

Ward-Beck at the XXI Olympiad



The XXI Olympiad, a dedication to excellence within the framework of competition. A challenge for the athletes. A challenge for the supporting communications equipment.

Ward-Beck is proud to have been chosen by Canadian Broadcasting Corporation to supply WBS 75046 Mobile Audio Consoles to broadcast the 1976 Olympic Games to the world.

WBS

Tomorrow's Technology Today.

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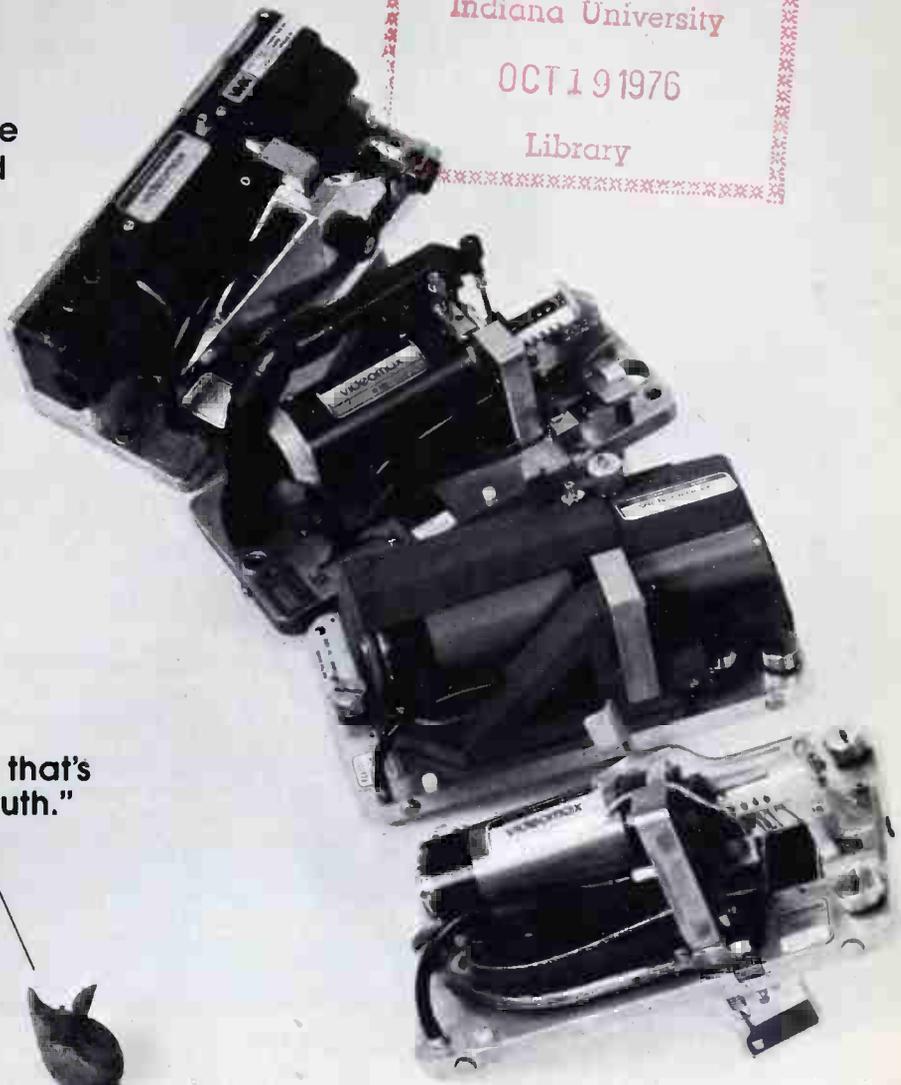
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Circle 120 on Reader Service Card

Now we can refurbish
the Mark XV, Max.
That makes us number one
in the world in quad head
capability."



"And that's
the truth."



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Library

VIDEOMAX NOW REFURBISHES MORE KINDS OF QUAD HEADS THAN ANY OTHER COMPANY IN THE WORLD.

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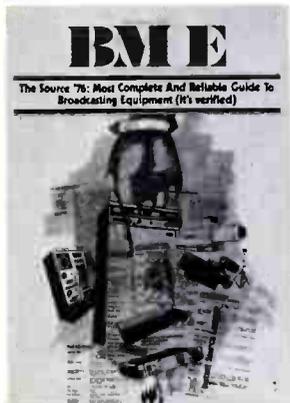
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BM/E

BROADCAST MANAGEMENT/ENGINEERING

SEPTEMBER 1976/VOLUME 12/NUMBER 9



6 Broadcast Industry News

*FM overtakes AM in 2 top markets; AM stereo to be discussed; mini-equipment scores at the Republican National Convention
News Briefs p. 23 Business Briefs p. 25 People p. 174*

28 FCC Rules & Regulations

Multiple ownership rules, corporate ownership reporting rules amended

34 A Speak Out Series—Do You Need a Recording Type Console in Broadcast Applications?

*No says Carroll Cunningham of Dyma Engineering.
Qualified yeses from Bob Ward of Auditorics and Nicholas Balsamo of Automated Processes*

41 "True" Station Value Is Key Ingredient In Broadcast Financing

An AM-FM station obtained a \$2 million loan and a number of other advantages

46 How Similar Strategy Helps Three Different Stations Maintain Popularity In The Same Market Area

Three different stations programmed to different audiences approach the problem of getting listeners in much the same way

50 Understanding Antenna Tuning Units

The mystique of coils and capacitors clears up once it is understood that antenna tuning units behave like quarter-wave transmission-line transformers

THE SOURCE 1976

57 Instant Source Locator

Who makes it; 10 categories & over 180 subcategories of broadcast & cable equipment, by manufacturer

75 Broadcast Equipment Manufacturers

Names, addresses, telephone numbers, product descriptions—all verified

118 Independent Broadcast Reps/Distributors

All major reps/distributors organized by state

152 Measuring Television Transmitter Noise

Four alternative noise measurements are described to get a true picture of TV transmitter performance

158 Great Idea Contest

Six new great ideas to read about

164 Broadcast Equipment

BM/E's survey of new products

171 New Literature

Useful new reading material



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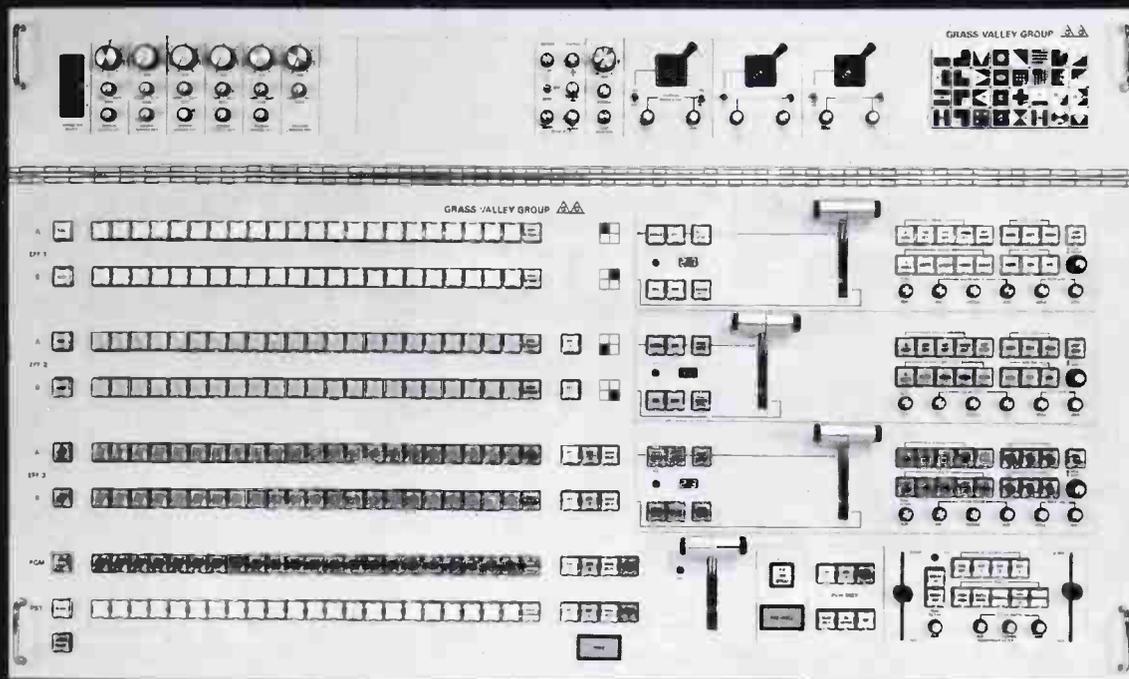


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GRASS VALLEY GROUP ®

Model 1600-7K

Switching System...



With Rotational Wipe Effects

Model 1600-7K is a 24-input, 8-output, production switcher with 3 mix/effects systems, plus program and preset buses with flip-flop mixing. Each mix/effects system provides both rotary and conventional wipe effects.

Several types of rotational transitions are possible, for example wipes which pivot about a fixed point to produce a clock, windshield wiper, or fan effect. The rotational feature can also be applied to many conventional patterns to produce either a rotational effect or a splitting effect. A square or a group of 4 squares can be made to rotate as they expand in size. Separation of the transition control levers allows *independent* control of size and rotation. Soft wipe and

bordered wipe operation is available with most rotary patterns.

Selection of a pivotal wipe is obtained by depressing a unique pattern button. Selection of the rotational mode or splitting mode for conventional patterns is achieved by first selecting the conventional pattern (e.g., a square), followed by operation of a "shift" key. A total of 54 patterns is available.

Model 1600-7K is also available in PAL and PAL-M versions. For additional information on the system, including a demonstration video tape, contact your nearest Grass Valley Group field office.

THE GRASS VALLEY GROUP, INC.

A TEKTRONIX COMPANY

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BROADCAST INDUSTRY NEWS

FM Beats AM In Two Top Ten Markets

Dallas-Fort Worth and Washington, D.C. are two top-ten markets found to have FM shares higher than AM according to a special Arbitron radio study. Dallas-Fort Worth's FM share for the April/May 1976 survey is 48.5, up 27% in one year, while AM stations pulled a 45.1 for the most current sweep. Washington, D.C.'s FM share is 46.2, up from a 40.7 last year, and against an AM total of 44.9 for April/May 1976. In the ten markets analyzed, on an average, FM shares are up almost 100% from April 1970 to April 1976 and up 10% in the past year alone.

Arbitron, since 1966, has used uniform measurement standards to survey both AM and FM radio audiences. The number of FM stations meeting in the

listing requirements for inclusion in Arbitron reports has increased 31% in the last six years. In the top ten markets, FM almost numbers the same as AM. The average ratio is 17 (FM) to 18 (AM).

The National Radio Broadcasters Conference, San Francisco, Sept. 19-22, was previewed in August. An up-to-the-minute report is covered in BM/E's San Francisco Survival Guide mailed to pre-registrants.

AM Stereo Topic At IEEE Broadcast Meet

The 26th Annual Broadcast Symposium of the Institute of Electrical and Electronic Engineers' (IEEE) Broadcast Group scheduled for September 23 to 24, 1976 at The Washington Hotel,

in Washington, D.C. will feature papers by prominent communication engineers and policymakers including "AM Stereo Broadcasting—A New Approach," by N.W. Parker and F.I. Hilbert; a discussion of "Public Broadcasting Satellite Interconnection Systems," by John E.D. Ball; and "AREAPOP—A Broadcast Coverage Prediction Model," by Edmund Williams of the Public Broadcasting System.

Lionel Van Deerlin, chairman of the House Subcommittee on Communications, and Robert D. Briskman, a assistant vice president of COMSAT General Corp., will deliver luncheon addresses. For additional information contact: Vic Nicholson, Chairman IEEE B-G Symposium, Cable TV Information Center, 2100 M Street, N.W.—Suite 412, Washington, D.C. 20037, (202) 872-8888.

Logging Rules Modified For AM, FM, TV

In another aspect of deregulation, FCC has:

Deleted the requirement for detailing changes on logs, as long as log-keeper, when signing off, certifies that all is correct, including changes; for automatic logging systems, the person responsible must certify that he inspected the equipment the close of his duty and certify that the best of his knowledge it worked properly throughout the period that any part kept manually is combined into one the requirement two entries, one identifying a commercial sponsor and the other showing that sponsorship's identification was over the air, (Docket 20600). The changes were effective July 9, 1976.

Large Changes Ease Remote Pickup Rules

The Commission has made substantial changes in the rules governing licensing and operation of remote pickup systems by broadcast stations effective August 31, 1976, in the continuing drive for "deregulation." Among them: remotes can be licensed as a group, or system, rather than

continued on page



Portable Equipment At The Republican National Convention

The RCA TK-76 ENG camera and the JVC CR4400U portable video cassette recorder (with TRI's SUN time code generator added) were used by KCMO-TV to cover Yippie demonstrations, airport arrivals, hotel goings-on, etc. Below a portable satellite base station by Comtech was used by Western Union to beam news to New York for use by Independent Television News Assn. and retransmission to Europe.

In heavy use, but not shown were Thomson-CSF RF microphone systems. Also new at Kansas City: video transmission via a light beam on American Laser Corp. system.



We've lightened your load.

Here and here.



New portable video cassette recorder/player makes eyewitness news easier than ever before.

has done two things to improve VCR performance: we've made it 50% lighter and we've lowered the initial cost. The brand-new CR-4400U Color Portable Capstan-Servo 3/4" U-VCR weighs only 24.5 pounds, complete with rechargeable battery and standard 20-minute videocassette tape. And it sits as lightly on your back as it does on your shoulder. With the CR-4400U at your side, you're set to record top-quality color video, with a S/N ratio of better than 40 dB. There's a full-function keyboard, including pause/still and audio still. Other JVC features include audio still and multi-purpose meter to monitor audio, battery, video and servo. Our exclusive auto assemble function enables you to get glitch-free edits between takes, and can be operated by a still trigger or remote switch. With 1/2" still time to full speed at less than 1 second, you're always ready to shoot. And you can shoot 50% longer, since the CR-4400U requires 50% less power than most other decks.

JVC's unique patented dubbing switch is provided to facilitate quality tape transfers. For playback through regular TV sets, an optional RF converter can be plugged right into the deck. The CR-4400U operates on AC as well with its companion

New JVC CR-4400U Color Portable Recorder, shown with new CR-8300U Full-Editing Cassette Recorder, GC-4800U Color Camera, CC-4800U Camera Control Unit and Dual-Machine Remote Controller.



AA-P44U Power Adaptor, which also functions as a battery charger.

But the best way for you to find out how this light-weight, low cost portable video-cassette system can add to your newsgathering ability is to get yourself a hands-on demonstration. Call your JVC dealer, or send us the coupon below.

JVC Industries, Inc.
58-75 Queens Midtown Expwy.
Maspeth, N.Y. 11378

Please send information on:

- CR-4400U Portable Color 3/4" Video Cassette Recorder/Player.
- GC-4800U Portable Color Camera
- CR-8300U Full Editing 3/4" Video Cassette Recorder/Player
- I'd like a demonstration

Name _____ Title _____

Organization/Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

JVC
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designed for television...

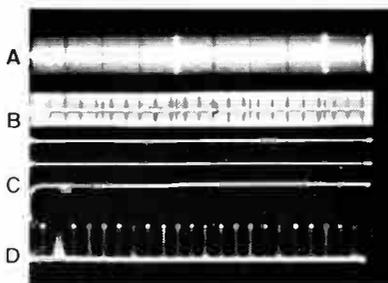


Datatek video sweep generator

TYPE D-630 A

Features:

- Self contained video sweep generator with internal or external sync and blanking.
- Wide sweep range, variable up to 10-0-20MHz or 20-0-10MHz. Excellent linearity.
- Variable sweep rates from 20 sec. to 1/60 sec. Fixed rates at power line and video field (locked) frequencies. Manual sweep.
- Sweep range set by separate start frequency and finish frequency controls. Sweep reversible.
- Built in frequency readout, switchable to show start, finish, variable marker and sweep output frequencies.
- Comprehensive marker facilities. Fixed markers at 1MHz and 5MHz intervals, color and aural subcarrier frequencies. Two continuously variable stop markers. External marker input.
- Symmetrical marker blanking in sweep output. Separate marker pulse output.
 - Internal or external sweep modulation, for applications including envelope delay measurement, detected amplitude displays, etc.
- Conveniently small unit, with signal connector facilities for either front or rear access.



A. Modulated sweep, non-comp., 2-0-20MHz, marker blanking 5MHz intervals, variable stop markers at 7.5 and 17.5MHz.
 B. Composite video sweep, 2-0-20MHz, marker blanking at 1MHz intervals.
 C. Detected non-comp. sweep, variable stop markers at 7.5 and 17.5MHz.
 D. Marker pulses output, 1MHz intervals (5MHz intervals evident).

Other Advanced Datatek Products:

- Transmitter Phase Equalizers and Waveform Correctors
- Differential Phase & Gain Measuring Sets
- Envelope Delay Measuring Sets
- Video Waveform Equalizers
- Video-Audio Routing Switchers
- Video, Audio & Pulse D.A.s

D
DATATEK
 CORP.,

1166 W. CHESTNUT STREET, UNION, N.J. 07083
 (201) 964-3656

Circle 124 on Reader Service Card

NEWS

20 channels in 450 and 455 MHz bands will be subdivided into 56 channels, to provide a total of 101; channels of several different bandwidth will be available, for "high fidelity, dispatching, tone signaling, etc; the number of bands for wireless microphones is increased; the need to get special FCC authorization for operation outside the station's area is eliminated; detailed logs on remotes are eliminated; the station can use remotes for any type of programming (but still not for "business" purposes, such as dispatching sales staff, etc). (Dock 20189).

FCC: Earth Station Cost Can Be Shared

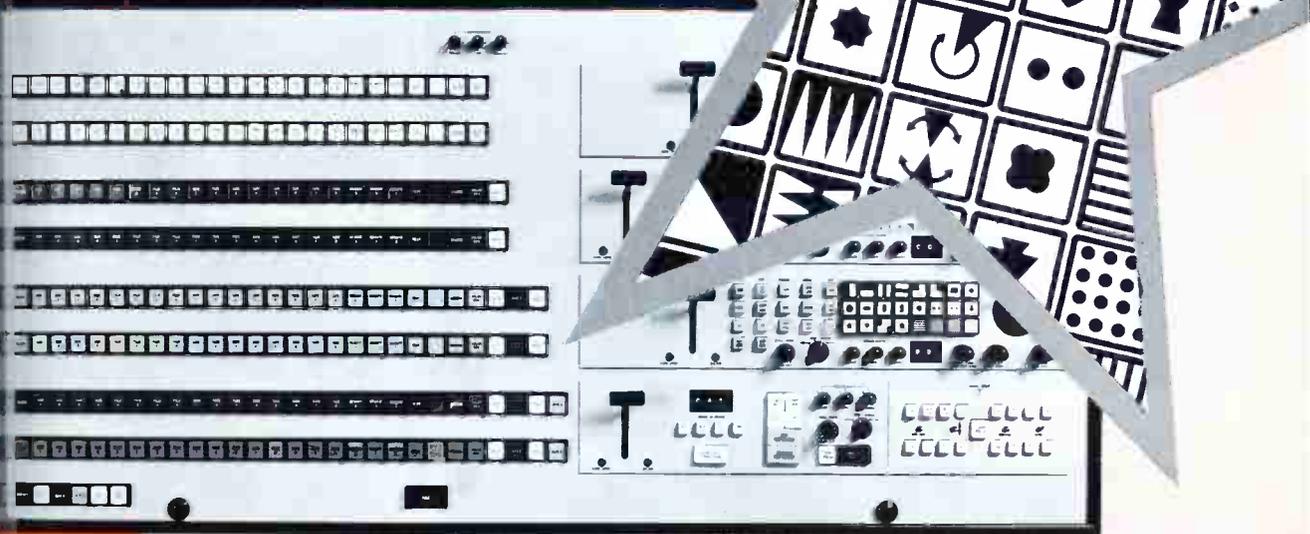
Cable television systems are free to split the cost of receive-only satellite earth station use with other non-affiliated cable systems, the FCC has announced in response to "many inquiries." However, the owning system could not make a profit on the arrangement, since that would convert to common-carrier status, with different licensing requirements, said the FCC. "Bona fide, non-profit, cost-sharing arrangements are consistent with our policies concerning ownership and use of receive-only earth stations," the Commission noted.

Excellent Years Ahead for TV, Radio, Says Report

The broadcasting industry, including both radio and television, has at least five years ahead of high growth and high profits, according to a quarterly economic report recently issued by Blyth Eastman Dillon, New York investment research firm. The report points out that both radio and television will have record years in 1976, with total TV revenues up 20% over the year before. The prospect is for further increases in coming years because TV now, and will probably continue to effectively "sold out"—there is very little additional time to sell, with demand going up. Higher rates are certain; companies priced out of TV prime time move to cheaper time or to radio, raising revenues in those areas. Blyth Eastman Dillon's analyst, Richard Steenken, believes that both radio and television are now underpriced as advertising media; many companies that cut back on television, he says, experienced sales drops that have brought them back on the air. The report advises investors to take a bright view of outlook for investments in broadcast properties.

continued on page

in Switching- the Star is Vital



- 12, 16, 20, or 24 inputs. 4 bus, 6 bus, 8 bus or more bus systems.
- All digital waveform and quad split generators.
- Digital key edging, border, shadow and outline available on all ME's.
- Vari-key. Soft, hard, shadow, or see-thru key.
- Digital quad split. Wipe or dissolve in each quadrant.
- Electronic vignette. Adjustable soft pattern edges.
- Superb linear chroma keyer. RGB or encoded.
- Automatic transition control on each ME.
- Ready to interface for computer aided operation.
- Many more state of the art and operational features described fully in series 114 brochure.

Choice of over 80 exciting patterns such as star, heart, binoculars, keyhole, rotary clockwise and more

Vital Industries, Inc. is the first manufacturer to introduce extensive use of digital circuitry in switching techniques. In addition to superb electronics, we furnish a control panel that allows easy and frequent use of all features you buy. Example is the separate illuminated pushbutton showing pattern in use on each ME. No secret coding or delegation is used.

Automatic transition on each ME is furnished for professionally smooth transitions of wipes, keys and dissolves.

The VIX-114 is the only switcher in the world that generates the star, heart, binoculars, keyhole and many useful and creative effects.

Delivery now in ninety days.

Do not fear to discover a superior product in the VIX-114 series switchers. Ask to see the demo tape for a sample of what we can do for users of switching equipment. You'll like it.



GOOD ENGINEERING IS VITAL

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ROBERT McALL Northeast
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Hicksville, N. Y. 11801
Phone 516/735-0055

GORDON PETERS Southwest
P. O. Box 912
Arlington, Texas 76010
Phone 817/261-6855

ERIC KING
Fox Hill Road
Lynchburg, Va. 24503
Phone 804/384-7001

GORDON PETERS West Coast
7960 West Beverly Blvd.
Los Angeles, California 90048
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Live radio belongs on TV.

Put yourself in this picture and find out why...

MARC VII is here, ready to go to work in your LIVE STUDIO. Not automation, but a manual assist technique that eliminates cartridge handling, unifies program control, reduces error, stops control-room confusion, and improves profits. Call or write today and we'll show you the better way.

the best there is!

IGM

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Circle 126 on Reader Service Card

News Dept.: You can automatically charge 5 Ikegami Battery Packs at one time.



Here's how: Just plug in [up to] 5 batteries, push the "Power" toggle switch to "On" and leave them alone.

Only one Frezzi Battery Sequencer with built-in charger does the job, automatically. In 12 hours (or less) totally unattended, the Frezzi Sequencer brings each Battery Pack in sequence to its full-charge state. Each Battery Pack then goes on trickle. Just unhook one (or more) & go.

For information call (N.J. 201) 427-1160 (N.Y.C. 212) 594-2294



Frezzolini Electronics Inc.

7 Valley St. Hawthorne, N.J. 07506 USA

Circle 127 on Reader Service Card

NEWS

Olympics Bring ABC \$72G A Minute For Spots

Those spot ads we saw along with ABC's excellent coverage of the Olympics in Montreal brought the network \$72,000 a minute, or a total of about \$41,000,000, according to a story in the *New York Times*. ABC paid \$25 million for the rights to televise the games; but its profits were obviously much lower than that suggests because of the very high production cost of the Montreal coverage.

Four FM Stations Join For Discrete Quad

What appears to be the first discrete quadrasonic network broadcast was carried out by a group of four FM stations in California late in July. In San Francisco, stations K-101 and KBRC each broadcast two of the four channels; listeners were advised to tune in two stereo receivers simultaneously one to each station, to get the program. All the programming was originated at station K-101, which used four channel tapes and CD-4 records as sources. In Sacramento, KZAP and KSFM each took two of the channels off a network feed, and again broadcast the two "halves" of the program separately, for listeners with two receivers.

CBS Says Net Radio Outdoes Spot TV

A study reported by the CBS Radio Network in late July indicates that network radio ads reach many more people in the top 50 ADI's than TV spots do. That means net radio should be part of the "media mix" for many companies says CBS. Some of the figures developed by CBS in the study are: about 59 million gross impressions for \$127,400 budget on spot TV; about 131 million impressions for the same budget on network radio, both for adults over 18.

News Plan for New Jersey Scored By Governor

The Federal Communications Commission's plan for ending New Jersey VHF TV "famine," the assignment of one news crew and one correspondent to New Jersey by each TV network affiliate, was called inadequate, and more than the stations are already doing, in a highly critical comment by Governor Byrne of that state. He said that the minimum need was for studios and facilities in the state. The FCC has postponed until September 13 a decision on whether to require each station to have

continued on page 10

***Regardless
of who made your
2/3-inch Plumbicon* TV camera,
or where it was made—
Amperex has the exact replacement
for the tube
that came with the camera.***



We know this tube as only its original—
you can know it. You can take our word
for it... *there is only one Plumbicon.*
And no matter where your Plumbicon
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size studio camera or one of the new
hand-held portables... Amperex has
the replacements for your equipment
that will give you equal or better per-
formance compared to any tube that came with
the camera.

There is this difference. Amperex replacement
tubes are immediately available, off-the-shelf,

for delivery within 24 hours through
local distributors and Amperex factory
sales representatives. And Amperex
tube distributors (your own local busi-
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their ability to support Plumbicon TV
camera systems with on-the-spot cus-
tomer support and on-the-spot cus-
tomer service.

For more information on Plumbicon TV camera
tubes, write or phone: Electro-Optical Devices Divi-
sion, Amperex Electronic Corporation, Slatersville,
Rhode Island 02876. Telephone: 401-762-3800.

Amperex®

TOMORROW'S THINKING IN TODAY'S PRODUCTS

A NORTH AMERICAN PHILIPS COMPANY

Sync? Think of the Possibilities!

When planning or modifying a facility consider the 1410 Series of modular generators for sync generation. Using a modular approach, the 1410 Series allows you to select just the signal capability needed now. Later, as your needs change, you simply **add modules** to meet those needs. Since you buy only what you need now, your costs are reduced. Since you can add signal modules later, your investment will be protected.

A 1410 Series master sync system starts as low as \$1925. Consisting of a 1410R Generator mainframe with built-in color standard and an SPG1 Sync Generator module, this economical system produces broadcast standard subcarrier, sync, blanking, H and V drives and black burst. For a little more you can have genlock with the 1410R/SPG2 at \$2125.

A 1410 Series sync system has several special features:

- **Automatic subcarrier to horizontal sync phasing** for example, important when editing or assembling video tape.
- **Slow-lock** operation, for those situations where non-synchronous switching can cause problems.
- **Adjustable blanking widths** help maintain blanking duration within FCC limits.
- **The VIR Signal**, on line 19 of black-burst or in full-field format to record on video-tape leaders. Use of full-field VIR signal makes playback adjustment as easy as 1-2-3.

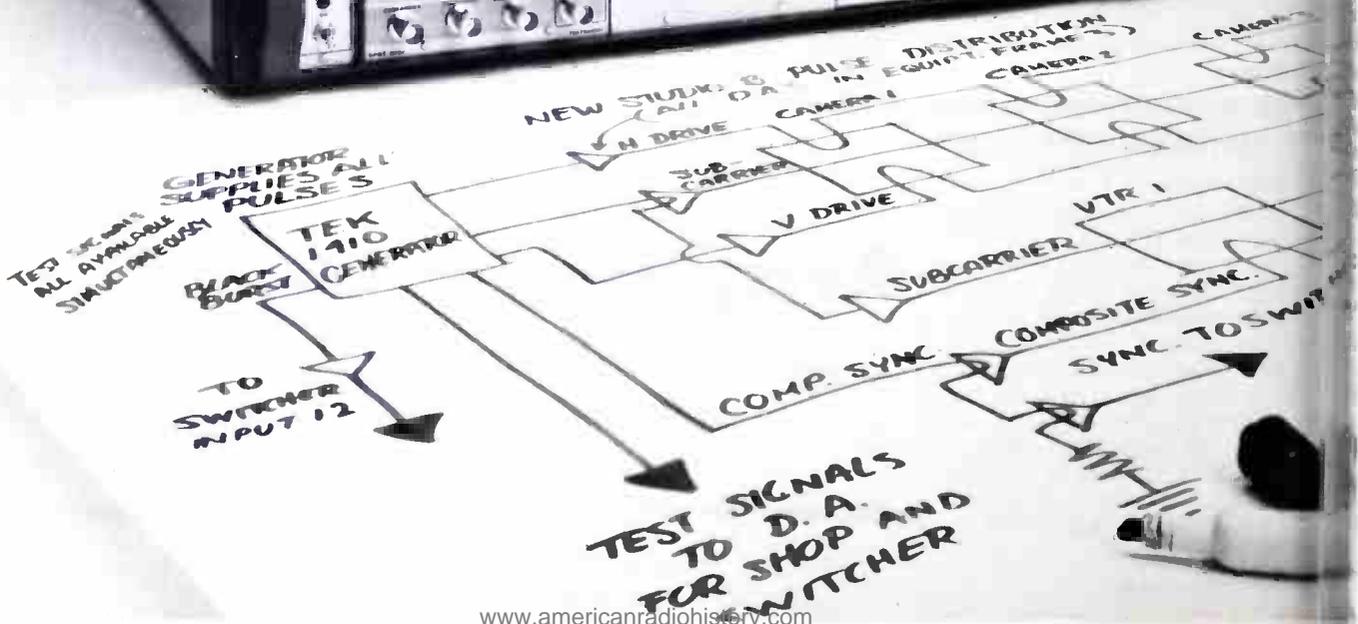
The 1410 Series can produce full field test signals too. Modules are available now for color bars, linearity, and convergence test signals. For more information about the 1410 Series, write us at P.O. Box 50 Beaverton, OR 97077; or use the reader service numbers below.



TEKTRONIX®

committed to
technical excellence

Circle 129 on Reader Service Card



facilities, and Governor Byrne he would wait until then before deciding whether to use action.

C Airs Ad Council Economic Campaign

series of "public service" ads with accompanying booklet, prepared by Advertising Council to "educate public in economics," is being aired by the National Broadcasting Company TV network, according to an announcement there late in July. The series is being studied by the other networks; CBS has expressed a belief that the topic is one about which there is debate, and that airing the series might require them to air contrasting viewpoints under the Fairness Doctrine. Supporting this view is the statement by Public Media, a public interest group, that the series has an "inherent corporate-industry bias." The Advertising Council has denied this; meanwhile more than 700,000 copies of the booklet, "The American Economic System and Your Part In It," are said to have been distributed.

Public Wants One Net At A Time On Conventions

poll run by the Roper Organization and overwhelming public preference—an unprecedented 85%—for having one network at a time cover political conventions, rather than having the three networks competing for separate coverage. A rotation plan seemed better, Roper reports, even to persons who might be classified as politically and socially active—81% of all persons voted for rotation.

TMI Will Make And Sell Faroudja Image Enhancer

An image enhancer which has been called the "Crisp-Matic," made by Faroudja, Inc., of Los Altos, Calif., has been licensed by that firm to Television Microtime Inc. for exclusive manufacture and sale. The standard enhancer, to be marketed by TMI under the name "Image Ex," operates by applying comb filtering, noise reduction, and frequency synthesis to open luminance transistions, to remove color cross talk, and reduce noise. TMI has already used the enhancer with their 2020 time base corrector, and will later add it to other correctors that are in the field.

B Wants More Reins On Cable; NCTA Wants Less

coming from opposite sides of the road
continued on page 14

Increase sharpness... improve camera sensitivity



For the sharpest image, the finest resolution, the best picture quality in your station's ADI, EEV's new 30mm Coaxial Leddicon® Camera Tube is the answer.

Features the fastest leading edge signal level rise and quickest trailing edge fall of any image tube now on the market. Patented coaxial design assures consistently accurate geometry and optimum registration no matter the tube orientation. RESULT . . . a noticeably superior picture quality even under the most difficult lighting conditions.

Direct replacement for most separate or integral mesh Plumbicon®, Vistacon or older Leddicon camera tubes. Available with exclusive internal fixed or variable light bias in extended red, extended green, luminance, blue, green, red or monochrome types. Call or write today for details.

Leddicon is a registered trademark of English Electric Valve Company Ltd.

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EEV NORTH AMERICA ENGLISH ELECTRIC VALVE NORTH AMERICA LTD.



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A member of the GEC-English Electric Group of Companies

Circle 130 on Reader Service Card

NEWS

cable-broadcast battle line, the National Association of Broadcasters asked the FCC to extend syndicated program exclusivity to all markets, instead of just the top fifty; and the National Cable TV Assoc. has urged the House Communications Subcommittee to break the "regulatory stranglehold" on cable. Syndicated program exclusivity forbids a cable operator to import from a distant station a syndicated program that a local station has bought

exclusive rights to. NAB argues that stations outside the top 50 need this protection, in many cases even more than the top 50 do. For its part, the NCTA fielded a large team of witnesses before the House Committee who emphasized that the exclusivity rules and others are hampering the growth of cable in many areas, depriving cable subscribers of much program diversity.

Portable Cameras Make Ads Fast For Two Stations

Portable video cameras of high quality, central in the ENG revolution, are also

very effective in "location" ad production, according to experiences reported by WCLY-TV in St. Petersburg, Florida, and WDCA-TV, in Washington, DC. WCLY-TV is using Sony portables, and Sony recording and editing units. Jim Bradley, creative services director, points out that a "special ad can be made on location and immediately shown to the client, who makes the portable camera an invaluable sales tool. Many "smaller businesses, car dealers, shoe and clothing stores, restaurants, service firms that could not use TV advertising before, can be served with mini-cam production, he says. At WDCA, RCA TKP-45 camera and a TR-6 VTR have been installed in a spec van as a mobile commercial production unit. This has proved a big success with auto dealers, department stores, and other retailers, says Bill Castleman, production manager.

New Survey Shows Tape Ahead of Film For Ads

The tape-vs-film battle for top place in the distribution of TV ads got an up-to-date assessment in a survey of some 500 stations recently completed for 3M Company, which shows that TV stations now get 60% of their ads on tape, only 40% on film. The study was released through the Videotape Production Association in New York. The study also showed that 75% of the stations transferred some or all film advertising to tape; and also that 84% of the stations getting ads on tape made some duplicate tape for air or back-up. Mordecai Dubin, chairman of the Videotape Production Association, said he believes the evident continued trend to tape arises in part from the growing use of automation by TV stations.

Advertisers Turning Away From TV Violence?

There's clear evidence at hand indicating violence on TV will get closer scrutiny by advertisers this fall. At the annual convention of the American Advertising Convention last June, president of J. Walter Thompson, cited pilot studies by his agency indicating that violent programs have a negative effect on sales of products advertised in those sections.

In late July the National Citizens Committee for Broadcasting identified those sponsors who supported the ten least violent programs and those who supported the most violence during the preceding six week period. They identified the ten least violent and most violent programs and ranked the networks: CBS, least, ABC, next, NBC, most.

According to NCCB's Mich... continued on page 6

Reel-to-reel... for real



Exciting things are happening in the reel-to-reel market. And it's all caused by a new machine called the ITC 850 Series. Here is the result of a long series of consultations with broadcasters to determine what they most desired in a reel-to-reel machine. Then we added a few innovations of our own. Truly, the 850 Series is equipment designed specifically with the professional broadcaster in mind. Some 850 features: motion sensing, multi-function edit mode, super quiet operation, automatic tape lifters, TTL logic circuitry, capability of handling dissimilar size reels... and more too numerous to mention here. If you're in the market for something new and vastly improved in reel-to-reel, a **collect** call to us will reveal an interesting story that you may have been waiting to hear. Make the real move to reel-to-reel... ITC. Collect number 309-828-1381.



INTERNATIONAL TAPETRONICS CORPORATION

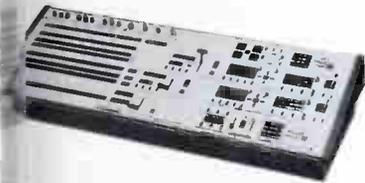
2425 South Main Street • Bloomington, Illinois 61701

Marketed exclusively in Canada by McCurdy Radio Industries Ltd., Toronto

Circle 131 on Reader Service Card

Video Switchers... Tape Editing Systems... Automation... Central Dynamics!

Recognized Throughout The World for
Leadership in Television Broadcast Equipment

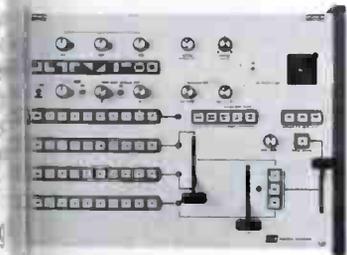


CD 480 The Smart Switcher
A revolutionary and modular switcher with unprecedented production power... and is extremely easy to operate with CDL's unique Sequential Effects (SFX) Amplifier. Two models available that offer every production feature with a variety of optional modular accessories.

Circle 100 on Reader Service Card.

CD 1260S Production Switcher
A Mix/Effects Switcher with 20 inputs, 4 buses, encoded chroma keyer and bordered

Circle 101 on Reader Service Card.



CD 4 Production Switcher
Contained and Remote models available with separate Effects, Mix and Title Amplifiers; 17 soft keys, wipes, split screens & spot positioner, and color black and matt generator.

Circle 102 on Reader Service Card.

CD 10 Production Switcher
A 10 input switcher with Mix and Wipe/Key Amplifiers.

Circle 103 on Reader Service Card.



CD 10 Audio Mixer/Switcher
A mixer/remote controlled switcher with 7 outputs, compressor-limiter, and switcher. Mix/Line sensitivity on all 7 inputs.

Circle 104 on Reader Service Card.



PEC-120 Video Tape Editor
A computer editing system with an easily operated control panel and CRT display for rapid and precise control of VTR's & switcher. CDL's unique Self Learning Cueing Software Program is a new feature.

Circle 105 on Reader Service Card.



EDS-200 Video Tape Editor
A two machine Time Code microprocessor Editor that interfaces to Quad, Helical or Sony VO 2850 cassette VTR's.

Circle 106 on Reader Service Card.

DK-2160 Title Keyer
Titles non-sync sources. Can Dissolve/Cut titles and fade to black. Inputs for 4 key sources and dual character generator inputs. Colored borders are optional.

Circle 107 on Reader Service Card.

VG-2210 Digital Sync Decoder
A programmable source of precisely timed standard pulses derived from a single reference signal input.

Circle 108 on Reader Service Card.

Master Control Switchers
Ranging from CDL's new CD 480 MC to a 2 Bus MCS-829 or a 3 Bus MCS-770. PTS-121 17 event memory available on MCS-829 & MCS-770. All 3 can be interfaced to System 100 Technical Automation System.

Circle 109 on Reader Service Card.



System 100 Automation
Computer controlled automation system for Technical Operations that communicates directly with a Business Computer System, and stores and retrieves the schedule with entry error checking, makes automatic time corrections, performs complicated audio/video switching sequences, assigns machines, verifies material, and prints the "As-Aired" log.

Circle 110 on Reader Service Card.

Also a complete line of production and TV Terminal Equipment including:

- SMPTE Time Code Generator and Reader (111)
- Video and Pulse Distribution Amplifiers (112)
- Chroma Keyers: RGB and Encoded (113)
- Processing Amplifiers (114)
- Audio/Video Routing Switchers (115)
- Pulse Assignment Systems (116)
- Machine Control Systems (117)

Circle () on Reader Service Card.

Request our New Condensed Catalog.



CENTRAL DYNAMICS LTD

Canada:
147 Hymus Blvd., Montreal, Que., H9R-1G1
514-697-0811

U.S.A.
230 Livingston Street, Northvale, N.J. 07647
201-767-1300

Chicago: 312-991-4720
Los Angeles: 213-789-0574

AGAIN & AGAIN POTOMAC INSTRUMENTS IS



First FCC Approved Antenna Monitor AM-19(204)

First Harmonic Reading Standard Broadcast Field Strength Meter FIM-41

First Digital Antenna Monitor AM-19D(210)

First Frequency Synthesized RF Bridge Source and Coherent Detector SD-31

First Solid State VHF Combination Field Strength Meter & RF Generator FIM-71

And Other FIRSTS to be Announced

CONTACT US NOW FOR DESCRIPTIVE LITERATURE ON OUR COMPLETE LINE OF BROADCAST INSTRUMENTATION.

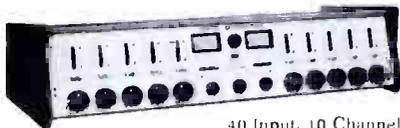
POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.
SILVER SPRING, MD. 20910
(301) 589-3125

Circle 132 on Reader Service Card

when high quality, operational ease and total product support are called for, CALL AMPRO*

Ampro's staff of broadcast knowledgeable sales and service engineers will fulfill your audio needs with consoles, cartridge tape equipment and other related products, including complete factory wired studio systems.



40 Input, 10 Channel Stereo Console

Ampro consoles come with 6, 8, 10 and 12 mixing channels in mono, dual mono, stereo, dual stereo and simulcast configurations.

Ampro cart machines are available with special features such as built-in splice finder, heavy duty motor and fast forward.



Stereo Recorder/Reproducer with Splice Finder Option

Ampro for: • competitive prices
• state-of-the-art engineering • total product support.

Financing available ... call or write today.



AMPRO CORPORATION

850 PENNSYLVANIA BLVD., FEASTERVILLE, PA 19047

* 215-322-5100 (24 hours)

Circle 133 on Reader Service Card

NEWS

Johnson (former FCC Commissioner MacDonald's has cut back on its sponsorship of violent programs after it so identified. NCCB hopes that ratings of violent programs and sponsors will cause others to behave similarly.

A week later, Best Foods, a \$24 million per year TV advertiser, did not issue guidelines forbidding the purchase of commercial time in or adjacent to programs that contain "injurious portrayal of violence" (Broadcasting, Aug. 9).

According to BI Associates, Washington DC, who have done the research for NCCB, the product and advertiser most associated with violent television programming during the six weeks under study was Tegrin Shampoo.

Others in the top ten, in order of violence, are: Burger King, Clorox, Colgate Palmolive Products, Gillette Hair Products, Breck, Ford, Johnson Johnson, American Motors & Lysol.

The ten advertisers whose commercials were associated with the televised violence during the period under study were: Aramid Radial Tire, IBM, Lipton Products, No Nonsense Hose, Oscar Mayer, Proctor & Gamble, Raid, Frito Lay Products, Chrysler Corporation and Holiday Inn.

Those ten most violent programs were, in order of violence: Saturday Night Live (ABC), The Rookies (ABC), Saturday Night at the Movies (CBS), Sunday Night at the Movies (ABC), Friday Night at the Movies (CBS), Rockford Files (NBC), Star Trek and Hutch (ABC), McMillan-Columbo (NBC), Saturday Night at the Movies (NBC), and Joe Forrester (NBC).

The ten least violent programs, the networks offering them, were: The Newhart Show (CBS), Mary Tyler Moore (CBS), Welcome Back Kotter (ABC), Chico and the Man (NBC), Rhoda (CBS), Doc (CBS), The Practice (NBC), the Waltons (CBS), L.A. Law (NBC), and House on the Prairie (NBC), Barney Miller (ABC).

Although Variety reported August that the "Webs Brush Off Nick Johnson's Ranking of Shows of Violence"—largely because of the mechanical nature of rating violence—it appears more and more citizens will shun such programs and their sponsors in the future.

\$1 Million for PBS News From Ford

The Ford Foundation announced that it would grant \$1 million to PBS for use in the production of documentaries and public affairs programming.

The "no-strings" grant is in addition to a similar grant announced last year. continued on page 16

Your professional turntable cannot match the performance or reliability of this one.



The Technics SP-10 MK II.

professional needs the precision of the Technics quartz-drive system. That's why radio stations use it. And discs abuse it. But every professional also needs abundant torque. And now you can have it. In the SP-10 MK II.

At $33\frac{1}{3}$ RPM, the SP-10 MK II will reach the exact playing speed within 0.25 of a second.

less than $\frac{1}{12}$ of a turn. While it comes to a dead stop in only 0.3 of a second. And you don't have to worry about subtle slowdowns because a tracking force of up to 1,000 grams won't noticeably affect its speed. You won't find any belts, gears or idlers in the SP-10 MK II. But you will find our lowest wow and flutter ever (0.1% WRMS). Inaudible rumble (-70dB DIN B). A quartz-platter that spins at the exact speed ($33\frac{1}{3}$, 45 or 78 RPM) regardless of fluctuations in AC line voltage or frequency. The reason: A quartz-locked frequency quartz motor DC servo motor.

And the SP-10 MK II is as reliable as it is precise. With its abundant torque, you can stop the platter with your hand. Because we designed it to take all the

punishment a professional can dish out. Even after years of continued use.

You'll also get all the refinements a professional needs. Like a quartz-locked stroboscope. Remote control. Electro-mechanical braking. A dynamically damped platter. And a separately housed power supply.

The SP-10 MK II. One component in the new Professional Series from Technics.



Panasonic Company
Technics Dept. 909
One Panasonic Way
Secaucus, N.J. 07094
Attention: Sid Silver,
Technical Service Specialist.

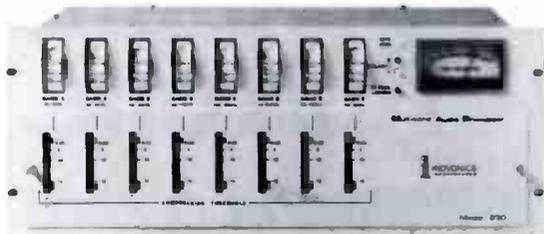
Technics
by Panasonic
Professional Series

- Send me technical information on the Technics SP-10 MK II turntable.
- Have a Technics audio specialist call for an appointment.

NAME _____ TITLE _____
COMPANY _____ Please Print
ADDRESS _____
CITY _____ STATE _____ ZIP _____
AREA CODE _____ PHONE NUMBER _____

Circle 135 on Reader Service Card

Maximize your modulation



Multiband Audio Processor Model 230, \$1500.

At Inovonics, we've designed a Multiband Audio Processor for AM and FM broadcast use which is capable of increasing average carrier modulation to a figure approaching theoretical maximum. Yet it contains program peaks within absolute prescribed limits without clipping.

Eight independent bands of average compression have attack and release timing optimized for each; individual Threshold and Compression Ratio adjustments permit response shaping to complement specific programming formats if desired.

Other features include gated expansion to prevent "pumping", program-controlled phase inversion and adjustable limiting symmetry for AM, and separate frequency-selective limiter with both 75- and 25-microsecond curves for FM.

i **INOVONICS**
INCORPORATED
1630 Dell Avenue, Campbell,
CA 95008 (408) 374-8300

Circle 136 on Reader Service Card

USE ANY VTR



with this Video Processing System

Model 6000

- Works with 1/4-inch to 2-inch VTR's—quad or helical scan—accommodates large time base errors
- Sync generator will lock to EIA or industrial sync or operate as master sync generator
- 360° burst phase adjustment
- Provides complete video processing—inserts new sync and blanking, regenerates old burst or inserts new burst
- Provides full sync, blanking, and drive pulse outputs locked to input video, subcarrier output locked to input burst
- Front panel control of video, chroma, pedestal, and burst phase
- Compensates for delays of one or more scan lines
- Competitively priced

Write or call today for complete specifications.

DYNASCIENCES | **video products**
Township Line Road, Blue Bell, PA. 19422
Tel.: (215) 643-0250/Telex: 84-6358

A SUBSIDIARY OF **Whittaker**

Circle 137 on Reader Service Card

NEWS

to the \$500,000 public television being established to help independent television producers gain access to airways. These two grants are examples of the special funding that the foundation said it would make to public broadcasting from time to time, which began to phase out its massive financial support of public broadcasting in 1975.

Standards for Antenna Towers Revised

The Electronic Industries Association has issued a revision of its Standard RS-222-C, governing "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures."

This is the fourth edition of the Standard and contains several new provisions and notes regarding ladder platforms, antenna twist and sway climbing and working facilities clarifications of definitions concerning terms and analysis techniques.

Copies of the new Standard can be purchased from EIA.

NBC Marks Its Golden Anniversary

The first commercial network, NBC, celebrating its 50th Anniversary, began with the marriage of 9 radio stations in 1926 has now proliferated to 230 radio stations and 217 TV stations. This anniversary, however, is more than the celebration of a single corporation. NBC, itself the progeny of an earlier American corporate giant, began a commercial venture that radically altered the life-style of a nation. Fifty years NBC and its competing networks have formed the chief connective tissue by which a nation gets information and receives its entertainment.

TV Networks Report 1975 Profits

The three networks all reported a profit in '75, but only NBC showed an increase in profits over '74.

NBC profits increased 11.2% over 1974 figures, making \$73.5 million. Last year NBC's profit was \$60 million.

CBS managed \$106 million in profit on \$596 million in revenues, a 3.6% increase from 1974.

ABC suffered the largest percentage drop in profits, moving down from \$100 million in 1974, to \$29 million in 1975, a plunge of 40.8%. Revenues for ABC amounted to \$510 million.

All three networks, however, reported 1976 profits to break existing records. CBS for instance, is running well.

continued on p

WHO-TV Eyewitness News is all over town, doubling news on film.

"There isn't a single piece of newsfilm equipment in this studio that hasn't paid for itself, one way or another," claims Lisle Shires, proudly. And that's only one aspect of their film production facility that has doubled the amount of film coverage for half-hour shows one year.



Lisle Shires, Newsfilm director of WHO-TV in Des Moines, Iowa.

Jack Cafferty, WHO's Television News director, recalls: "WHO-TV used to average about six film reports per show. Then, management made some drastic changes in news programming.

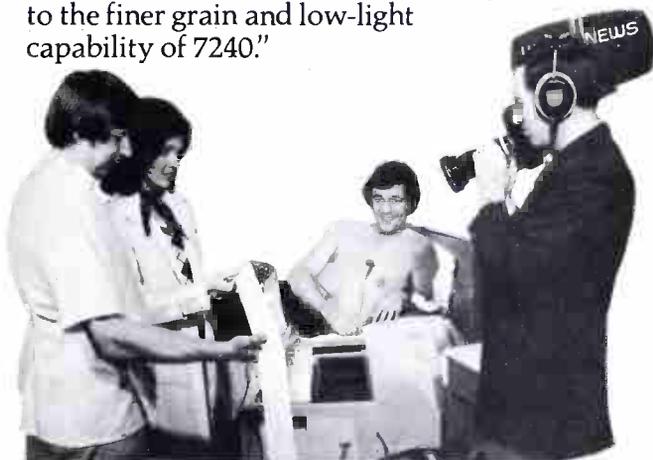
"We jumped from six to twelve film stories per news show, as a result, and we now have a dozen reporter-photographers.

"WHO-TV has always had a high percentage of film footage winding up on the air. Now we're shooting two to two-and-a-half times as

much film and one-third of it is still being broadcast.

much film and one-third of it is still being broadcast.

"Our field reporters have some of the finest film equipment available today. And although some of our film is still shot with silent cameras, we have a continuing program to upgrade our sound equipment. "Presently, we're shooting all prestripped Kodak Ektachrome EF film 7242 (tungsten). You never can tell when we may want to add voice-over later or use silent footage as a B roll with sound effects. We're in the process of converting to the new Eastman Ektachrome video news film 7240 (tungsten) and while 7242 looks good on the air, we're looking forward to the finer grain and low-light capability of 7240."



One of the most popular film features is "Cafferty is —," in which Jack takes on different jobs. Like driving a semi or in this case, working in a hospital where he first gives — and then gets — a cardiogram.

Cafferty anticipates continued heavy use of film. "With film, I can send a man out with a 16-pound camera and he'll come back with pictures that are simple to edit — and to store, too.

"One more thing — our news is getting a lot of attention. We've been getting very good response from our viewers. And that's what it's all about, isn't it?"

Film is good news.



Circle 138 on Reader Service Card

Introducing the Family of

Now you can add that perfect touch of editing professionalism to any news story or commercial on helical videocassettes with Convergence Corporation's Family of Fabulous Frame Finders. Discover how fast and easy it is to find any frame you're looking for and how simple it is to automatically do what you want once you're there.



SM-2 Joystick Search Module gives you incredibly flexible tape handling and remote control on a stand-alone VCR. The unique Convergence joystick allows you to see pictures at speeds continuously variable from still frame to three times normal play in forward and reverse. The LED tape timer lets you quickly screen and log news stories or commercials for pre-edit decision making. The SM-2 also programs precise on-air roll cues and lets you slave extra playback machines for A/B rolls.



ECS-1 Joystick Editor provides, for the first time, style editing flexibility on helical videocassettes. News film editors converting to video tape find the ECS-1 a joy to operate. In fact, networks and group owners are all using the ECS-1 by the hundreds. Production houses have found our Editor to be perfect for economical on-line off-line editing. The Convergence Editor is great by itself but it's fantastic when combined with the PC-3 and the TT-4 — the newest members of our Fabulous Family.

Fabulous Frame Finders.



TT-4 Digital LED Tape Timer fits neatly under the monitor on a standard ECS-1. It counts control track pulses to tell you know where you're at and where you're going. It's what helical video tape editors have been looking for. The TT-4 counts up and down and can be reset to zero or set to any number. It even times assemble edits to show you accumulated program time. Buy it now or add it later.

PC-3 Program Computer combined with the ECS-1 gives you precise end insert timing and scene duration timing. Insert and stopwatch functions are programmable with the simple-to-operate PC-3 computer keyboard. Now you can automatically preview insert edits as many times as you want and trim them up to ± 99 frames from the keyboard. What's more, plug your PC-3 into a TT-4 and get keyboard access to automatic bidirectional tape search.

Save the time and trouble out of your VCR searching and editing. Join the Family of Fabulous Frame Finders today. They'll help you find exactly what you're looking for. For complete specifications and address of your nearest distributor, write Department BME9.



17935 SKY PARK CIRCLE / IRVINE, CALIFORNIA 92714 / (714) 549-3146
Circle 139 on Reader Service Card

Introducing...



the only 950 Diversity Microphone System that really works!

At last, a wireless microphone that doesn't sound like a wireless microphone. Here's a diversity microphone system that has minimized distortion, maximized range and reception.

Automatic diversity switching using two antennas and high dynamic range front-ends, insure dropout-free performance, even in difficult locations.

It operates at 950 MHz and employs a combination of precision control, signal

processing and filtering to reduce intermodulation so that up to 15 non-interfering channels are available in a single studio. The 950 Diversity Microphone System offers the reliability of conventional studio microphones.

It's compact and easily concealed. Able to make the scene wherever the action is. No longer are creative forces bound by cables, booms and rigid spatial limitations. And the 950 Diversity Microphone System affords the flexibility of interchangeable microphones.

It will revolutionize studio programming and remote operations for news, sports, and special events.

950 Diversity Microphone System. The broadcast-quality wireless microphone that goes anywhere, captures anything. Already successfully on the job, it really works!



THOMSON-CSF LABORATORIES, INC.

37 Brownhouse Road, Stamford, Connecticut 06404
(203) 327-7700/TWX (710) 474-3346

Circle 140 on Reader Service Card

BWS

st year and expects to reap at least billion more in after-tax profits this than they had budgeted.

News Briefs

Meredith Corporation Broadcast-Group stations, KCMO-TV, 10-AM, and KCEZ-FM, an- ced plans to construct new admin- utive and studio facilities in Fair- Kansas. Certain operations, in- ng the landmark tower, will n in Kansas City, Mo. . . .

land got its first quad broadcasts ne 26th and July 2nd when Radio re in Glasgow, carried live the on 76" concerts of the Scottish onal Orchestra to its audience of r: than 2 million people.

id New York Broadcasting Cor- tion has agreed to purchase three systems from Covenant Cable Inc., a wholly owned subsidiary of Street Communications Corp., what has been called, "the largest transaction for CATV." Though actual cash amount was not ed, the sum is estimated to be y \$10.5 million, for the 35,000 riber systems. The sale is a com- divestiture of cable interest for d Street Communications.

At least 40 exhibitors will participate in the 1976 **Regional Con- sion of the Pittsburgh Chapter of**, (Society of Broadcast Engi-) to be held October 22nd, at ard Johnson Motor Lodge, Mon- alle, PA.

ants of nearly \$13 million have awarded under the Educational dcasting Facilities Program (P) to help establish or improve 73 ommercial public radio and TV ns in 34 states and the District of mbia, according to an HEW Office ducation statement.

le longest wave-guide ever built elevision broadcast has been in- ed at WKBN-TV, Youngstown, t. Built by Dielectric Communi- ns, the wave-guide consists of 138 sely fitted sections of rigid inium, and runs a total of 1600 e. The run is capable of conducting egawatt of radio frequency power 0 million cycles per second . . .

W-TV, Tacoma, WA., is another on to have an operational receive- eath station for receiving Inde- ent Television News Association amming, via satellite. The earth n became operational July 19th. It oys a 10 meter antenna, low noise ifers and TV satellite receivers ded by Andrew Corp.

he largest independent hookup of ividual TV stations in broadcast

history is being linked by the Hughes Television Network for this year's broadcast of the Jerry Lewis Labor Day Telethon. Two hundred stations have joined the Telethon "Love Network," to carry the program which benefits the Muscular Dystrophy Association.

Cox Broadcasting Corp announced it has completed the **acquisition of KOST-FM, Los Angeles, for \$2.2 mil- lion in cash and notes.** The acquisition was approved by the FCC on May 12th, 1976 **KMBZ Radio** has become the exclusive CBS Radio Network affil- iate for the metropolitan Kansas City, Mo. area, effective August 9th CBS Radio also announced plans to open a **CBS News Southwest Bureau** in Dallas, Texas. Travis Linn, a former Dallas newsman has been named to head up the new bureau **KEYH Radio, Houston,** has received the 1976 Texas Associated Press Broad- casters Radio News Competition for the best investigative story. The award cited KEYH's investigation of the events leading to the suspension of Houston Police Captain, Kenneth L. Nixon, in November, 1975.

Meredith Broadcasting is currently negotiating with representatives of Poland, Yugoslavia, and Hungary for the possible exchange of children's programming for the 1976-77 season. Meredith hopes to trade three of its pro- grams for the programs from the com- munist countries, to be included in its series of 1/2 hour children's shows, "The Young Experience."

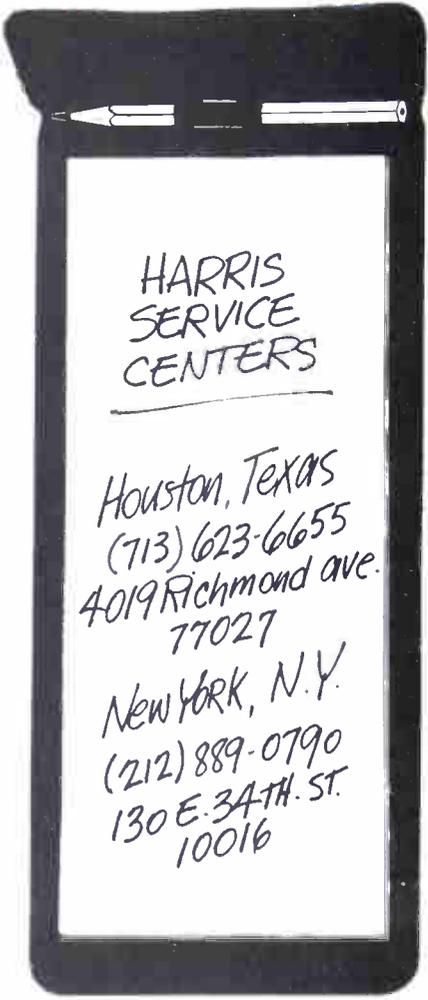
The CATV industry urged congress to immediately require the FCC to **reg- ulate the terms and conditions of pole attachments** used by CATV. Amos B. Hostetter, Jr., executive vice president of Continental Cablevision, Inc. and chairman of the Utilities Relations Committee of NCTA told the House Subcommittee on Communications that cable's ability to provide television programming and broadband commu- nications service to the public was "gravely threatened by an unintended and presently unregulated monopoly . . . involving the ownership and control of utility poles and underground conduits."

A criminal complaint was filed against the Vornado Corp., owners of Two Guys Department Stores, alleging that the store violated the new Cali- fornia "theft of services" law, by ille- gally intercepting and demonstrating Channel 100, pay cable programs, without paying for the service. The complaint was filed in San Diego by John W. Witt, City Attorney, based on evidence discovered by the San Diego Bureau of Investigation. This is the first complaint filed under the new law.

When the Teton Dam burst in June, **KRXK, Rexburg was washed out by**

continued on page 25

Put our numbers in your little black book



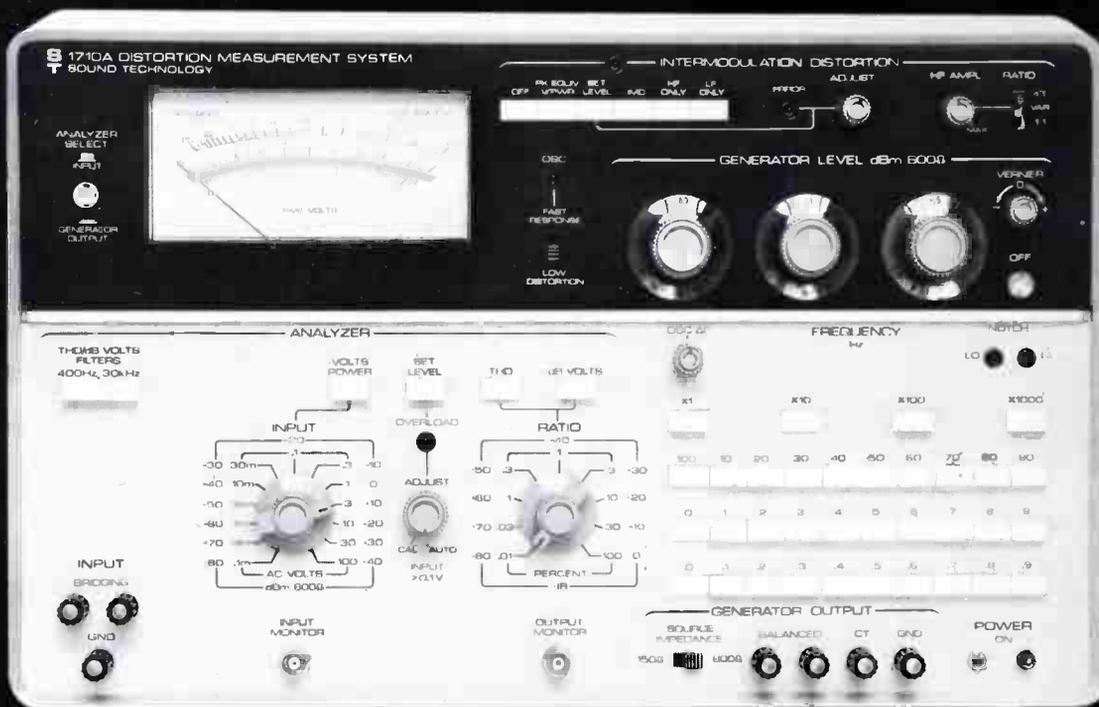
You can get the broadcast parts and equipment you need. When you need them. From Harris' service centers.

Isn't it nice to know we're here if you need us?



HARRIS
COMMUNICATIONS AND
INFORMATION HANDLING

Circle 141 on Reader Service Card



Your new automatic distortion measuring system for balanced measurements

REDUCED OPERATOR ERROR

Here's something you'll like — Sound Tech's new distortion measuring instrument for use in balanced work.

The new 1710A is much more than just a distortion analyzer. It's a system.

It contains its own ultra-low-distortion generator tracked with the analyzer. It's a system that greatly simplifies measuring — gives you fast measuring with simple operation that reduces operator error.

For example, push the frequency buttons and you set both generator and analyzer. Push "Distortion" and you have your reading. Automatically. No slow, tedious manual null-searching.

Features in the new 1710A include:

- a balanced, floating output (600/150 ohms)
- a balanced (bridging) input
- a high-level +26 dBm signal

- +26 to -90 dBm attenuator
- distortion measurements to .002%
- fast 5-second measuring speed
- automatic nulling, optional automatic set level.
- both harmonic and optional intermodulation distortion measurements.

SPECIAL OUTPUT CIRCUIT

In the 1710A you get a transformerless audio generator output that's balanced and floating. No transformer means no transformer distortion. Floating *and* balanced means you can connect to virtually any audio circuit regardless of configuration. And you can set the output from +26 to -90 dBm in 0.1 dB steps.

FAST, SIMPLE MEASURING

Automatic nulling and the automatic set level option (ASL) give you ex-

tremely fast measuring and little chance for operator error. You can measure 5 or 6 seconds. *With ASL you measure distortion vs. frequency, distortion vs. voltage or power with resetting level.*

IM OPTION

An additional optional bonus is the 1710A also measures intermodulation distortion. After you've made harmonic measurement, just push "IMD" button. In 3 seconds you'll have the IM reading. With this option you're ready for future IM requirements.

CALL/SEND NOW FOR LITERATURE

It's worth while getting the information on this major new distortion measuring system. Call Larry Maguire, Bob Andersen now and get our product brochure. It's ready and waiting.

S SOUND TECHNOLOGY
1400 DELL AVENUE
CAMPBELL, CALIFORNIA 95008
(408) 378-6540

Circle 142 on Reader Service Card

waters which swept away its transmitter shack. KRXX is Reigh's only radio station and its elimination meant a loss of vital emergency news to the town's 4,700 residents. A telephone call from Idaho's Governor, Cecil D. Andrus to RCA led to a chain of events that resulted in the delivery and installation of a new 1 AM transmitter. KRXX was back on the air within 4-days of the Governor's call to RCA.

KTVX-TV, Salt Lake City took a major step towards completion of its modernization program with the purchase of 3 LDK-25 color cameras from Amps Audio Video Systems. According to the station, the modernization program will make KTVX the most modern broadcast facility in the United States. . . . According to David E. . . . of RCA Consumer Electronics, the television industry expects to sell nearly 40 million color TV sets between now and 1980 in the U.S., "That is more than half as many as the sets are expected to be sold in the next four years as in the past 21 years."

A rabbitron study of night-time radio ownership has been completed for the FCC, as part of the "clear channel" inquiry; the study, associated with Docket 20642, is available for inspection at the FCC, 1919 M St. NW, Washington New forms, Nos. 302-L and 330-R have been prepared for applications for Instructional Television Fixed Station (ITFS) license applications. . . . There will be no restriction on ownership of cable systems by aliens, the FCC announced, but said that a close watch would be kept for future need.

The Eastern Union announced it had concluded a lease agreement for a transorbital Comtech Laboratories Earth station capable of transmitting and receiving simultaneously two color video signals with accompanying audio.

A recently completed study by Michael L. Ray and Peter Webb of Stanford indicates that long-time viewers of TV series developed a program that permits them to tune-out commercials and that commercials run in blocks of 2 over 6 breaks get more attention than blocks of 6 in 2 breaks.

Business Briefs

Medith Corp., announced the sale of WJH-AM, Syracuse to Roy H. . . . Broadcasting for \$2 million. . . . Time Inc. disclosed plans to . . . a multi-million dollar investment in motion pictures produced and distributed by Columbia Pictures. . . . e's investment will involve Co-

continued on page 173

STRAIGHT TALK FROM YOUR DITCH WITCH MAN



"Let's talk about the reasons we offer FREE TRENCHER DEMONSTRATIONS."

"We talk a lot about the many different jobs Ditch Witch can do. But we haven't forgotten many people need to dig trench and that's all. We know if trenching is all you need to do, you don't want to pay for features you won't be using.

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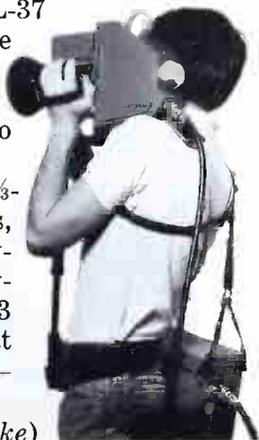
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Both cameras use three ⅔-inch Plumbicon* pickup tubes, f/1.4 prism optics. The viewfinder is 1½ inches. And everything else that made the HL-33 and HL-35 the real winners at the conventions is still there—just smaller and lighter.

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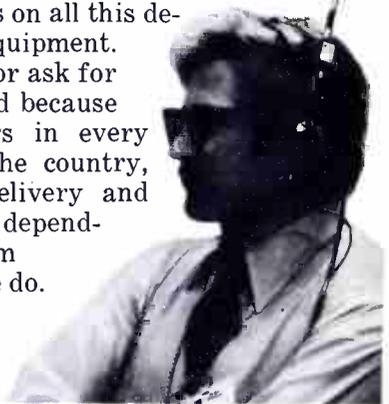
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INTERPRETING THE **FCC** RULES & REGULATIONS

Multiple Ownership Rules, Corporate Ownership Reporting Rules Amended

By Frederick W. Ford and Lee G. Lovett

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

Two recent FCC rule changes promise to make institutional ownership in medium and large-size communications companies more attractive and, at the same time, cut down significantly on FCC paperwork.

In one action, the Commission eased its rules limiting the institutional ownership of stock in broadcast and cable television companies.¹

In a related proceeding, the Commission amended its rules to require widely-held corporate broadcast licenses to file annual ownership reports (FCC Form 323).²

I. Multiple Ownership Proscription Eased

In essence, financial institutions such as insurance companies, banks and investment companies may now own up to, but not including, 5% of the stock of widely-held broadcast licensees or cable television systems (or their parent companies) *despite* ownership of stock in other media companies by these financial institutions. A widely-held corporation is one having more than 50 voting stockholders. Individuals and corporations (other than insurance companies, banks and investment companies) may own up to, but not including, 1% of the stock of widely-held (as defined above) broadcast licensees or cable television systems despite stock ownership in other media companies.

These 5% and 1% "benchmarks" amount to exceptions to the Commission's multiple ownership rules (Section 73.240) and cable television cross-ownership rules (Section 76.501).

A. The Multiple Ownership Rule

There are really two multiple-ownership rules. The *duopoly* rule prohibits: (1) the ownership, operation or control of two or more AM's, FM's or TV's whose specified contours overlap; (2) the cross-ownership of any two AM's, FM's or TV's if the specified contour of one completely overlaps the community of license of the other station; and (3) a broadcast station and a daily newspaper if the station's specified contour completely encompasses the newspaper's city of publication. The *seven-station* rule prohibits a company, its officers, directors or stockholders from owning, operating, controlling or having any interest in more than seven AM's, seven FM's or seven TV's (maximum five VHF's).

The cable television cross-ownership rules prohibit ownership, operation, control or interest in (1) a national

TV network and a cable system, (2) a TV and a cable system in the TV's Grade B contour, and (3) a cable system and a TV translator in the cable system's community.

As is apparent, these rules are pervasive. It appears quite likely that a financial institution's large investment portfolio would contain a stock in a widely-held broadcast licensee (or its parent corporation) and stock of other media companies, for which, without the 5% and 1% benchmark exceptions, would violate the multiple ownership rules.

Financial institutions and individual or corporate stockholders in a widely-held broadcast licensee (or parent company) that *exceed* the 5% and 1% ownership benchmarks, and own or hold official positions (e.g. vice president, director, member of the Executive Committee) in other broadcast and cable companies, are deemed to have "cognizable ownership interests" which may place such stockholders in violation of the above outlined multiple ownership rules.

B. Financial Institutions: 5% Benchmark

Insurance companies, banks and investment companies owning less than 5% of the outstanding stock of a widely-held broadcast licensee (or its parent) are deemed to have cognizable ownership interests for purposes of the multiple ownership rules, regardless of how much stock is also held by these institutions in other media companies.

Calculating the 5% benchmark figure for some investment companies may pose a problem. For example, a mutual fund or closed-end investment company may aggregate its holdings of stock in widely-held Company A with any of the same stock held by a private pension fund if the private pension fund is managed by the investment company's financial manager. The rationale underlying this requirement is that the manager's vote control over the pension fund and the investment company shares of Company A can contribute to undue concentration of control where these institutions also hold stock in other media companies. Thus, a common managed mutual fund and pension fund, each holding 3% of the stock of widely-held Company A, would exceed the 5% benchmark. This would mean that the media stock holdings of the mutual fund and the private pension fund, including holdings in Company A, would have to be considered when applying the multiple ownership rules outlined above; violation of the multiple

continued on page

¹Report And Order in Docket No. 20520, 37 RR 2nd 803 (1976).

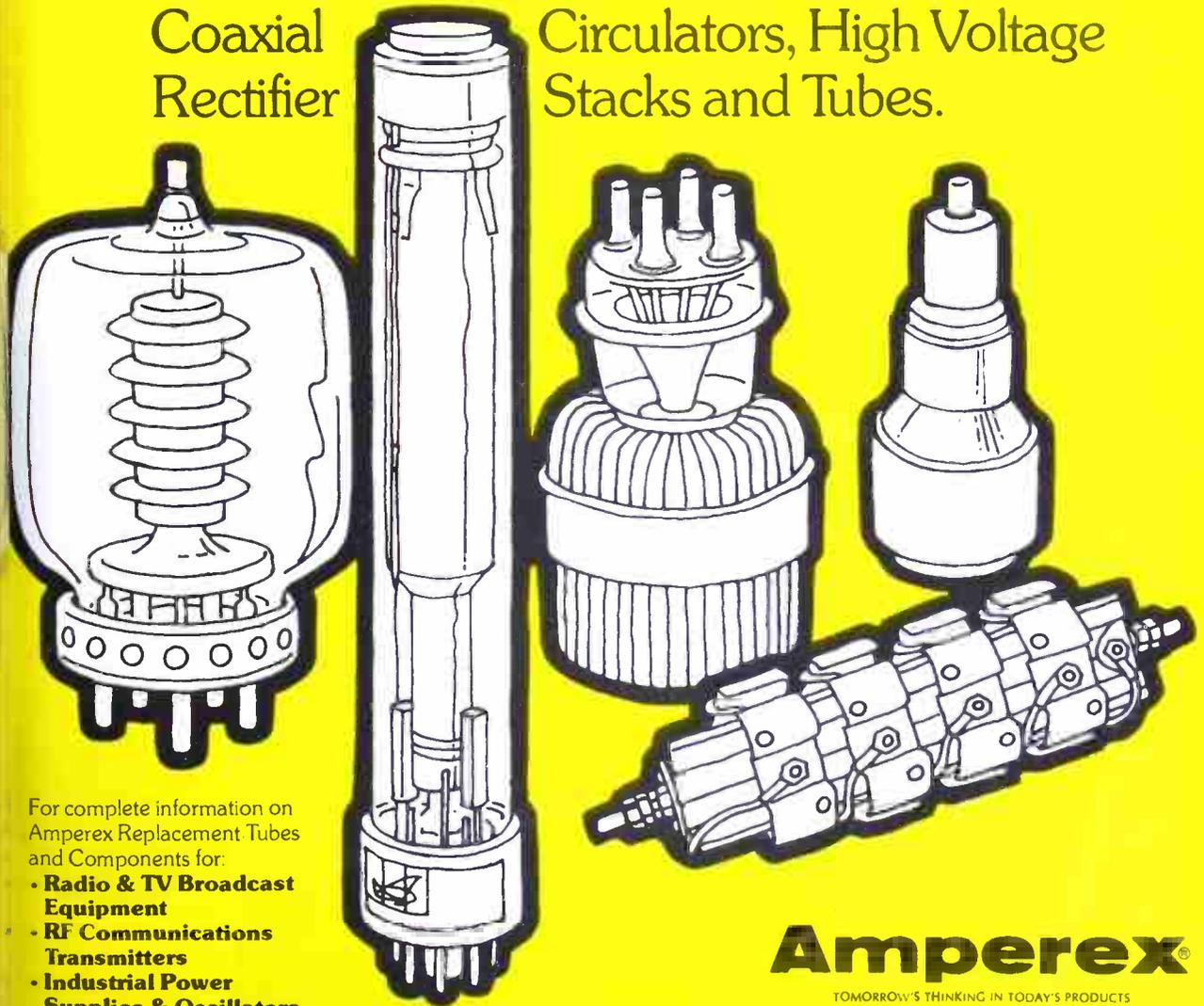
²Report And Order in Docket No. 20521, 37 RR 2nd 740 (1976).

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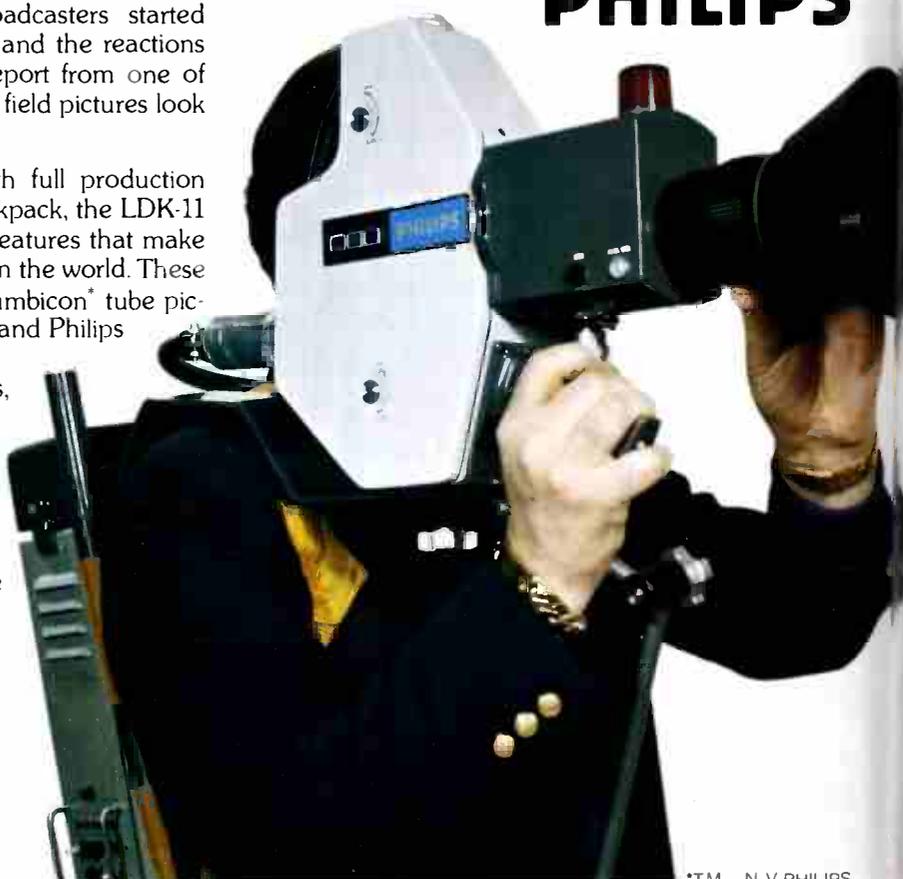
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FCC RULES AND REGULATIONS

ownership rule would be likely for a mutual fund having any sizeable portfolio. However, aggregation can be prevented in this case if the mutual fund *divests* itself of the power to vote the pension fund's Company A shares.

The Commission's *Report And Order* went on to reaffirm the requirement that stockholdings of *commonly-managed* investment companies must be aggregated. Unlike the investment company/private pension fund situation, divestiture of voting power of the stock of one investment company is unfeasible in the commonly-managed investment companies situation. This is because the stock of both investment companies *must* be voted by one manager.

Banking institutions are also subject to the 5% benchmark, but it applies only to stock over which the bank has voting power. If the Company A stock is held in trust, but with voting power reserved, the shares are *not* included in calculating the 5% benchmark. If the *unexpected* transfer of the original "res" of a trust (consisting of Company A stock) would put a bank over the 5% benchmark, violation of the multiple ownership rules can be obviated if the bank (1) immediately informs the Commission of the transfer and (2) submits a plan of prompt divestiture to the Commission.

A. Disclaimers

The Commission has deleted the requirement that financial institutions file with the Commission "disclaimers of intent to control the management or policies of portfolio companies" before utilizing the 5% benchmark exception to the multiple ownership rules.

A. Other Stockholders: 1% Benchmark

Individuals and companies (other than banks, insurance companies and investment companies) owning less than 1% of the stock of a widely-held broadcast licensee or cable television system (or their parents) will not be considered in applying the multiple ownership and cross-ownership rules. This exception is carried forward from previous Commission rules.

A. Annual Ownership Reporting

The Commission also amended its rules requiring tri-annual reporting of changes in corporate ownership by officers, directors and stockholders. (This particular ownership reporting requirement does not apply to cable television systems.)

A. The Prior Rule

For the purposes of ownership reporting, the Commission's old rule distinguished between companies with (1) 50 or fewer shareholders and (2) more than 50 shareholders ("widely-held" licensees). Corporate broadcast licensees coming within the former category were required to report stockholdings of all officers, directors and shareholders every three years at license renewal time. The size of shareholdings was irrelevant; all holdings had to be reported. Corporate broadcast licensees under the latter category had to report every three years on the holdings of officers, directors and 1% or more stockholders (of voting or non-voting stock). For both the former and the latter categories, a supplemental ownership report had to be filed within thirty days of any change of previously reported information.

B. The New Rule

(1) Closely-Held Corporate Licensees

The Commission retained the old rule completely un-

continued on page 32

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changed for closely-held licensees. FCC Form 1 (Ownership Report) must be submitted every three years at license renewal time. The holdings of all officers, directors and shareholders must be reported. Furthermore, a supplemental ownership report must be filed within thirty days of any change in previously reported information.

(2) Widely-Held Corporate Licensees

The new rule (Section 1.615(d)) requires the annual filing of FCC Form 323 for widely-held corporate broadcast licensees (e.g., with more than 50 shareholders). The first ownership report is due October 1, 1976, must reflect stockholdings as of any record date of corporate licensee's choice during the twelve-month period beginning October 1, 1975. The corporate licensee should choose this record date carefully because ownership reports for succeeding years must be filed within sixty days of the anniversary date of this record date. It might be convenient to choose an existing dividend record date to obviate duplicative clerical work. For example, a corporate licensee might choose June 1976, because it would coincide with the tabulation of a complete list of stockholders (together with stockholdings) for regular quarterly dividend payment purposes.

Because the Commission adopted an annual ownership reporting requirement, the supplemental ownership reports previously required have been abolished for widely-held companies. Henceforth, only a transfer of control of a corporate broadcast licensee (or its parent) will trigger a reporting requirement (in the form of an Application For Consent To Assignment) between annual ownership reports.

A distinction must be made between the ownership reporting rule and the institutional ownership rules for widely-held corporate licensees. All 1% or greater ownership positions must be reported on FCC Form 323 for corporate broadcast licensees. This includes ownership positions of financial institutions within the ownership benchmark that exempts such institutional holdings from consideration under the multiple ownership rules. This distinction need not be made for closely-held corporate licensees because the 1% ownership benchmarks do not apply in the first place.

C. New Rule Interim In Nature

The new annual ownership reporting rule may be interim in nature. The Commission noted that the Securities And Exchange Commission's "beneficial ownership" proceeding is still pending. Once completed, the FCC may do one or more of the following:

- (1) Designate one date upon which all licensees must file annual ownership reports;
- (2) shift the burden of reporting changes in stockholdings from the corporate licensee to the shareholder;
- (3) raise the 1% ownership reporting benchmark.

III. Conclusion

The FCC's two recent rule amendments should benefit to a variety of broadcast licensees and systems. Financial institutions will have significantly greater freedom to maintain stockholdings of corporate broadcast licensees and cable systems, resulting in a broadened base of ownership as well as greater liquidity in share trading.

The amended corporate ownership reporting rule will result in significantly less paperwork on the part of widely-held corporate broadcast licensees.

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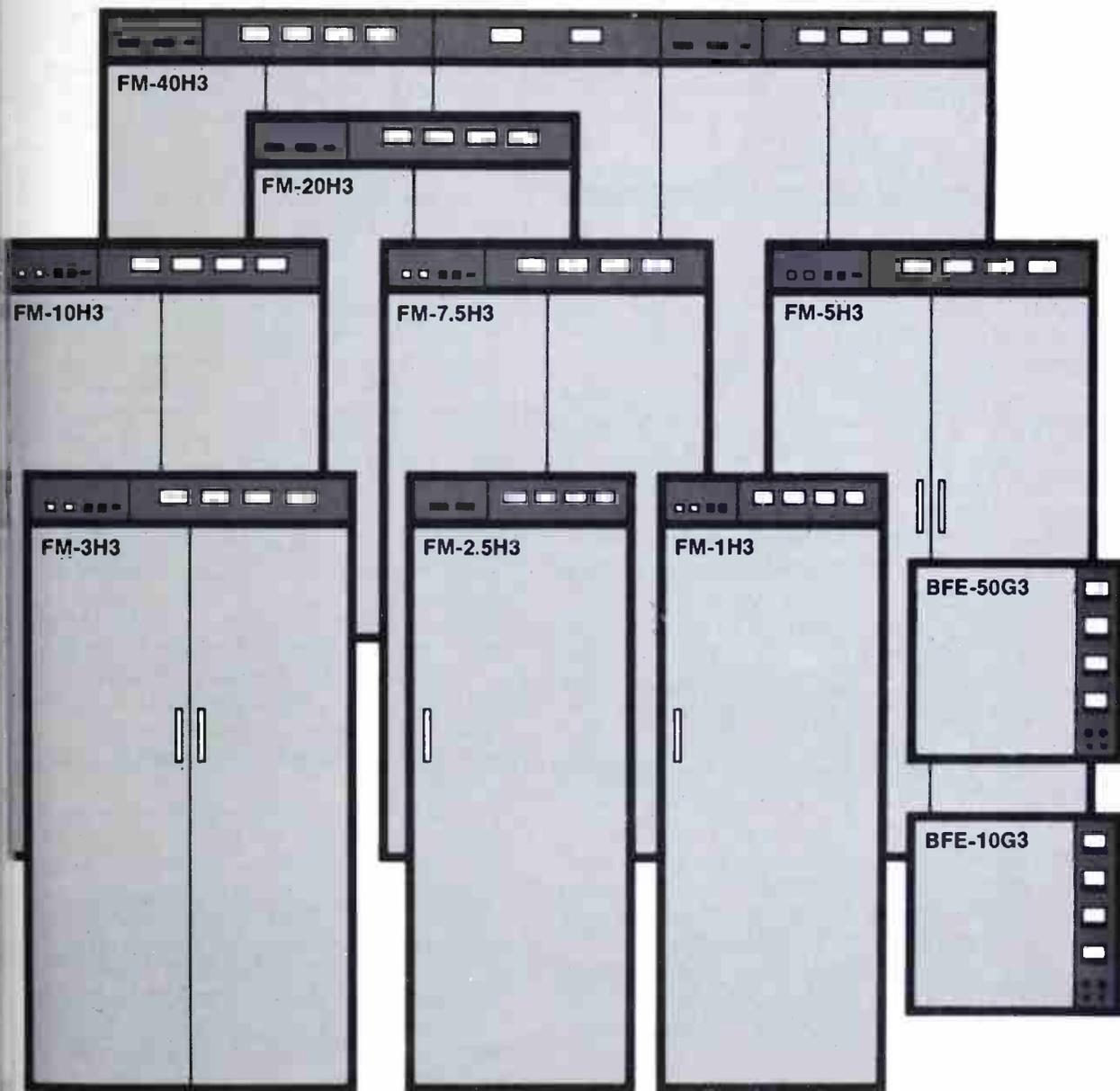
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Do You Need a Recording Type Console In Broadcast Applications?

A Speakout On Audio Consoles

"Speak Out" is a new feature in *BM/E*. Last month Ed DiGiulio spoke his mind on "knee jerk reactions" in hopping on the ENG bandwagon. This month Carroll Cunningham speaks out on what he sees as an "emotional swing" by broadcasters to "recording type" audio consoles. To encourage further dialogue on this subject we sought out rebuttals to Cunningham's opinions by other industry pros for simultaneous publication. The exchange is illuminating as well as provocative.

We intend to do more of this in the future. The positions taken will be argumentative though we will not always follow the debate format. Next month Dave MacDonald of Sony Corp. speaks out on using 35mm film techniques in producing video shows. We'd like to have not only manufacturers but broadcasters too, become advocates, protagonists, and critics in this "Speak Out" forum. This is an opportunity for all concerned members of our industry to air views on equipment, controversial industry practices or whatever subjects you wish to speak out on. Let's hear what's on your mind—it's your turn to "Speak Out!"

"No," says Carroll Cunningham, President of Dyma Engineering To Kick Off a Debate.

Programming and production people look at "recording" consoles that resemble the cockpit of a 747—they are filled with a deep longing to be in the pilot's seat. That longing often becomes so strong that they succeed in convincing engineering and management that what they need is a "recording type" audio console which to do "production."

To be sure, programming and production people certainly do need some of the capability and flexibility offered by a recording type console, but probably the thing in the world they need is a 30-channel monitor designed to do tasks completely different from a broadcast job. It is time for a little engineering and management restraint. This then is a brief explanation of what the difference is between a broadcast audio console and a recording console and why a recording console seldom fills the broadcast need.

The purpose of a broadcast console is to process, control and distribute various kinds of audio signals. It should be capable of doing other control jobs related to those audio signals and related to its environment—example, mute the control room speaker and turn on warning lights. Broadcast audio consoles have a variety of microphone inputs, a couple of turntable inputs, associated tape recorder inputs plus some off-the-wall auxiliary inputs for signals which range all the way from "clean and processed" to "dirty, weak and noisy."

So right off the bat it appears that a broadcast console doesn't need 30 channels of microphone inputs; it needs 30 channels, but they don't have to have 60 dB of gain and they all don't have to have equalization—especially one with fourteen controls on it. (Who has that in time?) Abruptly, the channels have stopped being identical. Yet, that is what a recording console is all about—that is the job it's got to do—it has to take 30 or more similar signals, i.e., microphone inputs (generally process them in various ways, and distribute them to various places).

A recording console very rarely has any facilities for starting and stopping the various machines associated with it. It rarely provides any muting facilities for the monitor speaker, and it is rarely laid out to accommodate the frantic pace of either on-the-air disc jockey or broadcast production people. (The production process for recording is vastly different and vastly more leisurely than the production process for broadcasting. Little hundreds of hours can be spent in post-production mixing of a three-minute tune, whereas the most sure production of a one-minute broadcast spot is like time compression contrasted to the patient, repetitive meticulousness of mixing music.) When a broadcaster buys a recording console, he buys a lot of stuff he doesn't use and misses a lot of things he needs.

Modularity can be carried too far

Recording consoles, since they usually have a large number of channels with very similar requirements,

continued on page

Choose Wisely And You Gain Immensely," Says Bob Ward, Auditronics.

input "monster" console, may not be necessary in broadcast production/recording facilities, but such console main frame should have the ability to accept between 10 and 20 inputs as a minimum.

A smaller approach forever limits capabilities to little more than voice over work which may be the original objective, but restricts growth to simply a fancier way of doing the same as has been done for 20 years. The progressive, successful stations we have seen are not making this short-range-thinking mistake.

They are buying consoles to do a recording/production which is entirely different from on-air work. And in the process showing considerable restraint and cost effective planning. Those who choose wisely sacrifice nothing and gain immensely.

The requirements of on-air consoles are well known to broadcasters. The requirements of sophisticated, multi-channel recording/reproduction are not as well known. It is commonly known that one cannot get something for nothing.

Economies of design, that have historically made consoles, sometimes fail to meet the tests of practicality when measured against the new requirements of expanded capability and performance. Inputs without utilization are ideal for on-air boards, but in recording/production, their use would be a major limitation. Consoles which accept high level only make good sense in saving down the overall cost of a control console, but whose limitations in design, flexibility, and expandability completely contrary to the basic concepts of multi-channel recording/reproduction.

Any properly designed and well thought out production/recording console will provide all the functions fundamental to broadcast on-air operation. Then it will include all of the basic recording functions.

Control layout will be planned to accommodate the pace of broadcast without oversimplification. Production presently available makes it possible to buy exactly what is needed, no more or less.

The modular concept is widely accepted because it

"Broadcast Type Unit Built Around Recording Technology Is Ideal," says Nick Balsamo of Automated Processes Inc.

The typical recording console is, of course, not suitable for broadcast application but neither is a traditional broadcast console flexible enough for today's programming needs. However, a broadcast-oriented unit built around recording system technologies (and features) is an ideal and realizable goal for today's station wishing to be ready for tomorrow.

Best broadcast audio (AM, FM, TV) leaves much to be

offers so many advantages for so few additional dollars. Maintenance is a small, but valid consideration. Beyond that are low cost and ease of expansion; physical rearrangements may be made quickly as circumstances change; and it becomes possible to move consoles around, so to speak, using "floating" modules which can be plugged into whichever of a number of main frames, needs the added capability, or size, at a given moment.

The flexibility in this type of system becomes almost unlimited when every input module can accept either microphone or high level sources.

Problems associated with inferior quality plug-in connectors and low quality P.C. boards should not, by inference, be attributed to quality production/recording consoles. Use of gold plated P.C. board fingers and good connectors with gold plated, bifurcated contacts makes this a virtually non-existent difficulty. Reliability equals or exceeds that of solid state devices.

Integrity of grounding and shielding is a critical factor in any quality audio control system. Success depends on proper design and installation. It is not necessary to sacrifice needed features in order to accommodate proper grounding. It is necessary to exercise great care.

Any builder whose products will not easily exceed the requirements of broadcast in terms of crosstalk, noise, distortion, and RFI immunity should not offer a production/recording console. Failure to do this indicates most serious basic design errors.

Our production and design people have not yet learned that recording consoles are fragile by nature. They are not going to either. We hope those users of recording consoles who have had them in mobile and portable applications for years will not stop motor freighting and flying them all over the world because they are "fragile."

In conclusion, we don't feel valid indictments of a properly designed product/recording console in broadcast have been raised. As radio and TV seek to add the capabilities of recording to basic broadcast functions the requirements to be met must be a blend of both arts.

The very concept of multi-channel production/recording dictates doing a different, much more complex job than on-air audio control. Logically, consoles for this purpose must be different and more complex. This is no need to fear the new and different. It is too easy to learn about it and grow.

desired in terms of quality. Audio boardmen have little opportunity to be creative. The broadcast audio console seems to be the biggest culprit. The console itself is usually inherently limited by the fact that it has relatively few inputs and processing circuits to handle the immediate needs of modern daily programming. There is a need for more flexible facilities to meet the new demands.

In radio, a station's *sound* and *programming* is its personality. This personality image builds audiences and ratings. Ratings mean revenues. Since the audio console is the workshop of sound and programming, the broadcaster needs all the tools he can get. A 3 mic-, 2 turntable-, 2 tape cart-, 1 remote-, 1 tape input-to-mono-output is not even a decent work bench!

It is a fact that manufacturers of turntables, tape
continued on page 36

have the electronics and controls manufactured identically. Thus, one can be interchanged for another—a very handy maintenance feature. Since a broadcast console doesn't have a large number of identical channels, one of the major reasons for having a modular audio console is beginning to disappear before our very eyes.

There are several more arguments weighing against modules: the modular console, while having numerous advantages in low-cost assembly of the modules, has a major disadvantage of requiring a substantial amount of duplicated metal work which runs the cost up, and it tends to run it up faster than the savings that can be made from repetitive production of identical components.

All of these modules plug in—on a big connector—and all of us know the most unreliable thing in any electronic assemblage is the connector to which it is attached. This doesn't mean that the components in any console shouldn't be plugged in—they should! (Is the back side of the front panel the *best* place for electronics to be?) But they should be smaller, less vulnerable groupings with ample opportunity to preserve the integrity of the grounding and shielding scheme. This is a very important matter in the case of a broadcast console since it often must handle *completely* diverse program material, whereas a recording console does not. The shielding and isolation and grounding schemes necessary to keep cross-talk between channels on a broadcast console are vastly more demanding than in the recording industry where different program material rarely is handled at the same time.

The connector requirement for modules raises another serious bogey, particularly in broadcast consoles that must operate in RF environments. Not only do connectors (and their concomitant imperfect connections) make lovely RF detectors, any less-than-optimum grounding system can seriously increase the susceptibility of the unit to the station's own radiated field. (Mother

BALSAMO

cont. from page 35

boards make marvelous pick-up antennas.) machines (cart and reel-to-reel), limiters, compressors, equalizers, exciters, modulators and even transmitters, have been upgrading their quality, recognizing the fact that audio has to be improved to make the broadcast end-product more palatable to the sophisticated consumer. Yet today, the audio console in use by most broadcasters is limited by technologies developed a decade or more in the past.

For quite some time now, quality, creativity and flexibility have been of paramount importance for a recording studio. Today's recording artists and producers demand it. While much of the flexibility comes from the use of multitrack tape machines (8, 16, and 24 tracks), that is only half of the story. For it is the audio console that is the "hands on" working area for creating the finished product that eventually ends up on the air. The console must be the highest quality and possess, in its cabinetry, all the electronic "goodies" needed for the demanding flexibility that is required to process audio as we know it today.

Much of the electronics in recording studio consoles are redundant and cause the console to be quite large, but

boards make marvelous pick-up antennas.)

Further, recording consoles are more fragile (or rugged, depending on your point of view) than broadcast consoles, despite the large number of stories concerning the propensities for recording engineers to spill everything on them from pot to coke. They are more fragile because they have to do more things. They are, of course, laid out differently than broadcast consoles. That is, the human engineering for a recording session is vastly different from the human engineering involved in broadcast production or broadcast air work.

We have to admit we are impressed by some of the vast and beautiful recording consoles we have seen and we respect the folks who run them. Both make some remarkable contributions to the world of audio. But we have learned the hard way that such consoles were made and are not designed or built for broadcasters. The problem they solve is a problem different from the one faced by a radio or TV station.

A broadcast console should feature card-frame, plug-in electronics, as identical as possible, and as little electronics as possible. Most recordings have already been made very carefully and painstakingly equalized and require no last minute tinkering; we do not feel further equalizing this material is desirable. All tape sources feeding a broadcast console should have had the material equalized before it was put on the tape. That is, if it's a cart to a machine and equalization is required, the product people on the *output* of the console should have equalized it. The concept of the modular console is an extremely over-rated one based on the job that it has to do. It is expensive, it is unreliable and it often fails to do the job intended because of the foreign environment in which it has to operate. A broadcast console should be laid out to provide as many operator conveniences as are conceivable: automating a large number of the repetitive functions, such as routine switch throwing and guarding, that the operator normally has to do manually and providing accessible machine controls, adequate warning lights and mute closures.

this is necessary for mix-down flexibility. Typically each input channel will have an input fader, Mic-Line switching, output assign switching, echo assign switching, channel assign switching, equalization, solo, channel "on" and muting. Other accessory items may be quad and stereo panning, overload indicators, pre-post fader switching, echo or eq., etc. The interesting point to note is that the input strip is multiplied by the number of input channels (16, 24, 32 inputs typically). This replication represents 70 percent of a recording studio console. The rest is assigned to monitoring, multitrack playback facilities (again a redundant section in itself) echo returns, master faders and metering. Yes, one looks at a console of this size and says, "How do you know which button to push first?", or "You need some kind of masters degree in engineering to even turn this thing on." Not so. The individual who operates the recording studio console is no different from the operator of a broadcast console during a live show. They both must be responsive to the pressures and hecticness that is concomitant with artists, producers, and directors trying to create their product.

A well-designed modern broadcast console is not a forest of buttons and switches seen in the recording

continued on page

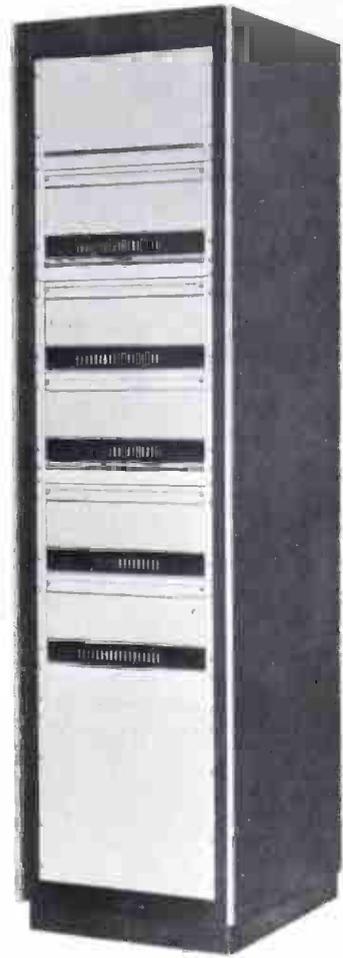
Shopping for a Distribution Switcher?

SAVE SPACE.

One of our competitors describes their 40 x 60 AFV switcher as occupying only two equipment racks. An equivalent TVS/TAS-1000 switcher takes about 2/3 of a single rack — without compromising performance specs (radio hum and noise measures -80 dBm on the TVS/TAS-1000 vs. -57 dBm on the competitive unit) and without use of single-source custom hybrid components.

SPEND LESS.

Another competitor boasts of video switching at less than \$30 per crosspoint. The TVS-1000 sells for as little as \$23 a crosspoint, and this price includes professional quality vertical interval switching, on-board electronic latching, and 100% computerized testing of parameters through all crosspoints.



40 x 50 AFV Switcher

SPECIFY THE SWITCHER WITH PROVEN RELIABILITY.

The TVS/TAS-1000 is more reliable because its simple design requires fewer active components in the signal path. This reliability has been proven at installations throughout the world in configurations ranging from 10 to 80 x 50. To find out more about the switcher offering compact, cost-effective signal distribution with true broadcast quality and reliability, contact your nearest TeleMation sales office.

TVS/TAS-1000 Video/Audio Distribution Switchers



TeleMation, Inc. P. O. Box 15068, Salt Lake City, Utah 84115 (801) 487-5399. Other sales offices located in: San Francisco (415) 348-3322 • Los Angeles (213) 845-7831 • Chicago (312) 729-5210 • Atlanta (404) 451-1801 • Washington, D. C. (202) 937-8700 • New York (212) 575-1466 • London • Rio de Janeiro • Sao Paulo • Santiago • Mexico City • Cairo.

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BALSAMO

mix-down studio. While based on recording studio technical developments, it is human engineered in terms of the controls presented to the operator. Controls grouped with on-air requirements in mind. Even some controls may be removed from the panel and placed under the bolster to keep them undisturbed. Neither recording nor broadcast equipment must break down, must take physical abuse, slamming of switches, faders, cigarette ashes, beverages and all other such happenings.

Technical specifications of a professionally manufactured recording console usually exceed specs required of broadcast equipment, i.e. crosstalk, frequency response, distortion, headroom noise, etc. For example, a Boston station was recently supplied with an 18-input console made to recording studio specs. It contains the necessary facilities, in modular form, for on-air as well as production and is extremely easy to use. A pushbutton switch on each input converts the incoming program from mono-to-stereo-to-quad with all the matrixing and levels. Typical specs are: clip level on outputs, +30 dBm; frequency response, mic in to line out, less than ± 0.5 dB from 30 Hz to 22 kHz; crosstalk in all channel combinations 86 dB maximum; signal to noise ratio 104 dB; harmonic distortion less than 0.1%, 30 Hz to 20 kHz at +18 dBm into 600 ohms.

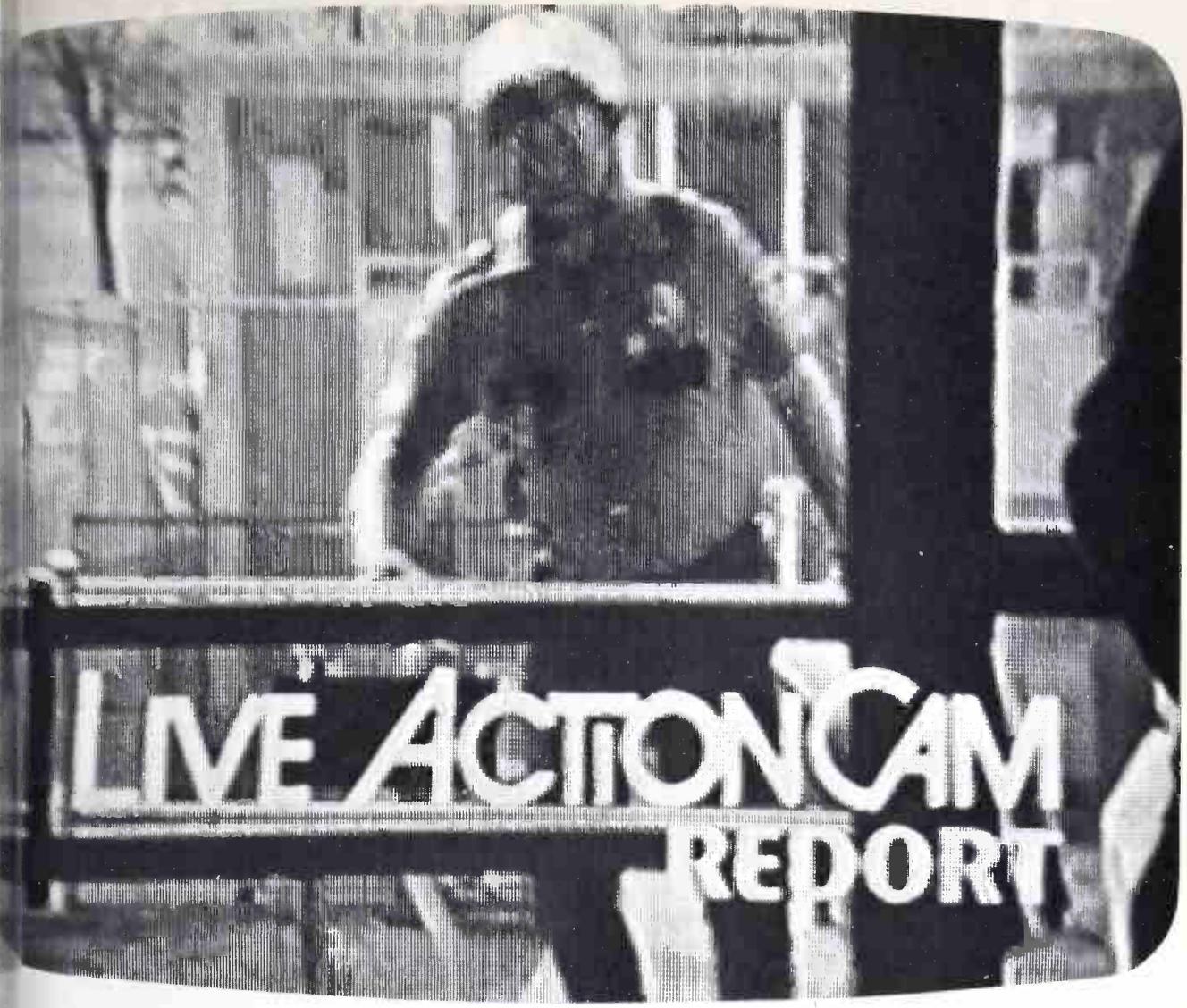
Flexibility, achieved only in modern broadcast consoles, comes from the techniques used in recording studio consoles. Room for expansion can only come from modular construction and leaving room in the console with blank panels covering prewired connector mother P.C. boards. Modularization allows a broadcaster to purchase a custom-made console with a reasonable price tag—due to standard mechanical configurations within the console frame and standard “mother” P.C. boards with highly reliable military P.C. connectors carrying all busses. Use of high quality operational amplifiers and standard switching techniques allow a high number of various plug-in modules to be available that contain most of the electronics, which is now front panel accessible for easy servicing. Customizing a console usually means a combination of standard modules plus a few that are custom made.

Maintenance personnel need only change defective modules by removing two screws and unplugging the culprit.

Audio is becoming a critical factor in competition for the broadcaster. Audiences are tuning in to the quality stations. In television, now that we have quality color pictures, we need audio to match. Stereo audio is in the wind for TV, quad for FM and stereo AM. In order to meet these demands consoles must not be behind the times.

Cunningham rebuts, briefly . . .

A broadcaster may need 30 channels—but not very often. Every certainly doesn't need equalization—99% of broadcasting is done with a maximum of a half-dozen sources. Equalization is best done by changing mics or changing rooms . . . Our experience shows modularization is rated and under used and not lowest cost . . . Good connectors help broadcasters know a huge percentage of system failures are connector related. And connectors do interfere with idealized grounding and shielding . . . A separate article is probably needed on specs. Nobody ever says they measure it or what it means. Is clipping of 30 dBm at peaks or 0 dBm? Nobody ever says at what frequency crosstalk is measured at—it's different at 20 kHz than at 1 kHz. Is S/N measured with a 60 dB gain in the circuit? What is harmonic distortion at different levels of modulation required in a proof of performance test? . . . I agree that we in audio are behind. We've got better pictures than sound. Let's do something at



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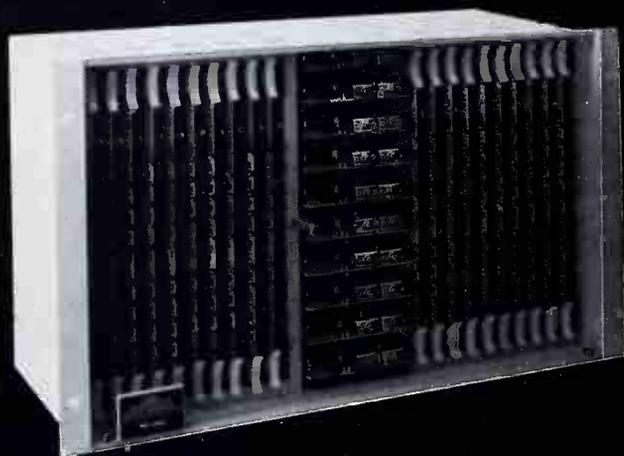


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- Externally accessible control latching and decoding which allows in-service maintenance, no interaction between matrix frames and uses no unique codes or non-compatible addressing schemes. All active control components are plug-in devices.
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"True" Station Value Is Key Ingredient In Broadcast Financing

Barry J. Dickstein

When an AM-FM station obtained a \$2 million loan—and a number of other advantages including no "equity kicker."

Approximately 10% of the nation's 7,000 plus commercial radio stations will face a major financing requirement this year. For the 400 station operators involved in station sales, as well as those engaged in major facilities upgrading or refinancing, traditional capital sources may prove exceptionally limited.

Capital formation within the radio industry in recent years has been a fragmented process, with availability largely dependent upon station size and requisite financing requirements. The large multi-station operators have enjoyed access to public markets as well as institutional bank sources. The combination of strong financial conditions, multiple markets, and substantial financing requirements has enabled such station groups to interest financial institutions that feature broadcast specialties.

Small station operators have generally relied upon local banks and seller notes as supplements to private equity sources for the satisfaction of modest capital needs.

While stations in both size extremes will continue to acceptance through traditional avenues of finance, medium-sized operator serving a single market with a major facility, will find the capital formation process changing dramatically.

Financing within this mid-range category has generally involved medium 6 to low 7 figure amounts primarily financed through seller notes supplemented by regional bank debt and private equity. However, financing sources for such broadcast financings have become increasingly strained as a result of basic adjustments with respect to four supply and demand factors.

First A marked increase in the volume of annual station trading has increased competition for available capital. There were 270 station sales in 1971 as compared to 363 sales in 1975.

Second Although the average station sales price decreased in 1975 the average selling prices of stations in recent years has generally increased. In 1975 the average station selling price was \$361,063.

Third Accelerating inflationary factors coupled with heightened uncertainty with respect to long-term funds markets have reduced availability of fixed rate seller-note financing.

Fourth Accelerating cost of funds coupled with hard loan losses have substantially reduced regional availability of fixed rate term loan packages.

Therefore, the continuing combination of an increasing demand for medium-sized broadcast packages and an erosion of seller note and regional bank capital

availability, may compel broadcasters to place increased emphasis on expensive equity-oriented capital sources. However, for those broadcasters involved in acquisition financing, facilities upgrading, or refinancing of existing debt, there may be an alternative to substantial equity dilution.

Intermediate term lender emerges as specialist

In response to the widening gap between traditional debt financing vehicles and equity-oriented sources, a new concept is emerging for medium-size broadcast financing. Blending the institutional specialty approach of debt packaging, with the cash flow and market analysis of equity investors, the intermediate term broadcasting lender is a rapidly developing financing factor.

As a cash flow lender specializing in broadcast property valuation, the intermediate term specialist adopts an ownership view of property value by employing stated multiples of anticipated net cash flow. Therefore, acknowledging the large disparity between "hard asset" value and true station value, the underwriting approach concentrates on market growth, market share, and resultant revenue and cash flow projections to establish loan collateral values.

Based on such "true market" values, the intermediate term specialist can structure a flexible debt package that will satisfy total financing requirements with adequate debt service flexibility. The notable missing ingredient is the dilutive "equity kicker."

The specialty term lending approach is illustrated by the following example.

A multi-station group recently offered a major market AM-FM property to its existing management for a purchase price of \$3 million. Terms consisted of \$2.3 million cash and a \$700,000 ten-year seller note at 8.5% amortizing evenly in years 6 through 10. Moreover, \$600,000 of the purchase price represented a five-year covenant not to compete which would be amortized over its term (\$120,000 per year). The purchasing group would provide \$300,000, or 10% of the purchase price, as its equity contribution. Therefore, a term loan was requested for \$2 million, or 67% of purchase price.

A financial review revealed the following balance sheet summary:

(000's Omitted)			
Cash	\$ 80	Accts. Payable	\$100
Receivables	250	Accruals	60
Other	70		
Current Assets	\$400.	Current Liabilities	\$160
Equipment (Net of \$500,000 of Depreciation)	250	Shareholders Equity	590
Trans. Property	100		
Total Assets	\$750	Total Liabilities & Stockholders Equity	\$750

Barry J. Dickstein is Assistant Vice President, Aetna Business Credit, Inc., East Hartford, Connecticut 06108.

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Now convert any monitor to a cross pulse monitor with VACC's new \$345 CPG-1 Cross Pulse Generator. Your monitor needs no modification. For the first time, adjust your cross pulse where you want it - both horizontally and vertically.

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If you need a video monitor, install VACC's Electro-optical Isolator in a Sony receiver. In less than an hour, an engineer or electronic technician can install VACC's A-1 Electro-optical Isolator in a 12", 15", or 17" Sony receiver. Use VACC's A1-A in KV 1711, KV 1712D, KV 1722, KV 1723D, KV 1910D, KV 1920D and KV 2101 Sony receivers.

Get both a high quality monitor and a receiver by the flip of a switch. With VACC's superior isolation, connect up to 20 monitors with no worry of group loops. Yours - in a half pound package - from Video Aids.

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Also new is VACC's Burst and H-Phase Meter. . . A low cost-cost substitute for most vectorscope applications where you need to keep those flesh-tones. Likewise, the unit is a low-cost substitute for an oscilloscope where H-Phase errors need to be monitored. Get twice the accuracy on H-Phase and about five times the accuracy on burst-phase when using VACC's Model BPM-1-02. It costs only \$638.00. Circle the bingo card and mail today.



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A five-year historical analysis indicated the following market and station statistics:

(000's Omitted)

	1971	1972	1973	1974	1975
SMSA Market Revenue	\$17,000	\$17,800	\$18,400	\$19,100	\$20,000
Station Share of Market Revenue	7.35%	7.58%	7.80%	7.91%	7.91%
Station Revenue	1,250	1,350	1,435	1,510	1,510
Operating Profit	310	330	385	410	410
Depreciation	60	60	55	55	55
Taxes	100	110	150	165	165
Net Profit	150	160	180	190	190

Given his cash flow and market orientation, the intermediate term lender had little concern as to low value book assets. His analysis commenced with projections of total market revenues based upon regression analysis employing historical demographic and sales data. No studies of the station's share of market revenues and audience ratings were related, resulting in a revenue projection. Historical expense levels were reviewed as a basis for operating leverage and operating profit forecasts. With the addition of interest and debt service projects, the following forecast was completed:

	1976	1977	1978	1979	1980
SMSA Market Revenue	\$21,315	\$22,381	\$23,500	\$24,675	\$25,000
Station's Share of Market Revenue	7.8%	7.8%	7.8%	7.8%	7.8%
Station Revenues	1,663	1,746	1,883	1,925	2,000
Operating Profit	500	540	585	630	630
Depreciation & Amortization	195	195	195	195	195
Interest	313	297	275	245	245
Taxes	—	13	40	85	85
Net Profit	\$ (8)	\$ 35	\$ 75	\$ 105	\$ 105
Add: Non-Cash Items	\$ 195	\$ 195	\$ 195	\$ 195	\$ 195
Net Cash Flow	\$ 187	\$ 230	\$ 270	\$ 300	\$ 300
Loan Repayment	100	150	200	250	250
Ending Loan Balance	\$ 1,900	\$ 1,750	\$ 1,550	\$ 1,300	\$ 1,000

As indicated above, a selective skewing of the loan amortization enabled comfortable amortization of half the term loan within the first five years. Moreover, further tailoring of amortization permitted an equitable repayment of the remaining balance as well as providing for debt service of the seller note, within the ten-year loan term.

As the example illustrates, the intermediate term broadcast lender can blend a market approach to station value with broad, structuring flexibility. The result can be a financial package ranging from complete single source financing, to a sophisticated incorporation of various classes of senior and junior debt as well as available equity. Further, custom-designing of permissible prepayments, and suitable commitment and loan advance schedules, can serve to provide a timely availability of funds, while accommodating partial or complete refinancing.

The creation of a specialty approach to debt placement may prove a meaningful step toward reversing the supply/demand imbalance in medium-size broadcast financing. For leveraged acquisitions, facilities upgrading, or refinancing, the intermediate term broadcast lender should be considered as a viable approach to improved financial leverage and reduced equity dilution.

BM

CANON'S NEW P18X16B2* 'INSTANT CLOSEUP' LENSES HAVE TURNED WPIX'S YANKEE BROADCASTS INTO A WHOLE NEW BALLGAME". Otis Freeman

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And to top it off the extreme wide angle of our new lens gives WPIX the best panoramic shots they've ever sent down the pipe.

If all this sounds good to you, seeing what our new lens can do is even better. No matter what kind of camera you're using—or contemplating—call us to arrange a demonstration.

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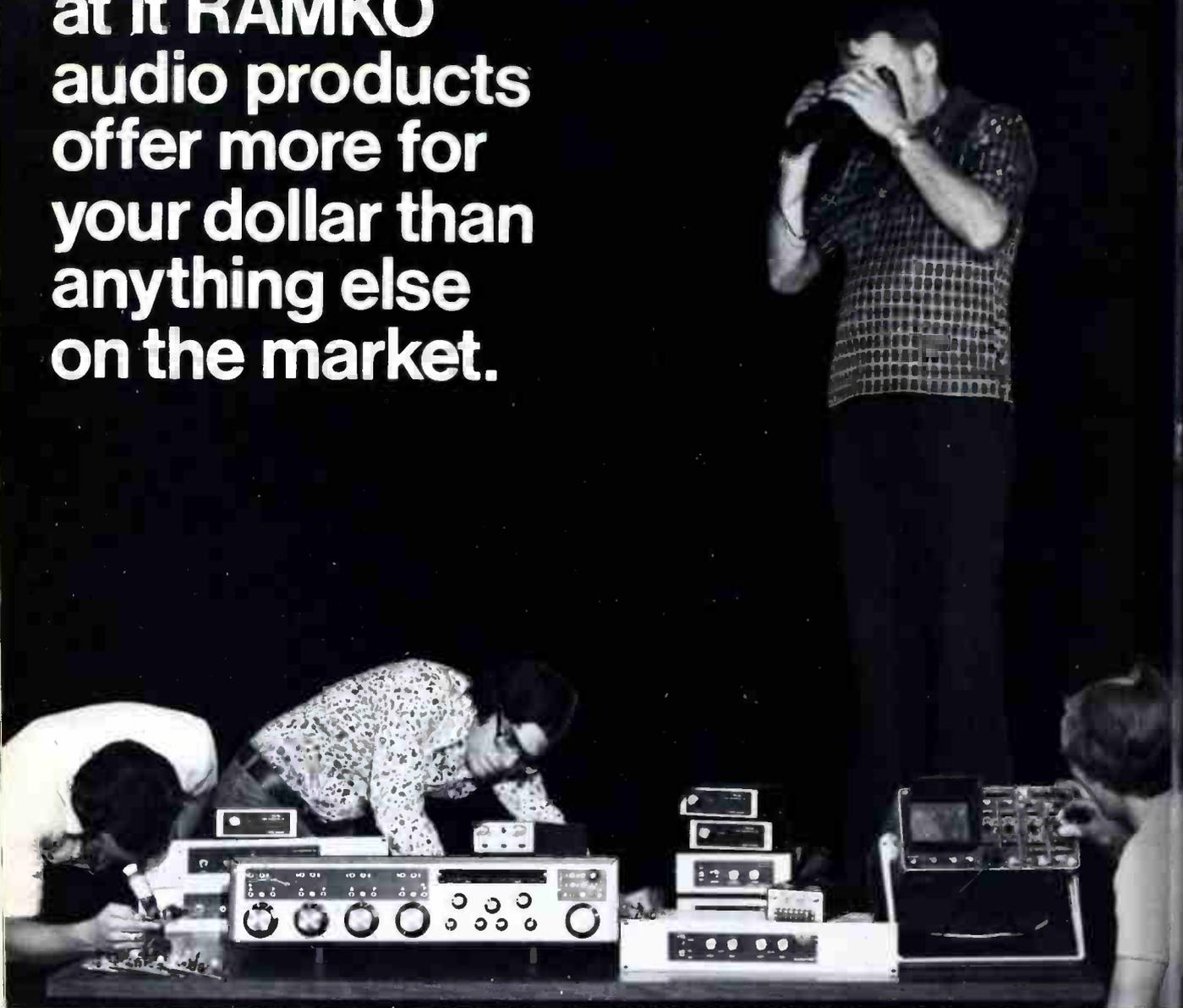
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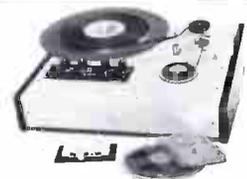
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How Similar Strategy Helps Three Different Stations Maintain Popularity In the Same Market

By Theartris Ervin

Three successful radio stations in metropolitan San Jose, California, are using essentially the same sophisticated strategies in presenting very different formats to very different listeners.

San Jose's KSJO-FM programs a "progressive rock" format designed primarily for men between 18 and 34. The city's KBAY-FM programs an "adult contemporary" musical format designed primarily for the 35 to 64 age group. And KLIV runs down a "contemporary top 40" format for the teens. Yet the managers of each of the stations agree that the key to getting a large chunk of the 1.3 million potential listeners in the metropolitan area is consistency and shrewd variations of the formats. In doing so, KSJO, KBAY, and KLIV aren't forgetting the other six stations that sit inside the county and the sharp "big city slicks" just fifty miles north in San Francisco. For example, KSJO's General Manager Steve Rosetta believes his station must compete with San Francisco's KSAN-FM for the 18 to 34 age group.

The managers agree each of the three stations has largely maintained its popularity through consistency and tempo variations of their musical format throughout the broadcast day. In fact, Rosetta at KSJO-FM distinguishes his "progressive rock" format from those of his competitors by the way he puts his music together rather than according to the musical selection.

Rosetta says the disc jockey has the primary role in putting the format together with the emphasis on the music rather than on the disc jockey's personality. "The jock is like the conductor who has all the musicians there doing the work. He kind of directs them in what they are doing and puts it all together so that it sounds nice. The jock's personality comes through in the music that he plays; in the way that he puts it together."

Rosetta believes the audience can identify and appreciate a disc jockey by the kind of sound he develops through his musical arrangement. "The jock who says his name only once or twice in a three-hour shift could be the most recognizable and the most successful with the audience . . . if he's turning them on musically."

Rosetta steers away from what he considers extremes in vocal presentations between records. "We try to bridge in between the very hip, laid back cool disc jockey and the very hype, screaming top 40 jock," Rosetta said.

Somehow this strategy manifests itself in what the station calls its "earth rock" progressive rock format. "Earth rock" incorporates the emphasis on music and the down-to-earth jock with a careful blending of rock music the audience seems to like. "Earth rock is a blend-

ing of current album cuts along with old hit singles old hit albums," said Rosetta. "It includes some familiar new material which hasn't been picked up top 40 stations."

This strategy assumes the chosen disc jockeys have "good musical taste" or special talent for figuring out what their audience likes. Within these boundaries there is room to manipulate the tempo of "earth rock" throughout the day while remaining consistent.

"We believe in the hills and valleys approach to signing the format," Rosetta explains. "In the morning people want to hear mellowing music," he says, "and in the afternoon they might want to hear harder rock so you have to change your music according to the time of the day, but be consistent. Consistency is part of the game," according to Rosetta.

The general manager at KBAY-FM—which produces a totally different brand of music agrees. General Manager Ray Hollingsworth describes his station as "adult contemporary" music station.

"We choose music that is going to be standard tomorrow," Hollingsworth explains. "Some songs that were considered rock during the hippie movement in San Francisco in the 60's are now being done by orchestras and being appreciated by older people through KBAY."

While Hollingsworth says proudly his station does not use a play list, he admits to a strict format. "We honor requests," he explains, "but only those which fit within our format." He argues his disc jockeys are free to be creative. "If you are so tightly controlled by a program director," he says, "then you wonder why you have men on the board."

KBAY's audience is different too. Hollingsworth describes it as "mostly upper income people who drive Cadillacs and Continentals." While most of them reside in the Santa Clara-San Jose market area, they are almost exclusively between the ages 35 and 64. The 35-49 group is the target audience. The 50 to 64 age group is the secondary target audience.

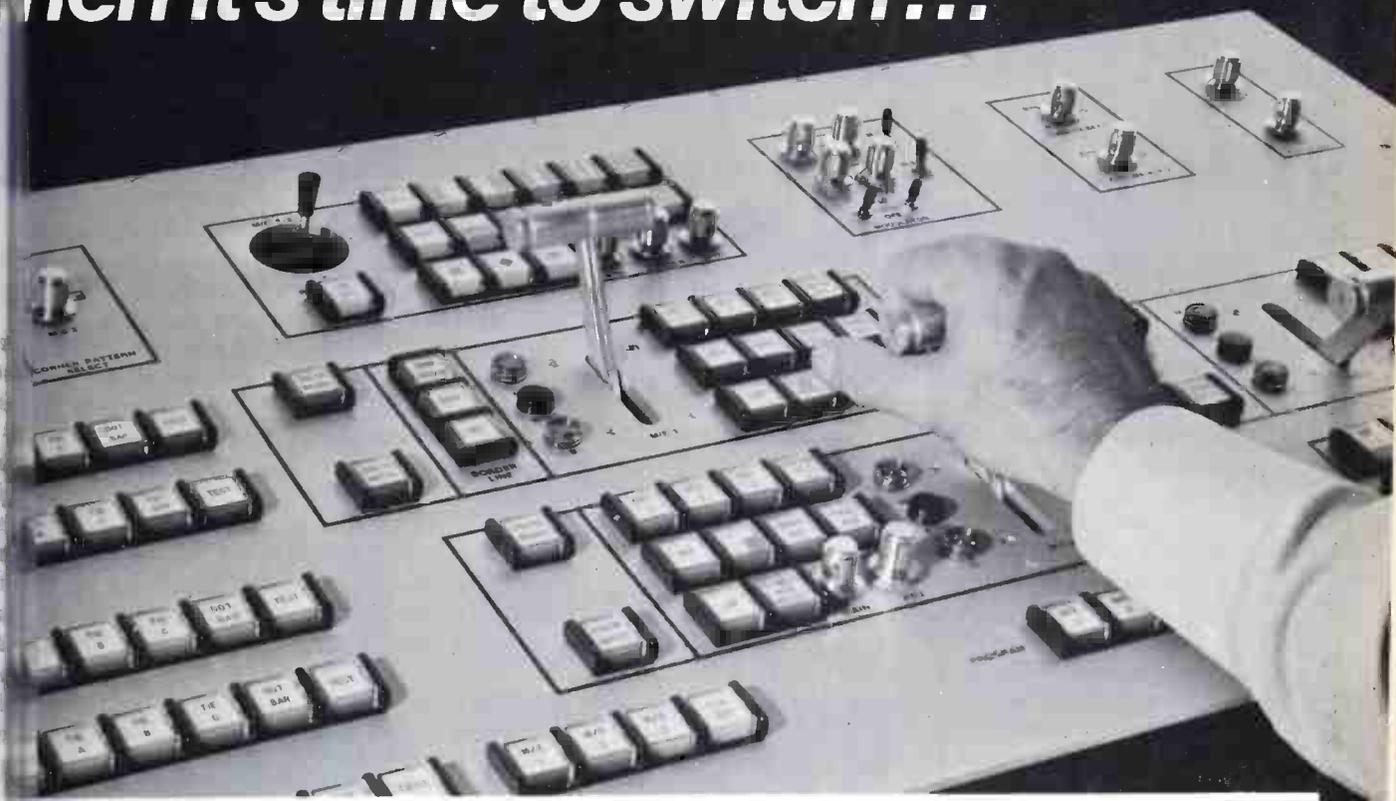
His audience, however, is still easily manipulated through the way he presents "adult" music. "We will change the tempo throughout the broadcast day to fit the mood of the listeners," explains Hollingsworth.

"For example, in the morning from 6 a.m. to 8 a.m. people are getting up," he explains. "Soft music will lull them back to sleep, so we, instead, do lively music or comedy." Hollingsworth believes people should eat and take their time when they eat. So at 8:30, breakfast time, KBAY begins a soft music tempo. "Gay music would encourage them to gulp their food down," Hollingsworth explains. Then from 9:30 a.m. until 11 a.m. the tempo picks up "to make the housewife happy

Miss Ervin is with the Department of Communication, Stanford University, Stanford, California.

continued on page 47

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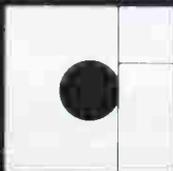
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she does her work.”

This is followed by “subdued” music for lunch (around noon). Then back to happy music. And finally, calm peaceful music around 5 p.m. at about the time the husband has come home from work and wishes to relax as he reads the paper.

Hollingsworth said he too maintains his tempo variations with consistency and predictability. “The listeners know that any time during the broadcast day they can tune in and find what they want to hear.” He believes that the station’s consistency is one of the more important things which contributes most to its success. Hollingsworth, who has been with KBAY since it was licensed in March 1963, adds, “You can’t build a loyal audience if you are not consistent.”

The management at “Top 40” rocker, KLIV concurs. “We play essentially 30 different songs a week depending on day parts,” according to Account Executive Terry Rust. KLIV’s format is more structured. “We add three new records each week. Twenty of the songs will be hits,” he explains, and “six songs will be on continued air play. That is, six songs will be specifically selected to be played more times during the day than other hits.”

The tempo is consistent as well. “We stay with current songs during our morning and afternoon drive,” Rust explains. “Morning drive” is between 6 a.m. and 10 a.m. “Afternoon drive” is between 3 p.m. and 7 p.m.

Rust believes women are more nostalgic than men. KLIV plays nostalgia music during the times of the day at which the housewives are listening. The station’s “nostalgia hours” are between 10 a.m. and 3 p.m.

KLIV’s target audience, however, is the fickle 24 age group. “They are button pushers,” Rust explains. “They do a lot of tuning out. They tune out news, free speech messages, and commercials,” he explains.

How does he cope with that? “We try to run content that lock people in,” he says. “We will announce that you are the tenth caller you win a record album to them listening.” Rust indicates the station has away cars and motor cycles in previous years.

Community involvement also contributes to the station’s success. “We cover the ‘Earth Quakes’ game professional soccer team, based in San Jose” and report the scores from various high school teams, says.

Clearly, Rust looks beyond that to agree with management at KSJO-FM and KBAY-FM that consistency along with tempo variations is the key to maintaining a loyal and a steady listenership. All assume that their audience’s mood is predictable and the audience, without regard for age and social class generally prefers one kind of format.

“If people want to hear news they tune into a station,” Rosetta says, “if they want to hear jazz tune into a jazz station. If they want soul, they tune into soul station. We don’t attempt to reach everybody.” Hollingsworth sums up, “It would be a disaster to try to be all things to all people.”

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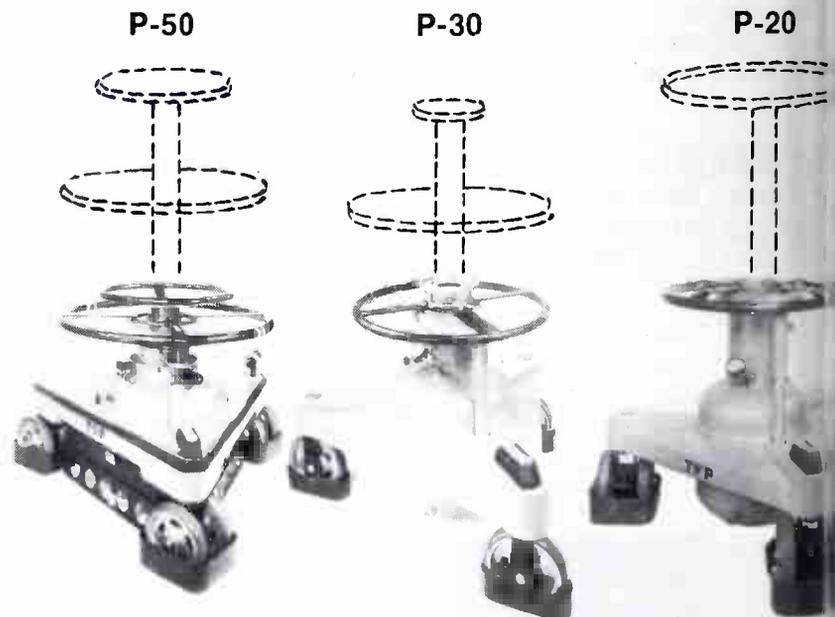
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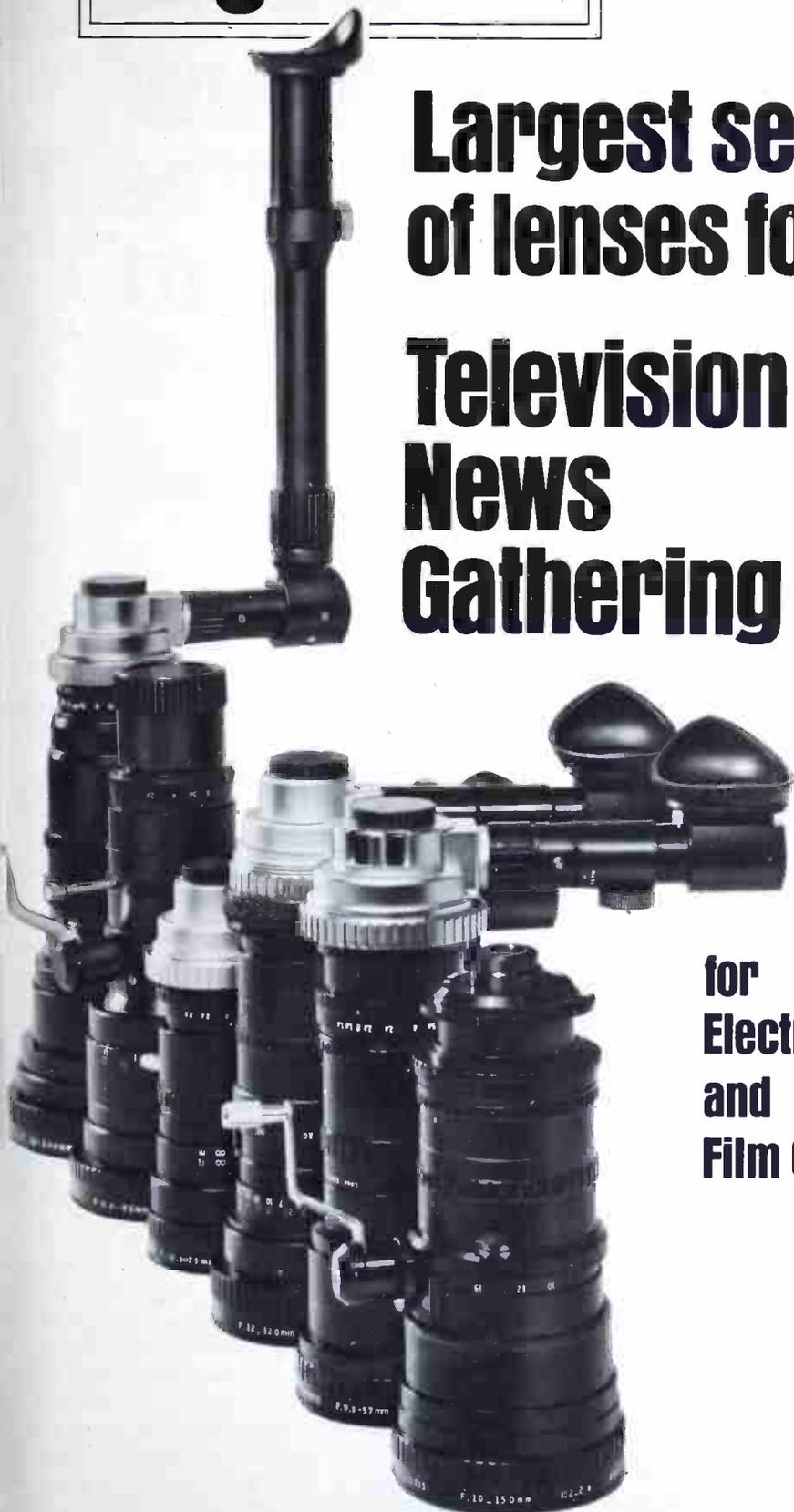
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Understanding Antenna Tuning Unit

by Philip Sonksen

Antenna tuning units behave like quarter-wave transmission-line transformers. Once you grasp that concept, the mystique of those coils and capacitors clears up.

If you are one of the many engineers who doesn't really understand the theory behind the hows and whys of the antenna tuning units of series-fed non-directional AM stations, this article should remedy the situation. I am going to try to explain in simplest theory the set-up of this mysterious maze of coils and capacitors. This should lead to understanding why you get the readings you do as a result of changing the coil tap.

First, think of the tuning unit as an artificial quarter wave length of transmission line. A quarter wave length of transmission line relative to a certain frequency can be used as an impedance transformer. For instance, if you take a quarter wave length transmission line with a characteristic impedance equal to that of the generator output, and connect one end to the generator and leave the other end open, an impedance transformation will take place due to standing waves in the line, Fig. 1. At the unterminated end, the impedance is highest because the voltage potential is highest and there is no current flow. At the generator end, there is high current and a low voltage potential which constitutes a short, or low

Mr. Sonksen is an engineer at WOW Radio, Omaha, Nebraska.

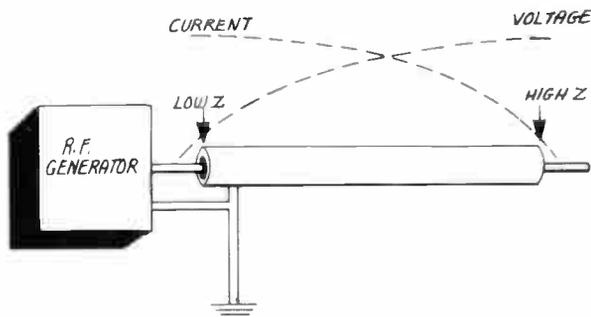


Fig. 1. Quarter wave length transmission line with an open end. R.F. Generator output of 50 ohms impedance is matched to transmission line characteristic impedance of 50 ohms.

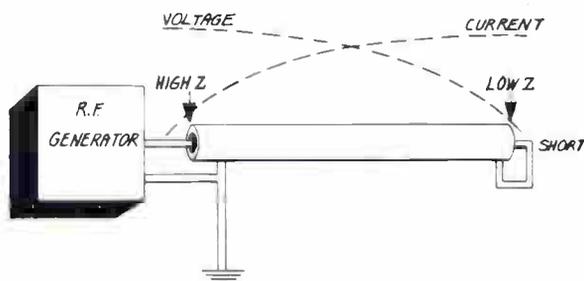


Fig. 2. Quarter wave length transmission line with a shorted end. Note this is the reverse of Fig. 1 with current a maximum and voltage a minimum.

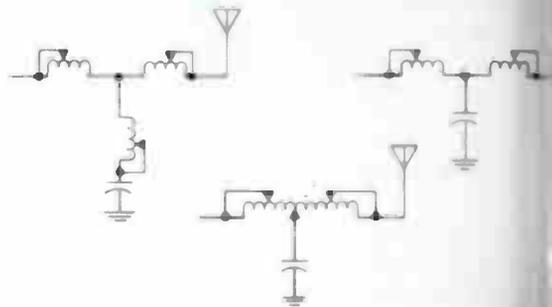


Fig. 3. Some typical T-configurations.

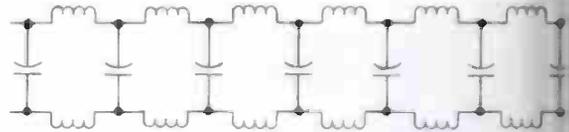


Fig. 4. Note that a transmission line is made up of small inductances and capacitances just as in a T-network.

impedance. If you take the same set-up and short the opposite the generator, the reverse of the open line take place, Fig. 2. At the shorted end, the voltage will be minimum and current will be maximum; at the generator end the voltage will be maximum and the current minimum.

This is basically how an impedance is inverted transformed in a quarter wave length of transmission line, which is commonly referred to as a quarter wave transformer. And this is exactly what is done in antenna tuning units, but by the use of coils and capacitors instead of an actual transmission line, which would be bulky to say the least. Most tuning units in non-directional AM stations use a Tee configuration for impedance transformation, although a Pi configuration has the same characteristics. Some Tee configurations are shown in Fig. 3.

Now let's take a look at the composition of a transmission line, Fig. 4. As you can see, the transmission line is made up of little inductances and capacitances, like the Tee network in the tuning unit, except that the tuning network uses real capacitors and inductors in the form of coils. With the proper mathematics, the tuning unit can be set up to act just like a quarter wave section of transmission line. By changing the characteristic impedance of a quarter wave transmission line, the impedance transformation can be set to the value desired between the generator (transmitter) and the load (antenna). As you can see in Fig. 5, there is an impedance transformation between the generator and the load. At the load end the voltage is higher and the current is lower than at the generator, and this constitutes a higher

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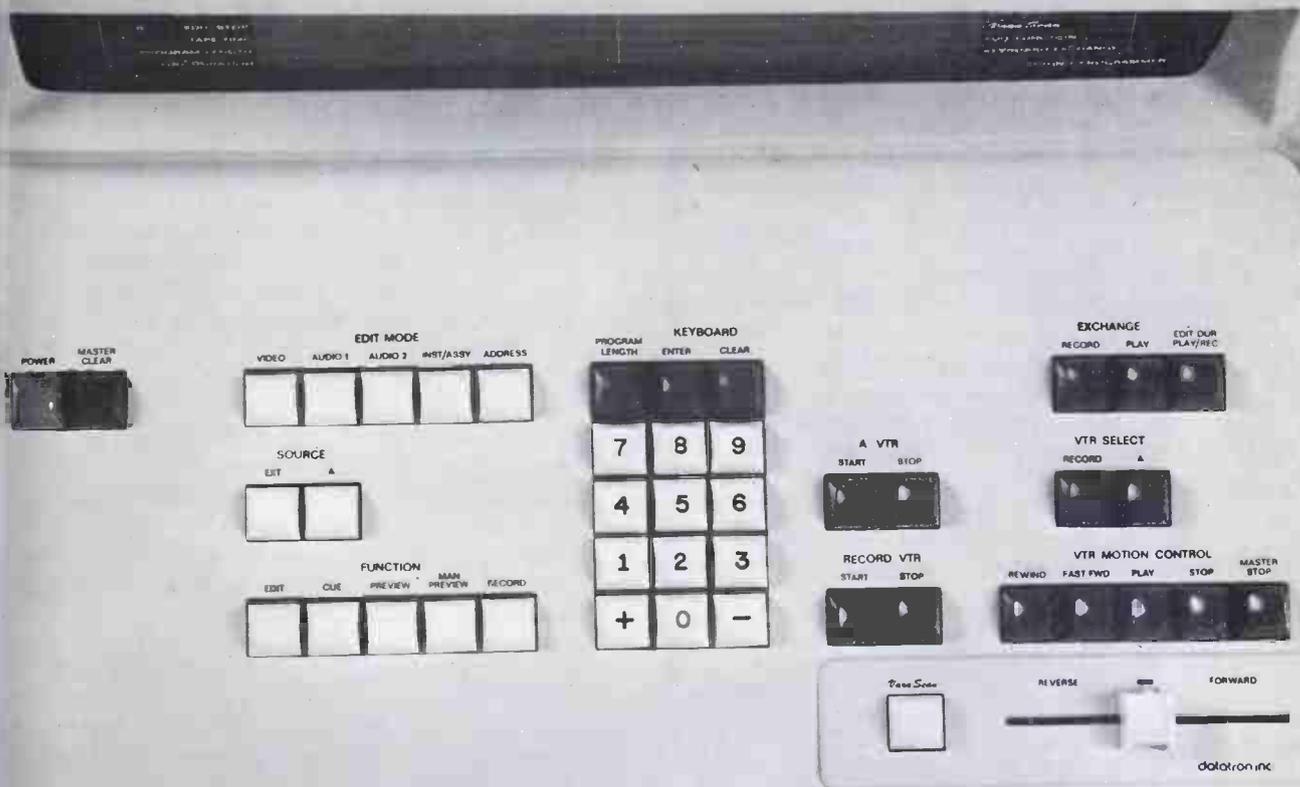
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pedance. At the generator end the voltage is lower and the current higher than at the load end, and this constitutes a lower impedance. The generator and load impedances are matched by a quarter wave section of 64.42 ohm line. To obtain the figure of 64.42 ohms for a quarter wave section of line, use the following formula:

Characteristic impedance of line =

$$\sqrt{\text{impedance out of generator} \times \text{resistance of load}}$$

Or, $Z_0 = \sqrt{50 \times 83} = 64.42 \text{ ohms}$

Now let's apply the theory to the antenna tuning unit. First, determine the characteristic impedance of the transmission line which is to be matched to the antenna, assuming that the transmitter is already matched to the transmission line. By using an RF impedance bridge, determine the resistance and the reactance of the antenna. For example, let's pick an antenna with 83 ohms resistance and no reactance ($J\phi$), and a transmission line whose characteristic impedance is 50 ohms. With these figures known, we can design and set up the antenna tuning unit using the formula:

$$X = \sqrt{Z_0 \times R \text{ antenna}}$$

in which
 X = reactance of the arms
 Z_0 = characteristic line impedance
 $R \text{ ant}$ = resistance of the antenna

Then, $X = \sqrt{50 \times 83}$, $X = 64.42 \text{ ohms}$

Now let's transpose the figures to the Tee network, Fig. 6. To make the Tee network act like a 64.42 ohm transmission line, we must bridge each individual arm separately and set each one to a reactance of 64.42 ohms as read on the impedance bridge.

Arm $X_1 = 64.42 \text{ ohms} + J$ (inductive reactance)

Arm $X_2 = 64.42 \text{ ohms} + J$

Arm $X_3 = 64.42 \text{ ohms} - J$ (capacitive reactance)

The inductance in series with the capacitor in Arm X_3 is used to trim the capacitive reactance. Some tuning units do not use a coil in series with the capacitor, so the capacitor in Arm X_3 must be carefully selected. It should be noted that almost all antennas have either $A+J$ (inductive reactance) or $A-J$ (capacitive reactance), and we have to get rid of this J , or reactance, before the tuning unit will function properly, Fig. 7.

Let's take another example with the transmission line having an impedance of 50 ohms, and the antenna having a resistance of 83 ohms but this time having a

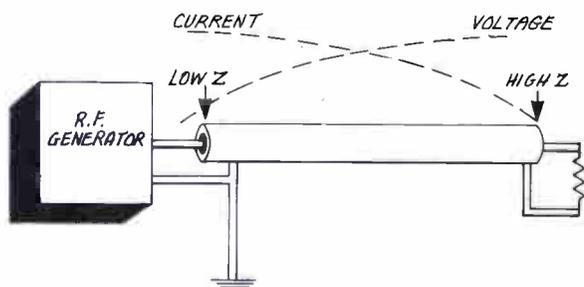


Fig. 5. With 83 ohms termination at the end of a quarter wave length transmission line there is an impedance transformation equaling 64.42 ohms.

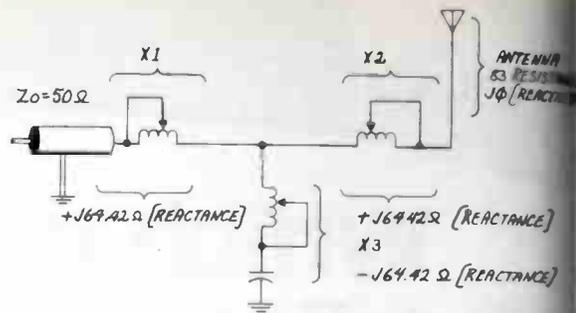


Fig. 6. The calculations of Fig. 5 transferred to a T-network.

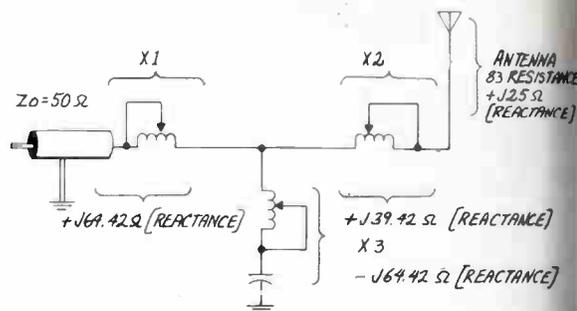


Fig. 7. The tuning situation with an antenna having an inductive reactance.

reactance of $+J 25$ ohms (inductance reactance). Notice now that Arm X_2 is $+J 39.42$ ohms. The reason behind this is that the rest of the reactance of Arm X_2 being provided by the antenna, which has a $+J 25$ ohm reactance. So the addition of $+J 39.42$ (Arm X_2) and $+25$ (antenna) equals $+J 64.42$, which makes all of the arms of the network symmetrical with a -90° phase shift. A 90° phase shift is the same as a quarter wave length of transmission line. If the reactance of the antenna were capacitive, such as a $-J 25$ ohms, you would need, in addition to the reactance in Arm X_2 (normal 64.42 ohms), an additional $+J 25$ ohms to cancel the -25 ohms in the antenna. So Arm X_2 should now be set $+J 89.42$ ohms.

Now for the final check of the tuning unit. All of the arms of the network should be connected, and the antenna should be connected to the output Arm X_2 . Connect an impedance bridge to the input of the tuning unit with the transmission line removed from the tuning unit. You should see a resistance of 50 ohms on the bridge which is the characteristic impedance of this particular transmission line. The reactance should always be zero ($J0$). If the resistance of the network as read on the bridge does not read the same as the characteristic impedance of the transmission line (in this case 50 ohms) move the coil tap on Arm X_2 . If the reactance is not zero on the bridge, move the coil tap on Arm X_1 . You may notice as you move a tap on one coil, that you will have to re-adjust the other coil tap until you obtain the correct readings.

That is really all there is to understanding the theory of operation and function of simple antenna tuning units.

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other VTR's are an integrated part
of the machine.



THE SOURCE 1976

Welcome to the Source: 1976. This year's guide to broadcast industry manufacturers, and independent reps/distributors is the most extensive listing ever compiled by *BM/E*. From the outset, we have strived to present the reader with a useful everyday reference to the most important sources of products and services to help keep him on the air and improve his everyday operations.

You will find that we have categorized products under 10 major headings. Every attempt has been made to breakout these major categories into useful and convenient subcategories so that you may find manufacturers of a specific item more quickly. Whenever possible, *BM/E* has verified the listing and product lines supplied by the manufacturer. The purpose behind the Verified Source (VS) notation is to assure you, the broadcaster, that the products noted in the company description are in production and regularly available to you. (*BM/E* has, on file, information supplied by each VS manufacturer to authenticate the availability of the product or products mentioned.)

The Source is divided into three sections: 1. The Instant Source Locator (p. 57). 2. An al-

phabetical listing of Manufacturers (p. 73). 3. Independent Reps/Distributors organized by state (p. 118).

Here's how to use your Source: First, identify the general category under which you would expect to find the item listed. For example, you are looking for a wireless microphone. The general category would be Audio. Using the Instant Source Locator, you will find that each major category is numbered. Audio is category 1. Go to this category and look down the column until you find the subheading, microphone. Then, read the subcategories and you will find that "wireless" is number 5. Scan the company names to the right and note the companies that are accompanied by the number 5. There may be more than one; moreover, if the name is also given an asterisk, this indicates that the company named is a Verified Source for the items noted.

Then, turn to the alphabetical listing and find the specific firm. There you will find the name of the firm, address, telephone number and a list not only of the product that you are seeking, but also other products manufactured by that firm.

In addition, the firm may have the notation VS to indicate that it is verified and a notation referring you to the page on which its advertisement appears (so that you may get additional information on the firm and its products) and a reference to the distributor section. If the listing has a reference to the distributor section, you may then turn to that section, find the state in which you do business and then identify the nearest distributor handling the product you want by looking for the manufacturer's ad reference noted in boldface type under the distributors listing. If no distributor in your state is listed for that product, then look in the neighboring state's listings for distributors there.

In some cases, you will find that the company listed in the manufacturer's section has listed field offices. In this instance, it is best to contact the nearest field office direct.

In the case of some generally available products, you may assume that they are normally available from any distributor handling that particular line of products. To locate such distributors in your area, simply scan the listings for your state and note the "line" which the distributor handles. Most distributors handle a number of manufacturers so their line description is necessarily general and you may have to inquire with them for the specific brand you desire.

Many companies have placed advertisements in this issue to present more information to you about their products and services. As you use *The Source* in the coming months, you may find that the *Advertisers Index*, on page 176, may serve as a good device for quickly locating these more complete explanations of the various products and services available.

BM/E has made every effort to make this directory as easy to use and as complete as possible. If you note any oversights, or know of any manufacturer or distributor that you feel ought to be listed, please write to us so that *The Source: 1977*, can be made even better.

Instant Source Locator

Audio Equipment
Video Equipment
Film Equipment

4. Lighting/Studio Equipment/
Set Design
5. RF/Transmitting/Receiving Equipment
6. Antennas/Towers/Transmission Lines

7. Measuring/Monitoring
8. Service
9. Cable TV Equipment
10. Components/Hardware/Systems

AUDIO EQUIPMENT

Amplifiers
Distribution

Altec 6,7*; Am. Data 1-3,5,6*; Ampro 3;
Audio Designs 1-3*; Audionics 6; Audio-
techniques (H&H Electronics) 6*; Autogram
1-6*; Automated Processes 1-8*; Belar 5*;
Bell 1-3,6,7*; Bethany Intl. 1*; BE 1-3,5*;
Boston Sound 3,8*; Caringella 3*;
Channelmatic 1*; Collins 3*; Cooke 1,3,5*;
Crown 3,5,6*; Datatek 1*; Di-tech 5;
Dunlap-Clarke 6; Dyma 1-3,5,6,8*; Dynair
1*; Elcom 3*; Electro & Optical 1,5,6;
Fisher-Burke 1*; Gotham (Neumann) 4*;
Harris 1,3,5,8*; Heath 3,6,9*; ISI 1,5; Intl.
Nuclear 1*; ITI Electronics 2,3,5,6,8*; John-
son 1,3,7*; LPB 1,3*; Marti 2,5*; McCurdy
1-3, 5,6,8*; McKay 5*; McMartin 5-7*;
Micro-Trak 3*; Modular Audio 1-6,8*;
Nakamichi 3,6*; National 5; NEC 1*; Neve
1*; Opamp Labs 1-3,4,6,8*; Orange 1-8*;
Panasonic 1,3,6*; Pacific Recorders 1-3*;
Pulse Dynamic 6,7*; Quad Eight 2,3,5;
Ramko 1-3, 5,6*; RCA 1-3, 5-8*; Revox
3,6*; Richmond Sound 1-4, 7*; Robins
1-6,8*; ROH 1-3,6,8; RTS Systems 3*;
Russco 3,5,6*; Sennheiser 5*; Sescom
2,3,5; Shinttron 1,5*; Shure 3,5,7*; Sontec
2-4; Spectra Sonics 1-3, 5-8*; Sparta
2,3,5*; System Engr. 1,2,4-6,8*; SMC 2,5*;
TEAC 2,3,5,6*; Tektronix 4,5*; TeleMation
1-5*; Telex 3,6,8*; Thomson-CSF 1*; TM
Systems 1,8*; UREI 1-4*; U.S. Pioneer
3,5,6*; United Res. Labs 1,3,4*; VIF 2,3*;
VAC 1*; Vamco 1; Vital 1*; Ward-Beck
1-3,6,8*; Wilkinson 1-3*

Controls
Attenuators
Variable Attenuators
Switchers

Alco 3*; Am. Data 3*; Ampro 1,2*; Audio
Designs 2*; Automated Processes 2,3*; BE
2,3*; Central Dynamics 3*; Channelmatic
3*; Comtec 3*; Crown 2*; Dyma 1-3*;
Dynair 3*; Gotham (Danner) 1,2*; Kay Ele-
metrics 1,2*; McCurdy 3*; MCI 2*; Modular
Audio 2*; Neve 3*; Orange 3*; Quad Eight
1-3; Richmond Sound 3*; Robins 1,2*; ROH
1,3; Spectra Sonics 2,4*; Switchcraft 3*;
Tech Labs 1,2*; Texscan 1*; UREI 2; VIF
3*; Vital 3*; Waters 1,2*

Processing
Equipment

Allison 2; Altec 2,4,5*; Ashley 5*; Audio
Designs 2,4*; Audio Interface 2*; Audio-
techniques (Audio & Design Record; Tri-
dent) 2,4,5*; Audiotronics 5*; Automated
Processes 1,5*; B&W 2,10*; Caringella 1*;
Dyma 1-3, 5-7*; Elcom 1-3*; ESC 4,5,8*;
ESE 8*; Eventide 1-3,5-8*; Gotham (EMT)
1-3,5*; Harris 1-3*; Heath 5*; Inovonics
1-3*; Ionic 12*; ITI Electronics 2,4*; Kahn
4*; Lexicon 7,8,12*; LPB 2,3*; Marti 1-3*;
McCurdy 1,2,4,5*; Micmix 6-8*; Modular
Audio 1,5*; Moseley 1,3*; Multronics 4-6;
Neve 1-5,9*; Opamp Labs 1,5*; Orban/
Parasound 3,5*; Orange 1,5*; Panasonic
5*; Pacific Recorders 2,3*; Quad Eight 2,4;
Ramko 1-3,7,8*; Rapid Q 9*; RCA 1-3*;
Richmond Sound 5*; Robins 1-3*; ROH 2*;
Shure 2-4*; Sescom 3; Sontec 2,3; Spectra
Sonics 2-4*; Sphere 4,5*; System Engr.
1-3,5,6*; SMC 1*; Thomson CSF 1-3,5*;
Transist-O-Sound 1*; UREI 2,3*; U.S.
Pioneer 5*; Ward-Beck 2,3,5*; Wilkinson
2,3*; Dorrrough

Automation
Equipment

1. sequencers,
relay
2. sequencers, time
insertion
3. controllers,
computer/
microprocessor
4. memory units
5. reel decks
6. multi-cart
machines
7. read out/display
8. data input
devices
9. auto loggers
10. tone generators
11. auto
time/weather
announcers
12. complete
systems
13. tone
detection/control

Aitken 1; Amilon 3,4,6,8,9*; Audio Services
1,12; Audio/Video Products 3,12; Autogram
1,2,4-6,9,10,12*; Automated Processes 4*;
BE 2*; Channelmatic 10*; Control Design
3-7; Datametrics 1,2*; ESE 7*; Harris 1-12*;
IGM/NTI 1-3,6,9-12*; Ionic 4; ITC 5,6*; MCI
5*; Microprobe 1,12*; Microtime 3*; NEC 3;
Nationwide 2-4,7-9*; Otari 5*; RCA 3-6,12*;
Revox 5*; Rivers 10,13*; Schafer 3-12*;
Scully 5*; L.J. Scully 5*; Spectra Sonics
10*; SMC 2-12*; Tape-Athon 5, 11, 12*;
Tektronix 7,8*; Telex 5*; UMC 6*; VIF
5,6,9,12*

Consoles

1. mixers
2. mono
3. stereo
4. quad
5. audio for TV
6. portable
7. automated

Altec 1,6*; Ampro 1-5*; Arp 1,2,6*; Ashley
1-3,6*; Audio Design 1-6*; Audio Interface
1*; Audiotechniques (Allen & Heath) 1,3,6*;
Audiotronics 3-5*; Autogram 2,3,5*; Auto-
mated Processes 1-5,7*; BE 1-3,5*; Boston
Sound 1*; Central Dynamics 1,5,6*; Cetec
Audio 3-6*; Collins 1-3*; Crossroads 1*;
Dyma 1-6*; Harris 1-3,5,6*; ISI 5*; KMS 1*;
LPB 1-3,5*; McCurdy 1-5*; McMartin
1-3,5,6*; MCI 1-5*; Micro-Trak 1-3,5,6*;
Modular Audio 1-3; NEC 5*; Neve 1-7*;
Opamp Labs 5,6*; Pacific Recorders 1,5*;
Philips Audio Video 1-5*; Pulse Dynamic 1*;
Quantum Audio 1,3,4*; Quad Eight 1-4*;
Ramko 1-3,5*; RCA 1-6*; Revox 1*;
Richmond Sound 1,3,5,6*; Robins 1-6*;
RTS Systems 6*; Russco 2,3*; Sennheiser 6*;
Shinttron 5*; Shure 1,2*; Spectra Sonics
1-4*; Sparta 1-6*; Sphere 1,3*; Switchcraft
1*; Studer 3; Systems Engr. 2,3; 2005 AD
1,3,5,6*; TEAC 1,3,4*; TeleMation 5*;
Transist-O-Sound 1*; UAP 1,5,6*; VIF 1*;
Ward-Beck 1-6*; Westlake Audio (Harrison)
1-4*; Wilkinson 2,3,5*

Disc Cutting
Equipment

Gotham (Neumann)*; Neve*; L.J. Scully*

Disc Playing
Equipment

1. turntables
2. pickup arms
3. pickups, stereo
4. pickups, quad
5. turntable
6. complete disc
consoles
7. test record

AKG 3*; Astatic 3; Ampro 1-6*; Aristocart
(WBC) 2*; Audionics 1; Automated Proc-
esses 5*; BE 1-3,5,6*; Broadcast Sound
1-4*; CBS Technology 7*; Dyma 1-3,5,6*;
Elcom 5*; Elpa 1*; Gotham (EMT) 1-3*;
Harris 1-5*; LPB 1,2,5,6*; McCurdy 1-3,5*;
McMartin 5; Micro-Trak 1-6*; Modular Audio
5*; Nakamichi 3*; Orange 5*; Panasonic/
Technics 1*; QRK 1-3,5*; Ramko 5*;
RCA 1-5*; Russco 1*; Sansui 1; Shure 2-5*;
Sparta 1-6*; Stanton 1,3-5*; TEAC 1,2*;
U.S. Pioneer 1*; Ward-Beck 5*; Wilkinson
5*

Headphones

AKG*; Audiotronics*; Beyer*; Broadcast
Sound*; ClearCom*; Koss; Nakamichi*;
Panasonic*; Pulse Dynamic*; RCA*;
Sennheiser*; Stanton*; Superscope; TEA (Am-
plivox)*; Telephonics; Telex*; U.S. Pioneer*

Asterisk denotes that manufacturers so identified have verified that the products mentioned are in regular production. Current data on these products are on file with BM/E.

SOURCE LOCATOR

Intercom Systems Clear Com*; Comrex*; Fisher-Berkeley*; Heath*; ISI*; McCurdy*; McMartin*; Orange; Philips Audio*; RCA*; Rivers*; RTS Systems*; Systems Engr.; TeleMat-ion*; TEA*; Telex*; VAC*; Ward-Beck*

Microphones
 1. dynamic
 2. condenser
 3. ribbon
 4. electret
 5. wireless
 6. shotgun
 7. lavalier
 8. booms, dollies, stands
 9. accessories
 10. nameplates

Advent 1*; AKG 1,2,4,6-9*; Altec 1,2,4,8*; Atlas 8,9*; Audiotechniques (Monks) 8,9*; Audiophonics 1*; Beyer 1,3,5,7-9*; B&K 2*; Comrex*; Dyma 1,2*; Eddor 2,4,7; Electro Voice 1,4,6,7*; Frezzolini 6; Gotham (Neumann) 2,7,9*; Group 128 2,8*; Ikegami 5*; JVC 1,2,4,6,8,9; KMS 4,7,9; Nagra 7,9*; Nakamichi 1,2,4*; Panasonic 1,2,4*; Pulse Dynamic 1*; RCA 1-3,8,9*; Redding Radio 10*; Sennheiser 1,2,4-7,9*; Sescam 1,4; Shure 1,3,7,9*; Sony 4; Studer 2; Superscope 4; TEAC 4*; TEA (Reslo)*; Television Products 8*; Telex 1,4*; Thomson CSF 5*; Transound 4; U.S. Pioneer 4*; Vega 5*

Music Synthesizers Arp*; Ionic*; Electrocomp; Moog

Noise Reduction Systems Audio Designs*; DBX*; Dolby*; Gotham (AEG Telefunken)*; Inovonics*; Orange; TEAC; U.S. Pioneer*; Ward-Beck

Patch Panels
 1. telephone jacks
 2. telephone plugs
 3. patch cords
 4. pre-wired panels

Audio Accessories 1-4*; Audio Designs*; Cooke*; Dyma*; McCurdy*; Potomac*; RCA*; Switchcraft 1-3*; Trompeter; Ward-Beck*

Quad Matrix Equipment
 1. encoder
 2. decoder

Audionics 1,2; CBS Technology 1*; Heath 2*; RCA 1,2*

Reverb Units AKG*; Dyma*; Eventide*; Gotham (EMT)*; Micmix*; MXR; Orban/Parasound*; Pulse Dynamic*; Robins*; U.S. Pioneer*

Sound Effects Eventide*; Ionic*; MXR; Orange

Speakers
 Advent*; Altec*; Atlas*; Audio Designs*; Audionics; Audiotechniques*; Audiophonics*; Broadcast Sound*; Cetec Audio*; Crossroads*; Crown; Electro-Voice; Gotham (K&H)*; Heath*; JBL; McCurdy*; Nakamichi*; Orange; Panasonic*; Philips Audio; Pulse Dynamic*; RCA*; Russco*; Sennheiser*; HH Scott; Shure*; Spectra Sonics*; Superscope; Tandberg*; U.S. Pioneer*; Westlake Audio

Studios
 1. cabinets and furniture
 2. acoustic materials and treatment
 3. complete studio construction
 4. on-air lights
 5. cue boxes

Ampro 1,3*; Audiotechniques 5*; BE 1*; Broadcast Sound 4*; Dyma 1,3*; Grinnan 1,3*; Harris 1*; LPB 1,3*; McMartin*; McCurdy 1,3*; Micro-Trak 1*; Pacific Recorders 1,3*; RCA 1*; Sparta 1*; Westlake Audio 1-3*

Synchronizing Equipment Automated Processes 1,2*; CMX 1,2*; Cooke 1*; Datatron 1,2*; Datametrics 1*; EECO 1,2*; Electro & Optical 1*; ESE 1*; MCI 2*; Magnatech 2; Magnasync/Moviola; Scully 1*; Skotel 1*

Tape, Audio Magnetic
 Advent 3*; Agfa-Gevaert 1,4*; Ampex 1-4*; Aristocart 1,4*; BASF 1-4*; BE 2*; Capitol Magnetics 1-4*; Fidelipac 2,4*; Fuji; Intl Audio 2,3*; 3M A/V 1-3*; McCurdy 2*; Maxell 1-3; Memorex 1-3*; Nakamichi*; Nortronics 4*; Panasonic 2,3*; Pentagon 3; RCA 4*; Recording Supply 1*; Redding Radio 3; Sparta 2*; Standard Tape 4*; Taber 4*; TDK 1-4*; United Res. Lab 1*; VIF 4*

Tape, Cartridge Player/Recorders
 1. single
 2. dual
 3. multiple
 4. time delay

Amilon 1-4*; Ampro 1,2*; Audi-Cord*; Bell 1; BE 1-4*; Harris 1-3*; IGM/NTI 3*; ITC 1-4*; LPB 1*; QRK; Rapid Q 1-4*; RCA 1-3*; Sparta 1-4*; SMC 1,2*; Tapecaster; Telex 1,3*; UMC 1-3*

Tape, Cassette Player/Recorders Advent*; Amilon*; Audiophonics*; Cetec Audio*; Heath*; Lexicon*; Nakamichi*; Panasonic*; RCA*; Sharp*; Superscope; Tandberg*; TEAC*; Telex*; U.S. Pioneer*

Tape, Open-Reel Recorder/Players
 1. portable
 2. studio systems
 3. tape decks
 4. time delay
 5. logging recorder

Ampex 1,2*; BE 3,4; Crown 3; Dyma; Electro Sound 1,3*; Elpa 1,3*; Gotham (Telefunken) 2*; Ikegami 5; ITC 2,3*; M 2-4*; 3M 2,3; Nagra 1*; Otari 1-3*; Pentagon 2,3; RCA 1,2,5*; Revox 1,3,4; Schafer 3*; Scully 2,3,5*; L.J. Scully 3; SMC 2,3*; Studer 1,2; Superscope; Tapathon 1-3,5*; Tandberg 1*; TEAC 2; Telex 2,3,5*; U.S. Pioneer 3*; United Res. Lab 2,3*; VIF 2,3,5*

Tape, Duplicators Ampex*; Audio/Tek; Cetec Audio*; Electro Sound*; Garner*; Gotham (Telefunken Intl. Audio)*; Otari*; Pentagon; Telex*

Tape Editing Equipment Automated Processes*; Datatron*; EECO Elpa*; Kaitronics; Nortronics*

Tape Heads
 1. new
 2. reconditioned

Computer Magnetics 1,2*; Ferra Flux; Mir Magnetics; Nortronics 1,2*; Saki*; Tat 1,2*; UMC*; Vikron*

Tape and Head Erasers
 1. tape degaussers
 2. bulk erasers
 3. conveyor erasers
 4. spot eraser

Annis 1,2*; Ampro 1,2*; BE 2*; Fidelipac; Garner*; HP 1*; ITC 2*; Microtran 1,2; Nakamichi 1*; Nortronics*; Optek 2*; R 1,2*; Robins 2*; Sparta 2*; Taber 2*; TE 1,2*; UMC 2*

Tape Storage
 1. open-reel
 2. cartridge
 3. cassette

Aristocart 2*; BE 2*; Capitol Magnetics; Dyma (Broadcast Record) 1-3*; Fidelipac 2*; Grinnan 1-3*; Harwood 1*; Micro-Trak; Neumade; Nortronics 3; RCA 2*; Simp; Sparta 2*; Storeel 1-3*

Telephone Coupling Equipment B&W*; Dyma; McCurdy*; Microtran; Nationwide*; Pulse Dynamic*; Reddi Radio*

VU and Peak Indicators
 1. analog
 2. digital
 3. LED

Amber 3*; Ampro 3*; Audio Designs*; Dyma 1; Electro & Optical 1*; Harris 1*; MCI; McGraw-Edison 1; Micmix*; Modular Audio 3*; Nationwide 2,3*; Pulse Dynamic; Quad Eight; Ramko 3*; RCA 1*; Sontek 1; TM Systems 1*; Triplet 1*; 2005 AD 2; Weston 1*

Tape Accessories and Services
 1. empty reels, carts, cassettes
 2. auto loaders
 3. splicing blocks
 4. auto splicers
 5. splicing tape
 6. leader tape
 7. tape timers
 8. tape cleaners
 9. tape cleaning and evaluating service
 10. tension gauges
 11. alignment gauges
 12. tension servo
 13. splice finders

Agfa-Gevaert 5; Ampro 11; Audio Audio/Tek 2; BE 1,2,7,8*; Electro Sound 1,4*; Elpa 3,5*; ESE 7*; Fidelipac 1,3,5,8,11*; Gotham (Lyrec) 7*; Harwood 1*; IGM/NTI 1,10,11; Inovonics 12*; JVC Audio 11*; 3M A/V 1,3,5,6,8*; McCurdy; Nagra 1,7*; Nortronics 3,8*; Nova 8; Panasonic 1*; Plastic Reel 1; Polyline 1; QRK; Ramko 2*; RCA 1,2*; Recording Supply 1,6*; Robins 8*; Senstrol 13; Sparta; Studio Tape Exchange 9; Telex 1*; TDK Tentel 10*; U.S. Pioneer 1*; UMC 1; Vamco 7; VIF 10*; Westlake Audio 3,8*

Other Audio Accessories
 1. connectors
 2. on-air light
 3. magnetometers
 4. disc cleaner
 5. cable tester
 6. polarity tester
 7. audio squelch
 8. voice line improber
 9. transformer
 10. precision oscillator
 11. stereo synthesizer
 12. silence alarm

Annis 3*; Audio Interface 2; Audiotech 4; Crossroads 5; Gotham 6; ITT Cannon; Kahn 7,8; King; MCI 5; Microtran 9; Moco Audio 9,10; Orban/Parasound 11; R 12; Switchcraft 1,5*

*The asterisk denotes that manufacturers so identified have filed that the products mentioned are in regular production. Rent data on these products are on file with BM/E.

5 Good Reasons to See the Datavision D-3000 Video Character Generator Before Making a Purchasing Decision.

D-3000 Character Generator produces video-type characters with excellent clarity (1120-element character resolution). Each letter is smooth and precise. Now you have a greater selection of type fonts including Upper and Lower Case, selected math symbols, and accented foreign language characters. Used with the optional D-4000 Random Access Memory, you can store up to 1,000 pages on each 5.25" floppy diskette. With our new Animation Mode (optional), you can play out full frames at a rate of 6 or 12 frames per second from the D-4000 Memory, creating motion pictures.

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SOURCE LOCATOR

2. VIDEO EQUIPMENT

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

Ampex 1,2*; CEI 1-3*; Cohu 2,3*; Fernseh 1,2*; GBC 1-3*; Harris 1-3*; Hitachi 1-3*; Ikegami 1-3*; IVC 1-3*; Magnavox 3; Marconi 1*; NEC 1,3*; Panasonic 2,3*; Philips AV 1-3*; RCA 1,2*; Sanyo 3; Sharp 3*; Sony Brdcast 2*; Sony Corp. 3*; Thomson CSF 1,2*

Cameras, TV Portable Color/Portable Battery Operated

Akai*; Ampex*; Asaca*; CEI*; Concord Comm; Fernseh*; GBC*; Harris*; Hitachi*; Ikegami*; JVC*; IVC*; Magnavox; Marconi*; NEC*; Panasonic*; Philips AV*; RCA*; Sony Brdcast*; Sony Corp.*; Thomson CSF*

Cameras, TV Mono

Akai*; Asaca*; Belden Comm*; Cohu*; Colorado Video*; Elec & Opt Sys*; GBC*; Gen Electrodynamics; GE*; Hitachi*; Lenco*; Marconi*; NEC*; Panasonic*; Philips AV*; QSI*; RCA*; Sony Corp.*; Telemation*

Camera Lenses and Accessories

AIC*; Angenieux*; Belden Comm*; Bosch & Lomb*; Canon*; CEI*; Cohu*; Dynasciences*; Fujinon*; GBC*; GE*; Ikegami*; IVC*; Javelin*; Lenzar*; Marconi*; Panasonic*; Rank*; Tele-Cine*; Visual Methods*; Cosmicar*; Zoomar

Camera Heads, Mounts, Dollies, ENG braces, etc.

AIC*; Cinema Prod*; Cohu*; GBC*; Ikegami*; ITE*; IVC*; KVC*; Listec*; O'Connor*; Panasonic*; Quick-Set*; RCA*; Saki*; Television Products*

Remote Control Mounts

Cunningham Corp*; ITE*; Tele-Cine*; Power Optics

Character Gens
 1. alpha-numeric gen
 2. graphics generator

Ann Arbor 1; BJA 2*; Chyron 1,2*; Comad 1*; Datametrics 1,2*; Datatron 1*; Ikegami 1,2*; Knox 2; 3M Mincom 1,2*; MSI TV 1*; Shintron 1*; System Concepts 1,2*; Telemation 1,2*; Thomson CSF 1,2*; Video Data Sys 1*; Visionary Elec 2; Laird*

Chroma Keyers
 1. RGB
 2. encoded
 3. luminance

American Data 1*; CDL 1-3*; Computer Image 1*; Comtec 1*; Dynair 1,2*; Dynasciences 2*; Image Transform 1*; Ind. Sciences 1*; Inter. Nuclear 1*; 3M Mincom 1*; Panasonic 3*; RCA 1*; Telemet 1-2*; Thomson CSF 2*; Viscount 1*

Color Correctors

CMC*; Datatek*; Ikegami*; Inter. Nuclear*; NEC*; Rank*; RCA*; Television Equip Assoc*; Thomson CSF*

Color Encoders

CEI*; Cohu*; GBC*; Ikegami*; Lenco*; 3M Mincom*; Marconi*; NEC*; Philips*; Rank*; RCA*; Telemation*

Dropout Compensators

Arvin/Echo*; Asaca*; 3M Mincom*; Microtime*; Micro Consultants*; NEC*; RCA*

Film Telecine Equipment
 1. 16mm projectors
 2. slide projectors
 3. multiplexer
 4. complete systems

Buhl Optical 1,2,3*; Clewer 1*; Cohu*; Fernseh 1,3,4*; GBC 1*; Ikegami 1-4*; IVC 3,4*; Marconi 4*; MSI TV 2*; Panasonic 3*; Philips 4*; Rank 2,4*; RCA 1-4*; Spindler & Sauppe 2*; Telecine 3*; Thomson CSF 4*; Zei-Mark 1-4*; Harris 1-3*; Kodak 1-3*; Laird 1-3*; Singer 1,3*; Telemation 1-4*

Film to Video Transfer

Multi-Track*; W.A. Palmer*; Tele-Measurements; Goldmark Comm.

Image Enhancers

Asaca*; Cohu*; Dynasciences*; Hitachi*; Ikegami*; 3M Mincom*; Microtime*; NEC*; Rank*; Thomson CSF*; Video-Optics*; Telemet*

Monitors, picture
 1. b&w
 2. color

Amtron 2*; Asaca 1*; Audiotronics 1,2*; Ball Brothers 1,2*; Belden Comm 1*; Cohu 1,2*; Conrac 1,2*; Elec. & Opt. Sys 1,2*; GBC 1,2*; Hitachi 1,2; Ikegami 1,2*; Javelin 1*; Panasonic 1,2*; Philips 2*; RCA 2*; Rhode & Schwarz (Barco) 1,2*; Sharp 1,2*; Sony Brdcast 2*; Sony Corp 1,2*; Tektronix 1*; Tri-Tronics 2*; Unimedia 2*; Video Aids 1,2*; World Video 2*; Electrohome 1,2; Broadcast Elec. 1*

Processing Amplifiers

American Data*; CDL*; Elec & Opt Sys Fung*; Ind Sciences*; Leitch*; Lenco*; Mincom*; NEC*; Telemation*; Thom CSF*; Versa Count*; Dynosciences*; Grass Valley*; Telemet*

Pulse & Distribution Amplifiers
 1. pulse
 2. distribution
 3. subcarrier
 4. DC coupled
 5. equalization

American Data 1-3*; CDL 1-4*; Coastcom Cohu 1-3*; Cooke 1,2*; Datatek 1-3*; Tech 1; Dynair 1,2*; Dynasciences 1; Elec & Opt Sys 1-3*; GBC 1,2*; Ikegami 1-3*; Ind. Sciences 1-3*; Inter Nuclear 1; J&D Inter 1-3; Lenco 1-4*; 3M Mincom 1; NEC 1-3*; Panasonic 1-3*; RCA 1,2*; Shintron 1,2*; Richmond-Hill 1,2*; Tektronix Telemet 1,2*; Thalner 2*; Thomson CSF 1-3,5*; Vamco 2*; Viscount 2*; Vital 1; Grass Valley 1-3*

Automated Technical Operation Systems

CDL*; Grass Valley*; Vital*

Production Switcher
 1. large
 2. small
 3. ENG

American Data*; CDL 1,2*; Compu Image 1,2*; Comtec 2*; Duca Richardson 1,2*; Dynair 1,2*; Dynasciences 2*; Elec Opt Sys 2; GBC 2*; Ind Sciences 1,2*; Nuclear 2*; Lines 3; 3M Mincom 2*; Marconi 1,2*; NEC 1,2*; Panasonic 2*; Richmond Hill 1,2*; Ross 1,2*; Shintron 2*; Sony Corp 2*; Technisphere 3; Telemet 3; TRI 1; Viscount 1,2*; Vital 1,2*; Grass Valley 1

Routing Switchers

American Data*; Avtel*; CDL*; Comte Datatek*; Di-Tech; Duca Richardson Dynair*; Dynasciences*; Elec & Opt Sys Ind. Sciences*; Inter Nuclear*; Marc NEC*; QSI; Richmond-Hill*; Telematic Telemet*; Vamco; Viscount*; Vital*; Grass Valley*

Signal Equalizing System

Datatek*; Ind. Sciences*; NEC*; Grass Valley

Sync Generator System
 1. sync
 2. color bar
 3. black burst
 4. stairstep/ramp
 5. multiburst
 6. digital sync decoder
 7. gen-lock

CDL 6*; Cohu 1-3*; Cooke 1*; Dynasciences 1-3,5*; Elec & Opt Sys 1,4*; GBC 1,2*; Grass Valley 1,3*; Hitachi 1; Ikegami 1-3*; Ind Sciences 1*; Lenco 1-5,7*; Mincom 1,2*; Marconi 1*; NEC 1-3*; Philips 1-5*; RCA 1-3*; Richmond-Hill 1*; Rhod Schwarz 1,4,5*; Shintron 1*; Technisphere 7; Tektronics 1,5*; Telemation 1-5*; Telemet 4,5*; Thalner 1*; Thomson CSF 1-5*; Ultra Audio Pixtec 1*; Video Data 1-5,7*; Video Data Sys 1,2*; Vis. Info Int. 1,2,4,5*; Vital 1,3,6*; Control Concepts

Switchers, automated

American Data*; CDL*; Computer Image; Comtec*; Duca-Richardson*; 3M Mincom; NEC*; Panasonic*; Vital*; Grass Valley

Standards Converters

Elec & Opt Sys*; Fernseh*; Marconi*; Micro Consultants*; Richmond-Hill

Synchronizer
 1. frame
 2. field

CVS 2*; Micro Consultants 1*; Microtime 3*; NEC 1,2*; RCA 1*; Vital 1*

Videotape
 1. new tape
 2. tape cleaning & evaluating
 3. reprocessed tape

Ampex 1*; Calvert 3*; DuPont 1*; Fuji Goldmark 3*; Intern'l Audio 1*; Kaitron 2*; Karex 1; 3M A/V 1*; Memorex 1*; Philips 1*; Recortec 2*; Sony Brdcast 1*; Sony Corp 1*; Studio Tape Exchg 2,3*; The Video Tape Co. 1-3*

Time Base Correctors
 1. helical
 2. helical non-capstan servo
 3. quad

Ampex 1*; Arvin/Echo 1; Asaca 3*; BJA 1-3*; Digital Video 1-3; Edutron 1; Kar State Micro Consultants 1-3*; Microtime 1-3*; NEC 1-3*; RCA 1,3*; Sony Brdcast 1-3*; Systamatics 1*

Videotape Acces.
 1. tape cleaners
 2. VTR head cleaners
 3. replacement heads
 4. reels
 5. tape evaluators
 6. storage
 7. tape tension gauge
 8. rewinder
 9. bulk erasers
 10. demagnetizers.

Annis 10*; Arvin/Echo 8*; Kaitronics 5* A/V 1,2,4,7*; Microtran 9*; Neumade 1,6,8; Nortronics 9*; N.O.V.A. 1*; Optelec 4*; Panasonic 4*; RCA 6,9*; Recording Su 4*; Recortec 1,5,7,8*; Television Equip Assoc 1*; Videomax 3*

otape rder/Players ad ical gmented-helical tomated stems	Akai 2*; Ampex 1,2*; Arvin/Echo 2*; Asaca 1*; Avonix 2,4*; Avtel 4*; Fernseh 3*; GBC 2*; Hitachi 2,3*; Ikegami 2*; IVC 2-4*; Javelin 2*; Merlin 1*; NEC 1,2*; Panasonic 2*; Philips 2*; RCA 1,2,4*; Recortec 1,4*; Sony Brdct 2*; Sony Corp 2*; Systa-Matics 4*; Vital 4*
ead and ine Rebuilding	AF Assoc*; Ampex*; CMC*; Merlin*; RCA*; Recortec*; Saki*; Videomax*
dge/Cassette y yers orders omation ntrollers mplete auto. mitems art systems oaded carts	Ampex 1-5*; Avonix 1,2*; CDL 3,4*; Channelmatic 4*; Dynasciences 3*; Merlin 1-3*; Microtime 3*; NEC 1,2*; NES 3,4*; Panasonic 1,2*; Philips 1,2*; RCA 1-6*; Recortec 6*; Re-Play 6*; Sony Brdct 1,2*; Sony Corp 1,2*; Systa-Matics 3*; Vital 4*
et tape Editing or-controller e code gens te timer nicers e code reader cessories me counter	Automated Processes 1*; Avonix 1*; Beta Tech 1,3*; CDL 1,2,5*; CMX 1,2,3*; Convergence 1,3,7*; Datametrics 2,5*; Datatron 1,2,5,7*; EECO 1,2,5*; Elec & Opt Sys 2,5,7*; ESE 3*; Kaitronics 2,5*; Merlin 3*; MicroVision 1,2*; RCA 1-6*; Recortec 1-3*; Skotel 2,5*; Sony Brdct 1,2*; Spectr-Vision 1-7*; Tech Elec 1*; Technisphere 1*; TRI 1,2,5*; Vamco 3; Visual Aids 1* Ampex 1*
otape icator ad ler	Ampex 1*; Arvin/Echo 2*; Microtime 2*; Panasonic 2*; Sony Corp 2*
to Film arfer	Ikegami*, Palmer Film; Teledyne
Identification ms	Ampex*; CDL*; Grass Valley*
Discs	Amcomp*; Ampex*; Arvin/Echo*; CMC*; Eigen*
Effects es ecorizers llimation te/date erator oor contrast aluator thesizers mpressors ositioners	Arvin/Echo 2; Beta Tech 1*; BJA 1,2,5*; Colorado Video 1*; Computer Image 2*; CVS 6; Elec. & Opt. Systems 1*; Ikegami 1*; Ind. Sciences 1*; Telemet 1*; Micro Consultants 6,7*; NEC 6*; Thomson CSF 1*; J&D Int'l 1;
Equip., Misc. omatic ecine light ontrol eo film noise ducers eo filters omb decoders ualizers D converters eo delays eo presence ector eo ater/prompter ame sync. ower packs, rtable video mera ito skew. rrector rge screen ojectors eo lock to ag. film record eo attenuators eo test charts slides lock A convertors glitchers lor phase equalizers rts, tables ounts, wall reen splitter eo line isolator	Advent 14*; Alexander Mfg. 12; Andersen & Assoc. 7; ASACA 6*; Audio-Video Eng. 3*; Avonix 18*; Coastcom 3; Colorado Video 8*; Comark 16*; Computer Lab 6, 19, 20*; CMC 5*; Cooke 5*; Corley 17*; Datatek 3,5,21*; ESC 3,5,7; GBC 8; Goldmark 13*; Gruber Prod. 22*; Ikegami 1,14*; Image Mag. 14*; Ind. Sciences 1*; Inter. Nuclear 5*; IVC 12*; Kalart Victor 14*; KVC 23*; Lenco 4,5,8*; McGraw-Edison 16*; Micro Consultants 6*; Microtime 3,7,13*; NEC 3,6,8,12,17*; Oregon Mag. 18; RCA 17*; TEA 7,11,17*; Tech Labs 16*; Telecomm. Ind. 11,17*; Tele-Measurements 17*; Telemet 7*; Texscan 16*; Thalner 24*; Thomson CSF 6,17*; Ultra Audio Pixtec 17*; Video Aids 25; Vis. Info. Inst. 9*; Zei-Mark 1*

3. FILM EQUIPMENT

Cameras, Cine	AIC*; Arriflex*; Bach Auricem; Belden Comm.; Canon*; Cinema Prod.*; ECAM*; Frezzolini*; Gen'l Cam.; Alan Gordon*; Hervic*; Kodak*
Camera Lenses	AIC*; Angenieux*; Arriflex*; Bosch & Lomb*; Belden Comm.*; Canon*; Cinema Prod.*; Dynasciences*; Frezzolini*; Hervic*; Javelin*; Lenzar*; Rank*
Camera Tripods & Accessories	AIC*; Arriflex*; Canon*; Cinema Prod.*; Alan Gordon*; Hervic*; Javelin; O'Connor*; Quick-Set*; Birns Sawyer
Carrying Cases	Arriflex*; Canon*; Hervic*; Multiplier*; Quick-Set*
Film	GAF*; Fuji*; Kodak*
Film Cases	Multiplier*; Neumade Prod.*
Film Cleaners	Neumade Prod.*
Film Editing Equipment	Clewer Cml.*; Hervic*; Neumade Prod.*; Magnasync/Moviola*; Harwald; Kodak*
Film Processors	AIC*; Jamieson*; Kreonite*; Pako; Technology Inc.*; Treise*
Film Projectors 1. motion picture 2. slide 3. flickerless	AIC 1*; Arriflex 1*; Fernseh 1*; Clewer Cml. 1*; GAF 1,2*; Alan Gordon 1*; Kalart Victor 1*; L-W Int. 1,3*; Magna-Tech 1,3*; W.A. Palmer*; RCA 1-3*
Magnetic Film 1. recording 2. test	Agfa-Gevaert 1,2*; Capitol Mag. 1*; Clewer Cml. 1*; 3M A/V 1*; RCA 1*; Stand. Tape Lab. 2*
Magnetic Recording Equipment & Accessories	CMC*; Magna-Tech*; MCI*; RCA*; Transist-O-Sound*
Misc. Film 1. pollution control; silver recovery 2. slide masks & mounts 3. multi-lock, video and magnetic film	Arriflex 1*; CPAC 1*; Magna-Tech*; Multronics 1*; W.A. Palmer 3*; Pako 2; Technology Inc. 1*

4. LIGHTING/STUDIO EQUIPMENT/SET DESIGN

Lamps	ALCO*; Berkey*; Cinema Products*; G.E.*; GTE Sylvania*; Olesen*; Teledyne*; Varian
Lighting Fixtures Incl. Stands & Hangers	Berkey*; Frezzolini*; GBC*; Great Amer. Market; Harwood*; Kliegl*; Olesen*; Rosco Labs*; Smith-Victor*; Teledyne*; Lowell*; Mole-Richardson*; Strand Century*
Light Dimmer Controls	Berkey*; Elec. & Opt. Systems*; Kliegl*; Olesen*; Skirpan*; Electronic Diversified*; Strand Century*
Patch Terminals	Berkey*; Kliegl*; Olesen*; Union Connect.*; Electronic Diversified
Plugs & Connectors	ITT Cannon*; Kliegl*; Olesen*; Union Connect.*
Lightmeters & Photometers	Tektronix*; Power Optics, Minolta
Studio Equipment 1. scenery, prefab 2. prompters, titling 3. set design 4. superimpose aids	American Cable Svc. 3*; Fiorentino 1*; Frank, Holmes 4*; Olesen 1*; Q-TV 2*; Rosco Labs 3*; Ultra Audio Pixtec 2*; Video Data Sys.*; Reynolds/Leteron

*The asterisk denotes that manufacturers so identified have verified that the products mentioned are in regular production. Current data on these products are on file with BM/E.

SOURCE LOCATOR

5. RF/TRANSMITTING/RECEIVING EQUIPMENT

Demodulators	Catel*; Coastcom; Comark*; Dynair*; Fung*; GTE Lenkurt; Microwave Assoc*; NEC*; Optek*; RCA Brcdst*; Scientific-Atlanta*; Telemet; Ward-Beck*; Wilkinson*
Diplexers	Alford Mfg*; Catel*; Cetec*; Coastcom; Collins Cmml Telecom*; Comark*; Cont Elec; Ikegami*; Micro Comm*; NEC*; RCA Brcdst*
Exciters	Acrodyne Ind*; AEL*; CCA*; Cetec*; Collins Brcdst*; Collins Cmml Telecom*; CSI*; Ikegami*; Kahn*; McMartin*; NEC*; RCA Brcdst*; Sintronic*; Solid Electronics*; Ward-Beck*; Wilkinson*
Modulators	CCA*; Cetec*; Coastcom*; Comm. Techniques*; Dynair*; Fung*; GTE Lenkurt; Ikegami*; Javelin*; Microwave Assoc*; Moseley*; NEC*; Philips*; RCA Brcdst*; Rhode & Schwarz*; Scientific-Atlanta*; Solid Electronics; UHF Assoc*; Varian*; Ward-Beck*; Wilkinson*
RF Amplifiers	AEL*; Belar*; CCA*; Cetec*; Comark*; CSI*; Ikegami*; LPB*; McMartin*; Microwave Assoc*; Moseley*; MPD*; Mu-Del*; Nat Elec Labs*; NEC*; Nurad*; RCA Brcdst*; RHG*; Scientific-Atlanta*; Solid Electronics; Tel Technology*; Ward-Beck*; Wideband Wilkinson*
RF Loads	Alford Mfg*; Barker & Williamson; Bird Electronic; Cetec*; Comark*; Cont'l Electronics*; Dielectric*; Electro Impulse*; Ikegami*; Micro Comm*; Microwave Assoc*; RCA*; Texscan*; Ward-Beck*
RF Switchers	Barker & Williamson; Cetec*; Collins Comm Telecom*; Comark*; CSI*; Dielectric*; Fung*; Micro Comm*; Multronics*; RCA Brcdst*; Solid Electronics; Texscan*
Microwave Equipment	Alford Mfg 6; Andrew Corp 5,6; Belden 6*; Cablewave Systems 5,6*; Cetec 1*; Comark 5*; Farinon 1-4*; GTE Lenkurt 1,2*; Ikegami 1-5*; ITE 7*; Marti 1,2,3*; McMartin 1*; Micro Comm 4,5,6*; Microwave Assoc 1,2,3,4*; Moseley 1-4*; NEC 1*; NES 1*; Nurad 1-7*; Phelps-Dodge 6*; Quick-Set 7*; Raytheon 2,5*; RCA Brcdst 1,3,4*; RHG 1-7*; Tepco 1-4*; Terracom 1-4*; Varian
1. STL & Remote Pickups	
2. Intercity	
3. Portable	
4. ENG	
5. Waveguide	
6. Coaxial Cable	
7. Supports, portable equipment	
Remote Control Systems	Cetec*; Comark*; Delta*; Dynair*; Harris*; Kaitronics*; Marti*; Micro Comm*; Moseley*; Nat Electro Lab*; NES*; Nurad*; RCA Brcdst*; Tepco*; Time & Frequency*
Receivers, Comm & Monitor	Belar*; Caringella*; Catel*; Comrex*; Cont'l Electronics*; Fixture Elec; McMartin*; Moseley*; RCA Brcdst*; Rivers Assoc*; Rhode & Schwarz*; Scientific Radio; Sequerra

*The asterisk denotes that manufacturers so identified have verified that the products mentioned are in regular production. Current data on these products are on file with BM/E.

Instant Source Locator

1. Audio Equipment
2. Video Equipment
3. Film Equipment
4. Lighting/Studio Equipment/Set Design
5. RF/Transmitting/Receiving Equipment
6. Antennas/Towers/Transmission Lines
7. Measuring/Monitoring/Timing/Logging Equipment
8. Service
9. Cable TV Equipment
10. Components/Hardware/Systems

SCA Equipment	CCA*; Cetec*; Collins Brcdst*; Cmml Telecom*; Fixture Elec; Harris; Johnson Elec*; McMartin*; Moseley; NES*; RCA*; Rivers Assoc*; Solid Electronics; Time & Frequency*; Wilkinson*
Translators	Acrodyne 2*; Ikegami 1,2*; Rhoads Schwarz 1,2*; Tel Technology 1,2*; Tel 2*; Versa Count 1,2*; Emcee
1. FM	
2. TV	
Transmitters	AEL 1,2*; CCA 1,2*; Cetec 1,2*; Cmml Telecom 1,2*; Cont'l Electronics; CSI 1,2; Harris 1,2*; Ikegami 2*; LPB 1; McMartin 1,2*; MPD 2; NEC 1,2*; RCA 1; Scientific Radio 2*; Sintronic 1,2*; Solid Electronics 2; Versa Count 2*; Ward 1,2*; Wilkinson 1,2*
1. AM	
2. FM	
Transmitters, TV	Acrodyne*; CCA*; Dynair*; Harris; Ikegami*; MPD; NEC*; Phillips*; RCA*
Antenna Tuning Unit	Fisher-Burke*
Satellite Earth Stations	Alden 1,2*; Collins Cmml Telecom; Farinon 1,2*; Marconi 1,2*; NEC 1; Nurad 1,2*; RF Systems 1,2*; Scientific Atlanta 1,2*
1. Transmitter	
2. Receiver	
Misc. RF Equipment	AEL 15*; Alden 5,16*; Alford Mfg 6,7; Andron Corp 7; Arvin/CATV 4; Barker & Williamson 4,8*; Belden 7*; Bird 4-8*; Bogner Sound & Power 8*; Catel 1,10*; Collins 1,2,4,10,13*; Coastcom 1*; Collins Comm Telecom 3*; Comark 4,6,8,14*; Cont'l Electronics 3*; CSI 2,3; Electro Impulse 17*; Elcom 19; Electro Impulse 4*; Farinon 1*; Fisher-Burke 3; Fung 8,14*; GTE Lenkurt 1*; Harris 1,13,14; GTE Lenkurt 1*; Ikegami 4,14,18*; Lenco 1*; LPB 2*; McMartin 1*; McGraw-Edison 4; Micro Comm. 8*; Microflex 20; Microwave Assoc. 1,6,8*; Moseley 1,10*; Phelps-Dodge 8,14*; Multronics 3*; Nurad 7*; Philips 4,8,14*; RCA 1,8,14*; Rhode & Schwarz 4*; Scientific Radio 4*; Tel Technology 6,8,14*; Texscan; Trompeter 7,13
1. program subcarrier	
2. carrier current	
3. phasing network	
4. RF attenuators	
5. facsimile	
6. TV connectors	
7. RF cables	
8. RF filters	
9. RF filter couplers	
10. FM processors	
11. tubes	
12. trans. color phase equalizer	
13. connectors	
14. converters	
15. FM Combiner	
16. Weather chart recorders	
17. ammeters	
18. RF cue system	
19. AM sample transformer	
20. passive repeaters	

6. ANTENNAS/TOWERS/TRANSMISSION LINES

Antennas	Alford Mfg 2*; Antenna Prod Co 1; 1,2*; Cetec 2*; Collins Brcdst 2*; Cmml Telecom 2*; Cont'l Electronics; Harris 1,2*; Micro Comm 2*; NEC; Phelps-Dodge 2*; RCA 1,2*; Stainless
1. AM	
2. FM	
Antennas, Microwave	Alford Mfg*; Andrew Corp; Anixter-MB Antennas For Comm*; Antennas Prod Bogner Broadcast*; Cablewave System Gabriel*; Microwave Assoc*; Micro Nurad*; RCA*; RF Systems*; Scientific Atlanta*
Antennas,TV	Alford Mfg*; Andrew Corp; Bogner Broadcast; CCA*; Cetec*; Harris*; Micro Comm; NEC*; RCA*; RF Systems*; SWR Inc*
Towers	Antenna Prod Co; CCA*; Cetec*; EZ-V Fort Worth Tower*; Gabriel*; D. H. Microflex*; RCA*; Stainless*
Tower Hardware & Construction Equip.	Cont'l Electronics*; Microflex*; Multi Philadelphia*; Stainless*; Unarco-Rohn
Tower Lighting	Antenna Prod Co; Dielectric*; Electro Flash-Tech*; Hughey & Philips*; Microflex*; Unarco-Rohn*
Transmission Line & Connectors	Alford Mfg*; Andrew Corp; Antenna Comm*; Belden*; Cetec*; Comark*; Cont'l Electronics; Micro Comm*; Microflex*; Phelps-Dodge*; RCA*; Rhode & Schwarz; Soll*; SWR Inc*; Trompeter
Waveguide	Dielectric*

COMPARE

OUR STANDARD FEATURES WITH OTHERS. YOUR CHOICE WILL BE MCI-JH-110.

Here's the most complete system of reliable and serviceable recorders/reproducers you can buy at a price that's less than other basic systems. Here are some of the features of the MCI-JH-110:

TRANSPORT

• 4 speeds (choice out of 4 speeds— $3\frac{3}{4}$, $7\frac{1}{2}$, 15, 30 IPS)
• Fully DC, TTL logic control (no relays) • Variable speed control $\pm 20\%$ • "MVC" (manual velocity control) continuously variable from FF to STOP to RW • Constant tape tension regardless of reel size or speed • "Soft Edit" feature due to special circuit activated only when in "STOP" mode.

ELECTRONICS

• Independent equalization and bias controls for each speed • Record head-room: greater than 20 dB at 1KHz, 15 IPS • Automatic "CUE" switching when entering record • PLUG-IN 4 position head assemblies maintain alignment during configuration changes ($\frac{1}{4}$ to $\frac{1}{2}$ inch, mono, stereo, quad).

Many other features are included in the basic price. (Manufacturer's suggested list price for MCI-JH-110-2-LP, \$4293.) For special applications, several options and accessory packages are available. For further information, see your MCI dealer or write:

MCI, Inc., 4007 N.E. 6 Ave., Ft. Lauderdale, FL 33308. (305)566-2853. TLX51-4362 MCI-FTL.

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in our custom
made overhead
bridge cabinet.



Circle 236 on Reader Service Card

SOURCE LOCATOR

7. MEASURING/MONITORING/ TIMING EQUIPMENT

Antenna Monitors	CCA*; Delta*; Potomac*; Sintronic*
Clocks, Time Systems 1. digital clocks 2. master clocks 3. slave clocks 4. timers 5. time distribution sys. 6. standard time receiver	Alpha 1; Audio Services 1-4; Boston Sound & Power 1*; Caringella 1,4,6*; Cetec 1*; Collins CmrcI Telecom 1,4*; Chrono-Log 1-5*; Comad 1-5*; Cooke 1-4*; Datametrics 1-3,5*; ESE 1-5*; Heath 1*; Kallman 4; McCurdy 1-5*; NES 1-5*; Pacific Recorders 1*; QSI 1*; Rhode & Schwarz 1*; Thainer 4*; Time & Frequency 1-4*; True-Time 1,2,5*; United Systems 1*; VAMCO 1-4; Video Data Systems 1*
Chart Recorders	Audio-Technica*; B&K Instr*; Heath*; Hewlett-Packard*; London Co.*; NES*
Demodulators	Comark*; Dynair*; Fung*; Philips Instr.*; RCA Brdcst*; Rhode & Schwarz*
Field Intensity Meters 1. AM 2. FM 3. TV	Arvin/CATV 1,2,3*; Castle 3*; Delta 1*; Fung 3*; Hewlett-Packard 2,3*; Potomac 1-3*; RCA Brdcst 1,3*; Rhode & Schwarz 1-3*; Sencore 1-3*; Sequerra 2*; Texscan 2,3*
Frequency Monitors and Counters	Ballantine; Belar*; Data Precision*; EIP*; Gaw; Harlrs*; Heath*; Hewlett-Packard*; McMartin*; NES*; Philips Instr.*; Singer; Systron-Donner*; Texscan*; Time & Frequency*; True Time*; United Systems*
Generators, Audio	Aitech; Amber*; Automated Processes*; Barker & Williamson*; Cetec*; Elpa*; Gaw; Heath*; Hewlett-Packard*; Marconi*; Modular Audio*; Phillips Instr.*; Potomac*; Rhode & Schwarz*; Shure*; Singer; Sound Tech*; Spectra Sonics; SMC; Tektronix*; Ward-Beck*; Wavetek; Control Concepts
Generators, RF	Boonton Elec; Cetec*; Comm. Techniques*; Delta*; Gaw; Heath*; Hewlett-Packard*; Kay*; London Co.*; Marconi*; McGraw-Edison*; Philips Instr.*; Potomac*; Rhode & Schwarz*; Sound Tech*; Telonic*; Tektronix*
Generators, Video 1. multiple output 2. cross pulse only	Lenco 1*; Philips Instr. 1*; Tektronix 1*; Texscan 1*; Ultra Audio Pixtec 2*; Video Aids 2*; Video Concepts 2*
Impedance Bridges	Alford Mfg*; B&K Instr.*; Boonton Elec; Delta*; Heath*; Hewlett-Packard*; Marconi*; Rhode & Schwarz*; Sennheiser*; Simpson; Telonic Altair*; Texscan*
Burst Phase Meters	Colorado Video; Rhode & Schwarz*
Voltmeters, Multimeters, etc. 1. Voltmeters 2. multimeters 3. dB meters	Amber Electro 3; Audio Designs 3*; Ballantine 1-3; Biddle Co 1*; B&K Instruments 1*; Boonton 1-3; Burwen 3; Data Precision 1,2*; DBX 3; ELPA 3*; Gaw 1; Heath 1-3*; Hewlett-Packard 1,2*; ITT Jennings 1*; McGraw-Edison 3*; Micmix 3; NES 1-3*; Philips 1,2*; Rhode & Schwarz 1,2*; Sencore 1,2*; Simpson 1-3; Systron-Donner 1,2*; Tektronix 2*; Telonic Altair 3*; TM Systems 3*; Triplett 1-3; United Systems 1-3*; Ward-Beck3*; Weston 1-3
Frequency Standards, Rubidium	Efraton; Tracor*
Harmonic Distortion Meters	Amber Electro*; Barker & Williamson*; B&K Instr*; Control Concepts; ELPA*; Gaw; Heath*; London Co.; Potomac*; Sound Tech*
Intermodulation Meters	Amber Electro*; B&K Instr.*; Heath*; Potomac Instr.*; Sound Tech*
Phase Meters	Bird Electronic*; B&K Instruments*; Gotham Audio*; Heath*; Hewlett-Packard*; Microprobe*; NES*; Video Aids

RF Watt Meters	Barker & Williamson*; Boston, Ohio; Electro Impulse*; Heath*; McGraw-Edison*; NES*; RCA Brdcst*; Rhode & Schwarz*
Oscilloscopes	Ballantine; Heath*; Hewlett-Packard; Philips*; Rhode & Schwarz*; Simpson; Tektronix*; Texscan*; Wavetek
Loggers and Logger Equipment/Digital Printers	Cetec*; Control Design; Hewlett-Packard; IGM Moseley*; NES*; Philips*; United Systems*
Modulation Monitors	Belar*; Comark*; Harms*; London Co.; Marconi*; McGraw-Edison*; RCA*; Sequerra; Time & Frequency*
Sideband Analysers	Marconi*; RCA*; Rhode & Schwarz*
Spectrum Analyzers	Amber Electro*; Audio Design*; Hewlett-Packard*; Kay Electronics; Marconi*; Rhode & Schwarz*; Systron-Donner; Tektronix*; Texscan*
Status & Alarm Indicators	Bird Electronics*; CCA*; Cetec*; CSIR; Harlrs*; Moseley*; NES*; RCA*; RFA Assoc.*; United Systems*
Automatic TV Monitors	Marconi*; Philips*; Rhode & Schwarz*; Sintronic*
Vectorscopes	Elec & Opt Sys*; Heath*; Tektronix*; Wavetek; Audio Pixtec*
Video Test Generators	Lenco*; Marconi*; Philips*; Rhode & Schwarz*; Tektronix*; Vis Info Inst.
VITS, VIR, Systems and equipment	Comark*; Lenco*; Philips*; Rhode & Schwarz*; Tektronix*; Television Equipment Assoc.*; Video Aids*
Waveform Monitors and Analyzers	Amber Electro*; Ball Brothers*; Control Concepts; Elec & Opt Sys*; Hewlett-Packard; Marconi*; Rhode & Schwarz*; Systron-Donner; Tektronix*; Ultra Audio Pixtec; Control Concepts
Wow & Flutter Meter	DBX*; ELPA*; Gotham Audio*
DIFF Phase-Gain Measurement	Datatek*; Marconi*; NES*; Philips*; Rhode & Schwarz*
EBS Two Tone System	Elcom*; ESE*; Gaw*; Inter. Nuclear; McMartin*; Rivers Assoc.*
Video Noise Meter	Lenco*; Rhode & Schwarz*; Tektronix*

8. SERVICES

Computer Business Services; Systems 1. broadcasting, TV 2. broadcasting, radio 3. cable TV	Cable Data 3*; Cable Facts 3*; Colson 1,2*; Cox Data 1-3*; Coyne Assoc. 3*, 4, 1,2*; Jefferson Data 1,2*; Kaman South 1,2*; PSI 1-3*
Video Equipment Rental Service 1. production equipment 2. post production equipment	Ampro 1,2*; CMX 2*; Fiorentino 1*, 2, 1,2*; NEC 1*; Petra 1,2*; Sawyer's Hollywood 1,2*; Tele-Cine 1*; Tri-Tronics
Film Laboratories	Frank Holmes*; W.A. Palmer
Studio Design 1. radio 2. TV	American Data 2*; Ampro 2*; Chas Seven 1*; Fiorentino 2*; Grinnan 1*; IVC Kreonite 1*; Lebow Labs 1,2*; LPB Microtime 2*; Multi-Trak 1* NEC 1,2*, 1,2*; Sound Systems 1,2; Spectra Sound 1*; Tele-Measurements 1*; Tri-Tronics Ultra Audio 1,2*; Westlake 1,2*
Video Tape/Film Recording Transfer	Image Transform*; Multi-Trak*; W.A. Palmer*
Mobile Van Construction	Avogix*; Rbt Bosch*; Chateau Sound; IVC*; Philips*; Sawyer's Hollywood*; Tri-Tronics

*The asterisk denotes that manufacturers so identified have identified that the products mentioned are in regular production. Current data on these products are on file with BM/E.

According to TRUTONE RECORDS... "The Stanton Calibrated 681 series is our total point of reference in our Disc Mastering Operation"



"Carl Rowatti, Chief Engineer, adjusting the Program limiters prior to cutting a master lacquer".

... can be described as a family enterprise... but... family! Father Lou Rowatti is the President; Son Carl... President and Chief Engineer; and daughter-in-law... handles the business end of the operation. They... great pride in their family, in their family's enterprise... their products. That's why they insist on using the... always.

... one Records in Northvale, New Jersey always uses... calibrated Stanton Triple-E for A-B comparisons be... tape and disc. They also use the Triple-E to check... frequency response of the cutter head (they'll record a... Hz tone and a 10 kHz tone twice a day to check the... on of the cutting stylus and the high end frequency... use of the cutter head).

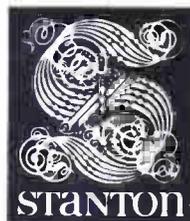
... they make test cuts and play them back, using the... Triple-E for reference, as high as 15 kHz all the way down... Hz. Carl Rowatti says "We use the Stanton Calibrated... series as our total point of reference in our disc master-

ing operation. Everything in the studio is judged — and we think perfectly judged for quality—with this great cartridge".

Professionals can't afford to take chances with quality. That's why they depend on Stanton in their operations.

Each Stanton 681 Triple-E is guaranteed to meet its specifications within exacting limits, and each one boasts the most meaningful warranty possible. An individually calibrated test result is packed with each unit.

Whether your usage involves recording, broadcasting, disco or home entertainment your choice should be the choice of the professionals... the Stanton 681 TRIPLE-E.



Write today for further information to:
Stanton Magnetics, Terminal Drive,
Plainview, New York 11803



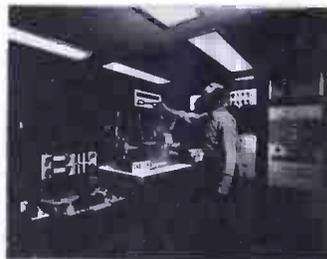
Rowatti inspects a master lacquer, and checks the lathe.



Carl Rowatti adjusts the pitch computer on the mastering lathe.



Carl installs the Stanton Calibrated 681 Triple-E on the playback table.



Lou Rowatti (The Prez) adjusting the high frequency limiter in his cutting room.

Circle 164 on Reader Service Card

SOURCE LOCATOR

9. CABLE TV EQUIPMENT

Amplifiers 1. trunk 2. distribution 3. line extenders 4. IDC	AEL Comm. Ameco 1,2*; AVA 1-3*; Amplifier Design 2*; Blonder-Tongue 1,2*; C-Cor 1-3*; Cerro Comm 4; Delta Benco Cascade 1-3; Arvin 3; Dynair 2*; GTE Sylvania 1-3*; Inter. Nuclear 2*; ITI 3*; Jerrold 1-3*; McCurdy 2*; Magnavox; RCA Comm TV 1-3*; Scientific-Atlanta 1-3*; Telcin 2*; Tocom Winegard 1-3*
Antennas, Receiving	Andrew Corp; Blonder-Tongue*; Bogner Broadcast*; Jerrold*; Johnson Elec*; Nurad*; RF Systems*; Scientific-Atlanta*; Winegard*
Cable 1. distribution 2. drop	AVA 1,2*; Belden*; Cerro Comm 1,2*; Comm/Scope 1,2; Daburn 1,2*; Gen. Cable 1,2*; Mohawk 1,2*; Pace W&C 2*; Systems W&C 1,2*; Winegard 1,2*
Connectors	AVA*; Blonder-Tongue*; Cablewave Systems*; Conn Assoc; Daburn; Gamco; GBC*; ITT Cannon; Jerrold*; LRC; Mohawk*; Pyramid; Tektronix*; Trompeter
Converters 1. standard 2. pay TV 3. filter trap	Ameco 2*; Conn Assoc 1-3; Gamco 2,3*; GTE Sylvania 1,3*; Jerrold 1,2*; Delta Benco Cascade; Magnavox
Distribution Accessories 1. passive 2. addressable taps	American Tech 1; Audio-Video Eng 1; Blonder-Tongue 1,2*; C-Cor 1*; Cerro Comm 1*; Gamco 1; GTE Sylvania 1*; Jerrold 1*; Telcin 1*
Head End Processors	Ameco; Blonder-Tongue*; Jerrold*; RCA Comm TV*; Scientific-Atlanta*; Telcin*
Information Systems, News, etc.	Systems Concepts*; Telemation*; UPI*
Automated Origination Systems	Channeimatic*; Goldmark Comm*; Micro-time (Avtel)
Microwave Equipment	Andrew Corp; Avantek*; Catel*; GTE Lenkurt*; Microwave Assoc.*; Nurad*; RHG*; Systron-Donner*; Tektronix*; Tepco*
Non-duplication switchers	Telemation*
Power Supplies	C-Cor*; Dynair*; GTE Sylvania*; NES*; Philips*; Sawyer Ind*; Sencore*; Spectrolab*; Systron-Donner*; Tech Labs*; Topaz*
Test Equipment, CATV	Alford Mfg*; Ameco*; Avantek*; Biddle Co*; Bird Electronic*; Castle*; GTE Sylvania*; Hewlett-Packard*; Jerrold*; Kay*; Telemetrics; Lenco*; Rhode & Schwarz*; Sencore*; Tektronix*; Television Equip Assoc*; Texscan*; Vis. Info. Inst.*
Construction Accessories Underground & Pole 1. aerial lifts 2. trenchers 3. cable installation tools 4. enclosures and pedestals 5. strands 6. pole hardware	Aberdeen 5; Blonder-Tongue 3,4*; Davis Mfg 2,3*; Gamco 6; Gen Cable 1,4-6*; Vermeer 2*; Winegard 4*
Services 1. maintenance 2. design consulting 3. construction 4. finance	American Cable Service 2*; Cablevision Constr. 2,3; Castle 1*; C-Cor 1*

10. COMPONENTS/HARDWARE/SYSTEMS

Batteries	Alexander Mfg.*; Rbt. Bosch*; Frezzoni Globe*; Topaz*; Versa Count; Yardney*
Cabinets, racks, enclosures, shipping cases	AMCO*; Emcor*; Grinnan*; Micro-Tn Neumade Prod.*; Scientific-Atlanta Storeel*; Tektronix*; Tele-Cine*
Connectors Also see cable TV connectors	Alford Mfg.*; Andrew Corp.*; AMP; Bl Cablewave Systems*; GAMCO; GBC*; Cannon*; Mohawk*; Olesen*; Pyramid Tektronix*; Trompeter
Emergency Power	Advance Conversion*; Alexander M C-COR*; Sawyer Ind.; Soll*; Spectrolab*
Power Tubes	Calvert*; EIMAC*; Eng. Elec.*; G Electrodynamics; NEC*; RCA Elec.-O; Thor; Vacuum Tube*
Rectifiers	Calvert*; Eng. Elec.*; IRC; RCA D&S*; kinson*
Surge Protectors	Boston Sound & Power*; Calvert*; M plier*; Sintronic*; Topaz*; Wilkinson*
Wire & Cable	Alpha Wire*; Andrew Corp.; Belden*; Bl Brand-Rex*; Calvert*; Daburn*; Gf Gen'l Cable; Gotham Audio*; ITT Sup ant; Mohawk*; Pace W&C; Phil. Resins
RF Inductors	Barker & Williamson*; Calvert*; Multron
Transformers	Calvert*; GAMCO; Gotham*; Micro Topaz*
Torque Motors	Calfor*
Quartz Crystals	Calvert*; Quaker
Vacuum Capacitors	Calvert*; ITT Jennings*
Tools	Alpha Wire; Weller-Xcelite
Camera Tubes	Amperex*; Eng. Elec.*; RCA Elec.-Opt
Hum Bucking Coils	Audio Video Eng.; Telemation*

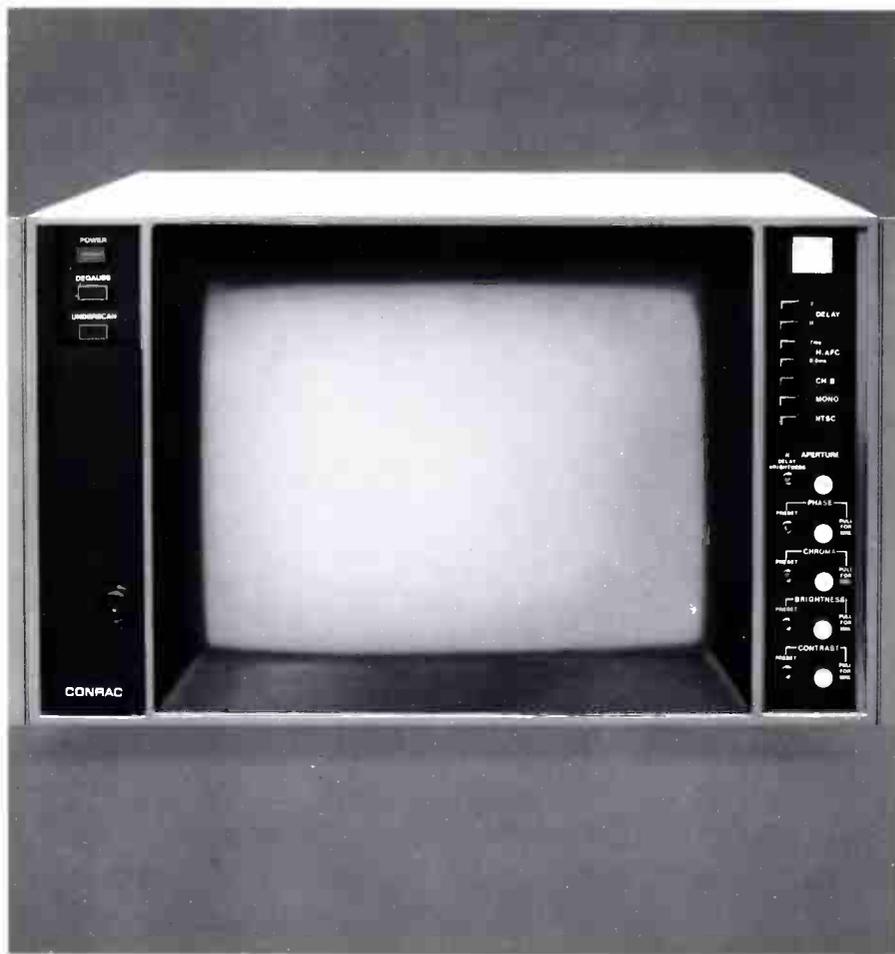
*The asterisk denotes that manufacturers so identified have notified that the products mentioned are in regular production. Present data on these products are on file with BM/E.

Instant Source Locator

1. Audio Equipment
2. Video Equipment
3. Film Equipment
4. Lighting/Studio Equipment/Set Design
5. RF/Transmitting/Receiving Equipment
6. Antennas/Towers/Transmission Lines
7. Measuring/Monitoring/Timing/Logging Equipment
8. Service
9. Cable TV Equipment
10. Components/Hardware/Systems

Conrac New Product Directory





Conrac Model 5700

A compact high-resolution 13V color monitor for VTR over-console mounting. A cabinet configuration is available for portable teleproduction applications.

New 13V high-resolution shadow mask CRT, color compatible.

Preset controls for contrast, brightness, chroma, phase, and aperture.

Horizontal and vertical delay switches.

Horizontal AFC time constant switch.

Convergence adjustments in front pull-out drawer.

Phase linear aperture correction.

Switchable NTSC corrective matrix.

New industrial design compatible with broadcast VTR over-console modules.

Rigid cast aluminum front.

The Conrac Model 5700 is expressly designed for size-limited signal evaluation applications in broadcasting and teleproduction.

Cost effective, advanced circuit design with compatible CRT phosphors. Performance will meet all small-screen professional applications.

Brightness and resolution — Minimum TV lines, 500 center, 400 corners, at 20fL.

Linearity and geometry — No point in the raster deviates from its proper position by more than 2% of raster height.

Convergence — Does not deviate more than .020" (.51 mm) in a centrally located area bounded by a circle, the diameter of which is equal to picture height. Elsewhere, the deviation does not exceed .040" (1.02mm). All convergence controls are located in a pull-out drawer, making them fully accessible from the front of the monitor.

Raster size regulation — Less than 1% change, 1% to 100% APL (Average Picture Level) at peak 20fL luminance.

Black level stability — Less than 1% of peak luminance from 10% to 90% APL.



Model DZB

styled 15V professy
 rome monitor for V
 mounting.
 rectangular 15V CRT
 phosphor.
 state.
 back-porch clamp.
 video input.
 ztural and vertical del
 ts.
 y within $\pm 1\%$ of pic
 hi
 or construction, all c
 d quick-disconnect.
 ur high voltage supp
 d st aluminum front.

Raster size regulation – Less than 1% change, 0% to 100% APL (Average Picture Level) at peak 20fL luminance.

Black level stability – Less than 1% of peak luminance from 10% to 90% APL.

tness and resolution – Mini-TV lines, 500 center, 400 cor- at 20fL.

ergence – Does not deviate than .020" (.51mm) in a cen- located area bounded by a , the diameter of which is to picture height. Elsewhere eviation does not exceed (.76mm).

er size regulation – Less than hange, 0% to 100% APL (Av- e Picture Level) at peak 20fL ance.

level stability – Less than f peak luminance from 10% % APL.

/S

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/S

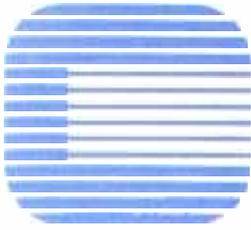
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10

/S

73



CONRAC

Conrac Division
600 North Rimsdale Avenue
Covina, California 91722
(213) 966-3511
Telex 67-0437

Regional Sales Offices

Western Regional Sales Office
600 N. Rimsdale Avenue
Covina, California 91722
(213) 966-3511
William A. Ems

Midwestern Reg. Sales Office
3166 Des Plaines Ave.
Des Plaines, Illinois 60018
(312) 298-8577
John F. Keenan

Eastern Regional Sales Office
122 E. Main Street
Elmsford, New York 10523
(914) 592-5522
John F. McClimont

Canadian Office
514 Champagne Drive
Downsview, Ontario M3J 2T9
(416) 635-9456
Brian Mitchell

Primary Distributors Western Region

General Electronics
Systems, Inc.
1440 San Pablo Ave.
Berkeley, California 94702
(415) 527-7700

Nortec West Ltd.
325 West 5th Avenue
Vancouver, B.C., Canada
(604) 872-8525

North-West Industries
5518 Empire Way South
Seattle, Washington 98118
(206) 725-1400

Omega Video, Inc.
14326 Isis Avenue
Lawndale, Calif. 90260
(213) 679-9021

Roh's, Inc.
4553 E. Broadway
Tucson, Arizona 85711
(602) 327-5929

Tri-Tronics, Inc.
4019 Tujunga Avenue
North Hollywood, Ca. 91604
(213) 877-9912
(213) 985-6616

Primary Distributors Midwestern Region

Alexander Electronics, Inc.
1820 Wyandotte Street
Kansas City, Mo. 64108
(816) 474-6656

Delcom
6106 East 32nd Place
Tulsa, Oklahoma 74135
(918) 663-9416

Emmons Associates, Inc.
10700 Lyndale Ave. South
Minneapolis, Minn. 55420
(612) 881-1118

R. P. Hermes Co.
9600 Whittier
Detroit, Michigan 48224
(313) 886-4566

Klopf Audio/Video Company
3381 Successful Way
Dayton, Ohio 45414
(513) 236-5500

Meade Electric Company
of Indiana
1825 Summer Street
Hammond, Ind. 46320
(219) 932-2100

Midwest Tele-Communications
3000 Carlisle
Dallas, Texas 75204
(214) 741-1440

Rich, Inc.
3531-35 N. Martens St.
Franklin Park, Ill. 60131
(312) 678-3100

Swiderski Electronics, Inc.
5456 N. Milwaukee Ave.
Chicago, Illinois 60630
(312) 775-3232

Television Engineering Corp.
519 Rudder Road
Fenton, Missouri 63026
(314) 343-5605

Video Images
12200 W. Adler Lane
West Allis, Wisconsin 53214
(414) 475-0111

Primary Distributors Eastern Region

AuViNic Ltd.
1280 Lachaine Street
St. Vincent De Paul
Quebec, Canada H7C 2P
(514) 661-5120

Cramer Video
120 Hampton Avenue
Needham Heights, Mass
(617) 449-2100

Glentronix Limited
160 Duncan Mill Road
Don Mills, Ontario
Canada M3B 1Z5
(416) 444-8497

Meritron Limited
514 Champagne Drive
Downsview, Ontario
Canada M3J 2T9
(416) 635-9456

Midwest Tele-Communi
3331 N.W. 82nd Avenue
Miami, Florida 33122
(305) 592-5355

Midwest Tele-Communi
Airport Industrial Park
1395 Air Rail Avenue
Virginia Beach, Va. 2345
(804) 464-6256

Midwest Tele-Communi
300 First Avenue
Nitro, West Virginia 2514
(304) 722-2921

Peirce-Phelps, Inc.
8204 Fenton Street
Silver Spring, Maryland
(301) 565-3660

Peirce-Phelps, Inc.
2000 Block N. 59th Street
Philadelphia, Pennsylvania
(215) 879-7000

Robert Slye Electronics
3415 N. Washington Blw
Arlington, Virginia 22201
(703) 525-7272

Sonocraft Corporation
29 W. 36th Street
New York, New York 10
(212) 760-9300

Tele-Measurements, Inc
145 Main Avenue
Clifton, New Jersey 070
(201) 473-8822

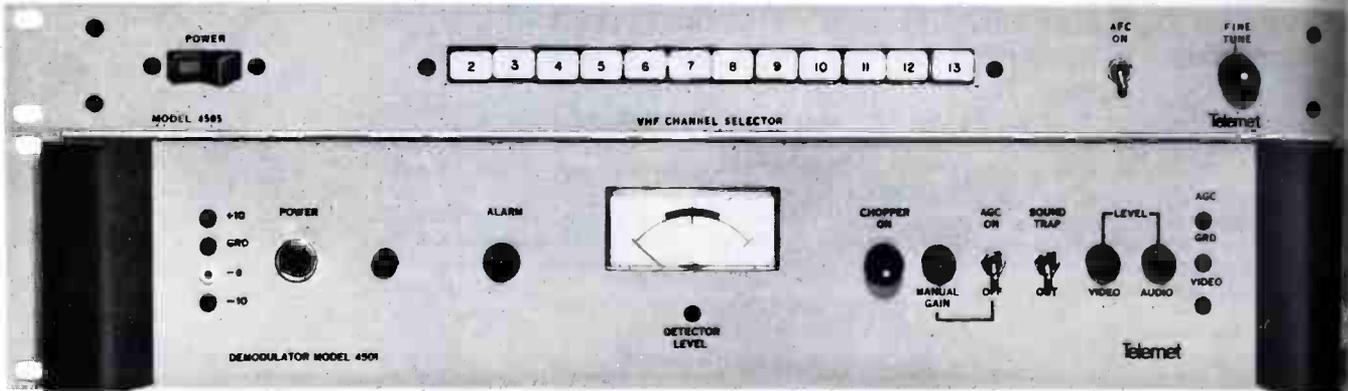
Broadcast Equipment Manufacturers Including Manufacturers of Cable TV equipment

Manufacturers in the Source directory—covering 10 major categories—received an extensive BM/E form to complete, stating which equipment or products are in regular production. Manufacturers were also asked to supply supporting product photos or catalogs as verification that the product is indeed bona fide and readily available. The VS designation following the product description indicates that such verification was forwarded and is on file with BM/E.

Distributors that are nationwide exclusive sources for equipment are included in this manufacturer's section. Non-exclusive distributors are in the rep/distributor section. Field offices are listed only for those companies which are advertising this issue. Advertisements are also referenced under corresponding reps/distributors except for those cases where the advertiser elected not to supply this data.

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GREEN COMPANY PO BOX 2663
RIVER CITY CA 90230 213 870-5353
cable, messenger strand, pole line
equipment, buried system accessories | AIRTECH (A CUTLER HAMMER
COMPANY) 19535 E WALNUT DR
CITY OF INDUSTRY CA
91748 213 965-4911
line of signal generators & broadcast
instrumentation | antenna towers & accessories; tower design,
construction, erection VS |
| GREEN VIDEO LTD 10 VIRGINIA AVE
BOSTON MA 02116 914 358-5504
repair service VS | AIR SPACE DEVICES INC PO BOX 197
PARAMOUNT CA 90723 213 774-4905
tower accessories; safety devices; climbers | ALLISON RESEARCH INC
2817 ERICA PLACE PO BOX
40288 NASHVILLE TN
37204 615 255-4766
limiter/compressor, console modules |
| GRADY INDUSTRIES INC
1000 COMMERCE DR MONTGOMERYVILLE
PA 17103 215 368-2600
transmitters & translators; RF amplifiers;
mixers VS | AITKEN COMMUNICATIONS INC
701 TENTH ST TAFT CA
93268 805 765-5403
automation programmer, audio controller,
time control | ALPHA ELECTRONIC SERVICES INC
8431 MONROE AVE STANTON CA
90680 714 821-4400
multi-function tone generators, (audible,
subaudible), digital clocks, remote control VS |
| GRAND CONVERSION DEVICES CO
100 HATH ST PASSAIC NJ 07055
..... 201 778-0707
power supply, uninterruptible
power systems, inverters VS | AKG ACOUSTICS 91 McKEE DR
MAHWAH NJ 07430 201 529-5900
condenser microphones, dynamic
microphones, special purpose microphones;
headphones; audio amplifiers; reverberation
systems; turntables; intercom systems VS | ALPHA WIRE CORP 711 LIDGERWOOD
AVE ELIZABETH NJ
07207 201 925-8000
cable, wire; tools VS |
| GRAND CORP 195 ALBANY ST
BRIDGE MASS 02139 617 661-9500
cassette players, cassette tape,
speakers, loudspeakers, TV projection
equipment VS | AKAI AMERICA LTD 2139 E DEL
AMO BLVD COMPTON CA
90220 213 537-3880
portable video cameras, portable videotape
recorder/players VS | ALTEC SOUND PRODUCTS DIVISION
1515 S MANCHESTER AVE ANAHEIM
CA 92803 714 774-2900
loudspeakers; microphones; audio consoles;
audio amplifiers; turntables, arms, pickups;
intercoms; audio processing units VS |
| GRAND COMMUNICATIONS CORP PO BOX
100 WINDSDALE PA 19446 215 822-2929
amplifiers, connectors, standard
equipment, passive distribution accessories,
equipment, CATV systems design and
installations VS | ALCO PRODUCTS INC 1551 OSGOOD ST
NO ANDOVER MA 01845 617 685-4371
machine knobs VS | AMBER ELECTRO DESIGN LTD
1064 CHEMIN DU GOLF NUN'S ISLAND
MONTREAL QUEBEC
H3E 1H4 514 769-2730
multipurpose audio test set, audio spectrum
analyzers VS |
| GRAND ASSOCIATES INC 20 BOOKER
STREET TOWSON NJ
07095 201 664-3000
building; mobile van construction;
turnkey installations; production
equipment rentals; color framer editing aid
equipment VS | ALDEN ELECTRONIC & IMPULSE
RECORDING EQUIP CO INC
1 WASHINGTON ST WESTBORO MA
01581 617 366-8551
fax recording systems; weather data
systems, satellite earth station receivers | AMCO ENGINEERING CO 7333 W
AINSLIE ST CHICAGO IL
60656 312 867-8500
racks, cabinets, enclosures VS |
| GRAND VAERT INC 275 NORTH ST
ROSELAND NJ
07068 201 288-4100
music audio tape, mag film, test tapes VS | ALEXANDER MFG CO PO BOX 1645
MASON CITY IA 50401 515 423-8963
batteries, portable power packs, emergency
power equipment VS
See ad Pg. 00—refer to rep/dist section | AMCOMP INC 686 W MAUDE AVE
SUNNYVALE CA
94086 408 732-7330
video disc
slow motion recorders VS |
| GRAND PHOTO INC 168 GLEN COVE
CARLE PLACE NY
11514 516 742-7300
film and TV (Soligor), film cameras
accessories (Bauer), film processors VS | ALFORD MFG CO 120 CROSS STREET
WINCHESTER MA 01890 617 729-8050
antennas, FM, TV, microwave; diplexers, RF
loads, RF switchers; microwave units;
transmission line & line accessories;
impedance bridge, CATV test equip VS | AMECO INC PO BOX 13741 PHOENIX
AZ 85002 602 252-5716
cable trunk and distribution amplifiers;
head-end signal processors; pilot carrier
generators; bandpass filters, combining
networks; CATV test equip & tools; video
automation equip, tap for pay TV VS |
| | ALLIED IMPEX CORP (DIV OF AIC
PHOTO INC) 168 GLEN COVE RD
CARLE PLACE NY
11514 516 742-7300
photographic equip & accessories including
super-8 cameras also optical & misc
accessories | AMERICAN CABLE SERVICE 839 SO
SUNSHINE EL CAJON CA 92020
..... 714 444-8258
CATV systems consultants; set design; local
origination programming VS |
| | ALLIED TOWER CO PO BOX 331 SOUTH
HOUSTON TX 77587 713 946-9546 | AMERICAN DATA DIV (AIRPAX CORP)
PO BOX 5228 HUNTSVILLE AL
35805 205 837-5180
audio & video distribution amplifiers; vertical
interval switcher; master control switcher;
chroma keyers; pulse distribution amplifiers;
production switchers; sync generators;
special effects generators; colorizers, A/D
converters; video test generators VS
See ad pg. 40—refer to rep/dist section |

7 Different Demodulators for Broadcast and Cable



Now Telemet has the right demodulator for every broadcast and cable application

- Tunable VHF • Fixed Channel VHF
- Fixed Channel UHF • Chopper
- Low Input Sensitivity

Broadcasters can now have all the quality and dependability of the Telemet 4501 Precision Demodulator in an all VHF channel version, Model 4501A1/4505A1. Whether it's your primary demod, a standby for multiple station operations or for off-air demodulation as an auxiliary pickup on network feeds, the Telemet Precision Demodulator remains the finest quality demodulator available today—at any price.

UHF stations can also get the superior performance

characteristics and quality that VHF stations get through the use of Telemet's improved downconverter which minimizes interference. This unit is only available as a fixed channel demod, Model 4501A2.

Cable installations can now have a single tunable demodulator, Model 4502B1 for standby operation, that provides all the quality, performance and dependability that broadcasters expect to come to expect from any demodulator bearing the Telemet name. A fixed channel demodulator, Model 4500B1 is available for all VHF channels; Model 4500B2 is the industry best fixed channel UHF demodulator.

Select the right demodulator for your application from the following chart.

SPECIFICATIONS

Model No.	4501A1	4501A2	4501A3	4501A1/4505A1	4500B1	4500B2	4502B1
Frequency Range	VHF	UHF	VHF	VHF	VHF	UHF	VHF
Application	Broadcast	Broadcast	Broadcast	Broadcast	CATV	CATV	CATV
Tuner	Fixed	Fixed	Fixed	Variable	Fixed	Fixed	Variable
Chopper	Yes	Yes	Yes	Yes	No	No	Yes
Video Frequency Response	±0.5 db	±0.5 db	±0.5 db	±0.5 db	±0.75 db	±0.75 db	±0.75 db
Differential Gain	±0.5 db	±0.5 db	±0.5 db	±0.5 db	±0.5 db	±0.5 db	±0.5 db
Differential Phase	±1°	±1°	±1°	±1°	±3°	±3°	±2°
Input Sensitivity (Min.)	5 mv	5 mv	1 mv	5 mv ; 1 mv	0.3 mv	0.3 mv	0.3 mv
Price	\$3800	\$3975	\$3975	\$4775	\$1700	\$1750	\$2400

NEW! SYNCHRONOUS DETECTOR \$1,050

The New Telemet Model 4504A1 Synchronous Detector, enables measurement of Transmitter Quadrature Distortion, when used with Model 4501 Precision Demodulator.

Both the Synchronous Detector and Demodulator's envelope detector utilize the identical RF, IF and band-shaping networks. Comparison of the differential phase between the two detection circuits enables the broadcaster to determine the amount of incidental phase caused by quadrature distortion. For detailed information, write or call today.

A Geotel Company
Telemet

For immediate product information, Call Ken Schwenk, Director of Marketing, Telemet, 185 Dixon Avenue, Amityville, NY 11701 (516) 842-2300. TW-510-227-9850

SOURCE '76

Wiseman 3200 Wilshire Blvd.
Suite 900 Los Angeles
3010 213 387-7756
Nordsiek 705 Bowie Blvd. Orange
Park 32073 904 269-2544
Munzer 233 W. Hill Ave. Glenn
Ellyn 60137 312 469-6200
Wilcox 5504 Waterway Rockville
20853 301 460-1454
Trevillian 2908 Mulberry Pasadena
77502 713 941-7272
DuPont 1280 Lachaine St Vincent De
Paul H7C 2N7 PQ 514 661-5120

CAN ELECTRONIC LABORATORIES
BOX 552 LANSDALE PA
..... 215 822-2929
transmitters; AM & FM transmitters; SCA
F amplifiers VS

AN TECHNOLOGY CO INC 2562 W
FO BLVD PHOENIX AZ
..... 602 272-1234
distribution accessories

ICI CORP 49-12 30TH AVE
IDE NY 11371 214 274-1794
cassette transport mechanisms VS

EX ELECTRONIC CORP 230 DUFFY
CKSVILLE, NY 11803 .. 516 931-6200
tubes for RF, VHF and UHF, variable
capacitors, klystrons, camera tubes
g. 29—refer to rep/dist section VS

EX ELECTRONIC CORP EOD DIV
ENCE PIKE SLATERSVILLE RI
..... 401 762-3800
video cameras; camera viewfinder
tube, UHF & VHF ferrite circulators
VS

gs. 11—refer to rep/dist secti
mrx 4747 N 16 St Ste D101 Phoenix
85016 602 279-9588

mrx 3760 Cahuenga Blvd N,
Hollywood 91604 213 980-4212

mrx 11568 Sorrento Valley Rd San Diego
92121 714 453-5440

mrx 3040 Scott Blvd Santa Clara
95050 408 249-1134

mrx 1200 S Wadsworth Ste
G8 Lakewood 80226 303 922-8434

mrx 175 Scott St Elk Grove Village
60007 312 437-8050

mrx 1393 Main St Waltham
02154 617 899-7100

mrx 19111 W Ten Mile Rd
#168 Southfield 480775
mrx 230 Duffy Ave Hicksville
11802 516 931 6200

mrx 4977 Northcutt Pl Ste
114 Dayton 45414 513 278 7351

mrx 600 Dekalb Pk King of Prussia
19406 215 265 4240

mrx 13773 N Central Expwy Ste
1228 Dallas 75242 214 231 3481

CORP 401 BROADWAY REDWOOD
94063 415 367-2011
ape; audio tape recorders/players
(cass, studio, multi-channel); audio time
bases; var speed ocs; videotape;
audio recorder/reproducers (quad &
automatic video cassette
reproducer; broadcast color
reproducer; time base correctors
g. 77—refer to rep/dist section
also exclusive distributor of EECO
(see listing)

mpex 500 Rodier Dr Glendale
91201 213 240-5000

mpex 3135 Chestnut Dr Suite
101 Atlanta 30340 404 451-7112

mpex 2201 Lunt Ave Elk Grove Village
60007 312 593-6000

mpex 10215 Fernwood Rd Bethesda
20034 301 530-8800

mpex 75 Commerce Way Hackensack
07601 201 489-7400

mpex 4130 Linden Ave Dayton
45432 513 254-6101

mpex 1615 Prudential Dr Dallas
75235 214 637-5100

CORPORATION
NSYLVANIA BLVD FEASTERVILLE

PA 19047 215 322-5100
audio consoles & mixers; audio controls,
equalizers, attenuators; tape cartridge
player/recorder; multicart machines; test
tapes; tape accessories, radio facility
turnkey installation VS
See ad pg. 16—refer to rep/dist section

AMP SPECIAL INDUSTRIES VALLEY
FORGE PA 19482 215 647-1000
CATV connectors & tools; patch panels &
terminals

AMTRON CORP 5620 FREEDOM BLVD
APTOS CA 95003 408 688-4445
color video monitors VS
See ad pg. 168—refer to rep/dist section

ANDERSEN (WALTER M A) &
ASSOCIATES INC 4 MAIN ST EXT
TARIFFVILLE CT 06081 203 658-7666
video delay lines and modules

ANDREW CORP 10500 W 153RD ST
ORLAND PARK IL 60462 312 349-3300
earth station antennas; antennas, TV &
microwave; transmission line & line
connectors; general connectors VS

ANDREWS TOWER INC 1420 LAYTON AVE
FT WORTH TX 76117 817 831-1222
AM antennas; antenna towers, tower
accessories; tower lighting

ANGENIEUX CORP OF AMERICA
1500 OCEAN AVE BOHEMIA NY
11716 516 567-1800
video camera lenses, cine lenses, lens
accessories & associated hardware controls,
lens repairing VS
See ad pg. 49

ANIXTER-MARK 5439 W FARGO SKOKIE
IL 60076 312 675-1500
microwave antennas & accessories; point to
point antennas, two way antennas VS

ANN ARBOR TERMINALS INC
6107 JACKSON RD ANN ARBOR MI
48103 313 769-0926
display & terminal CRT equip; alphanumeric
generators VS

ANNIS (R B) CO 1101 N DELAWARE ST
INDIANAPOLIS IN 46202 317 637-9282
demagnetizing kits, magnetometers VS

ANTENNA PRODUCTS CO BOX 520
MINERAL WELLS TX 76067 .. 817 325-3301
antennas, AM, microwave towers

ANTENNAS FOR COMMUNICATIONS INC
SILVER SPRINGS SHORES INDUSTRIAL
PK 486 CYPRESS RD OCALA FL
32670 904 687-4121
microwave antennas; earth station antennas
VS

ARISTOCART DIV OF WESTERN
BROADCASTING LTD 505 BURRARD ST
VANCOUVER CANADA
V7X 1C4 604 687-2844
tape cartridges, test tapes VS
See ad pg. 160—refer to rep/dist section

ARP INSTRUMENTS INC 320 NEEDHAM ST
NEWTON MA 02164 617 965-9700
music synthesizers, audio mixers, portable
VS

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

ARVIN/CATV 485 E. MIDDLEFIELD RD
MOUNTAIN VIEW CA 94040 .. 415 961-7145
RF amplifiers, RF switches, field intensity
meters, AM, FM, TV VS

ARVIN/ECHO 485 E MIDDLEFIELD RD
MOUNTAIN VIEW CA 94040 .. 415 961-7145
portable video tape recorder/reproducers VS

ASACA CORP OF AMERICA 1289 RAND

VS following the description of a company's
products stands for Verified Source. Com-
panies so identified have filed appropriate
literature with BM/E indicating the products
mentioned are in production and available.

To identify all manufacturers of a particular
product class or category consult the Instant
Source Locator pages 56-73.

RD DES PLAINES IL 60016 .. 312 298-4380
portable TV color cameras; monochrome
cameras; heads, quad TBC; video monitors;
videotape recorder/players VS

ASHLY AUDIO 1099 JAY ST ROCHESTER
NY 14611 716 328-9560
mono, stereo, portable mixers and consoles;
equalizers, filters VS

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

ATLAS SOUND 10 POMEROY RD
PARSIPPANY NJ 07054 201 887-7800
microphone stands & accessories, speakers,
columns VS

AUDIO ACCESSORIES INC 163 WATER ST
KEENE NH 03431 603 352-2320
patch panels, plugs, jacks, audio connectors
VS

AUDIO DESIGNS & MFG INC
16005 STURGEON ST ROSEVILLE MI
48066 313 778-8400
audio consoles; audio amplifiers, equalizers,
attenuators; audio processors; VU meters;
custom consoles, noise reduction systems,
speakers VS
See ad pg. 85—refer to rep/dist section

AUDIO INTERFACE SYSTEMS INC
2708 FIFTH AVE S IRONDALE AL
35210 205 956-1321
audio consoles, compressor/limiters, audio
accessories VS

AUDIO LTD 219 CROSSEN AVE ELK
GROVE IL 60007 312 640-1030
semi-automatic cassette loader VS

AUDIONICS INC SUITE 160 10950 SW
FIFTH ST BEAVERTON OR 97005
..... 503 641-5225
audio amplifier power; turntables; quad
matrix equipment VS

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

AUDIO SERVICES INC 3140 E JEFFERSON
ST DETROIT MI
48207 313 567-0555
transmitter computer for fault detection,
stand-by activation; remote control systems;
studio audio switcher, alarm indicators;
digital clock systems; custom-designed
studios & studio equip; automation systems;
EBS signal equip VS

AUDIO-TECHNICA US INC 33 SHAWASSEE
AVE FAIRLAWN OH
44313 216 836-0246
stereo & quad phono pickups, microphones,
arms, headsets, audio chart recorder; record
cleaners; audiocables VS

AUDIOTECHNIQUES INC 142 HAMILTON
AVE STAMFORD CT 06902 .. 203 359-2312
mixers (Allen & Heath), speakers &
accessories; mike stands & booms (monks);
amplifiers (H/H); lighting systems; equalizers
VS

See ad pg. 175
AUDIO/TEK INC PO BOX 5012 SAN JOSE
CA 95150 408 378-5586
audio tape cartridge loaders VS

AUDI-CORD CORP 1845 WEST HOVEY
AVE NORMAL IL 61761 309 452-9461
audio cartridge recorders/reproducers VS

AUDIOTRONCS CORP 7428 BELLAIRE
AVE NORTH HOLLYWOOD CA

continued on page 76

THE SOURCE '76

91605 213 765-2645
headsets, microphones, tape cassette
player/recorders, picture monitors VS

**AUDIO-VIDEO ENGINEERING CO 65 NANY
BLVD MERRICK NY 11566** ... 516 546-4239
hum reduction filters, video filters, hum
bucking coils

**AUDIO/VIDEO PRODUCTS 9336 FOSTORIA
ST DOWNEY CA 90241** 213 841-3020
audio automation equipment, controllers,
complete systems

**AUDITRONICS INC 207 SUMMIT ST
MEMPHIS TN 38104** 901 276-6338
audio consoles; line amplifiers; equalizers VS

**AUTOGRAM PO BOX 456 PLANO TX
75074** 214 424-8585
automation equip; audio amplifiers; mono &
stereo consoles VS

**AUTOMATED PROCESSES INC 789 PARK
AVE HUNTINGTON NY
11743** 516 427-6024
automated multi-channel mixer, audio
consoles; audio preamps; distribution, power,
line amplifiers; audio attenuators; equalizers;
compressor/limiters; tape machine
synchronizers, memory units, tape editing
equipment VS

**AVA ELECTRONICS 242 PEMBROKE AVE
LANSDOWNE PA 19050** 215 284-2500
cable TV multiple dwelling terminals;
distribution amplifiers, line extenders; coaxial
connectors; passive accessories VS

**AVANTEK INC 3175 BOWERS AVE SANTA
CLARA CA 95062** 408 249-0700
CATV test equip, microwave amplifier VS

**AVONIX DIV OF AV ELECTRONICS INC
PO BOX 505 BROOKFIELD WI
53005** 414 784-1800
videotape editor-controller, V-lock system,
mini-console; CU adaptors for Sony zoom
lens; video cassette equipment storage
cabinet, mobile van construction

**AVTEL CORP 1280 BLUE HILLS AVE
BLOOMFIELD CT 06002** 203 242-0761
video information systems for pay cable,
video switcher, automatic videocassette
player VS

B

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

**BALLANTINE LABORATORIES INC PO
BOX 97 BOONTON NJ
07005** 201 335-0900
frequency counters; dB meters; voltmeters;
waveform monitors; oscilloscopes

**BALL BROTHERS RESEARCH CORP
ELECTRONIC DISPLAY DIV PO BOX 3376
ST PAUL MN 55165** 612 786-8900
color & b&w monitors; video signal
multiplexers; special effects generators VS

**BARKER & WILLIAMSON INC CANAL ST
BRISTOL PA 19007** 215 788-5581
RF amplifiers; audio test equip, RF coils VS

**BASF SYSTEMS CROSBY DR BEDFORD
MA 01730** 617 271-4000
audio tape; calibration tape, videotape VS

**BAUSCH & LOMB SOPP 1400 NO
GOODMAN ST ROCHESTER NY 14602**
..... 716 338-6266
TV camera lenses; motion picture camera
lenses; spectrum analyzers VS

BCS—See Kaman Sciences

**BELAR ELECTRONICS LABORATORY INC.
BOX 826 DEVON PA 19333** ... 215 687-5550

AM, FM, & TV frequency & modulation
monitors; RF amplifiers; SCA equip VS
See ad pg. 171

**BELDEN COMMUNICATIONS INC 25 W
45TH ST NEW YORK NY 10036**
..... 212 730-0172
portable TV camera (Aaton), lenses;
monitors; motion picture cameras (Aaton);
lenses; monitors; motion picture cameras
(Aaton), lamps (Lee), diffusion material, gels
and filters VS

**BELDEN CORP (ELECTRONIC DIV)
PO BOX 1331 RICHMOND IN
47374** 317 966-6661
RF cable; audio cable; wire; transmission
lines; coaxial cable VS

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

**BELL P/A PRODUCTS CORP 1200 N
FIFTH S COLUMBUS OH
43201** 614 299-1487
amplifiers, background music systems,
commercial sound systems VS

**BENJAMIN ELECTRONIC SOUND CORP
790 PARK AVE HUNTINGTON NY
11743** 516 673-8600
audio equip; CCTV equip

**BENNETT TOWER PAINTING
6104 EVERGREEN HOUSTON TX
77036** 713 776-0979
tower painting, maintenance VS

**BERKEY COLORTAN INC
1015 CHESTNUT ST BURBANK CA
95102** 213 843-1200
studio lights, stands, controls, filters,
accessories VS

**BESTON ELECTRONICS 9024 W 51ST
TERRACE SHAWNEE KS
66203** 913 362-4400
automatic density light controls; oscilloscope
vector displays, rack frames

**BETA TECHNOLOGY INC 94 VERDI ST
FARMINGDALE NY 11735** 516 293-4313
sync generator assignment control; digital
timer; videotape editing timing control;
display systems; colorizer; time code
generator VS

**BETHANY INTERNATIONAL INC
5750 BINTLIFF SUITE 201 HOUSTON TX
77036** 713 783-1260
audio distribution amplifiers VS

**BEYER DYNAMIC 155 MICHAEL DR
SYOSSET NY 11791** 516 364-1900
microphones, wireless microphones,
headsets, mic accessories VS
See ad pg. 107—refer to rep/dist section

**BIDDLE JAMES G CO TOWNSHIP LINE &
JOLLY RDS PLYMOUTH MEETING PA
19462** 215 646-9200
CATV test equip VS

**B I ELECTRONICS 128 DONALDSON CTR
BOX 8813 GREENSVILLE SC
29604** 803 277-2759
teletype alarm systems VS

**BIOMATION 10411 BUBB RD CUPERTINO
CA 95014** 408 255-9500
analog to digital color video digitizer

**BIRD ELECTRONIC CORP 30303 AURORA
RD CLEVELAND (OLON) OHIO
44139** 216 248-1200
RF wattmeters; RF loads; RF filters; RF
attenuators; status & alarm systems VS

**BIRNS SAWYER INC 1026 NO HIGHLAND
AVE LOS ANGELES CA
90038** 213 466-8211
camera heads, tripods, dollies; camera &
lens accessories; film editing equip; lights &
light stands

**BIRNUP & SIMS PO BOX 2431 WEST
PALM BEACH FL 33401** 305 683-8311
cable TV construction, strand mapping, field
engineering

BJA SYSTEMS INC 666 DAVISVILLE RD

WILLOW GROVE PA 19090 ... 215 659
color video synthesizer, colorizer

**B&K INSTRUMENTS INC 5111 W 164TH
CLEVELAND OH 44142** 216 267-
chart recorders, impedance bridges,
voltmeters, harmonic distortion meters,
intermodulation meters, phase meters, RF
meters

**BLONDER-TONGUE LABORATORIES INC
ONE JAKE BROWN RD OLD BRIDGE NJ
08857** 201 679-
CATV headends, signal processing equip;
MATV equip; CATV test equip; FM & TV
antennas pay-TV systems

**BOGNER BROADCAST EQUIP CORP
156 HAVEN AVE PORT WASHINGTON N
11050** 516 883-
TV antennas; microwave antennas, FM
antenna

**BOONTON ELECTRONICS CORP RTE
287 AT SMITH RD PARSIPPANY NJ
07054** 201 887-
FM-AM signal generators; impedance
bridges; dB meters; RF watt meters;
capacitance test meters

**BORG-WARNER (INGERSOLL PRODUCT
DIV) See EMCOR**

ROBERT BOSCH CORP See Fernseh

**BOSTON INSULATED WIRE & CABLE CO
65 BAY ST BOSTON MA
02125** 617 265-
cable systems for TV cameras, connectors

See ad pg. 159
Calif BIW 12902 South Spring Street Los
Angeles 90061 213 532
Can BIW 118 Shaw Street Hamilton,
Ontario 416 529-

**BOSTON SOUND AND POWER SYSTEM
3 FREDITH RD WEYMOUTH MA
02189** 617 335-
RF filters, voltage transient suppressors,
mini mixers, digital clocks, precision power
supplies

**BRAND-REX CO PO BOX 498
WILLIMANTIC CT 06226** 203 423-
flexible transmission line, coaxial cable, w
& cable

**BROADCAST ELECTRONICS INC
8810 BROOKVILLE RD SILVER SPRING
MD 20910** 301 588-
single and multi-deck cartridge machines,
recorders, cart machine accessories; audi
consoles; audio processing and distribut
amplifiers, sound studio equipment and
accessories; video monitors, tapeheads
(Spotmaster)

See ad pg. 162—refer to rep/dist section
**BROADCAST EQUIPMENT LEASING CO
1412 GRANT BLDG PITTSBURGH PA
15219** 412 281-
leasing programs for broadcast & CATV
equip

**BROADCAST SOUND ASSOC PO BOX
337 BLUE BELL PA 19422** 215 539-
warning lights, stylus scales, turntables,
pick-up arms, stereo and quad (Satin)

**BSC INC 2932 RIVER ROAD RIVER
GROVE IL 60171** 312 452-
portable consoles, mixers

**BUHL OPTICAL 1009 BEECH AVE
PITTSBURGH PA 15233** 412 321-
CCTV film chains; slide projector; multipl
w.o. dedicated cameras

See ad pg. 167
**BULOVA WATCH CO INC—AM TIME
PRODUCTS DIV 61-20 WOODSIDE AVE
WOODSIDE NY 11377** 212 336-
studio clock systems & frequency standa

C

**CABLEDATA 3200 ARDEN WAY
SACRAMENTO CA 95825** 916 48

You punch up 15 inches per second
for a videotape recorded at 7½.



AVR-3 has the *intelligence* to play it right.

The most advanced video-recorder in the world is also the smartest. Even if a technician goofed and sets the wrong playback speed on a video band, it'll override the error and play the tape the right way. AVR-3 is the only "intelligent" VTR on the market. You'll probably buy an AVR-3 for the picture it produces. Super High-Speed Pilot uses a new combination of recording frequencies to take video quality further than ever before. Banding is virtually a thing of the past, and

7½-inch recording speed comes up looking as good as 15-inches used to.

But excellent recording fidelity is only part of the story. Even the best scenes have to be assembled in the right sequence. And while the AVR-3 has a truly advanced editing option, you'll go the last mile in creative freedom when you use this recorder in partnership with an Ampex EDM-1, Automated Editing System.

AVR-3 is the VTR from Ampex, designed for users who can't take chances.



AMPEX

Complete technical and performance specifications are available in a free brochure. Write us at 401 Broadway, Redwood City, California 94063, or call (415) 367-2011.

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

data processing services to CATV systems VS

CABLE FACTS 2444 PALUMBO DR LEXINGTON KY 40505 606 269-2323
computerized subscriber billing/management service with tele-processing

CABLEVISION CONSTRUCTION CORP PO BOX 38760 HOUSTON TX 77088 713 691-1271
Construction services system mapping

CABLEWAVE SYSTEMS INC 60 DODGE AVE NO HAVEN CT 06473 203 239-3311
transmission lines & line connectors; microwave antennas; transmission line pressurizing equip; waveguide & waveguide accessories VS

CADCO INC POB 18904, OKLAHOMA CITY OK 73118 214 271-3651
CATV pre-amps, message systems, antennas

CALIFOR (DIV OF ORROX) 3303 SCOTT BLVD SANTA CLARA CA 95050 .. 988-2000
torque motors VS

CALVERT ELECTRONICS INC 220 E 23 ST NEW YORK NY 10010 212 481-5303
camera pick-up tubes CCTV and broadcast; rectifiers, wire and cable; transformers; surge protectors, other components VS

CAMBRIDGE PRODUCTS CORP 101 FOLEY ST SOMERVILLE MA 02145 617 666-3343
CATV connectors & "F" fittings, C-D connectors VS

CANON SCOOPIC 10 NEVADA DR LAKE SUCCESS NY 11040 516 488-6700
professional 16mm motion picture cameras; lenses (including zoom); complete systems VS

CANON USA INC 10 NEVADA DR LAKE SUCCESS NY 11040 516 488-6700
video camera lenses, cine cameras & lenses, camera controls and accessories VS
See ad on pg. 43. Refer to rep/dist section

Cal Canon OBM 123 Paularino Ave E Costa Mesa 92626 714 979-6000

Ill Canon USA 140 Industrial Drive Elmhurst 60126 312 833-3070

Can Canon OBM 3245 American Dr Mississauga Ontario, L4V 1B8 416 678-2730

CAPITOL MAGNETIC PRODUCTS 1750 N VINE ST HOLLYWOOD CA 90028 213 462-6252
open-reel cartridge & cassette audio tape; cartridges & cassettes; magnetic film VS
See ad pg. 105

CA CMP 3116 W Ave 32 Los Angeles 90065 213 255-5103
CMP 2670 Leavenworth Street Suite 302 San Francisco 415 771-3210

GA CMP 1670 Freeway Access Rd. Atlanta 30329 404 321-5441

IL CMP 6401 Gross Point Rd Niles 60648 312 775-7101

MA CMP 235 Elm Street Dedham 02026 617 329-5770

MD CMP Century XXI, 20030 Century Blvd Germantown 301 428-0795

MI CMP 550 E Mandoline Street Madison Heights 48071 313 583-9600

NY CMP 1370 Avenue of the Americas New York 10019 212 757-7470

OH CMP 7123 Pearl Road Suite 105 Cleveland 216 888-6010

PA CMP #7 Bala Avenue Bala Cynwyd 19004 125 835-2450

TX CMP 6730 Oakbrook Blvd Dallas 75235 214 637-1890

CARINGELLA ELECTRONICS INC PO BOX 727 UPLAND CA 91786 714 985-1540
clocks, time systems, standard-time

receivers, audio compressors; security systems VS

CASTLE ELECTRONICS INC 5710 NO WESTERN AVE CHICAGO IL 60645 312 728-1800
TV field intensity meters; CATV test equipment, maintenance service VS

CATEL (DIV UNITED SCIENTIFIC CORP) 1400-D STIERLIN RD MOUNTAIN VIEW CA 94043 415 965-9003
FM modulators & demodulators; FM microwave sub-carrier systems; FM head end processors, TV modulators; filters VS

CATERPILLAR TRACTOR 100 NE ADAMS PEORIA IL 61629 309 675-1000
emergency power generators

CBS TECHNOLOGY CENTER 227 HIGH RIDGE RD STAMFORD CT 06905 203 327-2000
quadrophonic encoders, test records VS

CCA ELECTRONICS CORP 716 JERSEY AVE GLOUCESTER NJ 08030 . 609 456-1716
AM, FM, UHF, VHF transmitters all ranges, UHF-VHF antennas, FM monitors; STL, remote pickup equip, towers, SCA equipment, RF amplifiers, exciters, modulators, antenna motors VS
See ad pg. 171—refer to rep/dist section

C-COR ELECTRONICS INC 60 DECIBEL RD STATE COLLEGE PA 16801 814 238-2461
CATV trunk, distribution, extender amplifiers; headend equip; cable passives; CATV test equip; emergency power equipment; maintenance VS

CENTRAL DYNAMICS CORP 230 LIVINGSTON ST NORTHVALE NJ 07647 201 767-1300
TV automated technical operations systems; computerized videotape & audio tape editing equip; tape machine synchronizers; processing amplifiers, chroma keyers, video production switchers, pulse distribution amplifiers, routing switchers; sync generators, special effects generators, colorblock & cue dot generators, time code generators, time code readers, video mixing amplifiers; CCTV, CATV video production switchers VS
See ad pg. 15

Calif CDL 15130 Ventura Blvd. Suite 107 Sherman Oaks 91403 213 789-0574

Ill CDL 331 West Northwest Highway Palatine 60067 312 991-4720

NJ CDL 230 Livingston Street Northvale 07647 201 767-1300

Can CDL 147 Hymus Blvd Montreal Quebec H9Z-1G1 514 697-0811

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

CERRO COMMUNICATION PRODUCTS HALLS MILL RD FREEHOLD NJ 07728 201 462-8700
truck distribution & drop cable; IDC amplifiers, taps & couplers

CETEC AUDIO (DIV OF CETEC CORP) PO BOX 3941 NO HOLLYWOOD CA 91605 213 875-1900
audio amplifiers, controls; consoles, mixers; tape duplicators, tape cassette players/recorders; speakers VS
See ad pg. 102—refer to rep/dist section

CETEC BROADCAST GROUP 75 CASTILIAN DR GOLETA CA 93017 805 968-1561
see: SCHAFFER, SPARTA, JAMPRO VS
See ad pg. 129—refer to rep/dist section

Calif J. Chabin PO Box 33 Goleta 93017 805 968-9846

Col M. Shafer PO Box 1193 #40 Grand Junction 81501 303 243-5373

Ga B. Thomas 117 Golden Hills Dr Rt 3 Woodstock 30188 404 926-9008

Mass R. Dagenais 42 Main St Leominster 01453 617 534-0441

Mich. D. Lamoreaux 142 Ravine Pl Howell 48843 517 546-5488

Ore D. McDonald 50 Kerr Parkway #50 Lake

Oswego 97034 503 630-
Penn G. Pupala 401 Carver Dr Bethlehem 18017 215 691-
Tex T. Copeland 10523 Maplegrove Dallas 75218 214 328-

CHANNELMATIC ELECTRONICS 1234 ADOBE LN EL CAJON CA 92021 714 448-
automated videocassette programmer; A-V switchers, routing switchers, distribution amplifiers

CHARLES MACHINE WORKS INC (SEE DITCH WITCH)

CHATEAU SEVEN GROUP LTD 1125 EMPRESS ST WINNIPEG MANITOBA R3E 3H1 204 772-4
radio studio design, mobile van construct facility turnkey installation

CHOMERICS INC 77 DRAGON COURT WOBURN MA 01801 617 935-4
RFI strip gaskets, conductive RFI o-rings, shrinkable connector shields

CHRISTY CONCRETE PRODUCTS INC 44100 CHRISTY ST FREMONT CA 94538 415 657-
precast concrete & plastic housing for underground cable systems

CHRONO-LOG CORP 2 W PARK RD. HAVERTOWN PA 19083 215 853-
digital clocks & calendars; time-code generators & readers

CHYRON TELESYSTEMS 233 NEWTON I PLAINVIEW NY 11803 516 249-1
character generators; graphics systems; titling equip
See ad pg. 31
Calif CHYRON 851 Burlway Rd Bulingame 94010 415 348-

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

CINEMA PRODUCTS CORP 2037 GRANVILLE AVE LOS ANGELES CA 90025 213 478-
16mm film cameras; lenses for 16mm cameras; camera tripods, body braces; cases, accessories; camera sound record systems & accessories; audio & location lights, light stands, accessories
See ad pg. 99—refer to rep/dist section

CLEAR-COM 759 HARRISON ST SAN FRANCISCO CA 94107 415 989-
portable intercom systems, headphones

CLEVELAND/PRICE ENTERPRISES 12340 LINSHAN DR N HUNTINGTON PA 15642 412 864-
camera handle adaptor for attachment of umbrella and other accessories

CLEWER COMMERCIAL & TECHNICAL SERVICES LTD 836 YEOVIL RD TRADITION ESTATE SLOUGH BERKSHIRE ENGLA
film projectors, telecine systems, film edit equipment, mag film

CMX SYSTEMS (DIV OF ORROX CORP) 3303 SCOTT BLVD SANTA CLARA CA 95050 408 988-
videotape editing equip, portable time code generators
See ads pgs 111, 115
Calif CMX Los Angeles 213 98
NY CMX New York 212 37
Tex CMX Dallas 214 24

COASTCOM 2346 STANWELL DR CONCORD CA 94520 415 825-
demodulators; diplexers; modulators; video filters; subcarrier amplifiers; program subcarriers

COHERENT COMMUNICATIONS CO 13733 GLEN OAKS BLVD SYLMAR CA 91342 213 361-
power supplies for cond microphones; importer of Rycote windshield; film foot counter

continued on p6

ELECTION SPECIAL!

Everything you need to telecast network quality election results without having to buy equipment or hire special technical staff

your own character generator to put data on air seconds after receipt. Up-to-date local and national results while you're displaying the program. Choose your own display format or match network programming. Use percentage reporting or absolute numbers. And much

Telesource makes it happen! Telesource is fast. Flexible. Fully backed-up. Economical. Complete.

Telesource, through its Election Reporting Service, is a proven service with outstandingly successful experience in the 1972 and 1976 elections.

There is no need to purchase equipment or technical expertise. Telesource provides you with everything you need to offer your viewers top quality, complete and professional



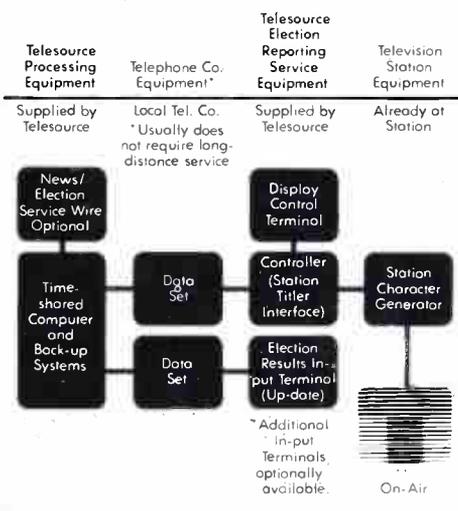
reporting of 1976 election results including a completely backed-up system, a written election guide, and training seminars for your key election personnel.

Ask about the Telesource Optional Election Services—low cost ways to further expand and enhance your station's election coverage or display flexibility.

IMPORTANT

Telesource must limit the number of participating stations. Pricing must increase as election time draws nearer because planning, training, and installation of Telesource equipment must be compressed into a shorter time. It's to your advantage to act now.

Call today for a demo. 702-786-2302.



Telesource
 TELESOURCE COMMUNICATION SERVICES, INCORPORATED
 1135 Terminal Way, Reno, Nevada 89510

Circle 236 on Reader Service Card

THE SOURCE '76

COHU INC ELECTRONICS DIV PO BOX 623 SAN DIEGO CA 92112 ... 714 277-6700
 TV color & mono cameras, studio & portable; color connectors, color encoders, image enhancers, video switchers, pulse distribution amplifiers; TV film cameras, telecine chains; color pattern generators, sync generators; distribution amplifiers **VS**

COLLINS COMMERCIAL TELECOMMUNICATIONS DIV OF ROCKWELL INTERNATIONAL 1200 NO ALMA RD RICHARDSON TX 95081 ... 214 690-5574

FM transmitters, AM transmitters, antenna systems; audio control consoles; microwave equip; frequency monitors; audio controllers & processors, full line consoles; satellite earth stations; SCA equipment, RF switchers; facility turnkey installations; dist of other lines **VS**

See ad pg. Cov. 4—refer to rep/dist section
 Alaska R.F. Cassady PO Box 2743 Fairbanks 99707
 Ariz Morris Courtright 1450 W Arroyo Dr Yuma 85365 602 783-6380
 Fla R.G. Beattie 6300 15th St. No. St Petersburg 33702 813 525-4206
 La W.J. Monroe 8427 Ridgemont Dr Pineville 71360 318 640-3412
 Md C.M. Beverage 10104-M Woodlake Dr Cockeysville 21030 301 666-7059
 Mich D.W. Hill 38780 Hartwell Sterling Heights 48077 313 979-6320
 Minn J.L. Littlejohn 200C West Branch Rd Maple Plain 55359 612 479-2633
 Mo John Shideler Rt #1 Box 217-B Oak Grove 64075 816 443-2080
 Penn A.A. Silver P.O. Box 941 Levittown 19058 215 943-3622
 Oreg T.T. Cauthers 1215 S.E. 73rd Ave Portland 97215 503 254-2818
 Tenn R.C. Evans Rt. # 2 Box 12 Glenmore Dr Rockford 37853 615 573-9717
 Texas W.R. Sheffield 1200 N. Alma Rd Richardson 75080 214 690-5424

COLORADO VIDEO INC PO BOX 928 BOULDER CO 80302 ... 303 444-3972
 mono cameras, video compression equip; color synthesizers; special effects generators **VS**

COLUMBINE SYSTEMS INC PO BOX 740 GOLDEN CO 80401 ... 303 279-6629
 computer business services for radio, TV **VS**

COMAD COMMUNICATIONS LTD 1770 ALBION RD REXDALE ONTARIO M9V 1C2 ... 416 745-6494
 time code generators (Skotel); digital clocks; master clocks; slave clocks; time distribution systems (Dynaquip) **VS**

COMARK INDUSTRIES INC PO BOX 196 MAIN LINE IND PARK WESTFIELD MA 01085 ... 413 568-1870
 RF amplifiers; RF switchers, other RF equipment; transmission line & connectors; demodulators; modulation monitors; VITS, VIR, systems and equipment **VS**

COMMERCIAL ELECTRONICS INC (CEI) 880 MAUDE AVE MOUNTAIN VIEW CA 94040 ... 415 969-1910
 TV cameras, studio & portable; color encoders; Image enhancers **VS**
See ad pg. 117

COMM/SCOPE CO PO BOX 2406 HICKORY NC 28601 ... 704 328-5271
 drop and distribution coaxial cable for CATV

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

COMMUNICATION TECHNIQUES 1279 RT 46 PARSIPPANY NJ 07054 ... 201 263-7200
 microwave equipment, modulators, RF generators **VS**

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

COMMUNICATIONS TECHNOLOGY INC 3070 LEEMAN FERRY RD HUNTSVILLE AL 35801 ... 205 883-7370
 audio switchers, video routing switchers, small and medium video production switchers **VS**
See ad pg. 114—refer to rep/dist section

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

COMPQUIP INC 366 S MAPLE GLENROCK NJ 07452 ... 201 444-3800
 mfg of fixed lens adapters for TV; distributor of lenses & film equip; stands, dollies; video animation aids **VS**

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

COMPUTER IMAGE CORP 2475 W 2ND AVE DENVER CO 80223 ... 303 934-5801
 animation equip; large & small production switchers, routing switchers **VS**
See ad pg. 47—refer to rep/dist section

COMPUTER LABS INC 505 EDWARDIA DR GREENSBORO NC 27409 ... 919 292-6427
 A/D converters; D/A converters; deglitchers **VS**

COMPUTER MAGNETICS CORP 125 W PROVIDENCIA AVE BURBANK CA 91502 ... 213 849-2356
 refurbished VTR and audio heads, video discs, color correctors, video equalizers **VS**

COMREX CORP PO BOX 269 SUDBURY MA 01776 ... 617 358-4042
 wireless mic systems for news gathering; wireless intercom systems; RF cue systems **VS**

COMSONICS INC PO BOX 1106 HARRISONBURG VA 22801 ... 703 434-5965
 remote switching equip for CATV

CONCORD COMMUNICATIONS SYSTEMS 790 PARK AVE HUNTINGTON NY 11743 ... 516 673-8600
 CCTV cameras, surveillance systems, cartridge & cassette VTR's, video switchers

CONRAC DIV CONRAC CORP 600 N RIMSDALE AVE COVINA CA 91722 ... 714 966-3511
 TV monitors **VS**
See Insert pg 67-72
 Ill Conrac 3166 Des Plaines Ave Des Plaines 60018 312 298-8577
 NY Conrac 122 E Main St Elmstord 10523 914 592-5522

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

CONSOLIDATED VIDEO SYSTEMS 3300 EDWARD AVE SANTA CLARA

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

CA 95050 ... 408 247
 time base correctors, field synchronizers, video compressor
See ad pg. 103
 Ala J. Knight Huntsville 35810 205 807
 Ga D. Tuttle Marietta 30062 404 433
 Ill M. Lang Hoffman Estates 60195 312 886
 NJ J. Hans 359 Passaic Ave Fairfield 07006 201 571
 Penn D. Smith Southampton 18966 215 356

CONTENDER CORPORATION 433 COMMUNITY LANE PO BOX "D" WOODLAND CA 95695 ... 916 662
 underground plant construction equip for CATV

CONTINENTAL ELECTRONICS MFG CO PO BOX 270879 DALLAS TX 75227 ... 214 381
 high-power AM broadcast transmitters; 5/10 kW transmitters; AM antennas; duplexers & RF loads
See ad pg. 95

CONTROL CONCEPTS CORP 2361 SO JEFFERSON DAVIS HWY ARLINGTON VA 22202 ... 703 920
 video sync generators; audio signal generators; harmonic & IM distortion meta; videowaveform equalizers; delay lines; te sets

CONTROL DESIGN CORP 4920 WYACONDA RD ROCKVILLE MD 20852 ... 301 468
 radio automation systems; tape cartridge players; digital clocks loggers

CONVERGENCE CORP 1935 SKY PK CIRCLE BLDGS C&D IRVINE CA 92714 ... 714 549
 video editing control systems
See ad pg. 20, 21

Ga Conv 868 E Rock Springs Rd NE Atlanta 30306 404 872
 NY Conv 553 Westchester Ave Portchester 10573 914 937

COOKE ENGINEERING CO DIV OF DYNATECH LABS 900 SLATERS LANE ALEXANDRIA VA 22314 ... 703 548
 video, audio & pulse distribution equip; audio equalizers & line amplifiers; patch panels; character generators; master clo systems; time distribution modules

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

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

CORLEY D&S LTD 80 GALAXY BLVD U 3 REXDALE ONTARIO ... M9V
 test materials for CATV

COSMICAR OPTICAL CO LTD 2-568 SHIMOOCHIAI SHINJUKUKU TO JAPAN
 video camera lenses; camera heads, mo & dollies; CCTV camera lenses, cine lens
See ad pg. 138—refer to rep/dist section

COX DATA SERVICES SUITE 100/PRA NORTH 5600 ROSWELL RD NE ATLAN GA 30342 ... 404 256
 computer systems for TV, AM, FM and CATV, database systems

COYNE ASSOC LTD 39 MAGIL RD DOLLARD DES ORMEAUX QUEBEC H9G 1N4 ... 514 620
 computer aided systems design for CATV

CPAC INC 2364 LEICESTER RD LEICESTER NY 14481 ... 716 382
 silver recovery and pollution control syst

CROCK BRUCE A INC 9118 WINTON R CINCINNATI OH 45231 ... 513 521
 storage racks for cartridges

The Travel Lab



A New Concept in Portable Test Equipment

TEKTRONIX TM 515 Traveler frame looks like luggage, but really a five-compartment main-
e that provides power and inter-
connections for TM 500 plug-in
ular test and measurement
ments. Typically weighing less
32 pounds (with instruments),
small enough to fit under an
aft seat, moisture and dust re-
sistant, and rugged.

In the TM 515, you can take the instruments with you that you
in the lab . . . and maintain the
standards in the field. The
holds five plug-in instruments,
the covers serve as a storage
for your accessories. Now you
concentrate on making mea-

surements instead of the logistics of getting your instruments to the test site.

You can optimize your system by selecting from over 35 general-purpose and specialized TM 500 plug-ins. Plug-ins include DMMs, counters, generators, power supplies, signal processors, logic analyzer, oscilloscopes, monitors, and even blank plug-ins for your custom

circuits. **Intended application areas range from digital field service to medical, from audio/communications to on-site industrial control maintenance.**

For more information, contact your local Tektronix Field Engineer or write or phone: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97077, (503) 644-0161 ext. 5542. In Europe: Tektronix Limited, P.O. Box 36, St. Peter Port, Guernsey, Channel Islands.



Circle 167 on Reader Service Card



TEKTRONIX®
committed to
technical excellence

THE SOURCE '76

CROSSROADS AUDIO INC 121 PAYNE ST DALLAS TX 75207 214 741-6002
concert sound reinforcement mixer; cable fault tester; speakers, audio production services VS

CROWN INTL 1718 W MISHAWAKA RD ELKHART IN 46514 219 294-5571
audio power amplifiers, audio preamplifiers; variable filters; tape player/recorders; intermodulation distortion test equip

CSI ELECTRONICS INC 2607 RIVER RD CINNAMINSON NJ 08077 609 786-1060
exciters; RF amplifiers; transmitters, AM, FM; carrier current; status and alarm indicators VS

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

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

D

DABURN ELECTRONICS & CABLE CORP 2360 HOFFMAN ST BRONX NY 10458 212 195-0050
wire and cable, CATV distribution and drop equipment VS

DATA COMMUNICATIONS CORP (BIAS) 3000 DIRECTORS ROW MEMPHIS TN 38131 901 332-3544
computer service for sales, traffic, operational accounting (TV & radio) VS

DATA LOGIC/RUST PO BOX 273 EVERETT MA 02149 617 658-5410
remote control systems

DATA METRICS 340 FORDHAM RD WILMINGTON MA 01887 617 658-5410
time code generator, digital clocks, master & slave clocks; time code readers VS

DATA PRECISION CORP AUDOBON RD WAKEFIELD MA 01880 617 246-1600
frequency monitors and counters; voltmeters; multimeters VS

DATATEK CORP 1166 W CHESTNUT ST UNION NJ 07083 201 964-3656
video/audio routing switchers; video, audio & pulse distribution amplifiers; video color phase equalizers & waveform correctors video sweep generators; video test equip; audio processing amplifiers VS

DATATRON INC 1562 REYNOLDS AVE IRVINE CA 92714 714 540-9330
videotape editing equip; time code readers/generators; synchronizing equipment, character generators VS
See ads pgs. 32, 51

NY DTR 505 White Plains Road Tarrytown 10591 914 631-4060

DATAVISION MINCOM DIV-3M COMPANY 15932 SHADY GROVE RD GAITHERSBURG MD 20760 301 948-0460
character generators, video display equipment VS
See 3M Company

DAVIS MANUFACTURING DIV OF J.I. CASE PO BOX 1801 WICHITA KS 67213 316 265-6251
trenchers for direct cable burial; line layers

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

DELTA-BENCO-CASCADE LTD 124 BELFIELD RD REXDALE ON CANADA

M9W 1G1 416 241-2651
headend, trunk amplifiers, distribution amplifiers for CATV

DELTA ELECTRONICS INC 5534 PORT ROYAL RD SPRINGFIELD VA 22151 703 321-9845
antenna/transmitter remote control systems; antenna monitors; field strength meters; impedance bridges, phase meters; monitoring & test accessories VS
See ads pgs. 112, 113—refer to rep/dist section

DIELECTRIC COMMUNICATIONS DIV OF SOLA BASIC RTE 121 RAYMOND ME 04071 207 655-4555
RF watt meters, RF loads, RF switchers; waveguide & accessories VS

DICTAPHONE CORP 120 OLD POST RD RYE NY 10580 914 967-6211
telephone answering equip

DIELECTRIC COMMUNICATIONS DIV OF SOLA BASIC RTE 121 RAYMOND ME 04071 207 655-4555
RF watt meters, RF loads, RF switchers; waveguide & accessories VS

DIGITAL COMMUNICATIONS INC 310 14TH AVE SOUTH ST PETERSBURG FL 33701 813 895-4201
pay-TV systems & software

DIGITAL VIDEO SYSTEMS 519 McNICOLL AVE WILLOWDALE ONTARIO M2H 2C9 416 499-4826
time base correctors, special effects generators VS
See ad pg. 149

DITCH-WITCH TRENCHERS PO BOX 66 PERRY OK 73077 405 336-4404
trenchers; vibratory plow; earth saw; backhoe; hydraulic breaker VS
Contact main headquarters for local office. See ad pg. 25

DI-TECH INC 315 WYANDANCH AVE NORTH BABYLON NY 11704 516 643-4040
video and pulse distribution amplifiers; passive video switchers; routing switchers; audio monitor amps

DIX HILLS ELECTRONICS INC 25 N MALL PLAINVIEW NY 11803 516 420-1166
cross modulation, intermodulation & distortion measurement equip for CATV

DOLBY LABORATORIES INC 731 SANSOME ST SAN FRANCISCO CA 94111 415 392-0300
noise reduction systems; audio processing amplifiers; magnetic recording accessories VS

DOWNE COMPUTER SERVICE INC 112 TENTH ST DES MOINES IA 50309 515 282-5131
subscriber billing services for CATV TV

DRACON INDUSTRIES 9541 MASON AVE CHATSWORTH CA 91311 213 882-8595
aluminum relay racks VS

DUCA-RICHARDSON CORP 11465 W 48TH AVE WHEAT RIDGE CO 80033 303 423-1300
master control, production, and routing switchers VS
See ad pg. 137—refer to rep/dist section

DUNCAN ELECTRONICS INC 2865 FAIRVIEW RD COSTA MESA CA 92626 714 545-8261
linear faders, electrical slide controls and knobs VS

DUNLAP CLARK ELECTRONICS 230 CALVARY ST WALTHAM MA 02154 617 899-2320
audio power amplifiers

DU PONT (E.I. DU PONT DE NEMOURS & CO.) MAGNETIC PRODUCTS DIV GLASGOW SITE WILMINGTON DE

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

19898 302 453-
video tape and video cassettes

DURNELL ENGINEERING INC HIGHWAY SOUTH EMMETSBURG IA 50536 712 852-
aerial personnel lift trucks

DYMA ENGINEERING PO BOX 1697 TAO NM 87571 505 758-
audio switchers, audio effects units, cabinetry, cart storage accessories, microphones, limiter/ducker amplifiers; custom audio consoles, studio builders

DYNAIR ELECTRONICS INC 6360 FEDERAL BLVD SAN DIEGO CA 92114 714 582-
video pulse & distribution amplifiers, routing & production switchers, sync generators, spec effects generators, modulators, demodulators, chroma keys, equalizers, exciters, diplexers, sideband analyzers, audio preamps, audio monitor amps, audio switchers, RF switchers, transmitters, rem control systems

DYNASCAN CORP B&K DIV 1801 W BELLE PLAINE AVE CHICAGO IL 60613 312 327-
CATV test equip

DYNASCIENCES VIDEO PRODUCTS TOWNSHIP LINE RD BLUE BELL PA 19422 215 643-
videotape editing equip; automatic program controllers; image enhancers, processing amplifiers, production switchers, pulse & distribution amplifiers, routing switchers, colorizers, sync generators, special effect generators, motion compensating lenses
See ad pg. 18—Call for local distributor

E

EASTMAN KODAK CO MOTION PICTURE & AUDIOVISUAL MARKETS DIV 343 STATE ST ROCHESTER NY 14650 716 325-
motion picture cameras; motion picture film projectors for TV; film processors
See ad pg. 19

Calif Kodak PO Box 38939 Hollywood 90038 213 464-
Kodak PO Box 3145 Rincon Annex San Francisco 94119 415 776-
Ga Kodak PO Box 4778 (Fed. Annex) Atlanta 30302 404 351-
Haw Kodak PO Box 17007 Honolulu 96817 808 833-
Ill Kodak 1901 W 22 St Oak Brook 60521 312 654-
NY Kodak 1133 Ave of the Americas New York 10036 212 262-
Kodak 1187 Ridge Road West Rochester 14650 716 254-
Texas Kodak 6300 Cedar Springs Rd Dallas 75235 214 351-
DC Kodak 500-12th St SW 20024 202 554-
Can Kodak 3500 Eglinton Ave W Toronto Ontario M6M 1V3 416 766-

EACM/ECLAIR CO 6420 SUNSET BLVD SUITE 304 HOLLYWOOD CA 90028 213 466-
professional motion picture cameras (Ecla

EDCO see Rapid Q

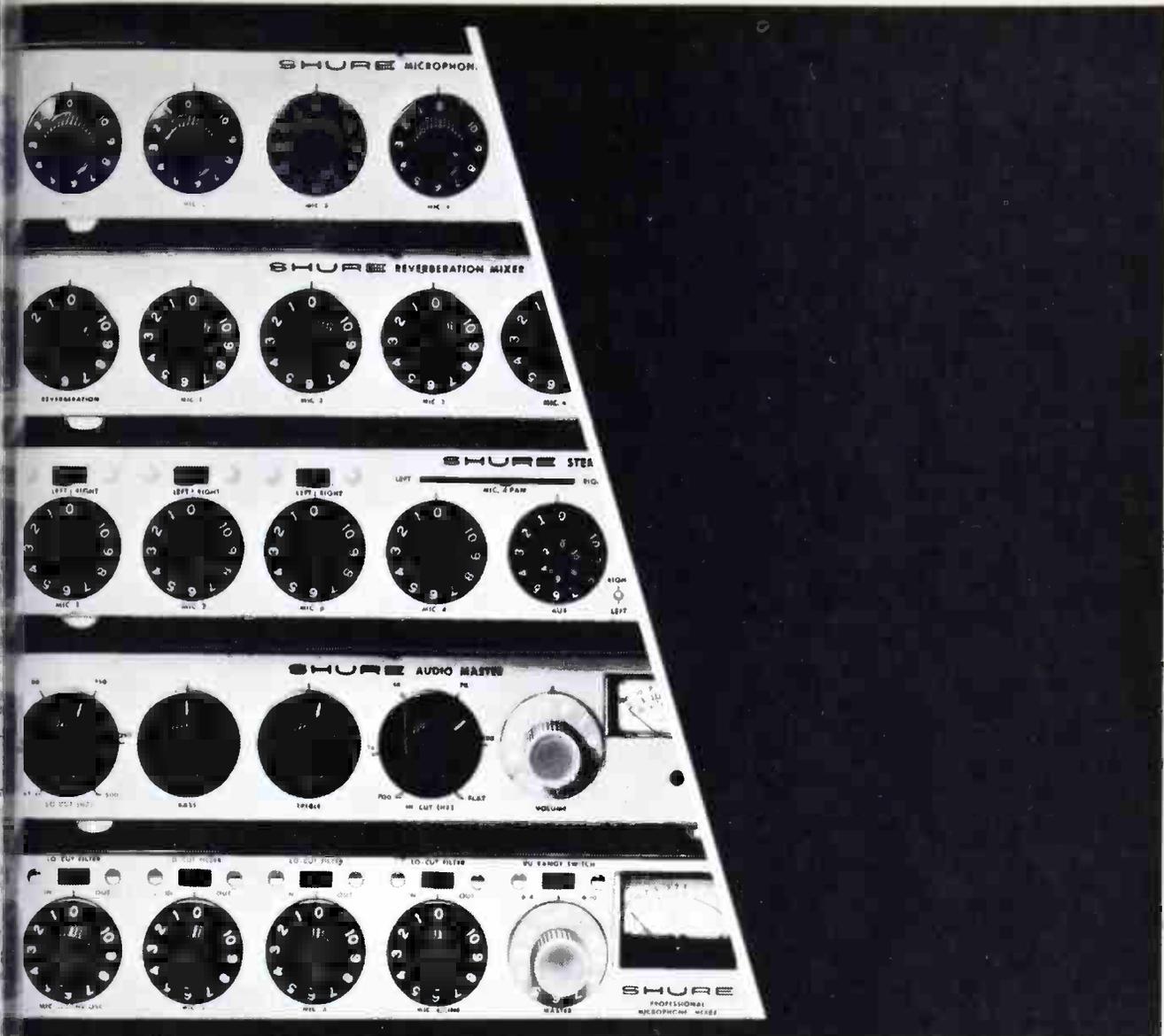
EDCOR DIV OF P.A.C. 3030 RED HILL AVE COSTA MESA CA 92626 714 556-
wireless microphones, dynamic & lavalier; wireless sound systems

EDISON ELECTRONICS See MCGRAW-EDISON

EDUTRON INC 3700 NE 53RD AVE GAINESVILLE FL 32601 904 377-
time base correctors

EEO 1441 E CHESTNUT AVE SANTA ANA CA 92701 714 835-
(SEE AMPEX) audio & video tape editing equip; character generators, synchronizing equipment

continued on pag



Rack 'em up.



For studio, broadcasting, recording, or public-address, Shure audio control components offer more features and more performance, dollar for dollar, than similar equipment. And—just as important—Shure audio components are easier to work with. Their compact size and versatility equip them for an extremely wide variety of audio control applications—and built-in input-output flexibility means quick set-up anywhere. For a permanent installation or a component system that can be adapted to meet any need, Shure has the right combination. To obtain a copy of the Shure catalog, see your dealer or write:

Shure Brothers Inc.
 222 Hartrey Ave., Evanston, IL 60204
 In Canada: A. C. Simmonds & Sons Limited



Manufacturers of high fidelity components, microphones, sound systems and related circuitry.

Circle 168 on Reader Service Card

THE SOURCE '76

(SEE AMPEX) audio & video tape editing equip; character generators, synchronizing equipment VS

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

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

EIGEN VIDEO PO BOX 1027 GRASS VALLEY CA 95945 916 273-1341
color disc recorder VS

EIMAC, DIV OF VARIAN 301 INDUSTRIAL WAY SAN CARLOS CA 94070 415 592-1221
complete line of broadcast quality power grid tubes (triodes, tetrodes, pentodes) VS

EIP INC 3230 SCOTT BLVD SANTA CLARA CA 95051 408 244-7975
microwave and FM frequency counters

ELCOM ENGINEERING PO BOX 10432 SANTA ANA CA 92711 714 544-5760
audio pre-amps, ALC and AGC amplifiers; compressor limiters, AM sample transformers; tower lighting; EBS systems, AM/FM facility turnkey installations VS

ELECTRA CO DIV OF MASCO 300 S COUNTY LINE RD CUMBERLAND IN 46229 317 894-3629
automatic scanning monitors

ELECTROCOMP ELECTRONIC MUSIC LAB INC PO BOX H VERNON CT 06066 203 875-0751
music synthesizers

ELECTROHOME LTD 809 WELLINGTON ST N KITCHENER ON CANADA N2G 4J6 519 744-7111
color & b&w monitors VS

ELECTRONIC DEVICES INC 21 GRAY OAKS AVE YONKERS NY 10710 914 965-4400
solid state rectifiers, replacements for vacuum tubes VS
See ad pg. 174—refer to rep/dist section

ELECTRONIC INTERFACE SYSTEMS INC 2409 S BROADWAY SANTA ANA CA 92707 714 979-0033
automated video cassette controller (random access) VS

ELECTRO IMPULSE INC PO BOX 870 RED BANK NJ 07701 201 741-0404
AM/FM/TV dry loads, cooling systems, RF attenuators; phase meters VS
See ad pg. 174

ELECTRONEERING INC PO BOX 85 SELMA NC 27576 919 284-2102
digital timers VS

ELECTRONIC INDUSTRIAL ENGINEERS
See RCA Community Antenna Systems

ELECTRONICS DIVERSIFIED 1675 NW 216TH ST HILLSBORO OR 97123 503 645-5533
studio light controls; patch panels

ELECTRONICS MISSILES COMMUNICATIONS INC PO BOX 116 WHITE HAVEN PA 18661 717 443-9575
low power TV transmitters for broadcast; TV transmitters for ITFS and MJS; TV translators; TV antennas

ELECTRO & OPTICAL SYSTEMS LTD 3015 KENNEDY RD SCARBOROUGH ONTARIO M1V 1E7 416 291-4492
audio distribution amps, monitor, power, speakers, time code generators, peak meters; b&w cameras, monitors, pulse and distribution amps, production switchers, routing switchers, special effects generators, standard converters, editing equipment, colorizer; lighting controls VS

ELECTRO SOUND INC 160 SAN GABRIEL

DR SUNNYVALE CA 94086 ... 408 245-6600
tape auto loaders, splicing blocks, open-reel tape recorders, portable, and decks, tape duplicators VS

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

ELECTRO-VOICE INC SUB OF GULTON IND INC 614 CECIL ST BUCHANAN MI 49107 616 695-6831
microphones & monitor loudspeakers VS

ELPA MARKETING INC PO BOX 1050 NEW HYDE PARK NY 11040 ... 516 746-3002
source for tape recorder/players (Ferrograph); tape editing equip (Editall); test equip (Ferrograph signal generators, distortion meters, wow & flutter) turntables (Thorens) VS

EMCOR INGERSOLL PRODUCTS 1000 W 120 ST CHICAGO IL 60643 ... 312 264-7800
cabinets; modular enclosure systems

ENGLISH ELECTRIC VALVE CO NO AM LTD 67 WESTMORE DR REXDALE ONT CAN M9V 3Y6 416 745-9494
camera tubes, power tubes, rectifiers VS
See ad pg. 13—refer to rep/dist section
NY EEV 1 American Dr Cheektowaga 14225 716 632-5871

ESC ELECTRONICS 534 BERGEN BLVD PALISADES PK NJ 07650 201 947-0400
delay lines, LC filters; equalizers

ESE 505½ CENTINELA AVE INGLEWOOD CA 90302 213 674-3021
digital clocks, programming devices, timers; tape timer; EBS two tone system VS
See ads pgs. 119, 166—refer to rep/dist section

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

EVENTIDE CLOCK WORKS INC 265 WEST 54TH ST NEW YORK NY 10019 212 581-9290
audio phase controllers; audio compressor/expander/limiters; audio digital delay lines; audio flanger, pitch changer VS

E-Z WAY PRODUCTS INC PO BOX 22845 TAMPA FLA 33622 813 677-7144
communication towers VS

F

FAIRCHILD SOUND EQUIPMENT (SEE ROBINS BROADCAST & EQUIPMENT CORP)

FARINON ELECTRIC 1691 BAYPORT AVE SAN CARLOS CA 94070 415 592-4120
microwave systems; multiplex equip; microwave repeaters; FM over video systems; relay systems for radio & TV broadcasters; microwave accessories; video distribution & subcarrier amplifiers; aural carrier generator; FM sub-carrier equip., engineering services VS
See ad pg. 125
Can FE 657 Orly Ave Dorval PQ H9P 1G1 514 636-0974

F&B/CECO OF CALIFORNIA INC 7051 SANTA MONICA BLVD HOLLYWOOD CA 90038 213 469-3601
manufacture & rental of motion picture equip lighting equip sound equip editing equip & CCTV equip VS
See ad pg. 174
NY 351 W 43rd St New York 10036 212 586-1420

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

VS following the description of a complete products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Source Locator pages 56-73.

FIDELIPAC 109 GAITHER DR MT LAUREL NJ 08057 609 235-
tape cartridges; cartridge storage racks, tape accessories; test tapes
See ads pgs. 104, 108

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

IMERO FIORENTINO ASSOC INC 10 W 66TH ST NEW YORK NY 10023 212 787-
kits for testing gray scale of colors, consulting service; color monitor calibrator, prefab scenery, studio design, TV production equipment rental

FISHER BERKELEY CORP POWELL & CHRISTIE EMERYVILLE CA 94608 415 655-9
intercom systems

FISHER-BURKE PO BOX 2468 PHOENIX AZ 85003 602 257-0
audio distribution amplifier, antenna tuning units, custom AM phasers

FIXTUNE SOLID STATE ELECTRONICS INC 1 WEST 30th NEW YORK NY 10001 212 683-9
one station FM receivers; SCA receivers

FLASH TECHNOLOGY CORP OF AMERICA 111 LOCK ST NASHUA NH 03060 603 883-0
strobe beacons for towers

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

FORGFLO CORP FRONT & REGAN ST SUNBURG PA 17801 717 286-
magnetic recorder heads for audio

FORT WORTH TOWER CO INC PO BOX 8597 FORT WORTH TX 76112 817 457-2
towers, prefab bldgs, reflectors

FREZZOLINI ELECTRONICS INC 7 VALLI ST HAWTHORNE NJ 07506 .. 201 427-1
professional 16mm cameras, lenses, accessories; motion picture lights; portable power packs for video cameras, batteries
See ad pg. 10

FRIBLEY ENTERPRISES PO BOX 389 CANADA RD PAINTED POST NY 14870 607 962-2
terminal boxes for CATV MATV

FUJI VIDEOTAPE, 350 FIFTH AVE, NEW YORK, NY 10001 212 736-
videotape

FUJINON OPTICAL INC 420 WEST END AVE NEW YORK NY 10024 ... 212 724-
camera lenses

FUNG ENGINEERING CO PO BOX 1082 SAN CARLOS CA 94070 415 591-
video processing amplifiers, RF converters filters, switchers, demodulators, modulators, TV field intensity meters

G

GABRIEL ELECTRONICS PO BOX 626 SCARBOROUGH ME 04074 ... 207 883-
parabolic, horn & shrouded antennas; elliptical waveguides, tower construction

continued on page

Quality, Reliability, Service...

Excellent Reasons for Choosing ADM[®]



Console custom-designed and built by
Audio Designs for WKY-TV, Oklahoma City.

When you buy an ADM Console, you buy a company. You buy our skilled engineers and design personnel, our professional know-how and more than ten years of experience in building consoles that are *unexcelled* for quality and reliability.

Audio Designs[®] has consistently been a leader in innovative concepts and "state-of-the-art" techniques. Our principals have worked on the studio side of consoles—they know what professionals want and need to do their demanding jobs faster and easier. And customers know that ADM Consoles are engineered for consistent high performance. That is the reason why our customer list reads like a "Who's Who" of the industry.

Our consoles are manufactured with the finest components for long life and trouble-free operation. Hopefully you will never need service, but if you do, we will provide assistance promptly and without question. Our five-year warranty is the most liberal in the industry. Before you buy any console—standard or custom—let us give you some more reasons why an ADM Console is your best buy. Call or write us soon.



AUDIO DESIGNS AND MANUFACTURING, INC.
16005 Sturgeon, Roseville, Michigan 48066
Phone: (313) 778-8400, Cable: AUDEX TLX-23-1114
AMPEX DISTRIBUTED OUTSIDE U.S.A.
BY AMPEX INTERNATIONAL OPERATIONS, INC.

Circle 209 on Reader Service Card

TANDBERG

10XD bridges the gap between consumer and professional tape recorders.

Meet the world's first and only 10½" reel tape recorder that operates at 15 ips and combines Tandberg's unique Cross-Field recording technique with the world-famous Dolby* B system. Result: A *guaranteed minimum* signal-to-noise ratio of 72 dB, measured on a 4-track machine using IEC A-weighting. Simply put, the 10XD completely eliminates audible tape hiss!

Here are some of the many sophisticated features that make the 10XD the finest tape recorder Tandberg has ever built:

- 3 speeds: 15, 7½, 3¾ ips. Electronically selected
- 3 motors; Hall-effect capstan motor
- 3 heads; plus separate bias head
- Electronic servo speed control
- Electronic logic mode controls, including photo optics
- Electronic balanced microphone inputs
- Echo, sound-on-sound, editing, A and B tests

- Peak reading meters
- Direct transfer from playback to record (flying start)
- Ferrite playback head with symmetrical balanced output for hum canceling purposes and differential playback amplifier.

Remote control and rack mount optional. Pitch control by special option. For a complete demonstration of this remarkable new advance in stereo tape recording, see your Tandberg dealer.



*Dolby is a trademark of Dolby Laboratories, Inc.

Tandberg of America, Inc., Labriola Court, Armonk, N.Y.
A. Allen Pringle Ltd., Ontario, Canada

SOURCE '76

transmission lines & connectors; turnkey installations VS

DRP 140 W 51ST ST NEW YORK
 20 212 582-7600
 films, slide films, motion picture films; processing equip; film & slide projectors; accessories VS

INDUSTRIES INC 291 COX ST
LE NJ 07203 201 241-7500
 fittings; splitters; directional 1 taps; traptester, passive distribution accessories; transformers; locking devices; hardware

ER ELECTRONICS 4200 N 48TH
LN NE 68504 402 465-5911
 duplication systems; conveyor-type tape VS

BROADCAST DIVISION (See
OS CORP.)

CO INC 141 ALGONQUIN PKWY
ANY NJ 07981 201 887-7210
 frequency monitors and counters, audio meters, voltmeters, harmonic distortion meters, EBS two tone systems VS

CLOSED CIRCUIT TV CORP.
TH AVE NEW YORK NY
 212 989-4433
 cameras, studio & portable (b&w color); mounts; telecine chains; monitors; lenses; spec effect gen; VTRs (helical); tape; audiotape; coaxial connectors, distribution amplifiers, pulse modulation amplifiers VS

RAL CABLE APPARATUS DIV PO
66 5600 W 88TH AVE
MINSTER CO 80030 303 427-3700
 construction tools; aerial lifts; ground splicing modules; cable production accessories (clamps, etc)

RAL CABLE CORP 500 W PUTNAM
GREENWICH CT 06830 .. 203 661-0100
 production cable, drop cable for CATV; processing systems, ventilators; tapes; dryers, aerial lifts, pole hardware VS

RAL CAMERA CORP 471 11TH AVE
YORK NY 10018 212 594-8700
 cameras; camera accessories; film magnetic recording equip

RAL ELECTRIC CO MIDPS RM 301
LE 7 ELECTRONICS PK SYRACUSE NY
 2 315 456-3293
 cameras; CCTV systems; lenses; tapes & accessories VS

RAL ELECTRIC CO LAMP BUSINESS
ION NELA PARK CLEVELAND OH
 216 266-2121
 studio, TV lamps VS

RAL ELECTRODYNAMICS CORP
FOREST LANE GARLAND TX
 214 276-1161
 ochrome TV cameras; camera tubes

RAL RADIO CO 300 BAKER AVE
CORD MA 01742 617 369-4400
 equip; bridges; sound level meters

ERT ENGINEERING CO 3700 N 36TH
PHOENIX AZ 85019 602 272-6871
 cable connectors, adapters, fittings, cables, accessories, tools

IE BATTERY 5757 N GREEN
AVE MILWAUKEE WI
 414 228-2116
 ies VS

DMARK COMMUNICATIONS CORP
MMERCE RD STAMFORD CT
 4 203 327-7270
 video transfer system; auto skew factor; reprocessed tape VS

DON ALAN ENTERPRISES INC 1430 N
JENGA BLVD HOLLYWOOD CA
 B 213 466-3561
 n picture cameras, camera mounts, ctors; lenses & accessories; film editing

equip VS

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

GOULD INC 467 CALHOUN ST TRENTON
NJ 08607 609 392-3175
 power inverters; battery chargers, batteries

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

THE GRASS VALLEY GROUP INC PO BOX
1114 GRASS VALLEY CA
 95945 916 273-8421
 automation equip; video production & routing switchers; pulse & distribution amplifiers, chroma keyers, processing amplifiers, sync generators, special effects generators; colorizers; equalizers VS

See ad pg 5

NY GVG Station Plaza E Great Neck
 11021 516 487-1311

Calif GVG 4419 Van Nuys Bl Ste
 307 Sherman Oaks 91403 .. 213 990-6172

Ga GVG 1644 Tuille Cir NE Atlanta
 30329 404 634-0521

Tex GVG PO Box 482 Mabank
 75147 214 887-1181

Ind GVG 810 W Bristol St Suite E-Elkhart
 46514 219 264-0931

THE GREAT AMERICAN MARKET PO BOX
178 WOODLAND HILLS CA
 91364 213 883-8182
 lighting heads, stands, fixtures; light projected patterns VS

GRINNAN FIXTURE CO
16041 GEORGETOWN ST NE MINERVA OH
 44657 216 862-2323
 disc and tape storage cabinets, racks; studio furniture VS

GROUP 128 INC 50 SUN ST WALTHAM MA
02154 617 891-1800
 electret microphones VS

GRUBER PRODUCTS CO 5254 JACKMAN
RD TOLEDO OH 43613 419 476-7200
 mobile ENG carts, A/V carts, projection tables VS

GTE LENKURT INC 1105 COUNTRY RD
SAN CARLOS CA 94070 415 591-8461
 microwave equip; remote control systems; remote pickup & STL systems; demodulators; program subcarrier equip VS

GTE SYLVANIA CATV EQUIPMENT &
INSTALLATION OPERATION 114 S
OREGON ST EL PASO TX
 79901 915 544-7550
 CATV distribution & truck amplifiers, passive devices, connectors, constr. services VS

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

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

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

H

HAMLIN INTERNATIONAL CORP 126 SW
153RD ST SEATTLE WA
 98166 206 246-9330
 CATV band-pass filters; converters; passive head-end processing devices; couplers; receivers

HARRIS CORP BROADCAST PRODUCTS
DIV 123 HAMPSHIRE ST QUINCY IL
 62301 217 222-8200
 AM & FM transmitters; radio automation; TV transmitters; TV exciters, modulators, drivers; RF switches, duplexers; TV, AM, FM antennas & accessories; TV studio cameras; telecine equip; video distribution switchers, color encoders; TV & audio consoles; microphones, turntables, arms, limiting amplifiers; tape cartridge player/recorders; tape accessories; monitor speakers; video monitors; sync generators, waveform monitors; videotape recorder/players; phase modulation, frequency monitors; RF amplifiers; transmission lines & accessories; remote control equip., SCA equipment, services VS

See ad pg 33
Field offices

Ca Harris Corp BE/Div 10960 Wilshire Blvd
 Los Angeles 213 477-2577

DC Harris Corp BE/Div 1522 K St NW
 Washington 20005 202 223-5508

Ga Harris Corp BE/Div 1745 Tully Circle
 NE Atlanta 30329 404 636-9006

NY Harris Corp BE/Div 130 E 34th St New
 York 10016 212 889-0790

Oh Harris Corp BE/Div 55 Public Square
 Cleveland 44113 216 781-6322

Tx Harris Corp BE/Div 4019 Richmond Ave
 Houston 77027 713 623-6655

PQ Gates Div Harris 212 Brunswick Blvd
 Pointe-Claire 514 695-3751

On Gates Div Harris 19 Lesmill Road Don
 Mills M3B-2T3 416 447-7234

District managers, radio

Al W. Bone 1866 Gatewood Dr Montgomery
 36106 205 277-4377

Ca D Evans PO Box 6566 San Jose
 95150 408 998-8222

Fl I Raulerson PO Box 958 Macclenny
 32063 904 791-0108

Mi D Orient 56 S Crestview Dr Adrian
 49221 313 423-4560

Mo K Jones PO Box 1173 Maryland
 Heights 63043 314 837-0504

Neb G. Hassinger 1479 19th Ave Waverly
 68462 402 786-2431

NC R Sawicki 701 G Greenhaven Dr
 Greensboro 27407 919 855-1146

NY E Karl 130 E 34th St New York
 10016 212 889-0790

Oh B Emery PO Box 492 Worthington
 43085 614 436-5103

Okla C Lutz PO Box 45107 Tulsa
 74145 918 251-8808

SC E R Lowder 7209 Stonehaven Drive
 Columbia 29209 803 776-2059

Tx L England 4019 Richmond Ave Houston
 77027 713 623-6655

Wa N Arveschoug PO Box W Oak Harbor
 98277 206 675-1574

DC P Timple 730 Federal Bldg 1522 K St
 NW20025 202 223-5508

Wi R Gorjance 3320 Ivy Lane Racine
 53402 416 639-7889

District managers, television

Ca T O'Hara 2836 E Panamint Ct Westlake
 Village 91360 213 747-7129

DC L Page 730 Federal Bldg 1522 K St NW
 Wash 20005

Ga G Hardy 3438 Hill Dr Duluth
 30136 404 476-4136

Ill V Russell 710 E Cherry Ln Arlington
 Heights 60004 312 255-9230

NY D Spindle 130 E 34th St New York
 10016

Oh B Culbertson PO Box 2927 Rocky River
 44116 216 333-6890

Tex V Killion 707 Rosewood Conroe
 77301 713 623-6655

HARRISON SYSTEMS BOX
22964 NASHVILLE TN 37202 - 615 834-1184
 consoles, audio components

continued on page 88

THE SOURCE '76

**HARWALD CO 1245 CHICAGO AVE
EVANSTON IL 60202** 312 491-1000
film inspection, cleaning equip; splicers;
editing equip

**HARWOOD MFG CO 1800 W FULLERTON
CHICAGO IL 60614** 312 929-1100
photographic & electronic lighting equip,
portable lighting bars

**HEATH CO BENTON HARBOR MI
49022** 616 982-3200
intercoms; tape cartridge equip;
loudspeakers; oscilloscopes; multimeters;
frequency counters; signal generators, af &
rf; distortion meters; impedance bridges;
CATV test equip, (Heath/Schlumberger
Instruments) VS

**HEINDL MASK MOUNTS 200 ST PAUL ST
ROCHESTER NY 14604** 716 454-5080
mounts & masks for photo slides

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

**HERVIC CORP 14225 VENTURA BLVD
SHERMAN OAKS CA 91423** ... 213 981-2345
Beaulieu cine cameras; Stellovox tape
recorders & mixers; lenses & accessories;
fluid tripods; film editors, microphones;
digital FM receiver VS

**HEWLETT-PACKARD CO 1501 PAGE MILL
RD PALO ALTO CA 94304** 415 493-1501
oscilloscopes, frequency counters, waveform
analyzers, digital multimeters, signal
generators, sweep oscillators, spectrum
analyzers, other test equipment for
broadcast and CATV; bulk erasers,
automatic data acquisition systems VS

**HITACHI DENSHI AMERICA LTD
58-25 BROOKLYN-QUEENS EXPRESSWAY
WOODSIDE NY 11377** 212 898-1261
studio & portable color & mono video
cameras; video monitors; pulse distribution
amplifiers; sync generators; special effects
generator; videotape recorder/players; video
cartridge recorder/players; microwave equip;
semi-conductors VS

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

**HOLMES FRANK LABS INC 1947 FIRST ST
SAN FERNANDO CA 91340** ... 213 365-4501
lab, filmstrip and slides VS

**HOVEY DAVE GENERAL CONTRACTOR
PO BOX 260 COFFEEVILLE MS 38922**
..... 601 675-2956
studio construction, antenna, tower, and
earth station construction; facility turnkey
installations VS

**HUGHEY & PHILLIPS INC 3050 N
CALIFORNIA ST BURBANK CA
91505** 213 849-1104
tower lighting, beacons, de-icers VS
See ad pg. 161

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

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

**IGM DIV OF NORTHWEST TECHNOLOGY
INC 4041 HOME RD BELLINGHAM WA
98225** 206 733-4567

radio automation systems; multicart
machines; random access memory; auto
logging systems; cartridge reproducer,
remote control cart handler read out/display
units; time/weather announcers VS
See ad pg. 10—refer to rep/dist section

**IKEGAMI ELECTRONICS (USA) INC
29-19 39th AVE LONG ISLAND CITY NY
11101** 212 932-2577
portable color TV cameras, accessories,
telecine equipment, production switchers,
monitors VS
See ad pg. 26-27

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

**IMAGE MAGNIFICATION INC
538 BLOOMFIELD AVE VERONA NJ
07044** 201 239-1141
large-screen TV projection systems VS

**IMAGE TRANSFORM INC
4142 LANKERSHIM BLVD NO
HOLLYWOOD CA 91602** 213 985-7566
videotape to film transfers, scene by scene
video correction, chroma keying/matting,
standards conversions VS

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

**INDUSTRIAL ELECTRIC REELS INC
1125 JACKSON ST OMAHA NE
68102** 402 422-1001
cable reels & collector rings

**INDUSTRIAL SCIENCES INC (ISI) 3521 SW
42 AVE GAINESVILLE
FL 32608** 904 373-6783
chroma keyers, processing amplifiers, pulse
and distribution amplifiers; production
switchers, routing switchers; sync
generators; VIRS generators; special effects
generators; colorizers; automatic telécine
light control; signal-equalization system VS

**INOVONICS INC 1630 DELL AVE
CAMPBELL CA
95008** 408 374-8300
solid state replacements for tube-type
Ampex recorder audio processing equip VS
See ad pg. 18—refer to rep/dist section

**INSTRUMENT LABORATORIES CORP
315 W WALTON PL CHICAGO IL
60610** 312 642-0123
test equip; cable locators; fault finders

**INTECH LAB 4175 VETERANS HWY
RONKONKOMA NY 11776** ... 516 585-6754
automatic CATV spectrum analyser

**INTERAND CORP 450 E OHIO ST
CHICAGO IL 60611** 312 943-1200
electronic video graphic systems, telestrator,
audio graphics, interactive video educating
device VS

**INTERNATIONAL AUDIO INC 2934 MALMO
DR ARLINGTON HEIGHTS IL
60005** 312 956-6030
audio and video tape, cartridge and
cassette; head alignment gauges; tape
duplicator VS

**INTERNATIONAL NUCLEAR CORP
608 NORRIS AVE NASHVILLE TN
37204** 615 254-3365
chroma keyers; video processing amplifiers;
video switchers; routing switchers, pulse
distribution amplifiers, burst phase corrector,
audio distribution amplifier, line equalizer
amplifier VS

**INTERNATIONAL RECTIFIER CORP
233 KANSAS ST EL SEGUNDO CA
90245** 213 278-3100
high power cartridge rectifiers; high voltage
rectifier columns; solid state tube
replacements

INTERNATIONAL TAPETRONICS CORP

VS following the description of a company
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panies so identified have filed appropriate
literature with BM/E indicating the products
mentioned are in production and available

To identify all manufacturers of a particular
product class or category consult the Insta-
Source Locator pages 56-73.

**2425 S MAIN ST BLOOMINGTON IL
61701** 309 828-13
tape cartridge equip; reel-to-reel; multi cart
machines, audio recorder/players
See ads pgs. 14, 140

**INTERNATIONAL VIDEO CORPORATION
(IVC) 990 ALMANOR AVE SUNNYVALE CA
94086** 408 738-39
video color cameras; telecine chains;
videotape recorder/players; diplexers;
multiplexers; time base correctors

**INTERSTATE TELEPHONE ELECTRONICS
PO BOX 34497 DALLAS TX
75324** 214 241-41
stand-by power supplies for head-end
microwave, line amplifiers; emergency
lighting

**INNOVATIVE TELEVISION EQUIP BOX 681
WOODLAND HILLS CA
91364** 213 888-94
heads for TV cameras, pedestals, stands;
remote control mounts

**IONIC INDUSTRIES INC 128 JAMES ST
MORRISTOWN NJ 07960** 201 539-11
music synthesizers, sound effects

**IRISH ELECTRONIC ENTERPRISES INC
270-78 NEWTOWN RD PLAINVIEW NY
11803** 516 293-55
video tape

**ITI ELECTRONICS INC 369 LEXINGTON
AVE CLIFTON NJ 07015** 201 546-39
CATV video leveler; audio amplifiers and
processing equipment

**ITT CANNON ELECTRIC CANADA FOUR
CANNON COURT WHITBY ONTARIO
LIN 5V8** 416 668-88
CATV connectors and plugs

**ITT JENNINGS 970 MC LAUGHLIN AVE
SAN JOSE CA 95122** 408 292-40
coaxial switchers, variable vacuum
capacitors; RF voltmeters; vacuum relays,
coaxial relays & switchers

**ITT SUPRENANT 172 STERLING ST
CLINTON MA 01510** 617 365-63
CATV wire, cable

J

**J&D INTERNATIONAL INC SUITE 624
LEWIS TOWER BLDG PHILADELPHIA PA
19102** 215 922-56
monitor, distribution amps; chroma keyers,
processing amplifiers, pulse & distribution
amplifiers, video production switchers, black
burst generators, special effects generators,
colorizer, equalizer

**JACOBSEN MFG CO SOD MASTER DIV
3456 WASHINGTON AVE N MINNEAPOLIS
MN 55412** 612 529-95
vibratory plows for cable burial

**JAMIESON FILM COMPANY 6911 FOREST
PARK RD DALLAS TX
75235** 214 350-12
color film processors; film processor
accessories

**JAMPRO ANTENNA CO 6939 POWER INN
RD SACRAMENTO CA
95828** 916 383-11
AM, FM, TV antennas; antenna accessories

continued on page



Bye, bye brute.

So long, spot. Ta-ta tener.
 Sewell, fay-lite. Miss you maxi
 mate and Molevator, too.
 We've got something better:
 something you've got to see—
 and try—to believe. Belden/Lee
 Compact Source iodide discharge
 lamps. A two-luminaire system
 that's better than a warehouse-
 full of conventional film, TV, still
 and arena lighting equipment...
 especially for location work.
 Because:
They've got instant restrike—
 you get all the benefits of
 iodide discharge without any
 drawbacks.
They're smaller—
 13½ x 13½" for single head;
 25 x 12" for the twin. Fit just

Exclusive U.S. Distributor:

B Belden
 Communications,
 Incorporated
 25 West 45th Street
 New York, New York 10036
 (212) 730-0172

about anywhere, for easy
 shipment and setup.

They're lighter—
 20 lbs. for the single head; 35 for
 the twin. Easier on your back.

They're brighter—
 at 100' and full spot, one 2kW twin
 delivers 200 foot candles. At 20'
 and full spot, it actually delivers
 5000 fc!

They're flexible—
 change patterns without re-
 lamping.

They're far more efficient—
 single requires 1000 watts (com-
 pares with 3-5000 watts and up);
 twin, 2000 (compares with 6-
 10,000 and up). In other words,
 CSI lamps draw only 1/3 to 1/5 the
power of any comparable day-

light corrected source.

**They're more
 economical—**
 PAR64 bulb
 delivers lowest
 operating cost-
 per-hour of any
 large source lamp.

They're versatile—
 output is perfect for video; can be
 filtered up for daylight; down for
 tungsten. Low heat output and
 weatherproof, too. Head can be
 operated 500' from ballast.

Now that you know what
 Belden/Lee CSI lights can do,
 why not find out more about what
 they can do for you. Write or call
 us for more information on
 purchase or rental.



Sales and Rental Representative:

**CAMERA
 MART** 

The Camera Mart, Inc.
 456 West 55th Street
 New York, New York 10019
 (212) 757-6977 Telex: 1-2078

Circle 170 on Reader Service Card

SUSTAINING
SMPTA
 MEMBER

pmpco

THE SOURCE '76

JAVELIN ELECTRONICS 6357 ARIZONA CIRCLE LOS ANGELES CA 90045 213 641-4490
CCTV cameras, lenses, accessories; video tape recorders; time and data generators; picture monitors; video amplifiers VS

JEFFERSON DATA SYSTEMS EXECUTIVE PLAZA 501 ARCHDALE DR CHARLOTTE NC 28208 704 374-3631
business data systems for radio & TV VS

JERROLD ELECTRONICS CORP 200 WHITMER RD HORSHAM PA 19044 215 674-4800
cable trunk, distribution & line extender amplifiers; cable passive distributors; headend processors; complete headend systems; turnkey cable installations; cable system design; coax connectors; pay-cable systems; antennas for cable, MATV; modulators, demodulators, RF amplifiers; transmission line end connectors VS

JOHANSON MFG CO ROCKAWAY VALLEY RD BOONTON NJ 07005 201 334-2676
variable capacitors

JOHNSON ELECTRONICS INC PO BOX 7 CASSELBERRY FL 32707 305 339-2111
FM & SCA broadcast receiving equip; pa amplifiers VS

JVC INDUSTRIES INC 58-75 QUEENS MIDTOWN EXPSWY MASPETH NY 11378 212 476-8010
video color cameras; portable video cameras; monochrome cameras; lenses, head mounts, tripods, camera accessories; videotape recorders/players; monitors; videotape; video cassette players; video editor-controller, microphones VS
See ad pg. 7

Calif JVC 1011 W Artesia Blvd Compton 90220 213 537-8230
Ill JVC 3012 Malmö Dr Arlington Hts 60005 312 593-8997

K

KAHN COMMUNICATIONS INC 74 NO MAIN ST FREEPORT NY 11520 516 379-8800
AM stereo exciter, passive equalizers and filters VS

KAITRONICS CORP 870 MAHLER RD BURLINGAME CA 94010 415 697-9102
SMPTÉ time code equip, remote broadcast control systems, tape evaluators VS

KALART VICTOR CORP HULTENIUS ST PLAINVILLE CT 06062 203 747-1663
large screen TV projectors; TV image impresser; optical multiplexer; TV film chain; TV movie projector, film editing equip, accessories VS

KALLMAN ASSOCIATES INC 2525 HYPERION AVE LOS ANGELES CA 90027 213 660-4900
alpha-numeric character generators, color monitors VS

KAMAN SCIENCES CORP (BROADCAST COMPUTER SERVICES) 1500 GARDEN OF THE GODS RD COLORADO SPRINGS CO 80907 303 598-5880
radio and TV computer business services VS

KANSAS STATE NETWORK INC 833 N MAIN ST WICHITA KS 67203 316 265-5631
time base correctors; character generators; information systems for CATV

KAPPA NETWORKS INC 165 ROOSEVELT AVE CARTERET NJ 07008 201 541-1600
delay lines, networks

KAREX INC 1262 LAWRENCE STATION RD SUNNYVALE CO 94086 408 734-3341

videotape VS

KAY ELEMETRICS CORP 12 MAPLE AVE PINE BROOK NJ 07058 201 227-2000
CATV test instruments; spectrum analyzers; rotary attenuators, slide attenuators; RF generators VS

KINGS ELECTRONICS CO 40 MARBLE DALE RD TUCKAHOE NY 10707 914 793-5000
coaxial & triaxial connectors; high voltage connectors; high density connectors; plugs & jacks VS

KLEIN MATHIAS SONS INC 7200 McCORMICK RD CHICAGO IL 60645 312 588-6820
hand tools; safety equip for CATV

KLIEGEL BROS UNIVERSAL ELECTRIC STAGE LIGHTING CO INC 32-32 48TH AVE LONG ISLAND CITY NY 11101 212 786-7474
lighting control systems & fixtures for remote pick-up, studio locations VS

KNOX LTD PO BOX 278 WASHINGTON GROVE MD 20880 301 840-1930
graphics generators

KMS ELECTRONICS 13733 GLENOAKS BLVD SYLMAR CA 91342 213 362-2566
portable battery-operated audio mixers for film & TV VS

KOLLMORGEN CORP 347 KING ST NORTHAMPTON MA 01060 413 586-2330
visual, TV special optical systems

KORTICK MFG CO 5600 THIRD ST SAN FRANCISCO CA 94124 415 822-6660
pole line hardware

KOSS CORP 4129 N WASHINGTON ST MILWAUKEE WI 53212 414 964-5000
headphones, dynamic & electrostatic

KREONITE INC PO BOX 2099 WICHITA KA 67201 316 263-1111
film lab and graphics studio design and turnkey installations; film processors VS

KTI MICROELECTRONICS DIV OF BEI ELECTRONICS PO BOX 1222 CAMPBELL CA 95008 408 371-5880
filters for telephone signals

KVC INC 770 LEXINGTON AVE NEW YORK NY 10021 212 752-3690
portable video camera shoulder braces; camera mounts, heads, tripods, equipment rental services, video repair services, studio design VS

L

LAIRD TELEMEDIA INC 2125 S WEST TEMPLE SALT LAKE CITY UT 84115 801 487-6251
character generators; multiplex equip; slide projectors; time/date generators VS
See ad pg. 38

LAMPKIN LABORATORIES INC 8400 NINTH AVE NW BRADENTON FL 33505 813 746-4175
signal generators; frequency meters; modulation monitors; deviation meters; TV signal conditioner

LEBOW LABS INC 56 CHESTNUT HILL AVE BOSTON MA 02135 617 566-1125
radio and TV studio design and installation VS

LEITCH VIDEO LTD UNIT 46 705 PROGRESS AVE SCARBOROUGH

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ONTARIO M1H 2X1 416 438-5
video synchronizing and timing systems, sync gens, video pulse and proc amps; pulse assignment switchers; video test equipment

LENCO ELECTRONICS 319 W MAIN ST JACKSON MO 63755 314 243-3
color encoders, processing amplifiers; pulse distribution amplifiers; sync generators; burst generators; video presence detector; changeover switch; helical genlock; program subcarrier; video noise meters, test generators; CATV test equipment; equipment rental service video camera (mono)

LENZAR OPTICS CORP 210 BRANT RD LAKE PK FL 33403 305 844-0
camera lenses

LEXICON INC 60 TURNER ST WALTHAM MA 02154 617 891-67
audio digital delay system; variable speed tape recorder; speech compressor/expander

LINDSAY SPECIALTY PRODUCTS LTD 418 CAREDEAN DR HORSHAM PA 19044 215 675-2
CATV headend antennas; cable connectors; trunk & distribution amplifiers; distribution accessories

LINES AUDIO-VIDEO SYSTEMS 219 SO JEFFERSON SPRINGFIELD MO 65806 417 862-55
small video switcher/fader

LIPSNER-SMITH CORP 7334 N CLARK ST CHICAGO ILL 60626 312 338-3
film inspection projectors; film, tape ultrasonic cleaner

LISTEC TELEVISION EQUIPMENT CORP 39 CAIN DR PLAINVIEW NY 11803 516 694-89
video camera heads, pedestals, tripods, dollies (Vinten and T.V.P.)

LONDON CO THE 811 SHARON DR CLEVELAND OH 44145 216 871-89
modulation monitors, chart recorders, RF generators

LOWEL-LIGHT MANUFACTURING INC 421 W 54TH ST NEW YORK NY 10019 212 245-67
TV studio & location lights; light stands, light accessories

LPB INC 520 LINCOLN HIGHWAY FRAZER PA 19355 215 644-11
audio consoles, equip; control room furniture; carrier current AM broadcast equip AM/ FM transmitters; audio processors
See ad pg. 170—refer to rep/dist section

LRC ELECTRONICS INC 901 SOUTH AVE HORSEHEADS NY 14845 607 739-38
cable TV connectors; CATV distribution passives; cable tools & accessories

L-W INTERNATIONAL 6416 VARIEL AVE WOODLAND HILLS CA 91364 213 348-86
TV film chain projectors flickerless

L-W PHOTO INC 15451 CABRITO RD VAN NUYS CA 91406 213 348-86
16 mm film chain projectors

M

3M COMPANY MAGNETIC AUDIO/VIDEO PRODUCTS DIV ST PAUL MN 55117 612 733-4
full line of recording tape for audio & video, magnetic film

3M COMPANY MINCOM DIV 3M CENTER BLDG 223-5E ST PAUL MN 55101 612 733-7
video color encoders videotape evaluator, color drop-out compensator, processing video amplifier, bridging video switchers, video image enhancer, special effects

continued on page 8

Old-New Reel Time Recorder

Telex/Magnecord series 1400 broadcast quality recorder/reproducer. An old name that spells reliability. A new design for today's state of the art.

The Old. Telex/Magnecord products are still made in the USA so parts and service are always available. The series 1400 is still built on a solid die cast aluminum main frame for reliable operation around the clock. It's still available in full, half and

quarter track configurations, has fail safe differential brakes and accepts 8 1/4 inch reels. It also still comes with three motors—but then, that's touching on the new.

• The New. A brushless d.c. servo drive with a crystal oscillator control reference so accurate it virtually eliminates program timing errors. New, three speeds: 3 3/4 - 7 1/2 - 15 ips. New catenary head block for straight tape loading, the convenience of one hand cueing and the bi-level illumination of push button controls. New DTL logic controls eliminate EMI and provide fast, spill

proof tape handling gentle enough for half mil tape. And new electronics, clean to 60 dB S/N at all speeds.

• If you're looking for a real time, reel recorder with old name reliability but designed for today's demands, you'll find it in the Telex/Magnecord series 1400. For complete information please write:



PRODUCTS OF SOUND RESEARCH

TELEX®

COMMUNICATIONS, INC.

9600 ALDRICH AVE. SO. • MINNEAPOLIS, MINN. 55420 U.S.A.

Europe: 22, rue de la Legion-d'Honneur, 93200 St. Denis, France
Canada: Telak Electronics, Ltd., Scarborough, Ontario

Circle 171 on Reader Service Card

When your signal is your bread and butter . . .

your transmitter had better be McMartin.

Your transmitter is a staple of your operation. Choosing the right one is important. An excessive purchase price means wasted capital. Poor reliability means unnecessary maintenance costs and possible lost revenues due to off-air failures.

McMartin transmitters "nourish" your station with high performance, high reliability and maintenance support, and low purchase price.

A wide range of models are available for all AM and FM power levels.

Your McMartin representative can give you the complete story. For the name of your representative, call or write McMartin.

McMartin Industries, Inc. • 4500 South 76th Street • Omaha, Nebraska 68127 • Phone (402) 331-2000 • Telex 48-

Circle 172 on Reader Service Card

www.americanradiohistory.com



VERIFIED SOURCE '76

ator, character generators, distribution
 ers, automated switchers VS
 pg. 59—refer to rep/dist section
 Mincom 688 Wasatch Dr Fremont
 94536 415 791-8344
 Mincom 15932 Shady Grove Rd
 Gaithersburg 20760 301 948-0460
 Mincom 4101 Oak Park Dr SE Grand
 Rapids 49508 616 455-5529
 Mincom L Wilson 3M Center Bldg
 223-5E St Paul 55101 612 733-7603
 Mincom 2121 Santa Anna Ave Dallas
 75228 214 327-7311

ASYNCR/MOVIOLA CORP
PRIVERTON AVE N HOLLYWOOD CA
 213 877-2791
 iting equip; field & studio tape
 ers

DA-TECH ELECTRONIC CO INC
INTH AVE NEW YORK NY
 212 586-7240
 atic film recorder/players; synchronizers
 ingnetic film recorders & motion picture
 up

DAVOX CO CATV DIV
AIRGROUNDS DR MANLIUS NY
 315 682-9105
 T trunk & distribution amplifiers,
 nution passives, connectors, terminals,
 esories, converters VS

DAVOX VIDEO SYSTEMS
MAGNAVOX WAY FT WAYNE IN
 219 482-4411
 & portable video color cameras; video
 orors, educational TV receivers VS

DECONI ELECTRONICS INC
TONEHURST COURT NORTHVALE NJ
 201 767-7250
 cameras; telecines; switchers;
 nitors; audio consoles; intercoms; video
 ides & distribution amplifiers VS

DECONI COMMUNICATION SYSTEM LTD
 igrate ground stations, transmitters,
 riers VS

DECONI INSTRUMENTS DIV
 adation monitors; TV sideband analyzers,
 erum analyzers, video test generators;
 atic TV monitors, digital synchronizers,
 test sets; sweep generators; other TV
 ear; frequency counters; audio & RF
 r generators; distortion meters VS
 ad pg. 119—refer to rep/dist section

DECO VIDEO SYSTEMS INC 6114 N
ST PHILADELPHIA PA
 215 849-9500
 routing switchers VS

DETI ELECTRONICS INC PO BOX 661
BURNE TX 76031 817 645-9163
 rte pick-up & aural STL equip; audio
 nifiers; remote control telemetry &
 atic digital transmitter logging
 ment; RF amplifiers; SCA equipment;
 o line amplifiers; audio
 nessor/limiters VS
 ad pg. 132

DEASUSHITA (SEE PANASONIC)

DETHEY PRINTED PRODUCTS LTD. (See
REVISION EQUIPMENT ASSOCIATES)

DEWELL CORPORATION OF AMERICA
W COMMERCIAL AVE MOONACHIE NJ
 774 201 933-4200
 io tape, video tape

DEE LABORATORIES 5151 WISCONSIN
NW WASHINGTON DC
 16 202 244-2050
 omatic digital logger, digital remote
 rol equip

DECURDY RADIO INDUSTRIES
1 CLINTON ST BUFFALO NY
 06 716 854-6700
 io consoles; audio distribution, line &
 amplifiers; audio controls & attenuators;
 io processing units; intercom systems;
 ch panels; turntables, pickup arms;
 phone coupling equipment; monitor

speakers; racks, cabinets, console
 assemblies; audio tape cartridges; complete
 studio installations VS
 See ad pg. Cover 3
 NJ McCurdy 223 N Saddle River Rd Saddle
 River 07458 201 327-0750

DEMGRAW-EDISON CO EDISON
ELECTRONICS DIV GRENIER FIELD
MANCHESTER NH 03103 603 669-0940
 audio line amplifiers, audio attenuators &
 potentiometers; intercom systems; RF
 attenuators; field calibration meters, IM
 distortion meters; RF watt meters; AF & RF
 signal generators; audio level meters VS

DE MCI INC 4007 NE 6TH AVE FORT
LAUDERDALE FL 33334 305 566-2853
 full line audio consoles, slide attenuators,
 open reel recorder/players, synchronizer,
 phasemaker, VU and peak meters; magnetic
 film recording accessories VS
 See ad pg. 60

DEMcKay DYMEK PO BOX 2100 POMONA
CA 91766 714 623-1236
 high fidelity AM receiver, shielded loop
 antenna, audio monitors

DEMC MARTIN INDUSTRIES INC 4500 S 76TH
OMAHA NE 68127 402 331-2000
 audio & TV consoles; audio mixers; line
 amplifiers; audio limiters; pa amplifiers;
 turntables, arms, intercom systems; RF
 amplifiers; AM & FM transmitters; exciters;
 remote control equip; remote pickup & STL;
 SCA equip.; FM antennas; antenna monitors;
 frequency monitors; signal generators;
 modulation monitors; EBS two-tone equip VS
 See ad pg. 92—refer to rep/dist section

Ark T. Butler PO Box 119 Limestone
 72646 501 428-5257

Calif J. Schneider PO Box 725 Diablo
 94528 415 820-3811

Calif B. Switzer 9025 Maza Circle
 Fountain Valley 92708 714 842-8422

Fl R. Henry 14018 W Parsley Dr
 Madeira Beach 33708 813 391-8065

NY J. Grey 4 F Underhill Road Middletown
 10940 914 342-5113

Neb D. Jones 3524 S 104th St Omaha
 68124 402 397-2866

Ohio E. Huber Rte 3 Rhinehart Rd
 Bellville 44813 419 886-4445

Wis D. Kelly 2253 S Oneida Green
 Bay 54304 414 497-1193

DEMEDIATECH 824 BUSSE HIGHWAY
PARKRIDGE IL 60068 312 644-1314
 tape-to-film transfer

DEMEMOREX CORP 1200 MEMOREX DR
SANTA CLARA CA 95052 408 987-1169
 audiotape; audiotape accessories; videotape
 for all video record formats; videotape
 accessories VS

DEMERLIN ENGINEERING WORKS
1880 EMBAR CADERO PALO ALTO CA
94303 415 329-0198
 rebuilt VTR machines, band color systems,
 air systems, TBCs, VTRs, video monitors VS

DEMICMIX AUDIO PRODUCTS INC
9990 MONROE DR SUITE 222 DALLAS TX
75220 214 352-3811
 reverberation units VS
 See ad pg. 172—refer to rep/dist section

DEMICRO COMMUNICATIONS INC RFD 3
GRENIER FIELD MANCHESTER NH
03103 603 624-4351
 RF transmitting/receiving equipment,
 diplexers, ENG microwave equipment,
 waveguides, remote control systems, RF
 filters, RF loads, FM and TV antennas,
 transmission lines and components VS

DEMICRO CONSULTANTS INC PO BOX 10057
PALO ALTO CA 94303 415 321-0832

VS following the description of a company's
 products stands for Verified Source. Com-
 panies so identified have filed appropriate
 literature with BM/E indicating the products
 mentioned are in production and available.

To identify all manufacturers of a particular
 product class or category consult the Instant
 Source Locator pages 56-73.

dropout compensators, standards converters,
 framestone synchronizers, time base
 correctors, repositioners, compressors, A/D
 converters VS

DEMICROFLECT CO INC 3575 25TH ST SE
SALEM OR 97302 503 363-9267
 billboard-type passive repeaters;
 tower-mounted reflectors, towers,
 transmission lines and connectors; facility
 turnkey installation VS

DEMICROPROBE ELECTRONICS INC SUITE
3201 875 NO MICHIGAN AVE CHICAGO IL
60611 312 787-3900
 automatic sequencers, complete systems VS

DEMICROTIME INC 1280 BLUE HILLS AVE
BLOOMFIELD CT 06002 203 242-4242
 time base correctors; velocity error
 correctors, automation video control
 equipment, image enhancers, skew
 correctors VS
 See ads pgs. 109, 124—refer to rep/dist section
 Network of over 40 dealer/distributors throughout
 the USA and Canada. Contact main office for name
 of local outlet.

Calif D. J. Sofie 7119 Pomelo Drive Canoga
 Park 91307 213 884-6269
 Conn R. McLean/N. Owens, Jr. 1280 Blue
 Hills Ave. Bloomfield 06002 612 242-4242
 Minn W. Baird 6317 Aldrich Ave. S.
 Minneapolis 55423 612 861-6228
 NY P. Dubs 385 Salem Ct. Hauppauge
 11787 516 234-5252

DEMICRO-TRAK CORP 620 RACE ST
HOLYOKE MA 01040 413 536-3551
 turntables, arms, pickups; pre-amps, mixers,
 equalizers; monitor speakers; cartridge tape
 racks; studio furniture, antenna heater
 controls VS
 See ad pg. 120—refer to rep/dist section

DEMICROTRAN CO INC PO BOX 236 VALLEY
STREAM NY 11582 516 561-6050
 bulk tape erasers; tape spot erasers, head
 and tape degaussers, telephone pick-up
 coils VS

DEMICROVISION SYSTEMS 800 NO EL
CAMION REAL #2 SAN MATEO CA
94401 415 348-1344
 video tape editor controller VS

DEMICROWAVE ASSOCIATES INC 63 THIRD
AVE BURLINGTON MA
01803 617 272-3000
 microwave TV equip for STL; spurs;
 intercity, ENG, systems; air-to-ground
 microwave TV relay systems, antennas VS
 See ad pg. 39—refer to rep/dist section

Calif MA 850A Stewert Dr Sunnyvale
 94086 206 232-3550

Ga MA 175 W Wieuca Rd, N.E. Atlanta
 30342 404 252-4311

Mass MA South Avenue Burlington
 01803 617 272-3000

Mo MA 8800 Blue Ridge Blvd Kansas City
 64138 816 763-5395

Texas MA 4398 Shady Bend Dr Dallas
 75234 214 239-2893

DEMICROWAVE ASSOCIATES INC (LAND
MOBILE DIV) PO BOX 8010 SUNNYVALE
CA 94088 408 736-9330
 UHF/VHF transmitter combiners, receiver
 combiners, isolators, circulators; RF filters,
 loads VS

DEMICROWAVE POWER DEVICES INC
ADAMS COURT PLAINVIEW NY
11803 516 433-1400
 microwave power amplifiers; RF amplifiers;
 FM, TV transmitters VS

DEMID-STATE COMMUNICATIONS INC
40 NORTH 7TH AVE BEECH GROVE IN
46107 317 786-9537
 frequency measurement equip; signal level
 meters; installer's meters

DEMILLER-STEPHENSON CHEMICAL CO INC
PO BOX 628 DANBURY CT
06810 203 743-4447
 degreaser; head cleaner; contact cleaner VS

DEMINNEAPOLIS MAGNETICS INC
8125 PLEASANT AVE SOUTH

THE SOURCE '76

MINNEAPOLIS MN 55420 612 884-7393
magnetic tape recorder heads; replacements
for leading recorder brands VS

**MINOLTA CORP 101 WILLIAM DR RAMSEY
NJ 07446** 201 825-4000
TV crt color analyzer; light measurement
equip; color temperature meter, lenses,
photo equipment VS

**MODULAR AUDIO PRODUCTS INC
1385 LAKELAND AVE BOHEMIA NY
11716** 516 567-9620
modular audio components; modular line
amplifiers, equalizers, compressor/limiters;
preamplifiers; power supplies, etc VS
See ad pg. 173—refer to rep/dist section

MODTEC
(See BROADCAST ELECTRONICS)

**MOHAWK WIRE & CABLE CORP
9 MOHAWK DR LEOMINSTER MA
01453** 617 537-9961
broadcast color camera cables, connectors,
accessories, CATV cables, connectors VS

**MOLE-RICHARDSON CO 937 N
SYCAMORE AVE HOLLYWOOD CA
90038** 213 851-0111
TV, photo lighting equip; microphone booms,
perambulators; mechanical special effects
equip VS

**MONROE ELECTRONICS INC 100 HOUSEL
AVE LYNDONVILLE NY
14098** 716 765-2254
unattended phone answering devices, tone
signal generators, detectors, timers,
multi-frequency receivers VS
See ad pg. 97

**MOOG MUSIC INC PO BOX 131
WILLIAMSVILLE NY 14221** ... 312 675-2000
music synthesizers

**MOSELEY ASSOCIATES INC
111 CASTILIAN DR GOLETA CA
93017** 805 968-9621
ALC and AGC amplifiers, FM audio limiter,
digital remote control systems; automatic
loggers; microwave systems for remote
pickup & STLs; RF amplifiers; SCA equip;
status & alarm indicators, RF modulators,
FM processors VS
See ad pg. 53

**MOUNTAIN WEST ALARM 4215 N 16TH S
PHOENIX AZ 85016** 602 263-8831
burglar & fire alarm systems

**MOXON INC SRC DIVISION
2222 MICHELSON DR IRVINE CA
92664** 714 833-2000
CCTV cameras; surveillance TV cameras;
mobile vans; airborne microwave TV
systems

**MSI TELEVISION 4788 S STATE ST SALT
LAKE CITY UT 84107** 801 262-8475
character generators; weather, news, stock
data systems; titling equip; data casting for
CATV VS

**MU-DEL ELECTRONICS INC 2426 LINDEN
LA SILVER SPRING MD
20910** 301 587-6087
RF amplifiers; RF attenuators &
multicouplers; band-pass filters VS

**MULTIPLIER INDUSTRIES CORP 464 SO
10TH AVE MT VERNON NY
10550** 914 699-0990
vehicle, aerial bucket, lineman safety equip

**MULTI-TRACK MAGNETICS INC
2 RUCKMAN RD CLOSTER NJ
07624** 201 768-5037
equipment rental services, studio design,
videotape/film recording and transfer
services VS

**MULTRONICS INC 9005 RED BRANCH RD
COLUMBIA MD 21045** 301 730-1122
equalizers and filters, passive and active;
RF switchers, phasing network, RF inductors
See ad pg. 146 VS

**MXR PROFESSIONAL PRODUCTS GROUP
277 N GORDON ST ROCHESTER NY**

14607 716 412-5320
digital delay system with special effects

**MYERS-OAK COMMUNICATIONS
CONSTRUCTION CORP CRYSTAL LAKE IL
60014** 815 459-5000
CATV system construction

N

**NAGRA MAGNETIC RECORDERS INC
19 W 44TH ST NEW YORK NY
10036** 212 661-8066
miniature reel-to-reel audio/cine recorders;
lovalier mics, tape reels, tape timers VS

**NAKAMICHI RESEARCH (USA) INC
220 WESTBURY AVE CARLE PLACE NY
11514** 516 333-5440
audio pre-amps, power amps, stereo
pickups, headphones, microphones,
speakers, cassette tape, head degaussers,
audio cassette records/players VS

**NASCO TELEVISION SYSTEMS
947 JANESVILLE AVE FORT ATKINSON WI
53538** 414 563-2446
video distribution equip; special effects units

**NATIONAL ELECTROLAB LTD
1536 COLUMBIA ST NO VANCOUVER BC
V7J 1A4** 604 985-0511
audio monitor, RF receivers, comm &
monitors, AM, RF amplifiers VS
See ad pg. 146

**NATIONAL VIDEO CORP 840 W
GLENOAKS BLVD GLENDALE CA
91202** 213 244-3115
helical video cassette players; editors for
VTR cassette players, editor controller

**NATIONWIDE ELECTRONIC SYSTEMS INC
1536 BRANDY PARKWAY STREAMWOOD
IL 60103** 316 289-8820
automation equipment, sequencers,
controllers, memory units, auto loggers,
complete systems; telephone coupling
equipment; VU meters; STL & remote
pickups, SCA equipment; time systems,
frequency monitors and counters, voltmeters,
multimeters, phase meters, status and alarm
indicators VS

**NEC AMERICA INC (NIPPON ELECTRIC
CO LTD) 277 PARK AVE NEW YORK NY
10017** 212 758-1666
audio amplifiers, controls, processing
equipment; consoles; intercoms;
microphones; patch panels; TV cameras;
teletext equip; switchers; video tape
recorders; time base correctors; monitors,
character generators; video distribution
systems; transmitter (AM, FM, TV);
antennas; microwave equip VS
See ad pg. 143

**NEFF ELECTRONICS INC
11511 MARYLAND AVE BELTSVILLE MD
20705** 301 937-4776
audio amplifiers; audio equip; tape encoders;
splicers; EBS generator/detector EBS
receiver

**NEUMADE PRODUCTS CORP PO BOX 568
SCARSDALE NY 10583** 914 725-4900
storage & filing cabinets for tape reels,
cassettes, rewriter; film storage equipment VS

**NEVE RUPERT INC BERKSHIRE IND
PARK BETHEL CT 06801** 203 744-6230
full line audio consoles, audio amplifiers,
disc cutting systems VS

**NORTH AMERICAN PHILIPS CORP (SEE
AKG DIV & PHILIPS AUDIO VIDEO
SYSTEMS)**

**NORTHEAST BROADCAST LAB INC BOX
1176 15 CHARLES ST SOUTH GLENS
FALLS NY 12801** 518 293-2121
radio facility turnkey installations VS

**NORTRONICS CO INC RECORDER CARE
DIV 8101 TENTH AVE N MINNEAPOLIS MN
55428** 612 545-0401
magnetic tape recorder heads; tape erasers;

VS following the description of a company
products stands for Verified Source. Com-
panies so identified have filed appropriate
literature with BM/E indicating the products
mentioned are in production and available

To identify all manufacturers of a particular
product class or category consult the Instant
Source Locator pages 56-73.

tape editors; test tapes; recorder care
accessories for audio & video machines;
VTR head cleaners V

**NORVER CO INC 7300 N CRESCENT
BLVD PENNSAUKEN NJ
08110** 609 665-2020
SCA receiver V

**N.O.V.A. CORP BOX 2121 CANOGA PARK
CA 91306** 213 888-5120
videotape cleaner attachment for VTR V

**NURAD INC 2165 DRUID PARK DR
BALTIMORE, MD 21211** 301 462-1700
quad polarized antennas for remote-TV
broadcasts; microwave equip, satellite earth
stations, transmission line and connectors
See ad pg. 122—refer to rep/dist section V

O

**OAK COMMUNICATIONS GROUP OAK
INDUSTRIES INC CRYSTAL LAKE IL
60014** 815 459-5000
converters; pay-TV devices; CATV amplifiers

**O'CONNOR ENGINEERING
LABORATORIES INC 100 KALMUS DR
COSTA MESA CA 92626** 714 979-3990
camera tripods and heads V

**ODETICS 1859 S MANCHESTER AVE
ANAHEIM CA 92802** 714 750-2111
time elapse VTR V

**OK MACHINE AND TOOL CORP
3455 CONNER ST BRONX NY
10475** 212 994-6600
wire-wrapping equip; connector pressers;
pliers; wire cutters; strippers

**OLEAN CASE CORP 322 HOUGHTON AVE
OLEAN NY 14760** 716 372-0700
vulcanized fiber & wood covered case for
audio & video equipment; film shipping V

**OLESEN 1535 IVAR AVE HOLLYWOOD CA
90028** 213 461-4660
lighting hardware, lighting equipment,
dimmer controls; rental services

**ONAN DIV ONAN CORP 1400 73RD AVE
NE MINNEAPOLIS MN
55432** 612 574-5000
emergency stand-by power generators V

**OPAMP LABS INC 1033 N SYCAMORE
AVE LOS ANGELES CA
90036** 213 934-3515
full line production consoles; portable
mixers; operational amplifiers; audio
components; basic amplifier kits

**OPTEK 5526 E LA PALMA AVE ANAHEIM
CA 92807** 714 528-2300
bulk erasers, demodulators, head
degaussers

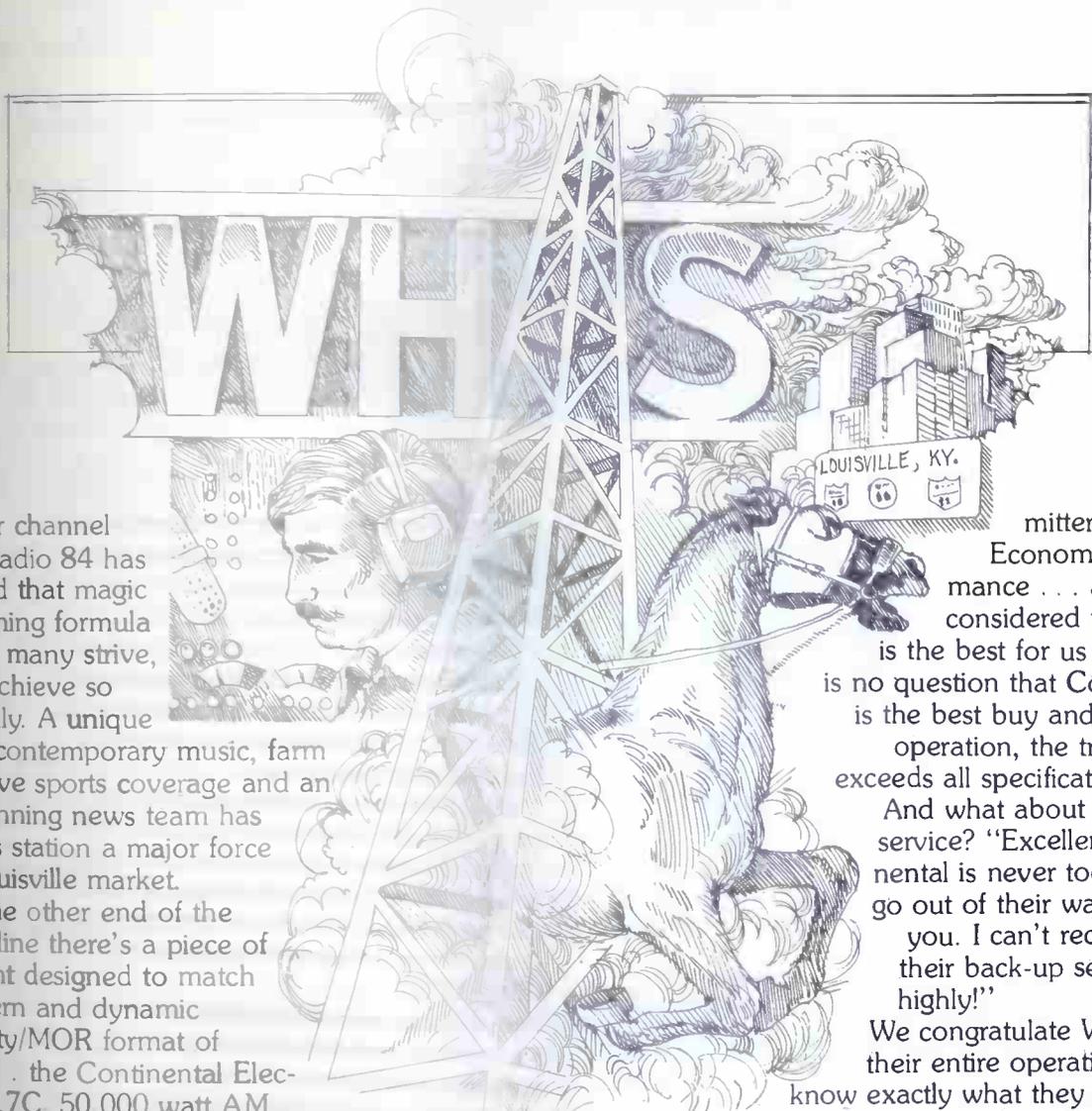
**OPTIMA ENCLOSURES DIV
SCIENTIFIC-ATLANTA 2166 MOUNTAIN
INDUSTRIAL BLVD TUCKER GA
30084** 404 939-6300
racks, equip enclosures

**ORANGE COUNTY ELECTRONICS CORP
LTD 1125 EMPRESS ST WINNEPEG
MANITOBA R3E 3H1** 204 775-8100
monitor amplifiers and speakers, audio
switchers, audio processors, pre amps,
equalizers and filters

continued on page

WHAS KNOWS EXACTLY WHAT THEY WANT IN A 50 KW AM TRANSMITTER.

SO DOES CONTINENTAL ELECTRONICS!



Clear channel WHAS Radio 84 has developed that magic programming formula for which many strive, but few achieve so successfully. A unique blend of contemporary music, farm reports, live sports coverage and an award-winning news team has made this station a major force in the Louisville market.

At the other end of the program line there's a piece of equipment designed to match the modern and dynamic Personality/MOR format of WHAS . . . the Continental Electronics 317C. 50,000 watt AM transmitter! Featuring high reliability and efficiency, small size and the Loud Sound of 125% positive peak handling audio, it is quality throughout.

It's no accident that it's in service at WHAS. Mr. William Hunter, Director of Engineering at the station says, "We visited the various plants of major manufacturers and watched their trans-

mitters on test. Economy, performance . . . all factors considered the 317C is the best for us . . . there is no question that Continental is the best buy and in actual operation, the transmitter exceeds all specifications . . ." And what about customer service? "Excellent! Continental is never too busy to go out of their way to help you. I can't recommend their back-up service too highly!"

We congratulate WHAS on their entire operation. They know exactly what they want in a 50 KW AM transmitter . . . so does Continental!

For information on the 317C, write Continental Electronics Mfg. Co., Box 270879 Dallas, Texas 75227



Continental Electronics



THE SOURCE '76

**ORBAN/BROADCAST 271 COLUMBIA AVE
SAN FRANCISCO CA
94133** 415 441-0666
FM modulation controller VS
See ad pg. 128—refer to rep/dist section.

**ORBAN/PARASOUND 680 BEACH ST
SUITE 411 SAN FRANCISCO CA
94109** 415 673-4544
compressor/limiters/FM filters, equalizers,
reverb units, stereo synthesizers VS
See ad pg. 98—refer to rep/dist section

**OREGON MAGNETICS PO BOX 13374
PORTLAND OR 97213** 503 233-9295
V-lock adaptor for helical scan VTRs VS

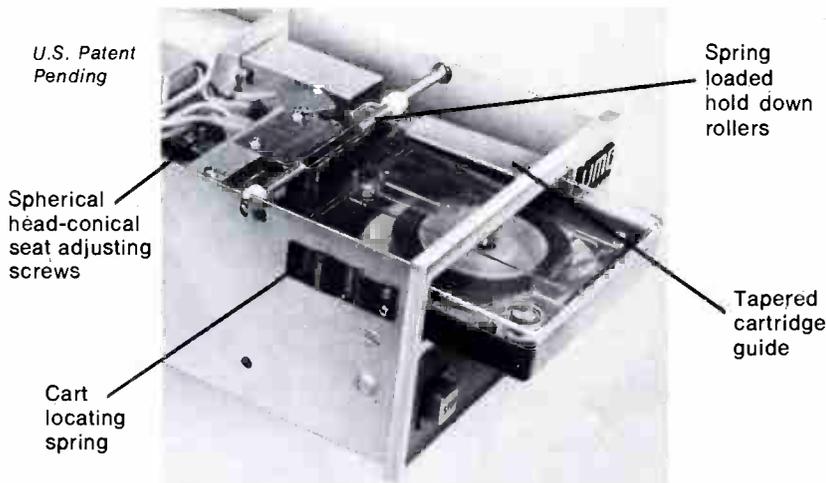
**OTARI CORPORATION 981 INDUSTRIAL
RD SAN CARLO CA
94070** 415 593-1648
reel-to-reel audio tape recorder/reproducers;
tape duplicators VS

P

**PACE WIRE AND CABLE CORP
3590 OCEANSIDE RD OCEANSIDE NY
11572** 516 678-2275
wire and cable VS

**PACKAGED LIGHTING SERVICES INC PO
BOX 285 WALDEN NY
12586** 914 778-3515

What's so special about Beaucart stereo machines?



Everything.

Don't let anybody tell you that all stereo broadcast cart machines are the same. It just isn't so. Because we've built into our Beaucart stereo units proprietary cartridge locating features which enhance stereo phasing from cartridge to cartridge under long term, continuous service conditions.

Take a look at the photo. No other machine incorporates these features. Our spring-loaded rollers ensure repeatable location of each cart's left corner post. The tapered cartridge guide allows each cart to squarely contact the roller and feed smoothly into the machine. Our locating spring positions the cart against the right-hand guide every time, and our unique ad-

justing screws for which patents have been applied provide uniform, positive contact immune to movement from external forces.

Little things? Sure! There are a hundred little things that make full-featured Beaucart the stereo machine for you.

Let us tell you more. Write or call today for further details and pricing. You'll be glad you did!

UMC
BEAUCART DIVISION
UMC ELECTRONICS CO.
460 Sackett Point Rd. North Haven, CT 06473 (203) 288-7731

Circle 174 on Reader Service Card

portable quartz lighting system for CCTV
**PACIFIC RECORDERS & ENGINEERING
CORP 11100 ROSELLE ST SAN DIEGO CA
92121** 714 453-32
headphone, microphone amplifiers; audio
switcher; compressor/limiter; digital timing
systems; custom audio consoles; preamps;
line & distribution amplifiers
See ad pg. 102

**PAILLARD INC 1900 LOWER ROAD
LINDEN NJ 07036** 201 381-58
16 mm cameras/projectors

**PAKO CORP 6300 OLSON MEMORIAL
HWY MINNEAPOLIS MN
55410** 612 540-63
film processors

**PALMER (WA) FILMS INC 611 HOWARD
ST SAN FRANCISCO CA
94105** 415 986-59
motion picture film projectors; color TV film
recorders, video/film transfers and lab
services

**PANASONIC VIDEO SYSTEMS ONE
PANASONIC WAY SECAUCUS NJ
07094** 201 348-70
complete line of cameras color and mono
(portable and studio); videotape recorders;
tape duplicators; studio equipment including
telecines; audio recorders/players, amplified
turntables

**PANDUIT CORP 17301 RIDGELAND AVE
TINLEY PARK IL 60477** 312 532-18
nylon cable ties, accessories; plastic wiring
duct; terminals

**PAPERWORK SYSTEMS INC 2000 "A" ST
PO BOX 38 BELLINGHAM WA
98225** 206 733-85
automated business systems for radio and
TV

**PENTAGON INDUSTRIES INC 4751 N
OLCOTT CHICAGO IL 60656** .. 312 867-92
high-speed tape duplicators

**PERMADYNE ELECTRONICS CORP 2929
SOUTHPORT AVE CHICAGO IL
60667** 312 525-55
SCA receiver

**PETRA COMMUNICATIONS PO BOX 562
DUBOIS PA 15801** 814 371-92
TV production equipment rental and post
production services, studio design for radio
and TV

**PHASECOM CORP 13130 S YUKON AVE
HAWTHORNE CA 90250** 213 973-41
cable TV headend signal processors; RF
modulators & demodulators; CATV
information systems

**PHELPS DODGE COMMUNICATIONS CO
RTE 79 MARLBORO NJ
07746** 201 462-18
FM antennas; transmission lines; RF filters,
coaxial cable

**PHILADELPHIA RESINS CORP
20 COMMERCE DR MONTGOMERYVILLE
PA 18936** 215 855-84
non-metallic antenna guys
See ad pg. 130

**PHILIPS AUDIO VIDEO SYSTEMS CORP
91 McKEE DR MAHWAH NJ
07430** 201 529-38
AUDIO & VIDEO DIVS
audio amplifiers, audio consoles & mixers;
headsets, intercom systems; microphones &
microphone accessories; tape
recorder/players, tape duplicators; turntable
column loudspeakers; CCTV cameras; video
cassette recorder/players; mobile TV vans

BROADCAST EQUIP DIV
studio & field TV color cameras, teletext chains
See ad pg. 30
Calif PAVSC 3760 Cahuenga Blvd North
Hollywood 91604 213 766-8
Fla PAVSC 1277 Sun Circle Eau Gallie
22-35 305 254-1
Ga PAVSC 3300 Northeast Expressway
Atlanta Suite 1G 30341 404 458-0
Ill PAVSC 7530 Frontage Rd Norelco House
Skokie 60076 312 679-8

PAVSC 412 Roy Court Keller
76248 817 379-5484

TEST & MEASURING
UMENTS INC 400 CROSSWAY PARK
OODBURY NY 11797 ... 516 921-8880
encoders; sync generators, color video
& pattern generators; pulse
ators; video level meter, decoder,
r calibrator, RF generators;
ators; frequency counters, audio
ators; video test equip; multi-meters,
scopes VS

TIC REEL CORP OF AMERICA 640 S
ERIAL AVE CARLSTADT NJ
..... 201 933-9125
or video & audio tape VS

ATOID CORP 42-61 24TH ST LONG
AD CITY NY 11101 212 786-6200
xl cable; direct burial coaxial cables;
re sealant coaxial cables

LLINE CORP 1241 RAND RD DES
AMES IL 60016 312 298-5300
st reels

MAC INSTRUMENTS INC
HILADELPHIA AVE SILVER SPRING
910 301 589-3125
media monitors; field strength meters;
ocera impedance bridges; video & RF
annels, intermodulation meters,
armonic distortion meters VS
— pg. 16—refer to rep/dist section

NR-OPTICS INC PO BOX 266
REW VILLAGE PA
..... 215 539-5300
oto control systems for TV camera
on

EDRME LINE PRODUCTS CO
SI BX 91129 CLEVELAND OH
..... 216 461-5200
eera tower accessories; preformed metal
bstaic deadends, lashings, guywires, etc

DELIN INC PO BOX 131 HIGHTSTOWN
20 609 448-2800
UHF antennas; flexible & rigid
mission line; transmission line
monitors; microwave antennas, reflectors,
reides

ODIT RECOVERY SYSTEMS PO BOX 25
ESTER NY 14481 716 382-3223
ec regeneration system; silver recovery;
bormal recovery; pollution abatement
tes

IDECTION SYSTEMS INC 517 VAN
BUEN AVE PASSAIC NJ
..... 201 473-0180
pjection systems (Amphicon)

TECHNOLOGY INC 1200 GRAND
TARAL AVE GLENDALE CA
..... 213 245-8424
optical printers for super 8 & 16mm
pecial effects; flickerless projector

LE DYNAMICS MFG CORP PO BOX
OLCHESTER IL 62326 .. 309 776-4111
o broadcast originating consoles &
VU meters, reverb units, mixers,
table public address systems; PA
beakers VS

RMID INDUSTRIES INC 2602 W
ENTO BLVD PHOENIX AZ
..... 602 269-2319
ocal cable; cable connectors VS

MANUFACTURING CO NEW BERLIN
7855 717 966-1017
stringing blocks & aerial construction
for coaxial cable

ELECTRONIC PRODUCTS (DIV OF
1568 N SIERRA VISTA FRESNO CA
3 209 251-4213
o turntables; pre-amplifiers; audio
ols; consoles; tape decks; tape

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

cartridge equip VS
See ad pg. 145—refer to rep/dist section

QSI SYSTEMS INC 993 WATERTOWN ST
W NEWTON MA 02165 617 969-7118
video sequential switcher, TV cameras
(mono); time date generator, portable sync
generator, video source identifier VS

Q-TV/TELESYNC 33 W 60TH ST NEW
YORK NY 10023 212 765-4200
TV prompter system VS

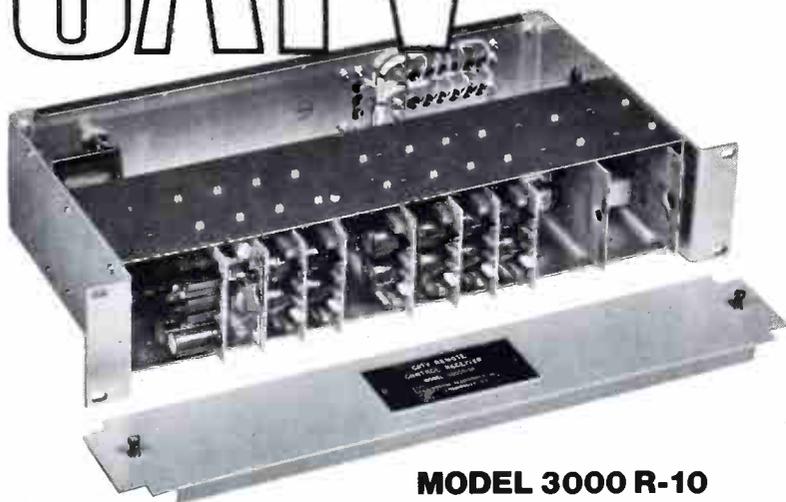
QUAD EIGHT ELECTRONICS CORP
11929 VOSE ST N HOLLYWOOD CA
91605 213 764-1516
audio preamps, line & power amplifiers,
equalizers; audio controls; audio consoles &
mixers; reverberation units; dB meters; noise
gates; audio digital delay unit; compressors;
attenuators; tone oscillators; cabinets, racks

QUAKER ELECTRONICS INC PO BOX 215
HUNLOCK CREEK PA
18621 717 256-3477
quartz crystals

continued on page 98

GATV

REMOTE CONTROL RECEIVER - SWITCHER



MODEL 3000 R-10

DOES YOUR COMPUTER KNOW WHEN A BALL GAME IS GOING INTO OVERTIME?

If not, you need a system as shown above to permit your engineer to take control from his home or office. Switch programs from a dial-up telephone line and/or microwave or radio link.

Write for complete data:



MONROE ELECTRONICS, INC.

100 HOUSEL AVENUE, LYNDONVILLE, NEW YORK 14098

Area Code 716 765-2254

Circle 175 on Reader Service Card

THE SOURCE '76

QUANTUM AUDIO LABS 1905 RIVERSIDE DR GLENDALE CA 91201 213 841-0970
audio consoles, mixers, stereo and quad VS
See ad pg. 144

QUICK-SET INC 3650 WOODHEAD DR NORTHBROOK IL 60062 312 498-0700
tripods; stands; mounts; dollies for TV, ENG camera braces VS
See ad pg. 170

R

RANK PRECISION IND INC 411 JARVIS AVE DES PLAINES IL 60018 . . 312 297-7720
video camera lenses; color correctors, encoders, film telecine equipment, image enhancers, Varotol Lens repair service VS
See ad pg. 175

RADIANT CORP 8220 N AUSTIN MORTON GROVE IL 60053 312 966-4200
front projection screen

RADIO MECHANICAL STRUCTURES INC 2600 N LONGVIEW ST KILGORE TX 75662 214 984-0555
satellite earth ground terminals

RAMKO RESEARCH INC 11355 "A" FOLSOM BLVD RANCHO CORDOVA CA 95670 916 635-3500
distribution amplifiers, preamplifiers, mic/line amplifiers, monitor amplifiers; ALC and AGC amplifiers, compressor/limiters, AM & FM; mixers, LED VU meters; controllers; cartridge & cassette loaders; consoles VS
See ads pgs. 44-45—refer to rep/dist section

RAPID-Q/EDCO PRODUCTS INC

680 BIZZELL DR LEXINGTON KY 40504 606 259-0434
stereo phase enhancers; tape cartridge players/recorders VS
See ad pg. 148

RAVEN SCREEN CORP 124 E 124TH ST NEW YORK NY 10035 212 534-8408
front & rear projection screens

RAYCHEM CORP 300 CONSTITUTION DR MENLO PARK CA 94025 415 329-3333
Thermofit sleeving & covers; waterproofing products for cable plant; molded parts

RAYTHEON DATA SYSTEMS 1415 PROVIDENCE TPK NORWOOD MA 02062 617 762-6700
microwave communications equip

RCA AMERICAN COMMUNICATIONS INC 201 CENTENNIAL AVE PISCATAWAY NJ 08854 201 885-4162
satellite transmission services VS

RCA CORP BROADCAST SYSTEMS FRONT & COOPER ST BLDG 2-5 CAMDEN NJ 08102 609 963-8000
audio line, power, distribution amplifiers; radio automation equip; consoles, mixers; automatic tape cartridge recorder/players, audio & video; headsets; intercom systems; microphones; patch panels; audio tape recorder/players; tape erasers; turntables, arms, pickups; loudspeakers; video automation equip; video color & mono cameras, studio & portable; ENG systems; camera heads, mounts, dollies; quad VTRs character generators, chroma keyers, drop-out compensators, color encoders; telecine chains; production & routing switchers, pulse distribution amplifiers, processing amplifiers, sync generators, special effect generators; videotape recorder/players; motion picture cameras, tripods, projectors, AM, FM & TV transmitters; modulators, demodulators, diplexers, exciters; remote control, remote pickup & STL links; RF amplifiers, loads,

VS following the description of a company products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Inst Source Locator pages 56-73.

switchers; SCA equip; AM, FM & TV antennas; antenna towers & lighting; transmission line; antenna monitors, modulation monitors, field intensity meters, audio generators; video picture monitors; phase meters, sideband analyzers, RF watt meters, mobile TV vans
See ad pg. 54-55—refer to rep/dist section

Ala	RCA Office Park Bldg #.10 Office Park Circle Birmingham 35223	205 871-1
Calif	RCA 330 Primrose Rd Suite 305 Burlingame 94013	415 343-2
Colo	RCA Suite 531 6363 Sunset Blvd Hollywood 90028	213 461-9
Fla	RCA 2695 Alcott St Suite 231-S Denver 80211	303 433-8
Fla	RCA 2747 Art Museum Dr Suite 5 Jacksonville 32207	904 398-4
Fla	RCA 3900 RCA Blvd Palm Beach Gardens Bldg 110 West Palm Beach 33410	305 622-1
Ga	RCA 3395 NE Expressway	404 634-6
Ill	RCA Gateway Bldg Suite 1400 120 S Riverside Plaza Chicago 60606	312 454-1
Ind	RCA 2511 East 46th St Suite Q01 Indianapolis 48205	317 546-4
Kan	RCA 5750 West 95th St Suite III Overland Park 66207	913 642-3
Mass	RCA 40 William St Wellesley 02181	617 237-6
Mich	RCA 24333 Southfield Rd Southfield 48075	313 359-5

continued on page 1

Orban/Parasound solves the Stereo Tape Cartridge Dilemma

Just use one track of your existing stereo cart machines—or, ideally, mono machines. Then, add the Orban/Parasound Stereo Synthesizer to the output bus of your bank of cart players.

The result is a highly seductive pseudo-stereophonic effect for stereo listeners. And listeners with mono receivers receive perfect reproduction of the original mono tracks—without any phase cancellation or quality loss.

You can also use the Stereo Synthesizer for converting announce mikes, mono discs, and mono agency spots to pseudo-stereo. Try it to generate a stereo effect from your mono remotes or network feeds. The results will delight your listeners!

At \$327, the Orban/Parasound Stereo Synthesizer pays for itself in reduced cart machine maintenance and in increased sponsor satisfaction with the air quality of his spots.

We also make a proven Spring Reverb with an excellent reputation for quality and reliability. Also, our Parametric Equalizer combines reasonable cost with unprecedented versatility for production work, line and remote equalization, "air-sound" frequency contouring, and dozens of other applications. And our Dynamic Sibilance Controller lets you equalize your announce mike and production work for stand-out impact without excessive "ess" sounds.

Four rather interesting products from Orban/Parasound—the price/performance leader.

For further information, contact:

orban/parasound

680 Beach Street, San Francisco, CA 94109. (415) 673-4544
or your local Orban/Parasound professional products distributor.



Circle 176 on Reader Service Card

There is no room for electronic bias on your balance sheet!

You must compare long-term equipment and operating costs of ENG vs. newsfilm.

It appears that television station management, especially at the network level, has an inherent electronic bias. In fact, television is basically an electronic medium, and the use of electronic news crews has always made the management staffs of many TV stations uneasy (as if dealing with some foreign body).

They even apply a double standard in the way they treat film compared to ENG. The demands of broadcast performance. Their demands for virtual perfection in newsfilm cameras are in glaring contrast with the terrible results they seem to consider acceptable for broadcast newsfilm days when it comes to ENG. (You can easily recognize most ENG stories by the considerable degradation in image and color quality that they exhibit, even on network news programs.)

This inherent electronic bias — a double standard — is most generous, though, when cost-accounting an ENG operation versus a newsfilm operation.

One of the major cost-accounting arguments that is put forth in favor of film asserts, again and again, that no matter how expensive setting up an ENG operation is (compared to newsfilm), ENG will eventually pay for itself because no relatively costly film processing is required, whereas newsfilm is both cheaper and, supposedly, totally re-useable!

This argument is pure hokum! 3/4" tape is indeed cheaper than 16mm newsfilm.

What is the only thing that's cheap about ENG!

To highlight the economic absurdity projected by proponents of total ENG, let's compare equipment rental rates.

Rental rates provide a more realistic picture of the long-term operational costs involved in ENG camera and recording equipment vs. a self-contained single-system newsfilm camera. Because — if equipment rental houses are to stay in business — rental pricing policies must reflect *true equipment costs*, accounting for original purchase price, proper service and maintenance, as well as the life expectancy of expensive, critical system components that must be replaced periodically.

A good, quality ENG camera rents for anywhere from \$500 to \$800 per day; and a quality 3/4" tape recorder rents for approximately \$125 per day. On the other hand, a self-contained CP-16R/A single-system newsfilm outfit rents for up to \$125 per day!

What a vast difference in true equipment costs!

Just think how much film-and-processing you could buy for \$500-\$800 per day!

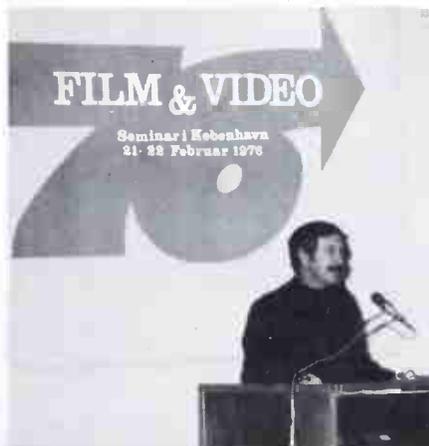
Interestingly, the rental figure for ENG cameras is disproportionately high when compared to their original purchase price. It simply reflects their much higher service and maintenance costs, and the cost of those very expensive Plumbicon tubes that need to be replaced every 6 months or so — all of which must be realistically accounted for by television stations as well.

As expected, during the past year there was a great deal of re-assessment on the part of many television stations — especially in the smaller markets — who had taken their first tenuous steps into ENG. There has also been a concomitant upsurge of activity in the purchase of newsfilm. And domestic sales of CP-16 cameras to television stations have soared to an all-time record high.

It's time you and your station management also did some re-assessing.

Before you take the plunge and commit \$200,000 or more per quality ENG outfit (complete with van and microwave transmitting equipment) — do consider what a reliable and efficient, completely self-contained CP-16R/A newsfilm camera can accomplish at about one twentieth of the cost!

Remember, there is no room for electronic bias on your balance sheet! 16mm newsfilm is the mainstay of a rational news gathering operation.



Ed DiGiulio, President of Cinema Products Corp., at the "Film & Video" conference in Copenhagen, Denmark.

This is one in a series of 'open letters' to the TV news industry — to station owners, managers, chief engineers, news directors, controllers and accountants — dealing with the role of ENG in relation to film in a news gathering operation.

If you have any question concerning the issues raised in these 'open letters,' please feel free to call me directly at Cinema Products.



cinema E products CORPORATION

Technology in the Service of Creativity

2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 ■ telex: 69-1339 ■ Cable: Cinedevco

Circle 177 on Reader Service Card



Not just four new products. One new ENG system fully integrated to broadcast needs.

Sony introduces the first fully integrated ENG system designed to meet broadcast requirements. The components of this system represent a new high in heterodyne picture quality as well as a practical approach to editing and airing ENG tapes. Each unit is designed to work independently or as part of a system to insure quality, reliability and true economy.

BVU-100 Portable Broadcast U-Matic® recorder

The new BVU-100 is the latest addition to the famous U-Matic format and is fully interchangeable with any of the previous portable U-Matic models. An additional longitudinal track, provided for recording SMPTE code on a battery-operated CG-100 SMPTE generator, is offered as an option. The new BVU-100 gives you extra dollar savings in addition to extra quality. Because it can be directly coupled to a VCR, you can go directly to air or microwave link, avoiding the cost of an additional playback machine in the remote van.

BVU-200 Broadcast Editing U-Matic

This recorder allows for high speed accurate editing utilizing either control track or SMPTE address systems. It incorporates BIDIREX™, a specially engineered system to move tape at faster or slower speeds in either direction.

When used with the Sony BVE-500 editing console, BIDIREX assures fast accurate editing that is fully frame servoed.

3. BVE-500 Broadcaster Editing Console

The BVE-500 provides a fully automatic editing control for tape-to-tape editing between a pair of BVU-200's. The BVE-500 is a three register editor with digital readouts for both source and record material. Changes in the edit-in and edit-out point can be programmed at a touch of a button. This highly accurate editing system provides both preview and frame trimming at a fraction of the cost of a computer editor. And of course all edits are frame servoed to insure clean picture quality without loss of timing information.

4. BVT-1000 Digital Time Base Corrector (not shown)

Sony's reputation for engineering reliability is combined with transparent picture quality and a wide 4H window to bring broadcasters a new standard of performance in time base correction. Line by line correction, velocity compensation, drop-out compensation, and full processing with standard advance sync, are all standard features of the BVT-1000.

For more information on this new ENG system, write to Sony Broadcast.

Sony Broadcast

Sony Corporation of America, 9 West 57 Street, New York, New York 10019

Sony® is a registered trademark of Sony Corporation of America.

Circle 178 on Reader Service Card for a demonstration
Circle 179 on Reader Service Card for literature

THE SOURCE '76

Calif	RCA 2700 W Olive Ave Burbank 91505	213 849-6741
DC	RCA 1800 "K" St NW Suite 810 20006	703 558-4166
Fl	RCA 8675 NW 53rd St Suite 207 Miami 33166	305 592-4140
Wash	RCA 1818 Westlake Ave N Suite 222 Seattle 98109	206 285-2375
Minn	RCA 4601 Excelsior Blvd Suite 307 Minneapolis 55416	612 920-6395
Mo	RCA 7701 Noah's Ark Suite 340 St Charles 63301	314 946-7755
NC	RCA 6320 Fairview Rd Suite 104 Charlotte 28201	704 366-0626
NJ	RCA Front & Cooper Sts Bldg 2-2 Camden 08102	609 963-8000
NY	RCA 1133 Ave of the Americas 3rd Flr New York 10036	212 598-5900
Ohio	RCA 11430 Hamilton Ave Cincinnati 45231	513 825-1550
Pa	RCA 761 N Washington Rd McMurray 15317	412 941-5570
Tex	RCA 3409 Executive Ctr Dr Suite 213 Austin 78731	512 345-2224
Tex	RCA 8700 Stemmons Freeway Dallas 75247	214 638-6200
Va	RCA 1901 North Moore St Arlington 22209	703 558-4166

RCA/COMMUNITY TELEVISION SYSTEMS (EIE) 7355 FULTON AVE N HOLLYWOOD CA 91605 213 764-2411
distribution amplifiers, headend signal processors, modulators & demodulators; microwave for CATV VS

RCA DIST & SPECIAL PRODUCTS DIV CHERRY HILL OFFICES BLDG 20G-2 CAMDEN NJ 08101 609 963-8000
camera tubes, receiving tubes, power tubes, SK replacements, semiconductors, replacement parts VS
See ad pg 139

RCA ELECTRO OPTICS & DEVICES NEW

HOLLAND AVE LANCASTER PA 17604 717 397-7661
TV camera tubes, power tubes, display tubes; blank audio tapes; batteries, test instruments; digital display devices; CCTV cameras; receiving tubes; semi-conductors; TV picture tubes, instrument cathode-ray tubes VS

RCA GLOBAL COMMUNICATIONS INC 60 BROAD ST NEW YORK NY 10004 212 363-3986
satellite communications service VS

RCA SERVICE CO (RCA DIV) DEPT 1614 BLDG 203-3 COMMERCIAL PRODUCT SALES CAMDEN NJ 08101 ... 609 779-5892
monitors (b&w/color), stands; FM-TV master antennas; automatic dial telephone systems VS

R-COLUMBIA PRODUCT CO 2008 ST JOHNS AVE HIGHLAND PARK IL 60035 312 432-7915
self-powered electrostatic headphone

RECORDING SUPPLY CORP 1291 RAND RD DES PLAINS IL 60016 312 297-0955
empty reels, magnetic tape, leader tape VS

RECORTEC INC 777 PALOMAR AVE SUNNYVALE CA 94086 408 735-8821
videotape recorders, video tape evaluators; video tape conditioners; quad upgrade kits; videotape editors; audio tape cartridges, tape cassettes, audio cassette duplicator, loader, feeder VS
See ads pgs 126-127—refer to rep/dist section

REDDING RADIO BOX 344 FAIRFIELD CT 06430 203 579-0284
microphone station identification plates; phone loop induction pickups

REGMO DATA CORP 6992 OXFORD ST MINNEAPOLIS MN 55426 612 925-3800
time-code controlled sequencer; A/V tape head cleaner & anti-static disc spray (Kontakt Chem.) VS

REK-O-KUT (See ORK)

REPCO PRODUCTS 7400 STATE RD PHILADELPHIA PA 19136 215 338-
CATV closures, for above & below ground

RE-PLER VIDEO CARTRIDGE SERVICE 328 MERRITT AVE PITTSBURGH PA 15227 412 881-9
reloaded quad VTR cartridges

REVEX CORP 155 MICHAEL DR SYOSSE NY 11791 516 364-11
open-reel tape recorder/player; FM tuner preamps; power amps; reel decks, portable audio consoles & mixers
See ad pg 121—refer to rep/dist section
Calif Revex PO Box 2229 Poluca Lake Station 91602 213 846-9

REYNOLDS/LETERON CO 9830 SAN FERNANDO RD PACOIMA CA 91331 213 899-59
TV titlers

REX RHEOSTATS CO INC 149 BABYLON TPKE ROOSEVELT NY 11575 516 379-11
dummy loads to 2kW

RF SYSTEMS INC 155 KING ST COHASSET MA 02025 617 383-11
CATV antennas; yagis for channels 2-13; log periodic antennas; microwave equip, translators, microwave antennas, satellite earth stations

RHG ELECTRONICS LABORATORY INC 161 EAST INDUSTRY COURT DEER PARK NY 11729 516 242-1
microwave relay links including portable systems, RF amplifiers

RICHMOND HILL LABORATORIES LTD 1240 ELLESMERE RD SCARBOROUGH ONTARIO CANADA M1P 2X4 416 291-7
automation equip; chroma keyers; video processing amplifiers; video production & continued on page 1

YOU'RE A BROADCAST PROFESSIONAL . . .



We supply the finest professional audio products from major equipment manufacturers

We manufacture the Multi-sync, Multilimiter, and Digitimer

We design complete broadcast audio facilities from the wall in

WE'RE PACIFIC RECORDERS AND ENGINEERING



PACIFIC RECORDERS AND ENGINEERING CORPORATION
11100 ROSELLE ST., SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255 TELEX 695008

Circle 180 on Reader Service Card

THE MOST ADVANCED STEREO CONSOLE IS ALSO THE SIMPLEST



CETEÇ SERIES 10

We build the Series 10 to be an extension of the announcer. 10 stereo mic or line input channels. Output channels for both stereo and automation. Built in cueing amplifier and speaker muting. And many more features than we can tell you here. Write or call for a full description of the most advanced Stereo Console on the market: Series 10.

From **Ceteq Audio**

A Division of Ceteq Corporation

13035 Saticoy Street, No. Hollywood CA 91605 Phone: (213) 875-190

Circle 181 on Reader Service Card

SEPTEMBER, 1976

audiopak[®]

BROADCAST CARTRIDGE
A-2 BY CAPITOL[®]



Think of it as a car.

Because, in a sense, it is like a car. All of the major components are assembled to get you from point A to point B. With efficiency and precision. For example, the constant-force, foam pressure pad assures unvarying head to tape contact over the life of the cartridge. The positive, non-slip brake mechanism locks the tape, other than the hub, assuring accurate cueing and timing. And, to assure you of premium performance, each part is individually tested—100%—for wow and flutter,

electrical output, tension, and other properties. And because we manufacture the entire package—from tape to packaging—we can assure you of the highest possible quality control.

The Audiopak A-2 by Capitol Broadcast Cartridge. The car you drive probably *isn't* as reliable as the A-2.

AUDIOPAK[®] A PROFESSIONAL PRODUCT MANUFACTURED BY THE SAME PEOPLE THAT MAKE AUDIOTAPE,[®] AUDIOFILM,[™] AUDIODISCS[®] AND THE LEARNING TAPE[™] BY CAPITOL[®]

audiopak[®]

BY CAPITOL

Capitol[™] CAPITOL MAGNETIC PRODUCTS A DIVISION OF CAPITOL RECORDS INC. 1750 NORTH VINE STREET, LOS ANGELES, CALIFORNIA 90028

Circle 185 on Reader Service Card

THE SOURCE '76

routing switchers; pulse & distribution amplifiers; sync generators; special effects generators VS

RICHMOND SOUND DESIGN LTD 1234 W 6TH AVE VANCOUVER BC V6H 1A5 604 736-7207
audio amplifiers, switchers, equalizers, filters, mixers, stereo and audio for TV VS

RIVERS ASSOCIATES INC BOX 58 LEOMINSTER MA 01453 617 537-4821
intercom systems, tone detection devices, audio silence alarm, SCA equipment, program subcarrier, EBS two tone systems VS

RMS ELECTRONICS 50 ANTIN PLACE BRONX NY 10462 212 892-6700
coaxial cable passives, connectors, hardware

ROBINS BROADCAST & SOUND EQUIPMENT CORP (FORMERLY FAIRCHILD) 75 AUSTIN BLVD COMMACK NY 11725 516 543-5200
complete line audio amplifiers, controls; ALC and AGC amplifiers, compressor/limiters AM and FM, equalizers and filters, passive; audio consoles, tape cleaners, bulk erasers, audio connectors VS
See ad pg. 163—refer to rep/dist section

RODELCO ELECTRONICS CORP 365A COMAC RD DEER PARK NY 11729 516 643-5110
TV & FM translators VS

ROGER MAYER ELECTRONICS INC 225 E 57TH ST NEW YORK NY 10022 212-486-1544
noise gates, stereo limiter, input transformers, line transformers, inductors, peak program meter VS

ROH CORPORATION 107 TECHNOLOGY PARK NORCROSS GA 30071 404 449-0873

audio preamps, line & power amplifiers; audio attenuators; distribution amps, audio routing switchers; all foregoing in modular form

ROHDE & SCHWARZ SALES CO (USA) INC 14 GLORIA LANE FAIRFIELD NJ 07006 201 575-0750
demodulators; field intensity meters for AM, FM TV; RF power meter; rubidium frequency standards; video test signal generators; VIT distortion meter; waveform monitor, monitor receivers; sideband analyzers; TV translators, video monitors (Barco); antennas, AM, FM and TV, microwave, transmission lines and connectors VS

ROHN MFG DIV UNARCO INC PO BOX 2000 PEORIA IL 61601 .. 309 697-4400
antenna tower builders & erectors; microwave reflectors VS

ROSCO LABORATORIES INC 36 BUSH AVE PORT CHESTER NY 10573 914 937-1300
lighting, heads, stands, fixtures, diffusion material, gels and filters, set design, lens cleaning tissue VS

ROSS BROADCAST PRODUCTS INC (GLETRONIX) 160 DUNCAN MILL ROAD DON MILLS ON M3B 1Z5 416 444-8497
video production switchers VS
See ad pg. 134

RTS SYSTEMS 4167 FAIR AVE NO HOLLYWOOD CA 91602 213 980-0511

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

audio pre-amps, IFB/system, intercom systems

See ad pg. 157

RUPERT NEVE INC (See NEVE)

RUSSCO ELECTRONICS MFG INC 1070 BROOKHAVEN DR CLOVIS CA 93612 209 299-
compact audio consoles; mixers; audio amplifiers; monitors; turntables; speakers

RUST CORP (SEE DATA LOGIC/RUST)

RYAN F B MFG CO PO BOX 451 CHARITON IA 50049 515 774-
underground cable plows

S

SADELCO INC 299 PARK AVE WEEHAWKEN NJ 07087 201 866-
CATV test equip

SAKI MAGNETICS INC 1649 12 ST SANT MONICA CA 90404 213 451-
audio and video magnetic tape heads, new and refurbished

SANSUI ELECTRONICS 55-11 QUEENS BLVD WOODSIDE NY 11377 212 779-
4-channel & stereo encoder; turntables; preamps; power amps; reverb units

SANYO ELECTRIC INC 1200 W ARTESU BLVD COMPTON CA 90220 .. 213 537-
audio tape recorders; helical VTRs, video cassette players; TV cameras color & mon

SAWYER INDUSTRIES INC 5649 PECK ARCADIA CA 91006 213 442-
CATV stand-by power supplies; uninterruptible power supplies; surge protectors

continued on page

For mono, stereo . . . AM, FM, TV

ONLY FIDELIPAC® GIVES YOU A CHOICE



MODEL 300

The most popular NAB cartridge . . . performance and price make it the mono broadcaster's first choice.



MODEL 350

For use in stereo machines with inadequate tape guidance. The precision is provided by adjusting the cartridge.



MASTER CART

For the modern stereo broadcaster satisfied with nothing less than the ultimate in performance.

AND, for extended play, there's Fidelipac's Models 600 and 1200. For details, contact your Fidelipac Distributor or



FIDELIPAC®

109 Gaither Drive - Mt. Laurel, NJ 08057
(609) 235-3511

® Trademark

CVS Introduces the First Digital Family of Time Base Correctors.



CVS 504B
The proven standard



CVS 520
High Performance
"Super" TBC



CVS 510
"Low Cost" digital TBC

CVS 520 satisfies capabilities desired by broadcasters. Standard segmented (Quads, IVC, etc.) and non-segmented (PAL, U-matic, etc.) video signals are time base corrected utilizing a 4 times subcarrier, PCM digital sampling technique.

Specifications include:

Signal-to-noise greater than 60 db

Differential Phase less than 2°

Differential gain less than 2%

Standard Features include:

Line-by-line velocity correction in all color modes

Automatic Direct/Heterodyne color switching

Built-in Drop out compensator

Built-in adjustable Proc-amp

Video level meter

Digital outputs on rear panel for future expansion capability

Small size, low power requirements

CVS 520 provides full flexibility with high quality performance necessary in any studio facility.

The CVS 504B NTSC and CVS 503 Pal/Secam digital TBC's have become the standard of the television industry worldwide. The proven dependability and capability of these TBC's have and will continue to contribute substantially to the advancement of this industry.

The CVS "TBC buying guide" is a great success. Do you have your free copy yet? If not, contact CVS. We'll help you in evaluating the real world of digital time base correction.



The CVS 510 is designed to satisfy the requirements of the non-broadcast facility where the technical needs are great but the budget small. Standard heterodyne color and B/W video signals are time base corrected utilizing a 6 bit, 4 times subcarrier digital sampling technique.

Specifications include:

- 1 h window of correction
- Signal-to-noise 48 db
- Differential phase 3°
- Differential gain 3%

Standard Features include:

- Built-in Drop out Compensator
- Built-in Proc-amp
- Operation with V-lock, line lock and non-standard sync VTR's
- Dub-up to quad capability
- Front panel video level controls
- Small size, low power requirements.

The CVS 510 can do much to add dependability and quality in performance in any Cable TV, Pay TV or Closed Circuit TV facility.



Consolidated Video Systems

3300 Edward Avenue
Santa Clara, California 95050
(408) 247-2050 Telex: 35-2028

Original and largest manufacturer of digital TBC's.

Circle 182 on Reader Service Card for more information
Circle 183 on Reader Service Card for a demonstration

Transmitters Love Our Modulimiter.

The Competition Will Hate Your New Sound.

The BL-40 Modulimiter is a unique automatic AM broadcast limiter, which will maximize modern transmitter performance. Whatever your format—hard rock to classical, Modulimiter will increase transmitter efficiency and extend coverage.

The BL-40's patented electro-optical attenuator provides smooth, unobtrusive, true RMS limiting. An ultra fast F.E.T. peak limiting section assures absolute protection from unwanted over modulation without peak clipping. Attack time is essentially instantaneous.

Three separate meters indicate RMS LIMITING, PEAK LIMITING AND OUTPUT LEVEL, simultaneously. All critical adjustments are behind a front security panel. A "phase optimizer" maintains most favorable signal polarity permitting up to 125% positive modulation without negative undershoot. "Its the limit" in today's broadcast limiters. UREI quality of course.

Available from your UREI dealer.

UREI
QUALITY
OF COURSE

UREI

11922 Valerio Street
No. Hollywood, California 91605 (213) 764-1500

Exclusive export agent: Gotham Export Corporation, New York



THE SOURCE '76

SAWYER'S HOLLYWOOD 6820 SANTA MONICA BLVD HOLLYWOOD CA 90038 213 466- mobile van construction; video and film equipment rental service

SC ELECTRONICS 530 FIFTH AVE NW NEW BRIGHTON MN 55112 .. 612 633- See Audiotronics See ad pg. 123

SCALA RADIO 1970 REPUBLIC AVE SA LEANDRO CA 94577 415 3514 broadcast antennas

SCHAFFER ELECTRONICS CORP 75 CASTILIAN DR GOLETA CA 93017 805 968- radio automation equip; multicart machine automatic logging equip. open-reel tape machines. See Cetec Broadcast Group for Field Offices

SCHAFFER INTERNATIONAL 5801 SOLEDAD MTN RD LA JOLLA CA 92037 714 454-

SCHNEIDER CORP OF AMERICA 154 LA ST HACKENSACK NJ 07601 201 343- video camera lenses; motion picture camera lenses; lens accessories

SCIENTIFIC-ATLANTA INC 3845 PLEASANTDALE RD ATLANTA GA 30340 404 449- CATV TV systems; headend modulators, demodulators, signal processors; satellite ground stations; microwave antennas; transmission line, CATV trunk, distribution amplifiers; CATV antennas; cabinets, rack

SCIENTIFIC RADIO SYSTEMS INC 367 ORCHARD ST ROCHESTER NY 14606 716 458- FM transmitters, RF receivers, comm. & monitors

SCOTT HH INC 111 POWDERMILL RD MAYNARD MA 01754 617 897- loudspeakers; digital FM tuner

SCOTT INSTRUMENTS LABORATORIES 533 MAIN ST ACTON MA 01720 617 263- sound level meters

L J SCULLY MANUFACTURING CORP 138 HURD AVE BRIDGEPORT CT 06604 203 368- tape deck reproducers, disc cutting equipment

SCULLY RECORDING INSTRUMENTS (AUDIO ELECTRONICS DIV OF DICTAPHONE CORP) 475 ELLIS ST MOUNTAIN VIEW CA 94043 .. 415 968- tape recorders/players (reel-to-reel), port studio; playback equip for automation; time code for loggers; loggers; underground call locators; time code generator; repair serv

SENCORE INC 3200 SENCORE DR SIOUX FALLS SD 57107 605 339- field intensity meters; sweep generators fr VHF, UHF, FM, & chroma; field effect meters; dual-trace oscilloscopes; AM/FM stereo analyzer; power supplies; CATV test equipment, voltmeters, multimeters, oscilloscopes

SENNHEISER ELECTRONIC CORP 10 V 37TH ST NEW YORK NY 10018 212 239- microphones, headsets, impedance bridg speakers, portable mixer

SEQUERRA CO 143-11 ARCHER AVE JAMAICA NY 11435 212 297 broadcast monitor; FM Intensity meters, modulation monitors

SESCOM INC 12931 BUDLONG AVE GARDENA CA 90247 213 770 audio amplifiers; audio equalizers

SHARP ELECTRONICS CORP

Circle 186 on Reader Service Card

STONE PLACE PARAMUS NJ
 201 265-5600
 tape decks; video cameras;
 monitors; sync generators; waveform
 generators; phase shifters VS

ODEN (See HITACHI SCHIBADEN)

**RON CO INC 144 ROGERS ST
 RIDGE MA**
 617 491-8700
 consoles, special effects generators,
 generators, video & audio distribution
 mixers, sequential video switchers,
 generator mixers, mic mixer, gen lock
 processor

LY LABS INC RT 302 RAYMOND ME
 207 655-3841
 test antennas; transmission line; filter;
 cables; coaxial switches, power combiners

**BROTHERS INC 222 HARTREY
 ANSTON IL 60204** 312 328-9000
 consoles, microphone accessories; audio
 mixers & preamplifiers; feedback controllers;
 pickup cartridges; audio level
 meters; p.a. systems; column speakers;
 consoles; compressor/limiters; reverb VS

Fig. 83—refer to rep/dist section

**ROBS CORP 186 WOOD AVE S ISELIN
 NJ 07030** 201 494-1000
 surge voltage lightning protectors
 amplifiers & power supplies

**PA INTERNATIONAL INC 369 SAN
 DR SUITE 365 NEWPORT BEACH
 CA 92660** 714 644-6857
 systems for racks

**SN ELECTRIC CO 853 DUNBEE AVE
 ORLANDO FL 32817** 312 697-8820
 digital voltmeters & multimeters;
 oscilloscopes VS

**STEMS 330 W 45TH ST NEW
 YORK NY 10036** 212 581-3597
 spectrum limiter, AGC amplifier VS

**EDUCATION SYSTEMS
 MONROE AVE ROCHESTER NY**
 716 586-2020
 overhead projectors VS

**RIE INSTRUMENTATION 5340 ALLA
 WOOD BLVD LOS ANGELES CA**
 213 822-3061
 density meters, test equip VS

**NIC CORP 705 HAVERFORD RD
 HAVERTOWN PA 19010** 215 252-3700
 broadcast transmitters; exciters;
 antenna protectors, antenna monitors VS

**ANTENNA CO 10330 NE MARX ST
 PORTLAND OR 97220** 503 253-2000
 test antennas; antenna preamplifiers;
 antenna towers & accessories; wired cable;
 antenna monitors VS

**PN LIGHTING CONTROL CORP
 100 W 111 ST WOODSIDE NY**
 212 274-7222
 stage lights, light systems, solid state
 lighting systems, light accessories VS

**TL PO BOX 310 STATION
 MONTREAL QUEBEC
 CANADA H3B 2Y8** 514 728-2285
 cassette generators and readers VS

**WICTOR CORP LAKE & COLFAX
 AVENUE FIFTH IN 46319** 219 838-6136
 lighting systems, heads, stands, fixtures,
 lighting material VS

**MASTER DIV JACOBSEN MFG CO
 100 WASH AVE MINNEAPOLIS MN**
 612 529-9566
 lighting plows for cable burial

**ELECTRIC 1717 BUSSE RD ELK
 GROVE VILLAGE IL**
 312 439-2800
 power supplies; CATV transformers

**AYNE INTERNATIONAL INC
 10000 CONVOY CT SAN DIEGO CA**
 619 279-7872
 cable communications equip

ELECTRONICS LABORATORIES

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

**49 FAIRFIELD RD HAVERTOWN PA
 19083** 215 446-4799
 FM transmitters, exciters, modulators, SCA
 equipment, RF amplifiers VS

**SOLL INC 401 E 74 ST NEW YORK NY
 10021** 212 988-0290
 emergency power systems, mobile van
 construction; RF control systems, radio and
 TV studio design; facility turnkey installations

**SONEX INTERNATIONAL 4001 WALAMEDA
 BLVD BURBANK CA 91505** 213 843-7484
 chroma keyers; luminance keyers VS

**SONTEC CORPORATION 10120 MARBLE
 COURT COCKEYSVILLE MD
 21030** 301 628-2282
 audio line amplifiers, preamps; audio
 limiter/compressors; equalizers

**SONY BROADCAST 9 W 57TH ST NEW
 YORK NY 10019** 212 371-5800
 ENG cameras, color monitors, VTRs helical
 and helical cassette, videotape editing
 controller, time coder generators, time base
 correctors VS
 See ad pgs 100, 101

CA Sony 700 West Artesia Blvd Compton
 90220 213 635-6322

IL Sony 6801 West Jarvis Street Niles
 60648 312 792-3600

NY Sony 47-47 Van Dam Long Island City
 11101 212 361-0014

**SONY CORP OF AMERICA 9 W 57TH ST
 NEW YORK NY 10019** 212 371-5800
 video cassettes, video cassette
 recorder/players; videotape recorder/players;
 audio preamps & power amplifiers; quad
 matrix equip; headsets; microphones; audio
 tape; audio cars & cassettes; tape
 accessories; audio tape recorders;
 turntables; phono cartridges; video cameras;
 video switchers; sync generators; special
 effect generators; video tape editing equip VS

**SOUND TECHNOLOGY 1400 DELL AVE
 CAMPBELL CA 95008** 408 378-6540
 audio generators; RF generators; harmonic
 distortion meters, intermodulation meters VS
 See ad pg. 24—refer to rep/dist section

**SPARTA ELECTRONICS CORP
 5851 FLORIN-PERKINS RD SACRAMENTO
 CA 92828** 916 383-5353
 AM & FM transmitters, audio amplifiers,
 audio cartridges, audio consoles & mixers;
 tape cartridge recorder/players; tape
 erasers; turntables; arms, monitor speakers;
 duplexers, exciters; remote control equip;
 SCA equip; FM antennas, antenna monitors;
 modulation monitors; status & alarm
 indicators VS
 See Cetec Broadcast Group for Field Offices.
 See also rep/dist. section

**SPECTRA SONICS 770 WALL AVE OGDEN
 UT 84404** 801 392-7531
 audio consoles; full line of audio amplifiers,
 slide attenuators, pan controls, tone
 generators, speakers, compressor/limiters;
 variable equalizers, electronic crossover
 filters; audio attenuators & accessories VS
 See ad pg. 148

Calif 6430 Sunset Blvd Suite 1117
 Hollywood 90028 213 461-4321

**SPECTRA-VISION CORP 1528 BELFIELD
 AVE PHILADELPHIA PA
 19141** 215 457-6500
 videotape editing equip; videotape

continued on page 108

the Bass Drum Mike...

"For recording a bass drum, there is no better mike than the Beyer M101.

It's ability to accept high levels and very flat response make it the best mike available."

Claude Hill
 Audio Consultants, Inc.
 Nashville, Tenn.

"The Beyer M101N is the finest bass drum microphone on the market today for the money.

I feel it is essential for any good studio..."

Emil Handke
 Nashville Studio Systems
 Nashville, Tenn.

There can be no better endorsement we can ask than that from the pros.

Join the Beyer professionals and use the Beyer M101.



Another innovation from

BEYER DYNAMIC

the microphone people.
 155 MICHAEL DRIVE
 SYOSSET, NEW YORK 11791
 TELEPHONE: (516) 364-1900

Circle 187 on Reader Service Card

FIDELIPAC® ACCESSORIES & CARTRIDGES

CART-A-ROUND CARTRIDGE STORAGE RACKS

Each WR-25 Modular Rack holds 25 Type A Cartridges... eight can be mounted on our Mobile Carousel Base to make up the MR-200.

WR-25 \$15.00
MR-200 \$145.95

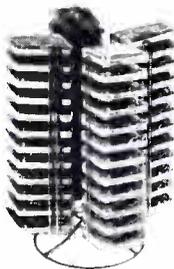
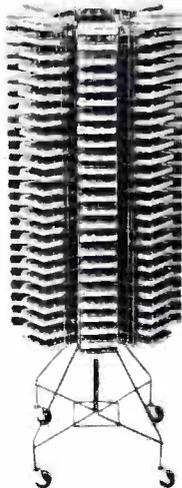


TABLE TOP CARTRIDGE RACK

Model TR-96 holds 96 Type A cartridges.
Model TR-48 holds 48.
TR-96 \$73.85
TR-48 \$38.55



STUDIO ON AIR LIGHT

brilliant red lettering on jet black background can be seen even in the brightest ambient light conditions. \$29.95



CART-E-RASE DEMAGNETIZER

can be used for erasing cartridges, reel-to-reel tape, film sound stripping, etc. \$34.50



ALIGNMENT PROBLEM?

Keep your cart equipment in perfect working order with:

- 350 STA Alignment Cartridge \$38.50
- 350 STF Wow and Flutter Cartridge \$24.50
- 350 STQ Cue Test Cartridge \$35.00
- Head Insertion Gage \$3.35
- Height Gage \$14.95
- Right Angle Zenith Gage \$21.75

Contact your Fidelipac Distributor or



FIDELIPAC®

109 Gaither Drive - Mt. Laurel, NJ 08057
(609) 235-3511

® Trademark

Circle 188 on Reader Service Card

THE SOURCE '76

VS following the description of a company's products stands for Verified Source. Companies so identified have filed appropriate literature with BM/E indicating the products mentioned are in production and available.

To identify all manufacturers of a particular product class or category consult the Instant Source Locator pages 56-73.

duplication; origination equip & equip service VS

SPECTROLAB SOUND POWER SYSTEMS
12500 GLADSTONE AVE SYLMAR CA
91342 213 365-4611
solar power systems, remote power systems VS

SPHERE ELECTRONICS 20201 A PRAIRIE
AVE CHATSWORTH CA
91311 213 349-4747
audio consoles, mixers, program amplifiers, equalizers VS

SPINDLER & SAUPPE INC 13034 SATICOY
ST N HOLLYWOOD CA
91605 213 764-1800
slide projection system for film chains VS

SPIN PHYSICS INC 11633 SORRENTO
VALLEY RD SAN DIEGO CA
92121 714 453-5410
videotape recorder/players; replacement heads for VTR's

STAINLESS INC THIRD STREET N WALES
PA 19454 215 699-4871
AM antennas; antenna towers; tower lighting, tower accessories VS

STANCIL-HOFFMAN CORP 921 N
HIGHLAND AVE HOLLYWOOD CA
90038 213 464-7461
magnetic tape recorder/players; digital clocks; digital time recorders for magnetic recorders

STANDARD ELECTRIC TIME 89 LOGAN ST
SPRINGFIELD MA
01101 413 732-1141
electronic master clocks

STANDARD TAPE LABORATORY INC
2081 EDISON AVE SAN LEANDRO CA
94577 415 635-3805
audio test tapes, test magnetic film VS

STANTON MAGNETICS TERMINAL DR
PLAINVIEW NY 11803 516 681-0200
stereo phono pickups; headphones; turntables, arms; turntable preamp/equalizer
See ad pg. 65—refer to rep/dist section VS

STOREEL CORP PO BOX 80523 ATLANTA
GA 30341 404 458-3280
cabinets & racks for equip; storage racks & enclosures for tape reels VS

STRAND CENTURY INC 20 BUSHES LANE
ELMWOOD PARK NJ 07407 .. 201 791-7000
TV lighting equip; lighting controls, stands, filters, accessories

WILLI STUDER AMERICA INC
1819 BROADWAY NASHVILLE TN
37203 615 329-9576
audio tape recorder/players; audio consoles; condenser microphones
See ad pg. 169

STUDIO FILM EXCHANGE 366 W 46TH ST
NEW YORK NY 10036 212 265-3740
film stock at reduced prices VS

STUDIO TAPE EXCHANGE 630 9TH AVE
NEW YORK NY 10036 212 977-9330
reconditioned video tape

SUMMIT SYSTEMS INC 171 W
ORANGETHORPE AVE PLACENTIA CA
92670 714 528-0700
automated videotape systems; video cartridge-cassette equip

SUPERSCOPE INC 8150 VINELAND AVE

SUN VALLEY CA 91352 213 767-
Sony tape recorders; microphones; tape; tape accessories

**SWITCHCRAFT 5555 NO ELSTON
CHICAGO IL 60630** 312 792-
audio plugs, jacks, connectors; cable assemblies, tester, tape deck comparitors, mixers

**SWR INC PO BOX 215 GOFFSTOWN NH
03045** 603 497-
transmission line accessories; RF equip & service; TV antennas

SYSTA-MATICS INC 510 N SHERIDAN
TULSA OK 74115 918 835-
automatic video cassette player system, automation controllers; time base corrector

SYSTEMS CONCEPTS INC 80 W TRUMAN
AVE SALT LAKE CITY UT
84115 801 486-
character generators

SYSTEMS ENGINEERING CO INC PO BO
49224 ATLANTA GA 30359 ... 404 939-
audio consoles; video consoles, modular lin amplifiers, equalizers, audio distribution amplifiers, power supplies

SYSTEMS MARKETING CORP 1005 W
WASHINGTON ST BLOOMINGTON IL
61710 309 829-
radio automation equip; controllers, multical machines, tape cartridge players; loggers; time/weather announcers; digital clock systems; audio amplifiers; audio generator line amplifiers, ALC and AGC amplifiers, sequencers; single and dual cartridge players, cart recorders

SYSTEMS WIRE AND CABLE INC 3500 S
30TH ST PHOENIX AZ
85040 602 268-
CATV distribution and drop equipment

SYSTRON-DONNER CORP 10 SYSTRON
DR CONCORD CA 94610 415 676-
frequency counters; digital clocks; sweep generators; spectrum analyzers; RF watt meters; time code generators; waveform analyzers, audio generators; digital multimeters; analog/keyboard computers; power supplies; frequency synthesizers; microwave equipment

T

TABER MFG & ENG CO 2081 EDISON AVE
SAN LEANDRO CA
94577 415 635-
replacement audio heads for VTR & audio recorder/players; test tapes; tape erasers
See ad pg. 171

Calif Taber 1227 N Vine Hollywood
90038 213 464-

JOEL TALL—see ELPA MARKETING
TANDBERG OF AMERICA INC LABRIOL
COURT ARMONK NY 10504 .. 914 273-
open reel recorder/players, cassette recorder/players, speakers, amplifiers
See ad pg. 86—refer to rep/dist section

TAPE-ATHON CORP 502 S ISIS AVE
INGLEWOOD CA 90301 213 776
tape recorders/players (reel-to-reel); playback equip for automation, loggers, mono & stereo music service

TAPECASTER TCM INC PO BOX 662
12326 WILKINS AVE ROCKVILLE MD
20851 301 881
tape cartridge equip; digital timers; programmers; clocks; amplifiers

TAPEHEADS 4020 BEECHER ST NW
continued on pag

Microtime 2020

New signal processor
better television pictures



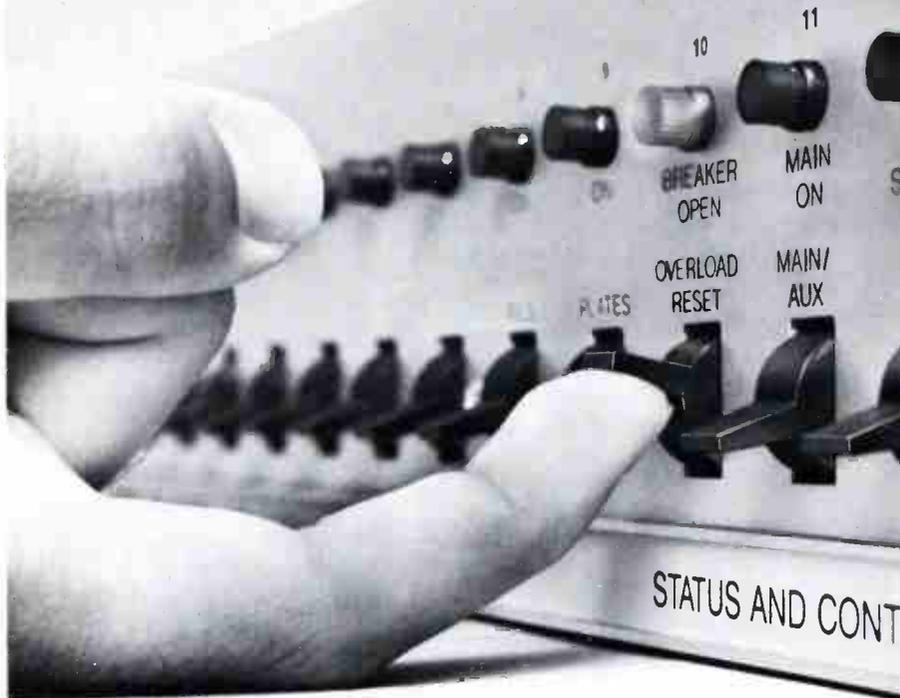
Corrects Time Base Error
Increases Resolution
Reduces Visual Noise
Improves Color Quality

1e
ie Hills Avenue
ald, Ct. 06002
2-4242 TWX 710-425-2390

MICROTIME

Circle 189 on Reader Service Card

Now! Remote transmitter control



is this simple.

Now there's an all digital system that gives you direct, positive on/off control and status monitoring of remote AM, FM and TV transmitters. We call it the X-14, and there's nothing else like it.

Fourteen toggle switches give you direct on/off control of up to 14 different functions like: filament voltage, plate voltage, main power, overload reset, tower lights and program source selection. No longer do you have to dial them in one-at-a-time.

In addition, fourteen status channels, each with its own, independent LED indicator, monitor such go/no-go functions and/or alarms as: power, voltages, temperatures, intrusion, VSWR and tower lights. You see a complete display of status and alarms, at-a-glance.

Besides all this, the X-14 is an economical way to add capability to an existing analog remote control system. It meets the FCC control failsafe requirements, and gives you a fully digital command system as

backup to your analog operation. So, the direct control switches on the X-14 can be used for critical "key" functions while, at the same time, you're using the analog system to read other transmitter parameters. With our optional Line Multiplex Filter, both the X-14 and your analog system will operate on the same phone line.

Exceptional data integrity is another advantage of the X-14. Both control and status information are updated every 400 MS, and a unique "double check" logic system virtually eliminates data errors. There are also fewer operator errors because there's no dialing and knob twisting. Each switch is labeled for a specific function. The X-14 is also ATS-compatible.

The X-14 is just one of the many new ways TET is applying digital techniques to simplify and improve broadcasting remote control. For a demonstration, call or write. In Canada: Orange County Associates, Winnipeg, Manitoba.

TET TIME AND FREQUENCY TECHNOLOGY, INC.
3000 OLCOTT STREET, SANTA CLARA, CA 95051 (408) 246-6365 TWX No. 910-338-0584

Circle 190 on Reader Service Card

THE SOURCE '76

WASHINGTON DC 20007 202 338
A/V programming equipment

TDK ELECTRONICS 755 EASTGATE BLVD
GARDEN CITY NY 11530 516 746
open reel, cartridge, cassette audio tape

TEAC CORP OF AM 7733 TELEGRAPH
MONTEBELLO CA 90640 213 726
audio tape recorders/reproducers,
microphones, mixers, audio monitors, pre
amps, power amplifiers, stereo and mono
consoles; studio systems

TECH ELECTRONICS INC
6000 PEACHTREE RD NE ATLANTA GA
30341 404 455
videotape editing controller

TECH LABS INC BERGEN BLVD
PALISADES PARK NJ 07650 . 201 944
audio and gain controls, RF and video
attenuators; electronic switches
See ad pg. 173—refer to rep/dist section

TECHNICS PANASONIC ONE PANASOI
WAY SECAUCUS NJ 07094 .. 201 348
turntables; audio components, speakers
See ad pg. 17

TECHNISPHERE CORP 215 E 27 ST NE
YORK NY 10017 212 888
helical edit controller, portable switcher
fader, color gen lock; equipment rental; p
production services:

TECHNOLOGY INC HF PHOTO DIV
11801 W OLYMPIC BLVD LOS ANGELES
CA 90064 213 479
8-, 16-, 35mm film processors, pollution
control and silver recovery systems

TEKTRONIX INC PO BOX 500 BEAVER
OR 97007 503 644
oscilloscopes, video & picture monitors,
sideband analyzers, spectrum analyzers,
demodulators, sideband analyzers, RF
correctors, waveform monitors, video test
generators, sync generators, automatic v
correctors, VTR equip, vectrosopes, mo
photometers video processing amplifiers;
repair service
See ads pgs. 12, 81
field offices:

Ala	TKX Suite 8, 3322 S Memorial Parkway Huntsville, 35801	205 88
Ariz	TKX 2643 E University Drive Phoenix 85034	602 249
Calif	TKX 2345 Stanwell Circle Concord 94520	415 668
	TKX 16601 Hale Avenue Irvine 92714	213 778
	TKX 6841 Convoy Court San Diego 92111	714 25
	TKX 3200 Coronado Dr Santa Clara 95051	408 24
	TKX 21300 Erwin St Woodland Hills (L) 91364	213 95
Colo	TKX 14 Inverness Dr East Suite 4A Englewood 80110	303 7
Conn	TKX 20 Commerce Park Rd Millford 06460	203 87
Fla	TKX 1871 West Oakland Park Blvd For Lauderdale 33311	305 75
	TKX Suite 109, 1040 Woodcock Rd Ori 32803	305 88
	TKX 4900 Bayou Blvd Suite 130 Pensa 32503	904 4
Ga	TKX Suite 3, 2251 Perimeter Park Atlanta 30341	404 4
Il	TKX 5350 Keystone Ct Rolling Meadow 60008	312 2
Kan	TKX 8920 West 62 Terrace Kansas Cit Shawnee Mission 66202	913 2
La	TKX 3004 34th Street New Orleans Metairie 70001	504 8
Md	TKX 1526 York Road Baltimore/ Lutherville 21093	301 3
	TKX 1335 Piccard Drive Rockville 20850	301 9
Ma	TKX 482 Bedford St Boston/Lexington 02173	617 8
Mich	TKX 25882 Orchard Lake Rd Farmingl Hills 48024	313 4
Mo	TKX 422 Anglum Road, St Louis/ Hazelwood 63042	314 7

KX 964 South Springfield Avenue
Springfield 07081 201 379-1670
KX 1258 Ortiz Drive, S.E. Albuquerque
87108 505 268-3373
KX 678 Troy Rd Albany/Latham
12110 518 785-3353
KX 100 Crossways Park West Woodbury
11797 516 364-9060
KX 31 Haight Ave Poughkeepsie
12603 914 454-7540
KX 1210 Jefferson Rd Rochester
14623 716 244-2600
KX 1 Northern Concourse North Syracuse
NY 13212 325 455-6661
KX 3725 National Drive Raleigh
27612 919 782-5624
KX 5689 Pearl Road Cleveland
44129 216 884-6558
KX 501 Progress Rd Dayton
45449 513 859-3681
KX Suite 201 800 NE 63rd Oklahoma
City 73105 405 849-3361
KX 8845 SW Center Court Tigard
97223 503 639-7691
KX 3834 Northern Pike Monroeville
15146 412 351-3345
KX 1777 Walton Rd Blue Bell
19422 215 825 6400
KX 4455 Sigma Rd Dallas
75240 214 233-7791
KX 3311 Roselawn San Antonio
78226 512 434-4334
KX 5755 Bonhomme Houston
77036 713 783-1910
KX 65 West 2950 South Salt Lake
City 84115 801 484-8501
KX 1929 Coliseum Dr Hampton
23366 804 826-4020
KX 2316 S Jefferson Davis Hwy Suite
1004 Arlington 22202 703 920-7770
KX 641 Industry Drive Seattle
98188 206 575-0180

**PHOTOGRAPH CORP 8700 BELLANCA
BOULEVARD LOS ANGELES CA**
..... 213 776-5022
audio equip

**TELEVISION INC 2604 MALT AVE COMMERCE
MISSISSIPPI** 213 726-2811
cable; trunk & distribution amplifiers;
audio signal processors; passive cable

**TELEVISION INC 5434 MERRICK RD
ROCKY HAVEN PEQUA NY 11758** 516 798-2828
audio pan & tilt heads; pan heads;
pedestals; motorized lenses
(viewer); camera housings; remote
control systems; equipment rental

**TELECOMMUNICATIONS INDUSTRIES LTD
100 WHEATWOOD AVE SUITE 204 LOS
ANGELES CA 90028** 213 461-3561
test pattern, charts, slides, films

**TELEVISION INC BIG BEAM 290 EAST PRAIRIE
SHEWAN LAKE IL 60014** 815 459-6100
stage lighting

**TELEVISION INC CAMERA SYSTEMS 131 N
LAUREL AVE ARCADIA CA**
..... 213 359-6691
film recording systems

**TELEVISION INC ENERGY SYSTEMS 110 W
WINDYBROOK RD TIMONIUM MD**
..... 301 252-8220
supplies for remote applications

**TELEVISION INC PO BOX 15068 SALT
LAKE CITY UT 84115** 801 972-8000
cameras mono; TV film cameras;

Following the description of a company's
products stands for Verified Source. Com-
pany identified have filed appropriate
forms with BM/E indicating the products
needed are in production and available.

Identify all manufacturers of a particular
product class or category consult the Instant
Locator pages 56-73.

telecine chains; character gens; encoders,
sync gens; routing switchers; source
identifiers, frame synchronizers, VTRs,
helical (cassettes); audio consoles,
processing amplifiers; pulse & distribution
amplifiers; special effects generator; video
cassette units; colorizers; TV event display
system, audio for TV, non-duplication
switchers, humbucking coils, CATV news,
weather, stockmarket, consumer shopping
and program guide

See ad on pg. 37—refer to rep/dist section

Calif	TM 375 Beach Rd Burlingame 94010	415 348-3822
Calif	TM 4421 Riverside Dr Suite 206 Burbank 91505	213 845-7831
GA	TM 3684 Wilton Ave Doraville 30340	404 451-1801
Ill	TM 1948-B Lehigh Rd Glenview 60025	312 729-5210
Md	TM 3930 Knowles Ave Kensington 20795	301 933-5250
NY	TM 25 W 43rd St Suite 606 New York 10036	212 575-1515

**TELE-MEASUREMENTS INC 145 MAIN AVE
CLIFTON NJ 07014** 201 473-8822
test slide projectors; test slides for b/w &
color camera alignment, light box
illuminators

**TELEMEDIA ELECTRONICS 1548 W
WINTON HAYWOOD CA
94545** 415 783-3311
automatic videocassette playback equipment;
tone generators; digital clock

**TELEMET 185 DIXON AVE AMITYVILLE NY
11701** 516 842-2300
multiburst, stairstep, window, waveform
generators; video distribution amplifiers;
envelope delay measuring equip; VITS
keyers; video switching systems; TV
demodulators cable TV modulator &
demodulators; chroma keyers; image
enhancers; video processing amplifiers; TV
test equip; audio monitors

See ad pg. 74—refer to rep/dist section

Ga	L. Parson PO Box 49364 Atlanta 30359	404 633-3097
NY	B. Griffith Easthill RFD #3 Brewster 10509	914 279-3231
Ohio	E. Platt 12992 Cedar Rd Cleveland Heights 44118	216 321-7523
Tex	L. Caput 13620 Littlecrest Dr Dallas 75234	214 241-0928

WEST COAST call 516 842-2300

**TELEPHONICS 770 PARK AVE
HUNTINGTON NY
11743** 516 549-6000
cordless stereo headphones

**TELESOURCE COMMUNICATION
SERVICES INC 1135 TERMINAL WAY
RENO NV 89502** 702 786-2302
computerized data for direct TV broadcast,
election returns, sports, business news;
customized services

**TELEVISION EQUIPMENT ASSOCIATES
BOX 260 SOUTH SALEM NY
10590** 914 763-8893
communications headsets; intercom systems;
color corrector; video-tape cleaners; video
delay lines; video envelope correctors; color
monitor comparator; video test slides

See ad pg. 167—refer to rep/dist section

**TELEVISION PRODUCTS CO INC
9016 AVIATION BLVD INGLEWOOD CA
90301** 213 776-3276
booms & dollies

See ad pg. 48—refer to rep/dist section

**TELEVISION RESEARCH INTERNATIONAL
INC 1003 ELWELL CT PALO ALTO CA
94303** 415 961-7475
video tape editing equip, portable production
switcher

**TELEVISION TECHNOLOGY CORP 5970 W
60TH AVE ARVADA CO
80003** 303 423-1652
TV & FM translators; RF amplifiers,
converters, filters; TV combiners; solar
power systems

continued on page 112

A GOOD BUY

THE BEST NEW PORTABLE TIME CODE GENERATOR

NOW \$2850

- small size
(8" x 1 3/4" x 8 1/2")
- light weight—2 lbs.
including battery
—40 hrs.
- front panel controls
reset/preset/run
preset times
- outputs hours:minutes:
seconds:frames
- liquid crystal display
- displays hours:
minutes:seconds

ASK FOR IT BY NAME:
**CMX PORTABLE TIME CODE
GENERATOR**

cmx systems
ORROX

3303 Scott Boulevard
Santa Clara, Ca. 95050
Phone: 408-988-2000
Telex: 910-338-0554
Sales & Service:
Dallas: 214-242-2690
Los Angeles: 213-980-7927
New York: 212-371-1122

DISTRIBUTORS WANTED

Circle 191 on Reader Service Card

THE SOURCE '76

TELEX COMMUNICATIONS INC
9600 ALDRICH AVE SO MINNEAPOLIS MN
55420 612 884-4051
headsets, tape recorder/players, tape
cartridge recorder/players, tape duplicators,
preamps, power amps VS
See ad pg. 91

Can Telex Electronics, Ltd. 590 Progress
Ave. Unit 3, Scarborough, Ontario
M1H 3A6 416 438-3804

TELECOM ALTAIR PO BOX 277 LAGUNA
BEACH CA 92652 714 494-9401
test instruments; RF attenuators; sweep
generators, RF filters, microwave
sub-systems; impedance bridges; dB meters VS

TENTEL 50 CURTNER AVE CAMELL CA
95008 408 377-6588
magnetic tape tension gauge VS
See ad pg. 140

TEPCO CORP PO BOX 680 RAPID CITY
SD 57701 605 343-7200
TV translators; receivers, comm. and
monitors, microwave equipment VS

TERRACOM DIV OF CONIC CORP
9020 BALBOA AVE SAN DIEGO
CA 714 278-4100
microwave equip

TEXAS ELECTRONICS INC PO BOX
7225-INWOOD STATION DALLAS TX
75209 214 827-3033
meteorological (weather) monitoring equip

TEXSCAN CORP 2446 N SHADELAND
INDIANAPOLIS IN
46219 317 357-
audio attenuators & switchers; coaxial
attenuators & switchers; signal generators
sweep generators, oscilloscopes, spectrum
analyzers, impedance bridges, cable TV
system analyzers, tunable filters, VHF/UH
tuner test equip, test accessories &
terminators

TEXWIPE THE CO 51 PROSPECT PLAC
HILLSDALE NJ 07642 201 664-
cleaners for tape heads

THALNER ELECTRONIC LABS
7235 JACKSON RD ANN ARBOR MI
48103 313 761-
character generators; special effect
generators; pulse & distribution amplifiers;
sync generators, screen splitters, slave
clocks

THERMODYNE INT. LTD 12600 YUKON
AVE HAWTHORNE CA
90250 213 679-
reusable shipping & handling containers

THETA-COM PO BOX 9728 PHOENIX AZ
85068 602 944-
microwave equipment

THOMSON-CSF LABORATORIES
37 BROWNHOUSE RD STAMFORD CT
06902 213 327-
video cameras; video discs; color flying sp
scanner; flying spot telecine; camera
telecine chain; TV transmitters, A/D
converters, pulse and distribution amplifier
sync generator systems, character
generators, complete telecine systems,
wireless mics, ALC and AGC amps,
compressor/limiters, AM and FM, equalizer
and filters
See ad pg. 22—refer to rep/dist section
Calif Thom CSF PO Box 36 La Canada
91011 213 790
Mo Thom CSF 4220 H Casa Brazila Dr St
Louis 63129 314 487

THOR ELECTRONICS CORP
741 LIVINGSTON ST ELIZABETH NJ
07207 201 354-
power tubes and rectifiers

TIME & FREQUENCY TECHNOLOGY INC
3000 OLCOTT ST SANTA CLARA CA
95051 408 246-
digital clocks, master clocks; frequency
counters; remote digital displays; frequency
monitors; modulation monitors; SCA
monitors; standard time & frequency
receivers
See ad pg. 110—refer to rep/dist section

TIMES WIRE & CABLE CO 358 HALL A1
WALLINGFORD CT 06492 203 265-
CATV cable & wire

TM SYSTEMS INC 25 ALLEN ST
BRIDGEPORT CT 06604 203 366-
line amps, amplifier power systems, VU
meters, dB meters

TOCOM INC 3301 ROYALTY ROW IRVIN
TX 75062 214 438-
CATV trunk, distribution amplifiers; head-
processors; connectors; distribution pass
two-way cable communication systems

TOMCO COMMUNICATIONS INC
2399 CHARLESTON RD MOUNTAIN VIE
CA 94043 415 969-
pre-amps, converters for CATV

TOPAZ ELECTRONICS 3855 RUFFIN RI
SAN DIEGO CA 92123 714 279
power supply converters, uninterruptible
powersystems, power isolators, surge
protectors

TRACOR INC 6500 TRACOR LANE AUS
TX 78721 512 926-
automatic, crystal frequency standards, vis
carrier generator, remote subcarrier syste
countdown unit

TRANSIST-O-SOUND INC 851 EUSTIS I
INDIANAPOLIS IN 46229 317 897
ALC and AGC amplifiers, portable mixer
amplifier, recording amplifiers for mag so
on film
See ad pg. 174

DELTA •••

for DIGITAL Antenna Monitoring •••

- FCC TYPE APPROVAL NUMBER 3-218.
- TRUE RATIO READINGS.
- HIGH RESOLUTION.
- STABLE UNDER HIGH MODULATION.
- UP TO 6 TOWERS DA-2 STANDARD, 12 TOWERS WITH EXTENSION UNIT.
- BASE CURRENT ADAPTER AVAILABLE.



DAM-1

And Antenna/Transmitter Remote Control.

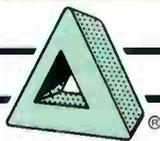
- REMOTES ALL DAM-1 CONTROLS AND READ-OUTS.
- PROVIDES CONTROL AND STATUS DISPLAY OF UP TO 30 FUNCTIONS; PROVIDES ALARM INDICATION OF 8 FUNCTIONS.
- FAILSAFE CIRCUITS CONFORM TO FCC REQUIREMENTS.



TMCS-1

DELTA ELECTRONICS

5534 PORT ROYAL ROAD
P.O. Box 1508
SPRINGFIELD, VIRGINIA 22151
TELEPHONE: 703/321-9845 TWX: 710-831-0620



...giving the description of a company's
...stands for Verified Source. Com-
...so identified have filed appropriate
...re with BM/E indicating the products
...ned are in production and available.

...etify all manufacturers of a particular
...d class or category consult the Instant
...Locator pages 56-73.

LUX CORP 625 MADISON AVE
NEW YORK NY 10022 212 751-3110
...ection screens VS

OUND INC 13733 GLEN OAKS
LYLMAR CA 91342 213 367-6543
...condenser microphone VS

ENG INC 1941 FIRST ST SAN
LEONIDO CA 91340 213 365-3124
...mixture color and B/W film
...bers; film cleaners; film processor
...sies VS

RA CORP OF AMERICA 30 WEST
VALON AVE ENGLEWOOD NJ
..... 201 567-3810
...video automatic line program alarm

OWER CORP 7182 RASMUSSEN
VALIA CA 93277 209 732-8383
...porting, guyed towers; portable
...s

LT CORP 286 HARMON RD
EFFTON OH 45817 419 358-5015
...d meters; unimeters; voltmeters;
...rners VS

RNICS INC 4019 TUJUNGA AVE NO
WOOD CA 91604 213 877-9912
...tion equipment rental, post-production
...obe studio design, radio and TV;
...ean construction, facility turnkey
...tion, color video monitor VS

METER ELECTRONICS INC
OMANCHE AVE CHATSWORTH CA
..... 213 882-1020
...tinax, triax cable patching equip;
...tinax switching matrices, RF
...evators, switchers, cables, connectors VS

IME INSTRUMENT CO 429 OLIVE
ATA ROSA CA 95401 .. 707 528-1230
...sime systems; frequency monitors
...nters VS

AINC 2005 NAUDAIN ST
PHILADELPHIA PA 19146 215 545-3488
...nsoles, VU meters VS

ASSOCIATES 6037 HAVILAND AVE
TER CA 90601 213 693-2506
...ulators, CCTV switcher VS

AUDIO PRODUCTS PIXTEC BOX
VERLY HILLS CA
..... 213 276-2726
...nsoles; rewinders; video picture
...s; videotape cleaners; prompters,
...quip; waveform monitors; pulse cross
...s, vectorscopes VS

LECTRONICS CO SENSTROL DIV
CKETT PT RD NORTH HAVEN CT
..... 203 288-7731
...asers, multi-cart machines, splice
...audio heads VS

O-ROHN DIV OF ROHN IND INC
X 2000 PEORIA IL
..... 309 697-4400
...as, TV; towers, hardware and
...ction equipment VS

NE CORP (RADONIC DIV)
OTT ST NORFOLK VA
..... 804 855-1089
...ss automation systems for radio & TV

UNIMEDIA RTE 2 PO BOX 2574 E AUBURN
CA 95603 916 272-1971
...video picture monitors VS
See ad pg. 136—refer to rep/dist section

UNION CONNECTOR CO INC
149 BABYLON TPK ROOSEVELT NY
11575 516 623-7461
...patch terminals; heavy duty plugs/connectors VS

UNITED PRESS INTL 220 E 42ND ST NEW
YORK NY 10017 212 682-0400
...newswire service; cable newswire VS

UNITED RECORDING ELEC IND (UREI)
11922 VALERIO ST N HOLLYWOOD CA
91605 213 764-1500
...compressors/limiters, amplifiers, modules,
...audio consoles, equalizers VS
See ad pg. 106—refer to rep/dist section

UNITED RESEARCH LAB CORP 16 E 52ND
ST NEW YORK NY 10022 212 751-4663
...op-amp modules, conversion amps, audio
...generators, professional tape recorders;
...rebuids of Ampex, Scully, etc VS

UNITED SYSTEMS CORP (DIGITEC)
918 WOODLEY RD DAYTON OH
45403 513 254-6251
...frequency counters, counter-timers; digital
...clocks; digital voltmeters; frequency
...converters, frequency synthesizers; pulse,
...sine, square-wave generators; time base
...generators, status and alarm indicators VS

U S PIONEER ELECTRONICS CORP
75 OXFORD DR MOONACHIE NJ
17074 201 935-4300
...tape recorders; head sets; microphones;

continued on page 114

DELTA •••

for ANALOG Antenna Monitoring •••

- FCC TYPE APPROVAL NUMBER 3-235.
- TRUE RATIO READINGS.
- SIMPLE INTERFACE WITH EXISTING REMOTE CONTROL EQUIPMENT.
- STABLE UNDER HIGH MODULATION.
- UP TO 8 TOWERS DA-2.
- PHASE SIGN DATA ALWAYS AVAILABLE - NO EXTRA OPERATION REQUIRED.
- LOW PRICE.



AAM-1

And Antenna/Transmitter Remote Control .

- REMOTES ALL AAM-1 CONTROLS AND READOUTS.
- ON/RAISE AND OFF/LOWER CONTROLS FOR UP TO 30 FUNCTIONS.
- PROVIDES DIGITAL DISPLAY OF UP TO 30 FUNCTIONS; PROVIDES ALARM INDICATION OF 8 DIFFERENT FUNCTIONS.
- FAILSAFE CIRCUITS CONFORM TO FCC REQUIREMENTS.



TMCS-2

DELTA ELECTRONICS

5534 PORT ROYAL ROAD
P. O. BOX 1508
SPRINGFIELD, VIRGINIA 22151
TELEPHONE: 703/321-9845 TWX: 710-831-0620



Circle 193 on Reader Service Card

NECESSITY A ~~LUXURY~~ YOU CAN AFFORD.

Routing Switchers:

Frame Size (system expandable)

40 x 20	3 level	audio & video plus aux.
20 x 10	3 level	
20 x 10	5 level	
16 x 10	audio & video with P.B. control	
15 x 2	audio & video	
15 x 6	variety of	
15 x 12	controls	
48 x 10	audio	
or	variety of	
24 x 20	controls	

40x

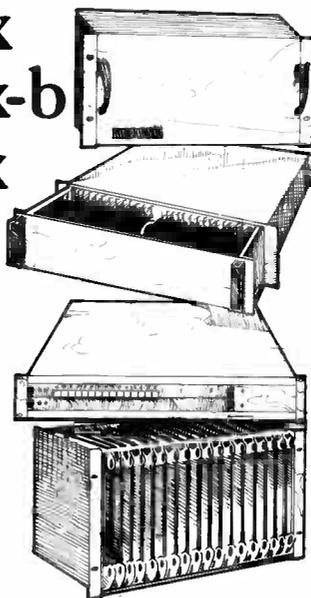
20x-b

20x

Rx

15x

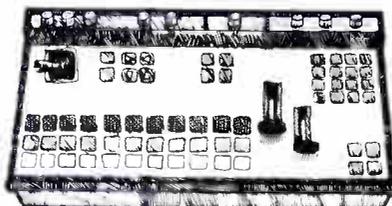
Ax



Production Switchers:

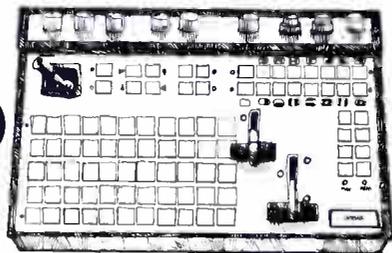
3 Bus 11 Inputs
Soft Wipes
Linear Key
All Vertical Interval
19 Effects
28 Features in one
Low Cost Unit

3100



5 Bus 11 Inputs
Remote Control
Chroma Key
Key Edger
Border Generator
Audio - Follow
Soft Wipes and Keys

3300



COMING SOON

3400

6 Bus - 3 Mix Effects

Low Cost



COMMUNICATIONS TECHNOLOGY, INC.

3070 Leeman Ferry Rd. Huntsville, Alabama 35801 Phone 883-7370 TWX 810-726-2105

Circle 194 on Reader Service Card

THE SOURCE '76

stereo monitor receivers

UTILITY BODY CO 901 GILMAN ST
BERKELEY CA 94710 415 524-9
aerial lifts

UTILITY PRODUCTS CO 6665 N 60 ST
MILWAUKEE WI 53223 414 353-1
buried cable closures

UTILITY TOOL CORP TOWN ST E HADDY
CT 06423 203 873-8
hand & machine-powered tools for cable
preparation

UTILITY TOWER CO PO BOX 12027
OKLAHOMA CITY OK
73112 405 946-5
antennas & towers for AM, FM, TV &
microwave

V

VACUUM TUBE INDUSTRIES 35 PECUIT
ST BOX 358 CANTON MA
02021 617 828-
vacuum power tubes, rebuilt
See ad pg. 150

VAMCO ENGINEERING BOX 7512 TULSA
OK 74105 918 252-4
digital tape timers; clock systems; A/V
distribution amplifiers; video tape timer (als
for ENG & TVC); A/V routing switcher;
chroma-key kit

VARIAN ASSOC ELECTRON DEVICE
GROUP 611 HANSEN WAY PALO ALTO
CA 94303 415 968-7
power vacuum tubes; RF switches; sockets
klystrons; TWTs; microwave components;
xenon lighting; cooling equip

VARIAN/BERERLY MICRO-LINK
PRODUCTS 8 SALEM ROAD BEVERLY M
01915 617 922-6
ITFS & MDS microwave & systems;
microwave RF components, assemblies &
subsystems; exciter, modulators, TV
translators

VEDCO INC 2320 N WOODLAWN AVE
METAIRE LA 7001 504 885-95
routing switchers; A/V distribution amplifier

VEGA ELECTRONICS DIV OF CETEC
9900 BALDWIN PL EL MONTE CA
91731 213 442-4
wireless microphone systems; wireless
microphone accessories
See ad pg. 116—refer to rep/dist section

VERMEER MFG CO PO BOX 200 POLLA
IA 50219 515 628-3
trenchers

VERSA COUNT ENGINEERING 553 LEVEL
BLVD ELK GROVE VILLAGE IL
60007 312 593-0
emergency power equipment, batteries;
video processing amps, FM and TV
translators, FM transmitters

VICON INDUSTRIES 140 CENTRAL AVE
FARMINGDALE NY 516 293-2
CCTV connectors

VIDEO AIDS CORP OF COLORADO 112 V
FOURTH ST LOVELAND CO
80537 303 667-3
sync generators; cross pulse generators;
gen-lock; ; burst phase meter; monitors;
videotape editors; intercom
See ad pg. 42

VIDEO COMPONENTS INC 601 SO MAIN
ST SPRING VALLEY NY
10977 914 356-3
video synthesizer and colorizer (BJA), CCT
and broadcast camera lenses (Canon USA
modulators and demodulators (CATEL),
mobile carts (Gruber Products), mounting
equipment (Quick-Set), 16mm TV projector
(Singer), lighting equipment (Smith-Victor),
sync generators, burst phrase meters,

owing the description of a company's
its stands for Verified Source. Com-
so identified have filed appropriate
re with BM/E indicating the products
ned are in production and available.

ntify all manufacturers of a particular
class or category consult the Instant
Locator pages 56-73.

optical isolators (Video Aids Corp.),
tial switchers (Portac), shipping cases
odyne), optical multiplexers (Zei-Mark)
VS

CONCEPTS INC 3715 LOMITA
TORRANCE CA 90505 213 373-8539
pulse generator; videotape editor;
clock timer; small video switcher VS

DATA SYSTEMS 657 OLD WILLETS
TAUPPAUGE NY
..... 516 234-1010
er generators; TV titling & data
systems VS

MAX (DIV OF ORROX CORP)
COTT BLVD SANTA CLARA CA
..... 408 988-2000
video recording heads & headwheel
colies, replacement heads VS
pg. 3—refer to rep/dist section
Bill Seidel 7020 Delco Avenue
Canoga Park 91306 213 980-7927
Frank Benson 11520 Bowen Rd. Roswell
(Atlanta) 30075 404 992-4490
erry Cudlipp 24 Addison Terr. Old
Tappan 07675 212 947-8031

MEMORY CORP 3070 KENNETH ST
CLARA CA 95050 408 246-5820
st quality helical VTR

OPTICS 1916 OLD MIDDLEFIELD
MOUNTAIN VIEW CA
..... 415 965-4298
ult level camera VS

SENTRY SYSTEMS 1080 RTE 46
NJ 07013 201 777-7600
udio TV program loggers

VIDEO TAPE CO 4212 LANKERSHIM
HOLLYWOOD CA 213 985-1666
ressed videotape; videotape cleaning &
on; tape accessories VS

TEK INC 640 E VINE ST STOWE PA
..... 215 367-6977
monitors VS
g. 144

EL INC 42 CENTRAL DR
NGDALE NY 11735 516 420-1470
eels & boxes for video & audio tape

ONICS 855 N CAHUENGA BLVD
WOOD CA 90038 213 466-9741
tape transfer

INTERNATIONAL BOX 1555 MT VIEW
142 408 739-9740
ound music systems; automatic
n intermix units; tape
r/players; tape heads; plug-in
ar adaptors for Ampex recorders;
mp; video program timers,
ssor/limiters/filters, FM VS

N 4918 WEST 35TH ST
APOLIS MN 55416 612 927-7716
tic tape heads VS

N See Listec

UNT INDUSTRIES LTD 105 E 69TH
ANCOUVER BC
V9 604 327-9446
roduction switchers; pulse &
tion amplifiers; routing switchers;
effects generators; chroma keyers VS

RIARY ELECTRONICS 141 PARKER
AN FRANCISCO CA
..... 415 751-2903
raphics generator (audio responsive)

L EDUCOM INC 4333 S OHIO ST
CITY IN 46360 219 879-8311
cameras; surveillance video cameras;
monitors, video switchers, distribution

amplifiers; sync generators, special effects
generators; tape duplicators; pulse
amplifiers; wire & cable; connectors

VISUAL ELECTRONICS CORP
(See Rapid Q)

VISUAL INFORMATION INSTITUTE INC PO
BOX 33 XENIA OH 45385 513 372-8637
test equipment for CATV, sync generator
systems, video test materials and generators
See ad pg. 169

VISUAL METHODS INC 5 WORTENDYKE
AVE MONTVALE NJ 07645 201 391-7383
TV surveillance cameras; camera lenses VS

VITAL INDUSTRIES INC 3700 NE 53RD
AVE GAINESVILLE FL
32601 904 378-1581
TV automation equip; video processing
amplifiers; video production & routing
switchers; video & audio distribution
amplifiers; pulse distribution amplifiers;
special effects generators; chroma keyers VS
See ad pg. 9

Calif G. Peters 7960 W Beverly Blvd Los
Angeles 90048 213 653-9438

Ind M. Beavers 2644 North 7th Street
Terre Haute 47804 812 466-3212

NY R. McAll 34 Autumn Lane Hicksville
11801 516 735-0055

Tex G. Peters Box 912 Arlington
76010 817 261-6855

Va E. King Fox Hill Road Lynchburg
24503 804 384-7001

VITEK ELECTRONICS INC 200 WOOD AVE
MIDDLESEX NJ 08846 201 469-9400
CATV test equip

W

WARD BECK SYSTEMS LTD
841 PROGRESS AVE SCARBOROUGH ONT
M1H 2X4 416 438-6550
audio consoles; modules; TV intercom, audio
amplifiers, audio processing equipment, dB
meters VS
See ad cover 2
NY WB 290 Larkin St Buffalo
14210 416 438-6550

WATERS MANUFACTURING INC
LONGFELLOW CENTER WAYLAND MA
01778 617 358-2777
audio attenuators & controls, rotary & slide

WAVETEK INDIANA INC 66 N FIRST AVE
BEECH GROVE IN
46107 317 783-3221
CATV test equip; sweep/signal generators,
RF detectors; function, signal, sweep
generators; oscilloscopes; phase meters;
transmission level test set; programmable
waveform synthesizers; test accessories

WABASH TAPE CORP 2720 DES PLAINES
AVE DES PLAINES IL
60018 312 298-8585
helical-scan video magnetic tape; audio
magnetic tape

WEAVER J A CO 8676 PENNELL DR ST
LOUIS MO 63114 314 997-5555
bonded copper ground rods, ground rod
clamps; jumper clamps.

WELLER-XCELITE ELECTRONICS DIV
COOPER GROUP PO BOX 728 APEX NC
27502 919 362-7511
soldering guns, wire stripping tools,
hardware

WESTLAKE AUDIO 6311 WILSHIRE BLVD
LOS ANGELES CA 90048 213 655-0303
tape splicing block & cleaner; speakers,
cabinets, furniture, acoustic materials,
complete studio construction VS
See ad pg. 141

WESTON INSTRUMENTS INC
614 FRELINGHUYSEN AVE NEWARK NJ
07114 201 242-2600
analog VU meters, voltmeters, multimeters,
dB meters

continued on page 116

ANOTHER GOOD BUY

THE BEST NEW TIME CODE READER/ DISPLAY

NOW \$1990

- reads fast forward and reverse—full speed
- reads from 1/5x to 50x real time
- auto hold activates when incoming code falls below 1/5 real time
- dynamic range ± 12db from nominal
- digital readout visible from 40 ft.
- displays user bits

ASK FOR IT BY NAME:
CMX TIME CODE
READER/DISPLAY

cmx systems
ORROX

3303 Scott Boulevard
Santa Clara, Ca. 95050
Phone: 408-988-2000
Telex: 910-338-0554
Sales & Service:
Dallas: 214-242-2690
Los Angeles: 213-980-7927
New York: 212-371-1122

DISTRIBUTORS WANTED

Circle 195 on Reader Service Card

THE SOURCE '76

WIDE BAND ENGINEERING CO INC PO BOX 21642 PHOENIX AZ 85036 602 254-1570
RF amplifiers, analyzers; impedance bridges; directional couplers; power dividers

WILKINSON ELECTRONICS INC PO BOX 738 TRAINER 19013 215 497-5100
AM & FM broadcast transmitters; audio consoles; audio compressor/limiters; distribution amplifiers, equalizers, line amplifiers; demodulators, exciters, RF amplifiers; modulation & frequency monitors; AC line surge protectors **VS**
see ad pg. 131—refer to rep/dist section

WINEGARD CO 3000 KIRKWOOD ST BURLINGTON IA 52601 319 753-0121
CATV antennas, amplifiers, drop and distribution equipment; accessories; home system amplifiers

WORLD VIDEO INC PO BOX 117 BOYERTOWN PA 19512 215 367-6055
broadcast & CCTV one-gun (Trinitron) color monitors; demodulators, AC/DC color portable monitor **VS**

Y

YARDNEY ELECTRIC CORP 82 MECHANIC ST PAWCATUCK CT 02891 .. 203 599-1100
silver, zinc & cadmium batteries; chargers, high intensity lights **VS**
See ad pg. 142

Z

ZEI-MARK CORP PO BOX 182 BROOKFIELD CENTER CT 06805 203 355-0008
optical multiplexer; neutral density wheel;

telecine film chain with preview; film chain adapters for 16 mm & super-8 mm film projectors, lap dissolve slide chain, telecine accessories

ZOOMAR INC 55 SEA CLIFF AVE GLEN COVE NY 11542 516 676-1111
optics; optical instruments

BM/E Invites Entries For 1976 Best Station Award

Entries are being sought for the *BM/E* sponsored Best Station Award Contest now in its third year.

The objective of the contest is to award the station which has organized the best broadcast studio or overall plant design or modernization that increases operating efficiency.

One station in each of the three categories, AM, FM, and TV, which can show that its approach to plant organization or studio design has been humanly engineered, with a cost-conscious and effective execution will win the award based on the response of our readers.

The 1974 winners were: KMWX-AM, Yakima, Washington; WNHU-FM, New Haven, Connecticut, and WTCN-TV, Minneapolis, Minnesota. Last year's winners were CHWO-AM, Oakville, Ontario; WIDH-FM, Kalamazoo, Michigan, and WPRI-TV, Providence, Rhode Island.

Each of these stations demonstrated a degree of excellence in management and engineering that *BM/E's* readers felt deserved recognition.

This year's contest expects to confront an even more difficult choice than before and is seeking wide participation by station management and engineering personnel who feel that their efforts deserve recognition. Complete details on entering contest are on page 151.

Vega Wireless Microphone Systems Ahead of Their Time, And Still Improving

- Crystal controlled, VHF operation for stability and low interference.
- Ultra-sensitive, high performance receivers have 4-cavity, helical-resonator preselectors for sharp selectivity and low distortion.
- New Model 77 transmitter has many improved features, Lemo "Quick-Loc" mic connectors, sturdy noise-free sealed case to resist moisture and corrosive body acids, separate battery compartment, and selectable output power and dual-function meter.
- New single-package and 4-channel diversity receiving systems let you handle severe conditions with extra convenience.

From our low-cost "Orator" model, to our hand-held "Performer", Vega has always been the leader in frequency response, dynamic range, low distortion and effective operating distance. Our transmitters now have all-new compressors that gently avoid overmodulation without harsh clipping, yet won't "latch up" ... even on gun shots. The unit also has a dual-function meter and selectable power output of 25mW or 100mW. All receivers have multi-function metering and headphone outputs for complete monitoring capability.

In response to popular demand, the Lemo "Quick-Loc" mic connector is now standard, yielding positive contact and longer cable life. Additionally, the Lemo connector will supply bias voltage for electret-condenser mics, eliminating external battery requirements. You can use the professional mic of your choice.

Vega receivers operate from AC, battery, rechargeable battery, or external DC power. There are many more features and products we'd like you to know about, so SEND FOR OUR NEW CATALOG today.

Vega

Division of Cetec Corporation
9900 Baldwin Place — El Monte, California 91731
Telephone: (213) 442-0782 TWX: 910-587-3539



It's what a lot of people who use
camera systems are telling us.
Specifically, they're saying that
they like the really extraordinary long-
term stability of the color, hour after
hour, all day long, without touching
the controls.
They like the fact that every system
element is light and easy to handle,

in or out of the studio.
They like the dependability, the feeling
of confidence they have when they
know they can rely on their cameras.
They like the system compatibility, the
fact that *all* CEI 200 Series cameras
operate from common control units.
With great color matching.
And best of all, they like the *afford-*

ability. There's simply nothing else
comparable at the price.
So they get hooked on CEI.
Take a look for yourself. You may end
up getting hooked, too, but we promise
you'll love every minute of it.
Call your CEI representative. Or write
us at 880 Maude Avenue, Mountain
View, California 94040.

TAKE A NEW LOOK **CEI**

**IF YOU'RE
NOT CAREFUL, YOU
CAN GET HOOKED
ON CEI.**

Circle 197 on Reader Service Card



Independent Broadcast Reps/Distributors

Including cross reference to companies
whose products are advertised

ALABAMA

BCS ASSOCS

3322 S. Memorial Pkwy.
Huntsville 35803
205-881-6220

Line: full line video equip
TFT see ad p 110
CEI see ad p 117

CALHOUN CO. INC.

240 Oxmoor Circle Suite 102
Birmingham 35209
205-942-7620

Line: full line video equip

CHEROKEE SUPPLY

103 Bibb St.
Alexander 35010

Line: audio components
Micro-Trak see ad p 120

JAMES W. CLARY CO.

1713 Second Ave. So.
Birmingham 35233
205-322-2486

Line: audio components
Micro-Trak see ad p 120

KELLEY'S AUDIO ENGINEERS

1905 35th
Sheffield 35660
205-381-1412

Line: audio equip
MCI see ad p 63

LEE ASSOCS.

817 Wheeler Ave.
Huntsville 35801
205-533-5896

Line: test instruments
Marconi see ad p 135

THE MAZE CORP.

P.O. Box 6636
Birmingham 35210
205-591-4800

Line: full line broadcast (radio & TV)
& recording equip
Micro-Trak see ad p 120

WILLIAM MOATS

P.O. Box 861
Athens 35611
205-232-6592

Line: radio equip

PROFESSIONAL REPS

804 Floral Ave.
Opelika 36801
205-745-2192

Line: audio and video products

JESS SWICEGOOD

P.O. Box 1741
Dothan 36302
205-794-6339

Line: audio equip; transmitters

20TH CENTURY MARKETING

P.O. Box 6127
Hertz Skycenter
Huntsville 35806

205-772-9237

Line: power tubes, components
Amperex see ad p 11, 29

ALASKA

HARRY J LANG & ASSOCS.

1406 W. 47th Ave.
Anchorage 99501
907-279-5741

Line: audio & video equip
McMartin see ad p 92

R.F. CASSADY

P.O. Box 2743
Fairbanks 99707

Line: radio equip
Collins see ad Cover 4

NORTHERN VIDEO SYSTEMS INC.

4600 Business Park Blvd.
Anchorage 99503
907-279-5571

Line: full line audio & video equip

ARIZONA

MORRIS COURTRIGHT

1450 W. Arroyo Dr.
Yuma 85364
602-783-6380

Line: radio equip
Collins see ad Cover 4

MEASUREMENT CONSULTANTS

P.O. Box 966
Scottsdale 85252
602-994-9519

Line: test instruments
Marconi see ad p 135

ROH'S INC.

4553 E. Broadway
Tucson 86711
602-327-5929

Line: full line video equip, CCTV
systems

SPECTRUM ASSOCIATES INC.

1944 W. North Lane
Phoenix 85029
602-997-6324

Line: audio components
Tech-Labs see ad p 173

ARKANSAS

ALLIED SOUND VISUAL ED. INC.

3520 W. 69th St. Suite 306
Little Rock 72209
501-568-2294

Line: full line video equip

TOM BUTLER

P.O. Box 119
Limestone 72646
501-428-5257

Line: audio and video equip
McMartin see ad p 92

CUSTOM PRODUCTS

107 East Calhoun
Magnolia 71753

Line: audio components
Micro-Trak see ad p 120

PAUL JAMESON

P.O. Box 247
Magnolia 71753
501-234-3778

Line: attenuators
Tech Labs see ad p 173

CALIFORNIA

ACCURATE SOUND CO.

114 5th Ave.
Redwood City 94063
415-365-2843

Line: full line of audio equip

ANIXTER-PRUZAN

2228 S. Ritchey
Santa Ana 92705
714-556-6270

Line: Sony studio video equip, cable
construction accessories, tools,
headend, passives, test equip,
power supplies

AUDIO CONCEPTS

7138 Santa Monica Blvd.
Hollywood 90046
213-851-7172

Line: audio equip
QRK see ad p 145

AUDIO INDUSTRIES CORP.

1419 N. LaBrea Ave.
Hollywood 90028
213-851-4111

Line: audio components, equip
MCI see ad p 63

TOM AYE ASSOCS.

1508 Albatross Dr.
Sunnyvale 94087
408-758-1406

Line: audio components, full line
radio equip

JÖHN BAUMANN

5526 East La Palma Ave
Anaheim 92807
714-528-9505

Line: video switchers, animation
equip
Computer Image see ad p 47

JACK BERMAN CO. INC.

P.O. Box 6003
Inglewood 90301
213-649-6111

Line: audio equipment
Shure see ad p 83

BROADCAST AUDIO ASSOCS.

5905 Jurupa Suite A
Riverside 92504
714-453-3255

Line: full line of audio equip

BROADCAST CARTRIDGE SERVICE

1227 N. Vine St.
Hollywood 90038
213-464-5100

Line: audio components & c
tridges

See ad p 168

BROADCAST COMMUNICATIO DEVICES INC.

5526 E. LaPalma Ave.
Anaheim 92807
714-528-9505
1850 Warburton Ave., Suite 203
Santa Clara 95050
408-984-6614

Line: full line audio & video equip
TFT see ad p 110

G.M. BURKHARDT CO.

26311 Marina Rd.
San Juan Capistrano 92675
714-495-4047

Line: multi-cart equip & tape equ
UMC see ad p 96, 146

CAMEX CORP.

6362 Hollywood Blvd.
Hollywood 90028
213-464-0174

Line: full line of radio equip

CARA PACIFIC SALES CO.

4145 Via Marina No. 120
Marina Del Ray 90291
213-821-7898

Line: audio components, test equ
Orban/Parasound see ad p 98
Orban Broadcast see ad p 128

JACK CARTER ASSOC., INC.

11200 Chandler Blvd.
No. Hollywood 91603
213-980-3450

Line: audio recorders & equip
Tandberg see ad p 86

COAST RECORDING EQUIP.

6114 Santa Monica Blvd.
Hollywood 90038
213-462-6058

Line: audio equip

HOWARD DEMSEY

1743 W. Vartikiam
Fresno 93705
209-439-1991

Line: AM & FM transmitters

EDUCATIONAL ELECTRONICS CALIFORNIA

Suite #8
90 Glen Way
Belmont 90004

415-592-5713
936 West Florence Ave.
Inglewood 90301

213-674-5595
Line: CCTV video systems

BRYANT W. ELLIS

1227 North Vine Street
Hollywood 90038
213-464-5108

Line: audio equip
Aristocrat see ad p 160

EQUINOX SALES CO.

210 N. Richman Ave.
Fullerton 92632
714-879-3190

Line: audio & sound systems

EVANS MARKETING CO.

1438 Rollins Rd.
Burlingame 94010
415-342-3030

Line: audio equip
Beyer see ad p 107
Revox see ad p 121

EVERYTHING AUDIO

Sherman Way
 91405
 3-4447
 audio equip
 see ad p 119, 166

ECO OF CALIF. INC.
 Santa Monica Blvd.
 Wood 90038
 6-9361
 cameras, lighting equip photo
 p 175

FM AUDIO CORP.
 LaBrea
 Wood 90046
 71-4447
 audio components

AMERICAN BROADCAST

Main Street
 93001
 64-7761
 audio components
 see ad p 119, 166
 see ad p 10

KHN
 Watch Drive
 94536
 71-8344
 video proc. equip
 see ad p 59

D. MOLLARD INC.
 Bayshore Rd.-Suite 104
 94303
 4-9321
 audio components
 see ads p 173

D. HILL
 Alhambra Rd.
 El Cerrito 94010
 4-2157
 video switchers and proc.

ComTec See ad p 114

JOHN G. HUMBLE
 2011 W. Kattella #44
 Anaheim 92804
 714-991-1964
 Line: audio & video equip

MARTY JACKSON
 1850 Warburton Ave. Suite 203
 Santa Clara 95050
 408-984-6614
 Line: automation & video switching
 equip
 Computer Image see ad p 47

JAYLIN ENGINEERING
 332 Peppertree Rd.
 Walnut Creek 94598
 415-933-0755
 Line: audio components
 Ramko see ad p 44, 45

KDH ELECTRONICS
 4233 W. Sierra Madre #205
 Fresno 93705
 Line: audio & video equip
 Dynasciences see ad p 18

DAVID LINT ASSOCS.
 2444 Old Middlefield Way-Suite M
 Mountain View 94043
 415-964-5344
 Line: audio equip
 Modular Audio see ad p 173

MacPHERSON SALES CO.
 P.O. Box 5212
 Walnut Creek 94596
 415-937-1482
 Line: audio equip
 Vega see ad p 116

MARSHANK SALES CO.
 10455 W. Jefferson Blvd.
 Culver City 90230
 213-559-2591
 Line: audio equip, sound systems

CHARLES MICHEL

P.O. Box 5218
 Redwood City 94063
 415-365-6263
 Line: camera lenses, full line CCTV
 video equip, video camera acces-
 sories, video editors

MOUTHROP SALES INC.
 1530 East 12 St.
 Oakland 94606
 415-261-7676
 Line: audio components, equip
 Shure see ad p 83
 Tandberg see ad p 86

MOXON ELECTRONICS
 17801 B. Sky Park Circle Dr.
 Irvine 92707
 714-556-6500
 2376 Walsh Road
 Santa Clara 95050
 408-249-2491
 7969 Engineer Road
 San Diego 92111
 714-292-4800
 1440 S. State College Blvd.
 Bldg. 6E
 Anaheim 92806
 714-635-7600
 Line: test instruments
 Marconi see ad p 135

NEWCRAFT INC.
 8383 Wilshire Blvd.
 Beverly Hills 90211
 213-655-1111
 Line: full line of CCTV, video equip

OMEGA ASSOCS.
 14169 Hawthorne Blvd.
 Hawthorne 90250
 213-644-3649
 Line: video equip

**PACIFIC RECORDERS & ENG.
 CORP.**
 11100 Roselle Street
 San Diego 92121
 714-453-3255

Line: full line audio equip acces-
 sories
 See ad p 102
 ESE see ad p 119, 166
 Micro-Trak see ad p 120
 MCI see ad p 63

PERSPECTIVE MEASUREMENT
 P.O. Box 470
 Cerritos 90701
 213-926-7002
 Line: video systems
 CEI see ad p 117

GORDON PETERS
 7960 W. Beverly Blvd.
 Los Angeles 90048
 213-653-9438
 Line: video switchers, equip
 Vital see ad p 9

RDX DIST. DIV.
 1287 Lawrence Station Rd.
 Sunnyvale 94086
 408-734-4500
 Line: electronic components
 Electronic Devices see ad p 174

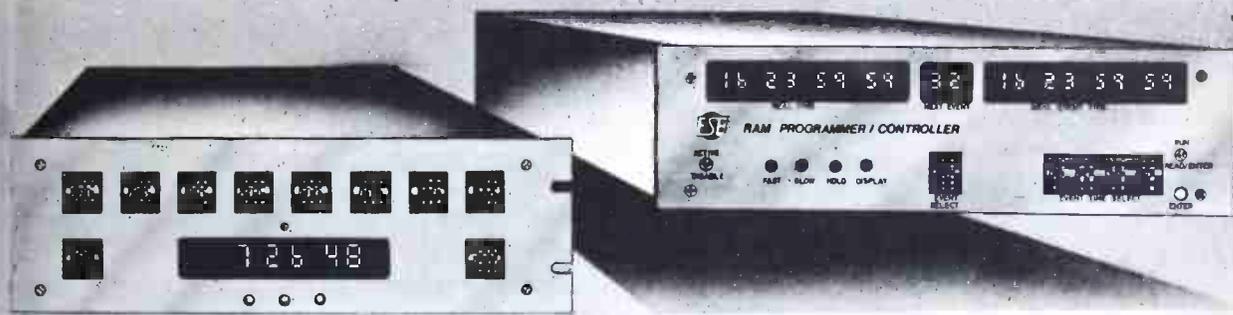
THE REP COMPANY
 8361 Vickers St.
 Suite 305
 San Diego 92111
 714-292-9001
 Line: electronic components, tubes
 Amperex see ad p 11, 29

RIGGINS ELECTRONICS
 3272 E. Willow St.
 Long Beach 90815
 213-598-7007
 Line: audio components, equip
 Micro-Trak see ad p 120
 Broadcast Electronics see ad p
 162

**SCHAFFER ELECTRONICS
 CORPORATION**
 75 Castilian Drive
 Goleta 93017

continued on page 120

PERFECT TIMING



Programmer/Comparators and Controllers

Whether your station is based in New York, Honolulu or any-
 where in between, perfect timing of programs, station breaks
 and commercials is essential. To meet your exacting timing
 requirements ESE now offers two precision timing systems.
 For flexibility and economy with up to ten events, ESE has de-
 signed the 750 Series of Programmer/Comparators.
 Regulated thumbwheel programmers coupled with an
 ESE clock or timer to provide a single pole contact
 closure (1 Amp contact rating) for the length
 of time program matches display. Low on cost, the
 reliable Programmer/Comparators start at \$305.
 Write, Wire or Call Today: 505½ Centinela Avenue



When you want to program more than ten events, consider
 the ES 780 Series of Programmer/Controllers: A Solid State
 Random Access Memory united with an ESE clock or timer to
 provide 32 user-programmed outputs. Ten minutes is all you
 need to program all 32 events. Manual override and ten sec-
 ond re-programming provide maximum flexibility.
 All this in 5¼ inches of rack space! Internal
 crystal time-base and battery pack are standard
 features. Four digit, 32 event units are \$1,200.
 and Eight digit, 32 event units are \$1,500.
 Custom options and special orders are available.
 Inglewood, California 90302 • (213) 674-3021

THE SOURCE '76

805-968-0755

Line: audio components
ESE see ad p 119, 166

JOHN SCHNEIDER

P.O. Box 725
Diablo 94528
415-820-3811

Line: radio and TV equipment
McMartin see ad p 92

BILL SEIDEL

7020 Delco Ave.
Canoga Park 91306
213-980-7927

Line: video heads, components
Videomax see ad p 3

SIGMA AUDIO SYSTEMS

P.O. Box 2469, H'wood Sta.
Hollywood 90038
213-462-8515

Line: full line of audio equip

DAN J. SOFIE

7119 Pomelo Drive
Canoga Park 91307
213-884-6269

Line: video proc. equip
Microtime see ad p 109, 124

SOUND DYNAMICS INC.

P.O. Box 32055
San Jose 95152
408-926-3588

Line: audio components
Micro-Trak see ad p 120

SOUND DYNAMICS, INC.

P.O. Box 1335
Sunnyvale 94088
408-926-3588

Line: audio components
ESE see ad p 119, 166

SOUND GENESIS INC.

445 Bryant St.
San Francisco 94107
415-391-8776

Line: audio equip
QRK see ad p 145

SPECTRUM ASSOCIATES, INC.

1823 E. 17th St.
Santa Ana 92711
213-323-0603

Line: audio components
Tech-Labs see ad p 173

ROBERT SWITZER

9025 Maza Circle
Fountain Valley 92708

714-842-8422

Line: radio & TV equip
McMartin see ad p 92

TABER MFG. & ENG.

2081 Edison Ave.
San Leandro 94577
415-635-3831
1227 N. Vine Street
Hollywood 90038
213-464-5108

Line: audio components
Inovonics see ad p 18

TECH-REP ASSOC.

P.O. Box 6103
Hayward

415-785-4531
Line: audio components
Robins see ad p 163

TELERGY

2412 Charleston Rd.
Mountain View 94043
415-067-6281

Line: TV prod. equip
CEI see ad p 117

TOTAL VIDEO SERVICE

4201 LaMirada Dr.
Bakersfield 93309
805-324-7239

Line: video equip

TREGO SALES CO.

2239 Benedict Canyon Dr.
Beverly Hills 90210
213-274-8351

Line: audio equip
Beyer see ad p 107
Revox see ad p 121

TRI TRONICS INC.

4019 Tujunga Ave.
N. Hollywood 91604
213-985-6616

Line: video equip

VIDEO EQUIPMENT CORP.

7377 Convoy Court
San Diego 92115
714-278-4274

Line: audio & video equip

VIDEODETICS CORP.

2121 S. Manchester Blvd.
Anaheim 92802

Line: video equip, lighting equip

VIDEO SYSTEMS INC.

12530 Beatrice St.
Los Angeles 90066
213-871-0677

Line: video equip.

VIF INTERNATIONAL

1151 Viscaino Ave.
Sunnyvale 94038
408-739-9740

Line: audio components & proc.
equip
Inovonics see ad p 18

WESTATES ELEC.

20151 Bahama St.
Chatsworth 91311
213-341-4411

Line: electronic components
Electronic Devices see ad p 174

WESTERN BROADCAST SERVICES

1030 West Evelyn
Sunnyvale 94086
408-738-2100

Line: audio equip, RF monitors

WINCO SALES, INC.

P.O. Box 238
San Carlos 94070
415-365-6082

Line: video & audio components

BILL WISEMAN

3200 Wilshire Blvd, Suite 900
Los Angeles 90010
213-387-7756

Line: video equip
American Data Corp. see ad p 40

YH ASSOCIATES

15352 Stanford Lane
Huntington Beach 92647
714-893-9487

Line: audio equip
ESE see ad p 119, 166

COLORADO

B&B ELECTRONICS

884 S. Lipan
Denver 80223
303-934-2123

Line: sound systems
Vega see ad p 116

B & B ELECTRONIC PRODUCTS INC.

500 Quebec St.
Denver 80237
303-733-6700

Line: audio equip
Vega see ad p 116

RON BOWEN & ASSOCS.

1440 S. Santa Fe

Denver 80223
303-744-2501

Line: audio & video equip

DENVER SOUND SPECIALISTS

5701 N. Logan
Denver 80216
303-573-5611

Line: full line of audio equip
Inovonics see ad p 18

DIDIER/DENVER

P.O. Box 1599
Evergreen 80439
303-674-6000

Line: full line audio & video equip
Datatek see ad p 8
TFT see ad p 110
Computer Image see ad p 47

TET TIME & FREQUENCY TECHNOLOGY INC

TRANSMITTER REMOTE CONTROL SYSTEMS

DIDIER/DENVER

674-6000

TWX 910-320-0380

Evergreen, CO 80439

ELECTRO TEK

Box 395
Westminster 80030
303-255-4566

Line: audio components, systems
Robins see ad p 163

GRIFCO

P.O. Box 1171
Suite 102, W. Littleton Blvd.
Littleton 80210
303-795-1989

Line: recorders and audio components
Tanderg see ad p 86

HIGHLAND ASSOCS.

80 Garden Office Ctr.
1380 W. Midway Blvd.

continued on page



The Studio Compact Shown With Optional Accessory Shelf

THE STUDIO COMPACT

Micro-Trak's "Studio Compact" is the newest, of a group of four, fully equipped audio control centers..... Designed for the professional, the Studio Compact offers top line Micro-Trak components throughout. 740 Turntables, 303 Tone Arms, 500-AL Cartridges, a high quality dynamic mike, and your choice of one of three different four channel audio consoles..... For broadcast the 6444 stereo or the 6454 mono, for disco the 6440 stereo.....

Best of all a "Studio Compact" with the 6454 console is only \$1745.00. With other console choices slightly higher.....

See your Dealer or contact our Marketing Office.....



MICRO-TRAK CORPORATION
620 RACE ST., HOLYOKE, MASSACHUSETTS 01040

Inside every Revox it's all Studer

Separate spooling motors of high torque and low weight construction,

Sealed mains input section and cabinet safety link socket.

Fully electronically stabilized power supply circuit.

Capstan motor servo control board using advanced IC design to maintain speed accuracy to better than 0.2%, incorporating electronic speed change.

Capstan motor speed pick-up head.

Plug-in power amplifiers (optional).

Capstan motor of patented construction for cool running, low current consumption and wow & flutter better than international broadcast requirements.

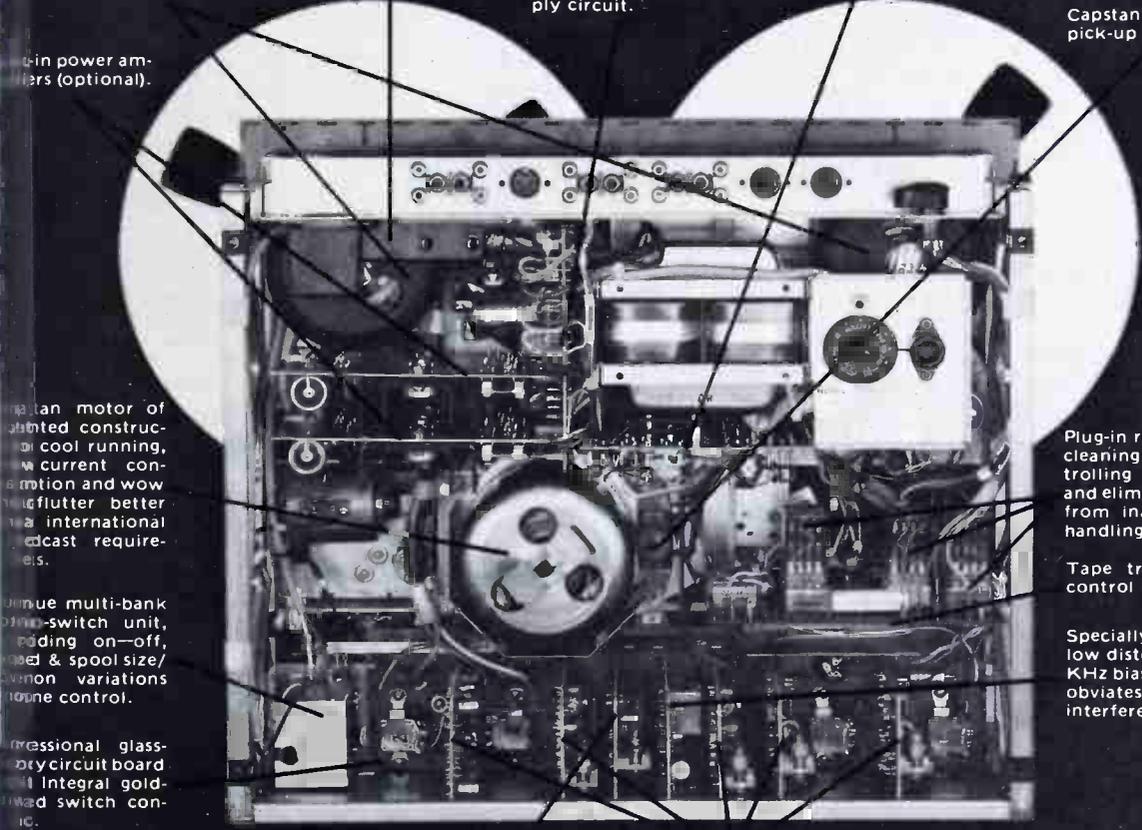
Studer multi-bank auto-switch unit, loading on-off, reel & spool size/rotation variations and tone control.

Professional glass epoxy circuit board with integral gold plated switch contacts.

Every Revox machine is Studer designed and built by Studer factories in Switzerland and conforms to Studer standards. From conception to component, the Revox displays the same meticulous attention to detail and extraordinary precision that has made Studer

and Revox products without equal in their respective fields. Consider the Revox A77 - a studio quality machine, compactly presented and offering features unique in its price class, with total indifference to minor fluctuations in mains supply voltage or periodicity.

With a wow and flutter level below broadcast standard requirements plus a linear response from 20-20,000 Hz at 7½ ips. (± 2 dB) and an ultra low noise level, the Revox A77 continues to set the standard by which the rest are judged.



Plug-in relays with self-cleaning contacts, controlling all functions and eliminating damage from inadvertent mis-handling.

Tape transport logic control circuit board.

Specially designed low distortion 120 KHz bias oscillator obviates multiplex interference.

Plug-in record relay.

Plug-in audio input/output amplifiers



REVOX

Write or call for further information:

155 Michael Drive, Syosset, N.Y. 11791 (516) 364-1900; West Coast Office (213) 846-0500.

For other countries: Revox International, Regensdorf 8105 ZH, Althardstrasse 146, Switzerland.

© Admark International

Circle 200 on Reader Service Card

THE SOURCE '76

Broomfield 80020
303-854-2003
Line: full line audio & video equip
Ramko see ad p 44, 45
Micro-Trak see ad p 120

HP MARKETING
2530 W. Church Ave.
Littleton 80120
303-794-8367
Line: audio test equip

McCLOUD & RAYMOND CO.
2020 S. Pontiac Way
Denver 80222
303-756-1589
Line: audio equip
Shure see ad p 83

INVERNESS MARKETING INC.
DIV. OF CLIFF-JOHN
ELECTRONICS INC.
Bldg. 1-Suite 1
14 Inverness Dr. East
Englewood 80110
303-770-2300
Line: audio components
Tech-Labs see ad p 173

PAR ASSOCS.
7305 Spring Ct.
Boulder 80303
303-499-4736
Line: test instruments
Marconi see ad p 135

RIA CORPORATION
430 Garland St.
Lakewood 80226
303-238-2593
Line: TV broadcast equip
CEI see ad p 117
Duca Richardson see ad p 137
SCIENTIFIC SYSTEMS, INC.

5765 Logan Suite 206
Denver 80216
303-623-6447
Line: video equip

CONNECTICUT

JOHN B. ANTHONY
922 High Ridge Rd.
Stamford 06905
203-332-9202
Line: full line audio equip
Orban/Parasound see ad p 98
Orban Broadcast see ad p 128
UREI see ad p 106

AUDIOTECHNIQUES, INC.
142 Hamilton Ave.
Stamford 06902
203-359-2312
See ad p 175

Line: full line audio equip, recording
accessories imported and domestic
MCI see ad p 63

BURNS ELECTRONIC SECURITY
INC.
735 Route 5
S. Windsor 06074
203-528-2186
Line: full line audio & video equip

CONCORD COMMUNICATIONS
DIV.
Auvitel Systems Corp.
176 Main St.
Norwalk 06852
203-846-9575
Line: video & audio equip

ENTERTAINMENT PRODUCTS
P.O. Box 11129
Newington 06111
Line: audio components
Micro-Trak see ad p 120

FRED LOCKE STEREO

60 Woodlawn Rd.
Berlin 06370
Line: audio components
Micro-Trak see ad p 120

RICHARD H. McLEAN/NEAL
OWENS, JR.
1280 Blue Hills Ave.
Bloomfield 06002
203-242-4242
Line: video proc. equip
Microtime see ad p 109, 124

NBS ASSOCIATES
P.O. Box 179
106 Main St.
Thomaston 06787
203-283-5959
Line: audio components
Tech Labs see ad p 173

DISTRICT OF COLUMBIA

BALATON MARKETING INC.
P.O. Box 17435
Washington 20041
703-471-1764
Line: audio equip
Beyer see ad p 107
Revox see ad p 121

BRENNER CINE-SOUND
5215 Wisconsin Ave. N.W.
Washington 20015
Line: sound & film equip

McBEE LABORATORIES
5151 Wisconsin Ave. N.W.
Washington, D.C. 20016
202-244-2345
Line: TV systems, equip
CEI see ad p 117

PROFESSIONAL PRODUCTS INC.

4964 Fairmont Ave.
Bethesda 20014
301-933-3451
Line: full line video equip
Vega see ad p 116

FLORIDA

AUDIO VISUAL SERVICES
5484 Jet Port Industrial Blvd.
Tampa 33614
813-884-1461
Line: audio components
ESE see ad p 119, 166

BCS ASSOCS. INC.
940 N. Fern Creek Ave.
Orlando 32802
305-896-4881
Line: measuring equip, mon
audio & video equip
TFT see ad p 110
CEI see ad p 117

R.G. BEATTIE
6300 15th St. No.
St. Petersburg 33702
813-525-4206
Line: radio equipment
Collins see ad Cover 4

F.T.C. BREWER CO.
P.O. Box 8057
Town & Country Plaza
Pensacola 32505
904-433-7932
Line: audio equip, transmitters
Micro-Trak see ad p 120

BROADCAST AUTOMATION
5199 NE 12th Ave.
Ft. Lauderdale 33308
305-776-4762

continued on page

Nurad offers antennas to meet all your microwave broadcast requirements

ELECTRONIC NEWS GATHERING • STL'S • FIXED REMOTES • MULTIPLE PICKUPS • SPECIALS

Description	2 GHz		7 GHz		13 GHz	
	Model No.	Gain*	Model No.	Gain*	Model No.	Gain
Lightweight, Directional, Circularly Polarized	20DC1	10	70HC1	8	130HC2	18
Lightweight, Directional, Multi Polarized	20DC2	10	70HC3	8	130HC3	18
Omni Quad Array, Quad Polarized	20QP1	13	70QP1	13		
Omnidirectional, Circularly Polarized	20CO1	6	70CO1	6	130CO1	6
Two foot Parabola, Circularly Polarized	20CR1	18	70CR1	31	130CR1	35
Two foot Parabola, Multi Polarized	20CR6	18	70CR4	31	130CR3	35
Four foot Parabola, Circularly Polarized	20CR2	25	70CR2	37	130CR2	41
Four foot Parabola, Multi Polarized	20CR3	25	70CR3	37	130CR4	41
GOLDENROD Circularly Polarized	20HE1	19				
DUAL ROD Circularly Polarized	20HE2	22				

* Gain in db referenced to a like polarized isotrope

These, plus other antennas and related products, are now available from Nurad.
Why not let us help you with your microwave system?

NURAD, INC.

ANTENNAS

2165 Druid Park Drive
Baltimore, Md. 21211

• (301) 462-17

Circle 201 on Reader Service Card

Your best buy in small screen monitors



*Suggested
user net
Dual Ten
Monitor \$485*

*Suggested
user net
Triple Six
Monitor \$690*

Everyone makes
large monitors-but we're
the leader in small screen units.

Satchell Carlson gives you a definite advantage in small screen video monitors with 9 different models to choose from, in 5", 6" and 10" screens. No one else offers such a wide selection.

Singles, duals and triples combine compact size with Satchell Carlson's well-known features. Like UNIT-IZED® 100% solid state circuitry, up front controls, regulated power supply, front panel screwdriver adjustments for vertical linearity, height and focus.

Feel more secure with Satchell Carlson.

Made in America.

SC ELECTRONICS, INC.
A SUBSIDIARY OF AUDIOTRONICS CORPORATION

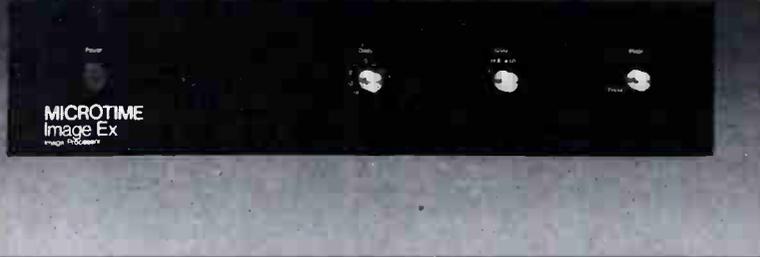
530 5th AVE. N.W. NEW BRIGHTON, MN. 55112 (612) 633-3131

Circle 202 on Reader Service Card

www.americanradiohistory.com

Image-Ex™

Image Processor



Crispens T.V. Picture

Reduces chroma crosstalk

Reduces visual noise by 3 db

Corrects chrominance/luminance

Standalone unit operates with any or TBC

Microtime
1280 Blue Hills Avenue
Bloomfield, Connecticut 06002
(203) 242-4242 TWX 710-425-2390

MICROTIME

Circle 203 on Reader Service Card

THE SOURCE '76

Line: full line audio & video products

BROADCAST ENG. CO.
Box 14444
Ft. Pierce 33450
Line: audio products

CONTINENTAL ELECTRONICS WHOLESALE CORP.
1620 W. 32nd Place
Hialeah 33012
Line: audio components
Micro-Trak see ad p 120

CONTROLLED DIST.
2922 N. State Rd. 7
Margate 33063
305-587-2716
Line: electronic components
Electronic Devices see ad p 174

CONTROLLED TECHNOLOGY INC.
2513 Tortugas Lane
Ft. Lauderdale 33312
305-587-2716
Line: full line audio & video equip
IGM see ad p 10

FLAGLER RADIO CO.
1068 W. Flagler St.
Miami 33130
305-373-6548
Line: audio components, equip
Micro-Trak see ad p 120

FLORIDA ELECTRONICS
P.O. Box 15889
Orlando 32808
305-293-4804
Line: audio & video equip

GRICE ELECTRONICS
320 E. Gregory
Pensacola 32501
904-434-2481
Line: full line audio/video equip

Micro-Trak see ad p 120

HARRIS CO.
633 Shenandoah
Miami 33145
305-854-2003
Line: audio equip
Micro-Trak see ad p 120
Ramko see ad p 44, 45

L.P. HENCH CO.
9900 Richmond Ave.
SW 168th St.
Miami 33157
305-251-4343
Line: audio products
Beyer see ad p 107
Revox see ad p 121

R. JERRELL HENRY
14018 West Parsley Drive
Madeira Beach 33708
813-391-8065
Line: radio and TV equip
McMartin see ad p 92

HUTTO-HAWKINS-PEREGOY INC.
P.O. Box 1277
Maitland 32751
305-831-0256
Line: audio equipment
Shure see ad p 83

IMAGE DEVICES INC.
1825 N.E. 149th St.
Miami 33181
305-945-1111
Line: video & audio equip
Vega see ad p 116

J&J ELECTRONICS
5855 Johnson St.
Hollywood
Line: video production switchers, pulse & distribution amps, routing switchers, special effects generators

LAUDERDALE ELECTRONIC LABS
16 S.W. 13th St.
Ft. Lauderdale 33315

305-764-7755
Line: audio components
Micro-Trak see ad p 120
ESE see ad p 119, 166
Ramko see ad p 44, 45

GORDON LUND
255 Whooping Loop
Altamonte Springs 32071
305-831-8458
Line: transmitters, radio equip

LYKES ELECTRONICS CORP.
1800 N.W. 23rd St.
Miami
5426 W. Crenshaw
Tampa 33622
813-886-6621
Line: full line audio & video equip

MANREP CORP.
P.O. Box 4808
Miami Lakes 33014
Line: audio components
Micro-Trak see ad p 120

MIDWEST TELECOMMUNICATIONS
3331 N.W. 82nd Ave.
Miami 33122
Line: audio & video equip

JERRY NORDSIEK
705 Bowie Blvd.
Orange Park 32073
904-269-2544
Line: video equip
American Data Corp. see ad p 40

PHOTOMART
6237 S. Orange Ave.
Orlando 32809
305-851-2780
Line: video equip

ORBEX CORP. MIAMI
9655 South Dixie Hwy
Miami 33156
Line: audio components
Micro-Trak see ad p 120

PROFESSIONAL REPRESENTATIVES
709 N. Franklin St.
Tampa 33602
813-223-2911
Line: camera lenses, full line C video equip, video camera editors

REPELECT
Box 7102
Tampa 33603
813-227-5051
Line: audio & video equip, trimmers
Shure see ad p 83
Robins see ad p 163
Sound Technology see ad p 2

REYNOLDS & ASSOCS.
476 North A1A - Suite 1A
Satellite Beach 32937
305-773-4700
Line: audio components
Tech Labs see ad p 173

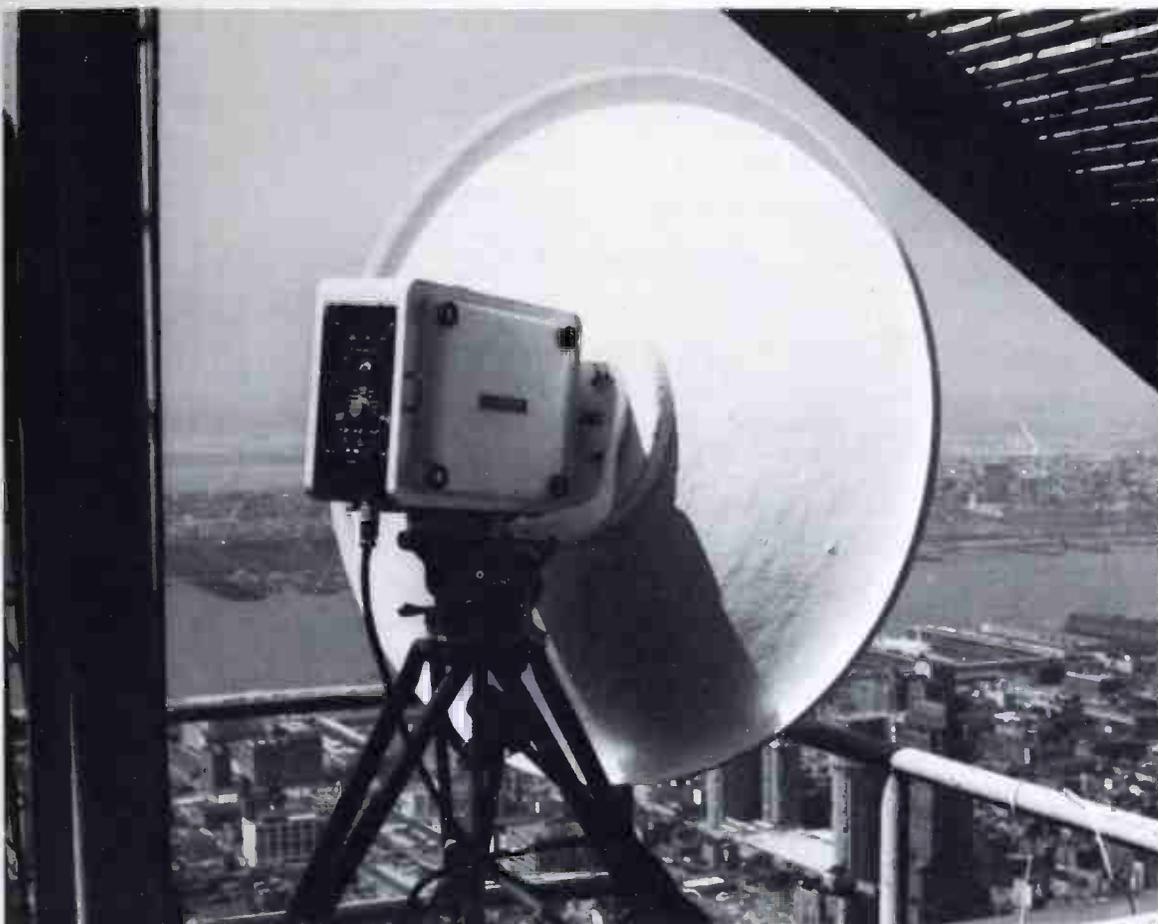
SAVE PRODUCTIONS INC.
281 Willowich Ave.
Templeterra 33617
Line: audio components
Micro-Trak see ad p 120

SOUTHEAST ELECTRONICS
1125 Rouselle St.
Jacksonville 32203
904-356-3007
Line: full line of audio/video eq
Micro-Trak see ad p 120
ESE see ad p 119, 166

STEREO SONICS LABORATORY
117 Robin Road
Altamonte Springs 32701
305-831-2575
Line: audio components
ESE see ad p 119, 166
Robins see ad p 163
Ramko see ad p 44, 45

continued on page

Here's News Out There...



Farinon's Portable, Frequency-Agile Microwave Antenna System Works It On The Air!

The new FV Portable Microwave system is available for all bands from 1.99 to 13.25 GHz. You dial-tune to your operating frequency in the spot. There's no need for bench-work when you set up a remote pick-up. No filter selection. You don't even need a screwdriver.

You can plug in video monitors, or clammers, or up to three sub-carrier channels.

You can run 500 feet of cable between the RF head and the FMT or FMR remote unit without roll-off or equalization.

And you get 1-watt output level from 6.875 to 13.25 GHz, 5-watt output (optional 20-watt) from 1.99 to 2.11 GHz, $\pm 0.002\%$ frequency stability; 60-dB signal-hum ratio from dc to 10 kHz, and 70-dB signal-noise ratio from 10 kHz to 5 MHz.

Farinon Electric, 1691 Bayport Ave., San Carlos, CA 94070, U.S.A. Tel. (415) 592-4120. Telex 34-8491.
... in Canada: Farinon Electric of Canada, Ltd., 657 Orly Ave., Dorval, P.Q. H9P 1G1, Canada.
Tel. (514) 636-0974. Telex 05-82-1893.

Farinon

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THE SOURCE '76

TECHNOLOGY MKTG. ASSOC.

1010 E. Atlantic Blvd.
Pompano Beach 33061
305-942-0774

Line: electronic components tubes
Amperex see ad p 11, 29

WORLD ELECTRONICS, INC.

229 Sunny Isles Boulevard
North Miami Beach 33160
305-949-8918

Line: audio equip
MCI see ad p 63

WORLD WIDE PRODUCTS

P.O. Box 279
Miami 33168
305-754-5475

Line: audio components, equip, tape
recorders
MCI see ad p 63

GEORGIA

ADAMS & ASSOCS.

830 W. Peachtree St.
Atlanta 30308
404-881-9595

Line: audio systems

ANIXTER-PRUZAN

4303 Pleasantdale Rd.
Atlanta 30340
404-449-6533

Line: Sony studio video equip, full
line of CATV equip, cable con-
struction accessories, tools, head
end, passives, test equip, power
supplies

BCS ASSOCS.

2522 Tanglewood Rd.
Atlanta 30033
404-321-0980

Line: full line video equip
TFT see ad p 110
CEI see ad p 117

FRANK BENSON

11520 Bowen Road
Roswell (Atlanta) 30075
404-992-4490

Line: video heads, recorder com-
ponents

Videomax see ad p 3

BROADCAST SUPPLY OF ATLANTA

2971 Flowers Rd. S. Suite 170
Atlanta 30341
404-458-0815

Line: full line audio equip & supplies

CALHOUN COMPANY

121 Forrest Ave. N.E.
Atlanta 30303
404-659-0750

Line: video systems, audio equip,
lighting equip

DEAN COOPER CO.

2387 Interstate 85, Suite 2
Access Rd.
Norcross 30071

Line: audio equip
Beyer see ad p 107
Revox see ad p 121

D & O SALES, INC.

3819 Oakcliff Industrial Court
Atlanta 30340
404-448-1701

Line: recorders, equip
Tandberg see ad p 86

GEORGIA BROADCASTING

Box 13646
Savannah 31406
912-354-4000

Line: audio components

Ramko see ad p 44, 45

GRADY DUCKETT SALES

P.O. Box 20967
Atlanta 30329
404-451-3529

Line: audio systems, components
Tech Labs see ad p 173

ELECTRONIC EQUIPMENT INC.

526 Plaster Ave. N.E.
Atlanta 30324
404-873-5841

Line: audio components & equip
Stanton Magnetics see ad p 65

FIDELICOM, INC.

P.O. Box 80644
Chamblee Station
Atlanta 30341
404-458-3616

Line: audio equip, test equip
Sound Technology see ad p 24

GRAY COMMUNICATIONS

132-38 Pine Ave.
Albany 31702

2128 Faulkner Rd.
Atlanta 30303
Line: audio & video equip, video
systems

C. HARRISON ASSOCS.

6695 Peachtree Blvd. #107
Atlanta 30341
404-449-7696

Line: audio & video equip
ComTec see ad p 114
Vega see ad p 116

MILLAR ELECTRONICS INC.

P.O. Box 12137
Northside Station
Atlanta 30305

404-261-6160

Line: audio equip
Shure see ad p 83

RADFORD ASSOCS.

3203 Lanier Drive
Atlanta 30319

Line: full line audio & video
Aristocart see ad p 160

SYSTEMS ENGINEERING CO.

P.O. Box 49224
Atlanta 30329
404-482-2446

Line: audio components
Micro-Trak see ad p 120

TECHNICAL SYSTEMS REP.

2080 Peachtree Ct.
Chamblee 30341
404-457-0426

Line: audio equip

Orban/Parasound see ad p 11
Orban Broadcast see ad p 11
UREI see ad p 106

D. TUTTLE

Marietta 30062
404-433-1570

Line: video equip
CVS see ad p 105

HAWAII

BROADCAST SERVICES INC.

2877 Kalakua Ave.
Honolulu 96815
808-533-3877

Line: full line audio equip,
equip

JAMES CHANG

190 S. King St.
Honolulu
808-531-2165

Line: audio and video equip
Beyer see ad p 107
Revox see ad p 121

VIDEO SPOT ASSEMBLER

"The VSA is a low cost alternative or back-up system to cart machines"



The Video Spot Assembler is a special purpose editing controller that makes spot reel assembly faster and easier. The VSA controls two existing VTRs to produce multi-break spot reels using less VTR and oper-

ator time than conventional methods. Before you submit your budget for an expensive cart, consider the VSA alternative. The VSA will accomplish most of the tasks attributable to the cart at a saving of a few

hundred thousand dollars. The VSA is an electronic dream, not a mechanical nightmare. Try it before you are committed to a cart. Call or write for details.

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TELEX: 910 339 936

Circle 205 on Reader Service Card

RONIC SYSTEMS, INC.
 imana St., Suite 500
 u 96813
 u-3848
 ll line of audio/video equip
 on see ad p 37

BER CO.
 unapuna St.
 u 96802
 -3207
 ll line audio equip
 see ad p 163
 ee ad p 83
 rge ad p 116

BROADCAST ASSOCS.
 1344
 96807
 -3991
 oadcast equip
 ve Assocs see ad p 39

ELECTRONICS
 ing St.
 6
 u 96813
 -6787
 io equip
 ee ad p 106

ASSOCS. INC.
 yndale Ave. S.
 u 96813
 -7655
 easuring equip
 ee ad p 110

JOIS

LYN
 Bruner St.
 60521
 -0495
 io & broadcast equip
 r Audio see ad p 173

ANCHA ELECTRONICS
 189 Gordin Street
 Elk Grove Village 60007
 312-437-7712
 Line: audio components
 Ramko see ad p 44, 45

A/V CENTER
 6160 W. Oakton St.
 Morton Grove 60053
 Line: audio/video equip

B.W. ASSOCIATES
 55 West Erie, Suite 1E
 Chicago 60611
 312-266-2086

Line: audio components
 UREI see ad p 106

CENTER VIDEO SYSTEMS
 5800 W. Fullerton Ave.
 Chicago 60629
 312-889-8866
 Line: video equip

CRIMSON ENGINEERING CO.
 P.O. Box 286
 Glenview 60025
 312-724-1780

Line: audio equip
 Tech Labs see ad p 173

VICTOR DUNCAN INC.
 676 St. Clair St.
 Chicago 60611
 Line: photo equip & supplies

GORDON DUVAL CO.
 6838 N. Ottawa St.
 Chicago 60631
 312-774-5115
 Line: audio components, full line
 radio equip

E.M.D.
 3722 W. North Ave.
 Chicago 60647
 312-486-0062
 Line: electronic components
 Electronic Devices see ad p 174

RAY R. HUTMACHER ASSOC. INC.
 7205 W. Pratt Ave.
 Chicago 60631
 312-631-3248

Line: audio components, communi-
 cations equip; tape recorders
 Ramko see ad p 44, 45
 Shure see ad p 83
 Robins see ad p 163

JOHN F. KEENEN & CO.
 187 Berteau Ave.
 Elm Hurst 60126
 312-279-5999
 Line: transmitters, equip

M. LANG
 Hoffman Estates 60195
 312-882-3336
 Line: video equip
 CVS see ad p 105

LA SALLE AUDIO
 740 N. Rush St.
 Chicago 60611
 312-266-7500
 Line: full line of audio equip

LOREN F. GREEN ASSOC.
 5218 W. Diversey
 Chicago 60639
 312-286-6824
 Line: sound equip; test equip

MEADE ELECTRONICS CO. INC.
 3100 S. 25th Street
 Broadview 60153
 312-278-2800
 Line: audio components
 ESE see ad p 119, 166

MILAM AUDIO CORP.
 1504 North 8th Street
 Pekin 61554
 309-346-3161
 Line: audio components, equip;
 recorders
 MCI see ad p 63

KENNETH MEYERS

7442 N. Harlew
 Chicago 60648
 312-774-6440
 Line: test instruments
 Marconi see ad p 135

BOB MUNZER
 233 W. Hill Ave.
 Glen Ellyn 60137
 312-469-6200
 Line: video equip
 American Data Corp. see ad p 40

THEODORE PAPPAS & ASSOC.
 5218 W. Diversey Ave.
 Chicago 60639
 312-685-2338
 Line: audio equip
 Orban/Parasound see ad p 98
 Orban Broadcast see ad p 128
 Vega see ad p 116

PRO AUDIO LTD.
 P.O. Box 730
 Barrington 60010
 312-381-4559
 Line: audio equip
 Beyer see ad p 107
 Revox see ad p 121

QUALITY CONTROL SOUNDS
 1 N. 44th St.
 Belleville 62223
 Line: audio components
 Micro-Trak see ad p 120

IRVING ROSE ASSOCS.
 137 Ridgeway Ave.
 Skokie 60076
 312-674-6790
 Line: audio and video equip
 Micmix see ad p 172
 Sound Technology see ad p 24

continued on page 128

NEW INTELLIGENT VTR

"Installing R-MOD is like a college education for your old VTR"



R-MOD (Reel-Servo Modification) makes your quad VTR handle tape with intelligence. R-MOD provides gentle tape handling, fast lock-up and fully automated operation including end-of-tape sensing. It provides all the desirable transport features

offered by the latest, higher priced VTRs. If the cost and variety of new VTRs is causing you to postpone a decision, yet you wish to have up-to-date quads, R-MOD is an economical investment that will pay off rapidly and at the same time extend the use-

ful life of your old VTRs. Before you submit a budget to equip your operation with the new VTRs, consider R-MOD as an alternative. It may give those quads enough intelligence to be worth keeping. Call or write for details.

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TELEX: 910 339 9367

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THE SOURCE '76

SWIDERSKI ELECTRONICS

5456 N. Milwaukee Ave.
Chicago 60630
312-775-3232
Line: audio & video equip
Ramko see ad p 44, 45

ZIMMER SALES, INC.

P.O. Box 723
1984 No. Brighton Lane
Hoffman Estates 60172
312-885-3438
Line: audio equip, recorders
Tandberg see ad p 86

INDIANA

ALLIED BROADCAST EQUIP.

124 S. 6th St.
Richmond 47374
317-962-8596
Line: audio equip for radio
See ad p 150
ESE see ad p 119, 166
Ramko see ad p 44, 45

AUDIO EQUIPMENT CO.

520 E. Indiana Ave.
South Bend 62301
Line: audio components
Micro-Trak see ad p 120

J.O. GOETZ SALES

5941 Brendonridge N.
Indianapolis 42226
317-545-5638
Line: audio & video equip

GRAHAM ELECTRONICS

133 South Penn. St.

Indianapolis 46204

Line: audio components
Micro-Trak see ad p 120

HUTCH AND SON, INC.

300 N. Main Street
Evansville 47711
812-425-7155
Line: electronic components
Electronic Devices see ad p 174

INDIANAPOLIS VIDEO

6226 LaPas Trail
Indianapolis 46268
317-293-3313
Line: video equip

JACKSON KEITH AND ASSOCIATES, INC.

P.O. Box 65
365 Walnut
Zionsville 46077
318-873-4079
Line: audio and test equip
Sound Technology see ad p 24

MAISH SALES

P.O. Box 186
500 Madison Street
Mulberry 46058
217-296-2322
Line: audio and test equip
Sound Technology see ad p 24

MEADE ELECTRONIC CO.

1825 Summer St.
Hammond 46320
219-932-2100
Line: audio & video products
ESE see ad p 119, 166

MEPCO/ELECTRA

P.O. Box 2207
Fort Wayne 46802
219-432-8567
Line: electronic components, tubes
Amperex see ad p 11, 29

DALE A. MILLER & ASSOC.

124 E. Main St.

Crawfordsville 47933

317-362-6348
Line: electronic components, tubes
Amperex see ad p 11, 29

RA-DIS-CO, INC.

814 N. Senate Ave.
Indianapolis 46202
317-637-5571
Line: full line broadcast equip
Ramko see ad p 44, 45

IOWA

BEAMS INC.

2318 (14B) Harding Rd.
Des Moines 50314
515-255-1148
Line: audio equip

K&M ELECTRONICS

1910 Ingersoll
Des Moines 50309
Line: full line video equip

LORENZ SALES INC.

Suite 302
Executive Plaza
Cedar Rapids 52402
319-393-6912
Line: electronic components, tubes
Amperex see ad p 11, 29

MASTERTONE CO.

1105 Maple St.
West Des Moines 50285
515-274-2551
Line: full line audio equip; transmitters, monitors
Micro-Trak see ad p 120

VIDEO COMPONENTS

3116 Dearborn Ave.
Sioux City 51104
712-276-0404
Line: camera lenses, full line CCTV

video equip, video camera series, video editors

KANSAS

B.C. ELECTRONIC SALES

11495 Lenaxa Dr.
Olathe 66061
913-888-6680
Line: electronic components
Amperex see ad p 11, 29

BEAMS INC.

9416 W. 87th Terrace
Shawnee Mission 66212
913-341-7744
Line: audio equip

FOREST ECKHOFF

1823 Monrovia
Lenexa, 66215
913-888-0127
Line: transmitters, radio equip

A.K. ELLIOTT CO.

P.O. Box 6129
Leawood 66206
913-649-0654
Line: audio products
Beyer see ad p 107
Revox see ad p 121

ENGINEERING SERVICES

7830 State Line Rd.
Prairie Village
913-694-4000
Line: microwave equip

WILLIAM MENEZES & ASSOCIATES

9604 Nall St.
P.O. Box 7070
Overland Pk 66207
913-649-2680
Line: audio and video equip

continued on page

OPTIMOD FM:

It's the only way to go!

If you demand uncompromised modulation control and natural, accurate, transparent audio quality, then Optimod-FM stands alone. Optimod is a *system*: compressor, limiter, and stereo generator are combined in one package. We have reduced loudness-robbing overshoots in the audio lowpass filters before the stereo generator to less than 3%. Unlike some new competing limiters which apply first-order correction and then claim that they have dealt with the overshoot problem, Optimod offers *absolute* modulation control that works with *all* program material.

Because of this control, we can apply optimum amounts of clipping without worrying about the overshoots usually produced. The amount of clipping is constantly monitored and controlled so that it never produces audible distortion. In contrast with ultra-fast attack time limiters now appearing, Optimod sounds solid and natural without the shaky, unnaturally modulated quality that ultra-fast attack times give to program dynamics. And Optimod's steady-state system

THD is astonishingly low: in *operate* mode it's typically below 0.05% midband, and 0.15% even at 50 Hz. The sophistication of the engineering and the attention to subtle psychoacoustical details in the processing makes Optimod's output sound exactly like its input for most program material. Optimod can be listened to for hours without fatigue, and can be an important factor in your station's quarter-hour maintenance ratings.

Find out more reasons why the original is still the greatest: call **(800) 227-4068 toll-free** for literature and applications information.

urban / broadcast

Eric Small & Associates
Marketing and Sales Agent
680 Beach Street, Suite 315
San Francisco, CA 94109
(415) 441-0666

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GUYS THAT OUTLAST THE TOWER

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- maintenance-free

If you are looking for
guys that eliminate the
usual problems of RFI
... and guys that never
need to be replaced
during the life of
the tower, then
PHILLYSTRAN is
the answer.

Cable assemblies can
be made to any length,
terminated and
proof-loaded.

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additional information.

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proprietary resin
impregnation process of
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215/855-8450 • Telex: 846-342 • Cable: PHILRES MMLL

Circle 272 on Reader Service Card

THE SOURCE '76

Tandberg see ad p 86
Sound Technology see ad p 24
Vega see ad p 116

KENTUCKY

BRUCK L. DAWSON
7105 Greenlawn Rd.
Louisville 40222
502-426-4022
Line: video equip, cameras, lenses

SIGHT & SOUND INC.
Box 1644
Louisville 40201
502-584-5535
Line: audio & video equip, CCTV
systems

LOUISIANA

AUDIOMEDIA ASSOCS.
P.O. Box 29264
New Orleans 70189
504-586-0140
Line: audio components, radio
transmitters
ESE see ad p 119, 166
Micro-Trak see ad p 120

INTERSTATE SCHOOL SUPPLY
2918 Neal Dr.
Pineville 71360
1620 Clio St.
New Orleans 70131
1835 Front St.
Baton Rouge 70821
504-387-5131
Line: audio & visual equip

LYKES ELECTRONICS
3308 Orleans Ave.
New Orleans 70119
Line: audio & video equip

MAR ELECTRONICS
3521 E. Louisiana State Dr.
Kenner 70062
504-729-4524
Line: full line audio & video equip
Micro-Trak see ad p 120

W.J. MONROE
8427 Ridgemont Drive
Pineville 71360
318-640-3412
Line: radio equip
Collins see ad Cover 4

MAINE

DOW HEBERT & PLOURDE
P.O. Box 969
Downtown Mall
Carribou 04736
Line: audio components
Micro-Trak see ad p 120

MARYLAND

ASSOCIATED SALES REPS.
8706 Wilson Ave.
Baltimore 21234
301-661-2888
Line: audio equip

BARTLETT ASSOCIATES, INC.
4405 East-West Highway
Bethesda 20014
301-656-3061
Line: video equip, switchers

C.M. BEVERAGE
10104-M Woodlake Drive
Cockeysville 21030
301-666-7059

Line: radio equip
Collins see ad Cover 4

EASTERN INST. CORP.
11700 Old Columbia Pike, Suite
Silver Spring
301-622-4200
Line: microwave equip

ROBERT HALVORSON
4000 Thornapple
Chevy Chase 20015
301-654-1680
Line: audio equip; audio tape
transmitters

HAYDEN ASSOCS.
16 Decatur Ave.
Annapolis 21404
202-296-6059
Line: measuring equip, monitors

HABCO ELECT.
603 Alleghany Ave.
Towson 21204
301-825-9637
Line: audio, video components
Tech Labs see ad p 173

PIERCE PHELPS INC.
8204 Felton St. Suite 105
Silver Spring 20910
Line: video equip, full line

PROFESSIONAL PRODUCTS INC.
4864 Fairmont Avenue
Bethesda 20014
301-657-2141
Line: full line video products
Vega see ad p 116
Unimedia see ad p 136

RECORDING CONSULTANTS II
7912 Georgia Ave.
Silver Spring 20910
301-565-2270
Line: full line of audio equip

SELINGER & ASSOCS.
401 Southlawn Lane
Rockville 20850
Line: audio & video equip

S&S ASSOCS.
7720 Wisconsin Ave.
Bethesda 20014
301-654-1434
Line: test instruments
Marconi see ad p 135

TAUB SALES
12810 Gaffney Rd.
Silver Spring 20904
301-622-0300
Line: audio equip

BILL WESTON
15932 Shady Grove Rd.
Gaithersburg 20760
301-948-0460
Line: video proc amp switchers

DWIGHT WILCOX
5504 Waterway
Rockville 20853
301-460-1454
Line: video equip
American Data Corp. see ad p 120

WILTRONIX INC.
5504 Waterway
Rockville 20853
301-460-1454
Line: broadcast equip & access
MCI see ad p 63

MASSACHUSETTS

CRAMER ELECTRONICS
120 Hampton Ave.
Needham 02194
617-449-6100
Line: CCTV systems

REEN
ingham Rd.
07610
8-8300
lectronic tubes, components
Electric Valve see ad p 13

HANLEY AUDIO
n St.
dge 02139
udio components
rak see ad p 120

BRINGTON SALES CO.
e St.
02193
5-5323
udio equip
rg see ad p 86

IA SOUND
erine St.
ter 01608
udio components
rak see ad p 120

TRIAL COMPONENTS

oston Rd.
ham 01067
8-3854
udio components
rak see ad p 120

STATE RENTAL SERVICE
ory St.
02130
udio equip, components
rak see ad p 120

ION ASSOCIATES
den St.
ay 02181
5-3977
udio equip
see ad p 107
see ad p 121

ORP.
tvale Ave.
am 02180
3-5464
ast instruments
see ad p 135

SYSTEMS CORP.
pel St.
02160
4-6881
ll line audio & video equip
e ad p 117

/ LABS
mbridge St.
02134
2-0600
udio components, radio equip
see ad p 44, 45
e ad p 119, 166
rak see ad p 120

McCABE
Terrace
02081
3-6736
udio components, test equip
Technology see ad p 24

N TECHNICAL SALES CO

eat Plain Ave.
am 02192
4-4780
udio equip
see ad p 83

PIPER & ASSOC.
sh St.
am 02192
9-1144
udio equip
see ad p 116

'S MUSIC & SOUND PROD.
ain St.
eld 01103
udio components
Trak see ad p 120

ALENTI
dle Club Rd.
ton 02173
1-0089

Line: audio equip, video equip,
camera lenses

VALLEY CINEMA/VALLEY SOUND
20 First Ave.
Chicopee 01020
Line: audio components
Micro-Trak see ad p 120

V.F. SALES, INC.
181 Worcester Rd.
Route #9
Natick 01760
617-237-6544
Line: audio & video products
Orban/Parasound see ad p 98
Orban Broadcast see ad p 128
UREI see ad p 106

WRIGHT RADIO CO.
329 East St.
Hingham 02043
Line: audio components
Micro-Trak see ad p 20

MICHIGAN

R.A. ALBRECHT & COMPANY
P.O. Box 470
429 Walnut Blvd.
Rochester 48063
313-652-2520
Line: audio components, test equip
ESE see ad p 119, 166
Sound Technology see ad p 24

AUDIO DISTRIBUTORS
2342 Division Ave. S.
Grand Rapids 49507
616-452-1596
Line: full line of radio equip
Ramko see ad p 44, 45
ESE see ad p 119, 166
Micro-Trak see ad p 120
Cetec Broadcast see ad p 129
Cetec Audio see ad p 102

CHAMPAGNE SALES CO.
24001 Southfield Rd. Suite 102
Southfield 48075
313-354-0270
Line: audio & video equip, trans-
mitters

COWIE ASSOCIATES INC.
1174 E. Big Beaver Rd.
Troy 48084
313-689-7252
Line: audio equip
Tandberg see ad p 86

VICTOR DUNCAN INC.
11043 Gratiot Ave.
Detroit 48213
Line: photo supplies & equip

H.M. DYER ELECTRONICS
2982 Wixom Road
Milford 48042
313-478-2157
Line: time stds, audio & video prod-
ucts
Computer Image see ad p 47
ComTec see ad p 114
TFT see ad p 110
CEI see ad p 117
ESE see ad p 119, 166

J. MALCOLM FLORA INC.
P.O. Box 201
Plymouth 48170
313-453-4296
Line: audio equip
Shure see ad p 83

GENERAL TELEVISION NETWORK
13225 Capital Avenue
Oak Park 48237
313-548-2500
Line: audio components
ESE see ad p 119, 166

R.P. HERMES CO.
9600 Whittier St.
Detroit 48224
313-886-4567
Line: audio & video equip

continued on page 133

THE WILKINSON AM2500B 2.5 KW AM BROADCAST TRANSMITTER

FEATURES

- Solid State Modulator Driver
- Solid State Exciter
- Only One Tube Type - (4) 4-1000A
- Variable Vacuum Capacitor Tuning
- Motorized Variable Capacitor Loading
- Low Distortion, High Level Modulation
- Accessible Drawer Construction
- Solid State Timing Circuits
- Self-Testing Silicon Power Supplies
- Automatic Recycle
- Simplified PA Tuning - Only two controls
- Double Duty Plate & Modulation Transformers
- Pretuned at Customer's Frequency
- Power Cutback (optional)
- Designed for Remote Control
- Ample, Roomy Cabinet for Ease of Service
- Completely Metered
- Uses Standard Parts with Original Maker Numbers



WILKINSON ELECTRONICS, INC.

P.O. BOX 738 TRAINER, PA. 19013
TELEPHONE (215) 497-5100

Circle 210 on Reader Service Card

MARTI

THE NAME TO REMEMBER

STEREO STUDIO-TRANSMITTER LINKS INTER-CITY RELAY

Stereo - Mono 950 MHZ FM - AM



STL Transmitter

The Stereo STL with
"Built-in Backup."

Dual Channel System (Stereo) \$4160.00
Single Channel System (Mono) \$2290.00

Antenna or Transmission line cost not included.

FEATURES: • All Solid-State • Direct FM Modulator • Field Proven Varactor Final • Plug-in Modular Construction • Solid-State Ovens • Hi-Accuracy Crystals

Why STL?

1. No "lost air" time due to cut, wet or electrically charged telephone lines.
2. Better Sound Quality Than a Class AAA telephone line.
3. EVENTUAL COST REDUCTION in operating expense.
4. Complete control of entire broadcast system.

Why Dual Channel?

1. A Dual-Channel costs less than a Composite.
2. Better Reliability than a Composite. "Built in Backup."
3. Greater Channel Separation than a Composite.
4. Less Signal Drive Required to Receivers means additional system Fade Margin.
5. Less Test Equipment Necessary and more Positive System Diagnosis.
6. Stereo Generator is away from Studio and Unauthorized Tampering.
7. Stereo Generator and Broadcast Transmitter Compatibility without Interface.
8. Having a Dual-Channel STL is like having a Spare Link.
9. Two Remote Control and Two Sub-Carrier Capability.

Why MARTI?

1. Channel Separation more than 65 db.
2. Channel Response matched to 0.25 db.
3. Distortion less than 0.5%.
4. All Solid State.
5. A Simple, True Direct FM Plug-in Modulator.
6. Complete accessibility to modules without removal from rack.
7. The Marti System Delivers Top Performance with Transmitter manufacturer's Stereo Generator.
8. Marti STL Systems Log over TWO MILLION (2,000,000) Broadcast Hours each Year.
9. AVAILABLE FROM STOCK.

THIS
SPACE
RESERVED
FOR NEW
RMC-20
DIGITAL
REMOTE
CONTROL
SYSTEM

WRITE
OR CALL
FOR DETAILS

RADIO REMOTE PICKUP 150 - 450 MHZ



RPU
Transmitter

\$975.00 (150 MHZ)
\$1145.00 (450 MHZ)

FEATURES: • All Solid-State • Direct FM Modulator • Broadcast Quality — Continuous • Four Audio Mixing Channels • Plug-in Modular Construction • I.F. Crystal Filter • Taut Meters

Radio Remote Pickup Equipment is versatile, dependable and an entree to profitable remote broadcasting. That is the acclaim given to American Radio Broadcast RPU Equipment by American Radio Broadcasters. "How did we ever operate a radio station without it?", is the comment most often heard. Equipment has been purchased and put to service.

The progressive minded, community spirit broadcaster, can find many uses for Radio Remote Pickup Equipment. He will do many more things than he is presently doing, simply because the equipment is available at a moment's notice. To coin an old cliché, "It doesn't cost a cent more to pay."

Add Color to
Your
Remotes . . .

PORTABLE BROADCAST REMOTE PICKUP TRANSMITTER

Model RPT-1

\$495.00 (150 MHZ)

FEATURES: • Portable operation on interchangeable nickel-cadmium battery. Total weight only 5¼ lbs. • All Solid-State • Built-in battery charger • Dual frequency operation (One channel included) • Meter indicates battery condition and modulation • Whip antenna mounted directly on unit • Broadcast-quality Compressor-Limiter handles toughest remote pickup conditions • Two microphone inputs (one push-to-talk) and one Hi-Level input each with individual mixing gain control

COMPLETE LINE OF ACCESSORIES AVAILABLE



MARTI Electronics, Inc.

P.O. BOX 661 • 1501 N. MAIN
CLEBURNE, TEXAS 76031
817/645-9163

SOURCE '76

MINNESOTA

HILL
Hartwell
g Heights 48077
9-6320
adio equip
s see ad Cover 4

HOUGHTON
dgeland
Oak 48073
9-6679
adio equip
see ad p 107
see ad p 121

RT MILSK CO.
Telegraph Rd.
eld 48075
2-6660
udio components
s see ad p 163

RICE
ak Park Drive S.E.
Rapids 49508
5-5529
ideo equip
ad p 59

OOD SCROGGS CO.
rbor Hills Rd.
n 49201
0-1170
udio components
abs see ad p 173

LO INC.
Woodward Ave.
bant Ridge 48069
7-4771
udio products
Parasound see ad p 98
Broadcast see ad p 128

JOHN E.M. ANDERSON CO.
5231 Humboldt Ave So.
Minneapolis 55419
612-823-6459
Line: audio components, equip
Modular Audio see ad p 173

WILLIAM E. BAIRD
6317 Aldrich Ave.
S. Minneapolis 55423
612-861-6228
Line: video proc. equip, TBCs
Microtime see ad p 109, 124

D&L BROADCAST SERVICES
3325 Flag Circle N.
Minneapolis 55427
612-545-3372
Line: complete line audio & video
equip

EMMONS ASSOCS., INC.
10700 Lyndale Ave.
Minneapolis 55420
612-881-1118
Line: full line video equip
Duca-Richurson see ad p 137
TFT see ad p 110

FMI/MAGNATECH CO.
3601 Park Center Blvd.
Minneapolis 55416
612-920-6677
Line: audio components & equip, FM
monitor equip, transmitters
Micro-Trak see ad p 120

MEL FOSTER CO. INC.
7389 Bush Lake Rd.
Edina 55435
612-835-2252
Line: audio equip
Shure see ad p 33

JAYNUS ASSOCS., INC.
10700 Lyndale Avenue S.
Minneapolis 55420
612-884-1700
Line: broadcast equip, transmitters

K&M ELECTRONICS
7360 Ohm Lane
Minneapolis 55435
612-835-3080
Line: full line audio & video equip
Amtron see ad p 168

KODO ASSOCIATES, INC.
8100 Penn Avenue S.
Minneapolis 55431
612-881-1255
Line: audio components, equip
Sound Technology see ad p 24

J.L. LITTLEJOHN
200C West Branch Road
Maple Plain 55359
612-479-2633
Line: radio equip
Collins see ad Cover 4

R.C. SALES
7127 Willow Rd.
Maple Grove 55369
612-425-5543
Line: audio products
Beyer see ad p 107
Revox see ad p 121

SIEDARE ASSOCS.
8836 7th Ave.
Minneapolis 55427
612-545-5663
Line: audio components, tubes,
electronic components
Amperex see ad p 11, 29

SKOR
1821 University Ave.
St. Paul 55104
612-645-6461
Line: audio products
Vega see ad p 116

SOUND 80, INC.
2709 E. 25th St.
Minneapolis 55406
612-721-6341
Line: audio components, equip;
recording accessories
MCI see ad p 63

MISSOURI

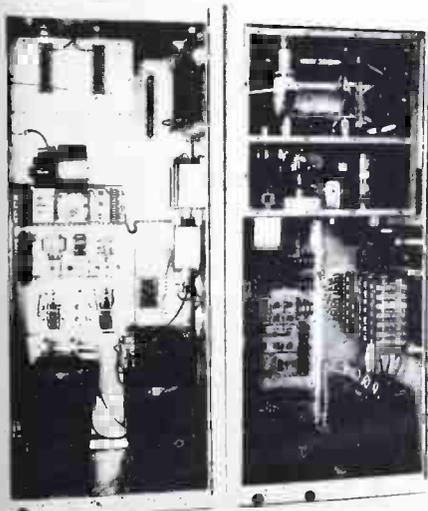
ALEXANDER ELECTRONICS INC.
1820 Wyandotte Street
Kansas City 64108
816-474-6656
Line: audio and video equip
Unimedia see ad p 136

ANIXTER-PRUZAN
9449 Aerospace Dr.
St. Louis 63134
314-423-9555
Line: Sony studio video equip, full
line of CATV equip, headend, pas-
sives, test equip, power supplies

BEAMS, INC.
689 Craig Rd.
St. Louis 63141
314-649-1060
Line: audio equip

continued on page 134

CCA 5000 Watt AM Broadcast Transmitter



AM-5000D Rear View RF Cover and Door Removed
Note: Full Accessibility, 100% RF Shielding, and
Substantial 30 Hz Response Modulation Components.

BROADCAST SPECIALTIES

Place your transmitter order now and
receive a FREE audio console valued up
to \$3750, upon delivery
call for money saving details now, and
how you can qualify

206-577-1681 or 206-577-8544

BROADCAST SPECIALTIES
3163 OCEAN BEACH HWY

LONGVIEW WASHINGTON 98632

Circle 212 on Reader Service Card

THE SOURCE '76

DAVID BEATTY STEREO
1616 Westport Rd.
Kansas City
Line: audio components
Micro-Trak see ad p 120

COMMUNICATIONS SYSTEMS INC.

1001 Perry Ave.
Cape Girardeau 63701
314-334-6097
Line: audio components, full line radio equip
Wilkinson see ad p 131

KSW ASSOCIATES

7546 Troost Ave.
Kansas City 64131
816-363-5651
Line: audio components
Robins see ad p 163

FORRISTAL-YOUNG SALES CO INC.

7110 Oakland Ave.
St. Louis 63117
314-645-2360
Line: audio equip
Shure see ad p 83

PAC

12710 2nd St.
Grandview 64030
314-731-2331
Line: full line broadcast equip
Marconi see ad p 135

PACER CORP.

11221 E. 76th St.
Raytown 64138
Line: video equip

J.C. SHIDELER

Route #1, Box 217B
Oak Grove 64075

816-443-2080
Line: radio equip
Collins see ad Cover 4

TV ENGINEERING

519 Rudder Rd.
Fenton 63026
314-343-5605
Line: broadcast equip
McMartin Industries see ad p 92
Thomson-CSF Labs see ad p 22
Broadcast Electronics see ad p 162
Duca-Richardson see ad p 137

NEBRASKA

DON S. JONES

3524 S. 104th Street
Omaha 68124
402-397-2866
Line: radio equipment, video
McMartin see ad p 92

K&M ELECTRONICS

120 S. 41st St.
Omaha 68131
402-551-7600
Line: video equip

SCIENTIFIC SYSTEMS, INC.

Lincoln 68505
402-467-2900
Line: video equip, switchers

VID-A-COMM SYSTEMS

2079 Fourth Ave.
Lincoln 68508
Line: video equip

NEVADA

CINEMA SERVICE OF LAS VEGAS

3050 Sheridan St.
Las Vegas 89102
Line: lighting equip

NEW HAMPSHIRE

TELECOMMUNICATIONS SERVICES

P.O. Box 141
Merrimack 03054
603-889-3001
Line: full line of audio/video equip

NEW JERSEY

BI STATE MARKETERS

753 Bergen Blvd.
Ridgefield 07657
201-943-5888
Line: audio components
Robins see ad p 163

FLOYD CHURCHILL

P.O. Box 43
50 Upland Way
Haddonfield 08033
609-429-7871
Line: audio components
Tech Labs see ad p 173

COMQUIP INC.

366 S. Maple Ave.
Glen Rock 07452
201-444-3800
Line: video & audio equip

ELDISERCO

12 Estal Place
Greenbrook 08812
201-968-0344
Line: audio and broadcast products
Orban/Parasound see ad p 98
Orban Broadcast see ad p 128
UREI see ad p 106

JERRY CUDLIPP

24 Addison Terr.
Old Tappan 07675
212-947-8031
Line: video heads, components
Videomax see ad p 3

SYLVAN GINSBURY LTD

Queen Anne Rd.
Teaneck 07666
Line: audio components
Micro-Trak see ad p 120

H.M. HOLZBERG ASSOCS.

P.O. Box 322
Totowa 07511
201-256-0455
Line: audio equip, program information, video switchers, program monitors, char generators, mitters, STL, microwave
TFT see ad p 110
Nurad see ad p 122
ComTec see ad p 114
CEI see ad p 117

LANDY ASSOCS.

12 Buxton Rd.
Cherry Hill 08003
609-424-4660
Line: audio consoles, video equip
Datatek see ad p 8
Computer Image see ad p 4

LA SALLE AUDIO

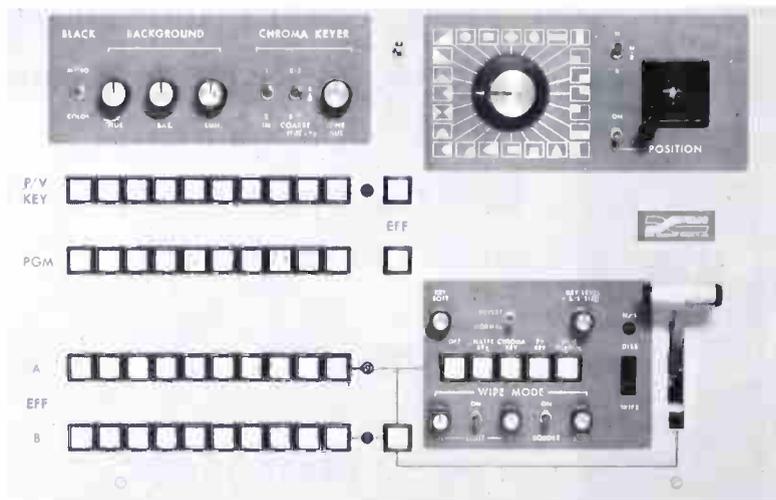
P.O. Box 373
Teaneck 07066
201-692-0010
Line: full line of audio equip

continued on page 1

RVS10-4 and RVS10-4R

The newest members of the Ross family are now available.

- MONO/COLOR BLACK GENERATOR
- BACKGROUND GENERATOR
- 2-INPUT RGB CHROMA KEYS
- 4 BUSSES — 10 INPUTS PER BUSS
- EFFECT A RE-ENTRY FACILITY
- V AND H LIMIT CONTROLS FOR WIPE PATTERNS



- 24 PATTERN SPECIAL EFFECT GENERATOR WITH POSITIONER
- SOFT KEY
- MATTE KEY
- PREVIEW KEY
- SPLIT SCREEN
- WIPE/DISSOLVE
- SOFT WIPE
- BORDER

- RVS 10-4 AVAILABLE IN SELF-CONTAINED AND REMOTE CONTROL MODELS. REMOTE CONTROL MODELS HAVE STANDARD LENGTH CABLE OF 25 FEET.

MARKETED EXCLUSIVELY BY



160 DUNCAN MILL ROAD
DON MILLS, ONTARIO, CANADA M3B 1Z1
(416) 444-8497



mi automatic TV monitoring sets free the engineers

Time was when highly trained transmission engineers had to waste their brains (and their time) watching a battery of waveforms and pictures — instead of concentrating on work more worthy of them.

Now the TV monitoring scene has been transformed. For TF2914 Insertion Signal Analyser, TF2915 Data Selector together form THE FIRST COMMERCIALY AVAILABLE AUTOMATIC TRANSMISSION MONITORING SYSTEM. In conjunction with a test line signal generator and inserter (such as **mi** TF2913), it will automatically cycle through the measurement of all the important parameters of the test line

signal from five separate inputs. Comparison with pre-selected limits is continuous, and an 'out of limits' fault can initiate executive action by automatic switching to standby, with remote alarm indication and simultaneous data transmission of fault location. Up to 24 parameters can also be measured manually by means of push-button selection and a self-contained digital voltmeter. Versions are available for all standards including the N.T.C. #7. Systems are now operating in ten countries. Applications include broadcast monitoring, common carriers and satellite operations. Call **mi** and discuss your application.

mi

MARCONI INSTRUMENTS
DIVISION OF MARCONI ELECTRONICS INC.

100 STONEHURST COURT, NORTHVALE, NEW JERSEY 07647 • TELEPHONE: (201) 767-7250 • TWX: 710-991-9752

Circle 214 on Reader Service Card

747R-3

Grand color monitors... Great dollar savings!



SMT-15

● TRINTRON PLUS PICTURE TUBE ● BLUE-GUN ONLY ● A-B VIDEO SELECTION ● EXTERNAL SYNC INPUT ● TALLY LIGHT ● FRONT ACCESS COLOR BALANCE.

OPTIONS:

● PULSE-CROSS ● UNDERSCAN ● RACK SLIDES ● CABINET VERSIONS ● SPEAKER AUDIO.

Anyway you look at them, Unimedia's SMT color monitors are good news! Professional quality . . . affordable prices.

The SMT Line is a complete family of one-gun color monitors, from 9-inch portables and rack models through 12, 15, 17, up to 19-inch rack-mount models.

If you're a broadcaster, CCTV or Cable operator, or production studio operator you can share in the dollar savings inherent in Unimedia's simple, straightforward SMT design. Now you have a golden opportunity to replace obsolete monochrome models with new SMT color monitors at attractive prices. Or replace tempermental large-screen color jobs with SMT 12s, 15s, 17s, or even the new 19s. If you're starting a new facility, Unimedia monitors can save enough to buy you an additional piece of needed equipment.

And Unimedia SMT Color Monitors are professional in every sense of the word. Their long-term dependability is the result of engineered design simplicity and quality components. We've delivered over four thousand units to satisfied customers in the last four years. You'll find NTSC and RGB models. In the nine-inch line you'll choose from singles, duals, and combination models with waveform monitors, vectorscopes, or audio speaker-amplifiers. Or combine a color nine with a high resolution monochrome nine for camera focus and registration.

You really owe it to yourself to check out the complete Unimedia line before you install another monitor in your facility. Write . . . or phone today. Remember . . . saving money isn't all that bad!

UNIMEDIA
22525 KINGSTON, LAKE OF THE PINES
AUBURN, CA 95603

TELEPHONES:
(916) 272-1971
(916) 878-1250

unimedia
unimedia
unimedia
unimedia

Circle 215 on Reader Service Card

THE SOURCE '76

L&M ASSOCS.

511 Victor St.
Saddle Brook 07662
201-843-8700
Line: test instruments
Marconi see ad p 135

MERRILL LENT

P.O. Box 189
East Hanover 07936
201-887-4849
Line: audio & video equip, char gen

BERNARD MUNZELLE

6 Kilmer Rd.
Edison 08817
201-985-3760
Line: video equip

NILESCO INTERNATIONAL LTD.

382 Springfield Ave.
Summitt 07901
Line: audio components
Micro-Trak see ad p 120

OPTIMEDIA SYSTEMS INC.

1080 Rte. 46
Clifton 07013
201-777-7600
Line: audio & video products

SHEA SALES

522 Prospect Street
Maplewood 07070
201-762-2382
Line: audio equip, test equip
Sound Technology see ad p 24

SONNY SIMBERKOFF ASSOCS. INC.

71 Valley St.
S. Orange 07079
201-763-7900
Line: audio equip
Shure see ad p 83

TECH LABORATORIES, INC. OFFICE

Bergen & Edsall Blvds.
Palisades Park 07650
201-944-2221
Line: audio components
Tech-Labs see ad p 173

TELEMEASUREMENTS, INC.

145 Main Ave.
Clifton 07014
201-473-8822
Line: full line audio & video equip

TELE-QUIP, INC.

P.O. Box 211
Bridgeport 08014
609-467-2500
Line: audio components
ESE see ad p 119, 166

NEW MEXICO

DYMA ENGINEERING

Rt. 1 Box 51
Taos 87571
505-758-2686
Line: full line audio equip, transmitters
Micro-Trak see ad p 120
Broadcast Electronics see ad p 162

Wilkinson see ad p 131

ESE see ad p 119, 166

G.C. VIDEO

9624 Gutierrez Rd. N.E.
Albuquerque 87111
505-296-5653
Line: audio & video products
Ramko see ad p 44, 45
CEI see ad p 117

VIDEO-MON INC.

222 Truman NE
Albuquerque 87108
Line: video equip

NEW YORK

ANIXTER-PRUZAN

180 Dupont St.
Plainview 11802
516-822-8585
Line: Sony studio video equip, line of CATV equip, cable construction accessories, tools, test end, passives, test equip, power supplies

AUDIO-VIDEO CORP.

55 Delaware Ave.
Delmar 12054
518-439-7611
Line: full line of audio/video equip
ESE see ad p 119, 166

AURORA COMMUNICATIONS

408 W. 57th St.
New York 10019
212-541-7040
Line: lighting equip

BACH SALES

4 Longview Place
Great Neck
212-233-3300
Line: sound systems

DAVID BAIN ASSOCS.

P.O. Box 1014
Port Washington 11050
516-883-4818
Line: audio equip, transmitter
CCTV systems, video equip
Inovonics see ad p 18

BARBIZON ELECTRIC CO INC.

426 W. 55th St.
New York 10019
212-586-1620
Line: lighting equip & supplies
See ad p 167

BOYTON STUDIOS

Melody Pines Farm
Morris 13808
Line: audio components
Micro-Trak see ad p 120

THE CAMERA MART

456 W. 55th St.
New York 10019
212-757-6977
Line: cameras & accessories
See ad p 89

CELEBRATION SOUND

157 Gray Rd.
Ithaca 14850
607-272-8964
Line: full line of audio equip
Micro-Trak see ad p 120

CHROMACORD CORP.

60 Margaret St.
Plattsburgh 12901
518-561-2900
Line: full line of audio equip

MAC PHERSON CONNER ASS

111 Red Hill Rd.
New City 10956
914-638-1976
Line: electronic components, transmitters
Amperex see ad p 11, 29

B. DARMSTEDTER & ASSOCS

8201 Speach Drive
Baldwinsville 13027
315-638-1261
Line: audio equip

PHIL M. DUBS

385 Salem Ct.
Hauppauge 11787
516-234-5252
Line: video proc. equip
Microtime see ad p 109, 124

FAIRMONT ELECTRONIC SA

35 S. Service Rd
Plainview 11803
516-694-8200
Line: electronic components
Electronic Devices see ad p 1

continued on page

BUILDING FOR YOUR FUTURE.

Inside this facility the most advanced video switching systems you can own are being produced.

By Duca-Richardson.



DRS
DUCA-RICHARDSON CORPORATION

This laboratory-like building near Denver is specially fitted out for Duca-Richardson, with the finest technical teams anywhere and manufactures standard and custom switching systems for the television industry. Duca-Richardson is a new name in video switching. Yet we're a company of industry veterans. We have a backlog of orders from major customers. And solidly behind us are two well-known banking and insurance companies.

Our product line of video switchers includes:

Production Switchers—The 4000 series of standard and custom systems designed to satisfy most customer requirements. However, if you need

a special or modified switcher we are prepared to meet your exact specifications.

- **Master Control Switchers**—The Master Control switching panel integrates all audio, video, and machine controls on one panel. Audio follow video, separate audio, audio over and mixing is provided on the preset and program buses. Machine controls and computer control inputs are added as special options.
- **Editing Switchers**—These switchers are offered with audio follow video and/or audio breakaway. Special effects,

audio mixing, linear keys with matted and bordered edges are available. Automatic digital controlled transitions are included for generating precise dissolves or fades to black.

- **Routing Switchers**—Large routing systems of video and audio switching modules can be built up to whatever size is required. Dual channel audio is standard, with optional features such as vertical interval switching, input clamping and equalization.

For specifications, quotations and delivery dates write or call Carl A. Hedberg, Manager, Engineering Applications, Duca-Richardson Corporation, 11465 West Forty-Eighth Avenue, Wheat Ridge, Colorado 80033 (303) 423-1300.

THE NEW IDEAS COME FROM



DUCA-RICHARDSON CORPORATION

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Circle 216 on Reader Service Card

THE SOURCE '76

F&B/CECO INC.

315 W. 43rd St.
New York 10036
Line: cameras & accessories
See ad p 174

GOTHAM AUDIO CORP.

741 Washington St.
New York 10014
212-741-7411
Line: audio components
UREI see ad p 106

JOHN GREY

4F Underhill Rd.
Middletown 10940
914-342-5113
Line: radio equip
McMartin see ad p 92

L.K. HANER ASSOCS.

P.O. Box 101
Commack 11725
516-864-2220
Line: audio components
Tech Labs see ad p 173

HARVEY RADIO CO.

60 Crossways Park W.
Woodbury 11797
212-297-7577
Line: audio components & equip

JOSEPH ASSOCS.

8 Cove Lane
P.O. Box 307
Port Washington 11050
516-883-1829
Line: audio equip, RF monitors

K&J ENGINEERING

53 Fairfield Dr.
Dix Hills
516-242-0888
Line: microwave equip

OSCAR E. KRAUT

530 D Grand St.
New York 10002
212-228-5511
Line: video equip

KVC, INC.

770 Lexington Avenue
New York 10021
Line: video equip

LISTEC TELEVISION EQUIPMENT CORP.

35 Cain Drive
Plainview 11803
516-694-8963
Line: video equip
Television Products see ad p 48

L.S.M. ASSOCIATES

27 Orchard Park
Phelps 14532
315-548-4891
Line: audio components
Robins see ad p 163

MARTIN AUDIO/VIDEO CORP.

320 W. 46th St.
New York 10036
212-548-4891
Line: audio components, equip,
recording accessories
Ramko see ad p 44, 45
ESE see ad p 119, 166

MOBIUS CINE LTD.

7 E. 47th St.
New York 10017
212-758-3770
Line: cameras & accessories

NET SALES, INC.

Box 7485 W. Ridge Station
Rochester 14615
716-467-4538
Line: audio components
Tech Labs see ad p 173

NORTHEAST BROADCAST EQUIP.

R.R. #2
Westport 12993
518-962-4567
Line: broadcast equip

NORTHEAST BROADCAST LABS.

15 Charles St.
South Glen Falls 12801
518-793-2181
Line: audio equip
Micro-Trak see ad p 120

JOSEPH PLANCENCIA CO.

521 Fifth Ave.
New York 10017
Line: audio components
Micro-Trak see ad p 120

P.M. ELECTRONICS

83 Russel Rd.
Garden City 11530
516-248-4858

Line: full line video equip

PROFESSIONAL AUDIO MARKETING

P.O. Box 153
Jackson Heights 11372
212-898-0200
Line: audio equip
Beyer see ad p 107
Revox see ad p 121

PROFESSIONAL ELECTRONICS CO.

678 Troy-Schenectady Rd.
Latham 12110
518-785-1660
Line: audio video products

Q.A.R.

621 South Columbus Ave.
Mt. Vernon 10550
914-699-2224
Line: electronic components
Electronic Devices see ad p 174

ROCKE INTERNATIONAL CORP.

P.O. Box 745

Melville 11746

Line: audio components
Micro-Trak see ad p 120

ROSNER CUSTOM SOUND

11-38 31st St.
Long Island City 11106
Line: audio components
Micro-Trak see ad p 120
F. EDWIN SCHMITT CO., INC.

311 Meacham Avenue
Elmont 11003
516-437-8150
Line: full line radio equip
McMartin see ad p 92
Shure see ad p 83

SENECA COMMUNICATIONS

112 Killewald St.
Tonawanda 14150
716-693-8446
Line: audio & video products

SINGER PRODUCTS CO.

One World Trade Center
Suite 3365
New York 10048
212-432-1400
Line: audio components
Micro-Trak see ad p 120

SONOCRAFT CORP.

29 W. 36th St.
New York 10018
Line: audio & video equip

SOUND SYSTEMS INC.

42-12 28th St.
Long Island City 11101
212-786-4474
Line: full line of audio/video eq
See ad p 166

TECH-MARK INC.

101 Jefferson Ave.
PO Box 120
Endicott 13760
607-748-7473

continued on page

PERFECT YOUR CCTV SYSTEM WITH COSMICAR® LENSES

NOW AVAILABLE COSMICAR ES SERIES LENSES, newly developed high sensitivity VIDICON LENSES with AUTOMATIC IRIS that operate for the ranges from 1.4 ft-c to 100,000 ft-c. SMALLEST in sizes, ECONOMICALLY priced and provide VERY WIDE APPLICATIONS.

NEW COSMICAR ES SERIES LENSES

- F.L. 8.5mm f/1.5—ES for 2/3" cameras
- F.L. 12.5mm f/1.4—ES for 2/3" & 1" cameras
- F.L. 16mm f/1.6—ES for 2/3" cameras
- F.L. 25mm f/1.4—ES for 2/3" & 1" cameras
- F.L. 50mm f/1.8—ES for 2/3" & 1" cameras



COSMICAR LENS DIVISION, ASAHI PRECISION CO., LTD.

424, Higashi-Oizumi, Nerima-ku, Tokyo, Japan Cable Address: "MOVIEKINO TOKYO"

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with tubes — camera, receiver and power. SK replacement conductors along with a complete stock of RCA exact moment parts.

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broadcast and broadcast maintenance needs much simpler to meet. With a minimum of panic and a maximum of efficiency.

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For full information, check with your RCA Distributor or contact RCA Distributor and Special Products Division, Bldg. 206-2, Cherry Hill Offices, Camden, New Jersey 08101.

In Canada, contact RCA Limited, Distributor and Special Products Division, Sainte Anne-Bellevue, P.Q.

RCA

Distributor and
Special Products Division

THE SOURCE '76

Line: electronic components, tubes
Amperex see ad p 11, 29

TEL-COM, INC.
 1475 East Henrietta Rd.
 Rochester 14623
 716-442-7900
 Line: CCTV systems

TELEMERICA INC.
 25 W. 43rd St.
 New York 10036
 212-687-0370
 Line: audio & broadcast products
Micro-Trak see ad p 120

TELESCO INTERNATIONAL SALES CO.
 #1 Dupont Street S.
 Plainview 11803
 516-433-6210

Line: audio components, transmitters, test equip
Micro-Trak see ad p 120
Ramko see ad p 44, 45
Potomac see ad p 16

TELEVISION EQUIPMENT ASSOCIATES
 Box 260
 South Salem 10590
 914-763-8893

Line: brand line radio & TV equip; accessories brand line radio & TV equip; accessories
See ad p 167

VERAXON INDUSTRIES
 312 Second St.
 Ithaca 14850
 Line: audio components
Micro-Trak see ad p 120

VICTOR INTERNATIONAL CORP.
 13 W. 46th St.
 New York 10036
 212-246-4410

Line: audio components
Micro-Trak see ad p 120

VIDEO COMPONENTS INC.
 601 S. Main St.
 Spring Valley 10977
 914-356-3700
 Line: camera lenses, full line CCTV video equip, video camera accessories, video editors

WESTEC AUDIO/VIDEO
 100 Riverside Drive #5B
 New York 10024
 212-873-1166

Line: audio components
ESE see ad p 119, 166

WINDSOR TOTAL VIDEO
 652 First Ave.
 New York 10016
 212-725-8080
 Line: videotape equip

NORTH CAROLINA

APPLIED VIDEO CONCEPTS LTD.
 3800 Menton Dr.
 Raleigh 27609
 Line: video equip

BCS ASSOCS.
 1310 Beamon Pl.
 Greensboro 27408
 919-273-1918
 Line: video products
TFT see ad p 110
CEI see ad p 117

BROADCAST SERVICES CO.
 P.O. Box 85
 Selma 27576
 919-284-2102

Line: full line of radio equip
Broadcast Electronics see ad p 162

A.W. GREESON, JR.
 219 Homewood Ave.
 Greensboro 27403
 919-292-1791
 Line: full line audio & video equip, RF monitoring equip
McMartin see ad p 92
ESE see ad p 119, 166
Micro-Trak see ad p 120

HAMMOND ELECTRONICS
 2923 Pacific Ave.
 Greensboro 27128
 919-275-6391
 Line: audio components
Aristocart see ad p 160

TECHNICAL VIDEO SYSTEMS
 1148 Burke St.
 Winston-Salem 27101
 919-725-2026
 Line: audio & video equip, CCTV systems

P.D. THOMPSON
 2550 Weymouth Rd.
 Winston-Salem 27103
 919-765-3157
 Line: full line broadcast equip (audio & video)

NORTH DAKOTA

K&M ELECTRONICS
 306 N. University Dr.
 Fargo 58102
 Line: full line video equip

OHIO

APPLIED VIDEO ELECTRONICS INC.
 P.O. Box 25

Brunswick 44212
 216-225-4443
 Line: full line video equip

A/V MEDIA, INC.
 3344 W. Broad St.
 Columbus 43204
 614-272-0014
 Line: video and audio products

BOLLER ELECTRONICS
 181 Fairway Blvd.
 Columbus 43213
 Line: audio components
Micro-Trak see ad p 120

N. BROWNING & CO.
 3120 Far Hills Ave.
 Dayton 45429
 513-298-5973
 Line: audio equip
Beyer see ad p 107
Revox see ad p 121

CAIN & COMPANY
 201 S. Broad St.
 Lancaster 43130
 614-654-4800
 Line: microwave equip

DOUG COOK & ASSOCS.
 2185 Trent Rd.
 Columbus 43229
 614-471-4114

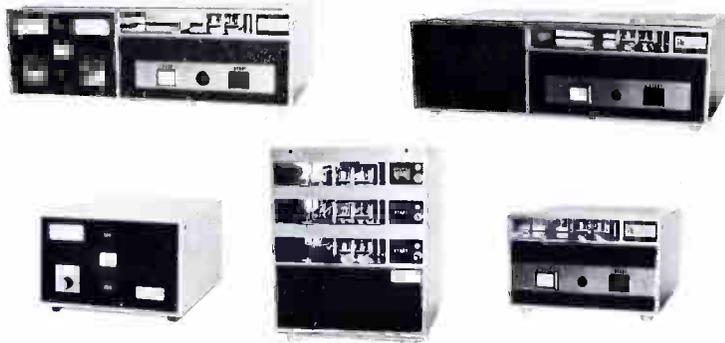
Line: audio & video equip, mixers
Micro-Trak see ad p 120

DAYTON COMMUNICATIONS CORP.
 2971 Bluefield Ave.
 Dayton 45414
 513-278-7937
 Line: video equip, CCTV systems

ELECTRONIC ENGINEERING
 362 W. Bowery
 Akron 44307
 Line: audio components

continued on page

ITC bench mark cartridge machines



Measure all others against us

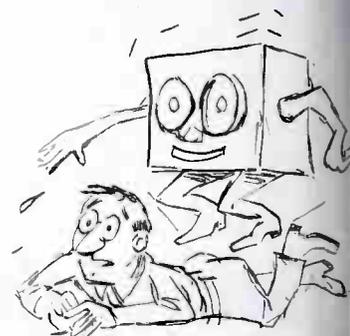
Other cartridge machines are copies of ITC's, but won't perform like ITC's. The differences are inside. Design innovations, master workmanship and superb customer services are ITC marks of leadership in quality cartridge equipment. We'll prove it with our famous 30-day guarantee of satisfaction. Write. Or phone us collect: 309-828-1381.

ITC INTERNATIONAL TAPETRONICS CORPORATION
 2425 SOUTH MAIN ST., BLOOMINGTON, ILLINOIS 61701

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The **TENTELOMETER** tape tension gauge can help isolate and correct these problems and others on your reel to reel and U-matic machine

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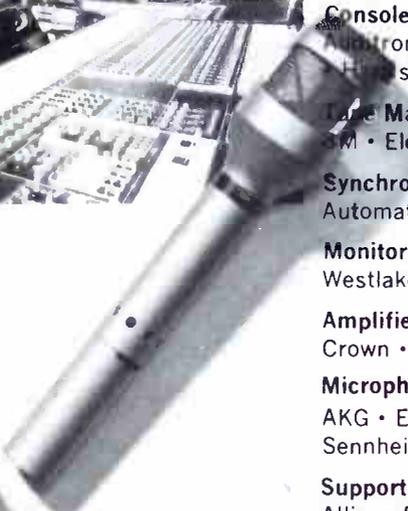
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Custom Acoustic Design

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Recording studio, control room and
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from acoustic design
to down beat...

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Los Angeles, California 90048
(213) 655-0303

Circle 220 on Reader Service Card

THE SOURCE '76

Micro-Trak see ad p 120

ELECTRONIC PRODUCTS CORP.

16006 Waterloo
Cleveland 44110

Line: audio & video equip

GOSS COMMUNICATIONS

1450 E. 289th St.
Wickliffe 44092
216-944-0268

Line: video equip

EDWARD H. HUBER

Rte. 3, Rhinehart Rd.
Belleville 44813
419-886-4445

Line: radio equip, full line
McMartin see ad p 92

KLOPF A/V CO.

3381 Successful Way
Dayton 45414
513-236-5500

Line: audio & video products

Micro-Trak see ad p 120

ESE see ad p 119, 166

MANDABACH ASSOCIATES

1773 18th St.
Cuyanoga Falls 44223
614-235-0265

Line: audio components
Robins see ad p 163

McFADDEN SALES, INC.

150 E. Broad St.
Columbus 43215
614-221-3363

Line: audio components
Shure see ad p 83

OHIO INSTRUMENTS

7180 Brundage Road
Waldo 43356
614-726-4242

Line: test instruments
Marconi see ad p 135

J.B. PARENT CO.

19706 Center Ridge Rd.
Cleveland 44116
216-333-9955
5188 Wedgewood Rd.
Medina 44256
216-725-8871

Line: audio equip
Vega see ad p 116

Orban/Parasound see ad p 98
Orban Broadcast see ad p 128

RIXAN ASSOCIATES

5062 Wadsworth Rd.
Dayton 45414
513-278-4216

Line: audio equip
Modular Audio see ad p 173

VIDEO PHONE SYSTEMS, INC.

4678 Broadview Rd.
Richfield 44286
216-659-9572

Line: video equip

A.C. WAHL & ASSOCS.

135 Williams St.
Cincinnati 45215
513-821-3270

Line: audio components
Tech Labs see ad p 173

WARREN RADIO

1002 Adams St.
Toledo 43697

Line: audio components
Micro-Trak see ad p 120

OKLAHOMA

HILL RADIO EQUIP. CO.

Rte 6, Box 622

Claremore 74017

918-341-5240

Line: audio components

DOUG BROWN ENTERPRISES

Box 7494

Tulsa 74105

918-747-5045

Line: audio components

OREGON

T.T. CAUTHERS

1215 S.E. 73rd Ave.
Portland 97215
503-254-2818

Line: radio equip

Collins see ad Cover 4

EARL & BROWN CO., INC.

P.O. Box 19406
Portland 97219
503-245-2283

Line: audio equip

Vega see ad p 116

ROGER MINTHORNE

7643 S.W. 33rd Ave.
Portland 97219
503-246-4556

Line: audio components

Robins see ad p 163

OREGON A/V SYSTEMS, INC.

117 S.W. Front Ave.
Portland 97204
503-224-4313

Line: audio & video products

SPS ELECTRONICS

8585 SW Canyon Lane #60
Portland 97225
503-297-3862

Line: audio components

Tech Labs see ad p 173

PENNSYLVANIA

ALPHA VIDEO & ELECTRONICS

9 East Mall Plaza
Carnegie 15106
412-279-6169

Line: video equip

BARTLETT ASSOCIATES, INC.

130 West Lancaster Ave.
Box 72
Wayne 19087

215-688-7325

Line: video equip, switchers

COMMUNICATION MEDIAS

P.O. Box 54
Allentown 18105
215-437-0607

Line: audio components, full
audio & video equip

Broadcast Electronics see
162

Micro-Trak see ad p 120

JERRY CONN & ASSOC.

550 Cleveland Ave.
Chambersburg 17201
717-263-8258

Line: CATV electronic units; co-
cable, cable connectors; broa-
cast antennas; TV and FM modu-
lators; processors; microwave systems

GEORGE M. CONNEEN CO., I

24 S. Newtown St. Rd.
Newtown Square 19073

Line: audio equip

EAST. INST. OF PHILA.

617 Cheltenham Ave.
Philadelphia
215-927-7777

Line: microwave equip

continued on page

How About That!

A Back Pack TV Camera
Battery With
250% More Power Output

(At No Increase In Weight)

Specify

silvercel

By Yardney

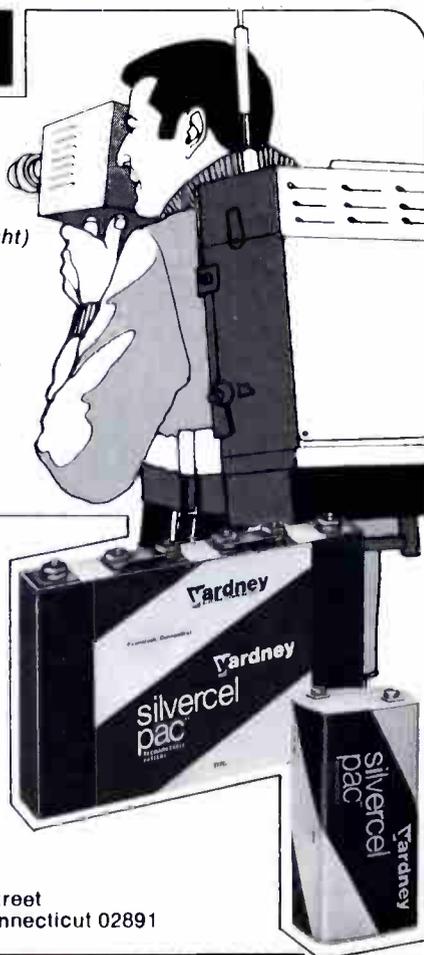
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As Powerful As You Want It . . .
How Would You Like To Have It
At 1/3rd Its Present Weight?

Silvercel rechargeable batteries pack the most useable power into the smallest and the lightest modular package. Used by all major manufacturers of TV Back Pack Cameras as original equipment, they offer the added advantage of a QUICK CHARGE without battery damage by the use of a quick pulse charge.

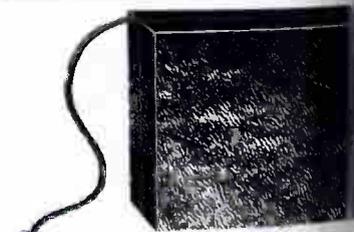
Silvercel (silver/zinc) rechargeable batteries — the recognized standard of excellence in power output for back pack TV cameras. Our technical assistance and catalog are yours for the asking.

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ELECTRIC CORPORATION

82 Mechanic Street
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Nickel Cadmium BATTERIES for ENG.



ALEXANDER **BP-20**

REPLACES SONY
LEAD ACID BP-20A

FITS MODEL NO.
TAPE RECORDER VO 380
CAMERA NO. DXC 1600

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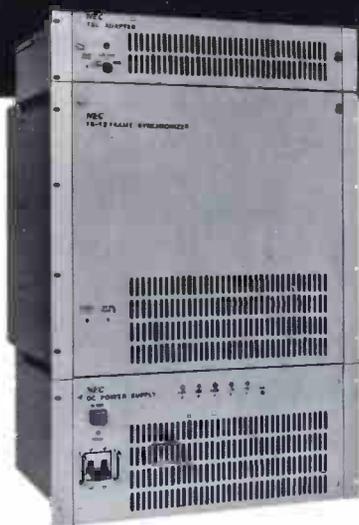
ALEXANDER manufacturing

Box 1645 Mason City, Iowa 50401
Phone (515) 423-8955

Circle 221 on Reader Service Card

Circle 222 on Reader Service Card

Super Supers for ENG At About Half Price!



NEC's Super Synchronizer lets you mix, fade, wipe and transfer from U-Matic VTRs as well as from all other remote sources without genlocking, remote phasing or tedious "talking in" fubidium-standard adjustments. Yet, the compact Super Synchronizer costs only about half the price of competitive units.

How's it possible? Our FS-12 Time Synchronizer is now augmented by our new Time Base Director adaptor. This provides an infinite correction window.

The combined unit allows operation with non-phased input video signals. This means no feedback control timing pulse is necessary for the U-Matic VTR.

So it is possible to work with a single video connecting cable. Further, you can feel free to move the VTR around during recording. The Super Synchronizer smooths out heavy time base errors. Also, velocity compensation is available.

Now you can integrate pictures from your ENG unit as

smoothly as those which originate in your studios. And price shouldn't stand in the way. We're the most reasonable people around. So you can save money and manpower both as you increase your commitment to ENG. It should be just a matter of getting started. Why not give us a call or drop us a line right now.

NEC America, Inc.

277 Park Avenue
New York, N.Y. 10017
Tel.: (212) 758-1666

NEC

Nippon Electric Co., Ltd.
Tokyo, Japan

An NEC frame synchronizer won the Emmy Award in 1975 as the year's outstanding achievement in engineering development.

Circle 223 on Reader Service Card

THE SOURCE '76

HOLT TECHNICAL SERVICE

428 Broadhead Ave.
Bethlehem 18016
215-865-3775
Line: audio & video products
Micro-Trak see ad p 120

LERRO ELECTRICAL CORP.

3125 N. Broad St.
Philadelphia 19132
215-223-8200
Line: video equip

L&M ASSOCS.

965-A Bristol Pike
Andalusia 19020
215-639-3100
Line: test instruments
Marconi see ad p 135

SAMUEL K MACDONALD INC.

1531 Spruce St.
Philadelphia 19102
215-545-1205
Line: audio equip
Shure see ad p 83

MARCO VIDEO SYSTEMS, INC.

6114 North 20th St.
Philadelphia 19138
215-849-9500
Line: CCTV systems

PEIRCE PHELPS, INC.

2000 N. 59th St.
Philadelphia 19131
215-477-9000
Line: audio & video equip, CCTV,
video systems
Micro-Trak see ad p 120

MARK PITKOW COMPANY

1580 Buck Hill Drive
Huntington Valley 19006
215-464-8921

Line: audio equip, components
Tandberg see ad p 86
Sound Technology see ad p 24

HENRY RHEA

1229 Hunt Club La.
Media 19063
215-566-6558
Line: audio equip; transmitters.

RO-CEL ELECTRONICS, INC.

731 Voice of the Theatre Bldg.
Rt 8 North
Pittsburgh 15223
412-781-2326
Line: audio components
ESE see ad p 116, 166

RPC ELECTRONICS

620 Alpha Drive
Pittsburgh 15238
412-782-3770
Line: full line of audio/video equip
Amtron see ad p 168

A.A. SILVER

P.O. Box 941
Levittown 19058
215-943-3622
Line: radio equip
Collins see ad Cover 4

D. SMITH

Southampton 18966
215-355-6642
Line: video equip
CVS see ad p 105

VAL-TRONICS, INC.

Penn Park Bldg.
Pittston 18640
717-655-5937
Line: audio & video equip, RF moni-
tors
Ramko see ad p 44, 45
Micro-Trak see ad p 120
McMartin see ad p 92

WAGGONER-VERHILL ASSOCS.

3550 Laketon Rd.
Pittsburgh 15235
412-241-5205
Line: audio components
Tech Labs see ad p 173

RHODE ISLAND

WRH PRODUCTIONS

5 Industrial Way
Riverside 02915
401-434-6272
Line: full line audio components,
equip RF monitors
Micro-trak see ad p 20

SOUTH CAROLINA

R.L. BRYAN CO.

301 Greyston Blvd.
Columbia 29210
803-779-3560
Line: audio & video products
Ramko see ad p 44, 45

CALHOUN A/V CO.

1217 Broad River Rd.
Columbia 29210
803-772-9130
Line: audio & video products

CANDOR CO.

P.O. Box 2220
Myrtle Beach 29577
803-448-8361
Line: electronic components; tubes
Amperex see ad p 11, 29

DIXIE RADIO & SUPPLY CO.

1900 Barnwell St.

Columbia 29202
Line: audio components
Micro-Trak see ad p 120

TENNESSEE

ALLIED SOUND-VISUAL EDUCATION DIV.

2741 Nonconah Blvd. S. Suite
Memphis 38132
901-396-4747
401 Spence Lane
Nashville 37210
615-254-6473
Line: audio & video equip

AUDIO CONSULTANTS, INC.

7 Music Circle North
Suite 105
Nashville 37203
615-256-6900
Line: audio equip
MCI see ad p 63

BARRY TRADING CO.

105 W. Market St.
Lebanon 37087
Line: audio components
Micro-Trak see ad p 120

BROADCAST DISTRIBUTOR

Bible Place
Cleveland 37311
615-472-8200
Line: audio components and c

BROADCAST EQUIPMENT & SUPPLY CO.

Rt. 1, Weaver Pike
Bluff City 37620
635-968-7342
Line: full line audio equip
Ramko see ad p 44, 45

continued on page

who
said you
can't
take it
with
you?



DON'T WAIT TO SET YOUR MIND AT EASE,
TAKE VIDEOTEK BATTERY POWERED COLOR MONITORS
WITH YOU AND FULFILL YOUR ENG NEEDS TODAY

for further information on our complete color monitor line
call Videotek or circle on Readers Service Card.

VIDEOTEK, INC.

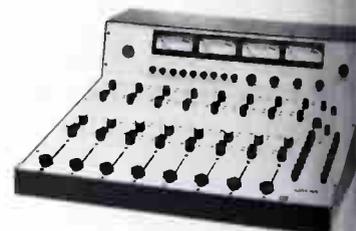
640 East Vine Street,
Stowe, Pennsylvania, 19464 Phone (215) 367-6977



**MAKE EYEWITNESS NEWS
TOTALLY PORTABLE** with

battery powered Color Monitors by Videotek. Both the five inch monitor and nine inch monitor (and) monitor/receiver are complete with battery pack that allows two and one-half hours of use. With battery powered color monitors you can be assured of quick, convenient and proper setup of cameras and playback of tape recorders at remote locations.

This Is Our Smallest



The QM-8A

Ask Us About Our Largest!

- From 8 in 4 out to 32 in 24 out
- Quality
- Easy to use
- Affordable

**QUANTUM
Audio Labs**

1905 Riverside Dr.
Glendale, Calif. 91201
(213) 841-0970

**In a radically
changing industry,
there are still
reliable standards.**

This is one of the few.



In fact, it's one of the most reliable pieces of studio equipment you can buy. All it does is work. And work. Quietly and reliably, year after year. So reliable that many of our original turntables, built nearly 30 years ago, are still in service all around the world.

Of course, the QRK you buy this year has changed from the original. It's changed from last year. This year, it comes with a new motor, new idler and 3 striking new colors. And orders are being filled the day they're received. But what made us famous and what no one's ever been able to copy is what's made us the industry standard: solid, quiet, built-by-hand reliability.

Still the industry standard for quiet reliability.



ELECTRONIC PRODUCTS, INC.

1568 North Sierra Vista, Fresno, California 93703, Phone (209) 251-4213

Circle 226 on Reader Service Card

www.americanradiohistory.com

THE SOURCE '76

Micro-Trak see ad p 120
Inovonics see ad p 18

CLW BROADCASTERS
2004 S. Orchard Knob Ave.
Chattanooga 37404
Line: full line of radio equip
Micro-Trak see ad p 120
ESE see ad p 119, 166

DELTRONICS
819 Woodland St.
Nashville 37206
615-262-3177
Line: video systems

ELECTRA DISTRIBUTING CO.
1914 West End Ave.
Nashville 37203
Line: audio equip
Micro-Trak see ad p 120

R.C. EVANS
Rt. #2 Box 12, Glenmore Dr.
Rockford 37853
615-573-9717
Line: radio equip
Collins see ad Cover 4

MEDIA ASSOCS.
P.O. Box 249
Franklin 37064
Line: full line radio equip

MOTION PICTURE LABORATORIES, INC.
781 S. Main St.
Memphis 38102
Line: cameras & accessories

SPHERE AUDIO SALES
478 Devens Drive
Brentwood 37027
615-794-0155
Line: audio equip

Micmix see ad p 172
STUDIO SUPPLY CO.
P.O. Box 280
Nashville 37202
615-327-3075
Line: audio components, equip,
recording accessories

WARREN RADIO CO.
190 S. Cooper St.
Memphis 38104
Line: audio components
Micro-Trak see ad p 120

WALLACE WILSON & ASSOC.
478 Devens Dr.
Brentwood 37027
615-794-0155
Line: audio equip
Vega see ad p 116

TEXAS

ACCENT AUDIO/VIDEO
6712 Oakbrook Blvd.
Dallas 75235
214-637-5660
Line: audio components
ESE see ad p 119, 166

ACCURATE SOUND CORP.
1206 Euless Blvd. Suite 106
Euless 76039
817-267-3911
Line: full line of audio equip

BOB AMOS & ASSOCS.
916 Green Hill Rd.
Dallas 75232
214-823-7820
Line: audio consoles, FM monitoring
equip, audio & video equip, transmitters
UREI see ad p 106

AUSTIN PROFESSIONAL AUDIO, INC.
308 W. 6th Street
Austin 78701
512-477-3706
Line: audio equip
MCI see ad p 63

ARNOLD BARNES CO.
P.O. Box 9748
Austin 78766
512-454-4371
7616 LBJ Freeway, Suite 401
Dallas 75240
214-233-5535
18100 Upper Bay Road, Suite 103
Houston 77058
713-488-4543
802 Lingco
Richardson 75080
214-235-4553
Line: audio, video, broadcast products

BRADENCO
2646 Andjon Drive
Dallas 75220
214-358-3278
Line: test instruments
Marconi see ad p 135

CAMPION SALES CO.
P.O. Box 88
Richardson 75080
214-238-8145
Line: audio equip
Shure see ad p 83

COLLINS RADIO GROUP
1225 North Alma
Richardson 75080
214-690-5000
Line: audio components
Ramko see ad p 44, 45

GARY COOPER
371 Oakview Drive
Lewisville 75067
817-430-1373

Line: electronic components, English Electric Valve see ad

CROUSE-KIMZEY CO.
3507 W. Vickery Box 9830
Ft. Worth 76107
817-737-9911

Line: audio components
Micro-Trak see ad p 120

D&J SALES COMPANY
2307 59 St.
Lubbock 79412
806-792-0001

Line: audio products, transmitters

VICTOR DUNCAN INC.
2659 Fondren Ave.
Dallas 75206

Line: cameras & accessories

DUNKEL ELECTRONIC ASSOC.
P.O. Box 35353
Houston 77035
713-729-1670

Line: audio components
Tech-Labs see ad p 173

GEE-GIBSON ELECTRONIC EN
4002 E. Houston Hwy.
Victoria 77901
512-578-4323

Line: audio, video products

GUARANTEE RADIO SUPPLY CORP.

1314 Iturbide St.
Laredo 78040
512-722-3233

Line: audio components

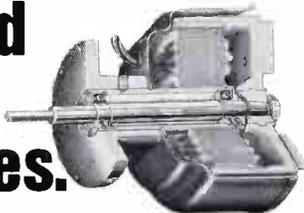
INDUSTRIAL AV INC.
7315 Ashcroft #.116
Houston 77036

Line: video equip

BOB LANDINGHAM
2121 Santa Anne Blvd.
Dallas 75028
214-327-7311

Line: video proc amp switchers

Beau. The only quality replacement motor for cartridge and reel-to-reel tape machines.



Ever wonder why the unique Beau, inside-out, hysteresis synchronous tape drive motor is specified in just about every major piece of cartridge tape equipment? Or why so many Ampex and Scully machines are equipped with Beau replacement motors? The answer is simple: Quality. Beau offers unbeatable operating specs, outstanding reliability, long life, quiet operation, compact size, and unconditional factory support. No import can beat Beau, the original broadcast tape drive motor.

To order Ampex and Scully replacements, specify tape speed and model number from the table below:

Type and Models	Beau Prices
Ampex — Model 440	\$180.00
Ampex — Models 350, 351, 354	\$195.00
Scully — Models 270, 275, 280, 282	\$180.00

For fast delivery of cartridge drive motors for ITC, ATC, Gates, Spotmaster, Ampro, and Sparta machines, call (203) 288-7731. Or write for our free Beau motor bulletin.

UMC® BEAU MOTOR DIVISION
UMC ELECTRONICS CO.
460 Sackett Point Rd. North Haven, CT 06473

Circle 227 on Reader Service Card

AM PHASING SYSTEMS

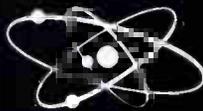


Quality and Reliability

— that's what you need and depend on with phasers and Antenna Tuning Units. Multronics builds them that way. Units are customized to meet specific requirements of stations and consultants.

OTHER HIGH QUALITY PRODUCTS:

- Fixed Inductors
- Variable Inductors
- Isolation Inductors
- RF Contactors



OUR NEW ADDRESS IS:
MULTRONICS, INC.
9005 Red Branch Road
Columbia, Maryland 21045
Phone: 301-730-1122

Circle 228 on Reader Service Card

video proc amp switchers
ad p 59

ALLES CO.
ale Blvd.

3-3831
udio products

ES LUCAS SALES CO.

x 24632
5224
nt Way
5236
0-8181
udio equip, test equip
Technology see ad p 24
rg see ad p 86

ELECTRONICS

bx 26816
h 77207
dio & video equip

**TN, ZIENKOSKY, BROWNE &
OS.**

rby, Sulte 834

nti 77006
51-4333
0mega Rd.
5240
21-5535
Ex 9748
in 8766
41-4371
: ll line of audio & video equip
es: ad p 110

WEST TELE

COMMUNICATIONS

arlisle Plaza
5235
7-1440
: dio components
se ad p 119, 166

QUAL BROADCAST EQUIP.

Floyd Rd.
ason 75080
6-3131

Line: audio and video equipment

BOBB PARTRIDGE

410 Elizabeth St.
Irving 75060
214-221-3175
Line: audio equip
Beyer see ad p 107
Revox see ad p 121

**PROFESSIONAL AUDIO
SERVICES**

P.O. Box 1953
Ft. Worth 76101
817-536-6254
Line: audio components
Aristocart see ad p 160

SAVCO

P.O. Box 427
Richardson 75080
214-234-1841
Line: wide range of products for
radio, TV & sound recording
Inovonics see ad p 18
Wilkinson see ad p 131

J.Y. SCHOONMAKER CO.

2995 Ladybird Lane
Dallas 75220
214-357-8481
Line: tape recorders, audio equip

SOUND IDEAS ASSOCS.

6123 Spruce Forest
Houston 77018
5641 Yale Blvd.
Dallas
Line: video equip

SOUTHWEST ELECT.

9226 Markville Dr.
Dallas 75231
214-690-9881
Line: audio components
Tech Labs see ad p 173

JIM SPECK

1105 High Vista
Richardson 75080

214-234-3602

Line: transmitters

STUDIO SOUND SERVICE

1401-F S. Floyd Rd.
Richardson 75080
214-690-3131
Line: audio components, equip

GENE SUDDUTH

2809 Raintree Drive
Carrollton 75006
214-242-2690
Line: full line vide equip
Audio Design see ad p 85
Datatek see ad p 8
CEI see ad p 117

TEXPORT CO.

1401-K S. Floyd
Richardson 75081
214-238-7117
Line: audio components
Robins see ad p 163

RUSSELL TREVILLIAN

2908 Mulberry
Pasadena 77502
713-941-7272
Line: video equip
American Data Corp see ad p 40
Comtec see ad p 114

VIDEO ELECTRONICS

3000 Carlisle St.
Dallas 75204
214-741-1440
Line: CCTV systems, audio & video
equip

VIDEO SYSTEMS

2000 A Governors Circle
Houston 77018
713-686-9651
Line: audio equip
ESE see ad p 119, 166

WHALIN'S PRO AUDIO SALES

2910 Buena Vista

Arlington 76010

817-261-8197

Line: full line audio & recording
equip

WYBORN SALES CO.

9450 Skillman #115
Dallas 75243
214-691-6484
Suite # 108
7315 Ashcraft
Houston 77036
713-772-0961
Line: audio components, equip
Vega see ad p 116

UTAH

BOB BACON

2536 Campus Dr.
Salt Lake City 84121
Line: video equip

B&B ELECTRONIC PRODUCTS

2605 E. 3300 So.
Salt Lake City 84109
801-486-3943
Line: audio equip
Vega see ad p 116

J.E. HALL COMPANY

2330 So. Main #8
Salt Lake City 84115
801-466-6105
Line: audio equip
UREI see ad p 106

H.P. MARKETING

2361 S. Main
Salt Lake City 84115
801-466-6105
Line: audio equip
UREI see ad p 106

LAWSON ASSOCS.

continued on page 148

**COMING
IN
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**New Technologies
Open New Vistas
for Instruction/
Media. . . .**

**Also: Extra
Circulation At
NAEB Convention**

Set it and forget it



The NEW RFA-5 AM RF Amplifier

- 30dB AGC Range • Signal Strength Meter • Three RF Outputs for monitors, frequency counter and oscilloscope • Optional 600 ohm Balanced Audio Output and Carrier/Audio-Fail Alarms.

"Set it and forget it" — that's the comment most often heard from AM station engineers who have installed a National Electrolab AM RF Amplifier. The new RFA-5 is even better than the previous RFA-4. AGC is now standard, and a built-in carrier level meter makes setup easy. As well as driving most modulation monitors, the RFA-5 also delivers a low level oscilloscope output and a clipped/limited output for a standard frequency counter. Four double-tuned selective stages in the preamp, combined with a MOS-FET front end, provide outstanding performance in frequency-congested areas. Over 250 radio stations in Canada and the U.S.A. are presently using National Electrolab RF amplifiers. Try one yourself — and forget it. For complete information, call any office of Gates Broadcast Equipment Div. of Harris Corp. or:



NATIONAL ELECTROLAB LTD.

Box 68, Blaine, Washington 98230
Canada: 1536 Columbia St., North Vancouver B.C. V7J 1A4 Phone (604) 985-0511

Circle 229 on Reader Service Card

THE SOURCE '76

5 Research Rd.
Salt Lake City 84112
801-582-9322
Line: video for broadcast and CATV

MEDIA WEST INC.
187 West 3100 South, Box 458
Bountiful 84010
801-295-3308
Line: audio components & radio equip
Micro-Trak see ad p 120

PARTRIDGE ELECTRONIC SALES
P.O. Box 21205
Salt Lake City 84121
801-943-0127
Line: audio test equip, generators
Beyer see ad p 107
Sound Technology see ad p 24
Revox see ad p 121

RIA CORP.
50 East Malvern Ave.
Salt Lake City 84115
801-486-8822
Line: TV broadcast and microwave equip
Nurad see ad p 122
CEI see ad p 117
Duca-Richardson see ad p 137

VIRGINIA

BCS
107 Rich Neck Rd.
Williamsburg 23185
804-245-1786
Line: video equip

BROADCAST CONSULTANTS CORP.
21 N. Wirt St.

Leesburg 22075
703-777-8660
Line: audio equip & broadcast products
Micro-Trak see ad p 120

BROADCAST ENGINEERS & EQUIP. REPS.
Box 4777
Richmond 23229
804-285-8888
Line: full line of radio equip

HABCO ELECTRONICS INC.
3116 Sedgewick Dr.
Lynchburg 24503
703-384-5236
Line: audio components
Tech Labs see ad p 173

LEE HARTMAN & SONS INC.
P.O. Box 659
3236 Cove Rd. N.W.
Roanoke 20004
703-366-3494, 3493, 3713
Line: full line audio & video equip
Micro-Trak see ad p 120

MEPCO/ELECTRA
5700 Old Richmond Ave.
Richmond 23226
804-282-6515
Line: electronic components; tubes
Amperex see ad p 11, 29

MIDWEST CORP.
1395 Air Rail Ave.
Virginia Beach 23455
804-855-1056
Line: audio & video products

PROFESSIONAL SOUNDS INC.
711 W. Broad St.
Falls Church 22046
703-533-0011
Line: full line of audio equip

ROBERT SLYE ELECTRONICS, INC.
1203 North Highland Street

Arlington 22201
Line: video equip

SPHERE ASSOC.
11250-7 Roger Bacon Dr.
Reston 22090
703-471-7887
NY 212-246-0176
Line: audio equip
Micmix see ad p 172
Vega see ad p 116

WASHINGTON

AERO MARC INC.
5518 Empire Way S.
Seattle 98118
206-725-1400
Line: audio & video products

ANIXTER-PRUZAN
1963 First Ave. So.
Seattle 98134
Line: Sony studio video equip full line of CATV equip, cable construction accessories, tools head end, passives, test equip, power supplies

BENNETT ENGINEERING CO.
Box 23
Mercer Island 98040
206-232-3550
Line: audio & video products; microwave
Nurad see ad p 122
Microwave Associates see ad p 39
TFT see pg 110

BROADCAST SPECIALTIES
3163 Ocean Beach Hgwy
Longview 98632
206-577-1671
Line: radio & audio equip
See ad p 133

BROADCAST SUPPLY CO.
2711 Locust Ave West
Tacoma 98466
206-565-2301
Line: broadcast products
Micro-Trak see ad p 120
Ramko see ad p 44, 45
Aristocart see p 160
IGM see ad p 10

DAVE CHAMPLIN
12528 22nd Ave. NE
Seattle 98125
206-362-0401
Line: audio products
Beyer see ad p 107
Revox see ad p 121

DATACOM ASSOCIATES
111 Tower Place
Seattle 98109
206-285-2525
Line: recorders, audio consoles monitors, video equip
McMartin see ad p 92

RUSH S. DRAKE
6133 6th Ave. S.
Seattle 98108
206-763-2755
Line: test instruments
Marconi see ad p 135

EARL & BROWN CO. INC.
P.O. Box 9285
Seattle 98109
206-284-1121
Line: audio equip
Vega see ad p 116

FLEECHART & SULLIVAN, INC.
10109 Aurora Ave. N.
Seattle 98133
206-522-1533
Line: audio equip
Shure see ad p 83

continued on page

COMPLIMITER™



MODEL 610

Used in recording studios; disc mastering studios; sound reinforcement systems; TV, AM, FM broadcast stations to maintain a sustained average signal at a level significantly higher than that possible in conventional limiters, and with performance that is seldom attained by most linear amplifiers.

Rack mounted, solid state, new functional styling, the Model 610 is in stock for immediate shipment.

Specifications are available from:

SPECTRA SONICS

770 WALL AVENUE, OGDEN, UTAH 84404
(801) 392-7531



Circle 231 on Reader Service Card

RAPID-Q

CARTRIDGE TAPE EQUIPMENT

Q RAPID-Q F
RAPID-Q RAPID
RAPID-Q RAPID
Q RAPID-Q I

RAPID-Q, the first to offer automatic fast-forward, has a cartridge machine just for you. We offer the RQ 71 Series for all size carts and the RQ-3000 Series for A size carts.

RAPID-Q units are available in many configurations; one is sure to fit your needs. Choose from mono stereo, single, dual or triple units; playback only or record/playback units.

RAPID-Q machines are among the smallest units available and most models can be rack mounted.

EDCO PRODUCTS, INC.
680 BIZZELL DRIVE LEXINGTON, KENTUCKY
(606) 259-0434

Circle 232 on Reader Service Card

We've added more features to the MOST DIGITAL TIME BASE CORRECTOR available today....

The DVL 2002 VIDEO PROCESSOR

Compare these standard features:

4 Times Subcarrier. We were the first with this industry standard, for better S/N ratio, better frequency response and far greater potential for system expansion.

3 Line Floating Window. Our super wide window eliminates the vertical jumping often encountered in other TBCs. If this window is exceeded by a ENG tape displaying gyro effects, full color lock is maintained and only a slight vertical movement will be displayed.

All Digital Control Panel. Push button controls and an LED display provide absolute repeatability of settings for any tape or scene. Programmable unity settings have a power down memory.

Digital Heterodyne Processing Coding, chroma/luminance re-ignition, and encoding are all accomplished in the digital 4x sub-carrier format.

Derived Subcarrier. 3.58 Mhz sub-carrier is derived from the video tape for conversion of heterodyne VTRs

to a direct color playback mode. This provides for the finest possible operation of cassette VTRs.

Chroma/Luminance Correction VTR delay mismatches (envelope delay) between the Y and chroma channels are corrected up to one microsecond.

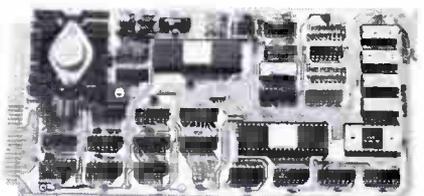
Full NTSC Advanced Sync. Advance is automatically adapted to each different VTR for zero system delay. Advance can also be manually controlled over ± 8 TV lines.

Digital Sync Generator. This full broadcast quality master sync generator with gen-lock is supplied with output drivers.

Digital Proc Amp. For absolute precision, burst and blanking are inserted as a stream of digital numbers prior to data conversion to analog. The standard DVL 2002 has a minimum of internal adjustments, adapts to any capstan servo VTR without modification, and every component has been burned in for at least 100 hours prior to shipment.

Dropout Compensator (optional)

This all digital system inserts correct color information from the previous line.



Microprocessor Servo (optional)

This motor drive logic system supplies the precise phase and frequency information to any motor drive amplifier which in turn powers your non capstan servo VTR. Full lock-up of H, V, and color is achieved within 5 seconds. This microprocessor system adapts to the VTR with absolutely no adjustments. With your non capstan servo cassette players, you can feed direct to air, or to your switcher for mixing. Dubbing to quad is not necessary.



Interested?

For more information or a demonstration write or give us a call.

DIGITAL VIDEO SYSTEMS

519 McNicoll Avenue, Willowdale, Ontario, Canada, M2H 2C9 (416) 499-4826

Circle 233 on Reader Service Card

THE SOURCE '76

HENRY JONCAS CO.

12058 Lake City Way, NE
Seattle 98125
206-363-9200
Line: audio equip, test equip
Sound Technology see ad p 24
Tandburg see ad p 86

JOHN McCLAMROCK CO.

11206 Des Moines Way S.
Suite #.108
Seattle 98168
206-244-9391
Line: full line radio equip
Wilkinson see ad p 131

MEPCO/ELECTRA

14040 NE 8th St.
Suite 103
Bellevue 98007
206-746-1212
Line: electronic components, tubes
Amperex see ad p 11, 29

NORTHSHORE MARKETING (NOR-MARK)

400 108 N.E. #20
Bellevue 98004
206-746-9423
Line: audio equip
UREI see ad p 106

NORTHWEST COMMUNICATIONS

N. 1324 A St.
Spokane 99201
509-326-4740
Line: video & audio equip

NUCOM ASSOCIATES

19415 36th Court NE
Seattle 98155
206-364-9911
Line: video & audio equip
CEI see ad p 117

DON ROSE

19001 40th Place N.E.
Seattle 98115
206-363-2200
Line: electronic tubes, components
English Electric Valve see ad p 13

SCIENTIFIC SYSTEMS

13550 Lake City Way, NW
Seattle 98125
206-363-8600
Line: video equip

SEA-TAC PRODUCTIONS

20103 Des Moines Way S.
Seattle 98148
206-624-1111
Line: audio & broadcast equip
Robins see ad p 163

SPS ELECTRONICS

545 Lake St. So.
Kirkland 98033
206-827-5811
P.O. Box 11066
Parkwater Station
Spokane 99211
503-297-3862
Line: audio components
Tech Labs see ad p 173

TRACK AUDIO

2134 South 295th
Federal Way 98003
206-941-2233
Line: audio components
ESE see ad p 119, 166

WISCONSIN

AVIONIX DIVISION
AV ELECTRONICS INC.
P.O. Box 505
21675 Doral Rd.
Brookfield 53005
Line: video systems

E. A. DICKINSON ASSOCS. INC.

3612 N. Green Bay Ave.
Milwaukee 53212
414-264-1080
Line: electronic components, tubes
Amperex see ad p 11, 29

DAVID M. KELLY

2253 Oneida
Green Bay 54304
414-497-1193
Line: radio equip, TV equip
McMartin see ad p 92

MILWAUKEE VIDEO

1024 6th St.
Milwaukee 53201
414-224-0660
Line: video products

SATTERFIELD ELECTRONICS

1900 S. Park St.
Madison 53701
608-257-4801
Line: audio & video equip
ESE see ad p 119, 116

VIDEO IMAGES

2400 S. Commerce Drive
New Berlin 53151
414-784-2080
Line: full line audio/video equip

CANADA

ADCOM ELECTRONICS LTD.

29-16 Connell Court
Toronto, Ont.
Line: audio & video equip
Amtron see ad p 168

APPLIED ELECTRONICS

299 Evans Ave.
Toronto M8Z 1K2
416-252-3761
Bay No. 1
4519 12th St. N.E.

Calgary, Alberta
403-277-8600
Line: full line radio & TV equip
Collins see ad Cover 4

ARBUTHNOT ELECTRONIC

307-400 Tache Ave.
Winnipeg, Manitoba R2H 3C5
204-233-4941
Line: audio, video equip,
ponents
ESE see ad p 119, 166

AUDIO ELECTRONICS

219 1147-17th Ave. S.W.
Calgary, Alberta T2T 0B7
403-245-1001
Line: audio automation system

BIO-ELECTRONICS

1883 Lawrence Ave. E.
Scarborough, Ont.
Line: audio equip
Micro-Trak see ad p 120

BROADCAST ENGINEERED SYSTEMS

1466 Kalligan Court
Mississauga, Ont.
416-277-0277
Line: audio equip

CALDWELL A/V EQUIP. CO.

1080 Bellamy Rd. N.
Scarborough, Ontario
416-438-6230
Line: full line audio & video e

CHATEAU SEVEN GROUP L

O.C. Div.
1125 Empress St.
Winnipeg, Mant. R3E 3H1
204-475-1026
Line: full line broadcast equip

CHROMOCORD CORPORAT

2343 43rd Avenue
Lachine, Quebec H8T 2K1
514-636-8183

continued on page

A Natural for Remote Broadcast Production Package Disco



MONO \$1275 STEREO \$1725 SHELF \$75

Pre-wired - can be assembled in 30 minutes - In Stock

ALLIED BROADCAST EQUIPMENT

124 South 6th Street

Richmond, Indiana 47374

317-962-8596

Circle 234 on Reader Service Card

REBUILT POWER AMPLIFIER TUBES

- New Tube Warrantee
- Guaranteed Satisfaction
- Off Shelf Delivery
- Fraction Of New Price

PARTIAL LIST OF TYPES:

125A	5771	680
207A	5891	680
356	5918	692
891	5919	700
891R	6420	748
892	6421	750
892R	6422	780
893 AR	6423	780
1089	6424	846
5667	6425	855
5671	6426	875
5681	6427	231
5682	6696	234
5770	6697	234

- Duds Purchased Or Rebuilt
- Send For Quote

VACUUM TUBE INDUSTRY

35 Pequit St., Canton, Mass. 020
617-828-1650

Circle 235 on Reader Service Card

ghan Road
Ontario M6C 2M2
-7722
udio equip, components
rak see ad p 120
e ad p 63

COMMUNICATIONS LTD.
ion Rd., Unit 7
e, Ont. M9V 1C2
-6494
udio components
e ad p 119, 166

CE DUPONT
haine
ent De Paul H7C 2N7 PQ
-5120
deo equip
an Data Corp. see ad p 40

RODESIGN LTD.
Ex 33
a Vancouver, B.C. V9L 3X1
leur Blvd.
L.Salle, 650
rtl Quebec H8R 3H9
erence Ave. West, Suite 219
119, Ontario M6A 1A2
ntreal Rd.
eOttawa, Ontario K1L 6C1
ttford Ave.
rg, R2V 0X1
icrowave equip

AROW ASSOCS.
kie Rd. Unit 33
stuga, Ont. L4W 1E4
-8151
udio components

NRONIX LTD.
Dican Mills Rd.
s Ont.
-8497
: ll line audio & video equip
e ad p 134

GOLD MARKETING
htee De Liesse
aent, Quebec
-4440
: dio, TV broadcast equip
ee ad p 129

AI ELECTRONICS LTD.
nan Drive
nt, 17, Ont.
-9080
: dio equip
cast Electronics see ad p 162
ee ad p 106

IRON, LTD.
Campagne Drive
nview, Ontario M3J 2T9
udio equip, components
ovics see ad p 18

REAL VIDEO CO.
ourg
tal 377, Quebec H4T 1J2
-4420
audio, video equip
nt see ad p 44, 45

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We will publish in the December, 1976 issue, all stories our editors find acceptable. Our readers will be invited to pick the winner in each of three categories: AM, FM and TV.

Each winner will get a Best Station Award plaque designed to enhance any station visitor's lobby, manager's office, or studio.

Winner will be announced in the March, 1977 issue.

Here are the simple rules:

Describe your construction or modernization briefly, including the logic of your equipment selections or design layout decisions. Focus on one section of your plant—transmitter, remote control, or studio control room layout, as examples—or describe the whole plant. Write as much, or as little as you need to tell the story clearly, but the upper limit is 1500 words. Include photos, block diagrams, schematics, floor plans as needed. See December 1975 for examples.

Remember—Get Your Story in by October 15th.

Send it to Best Station Award, BM/E, 295 Madison Ave., New York, NY 10017. For further information, write or call the Editor, BM/E, at the same address. Tel: (212) 658-5320.

*1975 winners: AM, CHWO, Oakville, Ontario; FM, WIDR, Kalamazoo, Mich.; TV, WPRI-TV, Providence, R.I. 1974 winners: AM, KMWX, Yakima, Washington; FM, WNHU, New Haven, Conn.; TV, WTCN-TV, Minneapolis, Minn.

Measuring Television Transmitter Noise

By Andrew J. Fandozzi

To get a picture of the true performance of a TV transmitter, one of four alternative broadband noise measurements (30 Hz to 4.2 MHz) are necessary.

Although much has been published in recent years about the linear and non-linear distortion present in television transmitters, much less attention has been directed to noise performance. Noise performance of modern TV transmitters is one of the most important parameters to consider when evaluating visual transmitter performance.

The generally accepted noise specification of present day broadcast TV transmitters is set by EIA RS240. However, it specifies only hum and low frequency noise (30 Hz to 15 kHz band), mainly the correlated ripple associated with power supplies.

The hum and noise, referenced to peak-of-sync, is better than -50 dB in most modern competitive transmitters. Meeting this level, however, is not a sufficient indication of the true performance of these transmitters. When demodulated and observed on an oscilloscope, this noise will show 60, 120, 180 and 360 Hz frequencies—i.e., they are power line related. These components may be reduced approximately 4 to 6 dB if the transmitter is checked with the clamp circuits on. However, due to the complex filtering required to reject the sync frequency and to measure the noise in the 15 kHz band, most broadcasters normally perform this test in the AC coupled mode. This measurement then can only be used for a cursory check of noise performance. Although the -50 dB measurement of low frequency noise shows that all power supplies are highly regulated and very well filtered, such signals can still be observed on a color monitor. Therefore, the modern transmitter must be much better than the RS240 Standard and should be measured in a way that reveals its true performance capability.

Further, this specification does not control the undesired noise that is easily observed on the color monitor in the 15 kHz to 4.2 MHz band. Although there have been many proposed standards for broadband noise of

TV transmitters, to date none have been adopted. High frequency noise degrades performance since it is an correlated ensemble of pulsed energy. The random noise has characteristics similar to those of the desired video information. Such energy in the high frequency range (4.2 MHz) does not seriously affect the quality of monochrome transmissions, but is a very serious concern in today's color transmission. High frequency noise can be demodulated in the receiver and can cause low frequency variations in the color along with undesirable picture smearing. This can be observed on a high quality picture monitor if these levels are greater than -55 dB referenced to the peak-of-sync.

There are many high frequency noise measuring techniques which detect degradations of picture quality whether it be caused by thermal noise or active device noise generated in the modulation or mixing process or other. They include:

1. Visual noise comparison
2. Oscilloscope channel comparison
3. Spectrum analysis
4. TV noise meter reading

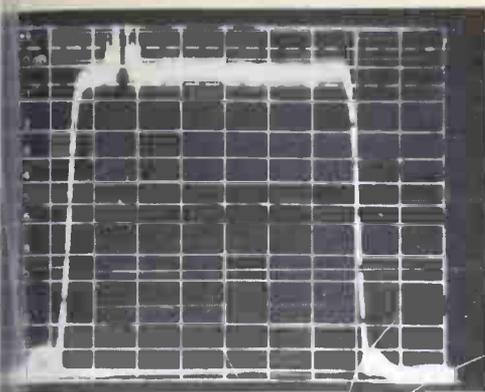
All of the above techniques are used in the broadcast industry and give satisfactory results. However, when using any of the above, one must understand the operation of his test equipment, and the uncertainty factors of the measured results.

To correlate the various high frequency noise techniques, the carrier-to-noise ratio is defined as follows:

$$C/N = \frac{\text{Sync peak to zero carrier}}{\text{RMS noise}}$$

The above definition is used because EIA Standard RS240 references the noise to the peak-of-sync. Most domestic TV manufacturers use this definition to specify the noise performance of their transmitter. Most equipment manufacturers refer the RMS noise to the peak-to-peak amplitude of the picture signal, or the difference in amplitude between blanking and white signal. Therefore, when using such equipment, a conversion factor

Mr. Fandozzi is a staff engineer for RCA Television Transmitter Engineering, Meadow Lands, Pa.



Sideband response of RCA F-line sinter.

C/N RATIO	IRE UNITS OF NOISE
40	9.6
45	5.4
50	3.0
55	1.7
60	0.96

IRE units of quasi-peak noise for various ratios.

Fig. 4. Bar magnified five times with noise generator off.

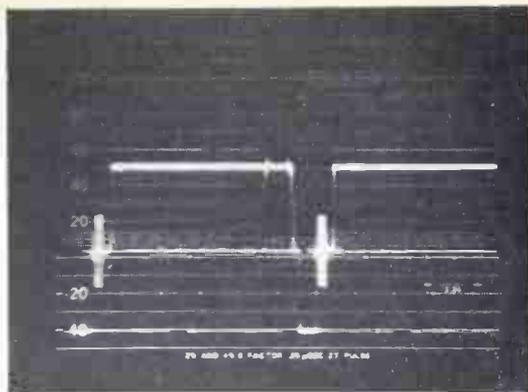


Fig. 2. Gray picture with -50 dB carrier-to-noise ratio.

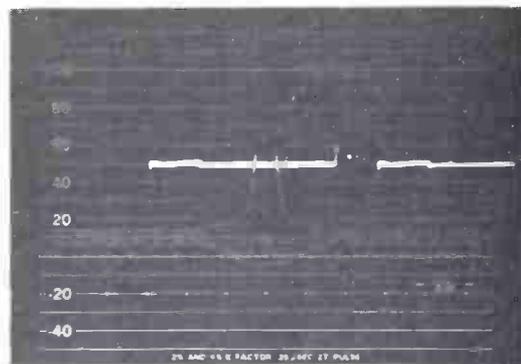


Fig. 2 shows a 50% APL video signal with -50 dB noise level. This figure, along with the data in Fig. 3, is included to enable the broadcaster to make an approximate evaluation of his transmitter performance by comparing the width of the video signal to the width of the signal generated by his transmitter. Fig. 4 shows the noise performance of a typical RCA F-line transmitter with the bar magnified five times and the generator noise off. Fig. 5 shows this bar with the noise generator set to -59 dB or -63.24 dB referenced to peak-of-sync. From this figure, one can see that the high frequency noise of the transmitter is less than the capability of this technique. This is, however, an excellent technique to determine if transmitted noise is less than -60 dB even with the uncertainty of the measurement. (It will be shown in the section on TV Noise Meter Reading Technique that the noise in the 10 kHz to 4.2 MHz band is -65.2 dB for this transmitter.)

This offset voltage is used to calculate the carrier-to-noise ratio from the following equation:

$$C/N = 20 \text{ Log} \left(\frac{2.28}{S} \right)$$

where S is the voltage separation measured in Step 7.

From Fig. 8, the carrier-to-noise ratio is calculated as:

$$C/N = 20 \text{ Log} \left(\frac{2.28}{.0015} \right) = 63.6 \text{ dB}$$

for this RCA transmitter.

In general, the above procedure is a very quick and convenient method to check the high frequency noise performance of a transmitter during normal maintenance without requiring any specialized noise measuring equipment.

Oscilloscope channel comparison technique

Many broadcasters are using this technique for meas-

to be added to reference the noise to 100% carrier modulation. These conversion factors are given in the appropriate sections of this article.

The RCA transmitters used in obtaining the following measurements have a sideband response as shown in Fig. 1.

Equal noise comparison technique

This technique is becoming popular since the broadcaster can measure the noise performance of his complete transmission system while the transmitter is in service. However, this paper covers only out-of-service performance on the transmitter and does not attempt to cover the complete transmission system.

For this test, a Tektronix 147A Generator is inserted between the demodulator output and the waveform monitor input. The generator connections used are "program in" and "preview monitor out." This generator takes part of the line and inserts a calibrated noise level during the deletion interval. The transmitter noise is then compared with the flat noise generated in the 147A generator. Although the noise generated in modern transmitters does not have a completely flat energy spectrum this measurement is accurate to within 2 dB since the rest factor for random noise is generally constant³ and approximates 6 for the energy spectrum of present F-line transmitters. This system is capable of measuring noise to -59 dB referenced to 0.70 volts. This reference is converted to peak-of-sync by adding the following conversion factor to the indicated noise of the generator.

$$CF = 20 \text{ Log} \frac{U.I}{1.14} = -4.24$$

Therefore, we can measure a -63.24 dB high frequency noise level referenced to peak-of-sync with this technique.

TELEVISION TRANSMITTER NOISE

uring high frequency noise since no specialized noise measuring equipment is required. In addition, this technique has been proven to be accurate within 3 dB for TV transmitters, since the high frequency noise in the 100 kHz to 4.2 MHz band closely approximates the Gaussian distribution which is required for this measurement. The distribution of noise density is defined as follows:

$$f(x) = e^{-\frac{x^2}{2\sigma^2}}$$

where x is the random noise variable and σ^2 is the variance of the noise.

For this noise density function, the RMS value of the

random noise is defined as one standard deviation, which can be measured by using the following procedure:

1. Calibrate both traces of a dual-trace oscilloscope to measure identical voltages in the maximum sensitivity position.
2. Connect both channels of a dual-trace scope to the output of a demodulator.
3. Set the transmitter input signal to gray picture. This can be varied from black to white to measure change in noise performance with brightness.
4. Obtain a display as shown in Fig. 6 in the coupled mode.
5. Change the offset of one channel until darkband appears as shown in Fig. 7.
6. Change the offset of this channel until darkband disappears.

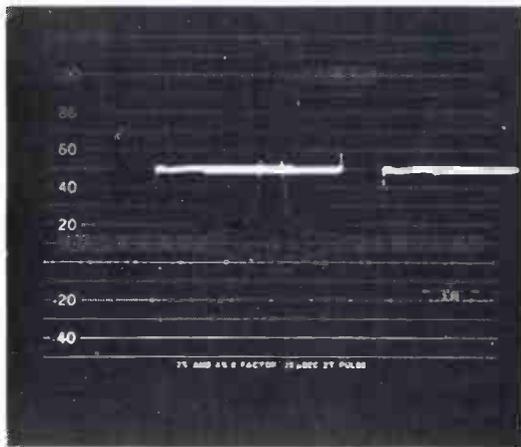


Fig. 5. Bar magnified five times with inserted noise set at -63.24 dB.

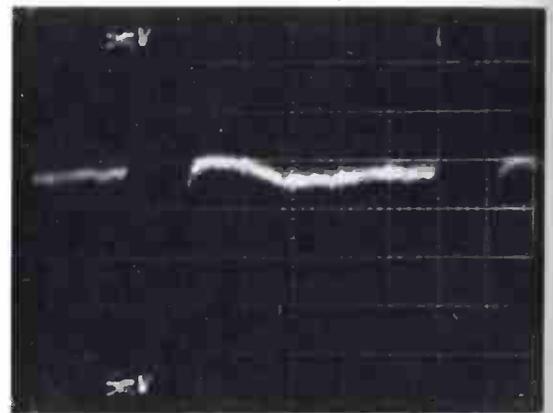


Fig. 6. Bar magnified to maximum sensitivity of scope.

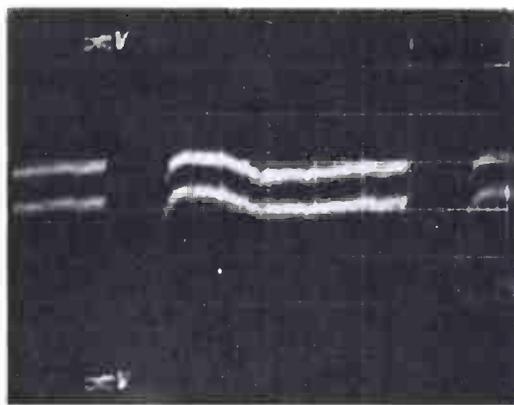


Fig. 7. Channel offset.

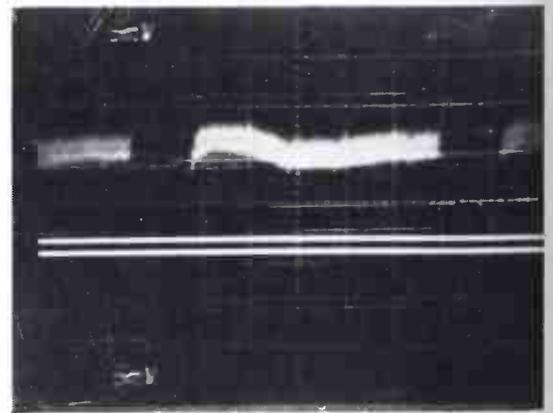


Fig. 8. Channel offset for twice the RMS noise.

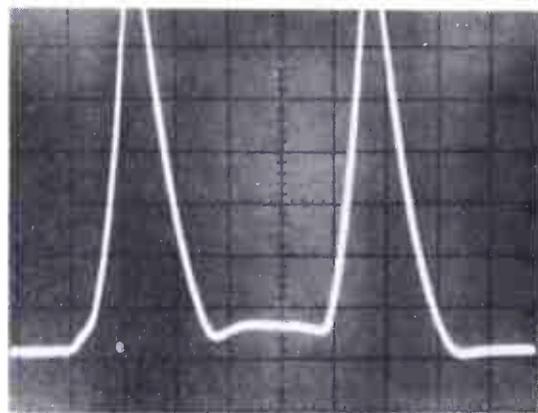


Fig. 9. Visual and aural carrier with 60 dB C/N.

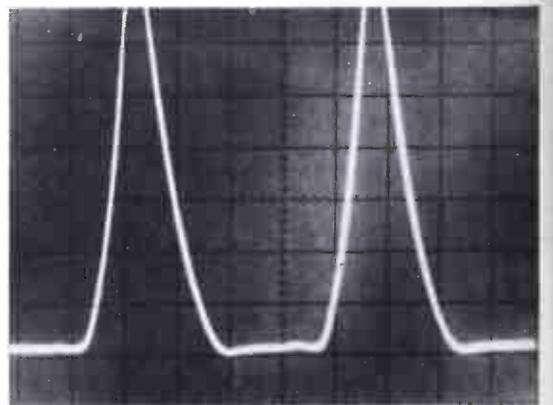


Fig. 10. Visual and aural carrier of an RCA F-line transmitter.

Remove the input to both channels; AC couple the channels and measure the voltage offset between these two channels as shown in the bottom trace of Fig. 8.

Spectrum analysis technique

Like the other techniques presented in this report, the use of a television demodulator which, due to its inherent noise, could limit the range of this measurement. Therefore, many broadcasters like to use the spectrum analysis technique to investigate the noise level of their transmitter. When using this technique, one must understand the operation of a spectrum analyzer and use appropriate conversion factors which are:

1. Conversion due to the limitations of the logarithmic display.

2. Conversion from 300 kHz bandwidth of the spectrum analyzer to 4.2 MHz.

The first conversion is required due to the Log display which tends to amplify the noise peak more than the other components of the noise. This factor is 2.5 dB. The second factor converts the 300 kHz bandwidth of the spectrum analyzer to the 4.2 MHz bandwidth of the signal. This conversion factor is given by the following:

$$CF = 10 \text{ Log } \frac{4.2}{0.3} = 11.46 \text{ dB}$$

The total conversion factor, therefore, is +13.96 dB. This amount must be added to the display noise to determine the C/N ratio.⁴

Fig. 9 shows the spectrum of the visual and aural carrier, with a C/N ratio of +60 dB, and the reference set to -10 dB. The RMS noise is obtained by adding +36 dB to the level shown in the video band, with the 4.2 MHz video filters of the spectrum analyzer on. There is, however, a 3 dB uncertainty when making measurements in this range due to limitation of the analyzer.

Fig. 10 shows the same spectrum of an F-line transmitter. This figure shows that the high frequency noise of this transmitter is lower than the noise measuring capabilities of the analyzer, since the noise floor in the video band is at the same level as the noise of the spectrum analyzer.

As shown in the next section that the high frequency noise in this range is typically -70 dB. This technique can only be used to determine that the high frequency noise is less than -60 dB referenced to peak-of-sync, since the error increases as the input noise approaches the noise limitation of the analyzer.

Noise meter reading technique

A TV noise meter such as Rohde and Schwarz, Type 4000 PS, is probably the most accurate, repeatable, and consistent instrument for measuring both low and high frequency noise. This meter measures true RMS noise directly on the video signal when one references 0 db to 1.4 volts. Since peak-of-sync is defined as the reference, the following conversion factor must be added to meter reading:

$$CF = 20 \text{ Log } \frac{0.714}{1.14} = -4.06 \text{ dB}$$

The meter enables one to evaluate the transmitter's noise performance over various bandwidths by use of a selectivity filter.⁵ The various bandwidths of these filters are listed in Fig. 11, along with the performance of an RCA transmitter. There is also a switchable noise

weighting filter (Christopher-Barstow curve) which is recommended by the CCIR and matches the sensitivity of the human eye to observe noise voltages on TV screen. This high frequency noise is harder to detect on a monitor due to its fine granularity as compared to low frequency noises whose large grain size tends to overlap and smear the picture. The attenuation versus frequency for this weighting network is given by the following formula:

$$\text{Attenuation} = 10 \text{ Log } \frac{\left[1 + \left(\frac{f}{0.27} \right)^2 \right] \left[1 + \left(\frac{f}{1.37} \right)^2 \right]}{\left[1 + \left(\frac{f}{0.39} \right)^2 \right]}$$

where f is the frequency in MHz. The plot of this equation continued on page 156

Bandwidth	Signal-to-Noise Ratio		
	White	Gray	Black
40 Hz to 10 MHz	62	60	61.2
40 Hz to 4.2 MHz	62.2	60.2	61.4
10 kHz to 4.2 MHz	65.8	65.2	66.2
10 kHz to 10 MHz	65.3	65.0	65.8
100 kHz to 4.2 MHz	71.2	70.4	70.0
100 kHz to 10 MHz	70.4	69.5	69.4
Weighted Noise	62.5	60.6	62.5

Fig. 11. Noise performance of an F-line transmitter.

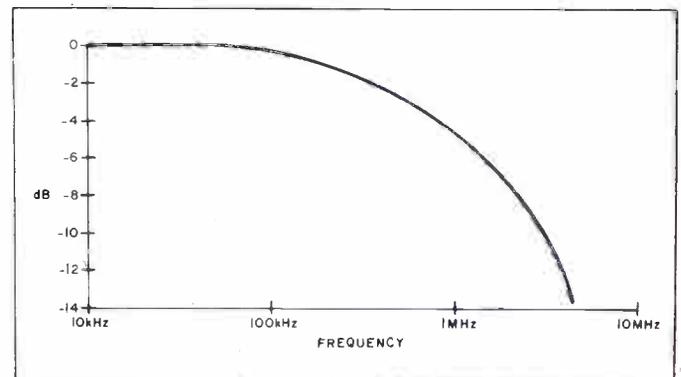


Fig. 12. Random noise weighting curve.

Do You Need A New Transmitter?

Improved signal transparency is a major requirement by broadcasters in today's highly competitive TV industry. With today's technology in high power solid-state modulators, amplifiers and voltages regulators, a broadband unweighted noise level of -60dB over the entire video band to 4.2 MHz can be achieved.

This type of performance eliminates transmission degradation due to the undesired noise generated in the transmitter and assures the performance with time due to the inherent stability of solid-state devices.

Getting a performance improvement of this magnitude over older TV transmitters that only met a -50dB rms noise specification over a bandwidth of 50 Hz to 15 kHz (when referenced to a sine wave voltage that modulated the transmitter from zero carrier to peak-of-sync) is a challenge that should receive serious thought.

TELEVISION TRANSMITTER NOISE

tion is given in Fig. 12.

This filter improves the broadband noise by less than 1 dB in RCA transmitters which indicates a very low, high frequency noise figure as shown in the data of Fig. 11.

From this data, it can be seen that the total noise is 5 dB less than the -55 dB which is accepted as the observable noise level on a TV monitor. Also from this figure, we can see that there is little change of the noise performance over the brightness range from white to black.

Although this is the best technique to measure TV noise performance, it is mainly used by equipment manufacturers and large networks since the equipment is usually considered by broadcasters to be too expensive for the limited use at a typical TV station.

Observable noise degradation

The final and most important requirement in determining the minimum noise performance is the subjective effect of noise on the viewing monitor. An experiment was conducted to determine the worst case noise that experienced TV observers could detect. This experiment used not only flat noise, but various undesired discrete frequency signals, since correlated noise is much more objectionable than uncorrelated noise. The test was performed to determine the maximum level of noise that would be imperceptible to expert viewers. The test signals used were highly saturated reds, which are very sensitive to noise degradations and gray pictures.

From the test, it was concluded that noise performance of -55 dB was required to satisfy all observers, in that, the noise inserted into the picture would not visually

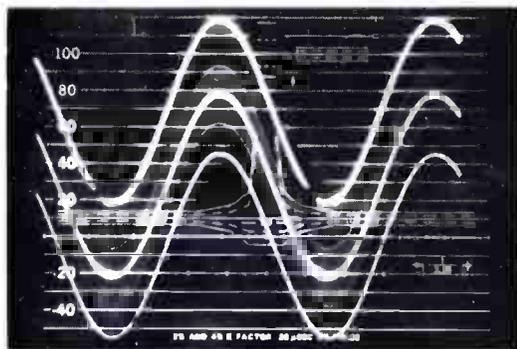


Fig. 13. Transmitter input.

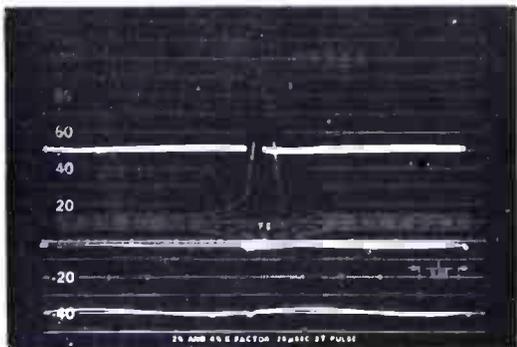


Fig. 14. Transmitter output

affect the overall picture quality; a requirement in broadcasting today. This conclusion is in agreement with data presented in Reference 1.

Reasons for the low noise performance of transmitters

One of the main considerations in the design leading to the hardware selected for the RCA F transmitters, was the optimization of picture quality. To achieve this goal, design features pertaining to low noise performance were required in these transmitters. The features include:

- Direct carrier high level modulation, which inherently has better noise performance than other types of level modulation systems due to the lower number of linear amplifiers, and the absence of a pump chain mixers required in other systems.
- Regulated DC filament, bias, and screen power supplies on all tube stages to minimize noise.
- Low incidental phase modulation to reduce any noise generated in the system due to amplitude-to-phase modulation conversion.
- Reference oscillators selected for minimum sideband phase noise.
- High level sideband filtering to attenuate lower sideband noise energy that is generated in the high power stages.

Finally, these transmitters incorporate hard clamper and an overall feedback circuit to reduce any undesired low frequency noise that is generated before the transmitter input. This reduction can be seen by comparing Fig. 13 which shows 100 IRE units of undesired modulation on the input, to Fig. 14 which shows transmitter output. These figures show approximately 35 dB improvement. Also, the video input circuit in these transmitters have been designed to operate with 8 V peak-to-peak common mode signal with greater than 40 dB common mode rejection.

Conclusions

From the above, one can see that broadband noise measurements are required to determine the true performance of a TV transmitter. There are many techniques, all of which are well suited and acceptable to measure the minimum requirements of observable noise. The one that a particular broadcaster uses will be determined by the equipment that he has available.

It is recommended that new standards be adopted for the specification of unweighted broadband noise which should be -56 dB below peak-of-sync. Also, serious consideration should be given to specifying the signal-to-noise ratio as a ratio of peak-to-peak amplitude of the picture signal (blanking-to-white or reference of 0.714 volts) to the RMS noise. The typical transmitter crest factor should also be specified. Along with these specifications the low and high frequency components should be specified separately.

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The Super System



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GREAT IDEA CONTEST

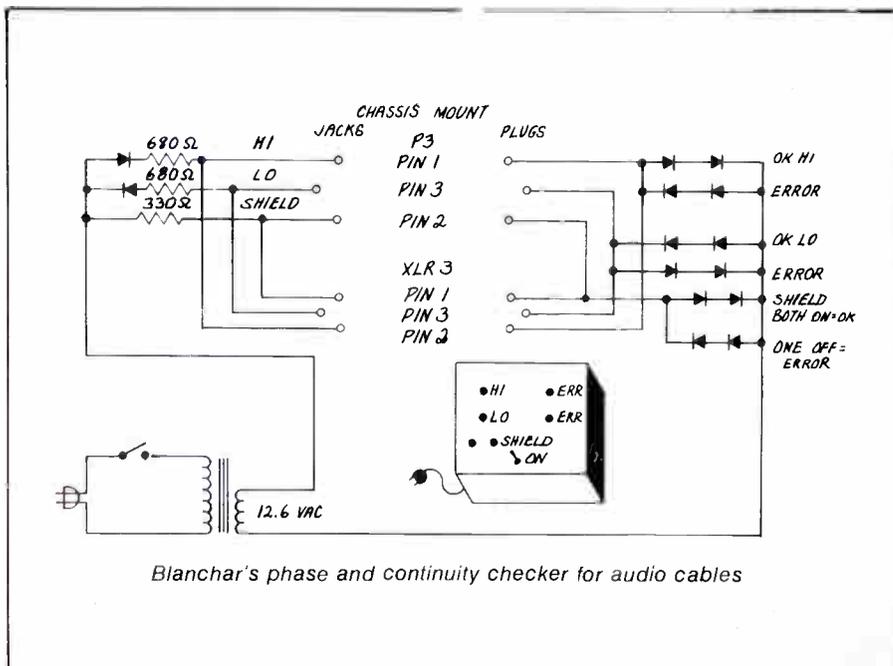
If you haven't done so already, send in your ideas for BM/E's most popular feature. The 1976 contest will be closing shortly. Remember, there is no limit on the number of ideas that one contestant can submit. And don't forget to vote on all published ideas.

21. Inexpensive instant phase and continuity checker for audio cables.

Andrew C. Blanchar, Maintenance Engineer, KGO-TV, San Francisco, CA

Problem: To design a one-step phasing and continuity checker for audio cables.

Solution: With the circuit shown,



the cable to be tested is plugged into opposite ends of the box and four LEDs (marked *) will come on if phasing is correct. Any other pattern of lamps reveals an error.

This checker can be used with any type of three-pin connectors for audio, intercoms, or power, and is especially easy when checking adapters such as a P-3 plug to a XLR-3 jack.

If colored lamps are substituted for the LEDs, the resistors should be removed.

22. Read-out System for Checking Cart Logging Data Before Use.

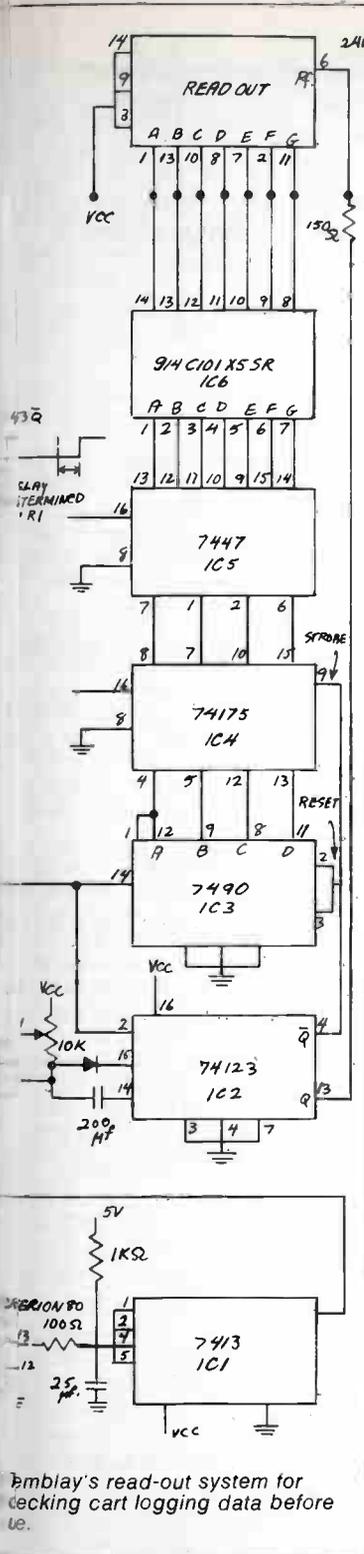
Bob Tremblay, Eng. Supervisor, KREM, Spokane Wash.

Problem: To check the correctness of logging data on carts without going through an on-air logging decoder.

Solution: The contact closure of the Gates Criterion 80 record unit is used to pulse a 7490 counter and play the results on a single LED out.

Schmidt Trigger IC1 shapes the coming pulses and feeds them to a 7490 counter and also to IC2, the output of which will remain LOW (Output) until the count ceases, will cause the count to latch in IC2 be read out while the unit counts the next digit. IC2 also resets the counter. R1 is adjusted to allow the 741 realize the count has stopped, strobe the latch before the next starts.

The unit was built up on a board and mounted on the tape. The readout socket was glued to the left side of the tape entry slot. 5 volts can be derived with the LED from the 24 volt supply of the recorder, and is on only when a cart is inserted. IC6 is a resistor chip, and can be replaced with separate 150 resistors.



Assembly's read-out system for decoding cart logging data before use.

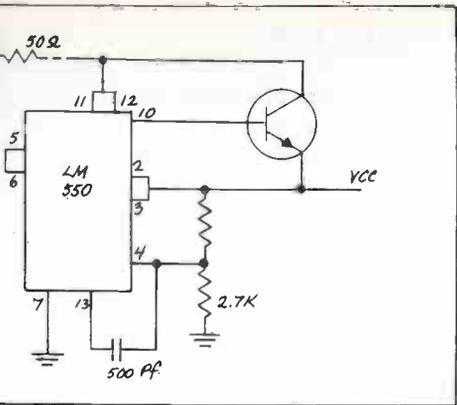
use, play the tape, and as the are displayed, you can read them ne at a time until all five have ured. I also used the unused Q pt of IC2 to turn off the decimal n when the unit is counting. e unit can be made more elab- by adding 4 more latches and ay circuits, but this one has ed our Bad Coding problems. It s us a chance to check the coding correctness before the cart is put service.

23. Simple Cue-Tone Defeat for Cart Player

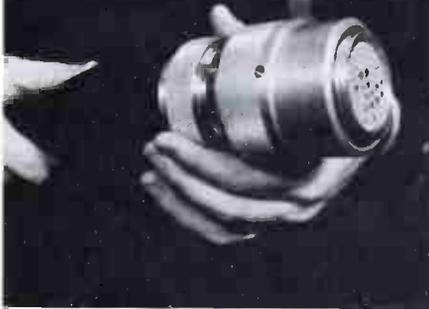
Ted Hicks, CE, KUGN, Eugene, Oregon

Problem: The station needed a front panel cue-tone defeat on ITC cart machines.

Solution: If the tertiary cue tone option is not used, that particular front panel button and lamp can be used. Otherwise a new button and lamp will
continued on page 160



1. Unscrew coupling ring



2. Slide off connector body



3. Complete access to pins and connector insert



Field-repairable

A damaged TV cable connector can put a camera out of action just when you need it most. But BIW cable with the new #85C Field-Repairable Connectors can be fixed on the spot. These unique connectors are easily disassembled for fast access to damaged pins or other

problems. No special tools required. Available in mini and standard sizes. Both East and West Coast facilities assure prompt supply and fast service on BIW cable and cable assemblies — the line preferred by local TV stations and every major TV network.

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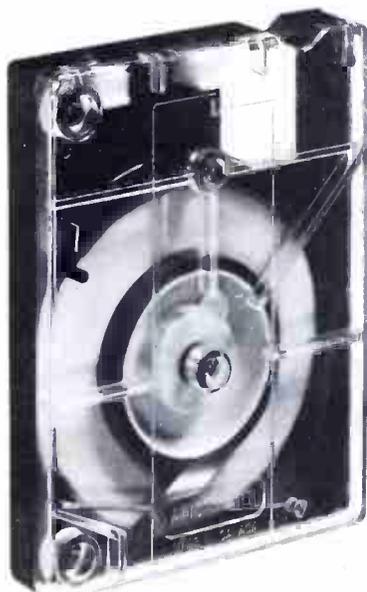
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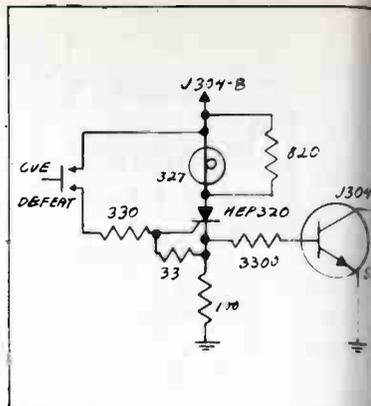
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Circle 239 on Reader Service Card

GREAT IDEAS

have to be added. All wires connected to the old button should be disconnected and stored. The new circuit is supplied with +24 volts from J304-8 when the machine is preset to record. When the cue defeat button is pushed, the SCR fires, lighting the warning lamp and forward biasing Q1 thereby grounding the original ITC cue defeat circuit control line, J304-14. The circuit resets when the machine is taken out of record mode.



Rules for BM/E's Great Idea Contest

1. Eligibility: All station personnel are eligible. Consultants to the industry may enter if the entry indicates the specific station or stations using the idea or concept. Manufacturers of equipment or their representatives are not eligible.

2. How to Enter: Use the Official Entry Form on this page or simply send BM/E a description of your work. State the objective or problem and your solution. Include diagrams, drawings, or glossy photos, as appropriate. Artwork must be legible but need not be directly reproducible but not exceeding three in number. Camera reproducible material is preferred. Length can vary, but should not exceed 500 words. BM/E reserves the right to edit material. Entry should include: Name, title, station affiliation, and the class of station—TV, FM, AM. Indicate if idea is completely original with you.

3. Material Accepted for Publication: BM/E editors will make all decisions regarding acceptability for publication. If duplicative or similar ideas are received, BM/E editors will judge which entry or entries to accept. A \$10 honorarium will be paid for each item published.

4. Voting: Every reader of BM/E is entitled to rank the ideas published. can be done on the Reader Service in the magazine or by letters or cards to the BM/E office. To vote, readers should select the three ideas they like and rank them 1, 2, or 3.

5. Winners: Relative ranking of each month's entries will be published periodically. Top-rated entries for various categories will be republished in late for a second and final round of scores. Final winners will be picked in February 1977 and notified by mail. Winners will be published in the March 1977 issue of BM/E.

6. Prizes and Awards: Three top prizes will be awarded: a slide rule engineer calculator for the entry receiving the votes in the respective categories of FM and TV. Ten pocket business calculators will be awarded as second prizes for the highest voted entries in the following additional categories (except three top winners): audio (three prizes each in categories AM, FM, TV); RF (three prizes one each in the categories of FM, TV); Control (three prizes one each in the categories of AM, FM, TV); Video (prize in TV).

Mail to: Editors, BM/E
295 Madison Avenue
New York, New York 10017

1976
Entry Form

Name _____ Title _____

Station Call Letters _____

City _____

State _____ Zip _____

Telephone No. _____

Licensee _____

Class of Station at which idea is used (check one) TV _____ FM _____

AM _____

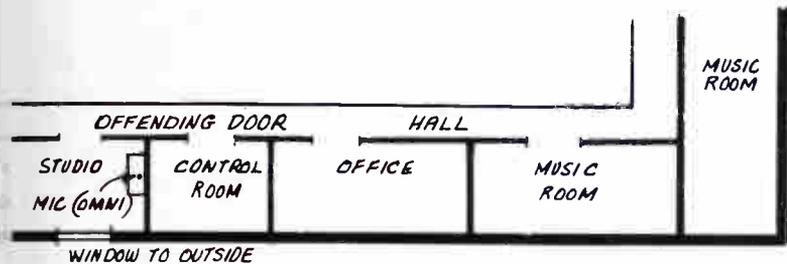
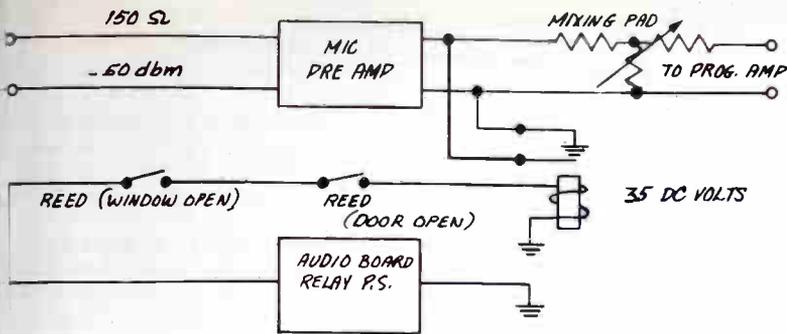
Category: Audio _____ RF _____ Video _____ Control _____

Objective or Problem: (in few words; use separate sheet for details) _____

Solution: (Use separate sheet—500 words max)

I assert that, to the best of my knowledge, the idea submitted is original with this station; and I hereby give BM/E permission to publish the material.

Signed _____ Date _____



White's solution to excess noise in the studio

Teaching high-school operators of FM station to eliminate noise.

White, CE, WLTL, La Grange,

Problem: WLTL is a high school station (10 watt) FM station in La Grange, Ill. Like most stations of this size, WLTL is located in a heavily populated section of the school. To make matters more interesting, the station and choir lessons were given in the same room. Needless to say the station was exposed to all types of noise. If a student left the studio door open it sounded as if there was a small war going on behind him when he went on the air. Unhappily, this was far from a pleasant occurrence.

Solution: To solve the problem I asked my fellow students to close the door of the studio before they went on the air. When this didn't work, while I was still a senior in the school, I put normally-open reed

switches on the door and window. The switches were tied to a normally closed relay as shown in the scheme. This simple circuit worked quite well. It created no clicks or pops. The first week was a horror, but after that there was no dead-air and no back-ground noise. The station now sounds more professional and the student operators have learned an important part of their skill.

25. Providing A Recue On The TCR 100 After Record In the A-B Dub Mode.

Barry Erick, Studio Engineer, WBRE-TV, Wilkes-Barre, PA.

Problem: To allow out TCR 100 to play re-cue following an A-B Dub. Following a normal recording, the cart play re-cues but following an A-B Dub, the recorded cart rejects and then, if the cart is to be checked out, as all of ours are, the operator must then push the Play Cue-up pushbutton.

Solution: In the PCL nest a wire wrap change was made, and a gate and a diode were added. This is compatible with all TCR 100's thru the 100A 6000 series. The B cart normally (in dub) rewinds and rejects when the B Reject/Rewind FF is set by gate 572 (an EOP A-B dub). To get the B tape to recue and not reject, a change must be made here. First we disconnect gate 572 from the AB Dub Reject bus and connect it to the A Recue Rwd FF,

continued on page 162

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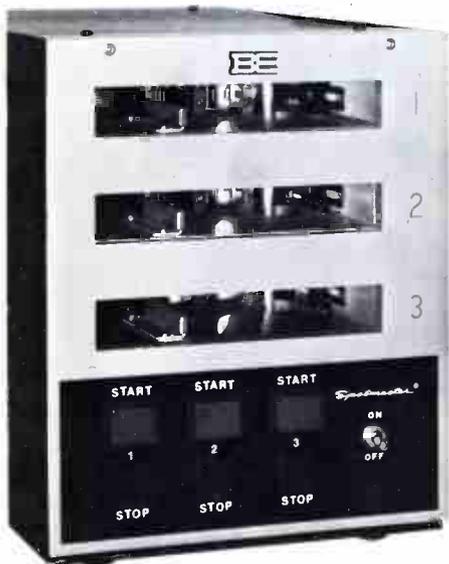
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GREAT IDEAS

element 509-9. We then add a gate to duplicate element 546 and feed its output to B Play Recue Request bus at element 605-10. (In place of this new gate, a diode could be used from gate 572-45 to 605-10, but there is only one available, and that would be used in the next step. If you wish, you may add a diode in the backplane area instead of adding a gate.) Now that this is done there is one nuisance to be taken care of. When the A cart is re-cueing, following the recording, the Record Recue indicator will come on, due to the A Rec Cueup FF not being reset, and this is where we use the one free diode in the PCL nest. We add a diode between gate 572-45 and 216-15 to set the inhibit during an AB Dub recue, just as it is on an AB Dub reject. The wire wrap changes, compatible with all TCR 100 & 100A's, except for * diode, for which a differ-

ent location diode is available, listed:

DELETE:

G3-16 to G7-45
G7-45 to G14-4

ADD:

G7-45 to G11-9 (572-45 to 509-9)
G7-47 to H8-11 (572-47 to new gate)
G7-49 to H8-12 (572-49 to new gate)
H8-8 to H9-10 (new gate to 605-10)
*G7-45 to G5-35
(572-45 to new diode cathode)
*G5-25 to G3-15 (anode to 222-15)
*if G5-25&27 are used and G5 is a PC11A (TCR 100A)

substitute the following two wraps in place of the starred ones only.

G7-45 to G5-52
(572-45 to cathode new diode)
G5-46 to G3-15
(anode new diode to 222-15)

Also, on early machines, it is not possible to preview-play a cart in the Dub mode. RCA now incorporates feature by changing, in the SCL nest at 1160-47 the AB or AB Dub Opt logic to just AB Option. RCA d

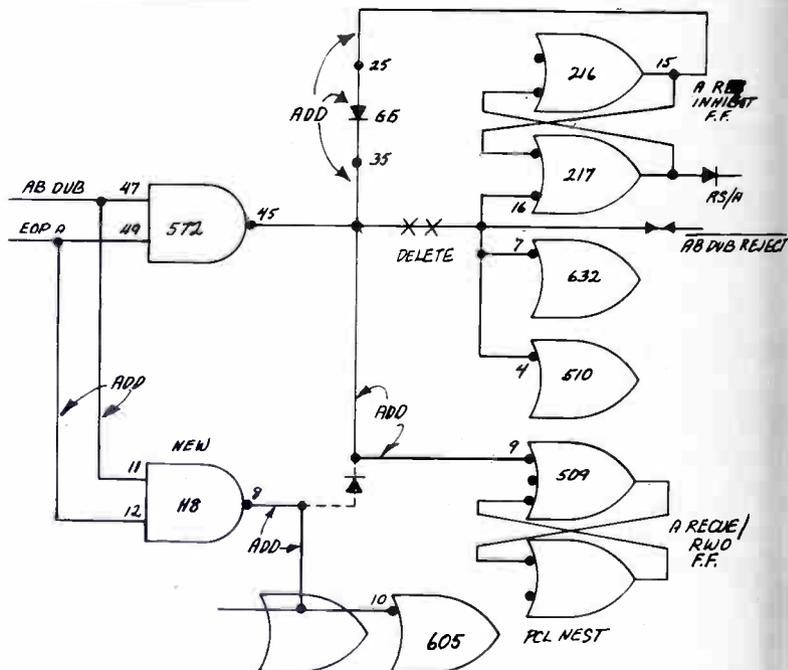


Fig. 1. Play recue following AB dub by Erick

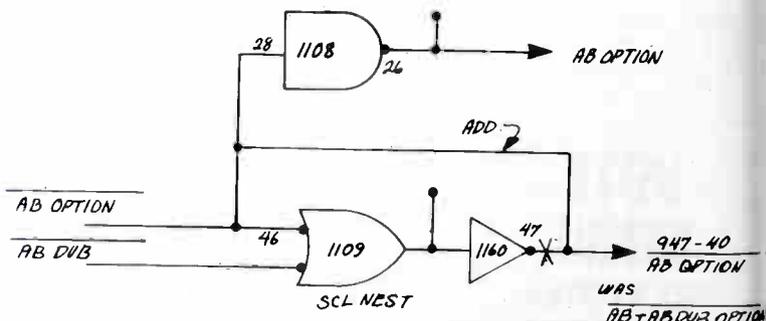


Fig. 2. PVW play in AB dub option

changing three gates (freeing
and using an inverter in place of a
We did it by moving one wire:

E:
47 to C4-40 (1160-47 to 947-40)

8 to C4-40 (1109-46 to 947-40)

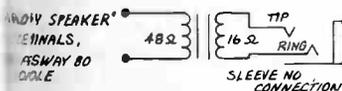
able to have the machine to
following a dub saves approx-
y 20 seconds of wait between
and playback. Of course the
will reject instead of recue, as
if the Reject p.b. is pushed or
dubbed cart is longer than the dub

Using Hi-Fi Headphones On Broadcast Consoles.

By B. A. Erickson, Chief Engineer,
Robins Broadcast & Sound Equipment
Commerce, TX

Problem: To be able to use the
hi-fi style headphones with typ-
ical broadcast consoles.

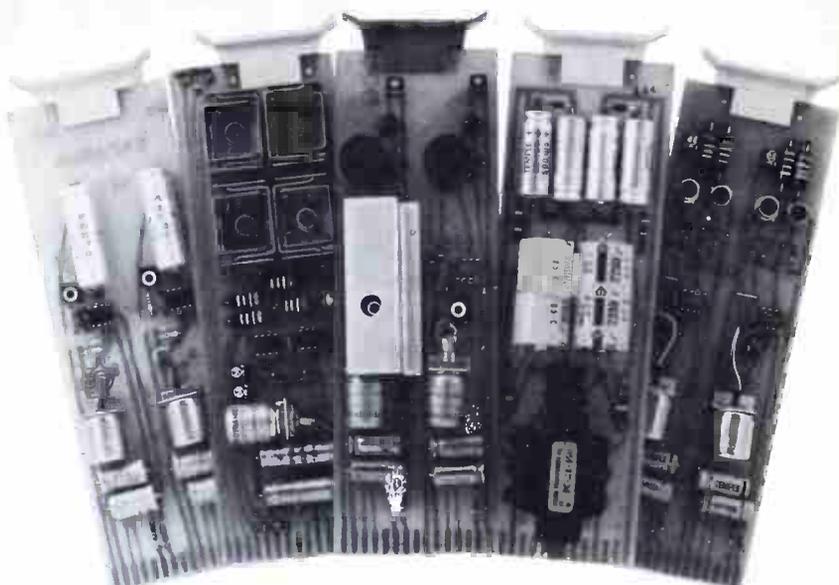
Solution: Since most of the hi-fi
headphones are low impedance they
do not work well with the consoles that
bridge the monitor across the program
with isolation resistors. Our
Integra 80 is of that type. I noticed
a mismatched pair of terminals that were
supposed to connect to the lobby speaker,
so as an experiment connected the
48 ohm HV/ILC headphones across
them. The results were everything I
could ask for. The usual volume of the
monitor speaker was a little lower than
normal for comfortable volume in the
control room. When the control room
microphone was keyed the headphones
went mute, nor change volume.



The final configuration retained the
monitoring transformer (48 ohms to 16
ohms) to protect the monitor amplifier
from any possibility of shorts. I used a
48 ohm headphone jack wired to the tip
and ring. This will now provide mono
monitoring when a standard stereo head-
set is plugged in and as well will
work with mono 'phones. The cost of
this set-up is almost nil.

One additional advantage of this
is that the operator can monitor
the product through his headset since
he can hear audio from the modulation
or to the external monitor input
on the console.

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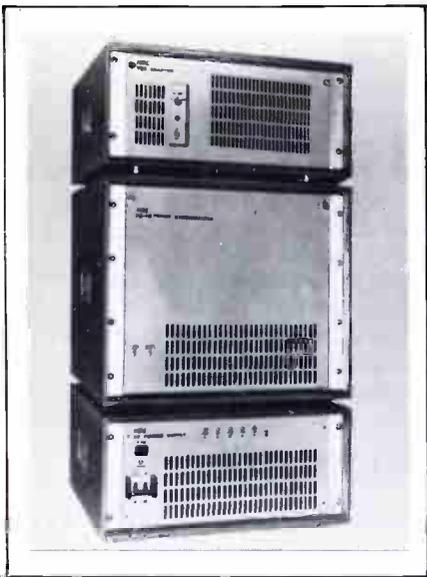
BROADCAST EQUIPMENT

'Super Synchronizer' from NEC and Sintronic FM Transmitter highlight BM/E's September Survey of New Broadcast Equipment

'Super' Frame Synchronizer 300

The "Super Synchronizer" is a new version of the first television frame synchronizer which won the 1975 Emmy award for outstanding achievement in engineering.

The new version adds a time base correction adaptor which has an infinite correction window and offers the capability to correct time base errors from

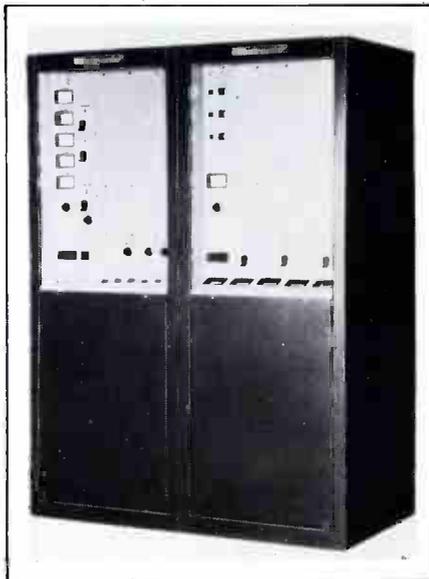


U-matic or other helical VTR signals. In addition, the adaptor allows for open loop operation with only a single connecting cable for non-phased input video. No feedback timing pulse is required for VTR.

The video signal transmitted from the VTR in the field or studio by the "Super Synchronizer" enables the time base correction and synchronization features to operate simultaneously. NEC AMERICA, INC.

Dual Power FM Transmitter 301

This new FM transmitter has a dual power output capability, rated at both 10 kW and 14 kW; providing a controllable Effective Radiated Power (ERP) in situations where the ERP is limited by law.



For example, 10 kW RF radiation may be allowed from the antenna, but due to a long feed line, 2.5 kW are lost in the transfer of power from the transmitter to the antenna. In such cases, the DMF-10B/DFM-14B would be set at 12.5 kW thus providing full authorized output power at the antenna.

The new transmitter utilizes direct FM all solid-state exciter, grounded grid power amplifier and conservative design features. A two cabinet design permits power operation as a one kW transmitter from a driver section in the event of power amplifier shutdown for maintenance. SINTRONIC CORP.

Audio Cable Tester 303

A time-saving, reliable method of checking audio cables is provided by the Q-Chek Cable Testers. The QC-1001 determines performance status of audio cables with over 180 combinations of standard audio terminations. QC-1002 offers 350 possible connector combinations.

The suspect cable is connected to the tester and a series of pushbuttons are depressed sequentially to instantly indicate cable condition with lighted buttons. Power for illuminated button is supplied by a 9 Vdc battery; cabinet is made of rugged 20 gauge steel; tester

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on reader service card.**

measures 4 x 5 x 11½ ins. and weighs 3.5 lbs. SWITCHCRAFT

FM Exciter

FM exciter Model 675 for use in standard FM broadcast band is a solid-state unit equipped with silicon transistors, diodes and ICs. It is the totally synthesized FM exciter on the market and has a highly stable 8 MHz crystal as the reference. Its divider circuits can produce any output frequency in kHz increments in the FM band.



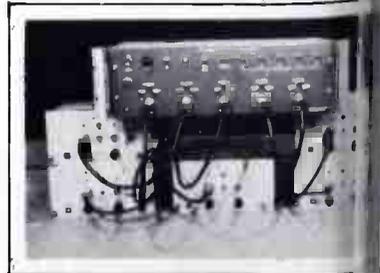
Using a phase-lock loop circuit, frequency-modulated oscillator inhibits the same frequency stability of the 8 MHz crystal, supplying full power with no spurious responses. \$1995. SWITCHCRAFT CORP.

Video Distribution Amplifier

The Model 110 Video Distribution Amplifier features 6 outputs with a maximum output level of 2.0 V. Maximum input level is up to 3.0 V and the gain is adjustable from +20 dB to -20 dB, with a gain stability of ±0.05 dB. Response is ±0.1 dB from 0 to 100 MHz. Three model 110 VDAs can be horizontally mounted into the frame or ten VDAs can be vertically mounted into the 103 frame. DI-INC.

ENG Battery Sequencer

The Battery Sequencer will automatically charge up to 5 HL-33/33A gamma battery packs at one time.

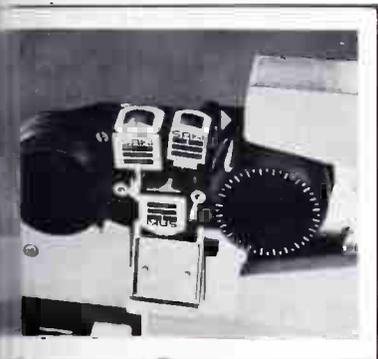


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ge. Full charge is indicated by a
o which indicates "ready." Five or
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continued on page 166

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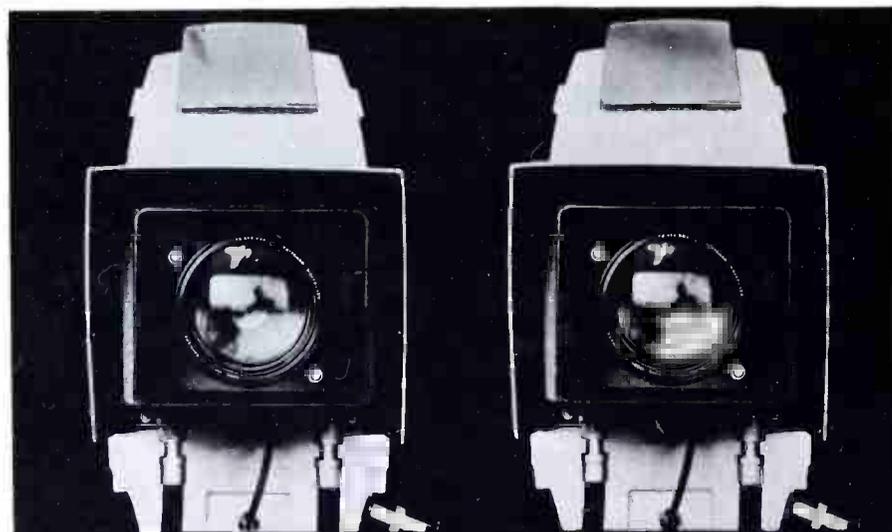
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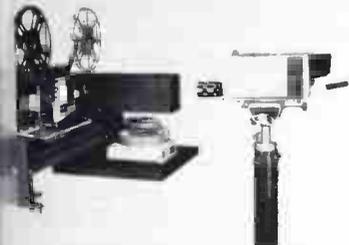
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MBER, 1976—BM/E

BROADCAST EQUIPMENT

slides, and the color fleshtone patterns. Series 100 and 200 slides are for use with 2 x 2 film chains slide projectors and direct coupled equipment. Series 300 and 400 slides cover the 8 x 10 size employed with Tele-Pat test pattern illuminators II-RS and IV-C. Patterns may be obtained on 18 in. x 24 in. paper charts for use under normal scene lighting. TELE-MEASUREMENTS INC.

Directional Power Meters 314

New directional power meters, Models 2001 and 2002 have been designed for all communication system applications. They are direct reading wattmeters with frequency ranges of 1-4 GHz or 4-8 GHz respectively. Power ranges are from 20 mW to 30 W. The instruments consist of an indicator unit and a measuring head connected by a 1.5 m long cable. The incident and reflected power are indicated on separate meters simultaneously so that different measurement ranges can be independently selected. RHODE & SCHWARZ.

Ultra-Isolation Transformers 315

New high power Ultra Isolation Transformer and AC Line Regulator systems for protection of sensitive equipment against line noise and voltage fluctuations utilize a unique box shielded design to achieve maximum attenuation of power line interference caused by switching spikes, lightning strikes and other line transients. The transformers are especially effective for isolating large computer installations where line noise can create serious problems, including data error, memory loss and equipment damage. The regulators feature 98% efficiency (for lower equipment operating cost), responses time of less than 1 cycle, and less than 0.1% harmonic distortion. TOPAZ ELECTRONICS.

Multi-Deck Tape Cart Machines 316

Spotmaster Series 5000 Multi-Deck Tape Cartridge Machines are available in 3- and 5-deck models, and feature



continued on page 168

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completely modular construction, hinged front panel, slide-out decks, plug-in electronics, and ribbon cable for increased reliability, versatility, and maintenance accessibility. They are designed to withstand continual 24-hour operation and incorporate one-half inch thick slide-out decks, massive air-damped solenoids, and a direct drive hysteresis synchronous motor. All models have an audio muting circuit that turns off the audio from any idle deck. Both 3- and 5-deck machines may be rack mounted or used as table top models. BROADCAST ELECTRONICS.

Spring Reverb Unit 317

Dual-channel Model 111B spring reverb features the same basic electrical design as its single channel predecessor but offers a new bass control and "quasi parametric midrange control



which permits stepless adjustment of its ± 12 dB equalization range, as well as continuously variable control over center-frequency and bandwidth. Includes the "floating threshold limiter" which minimizes "spring twang" and provides absolute protection from overload. Comes in a standard 19 in. rack mount and is 3½ in. high. \$695. ORBAN/PARASOUND.

NPR Magazine Cover 318

Improved magazine front protection cover for Eclair NPRs is made of form fitting rubber which will not get bent and absorbs shock, unlike metal covers. \$15. ECAM COMPANY.

Protective Marking System 319

A new system for marking property and valuable equipment with an invisible identification code has been developed. The system has the endorsement of insurance agents and various police departments. The kit uses a marker that applies invisible ink, and includes a Brink's emblem to warn that the item

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has been marked. A procedural guide also included. \$2.95 at stationery department stores. SANFORD CORP.

Noise Transfer Eliminator

The VIF 1002A is an operating adaptor which has been developed to eliminate mechanical noise transfer problems and reduce the weight noise levels of Ampex tape recorders. The adaptor is a sophisticated electronic amplifier circuit. Each adaptor comes with a detailed calibration chart showing frequency response and gain to noise ratio plus complete installation instructions and a revised schematic of the Ampex model in which it is used. It is designed for use in Ampex recorders equipped with the octal base 12SJ7 tubes, with the exception of Ampex Model 3200. VIF INTERNATIONAL.

Control Multiplex System

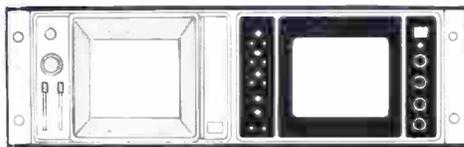
The CMUX-29 is a self-contained control multiplex system which allows an engineer to interface his control panel with remotely located equipment. CMUX-29 is, in effect, a "black box" which readily integrates into a wide variety of systems applications. It consists of a transmitter and remote receiver and relay unit utilizing CM

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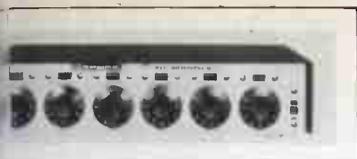
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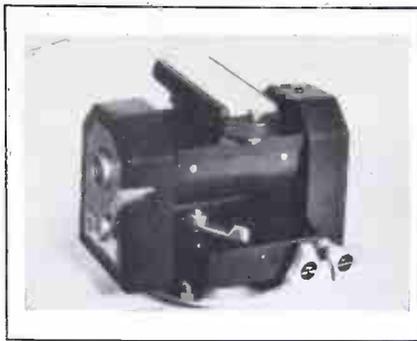
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remixers, the SE30 gated com-
miser, the M610 feedback con-
and the M63 audio master. It
powered from the nominal 28 to
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for portable, lightweight (up to
ENG and studio cameras is

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pan and tilt modes and features a quick
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vides 100 W of output power from a 28
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10 Channel Dual Mono Audio Console 325

The S-21 Signature II 10 channel dual
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substitution at will of high and low
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former inputs and outputs, internal 12
W monitor and cue amps, internal bar-
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munity. \$3,245. LPB INC.

"Super Studio" Lens 326

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M.O.D. of 15.7 in. and uses the stand-
continued on page 170



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CB Converter for Car Radio

Citizen Band Converter converts mobile AM radios to receive all channels without wiring changes. Known as CB-11, unit has an illuminated front knob switch for channel selection, and an all metal case that acts as a shield to cut down ignition motor noise and a built-in capacitor for quieting and a sensitivity control for sharper channel adjustment. SPARKOMATIC CORP.

Noise Suppression

Single-ended noise suppressor, Model 240 "Dynex," is a program control filter/expander which offers an effective means of suppressing a certain amount of residual background noise in audio reproduction systems, TV channels, and "phone patches." Features selective suppression of rumble or wideband noise, and restores program dynamics by linear broad expansion. Variable threshold adjustments and visual indication of operation are provided. VONICS, INC.

Flexible Audio Mixer

Audio mixer is comparatively compact, 29" x 15" x 5.5", 40 lbs, but incorporates highly flexible control systems for 16, 20, or 24 channels. Model 2022 claims intermodulation distortion of .008%, with 6-70 dB gain, 4:1, and output noise 80 dB below 1 dBm. Some features are: three equalizers on each channel; pan pot for mix for headphones, foldback on monitor; LED peak overload indicator on each input; three-color digital VU meters; echo return with solo and mute. \$5600, 16 channels; \$6500, 20 inputs; \$7660, 24 channels. 2005AD, INC.

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continued on page 172

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Broadcast News Handbook Donald W. Miles of the University of Florida covers news broadcasting the introduction of newsroom practices and principles to instructions for coverage of news stories. This text has been written for use by colleges, colleges, broadcasting schools, radio and TV stations. Subjects include ethics, stringer assignments, conferences, civil disorders, fair use of minorities, police and court relationships with hospitals, search rescues, disasters, government politics, the style of the newscast station management are covered. 392-page text, No. 21183, \$9.95. Howard W. Sams & Co., W. 62nd St., Indianapolis, IN. 46

Sound System Engineering discusses audio systems as a whole. It reviews the most significant personnel and events that brought audio systems to their present high level of technology. Supplementing text material is a complete guide to sound system engineering filled with drawings, photographs, charts, graphs, and tables. The book is 296 pages, 8½ × 11, hardbound lists for \$19.95. Howard W. Sams Co., 4300 W. 62nd St., Indianapolis, IN 46206.

Electronic Music Circuit Guide explains sound generation waveform synthesis and shaping includes many individual circuit generating and tailoring waveform individual specifications, schematics for such control elements as voltage controlled amplifiers and oscillators details on precision waveform generation, keyboard information, and construction and programming information. Book is \$9.95 hardbound \$6.95 paperback. Tab Books, Ridge Summit, PA 17214.

Radio Power describes radio propaganda, its techniques and historical development. The volume includes analyses of four models of international broadcasting: the wartime ideologue extremism of the Nazis as perfected by Dr. Goebbels; the Communist front service; the Voice of America; Radio Free Europe; and the copies are \$12.50 and are available from Temple University Press, Temple University, Philadelphia, PA 19

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EMBER, 1976—BM/E

Business Briefs cont. from pg 25

lumbia productions scheduled over the next 12 to 18 months.

RCA American Communications Inc. announced the signing of a multi-year contract with Hughes Television Network for at least 1,800 hours yearly of domestic satellite video transmission

Continental Electronics Mfg. Co., of Dallas, TX, has been awarded a contract valued at more than \$2 million by Radio Free Europe/Radio Liberty for the supply of ten 100,000 watt International Shortwave Broadcast Transmitters.

Goldmark Communications Corp., disclosed the consolidation of its operation's Transcan Division, in a new 12,000 square-foot facility in Stamford, CT. . . . **Data Communications Corp.**, announced the opening of a new division, Dataform, created to meet business form needs for DCC's BIAS customers and other users.

A \$618,000 contract has been awarded to **Cohu, Inc.**, Electronics Division, by the Sacramento Army Depot for the manufacture of four fully equipped Mobile Television Units. . . . **C-Cor Electronics, Inc.**, has been awarded a Key Case contract for the construction of cable television facilities in Frankfurt, Indiana.

Corning Glass Works announced its decision to withdraw from the stand-alone television image enhancer business. Corning will, however, continue to supply delay lines and custom subsystems to video broadcast equipment manufacturers. . . . **Dictaphone Corp.'s Scully/Metrotech Division** has been renamed Audio/Electronics Division. The Scully trademark will be retained.

Teledata Systems, Goleta, Cal., manufacturer of remote control and telemetry equipment for broadcasting and industrial control applications has merged with Time and Frequency Technology, Inc. . . . Frank M. Drendel of **Hutton-Drendel Associates** announced "an agreement in principle" with Superior Continental Corporation for the purchase of its coaxial cable manufacturing division, Comm/Scope.

Western Union announced an agreement with Robert Wold Company, Inc., of L.A., for use of a minimum 1,800 hours per year of video transmission services on its Westar domestic communications satellite system. The estimated value of the initial six year arrangement is \$3.8 million, and another seven-year contract for use of the satellite system, signed by the Corporation for Public Broadcasting, and Western Union will amount to \$2.4 million annually.

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People In The News

RCA President, **A.L. Conrad**, has been elected to an additional position as Chairman of the Board . . . **Charles A. Steinberg** has been named Ampex vice president of audio-video systems and data products.

The Board of Directors of Andersen Laboratories announced the election of **David E. Acker** to the position of vice president . . . **Juan C. Chiabrando** has been appointed vice president, operations, by CCA Electronics Corp. . . . **Robert N. Hurst** has been appointed to the staff of the RCA Broadcast Systems Technical Training Department.

Arch Deal is the new News Director for WLCY-AM-FM-TV . . . **Dr. David M. Guerra** has assumed the chairmanship of the Department of Radio-TV-Film at the University of Arkansas.

Donald C. Jensen is the new Quality Assurance manager for Dielec tric Laboratories, Inc. . . . **Dyma Engineering** has named **Elven Harvey, Jr.**, vice president.

Belva B. Brissett, former assistant to the minority counsel of the Senate Select Committee to Study Government Intelligence, has joined the Government Relations Department of the NAB . . . NAB also announced the appointment of new members to the Radio and TV Code Board. They are **Erica Farber**, **Edward O. Fritts**, and **Walter Rubens**.

NCTA has named **James T. McCorkle**, associate director of Government Relations and appointed **Marvin Dilbeck**, chairman of the Occupational Safety and Health Act Committee.

New members of the NCTA EEO committee will be **Clay Blanco, Jr.**, **James W. Cantor**, **Samuel Cooper**, **Beverly Land**, **Spencer Kaitz**, **Mitchell Kleinhändler**, **Don Shuler**, **Donald E. Anderson**, **Daniel Aaron**, **Charlotte Schiff Jones**, **Audrey Sculthorpe**, and **Dr. William A. Douglas**.

The National Broadcasters Club has elected new officers; they are: **Leonard Tuft**, president; **Roy Easley**, first vice president and treasurer; **Wally Briscoe**, second vice president, and **Patti Grace**, secretary . . . **Ted Hughett** has been elected to head the California Cable Television Association.

Jeff Tellis was re-elected president of the Intercollegiate Broadcasting System, Inc. . . . **Paul Montessoro** has been promoted to vice president of operations for Guam Cable TV System . . . **Thomas Wendt** was recently elected president of the Illinois-Indiana Cable TV Association.

Bruce D. Buck has been appointed vice president International Sales for CCA Electronics . . . **Bob Tria** has

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promoted to Sales Manager for National Tapetronics Corp. and Wasserman has joined ITC as advertising and Market Research manager.

Don Webster has been appointed sales manager for GTE Lenkurt

Harris Corp.'s Broadcast Products Division has announced the appointment of **George W. Hamilton** as manager of International Sales Administration.

erry N. Larkin has been named advertising director for LPB, Inc.

Felix D. Bonvouloir was appointed midwest regional manager, Broadcast Sales, for International Corp. Systa-Matics, Inc., named **T.V. (Ted) Anderson** to be its new western regional marketing manager.

thy Z. Sawyer has been named an engineer of KCMO-AM and KFEM, Kansas City. Chief

manager **James D. Parker** has been appointed to vice president at WXIX-TV, Cincinnati. KSAT-TV announced the appointment of **David Harris** as chief of engineering.

Ernur N. Terwilliger has been appointed president of International Wave Corp., Cos Cob, Ct.

Burke Broadcast Consultants has named **Lester Bollinger** as managing broadcast field sales. **Nick Pappas** has been named engineering manager for IGM/NTI.

Robert A. Hart, Jr., has been appointed to dual posts as vice president, Midwest-Hill Broadcasting Company, general manager of station

CI-TV, Denver. **Gary K.** has been named vice president,

operations, at Convergence Corp.

hip J. Davis has been appointed vice president, Corporate Marketing Administration at International Video Corp. GTE Sylvania has named **Joseph Marinis**, director of engineering Entertainment Products Group

Jim A. Summers has been ap-

pointed director of marketing for Consolidated Video Systems, Inc.

Modular Devices, Inc. has named **Leslie F. Cooley**, chief engineer, Modular Audio Products. **John Kircher** has been appointed Sales manager for LogiMetrics, Inc.

Joseph Gibbs has been appointed National Industrial sales manager for coaxial cable communications products of Magnavox CATV. Dictaphone Corp.'s Audio/Electronics Division has named **Stanley D. Becker** as the new manager of engineering.

Frederick L. Bones has been named sales manager for television and motion picture lenses by Rank Precision Industries. **John G. Campbell** has joined Convergence Corp. as vice president, marketing.

Robert L. Nelson, general manager of KNX/FM, L.A., has been named vice president, CBS Radio.

Pete Pappas has been named president of Big Valley Broadcasting; **Harry Pappas** has been appointed president of Pappas Television Inc., and **Mike Pappas** has been made president of KMUV-TV, Sacramento. **Casey Santos** has been named general manager of KGEN and KBOS Radio, Tulare, CA.

Pete Sieler joined KEVN-TV/KIVV-TV, Rapid City, SD, as station manager. **Albert C. Lucero**, general manager of WROC-TV, Rochester, and **Allen S. Feuer**, general manager of WEYI-TV, Flint have been named vice presidents of their respective Rust Craft Broadcasting Company Stations. **W. Austin Cross** has been named operations manager of Keokuk Cablevisions.

Gordon W. Pearlman will serve as the Western Regional sales manager for Kleigl Bros. **John F. Schneider** has been named Western District sales manager for McMartin Industries. Advent Corp. has promoted **Francis L. Reed** to director of marketing.

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ADVERTISER'S INDEX

Alexander Manufacturing Co.	142
Allied Broadcast Equip.	150
American Data Corp.	40
Amperex Electronic Corp.	11, 29
Ampex Corp.	77
Ampro Corp.	16
Amtron Corp.	168
Angenieux Corp. of America	49
Aristocrat	160
Audio Designs and Mfg., Inc.	85
Audiotechniques Inc.	175

Barbizon Electrical Co.	167
Belar Electronics Lab., Inc.	171
Beyer Dynamic	107
Boston Insulated Wire & Cable Corp.	159
Broadcast Cartridge Service	168
Broadcast Electronics, Inc.	162
Broadcast Specialties of the Northwest	133
Buhl Optical	167

Camera Mart	89
Canon USA Inc.	43
Capitol Magnetic Products	103
CCA Electronics Corp.	171
Central Dynamics Ltd.	15
Cetec Audio	102
Cetec Broadcast Group	129
Chyron Telesystems	31
Cinema Products Corp.	99
CMX Systems	111, 115
Collins Radio Group	Cover 4
Commercial Electronics Inc.	117
Communications Technology Inc.	114
Computer Image Corp.	47
Conrac	67-72
Consolidated Video Systems	105
Continental Electronics Mfg. Co.	95
Convergence Corp.	20, 21
Cosmicar Optical Co.	138

Datatek Corp.	8
Datatron Inc.	32, 51
Datavision/3M	59
Delta Electronics	112, 113
Digital Video Systems	149
Ditch Witch Trenchers	25
Duca Richardson	137
Dynasciences Video Products	18

Eastman Kodak Co.	19
Edco Products	172
Electro Impulse, Inc.	174
Electronic Devices, Inc.	174
English Electric Valve Co.	13
ESE	119, 166

F&B Ceco	174
Farinon Electric	125
Fidelipac	104, 108
Frezzolini Electronics Inc.	10

Grass Valley Group	5
--------------------	---

Harris Corp.	23, 33
Hughey & Phillips, Inc.	161

IGM, Div. NTI	10
Ikegami Electronics Ind. Inc.	26, 27
Inovonics, Inc.	18
International Tapetronics Corp.	14, 140

JVC Industries, Inc.	7
----------------------	---

Laird Telemedia Inc.	38
LPB Inc.	170

Marconi Instruments	135
Marti Electronics, Inc.	132

McCurdy Radio Ind. Inc.	Co
MCI	
McMartin Industries Inc.	
Micmix Audio Products, Inc.	
Microtime	109
Micro-Trak Corp.	
Microwave Associates, Inc.	
Modular Audio Products, Inc.	
Monroe Electronics, Inc.	
Moseley Associates, Inc.	
Multronics, Inc.	

National Electrolab Ltd.	
NEC America, Inc.	
Nurad, Inc.	

Orban/Broadcast	
Orban/Parasound	

Pacific Recorder & Engineering Corp.	
Philadelphia Resins Corp.	
Philips Audio/Video Systems Corp.	
Potomac Instruments	

QRK Electronics	
Quantum Audio Labs	
Quick Set Inc.	

Ramko Research	
Rank Precision Ind. Inc.	
Rapid Q	
RCA Broadcast Systems	
RCA Distributor & Special Products Div.	
Recortec, Inc.	126
Revox Corp.	
Robins Broadcast & Sound	
Ross Broadcast Products Ltd.	
RTS Systems	

SC Electronics	
Shure Brothers Inc.	
SMPTÉ	
Sony Corp. of America	100
Sound Systems Inc.	
Sound Technology	
Spectra Sonics	
Stanton Magnetics, Inc.	
Willi Studer America Inc.	

Taber Mfg. & Engr.	
Tandberg of America, Inc.	
Tech Laboratories, Inc.	
Technics by Panasonic	
Tektronix, Inc.	
TeleMation Inc.	
Telemet	
Telesource Comm. Systems	
Television Equipment Assoc.	
Television Products Co.	
Telex Communications, Inc.	
Tentel	
Thomson CSF Labs., Inc.	
Time & Frequency Technology, Inc.	
Transist-O-Sound	

Ultra Audio Products	
UMC Electronics Co.	91
Unimedia	
UREI	

Vacuum Tube Industries, Inc.	
Vega Electronics	
Video Aids Corp. of Colorado	
Videomax Corp.	
Videotek	
Visual Information Institute Inc.	
Vital Industries	

Ward-Beck Systems Ltd.	Co
West Lake Audio	
Wilkinson Electronics, Inc.	

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120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259
260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299
300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319
320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339
340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359
360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379
380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399

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120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259
260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299
300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319
320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339
340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359
360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379
380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399

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