evenings. (316) 722-5116." 8-71-1t

AMPEX 354—with custom case, and factory console case. First \$1,000.00 takes all. 9455 Halifax, Ventura, Calif. 805-647-6739. 8-71-1t

RADIO STATION TRANSMITTERS: Dallas-Fort Worth Regional Airport extends the date for opening proposals for 50 KW and 5 KW AM transmitters from July 20, 1971, to September 20, 1971. Both transmitters are in operating condition and are surplus due to relocation of Stations WFAA/WBAP from the Airport site. For particulars see our ad in the June issue of this magazine. 8-71-1t

FOR SALE: Used 150 foot uniform cross section Wind Charger tower, \$400.00. 1—used 300 mm code beacon light in excellent condition \$135.00 plus crating and shipping. Clark Communications Service, 924 Lancaster Street, Marietta, Ohio 45750. 8-71-1t

AMPEX 1000-C Video Tape Recorder. Includes amtec and colortec. KLFY-TV, P. O. Box 3687, Lafayette, La. 70501. 8-71-1t

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EV STEREO-4™
compatible four channel

4-CHANNEL SOUND

Electro-Voice is making it happen for you...today!

(Being more a progress report than an advertisement.)

The Promise

Thousands of people have heard 4-channel stereo reproduction at hi-fi shows and special demonstrations in the last few years. Others have read about this fascinating and rewarding technique that promises more faithful reproduction of musical performances. Early experiments have also shown 4-channel to be an effective tool in creating new sonic environments for both serious and popular musical forms. The concept has met with almost universal critical acclaim, and strong general approval.

The Problem

But alas only a handful of enthusiasts are actually enjoying this advance today. Because only a few 4-channel tapes have been produced for sale. The problem is simple, but basic: 4-channel means just that—four separate signals. And to reproduce it properly demands four of everything, right down the line.

It's possible (albeit expensive) with reel-to-reel and cartridge tape. But the stumbling block has been to put four completely independent signals in a record groove, or to broadcast them over a standard stereo FM station.

And if you can't make 4-channel discs, or play them on FM, the market is limited to a precious few 4-channel tape owners. But their numbers are so small that the record industry just can't afford to release four channel material. So the industry continues to produce 2-channel stereo that anyone *can* play (and that can be sold in volume).

The Way Out

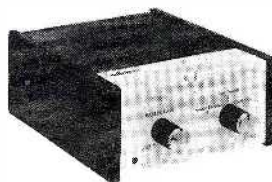
Now Electro-Voice has moved to break the impasse. With a system that can offer the significant advantages of discrete 4-channel, yet is compatible with present record manufacturing and playback equipment and present FM broadcasting. It is called STEREO-4.

STEREO-4 is a system that encodes four channels into a stereo signal that CAN be transmitted over FM or recorded on a disc, stereo cassette or cartridge. The home listener adds a STEREO-4 decoder, plus another stereo amplifier and a pair of rear speakers. The result is reproduction that closely rivals the original 4-channel sound. Four different signals from the speakers, with a feeling of depth and ambiance you have never before heard from any record.

Admittedly, STEREO-4 is not quite the equal of 4 discrete signals. But while there is some loss of stereo separation, there is no reduction in frequency response or overall fidelity. We might note that this reduced separation actually seems to aid the psycho-acoustic effect for many listeners in normal listening situations. And on the plus side, STEREO-4 offers an advantage that even discrete 4-channel cannot provide.

The Remarkable Bonus

Playback of almost all present 2-channel stereo discs and tapes is greatly enhanced when fed through the STEREO-4 decoder. It's the result of multi-microphone recording techniques that include a remarkable amount of 4-channel information on ordinary stereo discs and tapes. Adding STEREO-4 releases this hidden information for all to enjoy.



Model EVX-4
STEREO-4
decoder

The Decoder

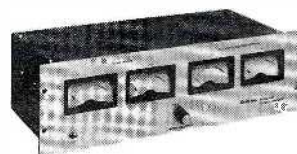
A STEREO-4 Model EVX-4 Decoder costs just \$59.95. And with it, plus 4 speakers and dual stereo amplifiers, the listener is equipped for almost any kind of sound available. Encoded 4-channel, enhanced stereo, regular stereo, and discrete 4-channel (assuming suit-

Circle Number 2 on Reader Reply Card

able source equipment). Even mono. So STEREO-4 is the one system that is compatible with the past, present, and foreseeable future.

The Present

And what about encoded 4-channel discs and broadcasts? Well, that's where you come in. Already recording companies have started mastering STEREO-4 records, and their ranks are growing. And STEREO-4 is now being broadcast in many major cities around the country.



Model 7445
Professional
STEREO-4
Encoder

The Encoder

All that is needed is a Model 7445 Professional STEREO-4 Encoder \$795.00 net, direct from the factory. The encoder is patched into your console. No other changes in equipment or handling, whether broadcasting or recording (except that you'll want to add 4-channel monitoring, of course). No increase in costs. And your performance standards are unaffected. The encoder doesn't add noise, distortion, or limitations on response. And listeners without a decoder still enjoy all the music in conventional 2-channel stereo. Some record producers even feel that the STEREO-4 encoder results in better 2-channel stereo than conventional mix-down techniques.

The Future

Like you, we hope for the day when discrete 4-channel sound will be commonplace on records and FM, and when STEREO-4 decoders will be relegated to enhancing present libraries. But that day will have to wait until some very knotty design problems are solved. And probably after a host of new FCC regulations define an utterly new system. Indeed, there is serious question whether these problems can be solved at all.

In the meantime, the STEREO-4 system is getting 4-channel recordings into the marketplace in increasing numbers, in a form that people can enjoy. EVX-4 STEREO-4 decoders are now on the market in quantity. And STEREO-4 decoder circuits are being designed into mass-produced stereo phonos and receivers. Even STEREO-4 juke boxes are now in use!

What Can You Do?

Write us today for all of the technical details, plus up-to-date news of STEREO-4. Make news yourself by adding compatible STEREO-4 for your audience. It's not too soon to start planning for tomorrow!

ELECTRO-VOICE, INC., Dept. 814V
638 Cecil Street, Buchanan, Michigan 49107
In Europe: Electro-Voice, S.A., Lyss-Strasse 55,
2560 Nidau, Switzerland

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We make the microphones, too.



Since our job is to make your job easier, we've developed an entire line of ingenious, low-cost circuitry devices that take the headaches out of tough installations. For instance, Shure makes nearly a dozen different-type modular add-on *Mixers*, including a professional mixer. They're the talk of the industry. We offer an *Audio Control Center* to shape response to match room acoustics. Our *Level-Loc* effectively controls audio levels. In-line transformers, and plug-in problem solvers (such as phase reversers, attenuators, etc.) are instant cures for knotty problems. Interested? Write

Shure Brothers Inc.,
222 Hartrey Ave., Evanston, Ill. 60204.

