

SEPTEMBER 1977

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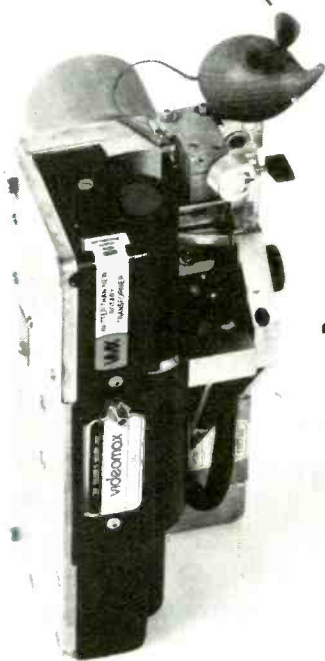
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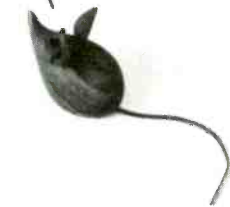
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BROADCAST INDUSTRY NEWS

Daytime Broadcasters Challenge Need For "Super-Power" Clear Channels

The Daytime Broadcasters Association (DBA) challenged the clear channel stations claims that 26 million people in alleged "white areas" listen to and depend on clear channel skywaves at night.

The DBS comments were part of a reply filed with the FCC regarding docket 20642 which seeks to determine if power for a few Class 1-A clear channel stations should be increased in excess of 50 kw and whether that would be in the public interest.

DBA pointed out in its reply that "the compelling greater need of about 44 million people in 1498 small markets, served during the daytime by daytime only AM stations is to have fulltime AM radio services broadcast locally. According to DBA rather than permit greater power for clear channels, an additional 12 Class IV channels would permit 2000 of the present 2250 daytime only stations to assume fulltime operation. These 12 Class IV local channels could be obtained by the Commission re-classifying 12 of 25 Class 1-A clear channels.

New Sitcoms Electronically Recorded Sans Production Switchers

Two new sitcoms of the fall TV season, "The Betty White Show" and "We've Got Each Other" (both MTM produc-



Prior to a full switch to video, test was made comparing 35mm film (left) with Thomson 1515 (center) and Thomson Microcam (right).

tions) were videotaped last month by CBS but with a significant break with tradition. The shows were shot on film lots using film sets by film craftsmen. There was no production switcher involved in the shooting phase.

Equipment used (Thomson 1515 studio cameras connected to one-inch Sony BVH-1000 recorders) was described last month in *BM/E* (p. 6) based on an earlier report by Joseph A. Flaherty, CBS Television Network at the 10th International Television Symposium, Montreux.

There are two firsts in the latest example of electronic cinematography: first time use of the low-cost one-inch VTRs for prime-time programming and the first time IATSE members are actually operating videotape equipment (as opposed to standing by and watching others) under the new IATSE/studio "videotape" agreement.

NRBA Sold Out For New Orleans Meeting

The National Radio Broadcasters Association appears to be well set for its biggest convention so far with exhibit space already entirely sold for the four-day stand, October 9 through 12, at the Hilton Hotel in New Orleans. About 70 firms are on the exhibit list and more than 30 additional firms signed up for hospitality suites at the time of writing (mid-July), with more expected.

The program, in near-final form, will have four to five concurrent sessions each morning, each consisting of a small panel of experts assembled to discuss "gut" topics for radio broadcasters under the general headings of Management, Sales, Promotion, Programming, Audience Research and Engineering. More than 40 topics of paramount current interest to radio broadcasters will be covered by panelists nationally known in their respective fields. John Richer, NRBA vice president, stressed to *BM/E* the completeness of the engineering coverage and said that NRBA aimed to provide radio engineers with a full account of the most needed current information. The planned sessions on sales, programming, etc. promised to be equally thorough and valuable to radio managements.

BM/E will distribute at the meeting,

an enlarged October issue, with a complete preview of the show, and also a New Orleans "Survival Guide," with information on eating, sightseeing, relaxation in the city, along with the meeting program.

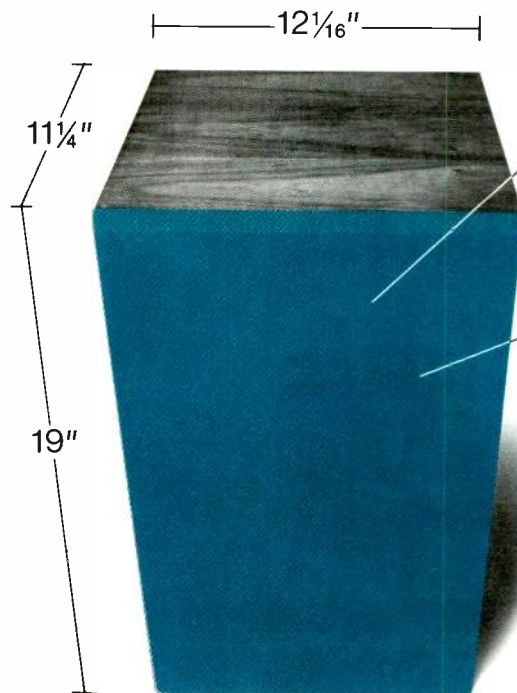
Inquiry Asks All FM Quad Questions: NQRC "On Record"

The broadcasters, hardware makers and record producers who have been pushing for some standardized form of quadrasonic transmission on FM must cap the enormous effort of the NQRC report with further comprehensive analysis and comment directed to the FCC to answer a Notice of Inquiry the Commission released on July 6 (Docket 21310). The inquiry, says the FCC, was opened as a result of three petitions urging the adoption of three respective systems: Pacific FM (with the Dorren system); General Electric (the GE system covered in the NQRC report—see *BM/E*, February, 1976); and CBS Inc., with the SQ matrix system. The objective, says the FCC, is to determine first if there is enough public interest to justify a ruling for any system; and if there is, to help the FCC decide what standards to adopt. The notice brings up for industry comment just about every important question on FM quad that could be raised. A few are (paraphrased here): How many people want it? Is the industry ready and willing to spend the money to install it? How will it affect the mono and stereo service of FM stations? What about protection ratios? Where would the programming come from? What are the advantages and disadvantages of choosing a specific 4-2-4 system (e.g. SQ) or should all matrix systems be allowable as at present? There are many others—interested persons must get a copy of the notice which asks that respondents key their answers to the question numbers and get them in to the FCC by September 15, 1977.

The Notice does refer to the NQRC report, saying that it will be part of the record. The FCC also points out that the NQRC comparative listening tests did not cover the most advanced 4-2-4 systems (as pointed out in *BM/E*'s story, Feb., 1976); consequently the FCC itself instituted comprehensive listening

continued on page 8

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News

tests, which have recently been completed. The test results will also be part of the Inquiry record and will be available to the public at a later date.

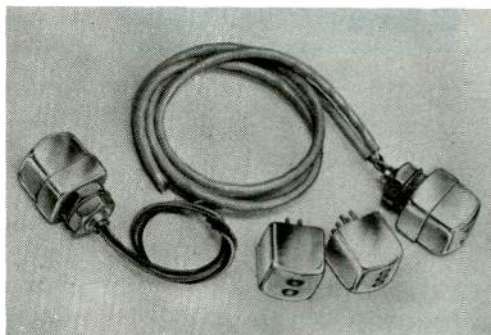
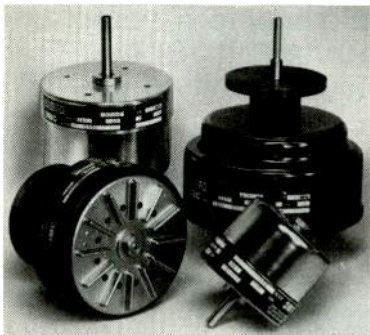
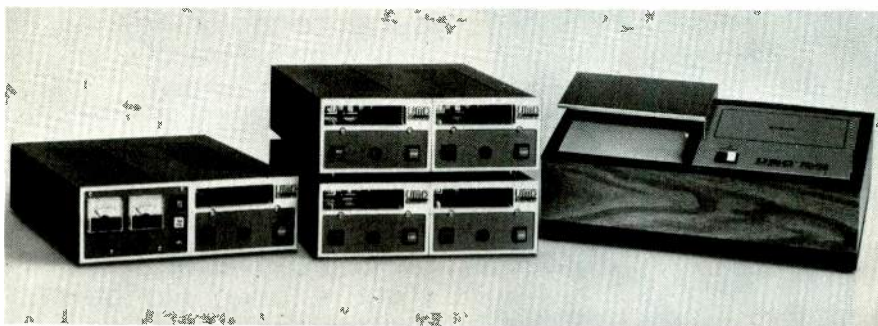
House Launches Broad Investigation Into Network Sports

The House Communications Subcommittee has expanded its inquiry into the way the networks handle sports cover-

age and major sporting events. A special counsel has been appointed to conduct the four month inquiry.

Chairman Van Deerlin (D-CA) and ranking Republican Rep. Lou Frey (R-FL) indicated that "we will try to determine whether the networks have become so involved with arranging, promoting and scheduling sports events that they, in effect, have come to control them." The goal of the investigation, according to the committee, is to provide the "widest and freest possible sports coverage for the American people."

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Philips Hochberg, a Washington attorney who represents both the NHL and NBA, has been appointed special counsel for the House investigation. Van Deerlin said that another staff member would investigate any areas concerning organizations that are clients of Hochberg in order to avoid any conflict of interest.

It was the opinion of the committee that someone knowledgeable in the workings of big time sports should head the investigation.

The investigation was sparked by questions arising from the CBS "winner-take-all" tennis matches, the ABC involvement in the U.S. Boxing Championships, and the NBC deal for the 1980 Olympics. Though no evidence of criminal activity on the part of the networks has been found or is expected to be found, the Committee hopes that the investigation will provide a basis for legislation to be written into the Communications Act rewrite.

Classical Listeners Are "Classy" Buyers Says WFMT

People who listen to classical music on the radio are the most likely buyers of more than 800 products, including not only higher-priced products and services but hundreds of "standard" items besides, according to a study released by good-music station WFMT in Chicago. The report is referred to be T.H. Richards in his column on classical programming on another page of this issue.

Calling their study "The Classical Advantage," the WFMT research team shows the buying propensity of classical listeners for each of the 800 products as compared with the buying propensity of listeners to each of eleven other standard radio formats. Average of all formats is taken as 100 for each product; the "classical advantage" then appears as a number over 100 (for example, Dodge cars, 182; Lincoln Continental, 255; trips to Japan, 301; Sanka, 161; Tropicana orange juice, 201; Edam cheese, 370; sailboat ownership, 417; Black and White whiskey, 270; Quaker Oats, 227; and so on through more than 800 products and services, up from 500 in a similar report last year).

The WFMT study, prepared by Christine Koyama, research coordinator, was based on the Target Group Index (TGI) of Axiom Market Research, New York audience research organization, which matches buying propensity, demographics, etc., of more than 30,000 respondents with favorite radio format and other data. The TGI has also allowed WFMT to prepare very detailed demographics on

continued on page 10

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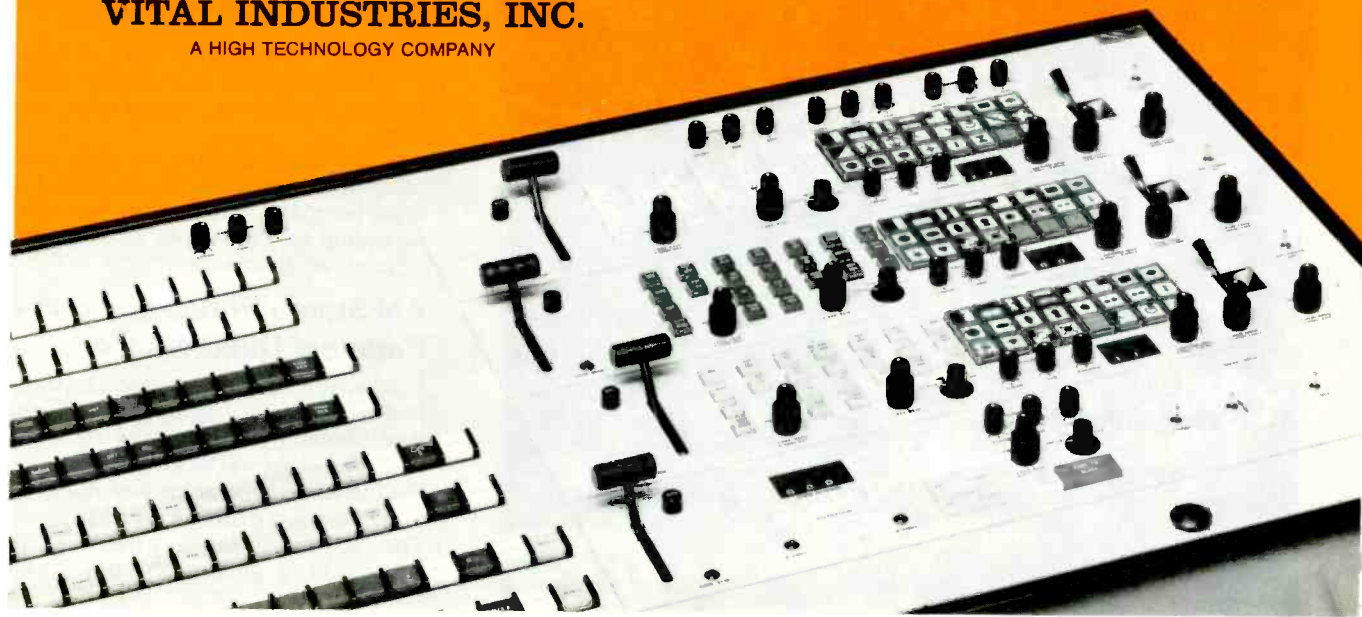
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News

the classical audience: in income, education, job status, it ranks considerably higher than any other format group.

For example, the classical listener is most likely of any groups to have a professional or managerial position, to be a college graduate, and to own a home worth \$50,000 or more. The TGI indicates that there are about 9,334,000 adult listeners in the U.S. who prefer classical music.

The detailed report is available from WFMT at 500 N. Michigan Avenue, Chicago, IL. 60611.

IVC Closes and Reopens In Same Month

International Video Corp., which ceased operations and filed a Chapter XI petition in early July, resumed operations after an agreement was reached with its bank creditors just two weeks later.

Ronald H. Fried was removed as president of the firm and replaced by Roy H. Woodman, president of Video Logic Corp., manufacturers of slow motion video equipment. Woodman will serve as chief executive of IVC as well as president. Another Video Logic officer, Jack L. Watts, will serve as executive vice president and chief operating office of IVC.

Video Logic Corp., of Sunnyvale, CA, was a customer of IVC and indicated that they learned of IVC's financial difficulties through this relationship. It is unclear whether Video Logic will eventually merge with IVC or whether its primary concern is operating the company to assure its continued supply of equipment for its own operation. Jack Watts said, according to a report in Electronic News, that merger was not "actually being discussed at this point... (but) anything is possible."

Top priority at this time is being given to service of IVC recorders and to further production, engineering and sales.

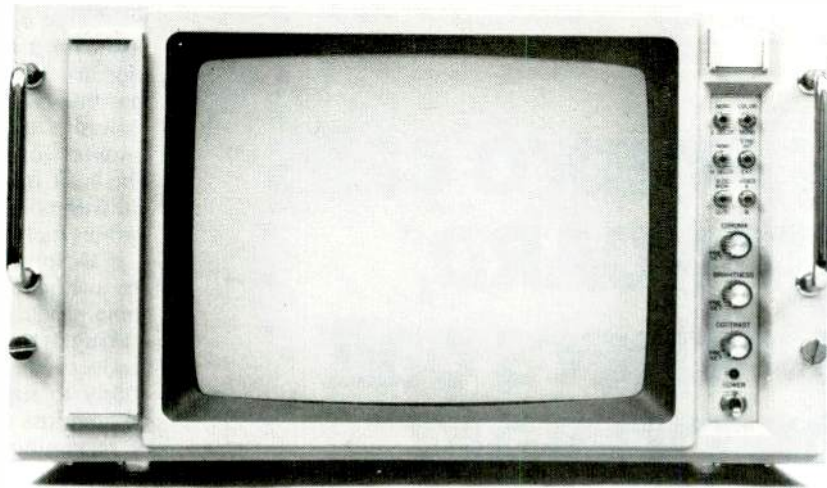
Acquisition discussions that were being held with Robert Bosch GmbH of West Germany, will have to start fresh according to Watts. No other details were as yet known.

AM Stereo Notice of Inquiry Parallels Quad Notice

In an action that in some respects parallels the Notice of Inquiry on FM Quad (see above), the FCC has issued a Notice of Inquiry (Docket 21313) seeking the same general kind of information to aid in a decision on AM stereo. The NOI responds, says the FCC, to rule-making petitions from Kahn

continued on page 12

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There are both pre-set and adjustable controls. Video response is from +1 to -2 dB from 60 Hz to 8 MHz.

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News

Communications of New York, and the Association for AM Stereo, Inc. (AAMSI). Kahn (as reported in earlier AM stereo stories in *BM/E*) asked for the adoption of a particular system, the one developed by Kahn and tested over a number of years. AAMSI did not endorse any specific system but emphasized the competitive disadvantage of AM stations as against FM stereo. The FCC said it had little technical information on AM stereo, but noted that

the report of the National AM Stereo Committee was being prepared and would reach the FCC soon. Some of the questions the FCC asked for comment on were (paraphrased here): How much public interest? Would the broadcasters and the receiver industry be prepared to meet that interest? What impact on FM? What cost for broadcasters and for the public buying receivers? Should the FCC regulate characteristics throughout the broadcast plant to insure a high quality signal? Should there be a standardized response to reduce the need for signal processing? Interested

parties should get the full text of the Notice and their responses are due by October 15, with replies by November 15.

Digital Effects Units Go To ABC And Screen Gems

Micro Consultants announced that its first two DPE (Digital Production Effects) 5000 systems will go to ABC and a third unit has been ordered by Screen Gems for use at its Editel facility in Hollywood.

The DPE-5000, a device for manipulating video images in a variety of ways (see *BM/E*, August, 1977), was taken on a nationwide demonstration tour last month. Producers told *BM/E* that they were most impressed by the "picture quality" achieved during compression and expansion functions. The basic machine is priced at \$65,000 but with noise reduction and expansion options included the price is \$125,000.

Despite the dramatic effects that are available in this type of machine, some producers cited its capability for making fine adjustments in everyday production. One example given was the ability to slightly expand the picture, without loss of quality, for the purpose of reframing the picture so that elements inadvertently included during production could be eliminated in post production.

(As *BM/E* went to press in August, late word on the redesignation of the machine from its former nomenclature, DEP-5000, was received. We mistakenly identified the new name as Digital Picture Effects. The correct name is Digital Production Effects, DPE-5000.)

Radio Networks Lost But O & O's Won in 1976

The seven nationwide radio networks lost a total of about \$2.5 million in 1976 but the 34 O & O stations of those networks made more than \$13 million during the year to put the seven nets cumulatively in the black according to figures released in July by the FCC. Total revenues for the stations plus nets were \$166 million, up 24 percent over 1975; cumulative profits were up 42.7% over 1975.

FCC Probe Of Nets Shuts Down

The FCC probe of the networks has been shut down indefinitely. The action was taken after Senate Appropriations Subcommittee chairman Ernest Hollings (D-SC) withheld funds for the investigation pending White House appointment of successors to FCC Chairman Wiley and Commissioner

continued on page 16

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2. The Advantage of BIDIREX. Film editing techniques, with a professional video recorder?

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But both the BVH-1000 and BVH-500 provide color framing capability as standard equipment. Add that to a logic system ideally suited for computer assisted editing, and the Sony BVH-1000 is your best bet to produce that "word from our sponsor."

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Never before has any production recorder offered the level of audio quality found in these two new Sony Broadcast machines.

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News

Hooks.

Wiley issued the order to suspend the investigation reluctantly but insisted that the Commission had little choice. Rep. Van Deerlin, chairman of the House Communications Subcommittee was not distressed since his own investigation on behalf of the Communications Act Rewrite will cover the same territory and a probe by the Justice Department looking into anti-trust violations will also continue.

'Copyright Fees For Record Companies And Performers Unfair': NAB

In testimony before the Copyright Office of the Library of Congress, NAB assistant counsel said that to require broadcast stations to pay fees to record companies and performers is constitutionally questionable, "unnecessary, unwise, and unfair."

NAB assistant counsel, James J. Popham said such a requirement would threaten the vitality of the radio indus-

try and reduce its capacity to serve the public.

Popham noted that stations would have to pay \$15.2 million (based on 1975 financial data) which would have a substantial impact on the industry. Pre-tax profits for the industry, said Popham, were \$90.7 million and copyright fees would have been 16.8 percent of those profits. According to FCC figures, nearly 40 percent of the AM and combination AM and FM stations lost money. New fee requirements could well "lead to reduction or total loss of service in many communities," said Popham.

Popham went on to testify that the current relationship between radio stations and artists is such that they are the primary beneficiaries of mass promotion for their product provided free.

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News Briefs

The **Radio Board of Directors** of the NAB directed the Radio Code Board to review its time standards and specified four areas of consideration: total elimination of the standards; bringing them in line with current FCC policies; network stations carrying uncompensated commercials in newscasts; and any other action the board may consider feasible. . . . **NAB called on the FCC not to ban** the manufacture of radio frequency amplifiers illegally used by some CB operators, but to use stricter enforcement to combat the illegal use. NAB suggested that purchasers should be required to prove "legitimate need" for the amplifiers and that records be maintained on amplifiers purchased.

An analysis of cross-media **tabulations from RADAR**, which CBS Radio has made for the past three years, reveals that of the 45 million women, 18 years and older, who watch no television between 10 AM and 3 PM, 21 million of them listen to radio during the same period for an average of 2 hours, 27 minutes. Further analysis also showed that ardent fans of prime-time television also **tend to be ardent fans of prime-time radio**. Of the 46 million U.S. adults, 18 and over, who are heavy viewers of weeknight television, 69 percent also listen to radio on a typical weekday morning for an average of 1½ hours between 6 AM and 10 AM.

NCTA filed a statement with the House Subcommittee on Communications which claimed that only a broadband communications network "similar to that offered by cable" could offer a **solution to telecommunications problems in rural regions**. "Demands on scarce public airwaves," said the statement, "are such that rural residents can never be adequately

continued on page 18

You've never seen a four tube, 2 megawatt amplifier.

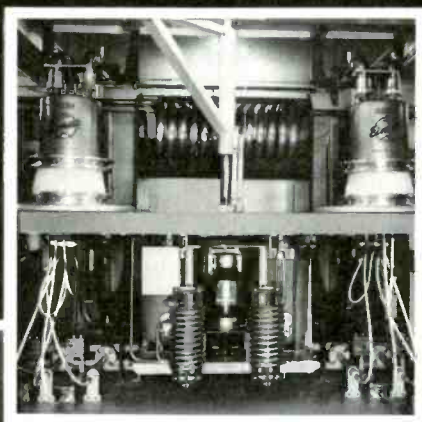
Until Now.

Look at this new generation Continental Electronics 323C medium wave broadcast transmitter. You'll see two EIMAC X-2159 tetrodes are used in each amplifier section, one as a carrier tube and the other as a peak tube. The two Doherty-type screen impedance modulated (SIM) amplifier sections are combined to provide a 2 megawatt carrier, 100 percent modulated.

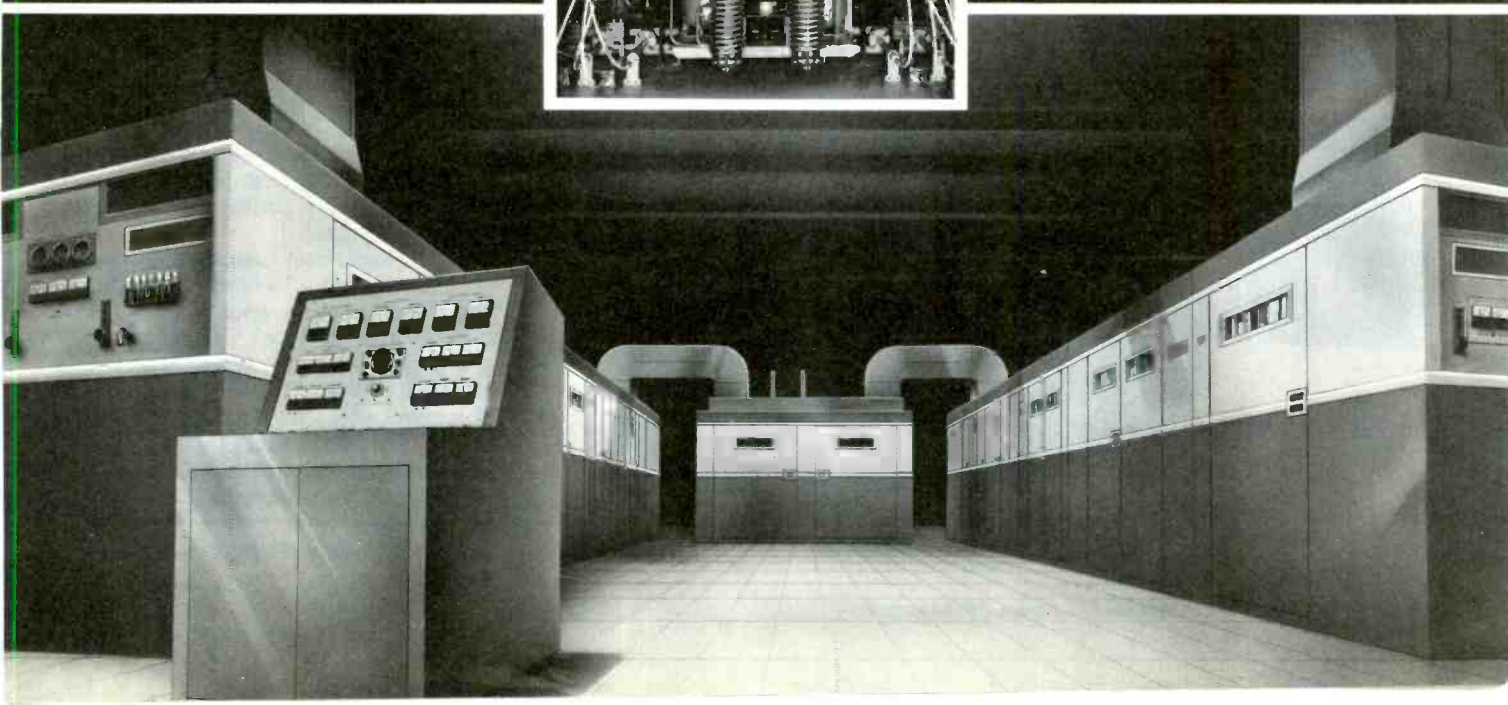
This is the first of 12 amplifier sections built for three Saudi Arabia locations. They will be used as building blocks for 1 or 2 megawatt transmitters in the

broadcast service. Similar approaches are planned for other locations in Saudi Arabia.

For information about power tubes for your transmitter, contact Varian, EIMAC Division, 301 Industrial Way, San Carlos, California 94070. Telephone (415) 592-1221. Or call any of the more than 30 Varian Electron Device Group Sales Offices throughout the world.



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News

served by over-the-air broadcast television.”

Kathryn F. Borman, president of Springfield Television Broadcasting Co., was elected **chairwoman of the Television Board of Directors** of the NAB . . . Len Hensel, vice president and gm of WSM, Nashville, was elected **chairman of the Radio Board of Directors** of NAB . . . Newly elected **chairman of the Joint Board of Directors** for NAB is Donald A.

Thurston, president of Berkshire Broadcasting Co., North Adams, MA.

The Board of Directors of the **NCTA rejected a recommendation** from its Blue Ribbon Committee that board membership be reduced on a systematic basis over the next 3 years. The present configuration of the board will be retained . . . The board also elected a new **vice president for engineering**, Robert A. Luff, formerly engineering assistant to FCC Chairman Wiley.

The **7th International Broadcasting Convention, IBC 78**, will take place in London, U.K., September

25-29, 1978. Inquiries should be addressed to the Secretariat, IBC, IEE, Savoy Place, London WC2R, England . . . With existing exhibit space for its Los Angeles conference (Oct. 16-21) sold out, **SMPTE has acquired a new area** at the Century Plaza Hotel for an additional 72 booths.

Video Expo '77 will be held from October 11-13, 1977 at Madison Square Garden, New York City. Some 7000 people are expected to attend . . . The Society of Broadcast Engineers, **Chapter 22**, will hold its **regional convention** and equipment show September 30, at the Syracuse Hilton Inn, Syracuse, New York . . . **Chapter 20** of SBE will have its regional convention and equipment show at the Howard Johnson's Motor Lodge in Monroeville, PA, October 21, 1977.

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Scully's versatile 280B/284B series offers professional recording features, including constant tension and pitch control . . . but total performance tells the real story; the reliability and quality that have made us the leading supplier of professional recorders.

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Business Briefs

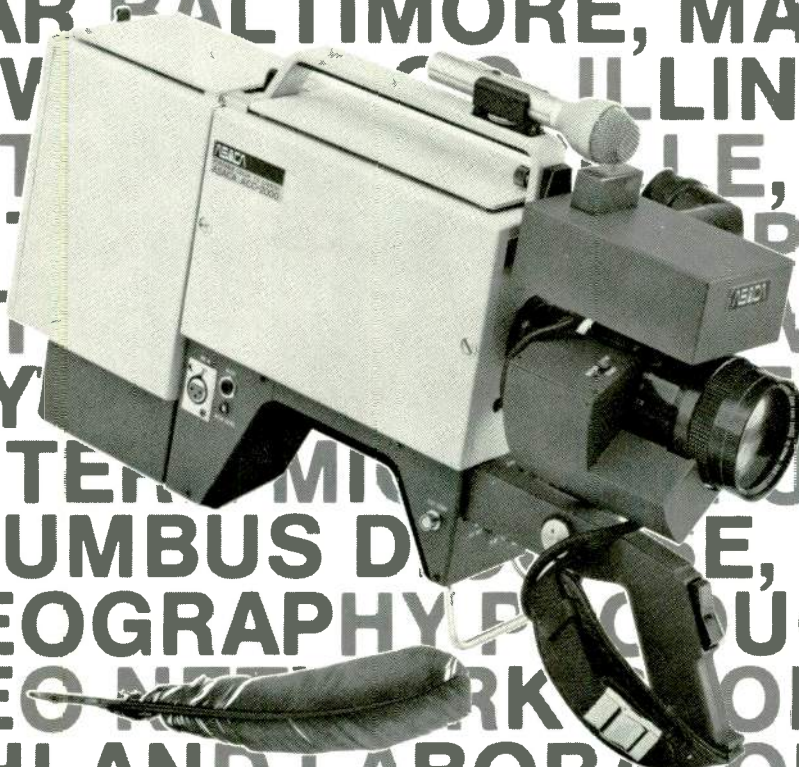
WNEW-TV, New York, took delivery from Bosch Fernseh on four new **BCN 1-in. videotape systems**. The purchase includes 3 BCN 50s with an EES-9 editing system and a BCN-20 portable VTR . . . **Jefferson Productions**, the nation's fifth largest videotape production house, recently purchased four of the **Sony BVH-1000** 1-in. VTR systems. Jefferson will use the systems in both production and post-production.

The return to **profitability of Tele-Mation's** hardware manufacturing and sales operation has spearheaded a first half profit for the corporation of \$257,000 on revenues of \$4,709,000. This compares with a loss of \$536,000 on revenues of \$4,754,000 for the same period last year.

An **early morning fire ravaged the KBIM-AM/FM/TV studios** in Roswell, New Mexico. Within seven days the radio operations were back on the air operating from a nearby building. The TV station began operations 3 days later. **Harris Corp.** played a major role by supplying TC-50 cameras, a TF-100 color film camera, System 90 program automation equipment and an assortment of consoles, turntables and other studio equipment.

RCA American Communications, Inc. announced a "**complete realignment**" of its organization to strengthen its customer service. Three business groups have been set up, each responsible for a distinct market: commercial communications services for industry; video and audio services for media; and dedicated communications services for government organizations. Engineering and operations groups have been integrated into a single supporting organization.

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 WTOP WASHINGTON, D.C.
 WMAR BALTIMORE, MARYLAND
 WTTV CHICAGO, ILLINOIS
 WJXT JACKSONVILLE, FLORIDA
 WESF PRINCETON, NEW JERSEY
 DIGITAL VIRGINIA
 POLYMER INSTITUTE, VIRGINIA
 WESTERN MICHIGAN UNIVERSITY
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RADIO

PROGRAMMING & PRODUCTION FOR PROFIT

Classical Does Win — Bach Can Be Bucks

By T.H. Richards

This month BM/E welcomes here as guest columnist T.H. Richards, of Radio Musical Monthly, who gives us a careful detailing of the factors needed for success with a classical format. Mr. Richards' prescriptions are not theory, but come out of the experiences of the outstanding successes in the field—WQXR, New York; WFMT, Chicago; WGMS, Washington; WCLV, Cleveland; KVOD, Denver; and others. As described by Mr. Richards, making classical go does take special effort and creativity—but, if classical music is your dish and you have the demographics he specifies, and if the competitive situation is right, and if you *do* make the effort, it could be a highly satisfying kind of success.

YES, THIS COLUMN IS HEADED "Programming for Profit" and yes, this article is about *classical* music on radio as a profitable venture. There's no paradox; it's simply something that most broadcasters don't think of as profitable because it's easier for them to believe in long-standing myths than to conduct a considered evaluation of the potentialities.

The myth that classical radio is a sure-fire money-loser is based in data that are outdated, obsolete, exaggerated and/or just plain wrong. It *is* true that it takes a special kind of approach

to make a classical radio operation successful, but the rewards can be, and are, substantial in both money and satisfaction, for stations like WQXR and WNCN, New York; WGMS, Washington; WFMT, Chicago; WCLV, Cleveland; KVOD, Denver and others.

Approaching classical broadcasting as a profitable format requires that the broadcaster consider several things. In approximate order of importance, we'll examine them here.

Market

A classical station *must* be in a market which has the right kind of demographics. The market should be as upscale as possible, with a preponderance of incomes of \$25+ and a heavily college/university-educated audience. A community of professionals with high income levels and college or graduate degrees will provide a solid base for the right kind of classical station. Naturally the larger the community the better the chances for good amounts of national sales. Also naturally, many of the large markets with these demographics already have one or more classical stations. Which leads us to Consideration Number Two.

Competition within a possible market

Competition between similar format stations in the same market is usually considered healthy, and accepted as the normal state of affairs. No one really expects to have the whole market to one's self. But we know only one clas-

sical broadcaster who says he's glad of his competition. The difference is interesting for the uninitiated, for the *kind* of competition is different from what most other stations run into. In classical circles, much programming competition comes from non-commercial public radio stations. Our thankful friend, Mike Cuthbert of WGMS AM/FM, the acknowledged giant of classical stations, was speaking specifically of these stations when he said, "I think they've benefitted the industry tremendously, in that by doing aggressive counter-programming, and going after the same corporations for grants as we go to for advertising, they've forced a lot of us to get off our butts and fight."

In the Washington, D.C. market where WGMS is located, Mr. Cuthbert's most effective incentive in that direction has come from WETA, a non-commercial station with a heavy classical schedule, a member station of the nationwide NPR web. WETA has been, according to both Mr. Cuthbert and Jerry Lyman, WGMS' general manager, deliberately programming against WGMS. In addition (and some consider this dirty pool), the public station has been "advertising" for a greater share of corporate dollars, claiming that a corporation can get its message to the same upscale audience by making a programming grant to WETA, for which WETA will give the company air credit.

According to some, this is perilously close to accepting paid advertising, a

continued on page 22

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DSM affords the ultimate in stereo and SCA performance,

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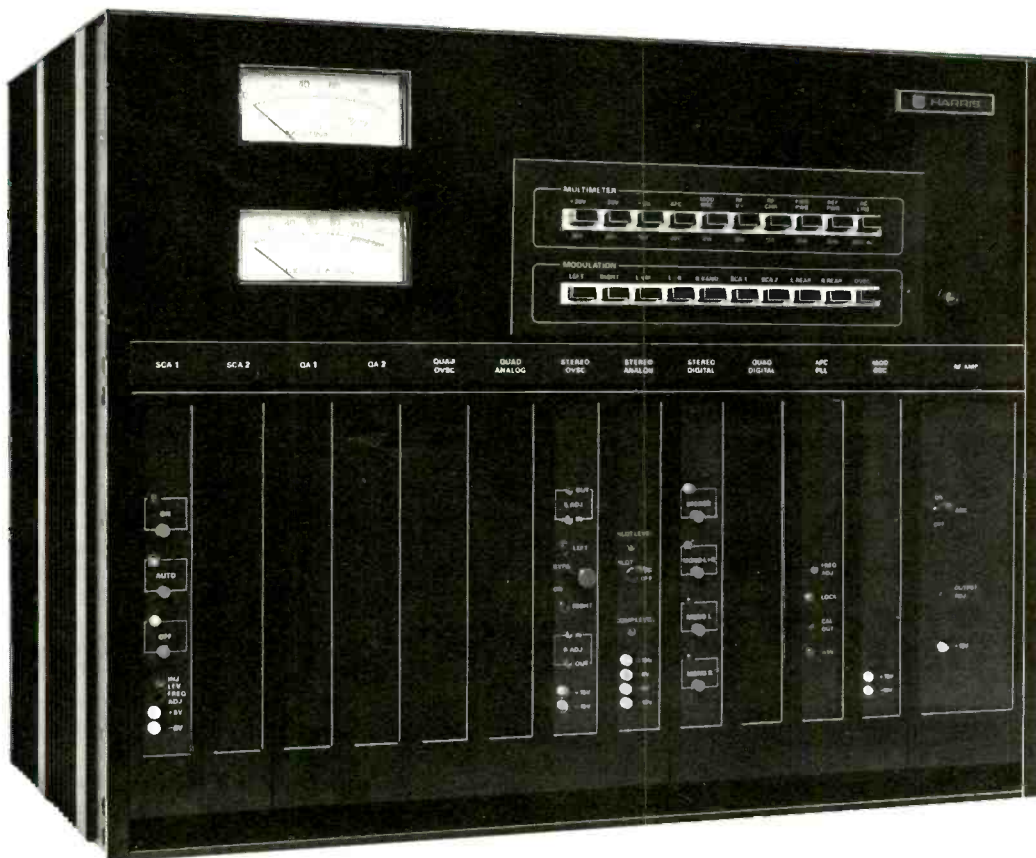
Thus, a 2 to 6 dB increase in loudness can be achieved while maintaining excellent transient response, high stereo separation, low crosstalk and low intermodulation distortion.

For the clearest, loudest sound around, write for information on the new Harris FM transmitters with the MS-15 exciter to: Harris Corporation, Broadcast Products Division, Quincy, Illinois 62301.

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Radio Programming

no-no for non-profit stations. Add to this resentment over the fact that much funding for public stations comes from the Federal Government (tax money), and a definite fight is brewing. Watch the FCC for a ruling soon.

We found no other opinion that coincided with Mr. Cuthbert's of gratitude toward his competitors. "At most," said Ray Nordstrand, president of WFMT, Chicago, "such competition might make one try to program a little more excitingly. I don't think it could be an incentive for a salesman to 'get off his butt'. Any salesman who was there in the first place is in trouble."

The format's format or "style"

The third consideration is again a direct flow-out of what comes before. Once a market is chosen, and the competition evaluated for risk factors, a *type*, or style of classical format must be decided on. Tyros in fine arts radio find it surprising that there are substantial differences in the "sound" of various classical stations. It's not like top-40's, where the only difference from one station to another is the spots and who has the best Cousin Brucie imitation this week—they all *try* to sound the same. Classical sub-formats vary widely, as is easily heard by anyone who has listened to both WQXR and WFMT. Both are top-ranked, top-quality stations, but their sounds are so radically different when the discs aren't turning that one would think they were totally unrelated.

WFMT is the last word in "class", in the connotative sense of the word, having a style extremely refined, cultured, quiet and—as the rockers say—"laid-back". WQXR, the "Radio Station of The New York Times", is the penultimate representative of the opposite school of thought (WGMS holds the undisputed first-place title there). Its style is nothing like that of WFMT; the station's announcers are very consciously and deliberately "personalities", the announcing itself is of a more "fluid" brand, reminiscent of those golden-throated gents on easy-listening stations.

WQXR also runs about four times as many commercials per hour as the Chicago station, and will run most as they were produced by the ad agency. WFMT is one of the last holdouts in that area, having a policy inflexible, which states "Live copy only".

It boils down to a basic difference in philosophy, yet both believe in classical music radio deeply. Walter Neiman, president of WQXR says, "Too many people feel that any touch of commercialism soils the product." Ray Nordstrand is most concerned

about "maintaining the respect and loyalty" of his very special kind of listeners, and feels the best way to do that is to maintain the way WFMT sounds on the air.

But both agree that the listeners in any particular market will become accustomed to whatever style they are "raised on". A radical switch from one's style to the other's would probably cause listeners in both cities to walk picket lines—or worse yet, turn to their phonographs.

Programming, sales or promotion?

Interestingly, this point is one which many of the most successful classical broadcasters differ over. What is the most important factor once one gets on the air—programming, sales or station promotion? Bob Conrad is vice president and program manager of WCLV (Cleveland), another of those "amazing classical success stories". Bob and partner C.K. "Pat" Patrick made the pages of several national news and business magazines a few years back, having bought a complete dog of a station and turned it into a thriving success.

Conrad says there is no way to separate the three factors. "They're like the legs of a three-legged stool—take away any one leg and the stool won't stand up." Mike Cuthbert agrees. Walter Neiman, on the other hand, feels programming is "always the first consideration" and Ray Nordstrand, while agreeing that all three factors are important, gives a slight edge to sales, qualifying that only by saying that "sales become problematical" if one doesn't have an audience with loyalty who are able and willing to give high response to advertisers. The implication is that this is gotten only through good programming.

It does seem that classical radio makes it harder to separate the three factors than it is in other formats. The differences of opinion indicate merely each individual's way of attacking the overall problem of making the classical format pay. Some start with the sales approach; others start with the programming. Still others think one must promote the hell out of a station in order to make listeners and advertisers aware of one's existence. The difference lies in that programming, selling and promoting a classical station is a *creative art*; it's not something one can do by checking the charts for this week's hits and the cumes for this month's numbers.

Classical "numbers" are looking better

The thing that has always presented a problem for classical broadcasters in the past years—low "numbers" and consequently difficult national

sales—are slowly giving way to the steady efforts of classical broadcasters. There has been a recent upswing in the numbers of classical listeners, attributable possibly to station promotions, or to a change in the demographic make-up of the country as a whole (what's happening to the middle class?). At the same time, steady pressure from industry leaders like Msrs. Conrad, Nordstrand, Neiman and Cuthbert, and their respective sales staffs, has slowly begun to "educate" agency buyers to the advantages of "qualitative" buys.

For instance: WCLV, for the first time in 15 years, is running *three* major airlines concurrently—Eastern, TWA and United. The airlines in general have found that for them, especially, classical radio is a terrific buy. This attitude is reflected, too, in the trend toward providing classical music features in the airline's "in-flight" magazines. WFMT (which has only one salesman and is billing 7 figures) recently celebrated the 20th anniversary of *uninterrupted, daily sponsorship* by a local bank. That bank started on WFMT 20 years ago with assets of \$217,000 and now has over 1.75 billion. The bank attributes its growth almost entirely to classical radio, to wit: WFMT.

Another plus factor is a new national rep firm which specializes in classical sales. Concert Music Broadcast Sales, Inc. (CMBS), owned and run by a couple of *wunderkinder* named Peter and Peter (Cleary and Besheer), has done a healthy amount of educating among agency buyers at the national level, as witnessed by their doubling of several of their stations' previous national billings. A fascinating side issue is that at the time CMBS was established—less than a year ago—there was a sudden embarrassment of riches. After years and years of virtually *no* representation by specialists for classical stations, there were now *two* fighting each other for the business. CMBS won out.

Making money on the side

Side issues can be more than fascinating; they can also be profitable. Many classical stations have found that one way to keep the books in balance is to run parallel non-broadcast activities. Such non-broadcast activities as syndication production, concert promotions and program guide publication have all added to the till to help stations stay afloat or merely increase profits. A "side issue to a side issue", tape duplicating evolving out of a successful syndication operation, became a not-so-side issue at WCLV, where Bob Conrad claims his duplicating operation is the most profitable of all the

continued on page 24

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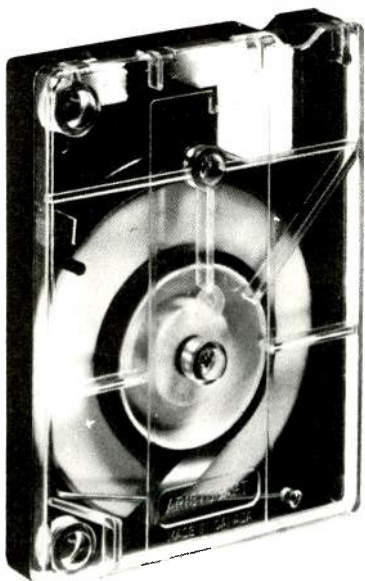
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Radio Programming

non-broadcast functions under the WCLV umbrella.

Program guides are more of a problem, thinks Ray Nordstrand, because even if they "eke out a profit", they're likely to be a drain on the efforts of station personnel, and divert energy from the prime mission of selling advertising on the station. A problem with the guides is that in most cases they cannot really generate a rate base large enough to guarantee the publication viability as an advertising medium. They may make money at first, then lose more and more as the book is improved and enlarged.

One way out of that hole is the route taken by WFMT, WQED (Pittsburgh, non-commercial), and WONO (Syracuse). These stations have all developed their program guides into full-scale regional magazines which maintain a circulation independent of the station's audience. *Chicago*, the magazine published by WFMT, is a monthly, four-color, slick, 200-300 page monster which makes Rupert Murdoch's *New York Magazine* look skinny. Still, thinks Mr. Nordstrand, any guide is an important part of a classical station because it helps generate and maintain that "loyalty" so important to the success of the station's sales efforts.

Good guidance

The research materials produced by some of the larger stations in recent

years (the WGMS "Listener Survey"; the TGI "Classical Advantage" compiled by WFMT; the "Markets In Focus" studies) now provide substantial ammunition and information for any creative radio station looking for a new way to make some bucks. One of the best ways to investigate all of the possibilities is to attend the yearly conference of the Concert Music Broadcasters Association (CMBA). This year brings an easy opportunity to do so, for the 1977 conference will be held in New Orleans on October 6, 7, 8, and 9, thus overlapping the first day of the NRBA convention being held in the same city. Those planning to attend NRBA have only to head for New Orleans a few days early. For complete registration information on CMBA one should write Pat Trickett at WCLV, Penthouse East, Terminal Tower, Cleveland, Ohio 44113.

Another industry conference, aimed more toward the musical side of classical radio, is the Music Personnel Conference (MPC) to be held this September 29 through October 2 at the Hyatt House in Pittsburgh. The MPC group is made up essentially of non-commercial programmers and music directors, but much of the discussion will be important for those who are interested in the classical radio medium. Details on MPC can be obtained from Marty Schneider, this year's conference host, at WQED-FM, 4802 Fifth Avenue, Pittsburgh, Pennsylvania 15213.

Remember—Bach is not only Beautiful; Bach is Bucks.

BME's Program Marketplace

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Peters Productions, Inc.

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WORKING LONG AND HARD on a program series that he hoped women would like especially, for the station where he was manager, gave Ed Peters, president of Peters Productions, a great programming success that catapulted him into syndication. The romantic, "one-to-one" quality he got into that original series is still evident throughout the four formats, one or another of which Peters Productions is furnishing today to more than 150 stations, with four to five new ones coming in every month.

Peters created the first series in 1968

for KFMB in San Diego, where he was manager of both the AM and FM stations. He had come there from a similar job at WMBD in Peoria two years before, when Midwest Television, already owners of KFMB, bought the Peoria station.

A large part of the immediate impetus was the necessity to stop duplication of the AM programs on FM. Peters said he wanted more than just a background sound: he wanted something women would actively like and respond to in a personal way. He put together a mix of fairly "emotional" instrumentals, with male vocals that had an "I-to-you" quality. There was also a very brief poem to introduce each segment during the day, the 3-hour segments being adapted to the usual woman's activities of each period, each with a

continued on page 26

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Intermodulation Distortion Analyzer optionally available.

Oscillator distortion is typically .001%.

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Measure voltage or power from 10 Hz to 110 kHz.

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Measure distortion down to .002% voltage or S/N ratios with 100 dB dynamic range.

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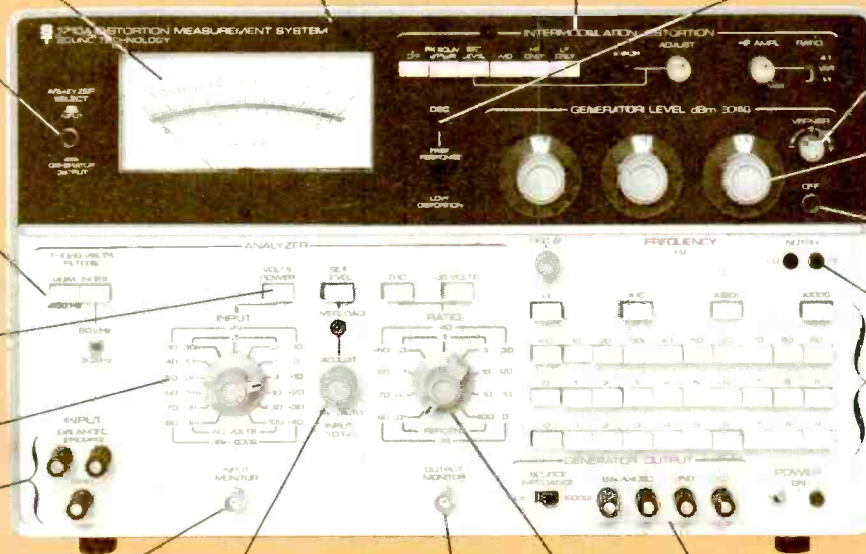
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Radio Programming

different program title.

This series, "Music Only For A Woman," zoomed up in the San Diego ratings, and before long, stations in other cities began to ask Peters if they could have it. So, early in 1970, he resigned from Midwest to go on his own — with an agreement that KFMB would continue to get the program as a subscriber.

That first year the subscribers came in one at a time, enough to get Peters Productions underway. One of the first was KNBR, the NBC O & O in San Francisco. Peters changed the title of the format to "Music . . . Just For The Two Of Us."

In 1972, he added "Country Lovin'" and "The Great Ones," his MOR series; and in 1973 came "The Love Rock," his adaptation of rock music to his romantic mood-building.

With each of his formats, Peters has three or four separate elements that can be varied in the "blend," to match different market and demographic situations. For example, in the "Country Lovin'," there is the current playlist (the 35 top-rated singles of the month); recent hits (selected recent Top Ten pieces); standard oldies (over 800 of the biggest country hits of all time); image oldies (carefully selected country and cross-over hits — "the most powerful songs of the past 4-5 years"); and album music (selected cuts).

In each format, all the music is delivered on 10½ inch reels but certain categories, under the complete programming plan Peters supplies for each station, are dubbed to carts for insertion in the program from a carousel.

Thus each format is "custom blended" for each station. The "customizing" also takes in to account the station's needs as to news, commercials, PSAs, etc. The music can be arranged to leave up to 18 minutes per hour for commercials, for example.

Fresh material goes out regularly to subscribers, Peters says, selected with aid from sales analyses, national industry publications, nationwide and regional music surveys. The objective is a very "up-dated" sound, extremely fresh.

A lot more than music

But the services of Peters Productions lately have been enlarged to take in a great deal more than music for the programming. In recent years Peters has undertaken to create a fresh marketing approach for each station that asks for this service — a detailed, overall plan for all the main aspects of station operation.

This is based on a complete market analysis made by the Peters organiza-

tion, which takes into account the competitive situation, the station's assets and characteristics, and the objectives of the management. Peters develops a "total image" for the station, and this in turn guides the creation by Peters of a complete sweep of promotional and sales aids, with a detailed operational manual. Included are IDs, jingles, PSAs; graphics for newspaper ads; TV and radio spots; plans for community campaigns; a sample tape of the format to be used by salesmen in demos for prospective clients (and the salesmen get selling training, focused on the station's "image").

This "full concept radio service," Peters says, is now in use by more than 25 stations, with new ones being added regularly. Peters emphasizes the objective of creating a new "state of mind" for the station which can infuse into all the activities of the station personnel and give the station a fresh presence in the marketplace.

Expansion

The swift growth of his "total concept" service, added to the steady growth of the demand for the syndicated programming itself, has led to enlargement of the Peters facilities. A new 20,000 square foot building will go into use shortly after this article is published. Here Peters will carry out (as he has for some time in the earlier location) all mastering and duplicating of tapes for subscribers. Tapes are duplicated at 1-to-1 speed of 7½ ips, to preserve quality as much as possible. As do most other successful syndicators, Peters finds top technical quality of his tapes to be essential to maximum audience appeal for his subscribers.

The staff of more than 20 now includes marketing, promotion and sales experts; and creators of advertising graphics, TV and radio spots, jingles, IDs etc. Not the least among them, says Peters, is the aide in charge of mastering and duplication, who is a musician as well as an engineer. Both skills are needed for the essential top musical quality in the master tapes and in the duplicates sent to subscribers.

Proof of the pudding

As with every syndicator, intelligent general objectives are a necessary, but not a sufficient, guarantee of excellence. The "bottom line" is musical taste, and this can be assayed only in a comprehensive sample of the music itself. Every station management considering a syndicator needs to try out such a sample, with the particular audience and competitive situation in mind. Peters Productions' 150 (going on 200) subscribers are, of course, strong preliminary evidence of high musical quality.

BME



- The MCI JH-110A series of recorders is now available with a 14" transport.
- Precise electronic editing (new bias and erase timing generators for all three speeds eliminate clicks, gaps and overlaps).
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- MONO and STEREO (on ¼" tape) as well as FOUR TRACK configuration (on ½" tape) are available.
- All systems are pre-wired for four-track operation.
- The JH-110A transport can easily be converted for ¼" and ½" tape use.
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- Independent head adjustments for Height, Zenith, Azimuth and Tape Wrap are non-interacting.

MCI

FEEDBACK

READ SOME LETTERS TO MCI REGARDING THE REMARKABLE JH-110A SERIES OF TAPE RECORDERS

I thought you may be interested in learning of some of the benefits this company has derived since we changed to MCI JH-110 tape recorders.

As you know, both stations are heavily automated. Several times during the day and night we are required to record spots from the NBC Network. One of the first "tricks" our production staff learned was to record the network on two recorders. At the beginning of spot No. 1, they punch the reset button of recorder No. 1; at the beginning of spot No. 2, they punch the reset button of recorder No. 2. Then, at their leisure, they punch the RTZ button on both recorders, and there are the two spots already cued.

The cue facility allows us tighter "drop-ins" on beginning and end tags, and in compiling programs generally.

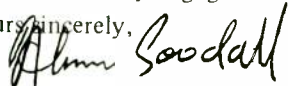
The calibrate/variable play and record level controls, and variable speed, are useful in that we have to process tapes received and from many different sources. The 3-speed capability also allows us to high-speed these dubs—saving valuable time.

Apart from the tremendous improvement in recorded quality (we were able to align the recorders to better than factory specifications) since installing the recorders we have not had one case of stretched or broken tape.

We have been able to design and build relatively simple units to interface with the control logic to enable us to—for example—pre-time record start and multi-recorder start and stop.

In closing, might I just say that original alignment and installation was very quick and simple, and maintenance has been virtually negligible.

Yours sincerely,



H. Graeme Goodall,
WVCG-WYOR, Coral Gables, Florida

It's been nearly a year since I purchased an MCI JH-110, and it's been a year of pleasure! I am (at least I consider myself to be) one of the best production persons in the country, and your machine puts all the others to shame!!!

I must tell you that I bought my machine by chance. I was not satisfied with our Ampex and ITC's, and Scully just couldn't handle it. I read a tiny ad in the trades and called your chief engineer for details on performance. Never having seen nor heard of your machine before, I



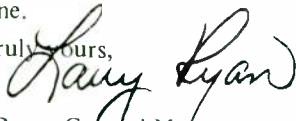
was impressed with his recommendations and therefore purchased one.

I have found several uses which were not listed in the Manual, and it seems we discover new ways to use the machine every week—and we do some pretty complicated production!

I assure you that when the money and the opportunity (and in that order) arises, I will purchase a 4-track and perhaps another 2-track and, hopefully, have you add a few more production aids which I feel could be of great value to our production load.

Again, I am totally satisfied with my MCI JH-110. It's a shame everyone has not had the good fortune to work with one.

Very truly yours,



Larry Ryan, General Manager,
KBCL, Shreveport, Louisiana

After using the MCI for a couple of weeks I'm greatly impressed by its improvements over traditional tape machines and its innovative features.

The machine is incredibly quiet—one reason being its motor does not idle but engages only during the play mode. Undoubtedly this feature will give the machine far greater mechanical life than its counterparts.

The machine's constant-tension transport feature is a plus in news situations where a mixture of small and large reels are used.

One of the more remarkable features is the machine's ability to time tape. At present, completed 60-minute shows are

Professional Recording Equipment



timed by running them through a conventional recorder at 15 IPS and the elapsed time doubled for an accurate reading of 7½ IPS programming. This MCI machine actually times the programming while in the fast-forward mode—reducing a 30-minute job to a 3- or 4-minute job and greatly reducing machine tie-up time.

Though the advantages of 2-deck electronic editing are obvious and ultimately the best state-of-the-art engineering for news producers, the MCI "tape return" feature by itself is quite helpful. I reset the mechanism while dubbing cassette material to reel-to-reel for quick and accurate recall of key segments.

The time saved in hunting material is valuable, but perhaps more importantly this is the first tape machine I have ever encountered that actually "assists" the operator. All other machines are neutral in their attitude to the job—they'll go when the right button is pressed, stop when another is pressed . . . but THIS machine actually is *positive*. It's a great device—too many engineers ignore the human engineering factor. These people have explored it and created a machine with a valuable accessory.

Other benefits: the machine is extremely easy to thread—and the proximity of the reels to the actual operating deck is an advantage over the Electro Sound transport system which is raised and creates the possibility of tape fall.

The machine is incredibly quick-starting, even at 15 IPS, which is the speed I most often use. I have often started the transport in mid-sentence on the air, where on other machines I have had to edit leader into the tape to account for slow-start wow.

The manual velocity control is another device which gives quick access to material on tape. I can audition material at variable speeds from a slow crawl to the speed of fast forward—slip into reverse direction with a minimum of mechanical effort—and locate key segments at three to five times the speed of conventional decks.

I intend to chain this demonstrator model to the wall when its test period is over. Congratulations to its manufacturer and designer for creating a machine with the human factor in mind.

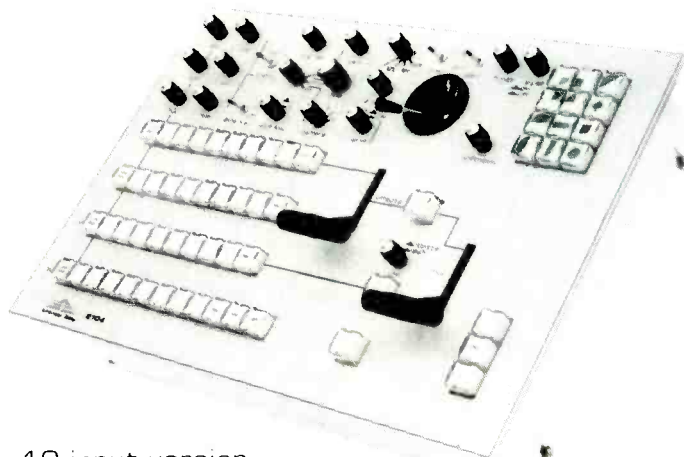


Mike Linder,
WNEW Radio, New York

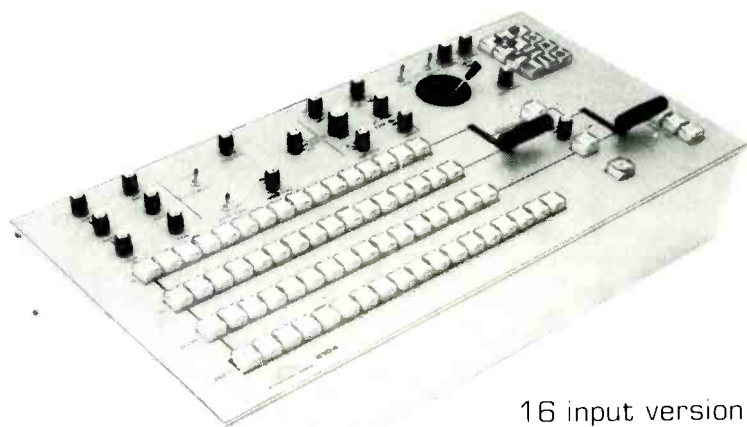
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TELEVISION

PROGRAMMING & PRODUCTION FOR PROFIT

Two Major Networks Make First All-Video Documentaries

NBC and CBS use very different styles but generally feel enthusiasm for the videotape medium in documentary production.

"A Day With President Carter" Inaugurates NBC's First Efforts In All-Video Documentary

"IT COULDN'T HAVE BEEN DONE any other way," said Jim Kitchel, general manager of NBC News Services. It was agreed that the documentary would be shot on the occasion of Egyptian President Anwar Sadat's official state visit to the White House, April 4, just ten days prior to the scheduled air date. Turn-around time would be very short and the NBC production team would have to get everything right the first time.

The decision to use videotape for such a documentary would have been very difficult for most documentary producers but NBC had used videotape exclusively in its coverage of the presidential campaign and felt very confident that they had worked out the operational bugs. Tom Wolzein, now director of NBC News Broadcast Services, was then a field producer assigned to NBC's Washington bureau. His knowledge of the White House and his long experience with EJ (as NBC prefers to refer to what is elsewhere known as ENG) were valuable assets to the program.

A considerable staff was lined up for the production. In addition to Wolzein, who functioned as associate producer for the program, was Ray Lockhart, producer, Gordon Manning, executive producer, and John Chancellor, who would conduct the on-camera interviews and host the documentary. The technical staff involved four camera people, four sound technicians, three

lighting technicians, an engineer for maintenance of the equipment and a couple of go-fors to shuttle back and forth between the crews and home base.

Home base for the operation was set up in the White House barbershop. On Sunday, April 3, the day preceding the shoot, all equipment was moved into the basement barbershop with the exception of the four TK-76 cameras. Pre-production involved a complete run-through of the next day's itinerary so that each member of the staff became familiar with the White House environment and could spot potential trouble for the technical operation. The windows of the Oval Office were gelled with number 85 & 86 material and some lighting was required in the Cabinet room, dining room and hallway. In most areas, however, the available light was sufficient for the TK-76s.

Sound proved to be the greatest problem. The President agreed to wear a wireless microphone with a disable switch that he could operate. Interference from RF and electrical sources as well as the obvious limitations on coaching the President caused some deficiencies in audio. For the vast majority of the time, however, the audio was quite acceptable. One pearl that was lost occurred when President Sadat arrived via limousine. Mrs. Carter informed the President that she had ordered the White House trumpeters; the

President responded, "Oh no, Rosalyn. Not the trumpets." To which the First Lady replied, "But Jimmy, I do love the trumpets so."

The shoot day began at about 4 AM Monday and lasted until about 2 AM Tuesday. Throughout the taping, the TK-76s and the Sony BVU-100s performed flawlessly. The cameras had been set up and tested using the same test patterns. Each was balanced under identical lighting conditions so that resetting of levels would be kept to a minimum. Since the four cameras operated simultaneously and as the output of each camera was recorded separately to provide optional angles during the editing process, it was essential that each camera produce identical colorimetry.

Time code generators were used on the four BVU recorders so that each camera's output could be synchronized in post-production. Some of the benefits of tape, according to Wolzein, were the ability to playback on location to make certain that the product was acceptable. Although NBC had complete editorial control over content, there were legitimate security concerns. At one point, a camera crew was doing an over-the-shoulder shot of the President from behind his National Security advisor, Zbigniew Brezezinski. Mr. Brezezinski was holding some classified documents in his hand and an immediate playback of the scene con-

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TV Programming

firmed that the papers were not intelligible to the camera. Another advantage involved a meeting of the Cabinet. The crews were invited into the meeting expecting a brief stay but wound up staying for 1 hour and 45 minutes. That could have run into a lot of film.

Cassettes were changed frequently. Eventually the mass of material grew to some 70 or so separate cassettes. The material was screened as soon as possible and simultaneously transferred in such a way that the time code was re-registered in the video.

A transcription of the audio track was made to help in selecting the most interesting segments and for preparing a script. Then, using the 2nd generation dubs with time code in the video, a video work tape was prepared. During this stage, the work tape was edited and re-edited numerous times until it was as much as 12 generations removed from the original. Extensive paper logs and time code made it possible to come up with a finished work tape in 1½ days.

The work tape was put together using four editors in four editing rooms working on Sony BVE editors.

With the work tape complete, the action moved to another editing facility. Here the original tapes were compared via time code to the selected segments on the work tape. Using the work tape as a sort of template, the originals were edited onto a master. A Microtime 2020 time base corrector and Image Plus noise reducer insured the best possible quality as the originals were edited to a master cassette. At this point, Wolzein claims that the quality was exceptional. As much as possible was done to improve the audio track and the video was clean, stable, and visually superb.

The next step was to dub up to quad. Using a time base corrector and a Thomson-CSF color corrector, the master cassette was transferred to quad. Once on quad, commercials, dissolves and other effects for graphics, etc., were edited in. Unfortunately, the inclusion of effects and commercials required the quad version to be edited into a third or fourth generation. During this

process, some quality was lost. Wolzein now believes that it might be wiser to do at least the special effects and graphics while still on cassette and leave only the commercials for insertion on quad.

Wolzein said that he compared "A Day with President Carter" to a similar production done on film during the Nixon administration and feels that this production was visually superior. Though generally satisfied with the videotape process, he would like to be able to work with the audio using the same techniques customarily used in film production. This would involve separating the audio track for processing and then being able to re-sync it with the video. Asked if NBC was planning more video documentaries, Wolzein told *BM/E* that none were planned in the immediate future because of the manpower requirements to work in this style. He added, however, that (NBC) was in the business of getting important pictures on the air and that implies using any medium that will get the job done.

CBS Special Report Producer Chooses ¾ U-Matic Cassette For Hour-Long Documentary

Bernard (Bernie) Birnbaum has been in film nearly all his adult life and for 20 years has been producing documentaries on film. This last summer he did his first videotape documentary, "The Retirement Revolution", which aired as a CBS News Special, July 26.

There were some around the West 57th Street studios who predicted that the experience would lead to Bernie's personal retirement. They couldn't have been more wrong. Birnbaum liked what he wrought and he's raring to do more. So are his colleagues on the project, executive producer Lee Midgley and veteran newsman Charles Collingwood.

What do all these key people like about electronically produced documentaries? Essentially they like the realness, the *alive* look that you can get only with a TV camera (less bluishness, warmer colors, more hue saturation). TV cameras make interviewees more human, more believable in Birnbaum's eyes. Collingwood refers to the "clairy" of the end product. Casey Davidson, who heads the CBS TV Network news operation, describes electronic cinematography as "more transparent", i.e. the medium introduces no artificiality.

Birnbaum, as producer, didn't have to learn any new tricks in his switch to electronic cinematography. He simply

practiced those fundamentals that have been his (and other good cinematographers) stock in trade all these years. "My cameraman, Phil Giriodi, who shot 95% of the interviews, is a pro. He's a stickler on light levels. We'd take 10-15 minutes before shooting to make sure the lighting was right. If scrim would help, we'd use it." Birnbaum predicted the final product would look as good as CBS's "60 Minutes" which is shot all in film. (*Ed. Note: technical critics who later saw the July 26 telecast reported they didn't know it wasn't film.*)

How does one get cassettes to look as good as film? By reasonably careful camera work (Ikegami HL 37s were used), image enhancement as necessary and noise reduction if called for (using a CBS-designed digital noise reduction system). Perhaps most importantly the Special Reports crew never goes beyond a second generation dub despite extensive editing.

And how do you avoid not going beyond a second generation dub? Simply by making a "work tape" cassette from the camera-made original and doing all of your editing from this cassette. This may mean you are down to a 4th or 5th generation tape before you get it right. This copy will be dirty and full of break-ups but that doesn't interfere with its being a guide as to what to

then dub from the camera original up to 2-in. quad. If four or five tries to get a final edit sounds like a lot of time and effort, it really isn't. This is because every camera take is recorded on its own cassette. "We may have 100 cassettes just to do a one-hour show," says Birnbaum, "but a cassette for every segment is the secret of making it manageable." It is a lot simpler editing a 5-minute cassette down to two than it is to edit a 30-minute cassette of several scenes down to 12.

And it is really not difficult to pick out the right cassette since each is tied to the program's script. If there is a segment featuring Mrs. Lacey, there is an individual cassette of the Collingwood-Lacey dialogue. In fact, there may be several Mrs. Lacey cassettes—one shot in her living room; another in her garden, etc. No single cassette is likely to have more than five minutes on it. In shooting "The Retirement Revolution", a gerontology expert, Dr. Boyack, is interviewed extensively. Five separate cassettes were made of the Collingwood-Boyack exchange.

Birnbaum's approach to making documentaries is admittedly patterned after the CBS Evening News show. Says Birnbaum, "If Cronkite can make up a half-hour program out of a bunch

continued on page 32

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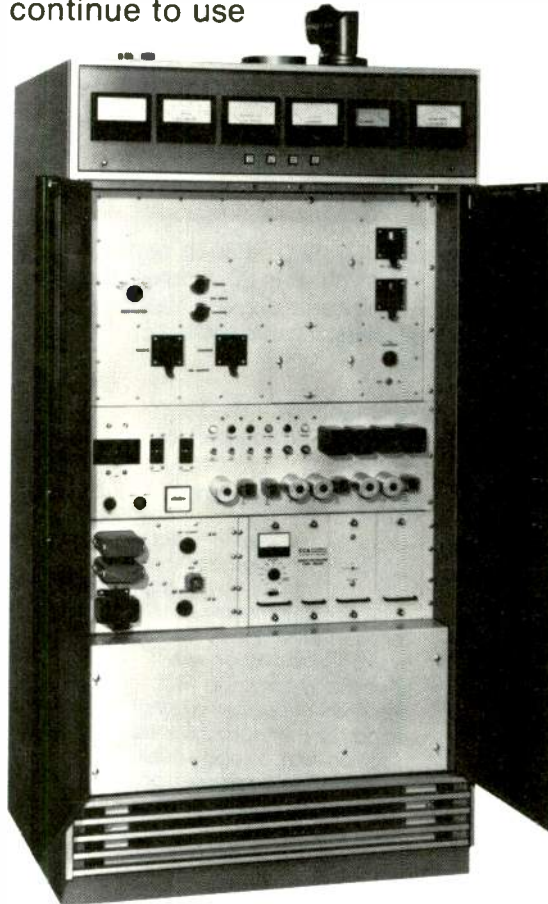
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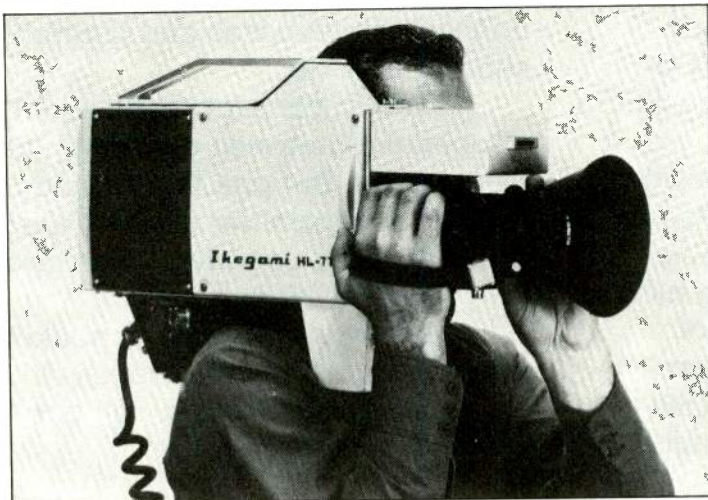
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TV Programming

of 2-2½ minute segments, we certainly ought to be able to string a few more together to do a documentary." Birnbaum reveals that admiration for the Cronkite show made him want to try the all-electronic approach. Executive producer Midgley was supportive since he is "journalist first" without biases in favor of film, for-or-against electronic cameras, etc.

All in all, there was no real time saved by going to electronic cameras and videotape—but neither did it take more time. Film editors quickly caught on how to handle the Sony BVE 200 editing system. All edits are sharp cuts cued to audio. Generally a few extra video frames follow the audio exit point. These frames are dubbed to quad and some may be taken out then using the recorder's Editec to get the final time precisely right.

Of course, a documentary is somewhat easier to do than a drama. "The Retirement Revolution" is a Collingwood show and as narrator-commentator he is the bridge between the various segments. Collingwood writes his own script and can readily tailor his material to cut or add a few seconds as necessary. The lineup for "The Retirement Revolution" at the time *BM/E* interviewed Birnbaum consisted of 41 segments from the tease to the final credits for a time of 57 minutes and 34 seconds, including six commercials. The first rough edit included 49 segments. To get to 57:34, two interviews were dropped and several shortened. Collingwood cut some of his narrative. The final length will have been shaved a few more seconds following our interview to work in one more "billboard". Since by this time all of the interviews were edited and dubbed to quad, Collingwood would do the accommodation.

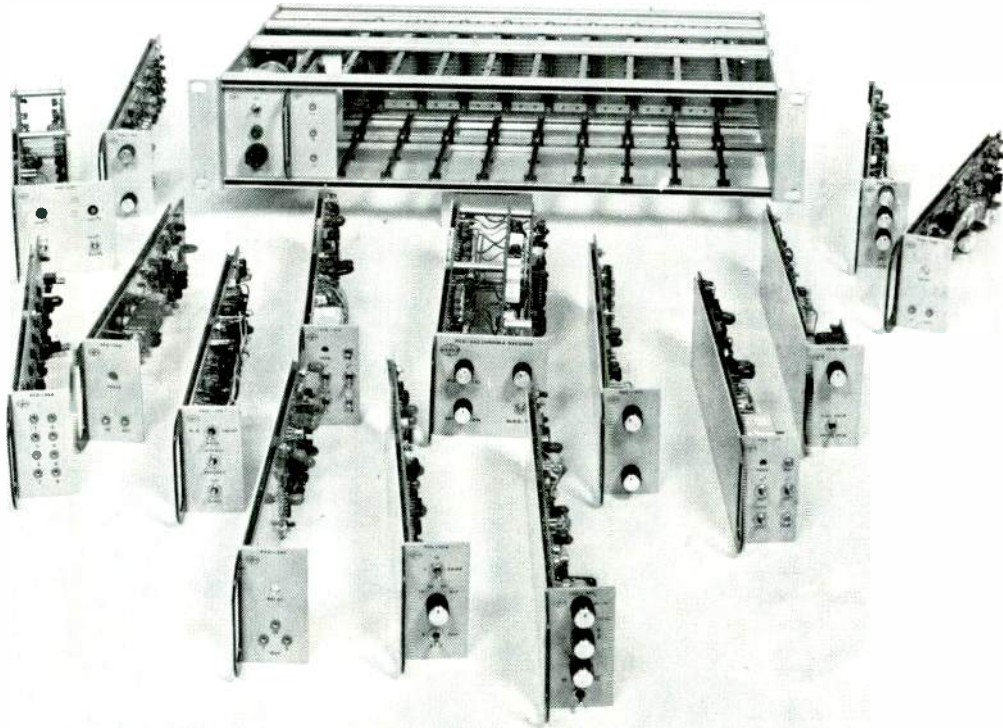
The program segments we observed at the time of the interview were high quality and the transitions were smooth. Of the 41 segments, 27 were electronic camera inserts. Collingwood entered live (i.e. direct on quad from the studio) 12 times. (Other inputs were slides and the VTR for commercials.) A Special Report documentary could include film clips—a CBS three-part special report on energy for showing this fall will use film from the library.

Can others emulate this CBS Special Report experience? We can't say for sure they can. Small stations might not just have the backup in personnel. During the dub from cassette to quad there were at least four persons in the cassette room—the editor, the cassette operator, the audio man, and one video operator handling the image enhancers, the TBC and noise reducer equipment. But that's what it takes to get the most from cassettes.

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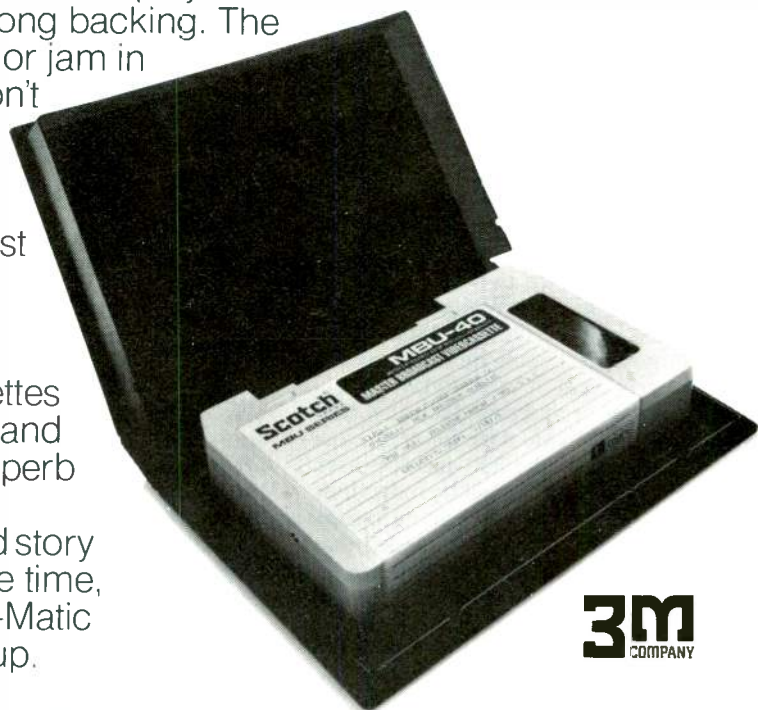
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Ideas, Trends on Production Shared At Montreux

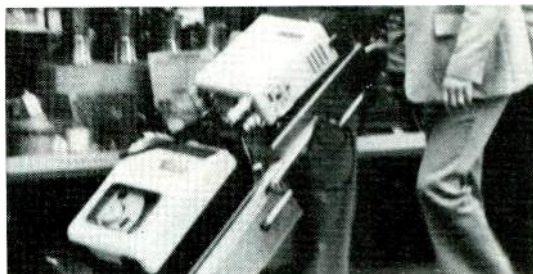
Part II of the 10th International Television Symposium looks at production trends and satellite developments.

PRODUCTION EQUIPMENT to better serve producer and creative people and the role of the computer/microprocessor in the production cycle was a recurring theme at Montreux. Such was the thrust of the keynote address by producer Werner Hess of ARD, Germany, on opening day. Both William Connolly, CBS, and Peter Rainger, BBC, stressed the same point during the Futures Panel discussion as reported in part I of this report (*BM/E*, Aug., p. 53). In addition, an entire day was given over to TV systems for production and post production. Subsequent sessions on editing and digital processing also dwelt on production trends. It is our purpose here to pick out some of the highlights of those sessions.

"New Horizons in TV Program Production, Post Production, And Continuity" was the title of a lead paper on the subject by Joseph A. Flaherty, vp, engineering and development, CBS Television Network. Flaherty said small studio cameras, professional quality one-inch helical scan videotape machines and computer-controlled time code editors are now ready to challenge the mobility and post production flexibility of film. He went on to describe a new videotape system that will be used by MTM Productions, in Hollywood to produce two new fall CBS sitcoms, "The Betty White Show" and "We've Got Each Other". (See *BM/E*, Aug., p. 6 for details on equipment.)

Flaherty said it was today's electronic post production facilities that limit the use of videotape for drama and documentaries—the 300 and 400 edits per hour necessary for such productions are too much for most editing equipment. The CBS executive added that the computer based approach taken by CMX is headed in the right way but that "more work is required". A breakthrough is at hand, Flaherty went on to say, since the new one-inch VTRs can show a viewable picture in either direction at both fast and slow speed.

The ideal editing system in George Gould's mind will be patterned after the light pen/video disc CMX 600 system.



"On location" was big trend identified at Montreux. Exhibitors showed how ENG-type equipment could go aboard helicopters or a simple hard cart.

The founder of Teletronics International said, "It will produce broadcast quality color pictures and sound and will have a minimum disc capacity of 120 minutes. Once developed, this system most assuredly would replace all other editing formats, both in film as well as in tape . . . There are no reels, no machinery."

Rough cuts can be seen on a large projection screen if desired. The light pen is used to select edit frames, control speed and perform edit commands.

Later in the week there was a session on electronic editing. K.F. Eichstadt of CMX said the industry needs editing systems for both on-line and off-line capability and systems capable of working with a large variety of videotape formats. Use of distributive

processing, made possible by microprocessors, gives the user the flexibility he needs. A key component in the distributed system is a dedicated interface unit for each VTR, audio recorder, film chain, etc.

Since the interface unit (with built-in microprocessor) can perform functions required of individual machines, the central computer is entirely free to handle other functions. Machine operation does not limit the system. Eichstadt said distributive processing is a positive direction for the future.

E.S. Busby of Ampex made much the same point. He said that sequential accessing and control of a number of VTRs while they are cueing or synchronizing severely taxes a minicomputer.

continued on page 38

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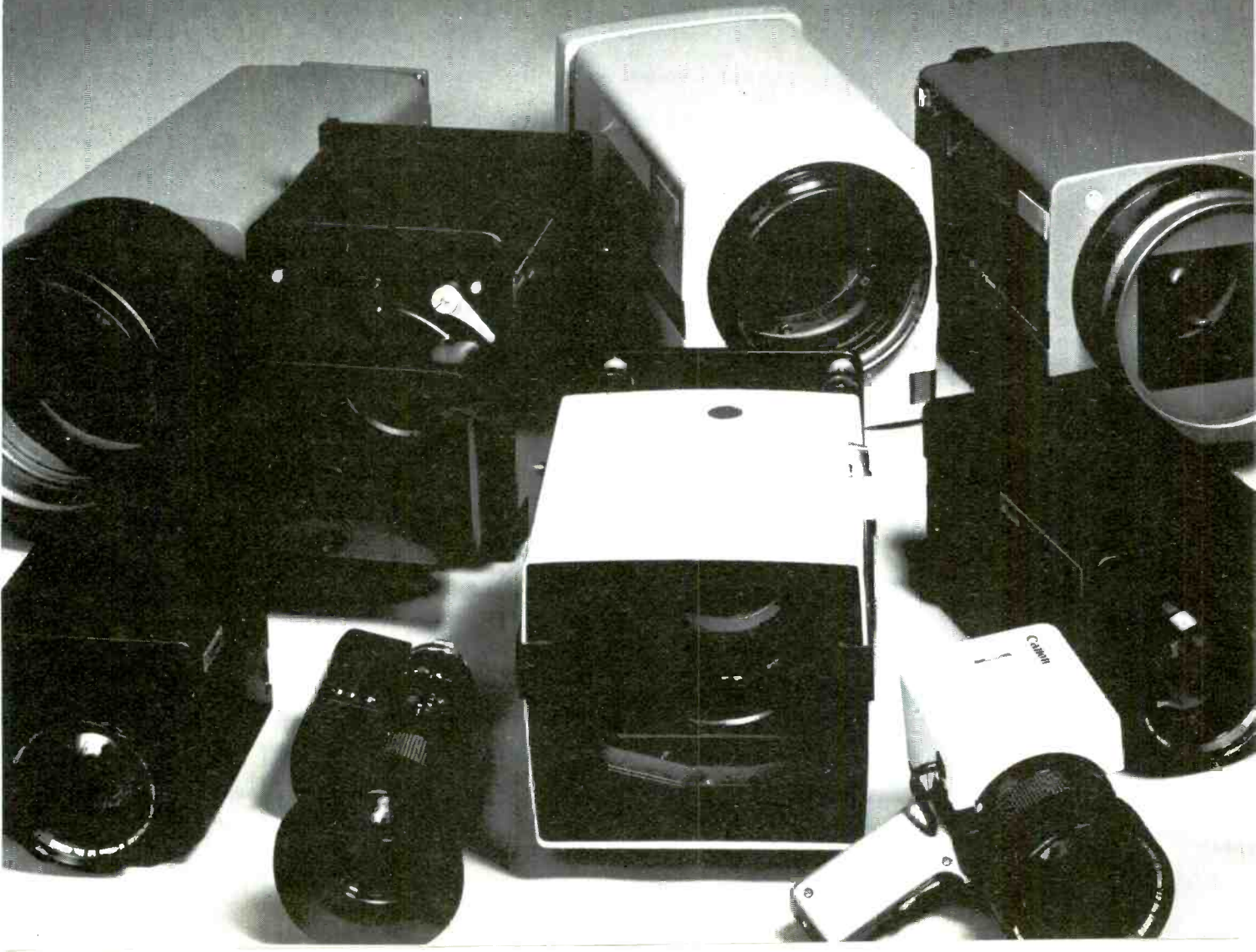
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ter. Verification of reproduced time code is time consuming when done in the computer. Hence intelligent machines (or interface units) relieve the central controller of a tedious burden.

But so that a lot of intelligent devices can be run from a central computer (or automation system) it is desirable to have a common language or protocol standard.

Busby made several recommendations regarding such a standardized protocol:

"I would suggest that every effort be made to preserve generality so that standards do not limit future development. Ordinary serial asynchronous transmission should be considered..."

"Messages should be formed into standard blocks of characters using a small number of block sizes. Each block should include a start character, at least two characters to identify a particular machine, a character to define an action, at least eight characters reserved for transmission of time code or other data and an end character.

"The maximum signaling rate should be high. Unlike automation systems, editing systems may need to exchange several messages within one television frame. The currently popular top speed of 9600 bauds is not fast enough. Integrated-circuit asynchronous devices, which operate as high as 100,000 baud, are readily available..."

Ampex has apparently followed the above guidelines in developing the tape editing system, EDP-1.

Automation in television recording and editing was the subject of a paper by Werner Habermann, Institut für Rundfunktechnik, München. Since time code handling is now essential, Habermann saw the need for standardization of recording parameters (magnetism, rise and fall time of recorded signals) and distribution

parameters (level, rise time, fall time). ICE is undertaking such a standardizing effort, Habermann said.

Habermann saw limits to automation in editing because of the need for creative and artistic decisions. Although 50% of sound edits are sharp edits, which could be handled by the automatic capability of modern recorders, a manual system is necessary. Habermann saw the need for some accommodation of automatic video editing and manual treatment of sound.

He said, "A possible, and in my opinion, generally applicable solution, is the incorporation of a multi-track audio recorder into the video assemblage system, recording the accompanying sound information alternating from scene to scene on separate tracks and sufficiently overlapping at the edit points."

There is no question but that the trend everywhere is toward more electronic recording in the field. Shawn Sutton, BBC producer, described new light weight mobile units used for full length plays. "The London Assurance" and Shakespeare's "Love's Labor Lost" are recorded with light-weight system equipment. Advantages, said Sutton, were high productivity (ten more minutes per day), ability to reshoot if necessary, lower costs, simpler editing.

Tape-on-location requires a change in production thinking. Writers have to visit the location before they start a script, Sutton said.

Michel Oudin, Societe Francaise de Production, said there is a trend to using portable equipment on location in France, too, but that so far film is the better tool because of its flexibility.

Film may stay more competitive in Europe for several reasons. A system has been developed to use EBU time code in film shooting (time code replaces usual synchronizing marks) and equipment is now available offering this feature. Oudin saw the evolution

of "video controlled" film production wherein a parallel video recording is made using a videotape cassette. The cassette lends itself to faster editing.

Satellites and CATV systems re-examined

Europeans have been considering satellite distribution of TV signals for about 15 years now (13 years formally under the aegis of CCIR). From the beginning the idea was to transmit either directly to the viewers homes or less directly through the intermediary of a community antenna. Montreux, on the heels of the 1977 World Administrative Radio Conference on Broadcasting Satellites (BM/E, May, p. 38), gave participants a good opportunity to be brought up to date on frequency allocations, systems planned, hardware built, and actual results from experiments to date. Since it is the 12 GHz frequency band that has been allocated for broadcast satellite service*, most of the papers dwelt with this service.

In the introductory session, C.A. Siocos of CBC, Canada, noted that based on 1977 WARC planning, circular polarized signals will be used and that both the video and sound carriers will be frequency modulated.

It is expected that the power flux density will be at least 103 dBW/m². With an antenna diameter of 90 cm and a figure of merit of 6 dB/K, a good picture should be received. Under WARC planning, interference from co-channel or adjacent channel emissions should be 30 dB down.

Although the stage is now set for direct-to-home broadcasting, there are no immediate plans for such implementation in Europe reported G. Salvatore of Telepaizo, Rome. Some experimental broadcast might take place in 1980 since that is the year that the European Space Agency expects to launch a communications satellite. At that time, the power output is expected to be a whopping 450 watts which means that receiving systems could be simple and inexpensive enough for purchase by home viewers.

It is the Canadian Communications Satellite (CTS) that is providing most of the experimental data on the 12 GHz band. Now dubbed Hermes, the experimental satellite has been operating since early 1976. Using 200 W traveling wave tubes, the radiated power is 800,000 W compared to 4000 W for the



Marconi introduced the mini-mobile. It can be equipped with two small cameras, a VTR, video mixer, audio mixer, sync generators, monitors, test equipment and microwave link plus a power generator.

*For Region 1, Europe and Africa, the band is 11.7 to 12.5 GHz. For Region 2, North and South America, and Region 3, Asia, it is 11.7 to 12.2 GHz. Channel spacing has been set at 11.18 MHz which provides 40 channels for Europe and 24 for Asia. In the U.S., the band is temporarily shared between the Fixed Satellite Service and the Broadcast Satellite Service and will not be resolved until 1982. Both Regions 1 and 3 have an orbital position reserved and the spacing between satellites is set at 6 degrees. In Region 2, there are two interim orbits totalling 55 degrees of equatorial arc.

continued on page 40

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- Used extensively by transmitter manufacturers.
- Synthesized carriers derived from internal 10 MHz oscillator.



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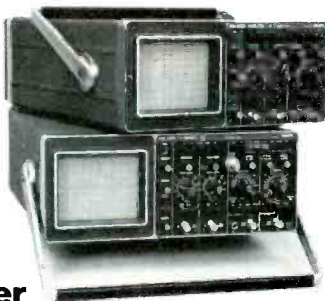
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antennas. J.W. Edens of Philips, Eindhoven, described at Montreux, results as measured on Philips-designed receiving terminals.

Eden reported excellent quality pictures and sound on the low cost 1.6 m antenna for all kinds of weather. Only

on a smaller-yet 60 cm antenna did heavy rain interfere with the signal. Eden reported that 1977 WARC requirements seem easily attainable based on Hermes experience.

The receiver built by Philips consisted of an antenna (reinforced glass fiber polyester), an outdoor frequency converter, and an indoor FM-to-AM converter which is connected to a

standard TV set. The outdoor frequency converter incorporates two balanced Schottky barrier mixer diodes on an aluminum MIC. A printed Hybrid ring couples the diodes with the local oscillator (described as an invar-cavity, stabilized Gunn diode operating at 11.675 GHz). The unit also includes a low noise amplifier followed by a wideband amplifier. The total noise

Studio Applications

visible loss in quality. The store opens up new areas of special effect capabilities and as a program production too that can same time.

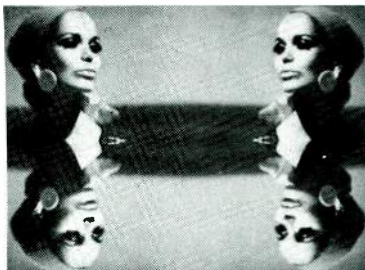
For example, four different video signals can be observed simultaneously on one monitor screen by using a quad-split feature of the store in conjunction with an expanded input circuit. In addition, it is possible to optionally freeze the individual compressed pictures, thus retaining a certain scene.

Particularly in conjunction with videotape recorders the store can perform many functions in editing, e.g. retaining the last picture prior to stopping the tape; producing still pictures of interesting scenes or phases of movement; single frame display in fast sequence (jogging) by appropriate control of the VTR; picture reproduction at tape speeds which differ from the normal speed.

Thus the still store as a rather economical VTR accessory becomes a powerful program production aid. It can work with any semi-professional VTR equipped with editing capability.



Four different signals can be observed simultaneously by using quad-split feature in conjunction with expanded input circuit.



Special effect produced with BCN digital store device as shown last month on BM/E's cover.



SMPTE standard slide as input (left) appears to be nearly perfectly reproduced (right) by 1/2 frame (one field) system when missing field is replaced by repeating first stored field.

A digital store adapted to the BCN

The decision in favor of component encoding was made above all because of the possibility of matching the sampling frequencies and storage capacity to particular requirements. In order to get by with only one A/D converter, the field-sequential A/D conversion of the two components appears to be a good solution.

The choice of sampling frequency for the luminance component was determined by weighing the storage capacity against the performance of picture detail which can be achieved. With the sampling frequency of only 4.875 MHz, a compromise was found permitting satisfactory sharpness to be obtained with life-like pictures. With the aid of an amplitude-dependent digital horizontal aperture corrector, rise times of approximately 200 ns can be achieved in the output signal of the store. The sampling frequency for the chrominance component is half the sampling frequency for the luminance component, i.e. the bandwidth of the chrominance component of the output signal is more than 1 MHz.

As mentioned, the luminance signal is separated from the color video by low-pass filtering. In the PAL version the chrominance component is obtained by comb filtering and subsequent synchronous demodulation; it is the line-alternating linear combination $U + V/U - V$ of the U and V color difference signals.

While the luminance signal requires 128 quantization levels and hence 7 bit, 6 bit are sufficient for the chrominance signal in this case.

With the above - described parameters the required storage capacity for the luminance component

is approximately 560 kbit, for the chrominance approximately 240 kbit. No storage space is provided for the horizontal blanking intervals. Thus only 4 k-RAMs were used to realize the store. It consists of 5 cards with 40 RAMs each.

The signals read out of the store are D/A converted and again combined into a standard color video signal in an encoder.

The BCN store is capable of storing non-synchronous color video signals, while the continuous read-out is controlled by a reference sync. Writing-in and reading-out are independent of each other.

Furthermore by varying the sequence of read-out addresses, it is possible to accomplish different geometric effects, e.g. the reduction of the picture size to one-fourth of the original area. First, four compressed pictures of the same content are produced. By combining the write-in command with the write-in addresses four different pictures can be fed into the four quadrants.

To reproduce a picture in a VTR search mode, machines with segmented-field recording require a video store. By means of a special interface the BCN store can be adapted to this mode of operation. The sequence of the picture lines coming from a segmented-field VTR is irregular.

The interface circuit calculates, from the headwheel- and track data, the write-in addresses of the picture lines and communicates them to the store. The writing-in of the lines in this case takes place in the irregular order of their occurrence, while the reading-out of the store is effected as usual with the studio sync.

figure of the receiver was about 7 dB.

The indoor unit amplifies the incoming 410 MHz IF signal and changes it to 120 MHz for easier discrimination. The functions performed are limiting, discrimination and remodulation of the baseband video and audio to an existing TV channel. Eden said this design was suitable for home use.

Japan is now destined to be the first country to provide answers to economic and operational questions related to direct-to-home satellite operation. A pilot project begins in Japan in 1978. A high power 12 GHz satellite will broadcast two regular television programs of NHK to all parts of Japan including far islands in the Pacific. The feasibility of mass-produced receivers will be tested. Japan will use 60 cm antennas since it feels any fading due to rain is short lived. The Japanese receiver is a planar circuit mounted in a waveguide plus an FM/AM signal processor. The microwave circuit is made from a metal plate by a simple pressing or etching technique. It can be mass-produced for a low cost. Dr. Yoshihiro Konishi of NHK described such a SHF-FM receiver at Montreux. This receiver has been tested in the U.S. based on signals received from the CTS Hermes satellite.

An Arab Regional Satellite System using a community type receiving sta-

tion is in the planning stage and was described by Hamzeh M. Shaweesh of the Development Office Co. of Jordan at Montreux. It conceivably could be built by 1980. This Arab-planned system envisions using two bands, the S band (2.45 GHz) for community TV and ten voice circuits and a C band. The C band will be used for telephony and will include 12 transponders patterned after the Intelsat design.

From 500 to 10,000 community TV and radio terminals are envisioned as operating within the Arab League network. Although no local rebroadcast or cable distribution is initially planned, the capability could be added later. Shaweesh said the Arab Regional Satellite Network is envisioned as helping Arab reunification by bringing the diverse cultures of the area in contact with each other. Simultaneous multidialect TV sound transmission would be used for distribution of information in Morocco, Algeria, Iraq and Sudan.

Progress in CATV in Europe seems to be in a quiescent state judged by Montreux sessions as various countries try to determine what services the telecommunications administrations should offer and what the ideal distribution system should be. The picture is more confusing than it was two years ago because now fiber optics must be considered as one of the practical alter-

natives.

British Post Office participants, A.G. Hare and S.H. Granger, were high on fiber optics and gave a long paper on telecommunications systems possibilities to "stimulate some imaginative conceptual ideas on how a future telecommunications network should be established." Down the road these speakers saw "wideband digital highways" appearing.

In Germany, policy planners are waiting to see what will happen from a laboratory experiment of 10,000 subscribers on an interactive CATV system. Such an experiment is now in the planning stage. In Japan, a test of what broadband services are useful is underway and several speakers from Japan were on hand to describe national experiments taking place at Tama-Newtown, a suburb of Tokyo. So far ten diversified services such as TV retransmission, local origination, pay TV, request still pictures, facsimile newspaper, response to broadcasts and copy service have been tried in 380 households. Speakers described the system for getting a viewer response to broadcasts and the Memo-copy system (which prints a message on a simple home copying machine). Although data is being gathered on which to base future decisions, the authors offered no speculative conclusion at Montreux.

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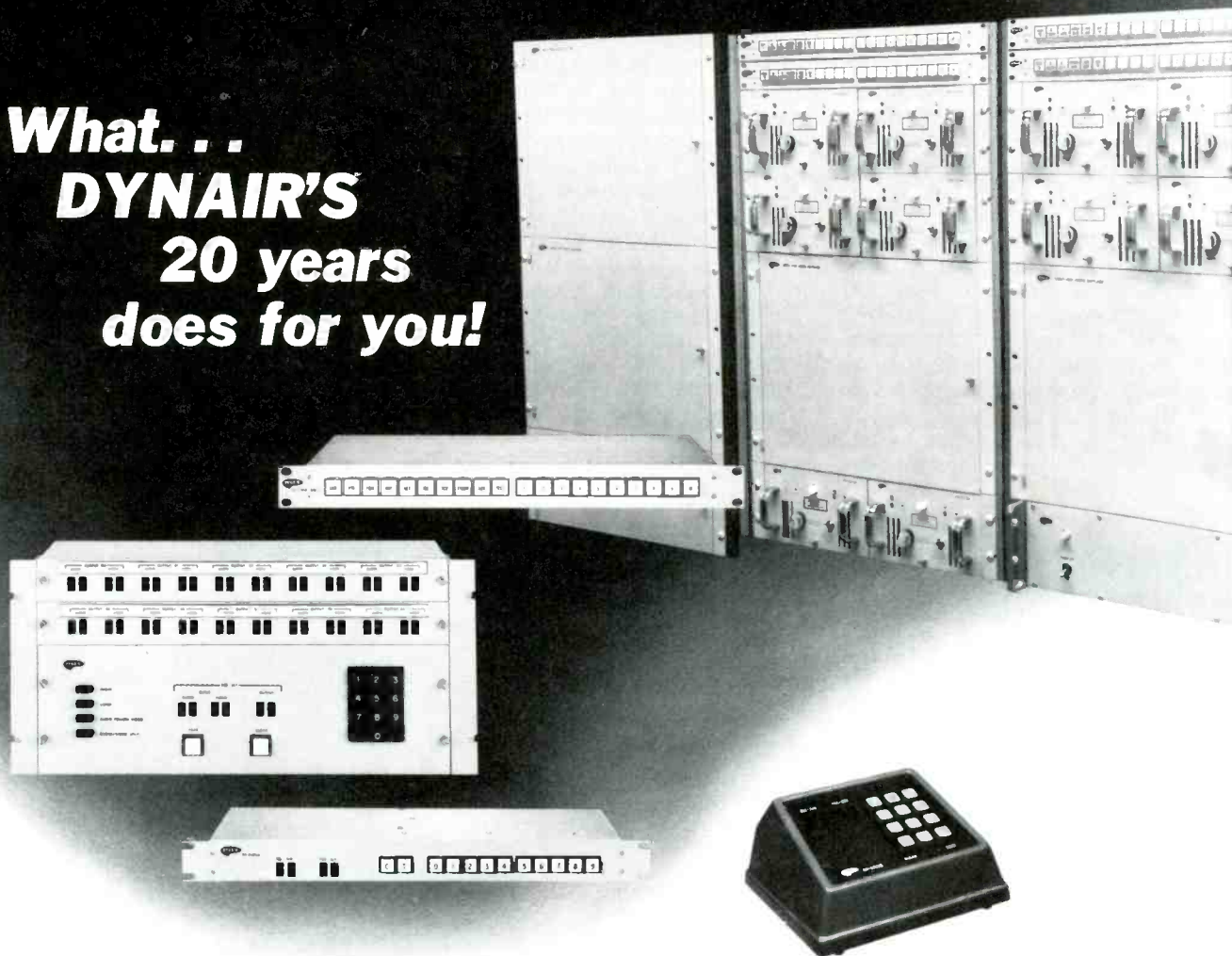
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New Uses For The Antenna Monitor In AM Directional Antenna Adjustment

By Frank S. Colligan

Modern antenna monitors can do much more than sampling tower conditions. They can be used to measure reactance and cable lengths, preadjust D.A. power dividers, etc., as the author shows.

The present state of the art in antenna monitors, formerly referred to as "phase monitors," has reached a high state of development over the last decade. We now have only to push a button assigned to a given tower to read current ratio and phase. There is no fussy presetting of voltage levels as was so common with the old vectorial voltmeter system. With more and more stations switching over to 24-hour-per-day-round-the-clock programming there is a demand for much faster set-up and adjustment of AM directional antenna systems and these new antenna monitors are serving us well. Because of their ease of use, the new monitors lend themselves to an assortment of other applications in the adjustment and maintenance of directional antenna arrays. This paper will outline a few of the most useful.

For starters, consider the "little black box" shown in Fig. 1. It is useful for measuring reactance or cable lengths. A common course of RF is fed, over equal lengths of cable, to 1. the antenna monitor reference and 2. the alternate input to the antenna monitor. In the box itself the path of the second or alternate RF feed is broken to allow for the insertion of a component such as a coil or capacitor. To obtain the reactance value of the component at your frequency, read the phase angle on the second input and multiply 50 times the tangent of the phase angle. The "50" comes from the standard 50 ohms input resistance termination that the monitor presents to the usual sampling cable if it has a 50 ohm characteristic impedance. The phase indicator is simply reading the phase angle that the reactor under test is producing against a pure resistance of 50 ohms. The accuracy of the 50 ohm input termination on an FCC type-approved antenna monitor is well within 1% and, incidentally, makes a good calibration checking device

for impedance bridges. This simple device, incidentally, will help you sort all those old mica capacitors that have been stacked up in the back closet for the last twenty years, each marked well with all the data one would ever need to know about them except the capacity value! A minor inconvenience in using this "black box" is that since we are inserting the unknown reactor in series with the RF path to the antenna monitor, both sides of the component must be "floating" above ground.

In making up the unit shown in Fig. 1., the test terminals should be SO-239 style UHF connectors. When pre-cut lengths of new sampling cable are purchased, this device may be readily used to accurately and directly measure one of the most vital statistics of a directional antenna system, the electrical phase length of the sampling lines. This information is extremely vital when unequal length lines are going to be employed. While the old impedance bridging technique may be used to determine the lengths of sampling lines it is a long and laborious technique in which substantial errors can creep in due to small amounts of attenuation. Measure your new sampling lines when you first receive them in coils since you then have ready access to both ends at the same time.

The normally open push button switch shown in Fig. 1, is to momentarily short the test terminals to verify an initial reading of equal loop current indications at zero phase shift on the antenna monitor. The common feed cable may be of any length but the two cables from the unit to the antenna monitor must be of equal length. RG-55 cable is an excellent choice of cable type to use for this purpose.

Before considering other applications, some discussion of the common R.F. source is in order. One of the best sources consists of the transmitter's sampling output that would normally be used to feed the frequency or modulation monitor. Their typical levels are safe to directly feed the antenna monitor, but fuses are an *absolute must!* A ¼ ampere fast-blow fuse is just right for the input voltage limit to the Potomac Instruments Model AM-19 monitor. Another source of RF for this purpose is the transmitter itself operating into a dummy load but with some RF "skimmed off the top" by means of a small 50 picofarad capacitor (mica-, vacuum- or large variable air plate type) connected from the hot side of the dummy load to the point where it is needed. Again, don't forget the fuse! The 50 picofarad value is about right for a transmitter operating with one kilowatt feeding a fifty-

Mr. Colligan is with A.D. Ring & Associates, Washington, D.C.

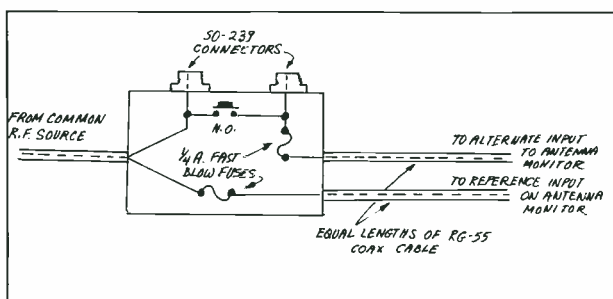


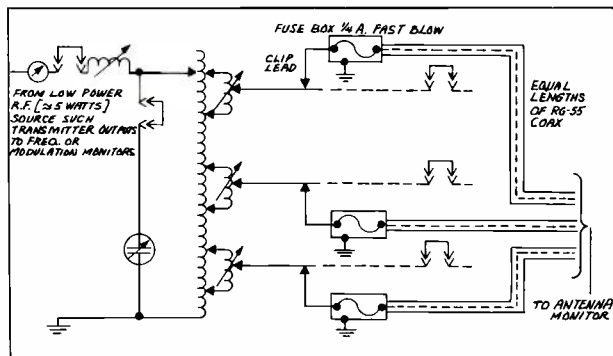
Fig. 1. "Black box" for measuring reactors or cable lengths.

Antenna Monitors

ohm dummy load.

Fig. 2 shows the use of an antenna monitor for preadjusting a directional antenna power divider prior to placing it in service at full power. This is followed by Fig. 3 which shows how the phase shifters are set up, after the power divider has been set. The antenna monitor not only reads out the required data but also provides the usual 50 ohm loads that the system will ultimately work into. This technique has proven to be extremely valuable in situations where new phasing and power dividing equipment is being installed to update an old station.

In one recent situation the frequency monitor feed was "borrowed" for use as a common RF source. The technique shown in Fig. 1 was used to set individual reactor arms to their assigned value. (The desired phase angles were precomputed and marked on the schematic for easy reference.) Next, the technique shown in Fig. 2 was employed to verify and trim the adjustments of the power divider alone, to obtain the desired output port voltage ratios and phase angles. The phase angle readings provide the information for any required design modifications to the phase shifters in order to accommodate the phase shifters incidental in the power divider alone. Finally the phase shifters were connected up, as shown in Fig. 3, and while leaving the power divider alone, they were trimmed up as required to produce the ultimately desired output port ratios and phase angles into 50 ohm loads. All of this was done at 2 P.M., *not* 2 A.M. Your off air time is too valuable to devote to anything other than essentials such as connecting in the new system and



NOTE: Each sampling point sees a fifty ohm load automatically provided by the antenna monitor input terminations.
Fig. 2. Antenna monitor used to load the output ports of the power divider alone and provide data for initial adjustment.

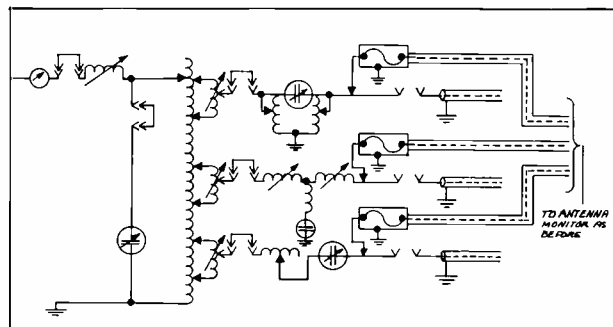


Fig. 3. Same as in Fig. 2 but including the phase shifters.

making the required adjustments to the tower base matching networks.

In the previous example, the tower base networks were subsequently set to predetermined values in each arm. Low power was applied and adjustments were made to the tower base networks with a *dead minimum* of adjustments to the power divider and phase shifters. The standing wave ratio on a transmission cannot be changed, let alone reduced to 1:1, by any adjustments other than those made at the power receiving end of the line. From that fact follows the cardinal rule of antenna adjustment: *one keeps adjustments to the power divider and phase shifters in the transmitter building to an absolute minimum until reasonable impedance matching has been accomplished by adjustments made at the tower base networks.* My usual rule is to get the VSWR value on a given line down to something under 2:1 before trimming in the transmitter building. The tower base networks are adjusted judiciously and logically, in small steps at a time and on a rotating basis starting with the highest power tower first. Each line is watched in its turn with a simple and inexpensive reflectometer. In the above outlined case the new power dividing and phase shifting equipment was completely preadjusted and ready to go several hours *before* sign-off time. At sign-off the cabinet was moved into place and connected up for full power operation. The tower base matching networks were set up and trimmed, as discussed in the previous paragraph. By sign-on time the pattern was on the monitor, the transmission lines were matched and the pattern was ready for initial field intensity measurements.

In using this preadjustment technique, by employing the antenna monitor in the manner described above, one must give due consideration to the negative resistance tower situation. The direction of power flow is incoming rather than outgoing and prior to using this technique one should allow for this. With all of the design values at hand for the negative tower, one need only compute what should show up on the antenna monitor if the load, in this case, were a positive rather than a negative 50 ohm resistance load on that particular port.

As a maintenance tool too

We turn now to the uses of the antenna monitor as a very useful maintenance tool on a day to day basis. After the proof of performance has been completed, the power divider may again be isolated from the remainder of the system and the readings recorded for future reference. A set of readings should be taken for the power divider alone followed by a second set of readings that include the phase shifters. If in the future something should go awry with the system, these data will prove to be extremely useful for pinning down one or more faulty components. The data gathered may not actually represent what is happening through the system when in operation at full power unless the transmission line matching is letter perfect. It does provide accurate and reliable data for future comparison.

The antenna monitor can prove useful on very old and shaky directional antenna systems. Simply disconnect the transmission lines, substitute the antenna monitor input ports in their place and record the data *before* a mysterious condition occurs. The data will help you determine just where the gremlin crept into the system.

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The Computer In The Newsroom

By Gordon Berry, Ph.D.

A process which has won wide acceptance in print journalism should be modified for use by broadcast journalists. That the pencil and pad boys are ahead of broadcasters with this modern journalistic tool is indeed suprising.

WORD IS GETTING AROUND—the microprocessor is going to revolutionize many areas of communications. The "CPU-on-a-chip" is already showing up in many different kinds of applications, and one of the most interesting applications is the creation of a new generation of microcomputers. Computers in the newsroom are not news to many journalists from a print background, but the expense of computer-based news handling has generally worked against the adoption of computer in the television newsroom. The microcomputer, based around a tiny microprocessor chip, has lowered the cost of computer-style work to the point that a newsroom system can be considered practical. In looking at a microcomputer-using newsroom, three factors need to be considered: the newsroom requirements, the equipment requirements, and the software requirements.

Newsroom requirements

In the medium to larger sized newsroom, there are four functions that can be served or modified by the adoption of a computer-based text handling system. These are a) editing; b) sharing; c) filing for later look-up; and d) tying to video.

Editing, as usually done in the newsroom now, is limited by the typewriter. In general, the reporter does the research required, acquiring a handful of notes about his subject. Back at the station, he sits a minute, thinking about the organization of the story, then starts typing. If, in his minute of thinking, he has forgotten a detail, he may look at his story, and either type it in as an afterthought, pencil it in between lines, or leave it out. Another option would be to re-type the story, rearranging and inserting material as desired, but time and inclination rarely result in this option, besides which, re-typing is extra effort which may be better spent in other areas. With a computer-based text editing system, the reporter would sit down at a video display terminal (VDT) and proceed to type in his story. If he wishes to later insert a line, correct a number (e.g. typing "100" when he meant "1000"), delete a line, or just generally rearrange the content, merely pushing a few keys accommodates his wishes, without extensive re-typing or marking up of the copy. This editing function alone represents a significant advantage for the computer-based system.

What may be termed a "sharing" function is necessary in most large newsroom operations. Story content must be available to the assignment editor, news director, or whatever. This usually means that stories are typed up with multiple carbons, chalkboards may be kept

with the story order for the broadcast (perhaps omitting details like who has newsfilm or tape with which story), and it may be a problem for the assignment editor to know what progress a reporter is making in his story development.

If a computer-based text editing system is in the newsroom, the assignment editor could expect to go to any terminal and call up a catalog of stories done, look at any of the stories he wishes, re-edit if he wishes, rearrange the order of the stories if he wishes, check on program time (duration of each story), and even figuratively look over the shoulder of the new reporter to see how he's coming on his first story.

Filing is a problem for the typical newsroom. Many stations file their material only under the date of broadcast. To go back and look up material that you may previously have broadcast about a subject is time consuming at best and fruitless in many cases. This is the situation when a reporter with a good memory for dates can be a big help. A computer-based system should allow for filing of stories by some kind of subject listing, perhaps two or three keywords, with allowances for proper names, as well as the date of broadcast. Information should also be included on film, tape, or slide morgue filing, to allow later recovery of any video material tied to the story.

A text editing computer system in the television newsroom certainly should accommodate cues for newsfilm or tape, slide or camera changes, perhaps even preroll cues. Such cues would surely be more precise than a pencilled in "SOF on 3,4 3" with indecipherable strikeovers confusing director and projectionist alike.

Equipment Requirements

With the development of the microcomputer market, a great many producers have sought to provide low-cost equipment, much of which would serve well in a newsroom system. Making various kinds of equipment work well together in the newsroom environment probably will require specialized software that would depend on specific equipment used, so what follows is a discussion of the types of equipment, rather than brand names.

Video display terminals have been mentioned. Low-cost terminals range in price from five hundred to fifteen hundred dollars. There are the so-called "dumb" terminals and the "intelligent" terminals. The "dumb" terminals allow material to be transmitted from the keyboard to the computer, and allow the computer to transmit information back for display on the screen. Some units are nicely packaged one-piece models, while other units consist of keyboard, electronics and cabinet, and use a small standard video monitor for display on the

continued on page 50

Dr. Berry is Director of Instructional Television, Central Missouri State University.



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Is this studio camera really the same as the portable one above?

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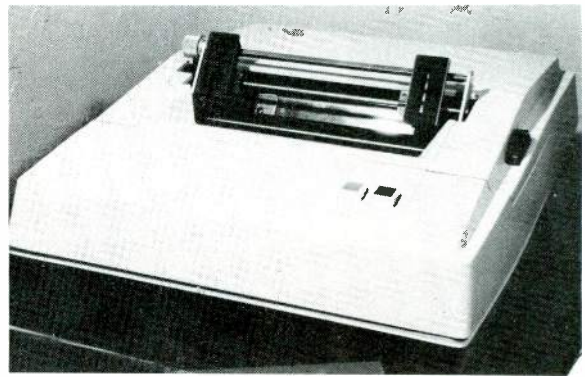
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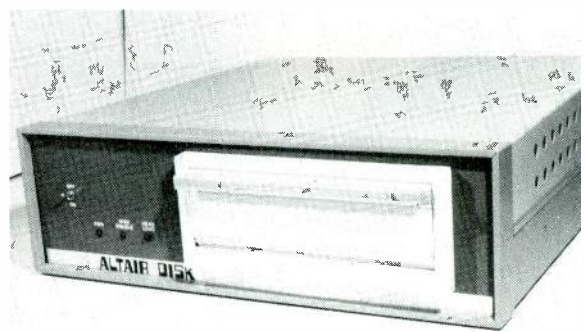
Lear-Seigler's "Glass Teletype"; model ADM-3 Video Display Terminal, marketed as a low-cost kit and sold over-the-counter in a number of retail computer stores in the major metropolitan areas.



Line Printers are high-speed printing devices; this Altair 110 Line Printer will produce 110 characters per second, 70 lines of print per minute.



Typical Micro can mount in a standard 19" rack frame.



Floppy Disc mass data storage devices include the standard size (shown) suitable for rack mounting.

screen. The "intelligent" terminals, on the other hand, include a microprocessor built into the terminal, and in many cases can operate as a stand-alone computer. While the cost of such a unit is higher, in the process of equipping a newsroom, it would not be significantly higher. The catch is that each terminal would have to have software specifically for itself. However, since a terminal with its own "intelligence" does offer more options, it is probably to be preferred.

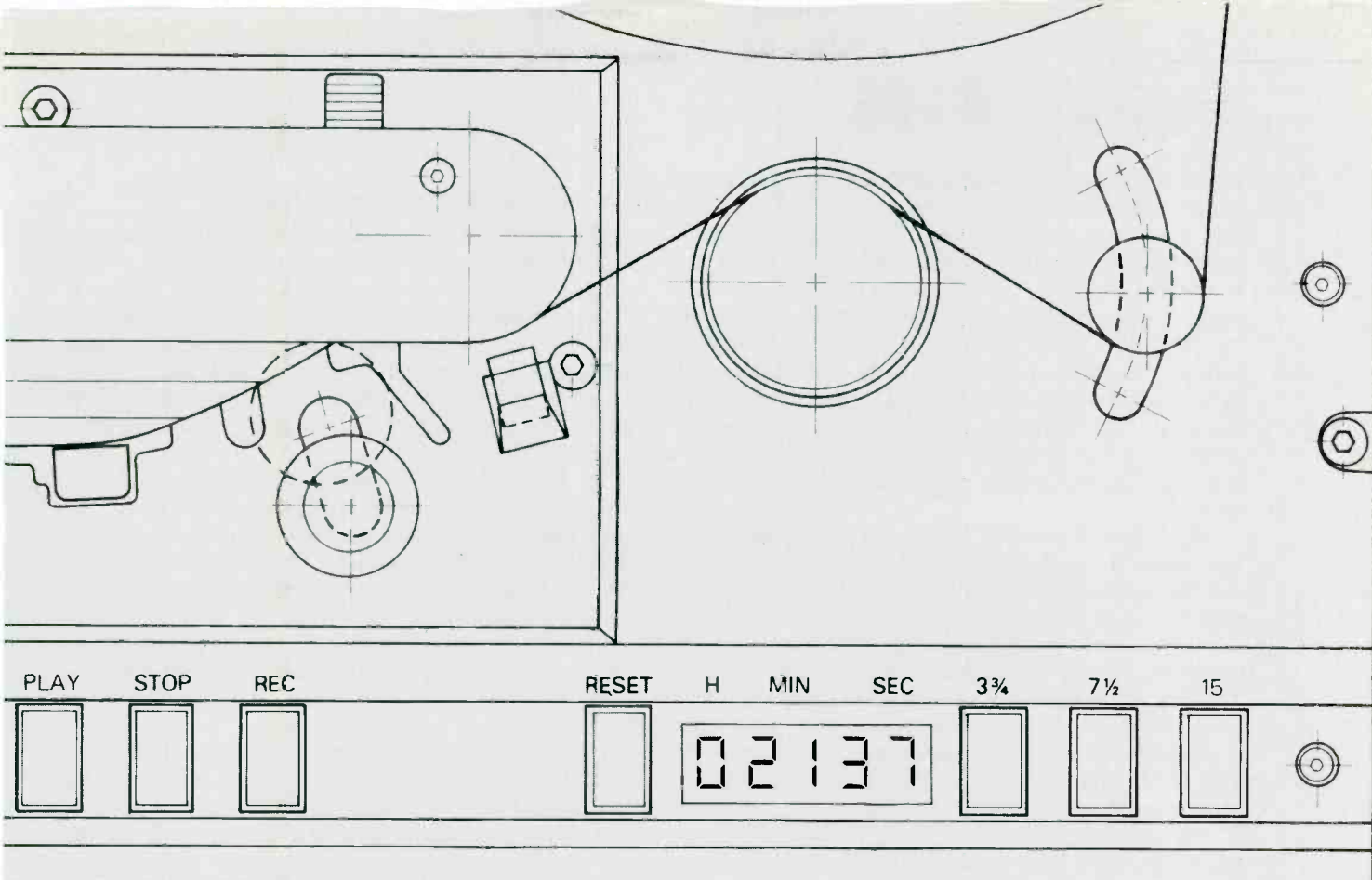
To allow the terminals to work together, to provide the intercommunication between terminals necessary, and to allow mass storage of data, there must be some kind of central processing unit (CPU). Several companies make units suitable for this type of task: MITS, IMSAI, The Digital Group, Processor Technology Corp., and of course the biggies, IBM, Digital Equipment Corp., Hewlett-Packard, etc. What is offered by the larger companies is more sophisticated software support, and equipment on a much grander scale. At the low-cost end of the line, software will probably have to be developed on a consultancy basis, with someone overseeing the entire installation for both hardware and software.

While the microcomputer market is a very competitive one, an interesting development has occurred: the initial machine in this market was the MITS Altair™. MITS developed a machine which provides sockets for the addition of circuitry to meet virtually any need. This so-called "buss structure" was followed by IMSAI, by Processor Technology, and by any number of other companies. Thus, a CPU machine based on the Altair buss offers the most flexibility and options for simply "plugging" various other things into it.

In order for the microprocessor circuit to know what it is to do, it must have instructions. The set of instructions form the machine's "software," and must be stored in some form of memory. Both Read/Write Random Access Memory (RAM) and Read-Only Memory (ROM) are typically used. Because ROM retains information when it is turned off, it typically is used to store instructions for starting-up the system. RAM is the working memory of the system, and is used to store both instructions for operating the system (OS), and data (the actual text being manipulated).

Over a period of time (like one newscast) enough copy may be generated to fill up the RAM storage. Also, to provide quick access to other material, some form of "on-line" mass storage will be needed. The fastest and most effective system is the floppy disc system (already used, perhaps, in the video character generator system in your station). There are, of course, larger and faster storage systems in the realm of the "biggies," and real "cheapies" can use the standard audio cassette as a mass storage medium, but for a working system, the floppy disc is optimum. The floppy disc component may range in price from six or seven hundred in kit form up to two or three thousand, depending on size of disc, number of disc drives, software included, etc.

At some point in the newsroom, you are still going to need written copy, a print-out of the information on the newscast. Some form of medium-speed printer will be necessary. Possibly the standard Teletype™ kind of printer will do, or a faster printer of some type may be desired. Here prices start close to a thousand dollars and go up. Probably the most imperative need is as back-up



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STUDER REVOX

Computer in the Newsroom

copy for the newscaster while he's on. For this need, the printer's type face and size need to be considered. Do you want copy for the director, or can he follow the script from a video display among the camera monitors? Really low-cost hard copy printers will not yet satisfy the working needs of the on-air talent or director, because of type face, line width, and paper width kinds of considerations. Further, because printers are mechanical beasts, the same kinds of maintenance problems can be expected with them that are expected with news wire printers and teletypes, that is, a certain degree of noise, and the need for periodic ribbon-changing and general up-keep.

Many stations now use typed copy for teleprompter-type material, scrolled beneath a monochrome camera and displayed on a video monitor mounted on the television camera. A character generator, linked to the microcomputer, could display the story as entered into the computer, without an intermediate "hard-copy" step. The same prompter display could be shown in the director's control room, for coordination with other programming elements. For prompter use, again special attention should be paid to type size and style for readability from a distance. Standard data displays may use up to 80 characters per line, and displaying that size of character would result in an unreadable display when viewed from the anchor desk.

Software requirements

Creating the software to make the machinery do what you want it to do may well be the most difficult part of installing the computerized newsroom. Some general requirements can be placed on it. The software must be reliable, and that means almost self-restoring in case power failure or failure of component parts. It must be able to serve as many terminals as might be used or added to the system, and keep track of which terminal is working on which story. Thus, a kind of "traffic management" of data, text, instructions is important.

In addition to the above characteristics, several functions of the software can be outlined. First, it should have an "editing" mode, allowing for individual story editing. Second, it should have a "catalogue" mode, allowing a look at all story titles and related information for the newscast. For instance, a call to the "catalogue" mode would display all current story titles, the length in minutes and seconds of the stories, the video sources and video length, and perhaps video tape numbers or some index for SOF filing.

Third, there should be some sort of "display" mode, if the system is also going to provide service as "prompter." The "display" mode would simply allow control of a presentation of current stories, in correct order, scrolled up through the screen like the standard prompter.

Fourth, the software will provide some type of "utility" or "supervisor" mode, which will allow for functions such as the printing of stories after they are edited, perhaps data transmission and reception of stories from points outside the station, perhaps linkage with data coming in from AP and UPI.

At the top of the software hierarchy will sit a "system monitor" which will allow actual changes to the data

handling instructions, for future expansion, changes in types of terminals, catching of "bugs" when the system doesn't do what it is supposed to do, etc.

The computerized newsroom Q&A

Q: Won't a computer installation require retraining for engineers trained in broadcasting? A: No. There would, of course, be the usual introduction to a new piece of equipment, but digital circuits are probably already in your station, in sync generators, test signal generators, perhaps in camera control units, video switchers, transmitter control, or other applications. The electronics will not be totally new and strange to your engineers.

Q: Will the station's reporters be able to adapt? A: A primary goal of the system installation should be ease of use, and therefore little adaptation should be needed. Actually using the system for an hour or two should suffice. Sometimes technical people installing a system can make it difficult for the novice user, so whoever puts the system together should always be on guard for this factor; please, no secret switches the user has to discover. Otherwise, learning to use the system should be no problem.

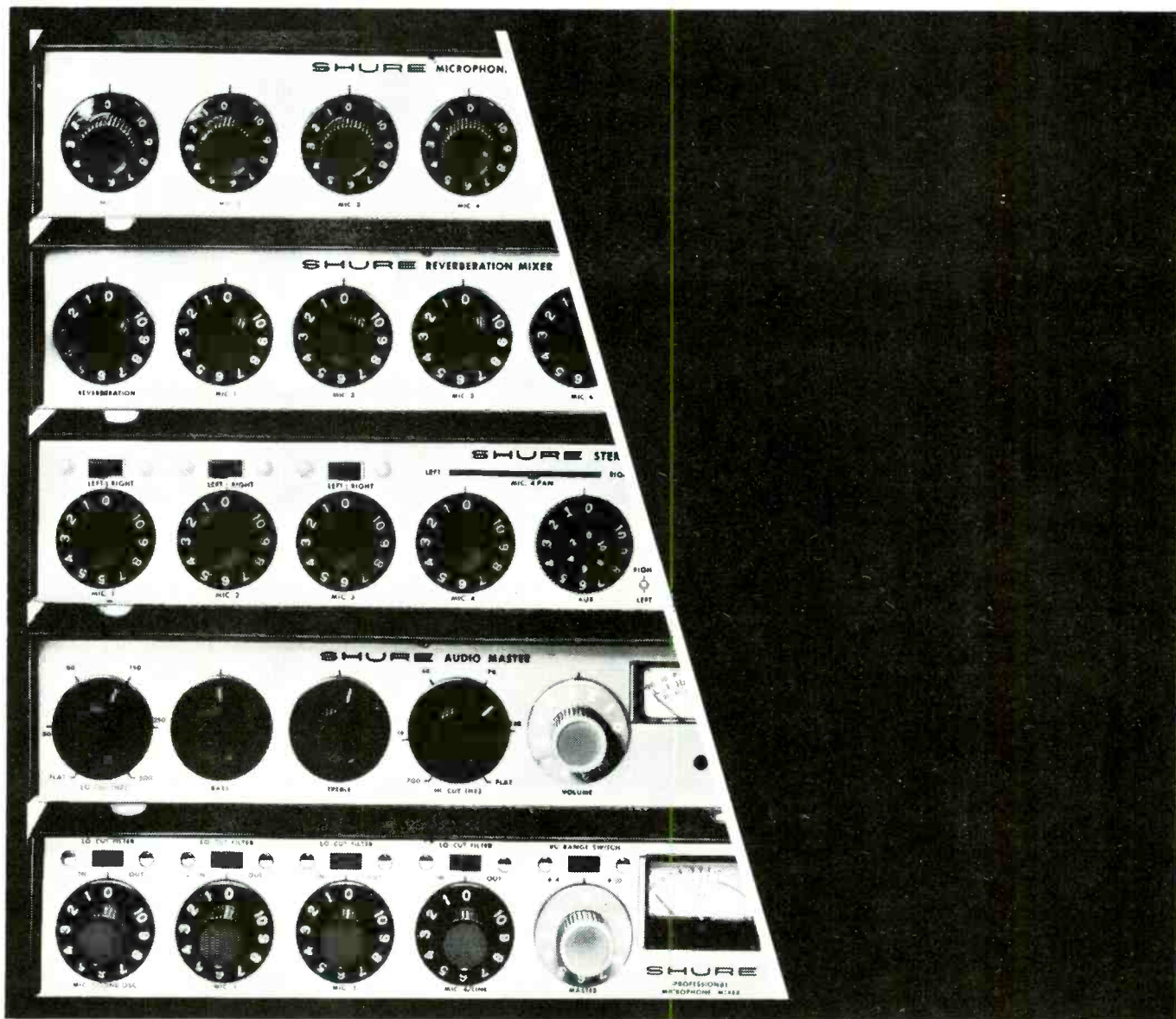
Q: Can the system be used with ENG? A: Yes. In fact, there are literally computers in a valise, which would make very admirable editing terminals in an ENG van. The reporter could type up a story as the ENG van moved from one location to another; after establishment of microwave linkage, the text could be transmitted back to the station along with video and audio. Perhaps the text could be recorded on the second audio track of the ENG VTR. Data transmission is not substantially different from video and audio transmission.

Q: As fast as the microcomputer field is moving, won't this system be obsolete very shortly? A: This is always a consideration, but the main developments are likely to center around better microprocessors, and more dense memory. The floppy disc storage mentioned above is already not much larger than a small audio cartridge machine; improved performance can only help the system, and the major system "ironware" (cases, power supply, cabling and connections) is most likely to remain useful for a substantial life cycle. Even in the area of software, some effort is being made to make new microprocessors compatible with the software of the "first generation" microprocessors.

Q: Could this be tied into the total automation of station operation? A: Bookkeeping, billing, logging, control of video switching, are all within the capabilities of a system using a microcomputer, but there are limits of speed and storage capabilities. On the other hand, if the station already has computer equipment such as printers in the business or traffic departments, then it might be desirable to tie the newsroom system to the other. Such hook-ups are generally called "distributed processing" by the computer people.

Summary

Systems such as that described above are already in use in journalistic applications, based on large-scale machines; for instance, the Kansas City Star uses a Digital Equipment DEC-10 system. Because broadcasting does not need the volume of text that a newspaper does, lower-cost microcomputer equipment will be practical in more newsrooms than ever before. **BM/E**



Rack 'em up.



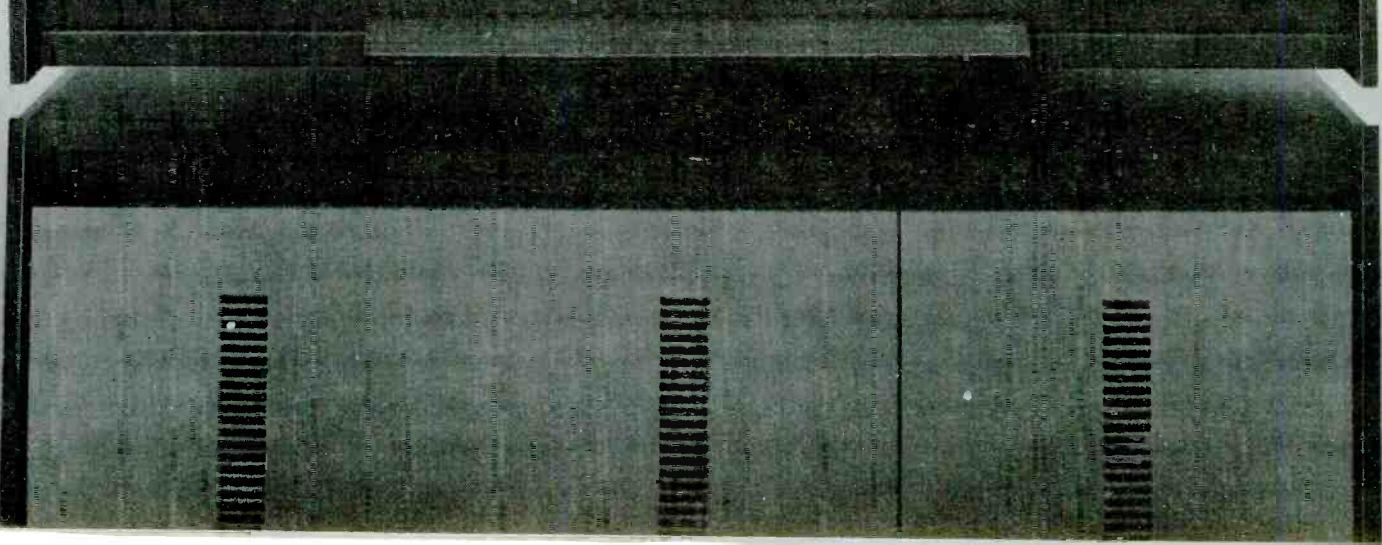
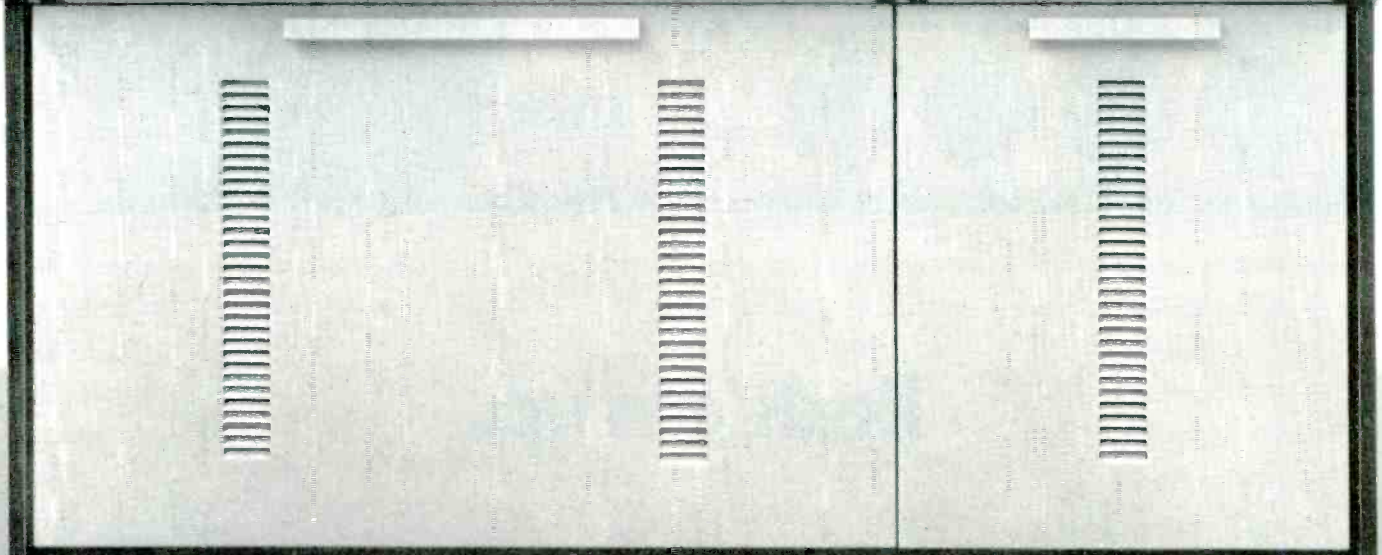
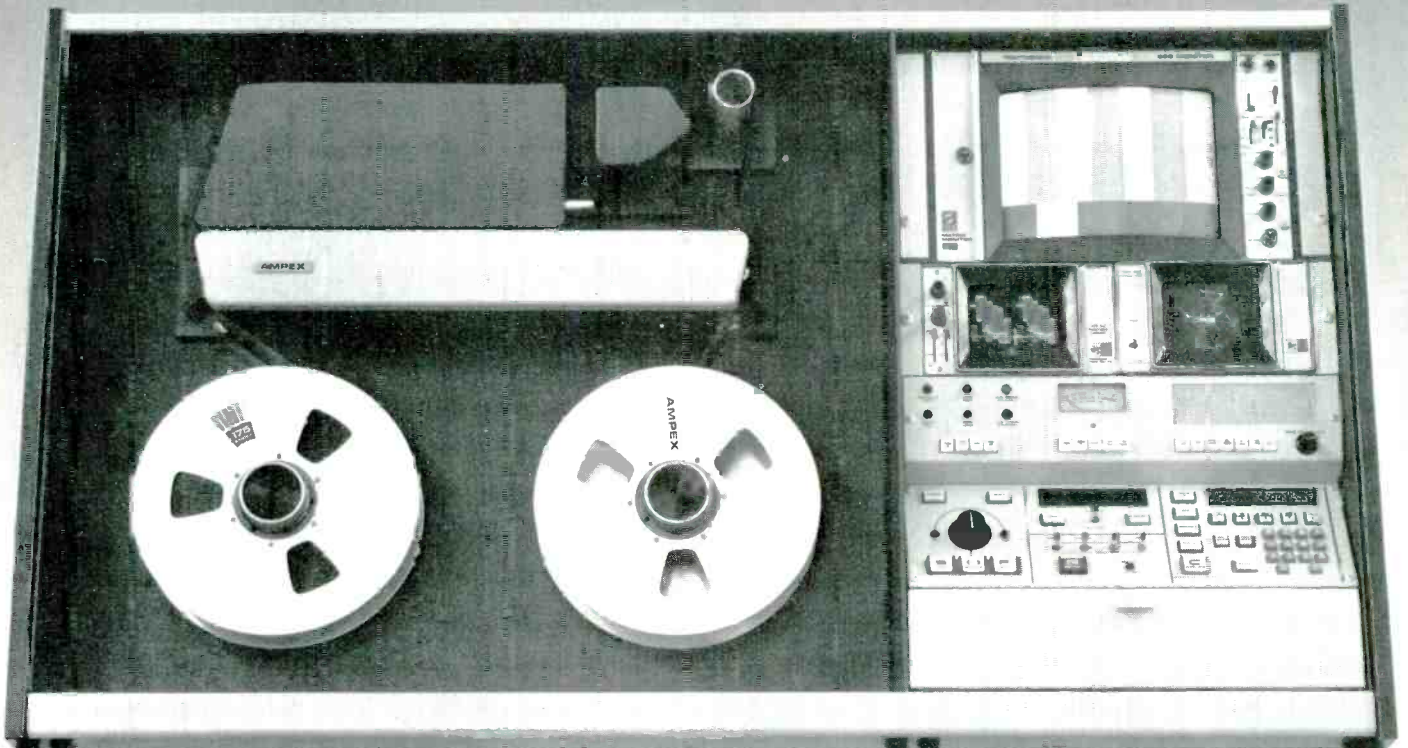
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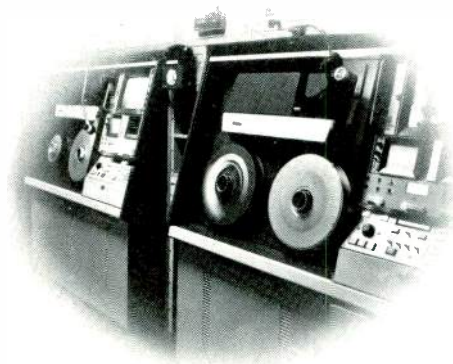
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7. public address
8. amplifier power supplies

Altec Lansing 6,7[▼]; American Data 1-3,5[▼]; Ampro 1-3,5[▼]; Audio Designs 1-4[▼]; Audionics 3,6; Audix 1-3,5,7; Autogram 2-6; Automated Processes 1-6,8[▼]; Bayly 1-3,5,6[▼]; Bethany 1; B&K Instruments 3,6[▼]; Bozak 3,5-7; Broadcast Electronics 5[▼]; Broadcast Sound Assoc. 5-7[▼]; Cetec 1-5[▼]; Channelmatic 1; Clear-Com 1,2[▼]; Crown Intl 3,6[▼]; Di-tech 1,5[▼]; Dyma Engr 1-3,5-8[▼]; Dynair 1[▼]; Electro & Optical 1,5,6[▼]; Elcom 3[▼]; Fisher Berkeley 7[▼]; Gotham Audio 4[▼]; Hammond 3,6[▼]; Heath 6,7[▼]; Holland 1-5[▼]; Industrial Sciences 1-3,5[▼]; International Nuclear 1-3,5,6; Johnson 1,3,7[▼]; JRF 5,6[▼]; JBL 2,3,5-7[▼]; Lear Siegler 1-3,5-8[▼]; Logitek 5[▼]; Long Engr 1-3,5[▼]; LPB 1,3[▼]; Marconi 1[▼]; Marti 2,6[▼]; McCurdy 1-3,5,6,8[▼]; McMartin 1-3,5-8[▼]; Micro-Trak 3,5[▼]; Modular Audio 1-6,8[▼]; Nagra 5-7[▼]; Nakamichi 3,6[▼]; Neve 1[▼]; Opamp Lab 1-6,8[▼]; Orange County 1-8[▼]; Pacific 1-5[▼]; Philips Electronics 1,2,5-7; QEI 5[▼]; QRK 3[▼]; Quad-Eight 2-6,8; Ramko 1-3,5,6[▼]; RCA 1-6[▼]; Richmond Sound 1-3[▼]; Robins 1-3,5-8[▼]; ROH 1-3,5-8[▼]; Russco 3,5,6; Sansui 3,6; Scott 3,6; Scientific Systems 1; Sescom 2,3,5; Sharp 6[▼]; Shintron 1,5; Shure 2,3,5-8[▼]; Sontec 2,3[▼]; Spectra Sonics 1-3,5-8[▼]; Sphere 2,3[▼]; Stancil-Hoffman 2,3,5,6; Tapeathon 7; TEAC 2,3,5,6; Technics by Panasonic 2,3,6[▼]; Tele-Measurements 1[▼]; Telemet 1,5[▼]; Telex 3[▼]; Thomson-CSF 1[▼]; UREI 2,3[▼]; United Research 1,4[▼]; U.S. Pioneer 3,5,6; Varian 3,6[▼]; Vicon 2[▼]; Ward-Beck 1,5,6,8[▼]; Wilkinson 1-3[▼]

Welcome to the Source 1977. This year's guide provides you, the broadcaster, with the most extensive list of manufacturers and independent reps/distributors serving the broadcast industry compiled by BM/E. The Source is designed to be a useful everyday guide to the most important products and services the broadcaster needs to stay on the air.

Everything has been done to assure the reader that the companies listed herein are reliable sources of products and services offered. Most of the firms are designated as Verified Sources (VS). This VS designation means that the company has supplied information to BM/E that indicates that its products are in production and regularly available to you. This supporting information supplied by the manufacturer is on file with BM/E.

The Source is divided into three sections: The Instant Source Locator (page 56), an alphabetical listing of manufacturers (page 71), and a listing of Independent reps/distributors organized by state (page 134). The Instant

Audio Controls

1. rotary attenuators
2. slide attenuators
3. switchers

Alco 3[▼]; Altec Lansing 2[▼]; Audio Designs 2[▼]; Automated Processes 2,3[▼]; Cetec 1-3[▼]; Comm Technology 3[▼]; Audio Elect 2; Duncan 2[▼]; Dynair 3[▼]; Gotham Audio 1,2[▼]; Industrial Sciences 3[▼]; International Nuclear 3; McCurdy 2,3[▼]; MCI 2[▼]; Modular 3[▼]; Opamp 2[▼]; Pacific Recorders & Engr 3[▼]; Quad-Eight 1,2; Robins 2,3[▼]; ROH 3[▼]; Sescom 2; Spectra Sonics 2[▼]; Switchcraft 3[▼]; Tech Labs 1,2[▼]; Tele-Measurements 1[▼]; Telemation 3[▼]; Ward-Beck 3[▼]; Waters Mfg 1,2[▼]

Audio Processing Equipment

1. ALC and AGC amplifiers
2. compressor/limiters, AM
3. compressor limiters/filter, FM
4. equalizers and filters—passive
5. equalizers and filters—active
6. phasers
7. flangers
8. delay lines
9. stereo phase enhancer
10. clipper
11. modulator
12. speech time compressor
13. variable filters
14. automatic modulation controller
15. pitch changer
16. sibilance controller

Altec Lansing 4,5[▼]; Ampro 1-3,9[▼]; A.P. Circuit 5[▼]; Ashley 2,3,5[▼]; Audio Disigns 5[▼]; Audiotechniques 6-8[▼]; Audix 5[▼]; Automated Processes 2-5[▼]; Bayly 4[▼]; BEI 1,5[▼]; B&K 4,5,8[▼]; Bozak 4,8[▼]; Broadcast Electronics 1-3[▼]; Caringella 1,2[▼]; Crown Intl 4,5,13[▼]; Custom Audio 5[▼]; Delta 14[▼]; Durrough 2,3[▼]; Dyma Engr 1,5-7[▼]; Elcom 1-3[▼]; ESC 4,8[▼]; Eventide Clockworks 6-8[▼]; Gotham 2,3,5-8[▼]; Hammond 5-8[▼]; Heath 4[▼]; Holland 5[▼]; Industrial Science 4,5[▼]; Inovonics 1-3[▼]; Lear-Siegler 1-5[▼]; Lexicon 8,15; LPB 2,3[▼]; Marconi 2[▼]; Marti 1-3[▼]; McCurdy 1,25-7[▼]; McMartin 2[▼]; MICMIX 6-8[▼]; Micro-Trak 4,5[▼]; Moseley 2,3[▼]; MXR 2,5,6,8[▼]; Opamp 1,2,4,5,7[▼]; Orange County 1-6[▼]; Orban Assoc 2,3,5,7,16[▼]; Orban/Parasound 5-7[▼]; Quad-Eight 2,4,5,7; Ramko 2-5[▼]; RCA 1,5[▼]; Richmond 5[▼]; RMS 4; Robins 1,4,7[▼]; ROH 1-3,5[▼]; Sansui 3,6; Sescom 3,5; Shure 1-3,5[▼]; Sontec 3,5[▼]; Spectra Sonics 2,5[▼]; Sphere 5[▼]; Stancil-Hoffman 1; Technics by Panasonic 5[▼]; Telemation 8[▼]; Tele-Measurements 1[▼]; Thomson-CSF 1-3,5[▼]; Transit-O-Sound 1; UREI 2,3,5[▼]; Ward-Beck 1,2,5,6[▼]; White 4,5[▼]; Wilkinson 1-3[▼]

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 system
13. tone detection/control

Aitken 2,12[▼]; Ampro 1,2,6,9,11[▼]; Autogram 1,2,4,7,10,12; Automated Processes 4,10,12[▼]; Automation Electronics 1-12[▼]; Broadcast Electronics 1-4,6,7,8,10-12[▼]; Broadcast Sound 5,12[▼]; Caringella 11[▼]; Cetec 1-12[▼]; Consolidated Elect 3,5-8,12; Dak 2-4,7,8; Datametrics 1,2; Dyma 1,10[▼]; Dytek 12; Harris 1-12[▼]; Harrison 3,7[▼]; IGM 1-3,6,10-12[▼]; International Tapetronics 5,6[▼]; Ionic Industries 2[▼]; McCurdy 2-10[▼]; Microprobe 1,12[▼]; Microtime 3,5,10,12[▼]; Moseley 9[▼]; NES 1-4,7,9,11,12[▼]; Neve 3,12[▼]; Nurad 3[▼]; PWH 3,7,8,10,12[▼]; Quad-Eight 3; Rivers 10[▼]; Robins 10[▼]; Scully Recording 5[▼]; Eric Small & Assoc 3,12[▼]; Sono-Mag 2-6,9-12[▼]; Spectra Sonic 10[▼]; Tapeathon 5,11,12; Telemet 2[▼]; Telex 5[▼]; TEA 10[▼]; VIF 5,12[▼]; Ward-Beck 12[▼]

Source Locator is designed to help you find manufacturers of particular products. Eleven major product categories have been noted. Each of the eleven major categories has been further subdivided into classes of products and then broken-out into specific types of products. For instance, Category I, Audio Equipment, has as its first subcategory, Audio Amplifiers, Audio Amplifiers are further divided into 8 specific types of amplifiers.

Here's how to use The Source: First, identify the general category to which the product you seek belongs. For example, you are looking for a wireless microphone. You would look to category I, Audio Equipment. Locate the subcategory, microphones, and then note the number assigned to the specific type of microphone you are looking for. In this case, you would find that "wireless microphone" is listed as number 5. Then, looking to the company to which the number 5 is attributed. For information on how to contact these firms, look up their listing in the alphabetical section. There, you will also find information

on other products manufactured by those firms. If the manufacturer is an advertiser in this issue, you will find a reference to the page on which their ad appears. Refer to the ad for further information. Also, you may find the company's field offices listed or a referral to the rep/distributor section. If so, you will be able to go the rep/distributor section and locate the local representative in your state for a nearby supplier of the product. For your convenience, local reps/distributors for manufacturers' advertising in this issue carry the name of that manufacturer in their listing. This should be an aid in quickly locating the local business carrying the product you want.

Remember, the VS in the alphabetical listing, or the ▼ in the Instant Source Locator, designates the firm as a Verified Source. This is our way of assuring you that the company so designated has supplied us with information that indicates that products attributed to them are in production and regularly available.

Consoles	Altec Lansing 1,6▼; Ampro 1-3,5▼; Ashly 1,6▼; Audio Designs 5,7▼; Audiotechniques 1,3-6▼; Audiotronics 1-7▼; Audix 1-3,5,6▼; Autogram 2,3▼; Automated Processes 1-6; Boston Sound & Power 1; Broadcast Electronics 1-3,5,6▼; Broadcast Sound 1,3,4,6▼; Central Dynamics 1▼; Cetec 1-6▼; Coherent 1-3,5,6▼; Collins 2,3▼; Crossroads 1; Custom Audio 1-3,6▼; Dak 1; Dyma 1-7▼; Alan Gordon 7▼; Hammond 1,3,5▼; Harris 1-3▼; Harrison 1-6▼; Holland 5▼; Industrial Sciences 1,2,5,6▼; International Nuclear 1; Johnson 1▼; KMS 1; Logitek 2,3▼; Long Engr 1▼; LPB 1-3,5▼; Marconi 1,5,6▼; McCurdy 1-6▼; McMartin 1-3,5,6▼; Micro-Trak 1-3,5,6▼; Modular Audio 2-5▼; Charles Moore 1-3,5▼; Neve 1-6▼; Opamp 1-7▼; Pacific Recorders & Engr 1-3,5▼; Philips Broadcast Equip 5▼; Philips Electronics 1-6▼; Quad-Eight 1-7▼; Quantum 1,3,4,6▼; Ramko 1-7▼; RCA 1-3,5,7▼; Richmond 1-7▼; Robins 1-6▼; ROH 5▼; Shintron 6; Shure 1-3,5,6▼; Spectra Sonics 1-5▼; Sphere 2-5▼; Studer Revox 1-3,5▼; TEAC 1,3,4▼; Tele-Measurements 1,5▼; Theater Tech 1,6; 2005 AD 1,3,6; TEA 1-6▼; Ultra Audio Pixtec 1,2,5,6▼; UREI 2-5▼; Ward-Beck 1-3,5,6▼; Wilkinson 2,3▼;
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Disc Cutting Equipment	Gotham Audio 1-3▼; L.J. Scully▼
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Disc Playing Equipment	Ampro 1-3,5▼; Audio Technica 2-4▼; Broadcast Electronics 1-3,5▼; Broadcast Sound 1-6▼; Cetec 1-3,5▼; Elcom 5▼; Elpa Mktg 1▼; Gotham Audio 1,3,6▼; Harris 1-5▼; Logitek 5▼; LPB 1,2,5▼; McCurdy 1-3,5,6▼; McMartin 5▼; Micro-Trak 1,2,5,6▼; Modular Audio 5; Nakamichi 3▼; Philips Electronics 3,5▼; Quad-Eight 5▼; QRK 1,3▼; Ramko 1-3,5▼; RCA 1,2▼; Robins 5▼; Scott 1▼; Sharp 1▼; Shure 2-4▼; Stanton Magnetics 1-3,5▼; TEAC 1,2▼; Tech Labs 5▼; Technics by Panasonic 1▼; TT Electronics 8▼; Wilkinson 5▼
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Headphones	Audio Technica▼; Audiotronics▼; Broadcast Sound▼; Beyer; Cetec▼; David Clark▼; Hammond▼; Koss▼; Magnasync/Moviola▼; Marconi▼; McCurdy▼; Nakamichi▼; Philips Electronics▼; RCA▼; R-Columbia▼; Sansui▼; Sennheiser▼; Sharp▼; Sony▼; Stanton▼; Superscope; TEA▼; Telephonics; Telex▼; U.S. Pioneer
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Intercom Systems	Audio Electronics; Automated Processes▼; Bayly▼; Cetec▼; David Clark▼; Clear-Com▼; Fisher Berkeley▼; Holland▼; Industrial Sciences▼; Lear Siegler▼; Long Engr▼; Marconi▼; McCurdy▼; McMartin▼; NOVA; RCA▼; R-Columbia▼; Rivers▼; RTS▼; Shintron; Tele-Measurements▼; Telex▼; Theatre Tech▼; Video Aids▼; Ward-Beck▼
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Microphones	Altec Lansing 1,2,8,9▼; Atlas Sound 8,9▼; Audio Technica 1,4,7▼; Audiotronics 1,2,4,7▼; B&K Instruments 2,8,9▼; Broadcast Sound 1,2,4▼; Cetec 1,2,5▼; Coherent 4,7,9▼; Comrex 5▼; Dyma 1▼; Electrovoice 1,2,4,5,8; GAF 8,9; Gotham Audio 2,7-9▼; Alan Gordon 5,8,9▼; Hammond 1-3,7-9▼; JVC 1,2,4,6,8,9; KMS 4,7,9; LPB 8▼; Magnasync/Moviola▼; McCurdy 1,2,8,9▼; Nagra Magnetic 2,7▼; Nakamichi 1,2,8,9▼; Panasonic 4▼; Philips Electronics 1,2,4,6,7,9▼; RCA 1,3,7▼; R-Columbia 1,2,4▼; Redding Radio 9▼; Sennheiser 1,2,4,7-9▼; Sescom 9▼; Shure 1-3,7,9▼; Sony 1,2,4,6-9▼; Studer Revcx 2▼; TEAC 4▼; TEA 5▼; Technics by Panasonic 4▼; Thomson-CSF 5▼; TV Products 8▼; Vega 5▼; HM Electronics
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Music Synthesizers	Arp; Electronic Music▼; Ionic Industries▼; Moog▼
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Noise Reduction Systems	B&K▼; DBX; Dolby Labs▼; Electronic Music▼; Gotham Audio▼; Innovation; Inovonics▼; Ionic▼; Microtime▼; MXR▼; Orange County▼
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Patch Panels	Audio Accessories; Audio Designs▼; Automated Processes▼; Dyma▼; Industrial Sciences▼; McCurdy▼; Potomac▼; Switchcraft▼; Theatre Techniques▼; Trompeter; Ward-Beck▼
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Quad Matrix Equipment	CBS 1,2▼; Sansui 1,2
1. encoder	
2. decoder	

Speakers	Acoustic▼; Advent▼; Altec Lansing▼; Audionics; Audiotechniques; Audiotronics▼; Broadcast Sound▼; Cetec▼; Crossroad; Electro & Optical; Gotham Audio▼; Hammond▼; Heath▼; Koss▼; JBL▼; Lear Sigeler▼; McCurdy▼; Nakamichi▼; Orange County▼; Technics by Panasonic▼; Philips Electronics▼; Ramko▼; RCA▼; Russo; H.H. Scott; Sharp▼; Shure▼; Sony▼; Spectra Sonics▼; Superscope; Telecro▼; UREI▼; U.S. Pioneer▼; Westlake▼
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Studios	Ampro 1,3▼; Audiotechniques 1-3; Broadcast Electronics 1▼; Broadcast Sound 1,3▼; Cetec 1▼; Dyma 1-3▼; Grinnan Fixture 1,3▼; LPB 1▼; McCurdy 1,3▼; Micro-Trak 1▼; Orange County 3▼; Plastic Reel 1▼; Pacific Recorders & Engr 1,3▼; RCA 3▼; Stantron 1▼; Spectra Sonics 1,3▼; Sphere 3▼; Whirlwind 1,3▼; Westlake 1,3
1. cabinets and furniture	
2. acoustic materials and treatment	
3. complete studio construction	

Synchronizing Equipment	Amplex 1,2▼; Automated Processes 1,2▼; BTX 1,2▼; Chrono-log 1▼; Datametrics 1; EECO 1,2▼; Electro & Optical 1; Magna-Tech 1,2▼; Microtime 2▼; MCI 1,2▼; Nagra Magnetics 2▼; RCA 1,2▼; Studer Revox 1,2▼; Telemation 2▼; TRI 1; Video Electronics
1. time code generator	
2. synchronizer	

Tape, Magnetic
 1. open-reel tape
 2. cartridges
 3. cassettes
 4. tape test

Ampex 1-4▼; Ampro 2,3▼; Aristocart 2,4▼; BASF 1-3; Broadcast Sound 1,3▼; Cetec 2,4▼; Consolidated Electronics 1,2▼; Fidelipac 2,4▼; Fuji 1-3▼; 3M 1-3▼; Maxell 1-3▼; McCurdy 2,4▼; Memorex 1-4▼; Nagra Magnetics 1,4▼; Nakamichi 3▼; Nortronics 4; Recording Supply 1,3▼; Redding Radio 3▼; Sony 1,3▼; Stancil-Hoffman 1,3; Standard Tape Labs 4; Studio Tape Exchange 1,3▼; Superscope 2,3; TDK 1-4▼; Telectro 1,3▼; United Research 1,4▼

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

Ampro 7,8,10,11▼; Aristocart 1,11▼; Audio Ltd 2,4▼; Broadcast Electronics 7-9▼; Fidelipac 1,3,5,11▼; Hammond 3,8▼; Innovative 11▼; International Tapetronics 4,11,12▼; 3M 1,3,5,6▼; Maxell 1▼; ; Nagy 3; Nagra Magnetics 1,7,8,11▼; Neumade 1,3,5,6▼; Nortronics 3,5,8,9▼; NOVA 8▼; Pacific Recorders & Engr 7▼; Plastic Reel 1▼; Ramko 4▼; Recording Supply 1▼; Recortec 1,2▼; Redding Radio 5▼; Schneider 11▼; Sony 1▼; Stancil-Hoffman 1,3,8▼; Standard Electric Time 7▼; Telex 1▼; Tentel 10▼; TRI 8; TDK 1; Ultra Audio Pixtec 8▼; UMC 12▼; United Research 3,5,6,8-10▼; U.S. Pioneer 1; VIF 10▼

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

Amilon 1▼; Ampro 1-4▼; Audi-Cord 1,3; Automation Electronics 1-3▼; Broadcast Electronics 1-4▼; Cetec 1-4▼; Consolidated Electronics 1-3▼; Edco 1-3▼; Harris 1-3▼; International Tapetronics 1-4▼; McCurdy 1-4▼; McKenzie 1-3; RCA 1-3▼; H.H. Scott 1; Sharp 1▼; Sono-Mag 1-3▼; Telectro 1,2▼; Tele-Measurements 1-4▼; Telex 1▼; UMC 1-4▼

Tape, Cassette Player/Recorder

Amilon▼; Ampro▼; Audiotronics▼; Broadcast Sound▼; Edco▼; K&H▼; Lexicon▼; Nakamichi▼; Ramko▼; Sansui▼; H.H. Scott; Sharp▼; Sony▼; Superscope; Tandberg▼; Technics by Panasonic▼; Tele-measurements▼; 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▼; Audiotechniques 2▼; Automation Electronics 1-3,5▼; Cetec 3▼; Consolidated Electronics 2▼; Dyma 4▼; Gotham Audio 2,3▼; International Tapetronics 2▼; Magna-Tech 2▼; McCurdy 1-5▼; MCI 2-4▼; Nagra Magnetic 1,3▼; Otari 1-5▼; Peirce-Phelps 1-3,5▼; Ramko 1,2▼; RCA 2,3,5▼; Scully Recording 1-3,5▼; Sono-Mag 3▼; Sony 1-3▼; Stancil-Hoffman 5; Studer Revox 1,2▼; Tandberg 3▼; Tapeathon 1,3; TEAC 2,3▼; Technics by Panasonic 3▼; Tele-Measurements 1-4▼; Telex 1,3,5▼; United Research 3; U.S. Pioneer 3; VIF 3▼

Tape Duplicators

Ampex▼; Audico Ltd▼; Cetec▼; Garner▼; Gotham Audio▼; International Audio▼; Microtime▼; Otari▼; Pentagon▼; Recortec; L.J. Scully; Telex▼

Tape Editing Equipment

Broadcast Electronics▼; Convergence▼; Edco▼; EECO▼; Elpa▼; TRI

Tape and Head Erasers
 1. head degaussers
 2. bulk erasers
 3. conveyor erasers

R.B. Annis 1▼; Broadcast Electronics 1,2▼; Cetec 2▼; Fidelipac 2▼; Garner 3▼; International Tapetronics 2▼; Nagra Magnetic 1▼; Nakamichi 1▼; Nortronics 1,2; RCA 2▼; Robins 1,2▼; Stancil-Hoffman 1,2; TEAC 1,2; UMC 2▼; VIF 1▼

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

Aristocart 2▼; Cetec 2▼; Dyma 1,2▼; Fidelipac 2▼; Grinnan Fixture 1-3▼; Micro-Trak 2▼; Neumade 1-3▼; Plastic Reel 1-3▼; Ramko 2▼; Simpax 2,3▼; Stancil-Hoffman 1; Storeel 1-3; TDK 3▼; Winsted 1-3▼

Tape Heads
 1. new
 2. reconditioned

Computer Magnetics 1,2; Ferra Flux 1,2; Grandy 1,2▼; Minn. Magnetics 1,2; Nortronics 1,2; Saki 1,2▼; Taber 1,2▼; UMC 1,2▼; Vikron 1,2▼

Telephone Coupling Equipment

Broadcast Electronics▼; McCurdy▼; NES▼; North Hills▼; Orange County▼; Redding Radio▼; RTS▼; Shure▼

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

Amber 2,3▼; Audio Designs 1▼; Automated Processes 1▼; Electro & Optical 1▼; Eric Small & Assoc 1▼; ESE 3▼; Gotham Audio 1,3; Harrison 1,3▼; International Instrument 1▼; McCurdy 1,3▼; MICMIX 2,3▼; Modular Audio 3▼; NES 2,3▼; Quad-Eight 3▼; Ramko 3▼; Technics by Panasonic 1▼; Triplet 1▼; 2005 AD 2,3; Weston 1

Other Audio Accessories
 1. connectors
 2. record care
 3. test record
 4. magnetometers
 5. audio silence alarm
 6. audio call tester

R.B. Annis 4▼; Bayly 1▼; Broadcast Sound 2▼; CBS 3▼; Crossroads 6▼; Gotham 1▼; ITT 1▼; Rivers 5▼; Switchcraft 1▼; Trompeter 1▼; UMC 5▼; Whirlwind 1▼

VIDEO EQUIPMENT

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

Ampex 1▼; Bosch Fernseh 1,2▼; CEI 2,3▼; Columbia Video 3; Comquip 3; GBC 2,3; Harris 1-3▼; Hitachi 1-3▼; Ikegami 1-3▼; IVC 1-3▼; Marconi 1▼; NEC 3▼; Panasonic 2,3▼; Philips Broadcast 1-3▼; RCA 1,2▼; Sanyo 3; Sharp 3▼; Sony 2,3▼; Tele-Measurements 2,3▼; Thomson-CSF 1▼

Cameras, TV, Portable Color, AC

Asaca▼; Bosch Fernseh▼; CEI; Comquip; GBC; Hitachi▼; Ikegami▼; IVC▼; JVC▼; Marconi▼; NEC▼; Philips Broadcast▼; RCA▼; Sigma▼; Sony▼; Tele-Measurements▼

Cameras, TV, Portable, Battery Operated
 1. integral head/electronics
 2. separate head/electronics

Akai 1; Ampex 1▼; Asaca 2▼; Bosch Fernseh 2▼; CEI 2; Cinema Products 1▼; Comquip 2; Concord 1; Frezzolini 1▼; GBC 1; Hitachi 1,2▼; Ikegami 1,2▼; IVC 1,2▼; JVC 1▼; Marconi 2; NEC 1▼; Panasonic 1▼; Philips Broadcast 1,2▼; RCA 1,2▼; Sigma 2▼; Sony 1,2▼; Thomson-CSF 2▼

Cameras, TV Mono

Akai▼; Asaca▼; Cohu▼; Colorado Video▼; Comquip; Electro & Optical; GBC; Hitachi▼; Ikegami▼; Marconi▼; NEC▼; Panasonic▼; RCA▼; Sigma▼; Sony▼; Tele-Measurements; Video Optics▼

Camera Lenses and Accessories

AIC Photo; Angenieux▼; Asaca▼; Bausch & Lomb; Birns & Sawyer▼; Bosch Fernseh▼; Canon▼; CEI; Comquip; Cosmicar▼; Dynasciences▼; F&B Ceco▼; Frezzolini▼; Fujinon▼; GBC; Ikegami▼; Lenzar; Panasonic▼; Philips Broadcast▼; Rank Optics▼; Rank Precision▼; RCA▼; Warren R. Smith▼; Telecine; Tele-Measurements▼; Vicon▼; Video Components▼; Visual Methods; Zoomar

Camera Heads, Mounts, Dollies, Etc.
 1. heads
 2. tripods
 3. pedestals
 4. cranes
 5. dollies
 6. ENG camera braces
 7. stabilizing system

AIC Photo 2; Cine 60 6▼; Cinema Products 1,2,6,7▼; Cohu 1-3▼; Comquip 1,2,5; Dak 5▼; F&B Ceco 1-6▼; GBC 1,2; Alan Gordon 2,5▼; Gruber 5,6; Innovative TV Equip 1-3,5,6▼; JVC 2▼; K&H 5,6; Listec 1-5▼; O'Connor 1-6; Panasonic 2,3,6▼; Quick-Set 1-3,5,6▼; RCA 1-3,5▼; Sharp 3▼; Tele-Measurements 1▼; Television Products 2,3,6▼; Video Components 1-3,5,6▼

Remote Control Mounts

Innovative TV Equip▼; Peirce-Phelps▼; Power-Optics▼; Quick-Set▼; Tele-Cine; Vicon▼

Character Generators
 1. alpha-numeric generator
 2. graphics generator

Ann Arbor 1,2▼; Beston 1▼; BJA 2▼; Chrono-Log 1▼; Chyron 1,2▼; Datatron 1; EECO 1▼; Kaitronics 1▼; Kapco 1▼; Knox 1,2▼; Laird 1▼; Lexicon 1▼; 3M 1,2▼; MSI 1▼; PWH 1▼; Shintron 1; System Concepts 1,2▼; Telemation 1,2▼; Tele-Measurements 1▼; Thomson-CSF 1,2▼; Vicon 1▼; Video Components 1▼; Video Data Systems 1,2▼; Video Electronics 1

Chroma Keyers 1. RGB 2. encoded 3. luminance	American Data 1,3▽; Central Dynamics 1-3▽; Dynair 1,2▽; Dynasciences 2▽; Dytek 1,2▽; Grass Valley 1-3▽; Industrial Sciences 1-3▽; International Nuclear 2; Marconi 1,2▽; 3M 1▽; Panasonic 3▽; Shintron 1-3; Tele-Measurements 1▽; Telemet 2▽; Thomson-CSF 1,2▽; Video Electronics 2,3
Color Correctors	Microtime▽; 3M▽; Rank Precision▽; Telemation▽; Thomson-CSF▽
Color Encoders	Lenco▽; Marconi ▽; 3M▽; Philips T&M▽; Telemation▽
Dropout Compensators	Microtime▽; 3M▽; Tele-Measurements▽
Film Telecine Equipment 1. 16mm projectors 2. slide projectors 3. multiplexer 4. complete systems	Buhl 2,3▽; Cohu 1-4▽; Comquip 1-4; GBC 1,4; Heindl Mask 'n' Mounts 2▽; Ikegami 4▽; IVC 3,4▽; Kodak 1-3,5▽; Laird 1-4▽; Magna-Tech 1▽; Marconi 1-4▽; Multi-Track 1,4; Panasonic 3▽; Peirce-Phelps 1-4▽; Philips▽; Rank Precision 2,4▽; RCA 1-5▽; Spindler & Sauppe 2; Tele-Cine 3▽; Telemation 3,4▽; Tele-Measurements 1▽; Thomson-CSF 4▽; Video Components 1-4▽; Zei-Mark 2-4▽
Digital Noise Reducers	Micro Consultants▽; Microtime▽; Tele-Measurements▽; Thomson-CSF▽
Monitors, Picture 1. b&w 2. color	Amtron 1,2▽; Asaca 1,2▽; Ball Brothers 1,2▽; Cohu 1,2▽; Comquip 1,2; Conrac 1,2; Electrohome 1,2▽; Electro & Optical 1; GBC 1; Hitachi 1,2▽; Ikegami 1,2▽; Lenco 1▽; Panasonic 1,2▽; RCA 2▽; Rohde & Schwartz SC Electronics 1,2▽; Sharp 2▽; Sony 1,2▽; Tektronix 1,2▽; Tele-Measurements 1▽; Unimedia 2▽; Video Aids 1,2▽; Videotek 2▽; World Video 2
Monitor Calibrator	Philips T&M▽; Power Optics▽; Tektronix▽; TEA▽
Processing Amplifiers	CEI, Central Dynamics▽; Dynasciences▽; Grass Valley▽; Industrial Sciences▽; Leitch▽; Lenco▽; 3M▽; Siegel▽; Tektronix▽; Tele-Measurements▽; Telemet▽; Thomson-CSF▽; Versa-Count▽
Pulse & Distribution Amplifiers 1. pulse 2. distribution 3. subcarrier 4. DC coupled 5. equalization	American Data 1-3▽; Avantek 1,2▽; Blonder-Tongue 2▽; Central Dynamics 1,3▽; C-Cor 1,2; Channelmatic 2; Cohu 1-3▽; Di-Tech 1,2▽; Dynasciences 1,2▽; Dynair 1-3▽; Electro & Optical 1,2; GBC 1,2; Grass Valley 1-3▽; Industrial Sciences 1-4▽; International Nuclear 1-4; ITI 4▽; Kapco 1-3▽; Leitch 1-4▽; Lenco 1-4▽; Marconi 1-3▽; Charles Moore 1,2▽; Panasonic 1-3▽; RCA 1,2▽; RHG 1,4; Shintron 1-3; Sigma 1-3▽; Tektronix 1-4▽; Telemation 1-3▽; Tele-Measurements 1,2▽; Telemet 1,2▽; Thomson-CSF 1,2,4▽; Vamco 2; Varian 1; Vicon 2▽; Video Aids 2▽; Video Electronics 1-3; Vital 1-3▽; Viscount 2▽
Production Switcher 1. large 2. small	American Data 1,2▽; Central Dynamics 1,2▽; ComTec 2▽; Dyma 2▽; Dynair 2▽; Dynasciences 2▽; Dytek 2▽; Duca-Richardson 1,2▽; Electro & Optical 2; Grass Valley 1,2▽; Industrial Sciences 1,2▽; International Nuclear 1,2; J&D 1,2▽; Kapco 2▽; 3M 2▽; Marconi 1▽; Panasonic 2; Philips Broadcast 2▽; QSI 2▽; Richmond Hill 1,2; Ross 1,2; Shintron 1,2; Sony 2▽; Telemet 1,2▽; TRI 2; Video Electronics 1; Viscount 1,2▽; Vital 1,2▽
Automated Technical Operations Systems	Central Dynamics▽; Grass Valley▽; Vital▽
Routing Switchers	American Data▽; Central Dynamics▽; Com-Tec▽; Datalogic▽; Di-tech▽; Duca-Richardson▽; Dynair▽; Dynasciences▽; Dytek▽; Electro & Optical; Grass Valley▽; Industrial Sciences▽; International Nuclear; Kapco▽; Leitch▽; 3M▽; Marconi▽; QSI▽; Richmond Hill; Telemation▽; Tele-Measurements▽; Telemet▽; Trompeter▽; Vamco; Vicon▽; Viscount▽; Vital▽

Film to Video Transfer	Hollogon; Palmer▽; Warren R. Smith▽; Zei-Mark▽
Image Enhancers	Asaca▽; Cohu▽; Dynasciences▽; Hitachi▽; Ikegami▽; Kalart Victor▽; 3M▽; Microtime▽; Rank Precision▽; Siegel▽; Telemation▽; Tele-Measurements▽; Telemet▽; Thomson-CSF▽; TRI
Signal Equalizing System	Di-Tech▽; Grass Valley▽; Industrial Sciences▽; Leitch▽; Telemet▽
Sync Generator Systems 1. sync 2. color bar 3. black burst 4. stairstep/ramp 5. multiburst 6. digital sync decoder	Asaca 1-5▽; Central Dynamics 6▽; Dynasciences 1-3,5▽; GBC 1; Grass Valley 1,3,6▽; Industrial Sciences 1▽; Ikegami 1▽; Kapco 1,3▽; Leitch 1-6▽; Lenco 1-6▽; 3M 1-3▽; Marconi 1-5▽; Philips T&M 1-5▽; Richmond Hill▽; Rohde & Schwarz 4,5▽; Sharp 1,2,4,5▽; Shintron 1-3; Sigma 1,3,7▽; Spectra-Vision 1-3▽; Tektronix 1,5▽; Telemation 1-3▽; Tele-Measurements 1-5▽; Telemet 1,2,4,5▽; Thomson-CSF 1-5▽; Ultra Audio 1-3▽; Video Aids 1▽; Video Components 1,3▽; Video Electronics 1-4; Viscount 1▽; Visual Information 1,2,4,5; Vital 1,3,6▽
Special Effects Generators	BJA▽; Colorado Video▽; ComTec▽; Dynair▽; Dynasciences▽; Dytek▽; GBC; Grass Valley▽; Industrial Sciences▽; Ikegami▽; Kapco▽; 3M▽; Marconi▽; Micro Consultants▽; Peirce-Phelps▽; Philips Broadcast▽; Sharp▽; Shintron; Sony▽; Tele-Measurements▽; Video Electronics; Viscount▽; Vital▽
Switchers, Automated	American Data▽; Central Dynamics▽; Com-Tec▽; Duca-Richardson▽; Dytek▽; Grass Valley▽; Industrial Sciences▽; Vital▽
Standard Converters	Electro & Optical; Marconi▽; Micro Consultants▽; NES▽
Synchronizers 1. frame 2. field	Consolidated Video 1,2▽; Grass Valley 1,2▽; Micro Consultants 1,2▽; Microtime 1▽; NEC 1,2▽; RCA 1,2▽; Vital 1,2▽
Time Base Correctors 1. helical capstan servo 2. helical non-servo capstan 3. quad	Ampex 1,3▽; Asaca 3▽; Consolidated Video 1-3▽; Digital Video 1,2; Edutron 1; Marconi 1▽; Merlin 1,3; Micro Consultants 1-3▽; Microtime 1-3▽; NEC 1-3▽; RCA 1-3▽; Sony 1▽; TRI 1,2▽
Videotape 1. new tape 2. tape cleaning & evaluating 3. reprocessed tape	Ampex 1▽; DuPont 1▽; Fuji 1▽; 3M 1▽; Maxell 1▽; Memorex 1; NOVA 2; Panasonic 1▽; Recortec 2; Research Technology 2▽; Sony Broadcast 1▽; Sony Corp 1,2▽; Studio Tape Exchange 2,3▽; TDK 1▽
Videotape Accessories 1. tape cleaners 2. VTR head cleaners 3. reels 4. tape evaluatois 5. storage 6. tape tension gauge 7. rewinder 8. bulk erasers 9. demagnetizer 10. tape loader 11. replacement heads	R.B. Annis 9▽; Audico Ltd 10; Fidelipac 8▽; Garner 8▽; Grinnam Fixture 5▽; Kaitronics 4▽; 3M 2,3▽; Merlin 1,7; Microtime 8▽; Neumade 5,7▽; Nortronics 2,8▽; NOVA 1▽; Optek 8▽; Panasonic 3▽; Peirce-Phelps 4▽; Plastic Reel 3,5▽; RCA 8▽; Recortec 1,4,6,7▽; Recording Supply 3▽; Research Technology 1,5▽; Schneider 4▽; Sony Corp 2,3▽; Tele-Measurements 1-5,7,8▽; TEA 1,4▽; Tentel 6▽; Ultra Audio 1▽; Winstead 5▽; Videomax 11▽
Videotape Recorder/Players 1. quad 2. helical 3. segmented-helical 4. helical cassette 5. automated systems	A.F. Assoc 1▽; Akai 2; Ampex 1,2,4▽; Arvin/Echo 2▽; Asaca 1▽; Avtel 5; Bosch-Fernseh 2-5▽; Channelmatic 5; Comquip 1,2,4; Ikegami 2▽; IVC 2-4▽; Marconi 2▽; Merlin 1,5; Microtime 5▽; NEC 1,2▽; Panasonic 2▽; Philips Broadcast 3,4▽; Peirce-Phelps 2-5▽; Programmable Systems 5▽; QSI 5▽; RCA 1-3▽; Recortec 2▽; Sawyer Camera 2▽; Sony Broadcast 2,4▽; Sony Corp 2,4▽; Tech Electronics 5; Tele-Measurements 2-5▽
▼ Means Verified Source	

SOURCE LOCATOR—II continued

VTR Head and Machine Rebuilding 1. head refurbishing 2. machine rebuilding	A.F. Assoc 2▼; Merlin 2; RCA 1▼; Recortec 1,2▼; Saki 1,2▼; Spin Physics 1▼; Tele-Measurements 1▼; Videomax 1,2▼
Video Cartridge/Cassette Equipment 1. players 2. recorders 3. automation controllers 4. complete auto systems 5. reloaded carts	Ampex 2,3▼; Arvin/Echo 1,2▼; Channelmatic 3,4; Comquip 1,2; GBC 2; Merlin 1-4; NEC 1,2▼; Panasonic 1,2▼; Programmable Systems 3,4▼; QSI 2,4,5▼; RCA 1,2,4▼; Re-Play Video 5▼; Sony Broadcast 1,2▼; Sony Corp 1,2▼; Tele-Measurements 1-4▼; Vital 4▼
Videotape Editing 1. editor-controller 2. time code gens 3. time code reader 4. frame counter 5. tape timer	Ampex 1▼; Artists Engr 1,5▼; Avonix 1,4▼; BTX 1-3▼; Central Dynamics 1-3▼; Chrono-Log 2,3▼; CMX 1-3; Convergence 1,4,5▼; Datatron 1-3; Datametrics 3; Dytek 1▼; EECO 1-4; Electro & Optical 2,4; ESE 3,5; Gould 2,3▼; Kaitronix 2,3▼; Merlin 5; Microvision 1; RCA 1-3▼; Recortec 1-3▼; Standard Electric Time 5▼; Shintron 2,3; Skotel 2,3▼; Sony Broadcast 1,2▼; Sony Corp 1▼; Spectra-Vision 1-5▼; Tech Electronics 1; TRI 1-5▼; Vamco 5; Video Aids 1▼; Video Electronics 1-5; Vital 1▼
Video to Film Transfer	Palmer▼; Teledyne
Video Identification Systems	Ampex▼; GBC; Leitch▼; QSI▼; Tektronix▼; Vic-on▼; Video Data▼; Visual Methods
Video Delays, Filter 1. delay lines 2. filters	Corning 1▼; ESC 1,2; Industrial Sciences 1▼; Leitch 1▼; Lenco 1▼; Listec 1▼; TEA 1,2▼
Video Discs	A.F. Assoc▼; Ampex▼; Arvin/Echo▼; Eigen▼
Videotape Duplicator 1. quad 2. other	Ampex 1▼; Arvin/Echo 2▼; Microtime 2▼; Panasonic 2▼; Sony Corp 2▼
Video Effects Devices 1. colorizer 2. synthesizer 3. repositioner 4. compressor 5. animation 6. digital video effects 7. video slater/prompter 8. test materials 9. power packs, portable video camera 10. auto skew corrector 11. large screen projectors 12. video lock to mag. film record 13. video attenuators 14. video test charts & slides	Asaca 5▼; Berkey 1,2▼; Beston 1▼; BTX 12▼; Blonder-Tongue 13▼; Channelmatic 6; Christie 9▼; Cine 60 9▼; Daburn 5▼; Di-Tech 4,6▼; Dynair 4▼; Frezzolini 9▼; GAM 12,14; Image Magnification 11▼; Imero Fiorentino 8▼; International Nuclear 4; Kalart Victor 11▼; Leitch 4▼; Lenco 3,4,6▼; Listec 7▼; Micro Consultants 5▼; Microtime 10▼; NES 5,8▼; Peirce-Phelps 5,6,9-11,14▼; Porta-Pattern 8,14▼; Projection Systems 11▼; Sony Corp 9▼; Tech Labs 13▼; Tektronix 5,8,13▼; Tele-Measurements 1,5-7,9,13,14▼; Thomson-CSF 2▼; Video Aids 6▼; Video Components 1,6▼; Visual Information 8,14; Zei-Mark 1▼

▼ Means Verified Source

FILM EQUIPMENT

Cameras, Cine	AIC Photo; Arriflex▼; Bach Auricon; Canon▼; Cinema Products▼; Comquip▼; F&B Ceco▼; Frezzolini▼; Alan Gordon▼
Camera Lenses	Angenieux▼; Arriflex▼; Bach Auricon; Birns & Sawyer▼; Canon▼; Cinema Products▼; F&B Ceco▼; Frezzolini▼; Alan Gordon▼; Heindl▼; Lenzar; Rank Optics▼; Rank Precision▼; Video Components▼

Camera Tripods & Accessories AIC Photo; Birns & Sawyer▼; Canon▼; Cinema Products▼; Comquip▼; F&B Ceco▼; Frezzolini▼; GAF▼; Alan Gordon▼; Innovative TV Equip; Peirce-Phelps▼; Quick-Set▼

Carrying Cases Birns & Sawyer▼; Cinema Products▼; F&B Ceco▼; Frezzolini▼; GAF▼; K&H▼; Neumade▼; Plastic Reel▼; Thermodyne▼; Video Components▼

Film Agfa-Gevaert; Fuji▼; Kodak▼

Film Cases F&B Ceco▼; Neumade▼; Plastic Reel▼; Research Technology▼; Studio Tape Exchange▼

Film Cleaners F&B Ceco▼; Lipsner-Smith; Neumade▼; Research Technology▼

Film Editing Equipment Birns & Sawyer▼; Comquip▼; F&B Ceco▼; Kalart Victor▼; Neumade▼; Plastic Reel▼; Research Technology▼

Film Processors Comquip▼; GAF▼; Houston▼; Jamieson▼; Magnasync/Moviola▼; Pako▼; Treise▼

Film Projectors
1. motion picture
2. slide
3. flickerless

Arriflex 1▼; Comquip 1,2▼; EIF 1; F&B Ceco 1▼; GAF 1,2; Alan Gordon 1▼; Heindl 2▼; Hollogon 1,3▼; Kalart Victor 1▼; Laird 1,2▼; L-W 1,3▼; Magna-Tech 1,3▼; McKenzie 1,2; Multi-Track 1,3; Palmer 1▼; RCA 1,2▼; Spindler & Sauppe 2▼; Video Components 1▼; Zei-mark 1▼

Magnetic Film
1. recording
2. test

Agfa-Gaevaert 1,2; F&B Ceco 1▼; 3M 1▼; RCA 1▼; Standard Tape 2; Studio Tape Exchange 1▼

Magnetic Recording Equipment & Accessories Cinema Products▼; Coherent▼; Magna-Tech▼; Multi-Track; RCA▼; Transist-O-Sound

Misc Film
1. pollution control, silver recovery
2. slide masks & mounts
3. multi-lock, video and magnetic film
4. inspection equipment

CPAC 1▼; Heindl 2▼; Multi-Track 3; Research Technology 4▼

IV LIGHTING/STUDIO EQUIPMENT/SET DESIGN

Lamps Barbizon▼; Belden▼; Berkey▼; GAM; GE▼; GTE▼; Olesen▼; Teledyne Big Beam; Tele-Measurements▼; Varian▼

Lighting Hardware & Accessories
1. heads, stands, and fixtures
2. diffusion material
3. gels and filters

Barbizon 3▼; Bardwell McAlister 1,2▼; Belden 1-3▼; Berkey 1-3▼; Birns & Sawyer 1-3▼; Cine 60 1▼; Cinema Products 1▼; F&B Ceco 1-3▼; Frezzolini 1▼; GAM 1; Janson 1▼; Kliegl 1▼; Lowel 1-3; Mole Richardson 1-3; Olesen 1-3▼; Packaged Lighting 1▼; Peirce-Phelps 1-3▼; Rosco 2,3; Smith Victor 1-3; Strand Century 1-3▼

Light Dimmer Controls
1. manual
1. automatic

Berkey 1,2▼; Electro & Optical 1; Industrial Sciences 2▼; Jason 1▼; Kliegl 2▼; McKenzie 2; Olesen 1-2▼; Packaged Lighting 1▼; Peirce-Phelps 1,2▼; Skirpan 1,2; Strand Century 1,2▼; Tele-Measurements 1▼; Theatre Techniques 1,2; Waters 1▼

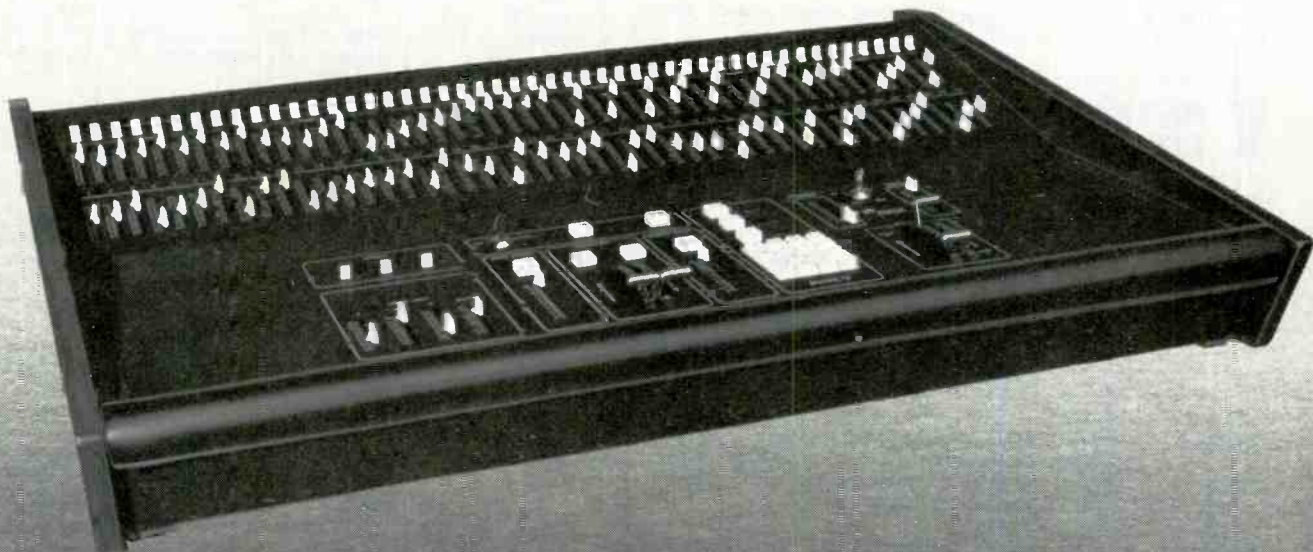
Patch Terminals Berkey▼; F&B Ceco▼; Kliegl▼; Olesen▼; Packaged Lighting▼; Peirce-Phelps▼; Rex-Rheostat; Skirpan▼; Strand Century▼; Tele-Measurements▼; Theatre Techniques▼; Trompeter▼; Union▼; Whirlwind▼

Plugs & Connectors Berkey▼; F&B Ceco▼; Kliegl▼; Olesen▼; Peirce-Phelps▼; Rex-Rheostat; SGL▼; Strand Century▼; Tele-Measurements▼; Trompeter▼; Union Whirlwind▼

continued on page 62

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A memory lighting control system complete with 2 scene preset capability.



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SOURCE LOCATOR—IV continued

Scenery, Prefab	GAM; Janson▼; Olesen▼; Tele-Measurements▼
Prompters, Titling	Listec▼; Q-TV/Telesync; Telescript; Ultra Audio▼
Set Design	American Cable▼; Imero Fiorentino▼; Olesen▼; Q-TV/Telesync; Tele-Measurements▼; TV Productions
Seamless Materials	Janson▼; Olesen▼
Lightmeters & Photometers	Kollmorgen▼; Minolta; Power Optics▼; Tektronix▼; Weston

RF/TRANSMITTING/RECEIVING EQUIPMENT

Demodulators	Blonder-Tongue▼; Coastcom▼; Comark▼; Cetec▼; Dynair▼; Ikegami▼; Marconi▼; McMartin▼; Moseley▼; Phasecom▼; Philips T&M▼; RCA▼; Scientific-Atlanta▼; Tektronix▼; Telemet▼; Townsend▼
Diplexers	AEL▼; Alford; Cetec▼; Coastcom▼; Comark▼; CSP▼; Dielectric▼; Marconi▼; Micro-Communications▼; Mu-Del▼; Multitronics▼; RCA▼; Townsend▼; Varian▼; Vitek▼
Exciters	AEL▼; Bayly▼; Cetec▼; Harris▼; Kahn; Marconi▼; McMartin▼; Philips Broadcast▼; RCA▼; RHG; Solid Electronics; Townsend▼; Varian▼; Versa-Count▼; Wilkinson▼
Modulators	Bayly▼; Blonder-Tongue▼; Catel▼; Cetec▼; Coastcom▼; Dynair▼; Ikegami▼; Marconi▼; Moseley▼; Phasecom; Philips T&M▼; RCA▼; Rohde & Schwarz▼; Scientific-Atlanta▼; Tektronix▼; Telemet▼; Varian▼
Microwave Equipment	Alford 6; Andrew 1,4,5,6▼; Belden 6▼; Cablewave 5,6▼; Catel 4▼; Coastcom 1,2▼; Collins 1,2,4▼; Comrex 1,4▼; Cooke 6▼; Dielectric 5,6▼; Farinon 1,7▼; GTE 1,2; Hewlett Packard 5▼; Hughes Microwave 1-4▼; Ikegami 1▼; Innovative TV Equip 7▼; International Microwave 1-7▼; Magnum Towers 7▼; Marti 1-4▼; McMartin 1,4▼; Moseley 1-4▼; Microwave Assoc. 1-7▼; Micro-Communications 4,5,7▼; Nurad 1-7▼; Prodelin 5,6; Quick-Set 7▼; Raytheon 2,5; RHG 1-6; Tepeco 1; Terracom 1-4▼; Texscan 5; Varian▼
Remote Control Systems	Automation Electronics▼; Bayly▼; Cetec▼; CSP▼; Datalogic▼; Delta▼; Dielectric▼; Dyma▼; Logitek▼; Marti▼; Micro Communications▼; Moseley▼; National Electr; Nurad▼; PWH▼; RCA▼; Tektronix▼; Time & Frequency▼
RF Attenuators	Avantek▼; Bird Electronics▼; Blonder-Tongue▼; Cetec▼; Dielectric▼; Electro Impulse▼; Microwave▼; Mu-Del▼; North Hills▼; Tech Labs▼; Tektronix▼; Telonic▼; Texscan▼; Trompeter▼; Varian▼; Waters▼
RF Filters	Bald Mountain▼; Bird Electronic▼; Blonder-Tongue▼; Boston Sound & Power; Catel▼; Cetec▼; Coaxial; Comark▼; CSP▼; Dielectric▼; Microwave▼; Mu-Del▼; Multitronics; North Hills▼; Tektronix▼; Telonic; Texscan; TT Electronics▼; Varian Assoc▼; Varian Beverly▼
RF Loads	Alford; Bayly▼; Bird Electronics▼; Cetec▼; Coaxial▼; CSP▼; Electro Impulse▼; Microwave▼; Varian▼; Wilkinson
RF Switchers	Blonder-Tongue▼; Cetec▼; Coaxial▼; Collins▼; CSP▼; Dielectric▼; ITT; Magnecraft▼; Marconi▼; Micro Communications▼; Microwave▼; Multitronics▼; Solid Electronics; Texscan; Trompeter▼

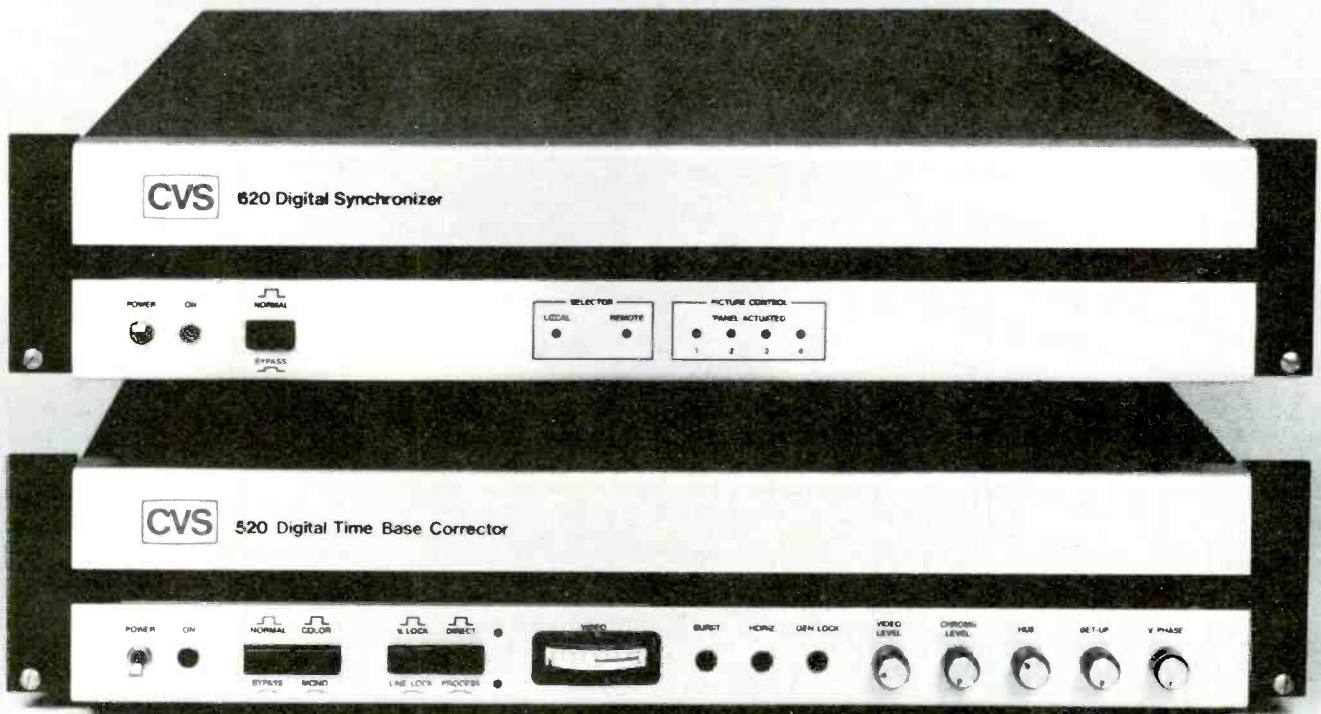
Receivers, Comm & Monitor	B&I; Bayly▼; Caringella▼; Comrex▼; Elcom▼; Electra▼; Fixture▼; Johnson▼; McKay▼; McMartin▼; Rivers▼; Rhode & Schwarz▼; Sequerra▼; Scientific Radio; Tandberg▼ QEI▼
RF Amplifiers	Alden▼; Avantek▼; AEL▼; Acrodyne; Blonder-Tongue▼; Bayly▼; Belar▼; Cetec▼; Electronics M&C; McMartin▼; Moseley▼; Mu-Del▼; Microwave▼; North Hills▼; Nurad▼; RHG; Scientific-Atlanta▼; Solid Electronics; Tektronix▼; Townsend▼; Varian▼; Wilkinson▼; QEI▼
Satellite Earth Stations	Alden 1,2▼; Andrew 1,2▼; Antennas for Communications 1,2▼; Coastcom 2▼; Farinon 2▼; McMartin 2▼; Micro-Link 2; RCA 1,2▼; RHG 2; RMS 1,2; Scientific-Atlanta 1,2▼; Telemet 1,2▼; Varian Assoc 1,2▼; Varian Beverly 2▼
SCA Equipment	Fixture▼; Johnson▼; McMartin▼; Moseley▼; RCA▼; Rivers▼; Solid Electronics▼; Time & Frequency▼; Wilkinson▼; QEI▼
Translators	Acrodyne 2; Electronic Missles & Comm▼; Ikegami 1,2▼; NES 1,2▼; Rohde & Schwarz 1,2▼; Tepeco 2; TV Technology 1,2▼; Versa-Count 1,2▼
Transmitters, AM	AEL▼; Bayly▼; CCA▼; Cetec▼; Collins▼; Continental Electronics▼; CSI▼; Harris▼; Ikegami▼; LPB▼; Marconi▼; McMartin▼; NEC▼; RCA▼; Sintronic▼; UHF▼; Varian▼; Wilkinson▼
Transmitters, FM	AEL▼; Bayly▼; CCA▼; Cetec▼; Collins▼; CSI▼; Ikegami▼; LPB▼; Marconi▼; McMartin▼; NEC▼; RCA▼; Sintronic▼; Solid Electronics; Varian▼; Versa-Court▼; Wilkinson▼
Transmitters, TV	Acrodyne; CCA▼; Electronic Missles & Comm▼; Harris▼; Ikegami▼; Marconi▼; NEC▼; Philips Broadcast▼; RCA▼; Townsend▼; Varian▼
Misc. RF Equipment	AEL 1,9▼; B&K 2▼; Catel 1,7▼; Cablewave 6,8▼; CCA 5▼; Cetec 6,8▼; Coastcom 1▼; Coaxial 10▼; Collins 1▼; Comrex 13▼; Delta 12▼; Dielectric 3,5,6,8▼; Fisher-Burke 3▼; GTE 1▼; LPB▼; LRC 8▼; Magnum Towers 6▼; McMartin 1,2,4▼; Micro Communications 5▼; Moseley 1,7▼; NES 9▼; RCA 5▼; RHG 9; Rivers 1,2▼; Solid Electronics 1; Townsend 11▼; Trompeter 6,8▼; TV Technology 5,9▼; Times Wire & Cable 6▼; Varian Beverly 10▼; Whirlwind 6▼

ANTENNAS/TOWERS/TRANSMISSION LINES

Antennas, AM	Alford; Bayly▼; Belar▼; Cetec▼; Dielectric▼; Harris▼; Jampro▼; Magnum Towers▼; Marconi▼; McKay▼; RCA▼; Rex Rheostat; Utility Tower
Antennas, FM	Alford; Bayly▼; Belar▼; CCA▼; Cetec▼; Collins▼; Comark▼; Dielectric▼; Harris▼; Jampro▼; Magnum▼; Marconi▼; Micro Communications▼; Phelps Dodge▼; RCA▼; Rex Rheostat; Winegard▼
Antennas, Microwave	Alford; Andrew▼; Cablewave▼; Dielectric▼; Gabriel▼; Magnum Towers▼; Nurad▼; Prodelin; Scientific-Atlanta▼
Antennas, TV	Blonder-Tongue▼; CCA▼; Cetec▼; Dielectric▼; Electronic Missles & Comm.▼; Harris▼; Jampro▼; Lindsay▼; Magnum Towers▼; Marconi▼; Micro Communications▼; Multitronics; RCA▼; Winegard▼
Towers	E-Z Way▼; Fort Worth; Gabriel▼; Jampro▼; Kline; Magnum Towers▼; Marconi▼; Microlect▼; Multitronics▼; Stainless▼; Unarco-Rohn▼; Utility Tower

continued on page 64

There's an affordable frame synchronizer in your future,



if you buy the CVS 520 Digital TBC today!

Now, the TBC that corrects all your VTRs will soon synchronize all your sources. How? With the CVS 620, a compact module that operates from the digital interface of the CVS 520 and comes with full bandwidth color frame or field "freeze."

With the CVS 620, your CVS 520 will become a true, microprocessor-controlled "infinite window" TBC. You'll be able to easily handle signals from network feeds, satellites and ENG microwave. It won't matter whether they're stable or unstable, heterodyne or direct color. You'll still get fully color framed, synchronous outputs. A picture positioner will add even more versatility.

Future synchronization, however, is just one of the reasons why a large number of users already have a CVS 520. It does just about any TBC job you can think of. For any VTR—segmented or non-segmented.

With the CVS 520, you can colorize old quads, bring quad quality to ENG, correct gyro errors without breakup or hue shift, handle noisy tapes containing multiple wrong field edits, and much more.

Of course, the CVS 520 has all the built-ins. Like a digital dropout compensator, a line-by-line velocity corrector, a gen-lockable sync generator and an adjustable proc amp. Plus simple, front panel controls that put you in total command of your video signal.

Of particular importance for ENG, the CVS 520 weighs only 30 pounds, is just 3½" high and uses only 150 watts. (The CVS 620 will be packaged the same way!)

In short, the CVS 520 is truly the TBC of the future. But you can get it from your Authorized CVS Distributor today! For details and a demonstration, call or write.

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Video
Systems, inc.

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SOURCE LOCATOR—VI continued

Tower Hardware & Construction Equip	Decca Austin; Kline; Magnum Towers▼; Marconi▼; Microflex▼; Philadelphia Resins▼; Preformed Line▼; Stainless▼; Unarco Rohn▼; Utility Tower
Tower Lighting	Decca Austin; Eric Small Assoc▼; Flash Technology▼; Jampro▼; Kline; Magnum Towers▼; Marconi▼; Stainless▼; Unarco-Rohn▼; Utility Tower
Transmission Line & Connectors	Alford; Andrew▼; Cablewave▼; Cetec▼; Comark▼; Dielectric▼; Electro Impulse▼; Gabriel▼; Jampro▼; Lindsay▼; LRC▼; Magnum Towers▼; Phelps Dodge; Prodelein; RCA▼
Antenna Tuning Unit	Broadcast Engr; Cetec▼; Continental Electronics▼; CSP▼; Dielectric▼; Fisher-Burke▼; Jampro▼; Magnum Tower▼; Multronics; NES▼; RCA▼; Wilkinson▼
DA Equipment	CSP▼; Dielectric▼; Jampro▼; Magnum Tower▼; Multronics; NES▼

VII MEASURING/MONITORING/ TIMING/LOGGING EQUIPMENT

Antenna Monitors	B&K▼; Delta▼; Electro Impulse▼; Eric Small Assoc▼; Gorman Redlich▼; Potomac▼; United Systems▼
Clocks, Time Systems 1. digital clocks 2. master clocks 3. slave clocks 4. timers 5. time distribution sys.	Broadcast Sound 1-5▼; BSC 1; Caringella 1,2,4▼; Channelmatic 1,2,4; Chrono-Log 1-5▼; Comad 1-5; Electronearing 4; ESE 1-5▼; Heath 1▼; Industrial Sciences▼; Leitch 2,3▼; Micro-Trak 1,4▼; NES 1-5▼; PWH 1-5▼; QSI 1-5▼; Rohde & Schwarz 1▼; Standard Electric Time 1-5; Spectra Sonics 1▼; Stancil-Hoffman 1; Tapeathon 4; Time & Frequency 2,3▼; True Time 1-3,5▼; United Systems 4▼; Video Components 4▼
Chart Recorders	Alden▼; B&K▼; Datalogic▼; Heath▼; Hewlett Packard▼; London▼; NES▼; Philips T&M▼; Rohde & Schwarz▼; Tektronix▼; Telemet▼
Demodulators	Optek▼; Philips T&M▼; Scientific-Atlanta▼; Rohde & Schwarz▼; Tektronix▼; Telemet▼
Field Intensity Meters 1. AM 2. FM 3. TV	B&K 1▼; Blonder-Tongue 3▼; Heath 1,2▼; Hewlett Packard 1-3▼; NES 1-3▼; Potomac 1-3▼; Rohde & Schwarz 1-3▼; Sequerra 2▼; Texscan 2,3
Frequency Monitors & Counters	Ballantine▼; Belar▼; Data Precision▼; Drantex▼; Edison▼; EIP; Elcom▼; Heath▼; Hewlett Packard▼; Hickok▼; Lectrotech; McMartin▼; NES▼; Philips T&M▼; RCA▼; Systron-Donner; Tektronix▼; Time & Frequency▼; True Time; United Systems▼; Wilkinson▼
Generators, Audio	Amber▼; Bald Mountain▼; Control Concepts; Dyma▼; Hammond▼; Heath▼; Hewlett Packard▼; Hickok▼; Lampkin▼; Lectrotech▼; London▼; Marconi▼; McGraw-Edison▼; Potomac▼; Philips T&M▼; Rockland▼; Rohde & Schwarz▼; Sencore▼; Tektronix▼; Telonic; Texscan
Generators, RF	Boonton; Delta▼; Heath▼; Hewlett-Packard▼; London Co▼; Marconi▼; McGraw Edison; Philips T&M▼; Potomac▼; Rhode & Schwarz▼; Sencore▼; Telonics; Texscan▼
Generators, Video 1. multiple output 2. cross pulse	Leitch 1▼; Listec 1▼; NTI 1▼; Philips T&M▼; Tektronix 1,2▼; Texscan 1▼; Ultra Audio Pixtec 2▼; Video Aids of Colorado 2▼; Video Concepts 2
Intermodulation Meters	Amber▼; B&K▼; Barker & Williamson; Crown; Heath▼; Hewlett Packard▼; Marconi▼; NES▼; Potomac▼; Sound Technology▼; TT Electronics▼
Phase Meters	B&K▼; Dranetz▼; Gorman-Redlich▼; Hewlett Packard▼; Microprobe▼; NES▼; Video Aids▼
RF Wattmeters	Barker & Williamson▼; Bayly▼; Bird; Boonton▼; Coaxial▼; Dielectric▼; Electro Impulse▼; Hewlett Packard▼; Hickok▼; McGraw-Edison▼; NES▼; Rohde & Schwarz▼
Multitest Systems	B&K▼; Data Precision▼; Hammond▼; Lectrotech▼; Lenco▼; NES▼; Rohde & Schwarz▼
Oscilloscopes	B&K▼; Ballantine▼; Heath▼; Hewlett Packard▼; Hickok▼; Philips T&M▼; Rohde & Schwarz▼; Sencore▼; Tektronix▼; Telonic; Texscan
Loggers and Logger Equipment 1. tape loggers 2. digital printers	Automated Electronics 1,2▼; Hewlett Packard 2▼; Moseley 2▼; NES 1,2▼; QSI 1,2▼; Stancil-Hoffman 1; United System 1,2▼
Modulation Monitors	Belar▼; Boonton▼; London▼; Marconi▼; McGraw-Edison; McMartin▼; Time & Frequency▼; Wilkinson▼
Sideband Analyzers	Marconi▼; Rockland▼; Rohde & Schwarz▼; Tektronix▼; Telemet▼
Spectrum Analyzers	A.P. Circuit▼; Amber▼; B&K▼; Hewlett Packard▼; Marconi▼; Rockland▼; Rohde & Schwarz▼; Sequerra▼; Tektronix▼; Telemet▼; Texscan; White Instrument▼
Status & Alarm Indicators	Belar▼; Bird▼; Fidelipac▼; GTE▼; Marti▼; Moseley▼; NES▼; PWH▼; QSI▼; Rivers▼; Stancil-Hoffman
Automatic TV Monitor	Marconi▼; Rohde & Schwarz▼; Tektronix▼; TEA▼; Video Aids▼; Videotek
Vectorscopes	Heath▼; Hickok▼; Lectrotech▼; Listec; Sencore▼; Sequerra▼; Tektronix▼; Ultra Audio▼
Video Noise Meters	Asaca▼; Lenco▼; NES▼; Tektronix▼
Video Test Generators	Colorado Video▼; Hickok▼; Leitch▼; Lenco▼; Marconi▼; PTM; Rohde & Schwarz▼; Tektronix▼; Telemet▼; TEA▼
VITS, VIR Systems and Equipment	Lenco▼; Marconi▼; PTM▼; Rohde & Schwarz▼; Tektronix▼; Telemet▼; TEA▼
Waveform Monitors and Analyzers	Colorado Video▼; Hammond▼; Hewlett Packard▼; Lectrotech▼; Listec▼; Marconi▼; NES▼; Rohde & Schwarz▼; Sharp▼; Systron-Donner; Tektronix▼; Ultra Audio▼
Wow and Flutter Meters	B&K▼; Fidelipac▼; Hammond▼; NES▼; Philips T&M▼; Potomac▼
Diff Phase - Gain Measurement	Amber▼; Dranetz▼; Marconi▼; NES▼; Philips T&M▼; Potomac▼; Rohde & Schwarz▼; Tektronix▼; Telemet▼
EBS Two Tone Systems	Bald Mountain▼; Elcom; ESE▼; Fixtune▼; Gorman-Redlich▼; International Nuclear; Logitek▼; McMartin▼; Rivers▼; Time & Frequency▼
Computer Business Services 1. broadcasting radio 2. broadcasting, TV 3. cable TV	Automated Electronics 1-3▼; Cable Data 3; Columbine 1,2▼; Cox Data 2,3▼; Coyne 3▼; DCC/Bias 1,2; Jefferson Data 1,2▼; Kaman 1,2; Paperwork Systems 1-3▼; Tele-Measurements 1-3

VIII SERVICES

Computer Business Services 1. broadcasting radio 2. broadcasting, TV 3. cable TV	Automated Electronics 1-3▼; Cable Data 3; Columbine 1,2▼; Cox Data 2,3▼; Coyne 3▼; DCC/Bias 1,2; Jefferson Data 1,2▼; Kaman 1,2; Paperwork Systems 1-3▼; Tele-Measurements 1-3
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First Hitachi developed the revolutionary Saticon tube. Then Hitachi designed the perfect camera for it...



The new portable **HITACHI SK-80**

The remarkable new SK-80 has three superior $\frac{2}{3}$ " Saticons at its heart, for unexcelled image and color fidelity. Hitachi's sophisticated electronics coupled with the high resolution capability of the Saticon set a new high level of performance for a portable EFP camera under the most demanding conditions.

Moreover, the SK-80 feels and handles like a true portable should. And its 2-hour battery belt with 1-hour charge time assures you of adequate power for continuous long-term shooting when you're on location. The standard C-mount and optional Arri adapters give you the added versatility of selecting the exact lens that fits your shooting requirements.

But performance is only half the SK-80 story. A special training tape on videocassette is available with complete camera set-up and maintenance instructions, to help you keep your SK-80 making its excellent pictures. Beyond this, our six Hitachi regional offices are all staffed with qualified engineers and fully stocked with parts. They stand ready to back up our vast national network of servicing dealers.

We urge you to check out the performance features of the SK-80, as well as its low price, before specifying any other camera. Arrange a demonstration with your local Hitachi dealer or call the Hitachi regional office nearest you.



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SOURCE LOCATOR—continued

Equipment Rental Services
 1. production equipment
 2. post production services

All Mobile 1,2; Angenieux 1; Birns & Sawyer 1; Columbia 1,2; F&B Ceco 1,2; General TV 1,2; KVC 1,2; Landy 1; Orange County 1; Peirce-Phelps 1,2; Soll 1,2; Spectra Sonics 1,2; Tele-Measurements 1,2; Ultra Audio Pixtec 2; Video Aids 2

Video Tape/Film Recording Transfer

Amplex; Columbia; Image Transform; Palmer; Teledyne Camera

IX CABLE TV EQUIPMENT

Amplifiers
 1. trunk
 2. distribution
 3. line extenders

Able 3; Blonder-Tongue 1,2; C-Cor 1-3; Dynair 2; Jerrold 1-3; Lindsay 1-3; Magnavox CATV 1-3; Merrill 1-3; RCA 1-3; Scientific-Atlanta 1-3; Tele-Measurements 1-3; Texscan 1-3; Toner Cable 1-3; Winegard 1-3

Antennas, Receiving

Andrew; Blonder-Tongue; Farinon; Jerrold; Lindsay; Nurad; Scientific-Atlanta; Toner Cable; Winegard

Cable
 1. distribution
 2. drop

Belden 1,2; Brand-Rex 1,2; Comm/Scope 1,2; Cooke 1; Essex 2; General Cable 1,2; Systems Wire & Cable 1,2; Times Wire & Cable 1,2; Toner Cable 1,2; Trompeter

Convertors/Descramblers
 1. standard
 2. pay TV (descrambler)
 3. filter trap

Blonder-Tongue 1-3; Lindsay 1,3; Magnavox CATV 1-3; MCE 3; Oak 1,2; RCA 2; Tele-Measurements 1-3; Toner Cable 2,3; Vitek

Distribution Accessories
 1. passive
 2. addressable taps

Blonder-Tongue 1; C-Cor 1; Lindsay 1; Magnavox CATV 1,2; Tele-Measurements 1,2; Texscan 1,2; Toner Cable 1,2

Head End Processors

Blonder-Tongue; Catel; MCE; Mosley; Oak; RCA; Scientific-Atlanta; Tele-Measurements; Texscan; Toner Cable

Information Systems, News, etc.
 1. character gen.
 2. programmers
 3. cassette players
 4. news service

Beston 1; Channelmatic 2,5; ECCO 1; Laird 1,5; MCE 4; Microtime 3; MSI 1; Peirce-Phelps 1-3; Programmable Systems; QSI 1,2; Reuter 4,5; Sharp 3; Shintron 1; System Concepts 1; Tele-Measurements 1-3; UPI 4; Video Components 1; Video Data 1,2,4,5

Microwave Equipment

Andrew; EIP; Farinon; GTE; Hewlett Packard; Hughes; Ikegami; International Microwave; Marti; Microwave; Nurad; Tele-Measurements; Texscan; Varian

Non-Duplication Switchers

QSI; Toner Cable

Power Supplies

Boston Sound & Power; C-Cor; Hewlett Packard; Ikegami; Lindsay; Magnavox CATV; NES; Rivers; Sawyer; SGL; Toner Cable; Winegard

Test Equipment CATV

Able; Avantek; Bald Mountain; Bird; Comsonics; Hewlett Packard; Lenco; Lindsay; MCE; Philips T&M; Sencore; Tektronix; Tele-Measurements; Texscan; Toner Cable; Wide Band

Construction Accessories Underground & Pole
 1. aerial lifts
 2. trenchers
 3. cable installation tools
 4. enclosures and pedestals
 5. strands
 6. pole hardware

C-Cor 1-6; Ditch Witch 2,3; Durrell 1; General Cable 1,4,5,6; General Machine 3,6; Jerrold 1-6; Preformed Line 6; Roll-a-Reel 3; Toner Cable 3,4; Utility Product 4,6; Utility Tool 3; Van Ladder 1; Vermeer 2

X COMPONENTS/HARDWARE

Batteries

Alexander Mfg; Birns & Sawyer; Christie; Cine 60; F&B Ceco; Globe; Alan Gordan; Multiplier; Sony; Teledyne Big Beam; Tele-Measurements; Temtron; Topaz; Yardney

Cabinets, Enclosures, Shipping Cases
 1. racks
 2. cabinets
 3. shipping cases

Avonix 2; Bayly 1,2; Dyma 1,2; Hammond 1; K&H 3; Neumade 1-3; Optima Enclosures 1,2; Stanton 1,2; Tele-Measurements 1-3; Toner Cable 1; Video Components 3; Whirlwind 2; Winsted 1-3

Connectors (also see Cable TV Connectors)

Andrew; Bayly; Blonder-Tongue; Boston Wire & Cable; Cablewave; Gilbert; ITT; Kings; Lindsay; LRC; RMS; Tele-Measurements; Temtron; Whirlwind

Hum Bucking Coils

A/V Engineering; North Hill

Power Tubes

Amperex; Bayly; Calvert; Ceco; CM Levit; Eimac; English Electric Valve; RCA Electro-Optics; Temtron; Thor; Varian

Camera Pick-Up Tubes

Amperex; Calvert; Ceco; CM Levit; English Electric Valve; RCA Electro-Optics; Temtron; Thor; Video Components

Rectifiers

Amperex; Bayly; CM Levit; Electronic Devices; English Electric Valve; Temtron; Thor; Varian

Surge Protectors

Bayly; Boston Sound & Power; C-Cor; CM Levit; Dielectric; Dyma; English Electric Valve; Lightning Elimination; MCG; Multiplier; Temtron; Toner Cable

Wire and Cable

Bayly; Brand-Rex; Comm/Scope; Daburn; Essex; General Cable; Hammond; RMS; Whirlwind

RF Inductors

CSP; Delta; Dyma; North Hills; Surcom; TT Electronics

Transformers

Delta; Gotham; Hammond; Ikegami; Long; North Hills; Sescom; Shure

Torque Motor

United Research Lab

RF Gasket

Chomerics

Quartz Crystals

Edison; Marti; Oak

Vacuum Capacitor

Amperex; Comet; English Electric Valve; ITT; Surcom; Temtron

Tools

Alpha Wire; Klein; Weller-Xcelite

Services
 1. maintenance
 2. finance

Able 1; C-Cor 3; Jerrold 3; Long 1; MCE 1; Microwave Associates 1; Oak 2; QSI 1; Toner Cable 1

XI SYSTEMS

Emergency Power Equipment

Advance Conversion; Alexander; Bayly; C-Cor; Christie; Precise Power; Sawyer; Soll; Spectrolab; Tech Labs; Teledyne Big Beam; Versa-Count

Mobile Van Construction

A.F. Assoc; Atlantic; Audiotechniques; Dyma; Grinnan Fixtune; Holland; Marconi; Merlin; RCA; Soll; Tele-Measurements; Ultra Audio; Whirlwind; Wolf Coach

Facility Turnkey Installation

A.F. Assoc; Atlantic; Audiotechniques; Broadcast Engineers; Dyma; Electronic M&C; Fisher-Burke; Gabriel; Grinnan Fixtune; GTE; Imero Fiorentino; Long Engr; McCurdy; McMartin; Merlin; Microwave Associates; Northeast Broadcast; Pacific Recorders & Engr; QSI; RCA; Soll; Spectra Sonics

VIDEOCASSETTE EDITING. MADE FOR SPEED. MADE FOR ACCURACY. MADE FOR QUALITY. MADE by JVC.



JVC INTRODUCES THE CR-8300U FULL EDITING VIDEOCASSETTE RECORDER...

FOR FASTER EDITS

Now you can significantly cut the time you spend editing 3/4U-format tapes, thanks to JVC.

The unique bi-directional search control of the CR-8300U Electronic Editing Recorder lets you fast-forward at 7 times normal speed. Reverse at 10 times normal.

And you can do it while the tape is threaded on the head. You don't have to stop to rethread.

The unique preview feature lets you pass the signal from a second source through the CR-8300U while it's playing, without erasing the tape. You'll cut down on false starts by knowing what your edit will be like.

FOR MORE ACCURATE EDITS

Accuracy is what the JVC CR-8300U is designed for.

The unique built-in Pre-Roll rewinds tape for about 4 seconds from the actual editing point, and puts the recorder in stand-by mode. When you push "Edit Start" the CR-8300U first plays back about 4 seconds of rewind program, then goes automatically into the recording mode at the edit point. You're assured of the highest accuracy.

When you assemble edit, video and audio signals are edited simultaneously. When you insert, you can edit video and either audio channel independently or in any combination. Either way, accuracy is ± 5 frames.

You want still frame and slow motion? You've got them. The forward speed can be adjusted from 0 to 1/15th normal speed. You'll always find the exact frame you want.

And the tape counter doesn't just count. It has a memory. When you know you'll want to find a particular point again you reset the counter to "000". Then when you rewind, it will automatically stop the CR-8300U right there.

No other moderately priced videocassette editor has this combination of features to give you the accuracy you're looking for.

FOR THE HIGHEST QUALITY PICTURE

But speed and accuracy are nothing without quality. And quality is what the JVC CR-8300U has most of. It has everything you need for NTSC-type color video built-in.

Automatic Phase Control and patented Color Dubbing assure generation after generation of duplicates with stable color lock and highest quality.

There's a built-in Dropout Compensator. There's a video S/N ratio

of better than 45dB (unweighted) on the Rohde & Schwarz noise meter. An audio S/N ratio of better than 45dB. Independent Audio VU Meters and Controls for both channels (which can be operated either automatically or manually) help you upgrade the quality of low-level audio recordings.

Black & white resolution is better than 320 lines; color, better than 240.

And if "flag-waving" turns you off, all you have to do is turn on the CR-8300U. The frame servo locks on the odd field, so every edit is smooth and clean.

JVC WORKS WITH YOU

JVC has worked with broadcasters and producers to give you what you want, what you really need. Speed, accuracy, quality. And the features you need to get them.

Features like an external sync input for V-locking other sources. A built-in capstan servo mechanism for jitter-free, stable tape speed. An internal time-lapse meter to make

regular maintenance easier. And a new remote-control system you can learn about by reading the next page.





AND...TO TIE IT ALL TOGETHER... THE JVC RM-83U REMOTE AUTOMATIC EDITING CONTROL UNIT.

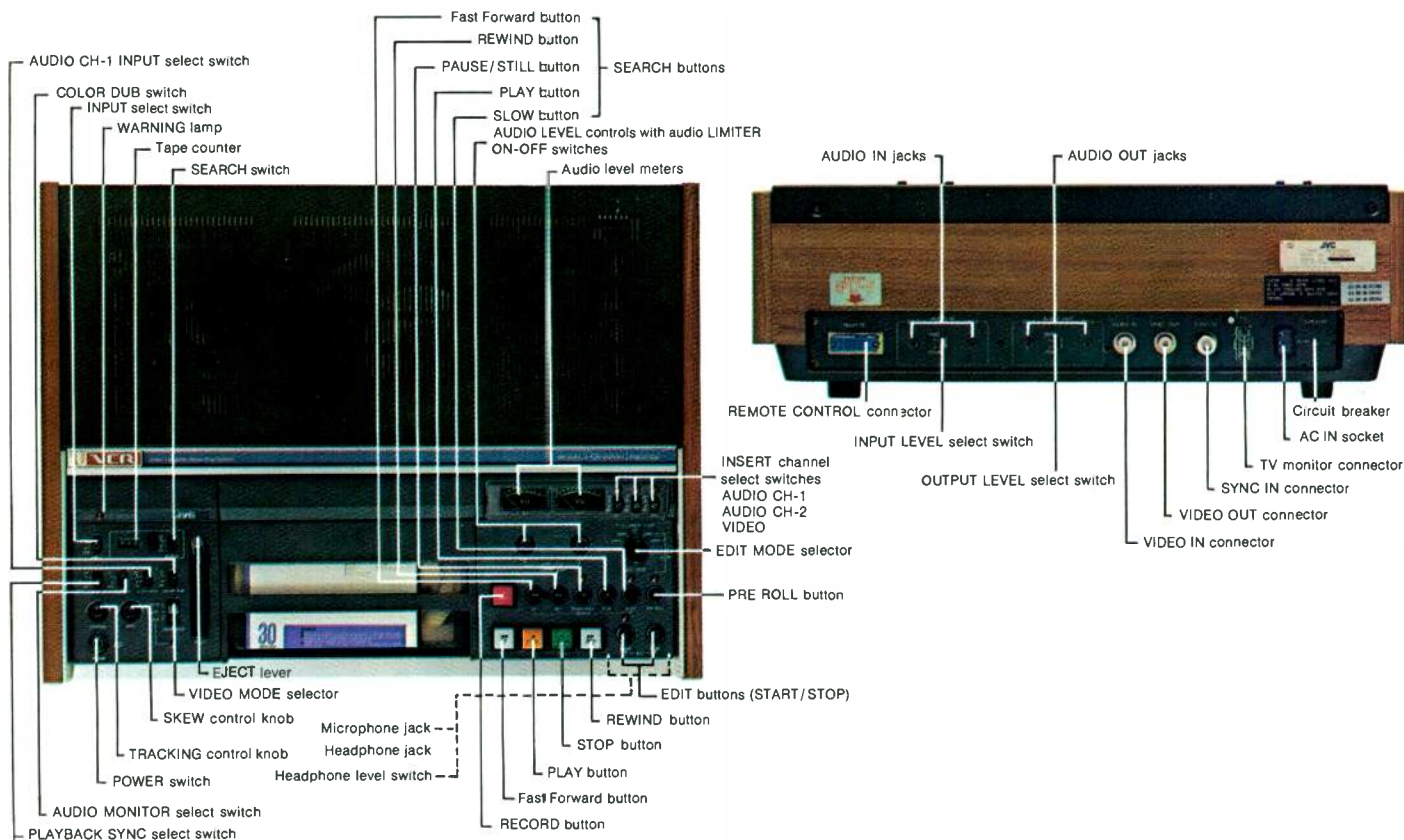
The RM-83U completely controls two JVC CR-8300U recorders for fast and accurate insert and assemble editing.

Its two independent LED timers (indicating minutes, seconds, and tenths of seconds) can be put on "Hold," so you can precisely identify the edit point. They then return to real time. "Hold" again at the end of the edit, and you've timed the length of your insert. Both clocks memorize the edit point—for fast and accurate review, you quickly return to it by touching "Search".

Not only can you *review*, you can *preview*. A unique rehearsal editing feature lets you see your edit without putting a signal on the tape. You can be sure you've got exactly what you want, exactly where you want it. After you've previewed, both machines go back to the edit point automatically. If you like what you saw, just push "Start" and you have it.

There are many more great features, such as the automatic safety device that shuts off both recorders if a tape is left in still-frame for 10 minutes. Get all the details on both the RM-83U and the CR-8300U by writing today to the address listed on the back page.

SPECIFICATIONS OF THE CR-8300U EDITING COLOR VIDEOCASSETTE RECORDER



GENERAL

Video Recording System : Rotary two-head, helical scan system
 Luminance : FM recording
 Color Signal : Converted subcarrier direct recording
 Video Signal System : NTSC-type color signal
 Power Requirement : 120 V AC, 60 Hz, 120 watts
 Temperature Operating : 41°F to 104°F (5°C to 40°C)
 Storage : -4°F to 140°F (-20°C to 60°C)
 Operating Position : Horizontal only
 Weight : 67.5 lbs. (30.6 kg)
 Dimensions : 24-1/16" (W) x 7-11/16" (H) x 17-3/4" (D) (610 mm x 195 mm x 450 mm)

Tape Transport

Tape Speed : 3-3/4 ips (95.3 mm/s)
 Fast Forward Time : Less than 6 min. for 60 min. tape
 Rewind Time : Less than 5 min. for 60 min. tape
 Wow & Flutter : Less than 0.2% RMS

Video Signals

Input : 0.5 V to 2.0 Vp-p, 75 ohms unbalanced
 Output : 1 V p-p, 75 ohms unbalanced
 Signal-to-Noise Ratio : More than 45 dBs (Rohde & Schwarz noise meter)
 Horizontal Resolution : Color 240 lines, Monochrome 320 lines

Audio Signals

Input : Mic -70 dBs, 600 ohms unbalanced
 : Line -20/0 dBs, 10k ohms unbalanced
 Line Output Level : -20/0 dBs (600 ohms unbalanced load)
 Headphone Output : -28 dBs/-37 dBs, (8 ohms unbalanced)
 Signal-to-Noise Ratio : More than 45 dBs (@ 3% distortion level)
 Frequency Response : 80 Hz to 15 kHz

Be sure to write today to JVC for more information on the CR-8300U Electronic Editing Color Videocassette Recorder and also for a copy of JVC's new Glossary of Video Terms.

JVC

JVC INDUSTRIES COMPANY, a division of US JVC Corp., 58-75 QUEENS MIDTOWN EXPRESSWAY, MASPETH, N.Y. 11378 (212) 476-8010

Circle 143 on Reader Service Card for literature
 Circle 144 on Reader Service Card for a demonstration

Broadcast Equipment Manufacturers

The manufacturers listed in the year's Source directory are producers of 11 major categories of products for the broadcast and CATV industries. Each manufacturer received an extensive questionnaire from BM/E. Based on the completion of this form and review of supporting literature supplied by the manufacturer—many have been listed as verified sources. Also included in this section are some distributors that are nationwide exclusive sources for certain brands of equipment.

A

ABERDEEN COMPANY

PO Box 2663 Culver City CA 90230
213 870-5353

Lashing wire, messenger stand, pole line hardware, buried system accessories

ABLE COMMUNICATIONS & ELECTRONICS

1248 Florida Ave PO Box 236 Palm Harbour
FL 33563

813 784-2734

Cable TV line extenders, CATV maintenance service

VS

ACCURATE SOUND CORP

114 5th Ave Redwood City CA 94063
415 365-2843

Audio tape duplicators, tape transports; playback electronics; digital cassette recorders; control boxes

VS

ACHRO-VIDEO LTD

10 Virginia Ave West Nyack 10994
914 358-5504

TV lens repair service

ACOUSTIC RESEARCH

10 American Dr Norwood MA 02062

617 769-4200

Speakers

VS

ACRODYNE INDUSTRIES INC

21 Commerce Dr Montgomeryville PA 18936
215 368-2600

TV transmitters & translators; RF amps; TV exciters

ADDA CORP

1671 Dell Ave Campbell CA 95008
408 379-1500

Digital frame store, electronic still processors

VS

ADERHOLD CONSTRUCTION CO

3384 Peachtree Rd NE Atlanta GA 30326
404 233-5413

TV and radio facility construction

VS

ADVANCE CONVERSION DEVICES CO

109 Eighth St Passaic NJ 07055
201 778-0707

Emergency power supply, uninterruptible power systems, inverters

ADVENT CORP

195 Albany St Cambridge MA 02139
617 661-9500

Tape cassette players, cassette tape, loudspeakers, TV projection systems, receiver monitors

AEL COMMUNICATIONS CORP

PO Box 507 Lansdale PA 19446
215 822-2929

CATV amps, connectors, standard converters, passive distribution accessories, test equip, CATV systems design and turnkey installations

AF ASSOCIATES INC

100 Stonehurst Court Northvale NJ 07647
201 767-1000

VTR rebuilding, mobile van construction, facility

turnkey installations, production equip rentals, color framer editing aid device

VS

AGFA-GEVARET INC

275 North St Teterboro NJ 07608
201 288-4100

Magnetic audio tape, mag film, test tapes

AIC PHOTO INC

168 Glen Cove Road Carle Place NY 11514
516 742-7300

Lenses film and TV (Soligor), film cameras and accessories (Bauer), film processors (JOBLO)

AILTECH (A CUTLER HAMMER COMPANY)

19535 E Walnut Dr City of Industry CA 91748
213 965-4911

Line of Signal generators & broadcast instrumentation

AIR SPACE DEVICES INC

PO Box 197 Paramount CA 90723
213 774-4905

Tower accessories; safety devices; climbers

AITKEN COMMUNICATIONS INC

214 Harrison St Taft CA 93268
805 765-4403

Automation programmer, audio controller, time control

VS

AKG ACOUSTICS

91 McKee Dr Mahwah NJ 07430
201 529-3800

Condenser mics, dynamic mics, special purpose mics; headphones; audio amps; reverb systems; turntables; intercom systems

The Source '77

AKAI AMERICA LTD

2139 E Del Amo Blvd Compton CA 90220
213 537-3880
Portable video cameras, portable videotape recorder/players

ALAN GORDON ENTERPRISES INC

1430 N Cahuenga Blvd Hollywood CA 90028
213 466-3561

Wireless mics (Swintek), film projectors (MP), specialty 16mm film camera, camera mounting equip, battery belts (Chiles Film Products), motion picture equip rental & repair services VS
See ad pg. 161—refer to rep/dist section

ALCO PRODUCTS INC

1551 Osgood St No Andover MA 01845
617 685-4371
Machine knobs 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 VS

ALEXANDER MFG CO

PO Box 1645 Mason City IA 50401
515 423-8963
Batteries, portable power packs, emergency power equip VS
See ad pg. 120—refer to rep/dist section

ALFORD MFG CO

120 Cross Street Winchester MA 01890
617 729-8050
Antennas, FM, TV, microwave; duplexers, RF loads, RF switchers; microwave units; transmission line & line accessories; impedance bridge, CATV test equip

ALL MOBILE VIDEO INC

415 W 55 St New York NY 10019
212 757-8919
Equip rental services, production equip; post production services

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

ALLIED TOWER CO

PO Box 331 South Houston TX 77587
713 946-9546
Antenna towers & accessories; tower design, construction, erection VS

ALLISON RESEARCH INC

2817 Erica Place PO Box 40288 Nashville TN 37204
615 255-4766
Limiter/compressor, console modules

ALPHA ELECTRONIC SERVICES INC

8431 Monroe Ave Stanton CA 90680
714 821-4400
Multi-function tone generators, (audible, subaudible), digital clocks, remote control

ALPHA WIRE CORP

711 Lidgerwood Ave Elizabeth NJ 07207
201 925-8000
Cable, wire; tools

ALTEC LANSING SOUND PRODUCTS DIV

1515 S Manchester Ave Anaheim CA 92803
714 774-2900
Audio power amp, public address amp; slide attenuator, equalizers and filters (passive and active); audio mixers; portable dynamic & condenser mics; booms & dollies; accessories, speakers VS

VS MEANS IT'S VERIFIED

AMBER ELECTRO DESIGN LTD

1064 Chemin Du Golf Nun's Island Montreal Quebec H3E 1H4
514 769-2739
Multipurpose audio test set, audio spectrum analyzers VS
See ad pg. 136—refer to rep/dist section

AMCO ENGINEERING CO

7333 W Ainslie St Chicago IL 60656
312 867-8500
Racks, cabinets, enclosures

AMCOMP INC

686 W Maude Ave Sunnyvale CA 94086
408 732-7330
Video disc, slow motion recorders

AMERICAN CABLE SERVICE

839 So Sunshine El Cajon CA 92020
714 444-8258
CATV systems consultants; set design; local origination programming VS

AMERICAN DATA

401 Wynn Dr NW Huntsville AL 35805
205 837-5180
Audio & video distribution amps; vertical interval switcher; master control switcher; chroma keyers; pulse distribution amps; production switchers; sync generators; special effects generators; colorizers, A/D converters video test generators VS
See ad pg. 28—refer to rep/dist section

CA	B Wiseman 445 S New Hampshire Ste 301 Los Angeles 90020	213 387-7756
GA	J Ryan 2219 Oakawana Atlanta 30345	404 633-2100
CAN	M Dupont 1280 Lachaine St Vincent De Paul H7C 2M7	514 661-5120
IL	B Munzner 203 Regency Dr Ste 635 Bloomington 60108	312 893-9399
MD	D Wilcox 5504 Waterway Rockville 20853	301 460-1454

AMERICAN ELECTRONIC LABORATORIES INC

PO Box 552 Lansdale PA 19446
215 822-2929
FM exciters, AM & FM transmitters, SCA equip, RF amps

AMERICAN TECHNOLOGY CO INC

4330 N 39th Ave Phoenix AZ 85009
602 272-9415
Passive distribution accessories

AMILON CORP

49-12 30th Ave Woodside NY 11377
214 274-1794
Audio cassette transport mechanisms VS

AMPEREX ELECTRONIC CORP

230 Duffy Ave Hicksville NY 11803
516 931-6200
Power tubes for RF, VHF and UHF, variable vacuum capacitors, klystrons, camera tubes VS

AMPEREX ELECTRONIC CORP EOD DIV

Providence Pike Slatersville RI 02876
401 762-3800
Tube for video camera; camera viewfinder picture tube, UHF & VHF ferrite circulators VS
See ad pgs. 122-123—refer to rep/dist section

CA	Amprx 3040 Scott Blvd Santa Clara 95050	408 249-1134
IL	Amprx 175 Scott St Elk Grove Village 60007	312 437-8050
TX	Amprx 13773 N Central Expwy Ste 1228 Dallas 75243	214 231-3481

AMPEX CORP

401 Broadway Redwood City Ca 94063
415 367-2011
Audio tape; audio tape recorders/players (portable, studio, multi-channel); audio time code gen; var speed ocs; videotape; videotape recorder/reproducers (quad & helical); automatic video cassette recorder/reproducer; broadcast color cameras; time base correctors; video editing equip; electronic still store VS
See ads pg. 54,55, —refer to rep/dist section
Amplex is also exclusive distributor of EECO products (see listing)

CA	Amplex 5000 Rodier Dr Glendale 91201	213 240-5000
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GA	Amplex 3135 Chestnut Dr Suite 101 Atlanta 30340	404 451-7112
IL	Amplex 2201 Lunt Ave Elk Grove Village 60007	312 593-6000
MD	Amplex 10215 Fernwood Rd Bethesda 20034	301 530-8800
NJ	Amplex 75 Commerce Way Hackensack 07601	201 489-7400
TX	Amplex 1615 Prudential Dr Dallas 75235	214 637-5100

AMPRO BROADCASTING INC

850 Pennsylvania 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. 12—refer to rep/dist section

AMP SPECIAL INDUSTRIES

Valley Forge PA 19482
215 647-1000
CATV connectors & tools; patch panels & terminals VS

AMTRON CORP

5620 Freedom Blvd Aptos CA 95003
408 688-4445
Color video monitors VS
See ad pg. 173—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. 41—refer to rep/dist section

CA	Ang 13381 Beach Ave Venice 90291	213 821-5080
CAN	Ang 4 Haven Hill Sq Agincourt Scarborough Ontario M1V 1M4	416 291-2362

ANIXTER-MARK

5439 W Fargo Skokie IL 60076
312 675-1500
Microwave antennas & accessories; point to point antennas, two way antennas

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 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

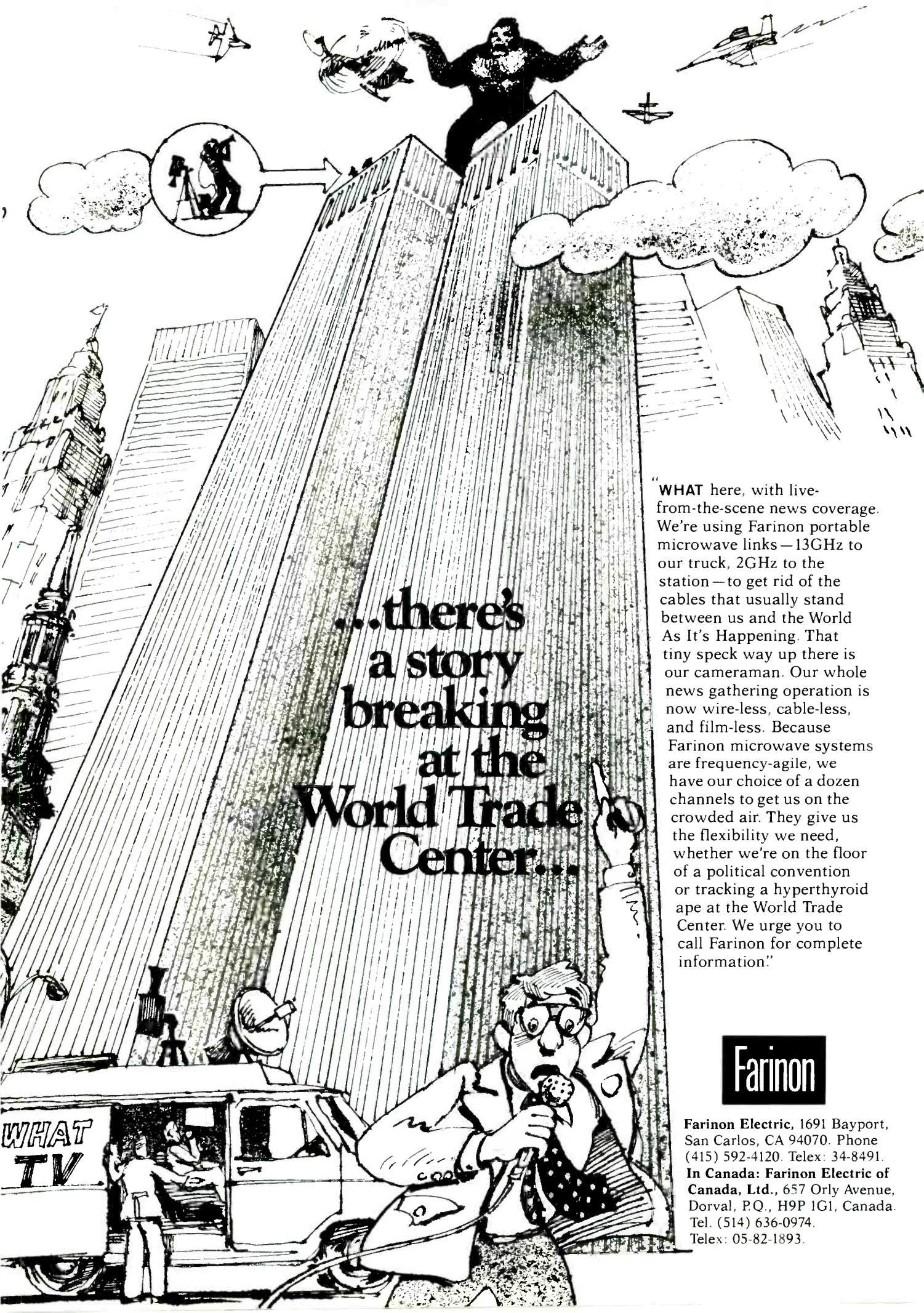
ANTENNAS FOR COMMUNICATIONS INC

Silver Springs Shores Industrial Pk 486 Cypress Rd Ocala FL 32670
904 687-4121
Microwave antennas; earth station antennas VS

AP CIRCUIT CORP

865 N 2nd Ave New York NY 10025
212 222-0876
Equalizers, filters (active); spectrum analyzers VS

continued on page 74



...there's
a story
breaking
at the
World Trade
Center...

"WHAT here, with live-from-the-scene news coverage. We're using Farinon portable microwave links—13GHz to our truck, 2GHz to the station—to get rid of the cables that usually stand between us and the World As It's Happening. That tiny speck way up there is our cameraman. Our whole news gathering operation is now wire-less, cable-less, and film-less. Because Farinon microwave systems are frequency-agile, we have our choice of a dozen channels to get us on the crowded air. They give us the flexibility we need, whether we're on the floor of a political convention or tracking a hyperthyroid ape at the World Trade Center. We urge you to call Farinon for complete information."

Farinon

Farinon Electric, 1691 Bayport,
San Carlos, CA 94070. Phone
(415) 592-4120. Telex: 34-8491.
In Canada: Farinon Electric of
Canada, Ltd., 657 Orly Avenue,
Dorval, P.Q., H9P 1G1, Canada.
Tel. (514) 636-0974.
Telex: 05-82-1893.

The Source '77

ARISTOCART DIV OF WESTERN BROADCASTING LTD
 1960-505 Burrard St. Vancouver B.C. V7X1M6
 604 687-2844
 Tape cartridges, test tapes VS
 See ad pg. 24—refer to rep/dist section

ARP INSTRUMENTS INC
 45 Hartwell Ave Lexington MA 02173
 617 861-6000
 Music synthesizers; audio mixers, portable

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

ARTISTS' ENGINEERING
 234 2nd St Davis CA 95616
 916 785-4210
 Editor-controller, tape timer VS

ARVIN/CATV
 485 E Middlefield Rd Mountain View CA 94043
 415 961-7145
 RF amps, RF switchers, field intensity meters, AM, FM, TV

ARVIN/ECHO
 485 E Middlefield Rd Mountain View CA 94043
 415 961-7145
 Portable still-store floppy-disc videotape recorder/reproducers; analog VS

ASACA CORP OF AMERICA
 1289 Rand Rd Des Plaines IL 60016
 312 298-4380
 Portable TV color cameras; monochrome cameras; TBC; video monitors; one-inch (quad) videotape recorders/players VS
 See ad pg. 19—refer to rep/dist section

ASHLY AUDIO
 1099 Jay St Rochester NY 14611
 716 328-9560
 Mono, stereo, portable mixers and consoles; equalizers, filters VS

VS means that BM/E has reviewed this manufacturer's supporting literature

ASTATIC CORP
 Box 120 Conneaut OH 44030
 216 593-1111
 Pickups, mics, mic stands

ATLANTIC RESEARCH CORP
 5390 Cherokee Ave Alexandria VA 22314
 703 354-3400
 Mobile van construction, facility turnkey installation, consulting VS

ATLAS SOUND
 10 Pomeroy Rd Parsippany NJ 07054
 201 887-7800
 Mic stand & accessories, speakers, columns VS

AUDIO ACCESSORIES INC
 163 Water St Keene NH 03431
 603 352-2320
 Patch panels, plugs, jacks, audio connectors

AUDIO DESIGNS & MFG INC
 16005 Sturgeon St Roseville MI 48066
 313 778-8400
 Audio consoles; audio amps, equalizers, attenuators; audio processors; VU meters; custom consoles, noise reduction systems, speakers VS
 See ad pg. 23—refer to rep/dist section

AUDICO 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 amp power; turntables; quad matrix equip VS

AUDIOSEARS CORP
 South St Stamford NY 12167
 607 652-7305
 Mics, dynamic & dynamic windscreens, headsets VS

AUDIO-TECHNICA US INC
 33 Shawassee Ave Fairlawn OH 44313
 216 836-0246
 Stereo & quad phono pickups, 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; mic stands & booms (Monks); amps (H/H); lighting systems; equalizers VS

AUDIO/TEK INC
 503 Van Dell Way Campbell CA 95008
 408 378-5586
 Audio tape cartridge loaders

AUDI-CORD CORP
 1845 West Hovey Ave Normal IL 61761
 309 452-9461
 Audio cartridge recorders/reproducers

AUDIOTRONCS CORP
 7428 Bellaire Ave North Hollywood CA 91605
 213 765-2645
 Headsets, mics, 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 VS
 See ad pg. 151

AUDITRONICS INC
 3750 Old Getwell Rd Memphis TN 38118
 901 362-1350
 Audio consoles, line amps, equalizers VS
 See ad pg. 117—refer to rep/dist section

AUDIX LTD
 Station Rd Wenden Saffron Walden Essex UK Saffron Walden (0799) 40888
 Audio amps, distribution line, pre-amps, op-amps, monitors and power amps, PA; equalizers; audio consoles, mixers (stereo, mono, quad, TV audio) portable mixers VS

AUTOGRAM
 PO Box 456 Plano TX 75074
 214 424-8585
 Automation equip; audio amps; mono & stereo consoles

AUTOMATED PROCESSES INC
 790 Park Ave Huntington NY 11743
 516 427-6024
 Automated multi-channel mixer, audio consoles; audio preamps, distribution-, power-, line amps; audio attenuators, equalizers; compressor/limiters; tape machine synchronizers; memory units; tape editing equip VS

AUTOMATION ELECTRONICS INC
 1001 South St Lafayette IN 47905
 317 423-2572
 Radio technical automation systems, TV, radio & CATV business automation systems VS
 See ad pg. 129
 TX Autotron Dallas..... 214 233-7629

AVA ELECTRONICS
 242 Pembroke Ave Lansdowne PA 19050
 215 284-2500
 Cable TV multiple dwelling terminals; distribution amps, line extenders; coaxial connectors; passive accessories VS

AVANTEK INC
 3175 Bowers Ave Santa Clara CA 95062
 408 249-0700
 CATV test equip, microwave amp 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 equip storage cabinet, mobile van construction VS

AVTEL CORP
 1280 Blue Hills Ave Bloomfield CT 06002
 203 242-0761
 Video information systems for pay cable, video switcher, automatic videocassette player

B

BACH AURICON INC
 6950 Romaine St Hollywood CA 90038
 213 462-0931
 Heads, mounts & dollies; cine cameras & lenses

BALD MOUNTAIN LAB
 230 Belleview Rd Troy NY 12180
 518 279-9753
 Audio stepping test generators, harmonic distribution meters, RF filters, EBS 2 tone systems, off air frequency measurement services VS

BALLANTINE LABORATORIES INC
 PO Box 97 Boonton NJ 07005
 210 335-0900
 Frequency counters; dB meters; voltmeters; waveform monitors; oscilloscopes VS

BALL BROTHERS RESEARCH CORP ELECTRONIC DISPLAY DIV
 PO Box 43376 St Paul MN 55164
 612 786-8900
 Color & b&w monitors, video signals multiplexers, special effects generators VS

BARBIZON ELECTRIC
 426 W 55th St New York NY 10019
 212 586-1620
 Lamps, gels & filters VS
 See ad pg. 110—refer to rep/dist section

BARDWELL & MCALISTER
 7269 Santa Monica Blvd Hollywood CA 90046
 213 876-4133
 Lighting equip, heads, stands, fixtures, diffusion material

BARKER & WILLIAMSON INC
 Canal St Bristol PA 19007
 215 788-5581
 RF amps; audio test equip, RF coils; TVI filters, antenna switching unit, filament & plate chokes

BASF SYSTEMS
 Crosby Dr Bedford MA 01730
 617 271-4000
 Audio tape; calibration tape

BAUSCH & LOMB SOPD
 1400 N Goodman St Rochester NY 14602
 716 338-6000
 TV camera lenses, motion picture camera lenses, spectrum analyzers

BAYLY ENGINEERING LTD (AEG-TELEFUNKEN)
 167 Hunt St Ajax Ontario L1S 1P6
 416 683-8200
 Audio amps (distribution, line, pre-amps, monitor, power); equalizers & filters (passing); intercom systems connectors; exciters; modulators; remote control; comm receivers & monitor, RF amps, RF loads, AM & FM transmitters and antennas, RF watt emergency power equip VS

continued on page 76

About the only thing our new 3M D-8800 Titling System can't do is spell.



Letter spacing
Variable font sizes
Font & color selection
Underline

*Video effect simulated.

If you can spell, you can create video excitement never before possible with the new dual-channel 3M Datavision D-8800 Titling System. That's because we've combined two fast, programmable microprocessors with some innovative video engineering to produce a flexible video graphics system that'll make you look great on the tube, whatever the job.

At the 8800's control console, you can make titles and credits using up to four complete type fonts at a time, chosen from our varied and extensive library. You can

change from one font program to another letter by letter, generate letters and words in 8 different colors, and in several sizes at the touch of a button. You can even control the letter spacing!

On the 8800, not only will your words be gorgeous, you can present them just the way you want 'em, too.

You can initiate roll and crawl at several speeds and adjust both the roll and crawl masking to achieve just the 'right' look. And you can also select crawl position and roll and crawl direction. An

inter-active panel display 'walks' the operator through every move, so complicated effects are easy to make and error free.

All graphic font and title information is stored on floppy discs for quick, easy program changes and retrieval. And the 8800 features numerous custom fonts and other options, to help you create those very special images you want for your station.

If you want great video graphics, put your best font forward. Take a good look at the new 3M Datavision Model D-8800.

3M
COMPANY

The Source '77

BCS— See Kaman Sciences VS

BEBELL INC
416 W 45th St New York NY 10036
212 245-8900
Film lab services VS

BEI ELECTRONICS INC
1101 McAlmont Little Rock AR 72203
501 372-7351
Audio processing equip, ALC & AGC amps, equalizers and filter (active) VS

BELAR ELECTRONICS LABORATORY INC
Box 826 Devon PA 19333
215 687-5550
AM, FM, & TV frequency & modulation monitors; RF amps; SCA equip VS
See ad pg. 106—refer to rep/dist section

BELDEN COMMUNICATIONS INC
25 W 45th St New York NY 10036
212 730-0172
Lamps (Lee and Thorn), 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

BELL & HOWELL (AV PRODUCTS DIV)
7100 McCormick Rd Chicago IL 60645
312 262-1600
Film chains, projects

BELL P/A PRODUCTS CORP
1200 N Fifth S Columbus OH 43201
614 299-1487
Amps, background music systems, commercial sound systems

VS means that BM/E has reviewed this manufacturer's supporting literature

BENJAMIN ELECTRONIC SOUND CORP
790 Park Ave Huntington NY 11743
516 673-8600
Audio equip; CCTV equip

BERKEY COLORTAN INC
1015 Chestnut St Burbank CA 95102
213 843-1200
Studio lights, stands, controls, filters, accessories, camera dollies VS

BESTON ELECTRONICS
903 S Kansas Ave Olathe KS 66061
913 764-1900
Automatic density light controls; multiplexer logic relay cords, rack frames, character generators VS

BETA TECHNOLOGY INC
94 Verdi St Farmingdale NY 11735
516 293-4313
Sync generator assignment control; editor-controller, time code reader, tape timer; colorizer

BETHANY INTERNATIONAL INC
6161 Savoy Dr Suite 940 Houston TX 77036
713 783-1260
Audio distribution amps

BEYER DYNAMIC
155 Michael Dr Syosset NY 11791
516 364-1900
Mics, wireless mics, headsets, mic accessories VS

BIDDLE JAMES G CO
Township Line & Jolly Rds Plymouth Meeting PA 19462
215 646-9200
CATV test equip

B I ELECTRONICS
128 Donaldson Center Greenville SC 29065
803 277-5985
Teletype alarm systems

BIOMATION
10411 Bubb Rd Cupertino CA 95014
408 255-9500
A/D color video digitizer

BIRD ELECTRONIC CORP
30303 Aurora Rd Cleveland (Solon) OH 44139
216 248-1200
RF wattmeters; RF loads; RF filters; RF attenuators; status & alarm systems; CATV test equip 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; batteries; equip rental VS

BJA SYSTEMS INC
666 Davisville Rd Willow Grove PA 19090
215 659-1414
Color video synthesizer, colorizer, animation equip VS

B&K INSTRUMENTS INC
5111 W 164th St Cleveland OH 44142
216 267-4800
Chart recorders, impedance bridges, voltmeters, harmonic distortion meters, intermodulation meters, phase meters, RF meters VS

BLONDER-TONGUE LABORATORIES INC
One Jake Brown Rd Old Bridge NJ 08857
201 679-4010
CATV headends, signal processing equip; MATV equip; CATV test equip; RF amps, loads, filters; FM & TV antennas; pay-TV systems VS

BOGNER BROADCAST EQUIP CORP
401 Railroad Ave Westbury NY 11590
516 997-7800
TV antennas; microwave antennas, FM antenna

BOONTON ELECTRONICS CORP
Rte 287 at Smith Rd Parsippany NJ 07054
201 887-5110
FM-AM signal generators; impedance bridges; dB meters; RF watt meters; capacitance test meters VS

BORG-WARNER (INGERSOLL PRODUCTS DIV)
See EMCOR

ROBERT BOSCH CORP See Fernseh VS

BOSTON INSULATED WIRE & CABLE CO
65 Bay St Boston MA 02125
617 265-2102
Cable systems for TV cameras, connectors

BOSTON SOUND AND POWER SYSTEMS
3 Fredith Rd Weymouth MA 02189
617 335-6406
RF filters, voltage transient suppressors, mini mixers, digital clocks, precision power supplies

BOZAK INC
587 Connecticut Ave S Norwalk CT 06854
203 838-6521
Amps (pre-amps, monitor, power, public address); equalizers & filters (passive); delay lines

BRAND-REX CO
PO Box 498 Willimantic CT 06226
203 423-423-7771
Flexible transmission line, coaxial cable, wire & cable

BROADCAST ELECTRONICS INC
4100 N 24th St Quincy IL 62301
217 224-9600
Single and multi-deck cartridge machines, recorders, cart machines accessories; audio consoles; audio processing and distribution amplifiers, sound studio equip and accessories; video monitors, tapeheads VS

BROADCAST SOUND ASSOC
PO Box 337 Blue Bell PA 19422
215 539-7091
Warning lights; stylus scales, turntables, pick-up arms, stereo and quad (Satin); digital wall clocks (Chronalert) VS

BSC INC
2932 River Road River Grove IL 60171
312 452-5551
Portable consoles, mixers

BTX CORP
438 Boston Post Rd Weston MA 02193
617 891-1239
Synchronized equip, editor-controller, time code gens, time code reader video lock to mag film record VS
See ad pg. 10—refer to rep/dist section

BUHL OPTICAL
1009 Beech Ave. Pittsburgh PA 15233
412 321-0076
CCTV film chains; slide projector; multiplexer w.o. dedicated cameras VS
See ad pg. 118—refer to rep/dist section

BULOVA WATCH CO INC AM TIME PRODUCTS DIV
61-20 Woodside Ave Woodside NY 11377
212 335-6000
Studio clock systems & frequency standards

BURNUP & SIMS
PO Box 2431 West Palm Beach FL 33401
305 689-8312
Cable TV construction, strand mapping, field engineering

C

CABLEDATA
3200 Arden Way Sacramento CA 95825
916 485-2911
Data processing services to CATV systems VS

CABLE FACTS
2444 Palumbo Dr Lexington KY 40509
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 N Haven CT 06473
203 239-3311
Transmission lines & line connectors; microwave antennas; transmission line pressurizing equip; waveguide & waveguide accessories VS

CALIFOR (DIV OF ORROX)
3303 Scott Blvd Santa Clara CA 95050
988-2000
Torque motors

CALVERT ELECTRONICS INC
220 E 23 St New York NY 10010
212 481-5303
Camera pick-up tubes CCTV and broadcast; rectifiers VS

CANON SCOOPIC
10 Nevada Dr Lake Success NY 11040
516 488-6700
Professional 16mm motion picture cameras; lenses (including zoom); complete systems VS

continued on page 78

TeleMation Announces First-Half Earnings

(SALT LAKE CITY, UTAH)—TeleMation, Inc., reported first-half profit of \$257,000, or 25 cents per share, on revenues of \$4,709,000. This compares to a loss of \$536,000, or 52 cents per share, on revenues of \$4,754,000 for the first half of 1976.

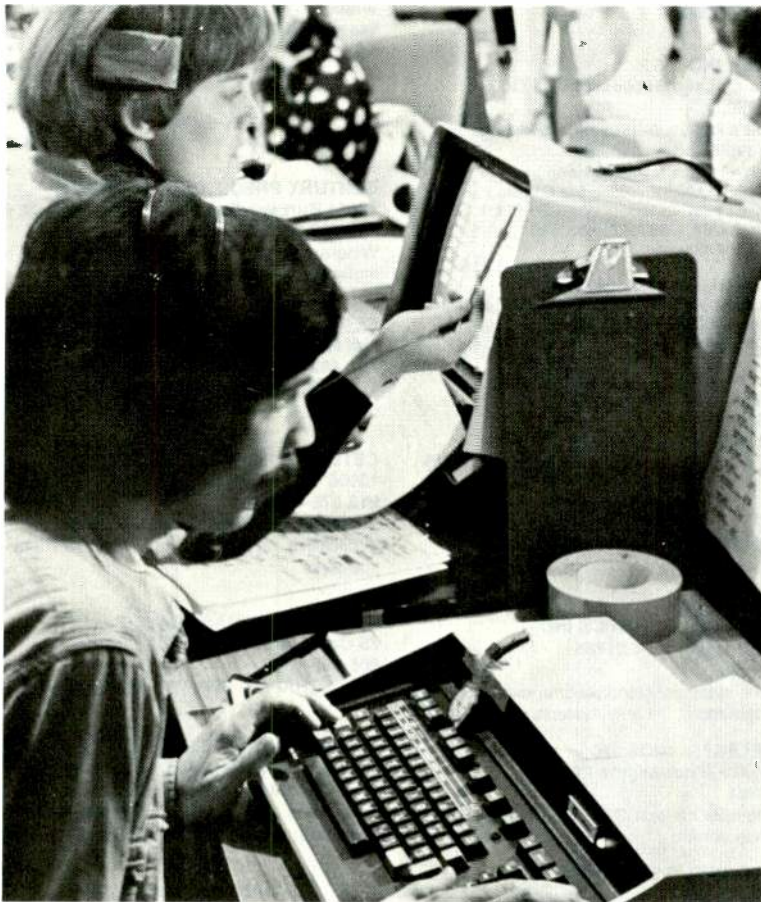
Results for the three-month period ended June 30, 1977 were a net profit of \$213,000, or 21 cents per share, on revenues of \$2,414,000 compared to the loss of \$314,000, or 30 cents per share, on revenues of \$2,339,000 for the three-month period ended June 30, 1976.

The above figures are after extraordinary credits resulting from reduction of taxes by use of a tax loss carry-forward. Profits before the extraordinary credits were \$144,000, or 14 cents per share, for the first half and \$120,000 or 12 cents per share, for the second quarter.

W. Paul Warnock, president of the video equipment manufacturing and television production company, said that the return to profitability in the first half of 1977 was due to the substantially improved performance of the hardware portion of the company's business. "TeleMation Productions, our television production studio in Chicago, continues profitable as in recent years," he stated.

He attributed the improvement in the company's hardware business to a continuing strong demand for the company's principal products and to extensive action taken at year-end 1976 to bring the company's expense level into line with revenues. Mr. Warnock pointed out that backlog at June 30 was \$1.7 million compared to \$2.1 million at December 31, 1976. "The return of our hardware business to profitability has been very gratifying to us at TeleMation. The dedicated efforts of all our employees have made it possible," he said.

TeleMation, Inc. A Salt Lake City based manufacturer of professional television equipment, maintains offices in San Francisco; Minneapolis, Danbury, Connecticut; Washington, D.C.; and London. TeleMation also operates a television commercial production division in Chicago.



Which character generator produces the highest- quality graphics?

Our customers tell us that the Composer I Graphics System gives them the sharpest, clearest, most distinctive electronic characters they've ever seen. Like to see for yourself? Circle the number below on the reader reply card and we'll send you a series of actual untouched color monitor photographs of Composer I graphics. Compare these pictures with those provided by any other manufacturer, and you'll agree with what our customers are saying. Better yet, visit our booth at the SMPTE show in Los Angeles, October 17-20. Put in some keyboard time. Build some pages. Store. Recall. Edit. Whatever you want. Or, if you can't make it to the show, circle the alternate number below for a demonstration in your area. Find out why our customers call the Composer I "the Excitement Generator". TeleMation, Inc., P.O. Box 15068, Salt Lake City, Utah, 84115. Call (801) 972-8000, ext. 350.

 **TeleMation**

Circle 150 on Reader Service Card for literature
Circle 151 on Reader Service Card for a demonstration

The Source '77

CANON USA INC

10 Nevada Dr Lake Success NY 11710
516 488-6700

Video camera lenses, cine camera & lenses, camera controls and accessories VS

See ad pg. 37—refer to rep/dist section

CA Canon USA 123 Paularino Ave E Costa Mesa 92626..... 714 979-6000
HA Canon USA 1050 Ala Moana Blvd Bldg B-2 Honolulu 96814..... 808 521-0361
IL Canon USA 140 Industrial Drive Elmhurst 60126..... 312 833-3070
CAN Canon OBM 3245 American Dr Mississauga Ontario, L4V 1N4..... 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

VS MEANS IT'S VERIFIED

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
5233 Hwy 37S Bloomington IN 47401
812 824-9791

TV field intensity meters; CATV test equip, maintenance service

CATEL DIV UNITED SCIENTIFIC CORP
1400 D Stierlin Rd Mountain View CA 94043
415 959-9400

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

Quadruphonic encoders, test records VS

CCA ELECTRONICS CORP
Broadcast Plaza Cherry Hill NJ 08034
609 424-1500

AM, FM, UHF, VHF transmitters all ranges; UHF-VHF antennas; FM monitors; STL; remote pickup equip; towers; SCA equip; RF amps; exciters, modulators; antennas (FM, TV) VS

See ad pg. 31—refer to rep/dist section

FL R Sidwell Box 9590 Panama City Beach 32401..... 904 234-5048
MI D Oriente 56 S Crestview Dr Adrian 49221..... 517 423-5680

C-COR ELECTRONICS INC
60 Decibel Rd State College PA 16801
814 238-2461

CATV trunk, distribution, extender amps; headend equip; cable passives; CATV test equip; emergency power equip; maintenance VS

CECO COMMUNICATIONS INC.
2115 Ave X Brooklyn NY 11235
212 646-6300

Power tubes, camera pick-up tubes 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 amps, chroma keyers, video production switchers, pulse distribution amps, routing switchers; sync generators, special effects generators, colorblock &

cue dot generators, time code readers, video mixing amps, CCTV, CATV video production switchers VS

See ad pg. 109—refer to rep/dist section

CA CDL 15130 Ventura Blvd Suite 307, Sherman Oaks 91403..... 213 789-0574
IL CDL 331 W NW Hwy Palatine 60067..... 312 991-4720
CAN CDL 147 Hymus Blvd Montreal Quebec H9R-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 VS

CERRO COMMUNICATION PRODUCTS HALLS
Mill Rd Freehold NJ 07728
201 462-8700

Truck distribution & drop cable; IDC amps, taps & couplers VS

CETEC AUDIO DIV CETEC CORP
13035 Saticoy St N Hollywood CA 91605
213 875-1900

Audio amps, controls; consoles; mixers; tape duplicators, tape cassette players/recorders; speakers VS

CETEC BROADCAST GROUP
75 Castilian Dr Goleta CA 93017
805 968-1561

See: SCHAFFER, SPARTA, JAMPRO, VEGA VS

CHANNELMATIC ELECTRONICS
2232 Lindsay Michelle Dr Alpine CA 92001
714 445-2691

Automated videocassette programmer; A-V switchers; routing switchers, distribution amps

CHARLES MACHINE WORKS INC
(See Ditch Witch)

CHOMERICS INC
77 Dragon Court Woburn MA 01801
617 935-4850

RFI strip gaskets, conductive RFI o-rings, shrinkable connector shields

CHRISTIE ELECTRIC CORP
3410 W 67th St Los Angeles CA 90043
213 750-1151

Battery, emergency power equip, Ni-Cad 20 min chargers, power packs, video cameras VS

CHRISTY CONCRETE PRODUCTS INC
44100 Christy St Fremont CA 94538
415 657-7070

Precast concrete & plastic housing for underground cable systems

CHRONO-LOG CORP
2 W Park Rd Havertown PA 19083
215 853-1130

Digital clocks & calendars; time-code generators & readers VS

CHYRON TELESYSTEMS
233 Newton Rd Plainview NY 11803
516 249-3296

Character generators; graphics systems; titling equip VS

CINE 60 INC
630 Ninth Ave New York NY 10036
212 586-8782

ENG camera braces, power packs, portable video camera leads, stands and fixtures; batteries VS
See ad pg. 139

CINEMA BEAULIEU DIV HERVIC CORP
14225 Venture Blvd Sherman Oaks CA 91403
213 981-2395

Film cameras & lenses; tripods, camera accessories; mics, tape recorder/players

CINEMA PRODUCTS CORP
2037 Granville Ave Los Angeles CA 90025
213 478-0711

16mm film cameras; lenses for 16mm cameras; camera tripods, body braces; video/film camera stabilizing system; cases, accessories; camera sound recording systems & accessories; audio & location lights, light stands, accessories VS
See ad pg. 47—refer to rep/dist section

CLEAR-COM
759 Harrison St San Francisco CA 94107
415 989-1130

Portable intercom systems, headphones VS

CLEWER COMMERCIAL & TECHNICAL SERVICES LTD
836 Yeovil Rd Trading Estate Slough Berkshire England
Film projectors, telecine systems, film editing equip, mag film

CMX SYSTEMS (DIV OF ORROX CORP)
3303 Scott Blvd Santa Clara CA 95050
408 988-2000

Videotape editing equip, portable time code generators VS

See ad pg. 3

CA CMX Los Angeles..... 213 980-7927
NY CMX New York..... 212 371-1122
TX CMX Dallas..... 214 242-2960

COASTCOM
2312 Stanwell Dr Concord CA 94520
415 825-7500

Demodulators; diplexers; modulators; video filters; subcarrier amps; program subcarriers VS

COAXIAL DYNAMICS INC
13110 Enterprise Ave Cleveland OH 44135
216 267-2233

RF filters, RF loads, RF switchers, directional power detectors, couplers, RF wattmeters, adjustable-tap RF sampler VS

COHERENT COMMUNICATIONS CO
13733 Glen Oaks Blvd Sylmar CA 91342
213 362-2566

Power supplies for cond mics; importer of Rycote windshield; lavalier mic; film footage counter; mixers (Audio Developments, KMS Electronics) VS

COHU INC ELECTRONICS DIV
5725 Kearny Villa Rd San Diego CA 92123
714 277-6700

TV color & mono cameras, studio & portable; color connectors, color encoders, image enhancers, video switchers, pulse distribution amps; TV film cameras, telecine chains; color pattern generators, sync generators; distribution amps VS

See ad pg 97—refer to rep/dist section

CA Cohu 770 Welch Rd Suite 154 Palo Alto 94304..... 415 326-0280
MI Cohu 41816 Langley Dr Sterling Heights 48078..... 313 739-5444
NJ Cohu 23 E Madison Ave Florham Park 07932..... 201 377-6636

COLLINS COMMERCIAL TELECOMMUNICATIONS DIV OF ROCKWELL INTERNATIONAL

1200 N 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 equip; RF switchers; facility turnkey installations; dist of other lines VS

See ad Cov 2—refer to rep/dist section

AL RF Cassidy PO Box 2743 Fairbanks 99707..... 907 452-6044
AZ Morris Courtright 1450 W Arroyo Dr Yuma 85364..... 602 783-6380
FL RG Beattie 6300 15th St N St Petersburg 33702..... 813 525-4206
MI DW Hill 38780 Hartwell Sterling Heights 48077..... 313 979-6320
MN JL Littlejohn 200C W Branch Rd Maple Plain 55359..... 612 479-2633
MO JC Shideler Rt #1 Box 217-B Oak Grove 64075..... 816.443-2080

continued on page 80

OUR LIPLOCK™ DOES FOR AUDIO WHAT OUR JOYSTICK DID FOR VIDEO

Editing Videotape Means AUDIO as Well as Video

Most videotape editing systems ignore audio. They solve only half your editing problems. The Convergence ECS-1B Joystick Editing System with Liplock™ solves both your audio and video editing problems and sets a *new world standard* for speed and precision.

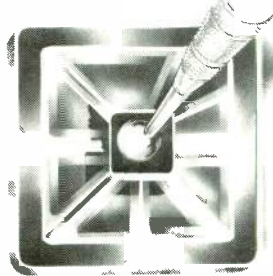
Now that you've selected your edit points in world record time, set another speed record for getting that edit on tape with our new switchable Half-Time edit cycle.

AUDIO CUE



VIDEO CUE

REV ← → FWD



EDIT POINT
SELECTOR

Half-Time reduces cue pre-roll, post-roll and recue times by 50% and saves crucial time when you need it the most.

Liplock™ and Half-Time are deliverable now and available only on Convergence ECS-1B Joystick Editing Systems. As a matter of fact, we even have the patent* on Joystick Editing Systems. Call us for a demo — There's a lot more you need to see — and hear — for yourself.

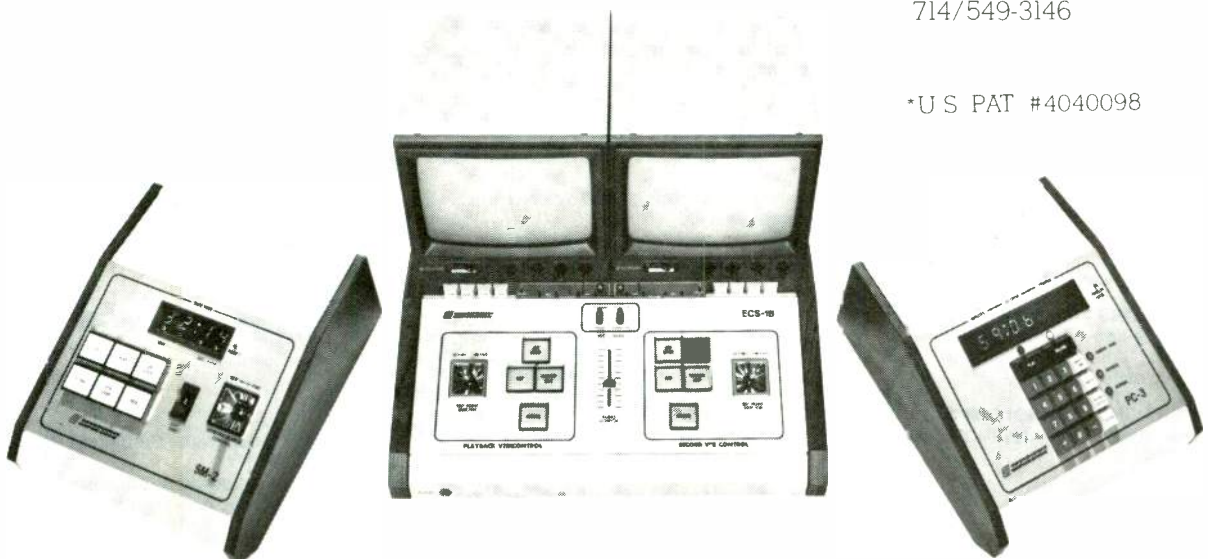
Editing Means Convergence



17935 Skypark Circle
Irvine, CA 92714
714/549-3146

See us at SMPTE Booth 230-231
See us at RTNDA Booth 54-55

*U S PAT #4040098



Circle 148 on Reader Service Card

The Source '77

MI	DW Hill 38780 Hartwell Sterling Heights 48077.....	313 979-6320
MN	JL Littlejohn 200C W Branch Rd Maple Plain 55359.....	612 479-2633
MO	JC Shideeler Rt #1 Box 217-B Oak Grove 64075.....	816 443-2080
NJ	Keith Leach PO Box 16 Newton 07860.....	201 383-8797
NY	John Ring RR #2 Westport 12993.....	518 962-4567
OR	TT Cauthers 1215 SE 73rd Ave Portland 97215.....	503 254-2818
PA	AA Silver PO Box 941 Levittown 19058.....	215 943-3622
TN	RC Evans Rt #2 Box 12 Glenmore Dr Rockford 37853.....	615 573-9717
TX	WR 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; video test equip **VS**

COLUMBIA VIDEO SYSTEMS
1805 St Johns Ave Highland Park IL 60035
312 433-6010

CCTV & CATV video systems & rentals service, post production services **VS**

COLUMBINE SYSTEMS INC
PO Box 740 Golden CO 80401
303 27-4000

Computer services for radio, TV **VS**

COMAD COMMUNICATIONS LTD
1770 Albion Rd Rexdale Ontario M9V 1C2
416 745-6494

Digital clocks; master clocks; slave clocks; time distribution systems (Dynaquip)

COMARK INDUSTRIES INC
PO Box 196 Main Line Ind Park Westfield MA 01805
413 568-1832

Demodulators, diplexers, RF filters, transmission line accessories; FM antennas **VS**

COMET SALES
PO Box 4755 Springdale CT 06907
203 329-2764

Vacuum capacitors **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. 49

COMM/SCOPE CO
Rt 1 Box 199 A Catawba NC 28609
704 241-3142

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 equip, modulators RF generators

COMMUNICATIONS TECHNOLOGY CORP
2237 Colby Ave Los Angeles CA 90064
213 473-5024

CATV splicing, materials, fittings

COMMUNICATIONS TECHNOLOGY INC
3070 Leeman Ferry Rd Huntsville AL 35801
205 883-7370

VS means it's verified

Audio switchers, video routing switchers, small and medium video production switchers **VS**
 See ad pg. 114—refer to rep/dist section

COMQUIP 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; TV cameras, VTRs **VS**

COMPU/NET INC
8616 La Tijera Blvd Inglewood CA
213 642-2211

Automated business services for radio & TV

COMPUTER IMAGE CORP
2475 W 2nd Ave Denver CO 80223
303 934-5801

Animation equip, computer animation services **VS**

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
213 843-6674

Refurbished VTR and audio heads, video discs, color correctors, video equalizers

COMREX CORP
PO Box 269 Sudbury MA 01776
617 443-5077

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; surge protectors; RF leakage detector **VS**

CONRAC DIV CONRAC CORP
600 N Rimsdale Ave Covina CA 91722
213 966-3511

TV monitors

CONSOLIDATED DIESEL ELECTRIC
1500 E Putnam Ave Old Greenwich CT 06830
203 637-4341

Emergency power generators

CONSOLIDATED ELECTRONIC INDUSTRIES
9721 Singleton Dr Washington DC 20034
301 530-6080

Radio automation equip, studio systems, open-reel tape, cartridges, controllers, reel decks, multi-cart machines, read out/display data input devices, complete systems. **VS**

CONSOLIDATED VIDEO SYSTEMS
1255 E Arques Ave Sunnyvale CA 94086
408 737-2100

Time base correctors, field synchronizers, video compressor **VS**

See ad pg. 63—refer to rep/dist section

GA	D Tuttle 2693 Twigg Circle Marietta 30067.....	404 433-1570
IA	C Selthun 1000 Independence St Pella 50219.....	515 628-9389
IL	M Lang Hoffman Estates 60195.....	312 882-3336
NJ	A Leon 369 Passaic Ave Fairfield 07006.....	201 575-7668
PA	D Smith 101 Davidville Rd Southampton 18966.....	215 355-6642

CONTINENTAL ELECTRONICS MFG CO
PO Box 270879 Dallas TX 75227
214 381-7161

High-power AM broadcast transmitters; 5/10 kW

transmitters; AM antennas; diplexers & RF loads **VS**
 See ads pg. 108, 112, 120, 128, 159, 163

CONTROL CONCEPTS CORP
2361 S Jefferson Davis Hwy Arlington VA 22202
703 920-5740

Video sync generators; audio signal generators; harmonic & IM distortion meters; videowaveform equalizers; delay lines; test sets

CONVERGENCE CORP
17935 Sky Park Circle Bldg D Irvine CA 91724
714 549-3146

Video editing control systems, frame counter, tape timer; audio tape editing equip **VS**

See ad pg. 79—refer to rep/dist section

GA	Conv 868 E Rock Springs RD NE Atlanta 30306.....	404 872-5454
NY	Conv 553 Westchester Ave Portchester 10573.....	914 937-1316

COOKE ENGINEERING CO DIV OF DYNATECH LABS

900 Slaters Lane Alexandria VA 22314
703 548-3889

Coaxial and twin axial patching equip

COPPERWELD STEEL CO WIRE CABLE DIV
1000 Monongahela Ave Glassport PA 15045
412 461-4020

Antennas tower accessories, wire & cable

CORLEY D&S LTD
80 Galaxy Blvd Unit 3 Rexdale Ontario M9W 4Y8
 Test materials for CATV **VS**

CORNING GLASS WORKS
3900 Electronic Drive Raleigh NC 27604
919 876-1100

Video delay lines, ultra sonic delay lines **VS**

COSMICAR OPTICAL CO LTD
424 Higashi — Oizumi Nerima-ku Tokyo Japan
 Video camera lenses; camera heads, mounts & dollies; CCTV camera lenses, cine lenses **VS**
 See ad pg. 175—refer to rep/dist section

COX DATA SERVICES
Suite 100 Prado N 5600 Roswell Rd NE Atlanta GA 30342
404 256-5200

Computer systems for TV, AM, FM and CATV, database systems **VS**

COYNE ASSOC
Suite 360 Cavendish Blvd Montreal PQ Canada H4B 2M8
514 487-5019

Computer aided systems design for CATV; broadband consulting service **VS**

CPAC INC
2364 Leicester Rd Leicester NY 14481
716 382-3223

Silver recovery and pollution control systems **VS**

CROCK BRUCE A INC
9118 Winton Rd Cincinnati OH 45231
513 521-5040

Storage racks for cartridges

CROSSROADS AUDIO INC
121 Payne St Dallas TX 75207
214 741-6002

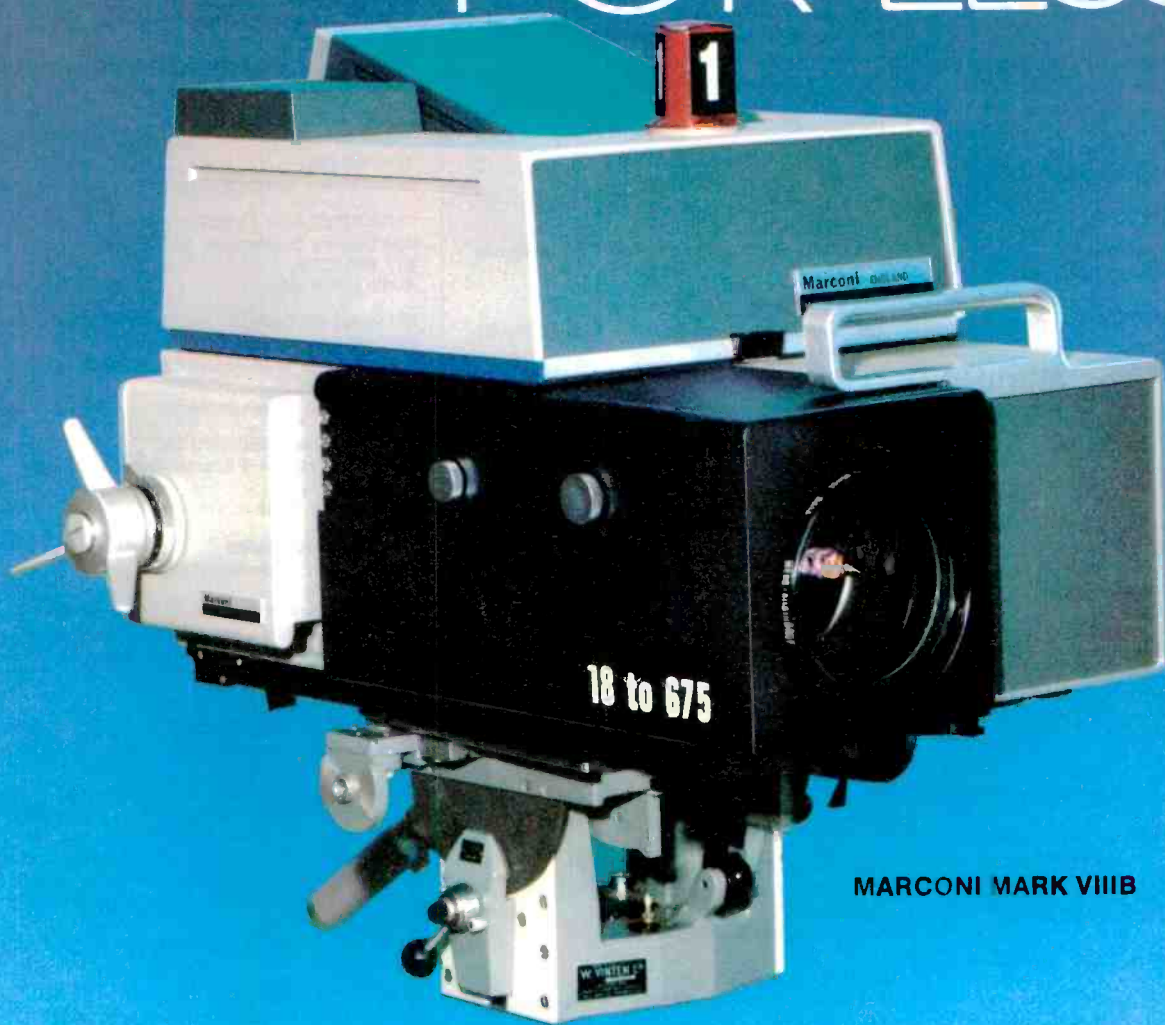
Cable fault tester; speakers

CROWN INTL
1718 W Mishawaka Rd Elkhart IN 46514
219 294-5571

Audio power amps, audio preamps; equalizers; variable filters; intermodulation distortion test equip **VS**

continued on page 82

DON'T SETTLE FOR LESS



MARCONI MARK VIII B

The Marconi MARK VIII B is the largest selling, fully automatic color camera in the world today. With all the features shown as *STANDARD* and *NOT OPTIONS*, it offers outstanding value without compromise. You may think we're expensive with all this luxury. Call us — you'll be pleasantly surprised at how competitive we are!

- Fully automatic registration
- Continuous auto centering from live scene

- Automatic color balance from live scene
- Electronic color temperature control
- Automatic self-diagnostic check out
- Choice of pick-up tubes
- Tilting view finder
- Standard or mini cable
- Portable MARK VIII P uses same CCU

Let us show you the Marconi MARK VIII B and prove that YOU DON'T HAVE TO SETTLE FOR LESS.

Marconi Electronics, Inc.

100 Stonehurst Court • Northvale, New Jersey 07647 • (201) 767-7250

Circle 149 on Reader Service Card

The Source '77

CSI ELECTRONICS INC
3800 S Congress Ave Boynton Beach FL 33435
305 737-5626

Transmitters (AM, FM, carrier current); status and alarm indicators; stereo and SCA generator VS

CSP INC
203 Airport Rd Doylestown PA 18901
215 345-7386

RF inductor, diplexers, remote control system, RF filters, RF loads, RF switchers, phasing network, antenna tuning unit, DA equip VS

VS means that BM/E has reviewed this manufacturer's supporting literature

CUSH CRAFT
621 Hayward St Manchester NH 03103
603 627-7877

Yagi antennas for CATV

CUSTOM AUDIO ELECTRONICS
2828 Stommel Rd Ypsilanti MI 48197
313 482-6568

Audio mixing consoles; slide attenuators, equalizers & filters (active); intercom systems VS

D

DABURN ELECTRONICS & CABLE CORP
2360 Hoffman St Bronx NY 10458
212 195-0050

Wire and cable, connectors, terminals VS

DAGE-MTI INC
208 Wabash St Michigan City IN 46360
219 872-5514

TV mono cameras; b&w picture monitors; distribution amps; sync generator systems; production switcher VS

DAK INDUSTRIES INC
10845 Vancouver St N Hollywood CA 91605
213 984-1559

Automation equip, sequencers, time insertion, read out/display, audio mixers; camera dollies

DATA COMMUNICATIONS CORP (BIAS)
3000 Directors Row Memphis TN 38131
901 332-3544

Computer service for sales, traffic, operational accounting (TV & radio)

DATA LOGIC/RUST
PO Box 273 Everett MA 02149
617 389-3380

Remote control systems VS

DATA METRICS
340 Fordham Rd Wilmington MA 01887
617 658-5410

Time code generator, digital clocks, master & slave clocks; time code readers

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 amps; video color phase equalizers & waveform correctors video sweep generators; video test equip; audio processing amps

DATATRON INC
1562 Reynolds Ave Irvine CA 92714
714 540-9330

Videotape editing equip; time code

readers/generators, synchronizing equip, character generators

DAVID CLARK CO INC
360 Franklin St Worcester MA 01604
617 756-6216

Headphones, intercom systems VS

DAVIS MANUFACTURING DIV OF JI CASE
PO Box 1801 Wichita KS 67213
316 265-6251

Trenchers for direct cable burial; line layers

DBX INC
71 Chapel St Newton MA 02195
617 964-3210

Tape recorder noise reduction systems; dynamic expanders; noise reduction modules, gain control modules; dB meters VS

DECCA AUSTIN INSULATORS
71 Selby Rd Brampton ONT L6W 1K5
416 457-8722

Insulators, transformers for towers and antennas

DELTA-BENCO-CASCADE LTD
124 Belfield Rd Rexdale on Canada M9W 1G1
416 241-2651

Headend, trunk amps, distribution amps for CATV S

DELTA ELECTRONICS INC
5534 Port Royal Rd Springfield VA 22151
703 321-9845

Antenna/transmitter remote control systems; antenna monitors; impedance bridges, monitoring & test accessories; automatic modulation controller, power controller

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; diplexers; waveguide & accessories; dehydrators VS

DIGITAL COMMUNICATIONS INC
310 14th Ave S 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

DITCH-WITCH TRENCHERS
PO Box 66 Perry OK 73177
405 336-4404

Trenchers, vibratory plows; earth saw; backhoe; hydraulic breaker VS

DI-TECH INC
Wyandanch Ave N Babylon NY 11704
516 643-4040

Video & pulse DAs; passive video switchers, routing switchers; audio monitor amps VS

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 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

DRANETZ ENGINEERING LABS
2385 S Clinton Ave S Plainfield NJ 07080
201 755-7080
Frequency monitors & counters, impedance bridges, voltmeters, multimeters, phase meters, diff phase-gain measurement VS

DUCA-RICHARDSON CORP
11465 W 48th Ave Wheat Ridge Co. 80033
303 423-1300
Master control, production 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 amps VS

DU PONT (EI DUPONT DE NEMOURS & CO) MAGNETIC PRODUCTS DIV
Glasgow Site Wilmington DE 19898
302 453-2240
Videotape and video cassettes VS

DURNELL ENGINEERING INC
PO Box 60 Hwy 4 S Emmetsburg IA 50536
712 852-2611
Aerial personnel lift trucks VS

DYMA ENGINEERING
PO Box 1697 Taos NM 87571
505 758-2686
Audio switchers, audio effects units, cabinetry, cart storage accessories, mics, limiter/ducker amps; custom audio consoles, studio builders; RF detuning choke VS

DYNAIR ELECTRONICS INC
5275 Market St San Diego CA 92114
714 263-7711
Video pulse & distribution amps, routing & production switchers, sync generators, spec effects generators, modulators, demodulators, chroma keyers, equalizers, exciters, diplexers sideband analyzers, audio preamps, audio monitor amps, audio switchers, RF switchers, transmitters, remote control systems
See ad pg. 44—refer to rep/dist section

DYNASCAN CORP B&K DIV
1801 W Belle Plaine Ave Chicago IL 60613
312 327-7270
CATV test equip

DYNASCIENCES VIDEO PRODUCTS
Township Line Rd Blue Bell PA 19422
215 643-0250
Videotape editing equip; automatic program controllers; image enhancers, processing amps, production switchers, pulse & distribution amps, routing switchers, colorizers, sync generators, special effects generators, motion compensating lenses VS
See ad pg. 170—refer to rep/dist section
1IL R Priske 5050 Mulford St Skokie
60076..... 312 677-7857

DYTEK INDUSTRIES INC
2475 W 2nd Ave Ste 4 Denver CO 80223
303 934-5804
Production switchers, routing switchers, automated switchers, special effects generators, chroma-keyers, edit controllers VS
See ad pg. 149—refer to rep/dist section
CA J Morriso 999 N Sepulveda Blvd
El Segundo 90245..... 213 640-2348

continued on page 84

Don't settle for ENG-Only!



LDK-11 is an ENG and EFP Camera.

It's the unique Philips camera that started everyone thinking ENG and Field Production. The one camera that does *both* without compromising quality or operational features. One of the many innovations that has earned Philips its reputation as "the INNOVISION company."*

With *exclusive* Philips design and performance, the LDK-11 outperforms those "mini" and "micro" ENG-Only cameras. It is lightweight, battery or AC powered, totally portable and easy-to-operate for ENG; with full production control either remotely or at the backpack. Yet the LDK-11 incorporates the Philips picture-determining features that go into our most advanced studio cameras.

Plus...the LDK-11 includes many additional unique features for difficult field production and ENG applications. Here are just a few:

- Outstanding low-light performance; 6 to 12 dB additional gain to match

specific requirements down to 8 ft. candles.

- Bias-lit Plumbicon™ tubes for lowest lag.
- Lowest Delta T permits high ambient temperature operation.
- Ultra stable gamma circuitry for true color rendition down to black.
- Switchable gamma to .35 provides contrast compression.
- Production gen-lock capability up to 3000 feet.
- New 2/3" Plumbicon tubes with studio camera resolution.
- Up to 300' of 1/2" cable between camera head and backpack.
- Carry head only. Ideal operator's weight (14 lbs. with 10:1 lens).
- Change head-to-backpack cable length without adjusting registration or set up.
- True broadcast quality (27 MHz) 2-line contours with coring and

combing for maximum sharpness and minimum noise.

- Magnetic shielding as in studio cameras.
- Optional 5" viewfinder.

The broad application of the LDK-11 in studios, documentaries, sports, local spots *and* ENG confirms that broadcasters need—and want—more than just an ENG camera. Prove it for yourself. For more information or a demonstration of the LDK-11 call your local Philips representative or contact Philips Broadcast Equipment Corp., 91 McKee Drive, Mahwah, N.J. 07430 (201) 529-3800.

the
INNOVISION
Company*

*Innovative Leader in World Television.

PHILIPS
TM-N.V. Philips



Circle 265 on Reader Service Card for literature
Circle 266 on Reader Service Card for a demonstration

The Source '77

VS MEANS IT'S VERIFIED

E

EASTMAN KODAK CO MOTION PICTURE & AUDIOVISUAL MARKETS DIV 343 State St Rochester NY 14650 716 325-2000

Motion picture cameras; motion picture film; projectors for TV; film processors **VS**
See ad pg. 19

CA	Kodak PO Box 38939 Hollywood 90038.....	213 464-6131
	Kodak PO Box 3145 Rincon Annex San Francisco 94119.....	415 776-6055
GA	Kodak PO Box 4778 (Fed. Annex) Atlanta 30302.....	404 351-6510
HA	Kodak PO Box 17007 Honolulu 96817.....	808 833-1661
IL	Kodak 1901 W 22 St Oak Brook 60521.....	312 654-5300
NY	Kodak 1133 Ave of the Americas New York 10036.....	212 262-7100
	Kodak 1187 Ridge Road West Rochester 14650.....	716 254-1300
TX	Kodak 6300 Cedar Springs Rd Dallas 75235.....	214 351-3221
DC	Kodak 500-12th St SW 20024.....	202 554-9300
CAN	Kodak 3500 Eglinton Ave W Toronto Ontario M6M 1V3.....	416 766-8233

EDCO PRODUCTS INC 680 Bizzell Dr Lexington KY 40504 602 259-0434

Stereo phase enhancers; tape cartridge players/recorders; audio cassette editor **VS**
See ad pg 155—refer to rep/dist section

EDCOR DIV OF PAC 3030 Red Hill Ave Costa Mesa CA 92626 714 556-2740

Wireless mics, dynamic & lavalier; wireless sound systems

EDISON ELECTRONICS See McGraw-Edison

EDUTRON INC 3700 NE 53rd Ave Gainesville FL 32601 904 377-8276

Time base correctors

EECO 1441 E Chestnut Ave Santa Ana CA 92701 714 835-6000

(SEE AMPEX) Audio & video tape editing equip; character generators, synchronizing equip **VS**

EFRATOM CALIF INC 3303 Harbor Blvd 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

EIDSON ELECTRONIC CO PO Box 96 Temple TX 76501 817 773-3901

Crystal maintenance and monitor service **VS**

EIGEN VIDEO PO Box 1027 Grass Valley CA 95945 916 273-1341

Color floppy 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**

See ad pg 17—refer to rep/dist section
AZ Varian 7117 Third Ave Suite 106

CA	Scottsdale 85251.....	602 947-5461
	Varian 4940 El Camino Real Los Altos 94022.....	415 968-7630
	Varian 2901 Wilshire Blvd Suite 102 Santa Monica 90430.....	213 828-5588
CAN	Varian 45 River Dr Georgetown Ontario L7G 2J4.....	416 457-4130
FL	Varian 314 S Missouri Suite 307 Clearwater 33516.....	813 446-8513
GA	Varian 1115B Watson Blvd Warner Robins 31093.....	912 923-6387
	Varian 665-Powers Ferry Rd NW Suite 100 Atlanta 30339.....	404 955-1397
IL	Varian 205 W Touhy Ave Park Ridge 60068.....	312 825-6686
MA	Varian 400 Totten Pond Rd Bldg 1 Waltham 02154.....	617 890-4560
MD	Varian 4701 Lydell Rd Cheverly 20781.....	301 773-7010
NJ	Varian 306 Fellowship Rd Mt Laurel 08054.....	609 235-6800
	Varian 25 Rte 22 Springfield 07081.....	201 376-6600
NY	Varian 6489 Ridings Rd Syracuse 13206.....	315 437-2568
OH	Varian 4134 Linden Ave Suite 101 Dayton 45432.....	513 258-3930
TX	Varian PO Box 689 558 S Central Expy Suite 202 Richardson 75080.....	214 235-2385

EIP INC 3230 Scott Blvd Santa Clara CA 95051 408 244-7975

Microwave and FM frequency counters

ELCOM ENGINEERING 13161 Barret Hill Santa Ana CA 92705 714 544-5760

Audio preamps; ALC and AGC amps; compressor limiters; AM sample transformers; frequency monitoring system; tower lighting; EBS systems, AM/FM facility turnkey installations **VS**

ELECTRA CO DIV OF MASCO 300 S County Line Rd Cumberland IN 46229 317 894-1440

Automatic scanning monitors **VS**

ELECTROCOMP ELECTRONIC MUSIC LAB INC PO Box H Vernon CT 06066 203 875-0751

Music synthesizers, A/D converter

ELECTROHOME LTD 809 Wellington St N Kitchener ON CAN 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**

ELECTRONIC INTERFACE SYSTEMS INC 2411 S Broadway Santa Ana CA 92707 714 979-0033

Automated video cassette controller (random access)

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. 162—refer to rep/dist section

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

TV translators; low power TV transmitters for broadcast; TV transmitters for ITFS and MDS; TV antennas **VS**

ELECTRONIC MUSIC LABORATORIES PO Box H Vernon CT 06066 201 875-0751

Music synthesizers **VS**

ELECTRO & OPTICAL SYSTEMS LTD 3015 Kennedy Rd Scarborough Ontario M1V 1E7

416 291-4492
Audio distribution amps, monitor and power amps, speakers, time code generators, peak meters; b&w cameras, monitors, pulse and distribution amps, production switchers, routing switchers, special effects generators, standard converters, editing equip, colorizer; lighting controls

ELECTRO SOUND INC 160 San Gabriel Dr Sunnyvale CA 94086 408 245-8600

Tape auto loaders, splicing blocks, open-reel tape recorders, portable, and decks, tape duplicators

ELECTROVERT INC 86 Hartford Ave Mount Vernon NY 10553 914 664-6090

Harnessing equip, markers

ELECTRO-VOICE INC SUB OF GULTON IND INC 600 Cecil St Buchanan MI 49107 616 695-6831

Mics; loudspeakers

ELF AUDIO VISUAL LTD 836 Yeovill Rd Trading Estate Slough Berks England

Tel: Slough 36123 Telex: 847628 **VS**
Film projectors

ELPA MARKETING INC PO Box 1050 New Hyde Park NY 11040 516 748-3002

Tape editing equip (Edital); turntables (Thorens) **VS**

ENGLISH ELECTRIC VALVE CO N AM LTD 67 Westmore Dr Rexdale Ont Can M9V 3Y6 416 745-9494

Camera tubes, power tubes, rectifiers; surge protectors, vacuum capacitor **VS**

ERIC SMALL & ASSOCIATES 680 Beach St Suite 315 San Francisco CA 94109 415 441-0666

Automation equip, controllers, computer/microprocessor, complete systems, analog VU & peak indicators, tower lighting monitors **VS**

ESC ELECTRONICS 534 Bergen Blvd Palisades Pk NJ 07650 201 947-0400

Delay lines, LC filters; equalizers

ESE 505 1/2 Centinela Ave Inglewood CA 90302 213 674-3021

Digital clocks, programming devices, timers, time calculators; tape timer; LED VU meter; EBS two tone system **VS**

ESSEX INTERNATIONAL INC COMMUNICATIONS/CATV DIV 6235 S Harlem Ave Chicago IL 60638 312 586-3000

Coaxial cables; CATV drop cables; wire & cable generally **VS**

EVENTIDE CLOCK WORKS INC 265 W 54th St New York NY 10019 212 581-9290

Audio phase controllers; audio compressor/expander/limiters; audio digital delay liners; audio flanger, pitch changer **VS**

continued on page 86

UNCOMPROMISING PERFORMANCE

Aural Studio-Transmitter Links

148-174 MHz 215-240 MHz 330-330 MHz 450-470 MHz 890-960 MHz



PCL-505 Transmitter

All solid state circuitry and utilizing direct FM, Moseley aural studio-transmitter links offer uncompromised, dependable performance—a Moseley tradition. Micro-stripline techniques and true modular construction are but a few of the features typical of the advanced technology used in the PCL-505 and PCL-101 series STL systems.

For AM PCL-101 or PCL-505 For FM PCL-101 or PCL-505

For FM Stereo

DUAL STL—Two monaural links conveying left and right audio.

COMPOSITE STL—Stereo on a single RF carrier—the PCL-505/C—a system pioneered by Moseley!

Remote Control

DIGITAL



DCS-2A Control Terminal

Fully digital remote control of a remotely located transmitter plant is provided by the **DCS-2A Digital Control System**. Multiple transmitter site operation — a standard option. Command, telemetry, and status provided in groups of thirty channels. **Automatic parameter logging available.**

Computer-assisted operation of the DCS-2A is another standard option, and can provide **totally automated plant operation**. With CRT display, thirty telemetry or status channels are displayed simultaneously. Tolerances on all telemetry channels and logging are also provided.

The **Model DRS-1A Digital Remote System** provides telemetry, command and status capability at an affordable price. The system is available for operation over telephone or radio interconnecting facilities. Automatic logging is accommodated by the companion **Model DLS-1 Digital Logging System**.



MOSELEY ASSOCIATES, INC.

SANTA BARBARA RESEARCH PARK



Loudness and clarity without compromise... the Moseley Associates **TFL-280 Audio Limiter** precisely controls the modulation levels of FM and TV aural transmitters. FM monaural, stereo, quadrasonic, FM SCA, TV aural are all expertly processed. This frequency-conscious limiter cleanly solves the problems associated with the transmission of pre-emphasized audio, including the ringing (over-modulation) produced by low-pass audio filters.

Audio Limiter

OTHER MOSELEY PERFORMERS:

- Model SCG-9 Stereo Generator
- Model RPL-4A Remote Pickup Link
- Model RPL-3A Remote Pickup Link

TCS-1 Command Terminal

Fully independent command and status reporting capability is provided by the **Model TCS-1 Telecontrol System**. Applications for the TCS-1 include command and status (tally-back) from broadcast transmitters, electronic news-gathering or similar antenna systems, microwave transmitters and receivers, or remotely-located television cameras.

ANALOG REMOTE CONTROL

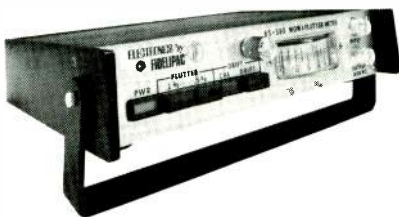
Fifteen telemetry and 30 command functions are provided by the **TRC-15A Remote Control System** on telephone or radio interconnection circuits.

- STL Accessories
- Remote Control Accessories
- Model SCG-8 Subcarrier Generator
- Model SCD-8 Subcarrier Demodulator

SANTA BARBARA RESEARCH PARK, 111 CASTILIAN DRIVE, GOLETA, CALIFORNIA 93017
(805) 968-9621 TELEX: 658448 CABLE: MOSELEY

Q.
What's smaller
than a breadbox,
tells the truth,
and won't
flutter your RFI
or wow
your wallet?

A. **FIDELIPAC®**
WOW &
FLUTTER METER.



For less than \$350.00 you can have a portable, solid-state instrument that quickly and accurately measures the wow, flutter and drift characteristics of any sound reproducing device . . . cartridge or reel-to-reel tape recorder, turntable, film chain, etc. It's easily connected to your equipment and features a standard phone output jack for oscilloscope connection as well as a self contained switchable weighting filter. With its internal precision 3,150 Hz reference oscillator and its complete immunity to EMI and RFI, Fidelipac's Model 65-390 Wow and Flutter Meter is truly indispensable for your test bench or studio.

For more information,
contact Fidelipac or your local
Fidelipac distributor.

ELECTRONICS by
FIDELIPAC®



109 Gaither Drive
Mt. Laurel, NJ 08057
(609) 235-3511

*Trademark

Circle 152 on Reader Service Card

The Source '77

E-Z WAY PRODUCTS INC
PO Box 22845 Tampa FL 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 amps; aural carrier generator; FM sub-carrier equip., engineering services VS
See ad pg. 73
CAN FE 657 Orly Ave Dorval PQ
H9P 1G1 514 636-0974

F&B CECO INC
315 W 43rd St New York NY 10036
212 586-1420
Manufacture & rental of motion picture equip, lighting equip, sound equip, editing equip, & CCTV equip VS

FERNSEH GROUP ROBERT BOSCH CORP
279 Midland Ave Saddlebrook NJ 07662
201 797-7400
Studio & portable TV cameras, lenses, accessories; VTRs (segmented helical cassette), automated systems; picture monitors VS

FIDELIPAC
109 Gaither Dr Mt Laurel NJ 08057
609 235-3511
Magnetic tape cartridges, test tapes, empty reels, carts, cassettes, splicing blocks & tape, alignment gauges, bulk erasers, tape cartridge storage, videotape bulk erasers, on-air lights, wow & flutter meters VS
See ads pgs. 86,100—refer to rep/dist section

FILMLINE CORP
43 Erna St Milford CT 06463
203 878-2433
Film processors

IMERO FIORENTINO ASSOC INC
10 W 66th St New York NY 10023
212 787-3050
Kits for testing gray scale of colors, consulting service; color monitor calibrator, prefab scenery, studio design, TV production equip rental VS

FISHER BERKELEY CORP
5800 Christie Ave Emeryville CA 94608
415 655-9696
Intercom systems VS

FISHER-BURKE
PO Box 2468 Phoenix AZ 85003
602 257-0225
Audio distribution amp, antenna tuning units, custom AM phasers

FIXTUNE SOLID STATE ELECTRONICS INC
1 W 30th St New York NY 10001
212 695-4767
One station FM receivers; SCA receivers VS

FLASH TECHNOLOGY CORP OF AMERICA
55 Lake St Nashua NH 03060
603 883-6500
Strobe beacons for towers VS

FLUKE JOHN B MFG CO
PO Box 7428 Seattle WA 98133
800 426-0361
Frequency counters, calibrators, test sets, gen purpose test equip VS

VS MEANS IT'S VERIFIED

FORGFLO CORP
Third & Regan St Sunbury PA 17801
717 286-5611
Magnetic recorder heads for audio

FORT WORTH TOWER CO INC
PO Box 8597 Fort Worth TX 76112
817 457-3060
Towers, prefab bldgs, reflectors

FREELAND PRODUCTS CO
3233 Conti St New Orleans LA 70119
504 822-9222
Rebuilt power tubes VS

FREZZOLINI ELECTRONICS INC
7 Valley St Hawthorne NJ 07506
201 427-1160
Professional 16mm cameras, lenses, accessories; motion picture lights; portable power packs for video cameras, batteries VS
See ads pgs. 112,162

FRIBLEY ENTERPRISES
PO Box 389 Canada Rd Painted Post NY 14870
607 962-3890
Terminal boxes for CATV MATV

FUJI PHOTO FILM MAGNETIC TAPE DIV
350 Fifth Ave New York NY 10001
212 736-3335
Videotape; audio tape VS

FUJINON OPTICAL INC
672 White Plains Rd Scarsdale NY 10583
914 472-9800
Camera lenses VS
See ad pg. 95

FUNG ENGINEERING CO
PO Box 1082 San Carlos CA 94070
415 591-5141
Video processing amps, RF converters, filters, switchers, demodulators, modulators; TV field intensity meters

G

GABRIEL ELECTRONICS
PO Box 626 Scarborough ME 04074
207 883-5161
Parabolic, horn & shrouded antennas; elliptical waveguides, tower construction equip; transmission lines & connectors; facility turnkey installations VS

GAF CORP
140 W 51st St New York NY 10020
212 582-7600
Color films, slide films, motion picture films; film processing equip; film & slide projectors; accessories VS

GAMCO INDUSTRIES INC
291 Cox St Roselle NJ 07203
201 241-7500
CATV fittings; splitters; directional 1 taps; field pay traptester, passive distribution accessories; transformers; locking terminators; hardware, complete line of coral active gear

GARNER ELECTRONICS
4200 N 48th St Lincoln NE 68504
402 489-9100
Tape duplication systems; conveyor-type tape erasers VS
See ad pg. 164

GATES BROADCAST DIVISION
See Harris Corp.

GAW CO INC
53 S Jefferson Rd Whippany NJ 07981
201 887-7210
Frequency monitors and counters, audio generators, voltmeters, harmonic distortion meters, EBS two tone systems

continued on page 88



Introducing two new ways to get the lighter side of the news.

Microwave Associates' MA-2CP and MA-2EP.

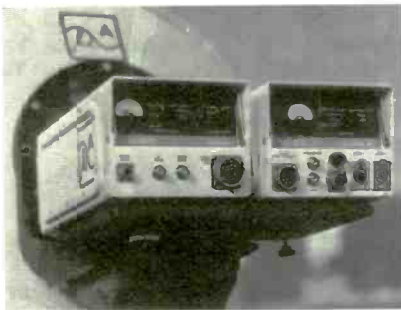
They're by far the lightest, easiest to carry, simplest to use and maintain portable microwave radios to move onto the market.

Because they're so light, the 2 watt MA-2CP and 8 watt MA-2EP open up a new era of flexibility in news gathering at 2GHz. You can go almost anywhere the news is.

Both models have a unique frequency offset capability that gives you a total of 21 microwave channels. Three times the frequency agility of older models.

If you want, we also offer the 2CP and 2EP in 1-channel and 7-channel versions.

In addition, the MA-2EP provides sophisticated diagnostics, switch-selectable tuning and the opportunity of mounting the



RF head up to 30 feet away.

Both the MA-2CP and MA-2EP are engineered with people in mind. And each system is compatible with all our Portable Line accessories.

So if you need two great little portables for ENG remotes, write or call for the complete details.

The MA-2CP. And the MA-2EP.

They're guaranteed to give your news gathering a nice, light touch. Microwave Associates, Communications Equipment Group, Burlington, MA 01803. 617-272-3100.

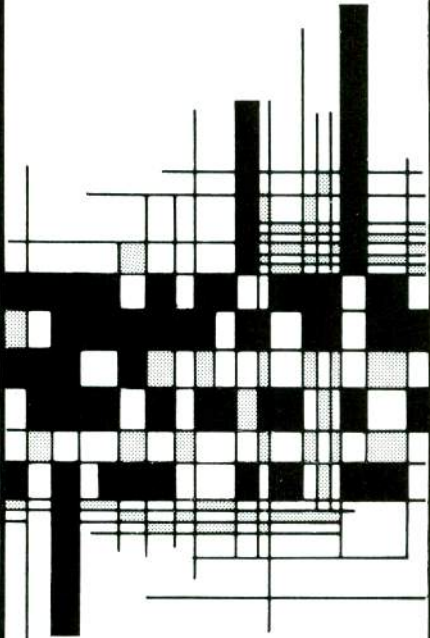


**MICROWAVE
ASSOCIATES**

Field Sales Offices: Atlanta, Ga. (404) 455-3815 • Dallas, Tx. (214) 234-3522 • Kansas City, Mo. (816) 891-8895 • Sunnyvale, Ca. (408) 733-0222.

Circle 153 on Reader Service Card

Broadcast Financing?



Heller-Oak knows the Industry's needs.

- Loans
- Leases
- Acquisitions
- Refinancing
- Discounting Seller Notes

Heller-Oak has built its reputation in communications financing on these clear-cut principles:

- No equity participation
- No commitment or investigation fee
- Each transaction is an "Original" structured to your specific needs

From \$200,000 to \$20,000,000 we would like to see your deal. If there is a way to put it together, we would like to work with you to produce the best financing possible.

Call or Write:

David M. Robbin or Loren N. Young



Communications Finance Corp.

105 W. Adams Street
Chicago, Illinois 60690
Telephone: 312/346-2300

A joint venture of
Walter E. Heller International Corporation
and Oak Industries Inc.

The Source '77

GBC CLOSED CIRCUIT TV CORP.
74 Fifth Ave New York NY 10011
212 989-4433

TV cameras, studio & portable (b&w color); camera mounts; telecine chains; monitors; sync gens; spec effect gen; VTRs (helical); videotape; audiotape; coaxial connectors, video distribution amps, pulse distribution amps

GENERAL CABLE APPARATUS DIV
PO Box 666 5600 W 88th Ave Westminster Co
80030
303 427-3700

CATV construction tools; aerial lifts; underground splicing modules; cable construction accessories (clamps, etc)

GENERAL CABLE CORP
500 W Putnam Ave Greenwich CT 06830
203 661-0100

Distribution cable, drop cable for CATV; cable processing systems, ventilators; heaters; dryers, aerial lifters, pole hardware

GENERAL CAMERA CORP
471 11th Ave New York NY 10018
212 594-8700

Cine cameras; camera accessories; film magnetic recording equip

GENERAL ELECTRIC CO MIDPS
Rm 301 Bldg 7 Electronics Pk Syracuse NY
13201

315 456-3293
CCTV cameras; CCTV systems; lenses; tripods & accessories VS

VS means that BM/E has reviewed this manufacturer's supporting literature

GENERAL ELECTRIC CO LAMP BUSINESS DIVISION
Nela Park Cleveland OH 44112
216 266-2121

Stage, studio, TV lamps

GENERAL ELECTRIC CO VIDEO DISPLAY EQUIP CO
Electronics Pk 6-205 Syracuse NY 13201
315 456-2562

Large screen video projectors VS
See ad pg. 134

GENERAL ELECTRODYNAMICS CORP
4430 Forest Ln Garland TX 75042
214 276-1161

Monochrome TV cameras; camera tubes

GENERAL MACHINE PRODUCTS CO INC
3111 Old Lincoln Hwy Trevese PA 19047
215 357-5500

Cable installation tools, pole hardware VS

GENERAL TELEVISION NETWORK
13225 Capital Ave Oak Park MI 48237
313 548-2500

Production facilities, post production services, TV equip repair service VS

GILBERT ENGINEERING CO
3700 N 36th Ave Phoenix AZ 85019
602 272-6871

Coaxial cable connectors, adapters, fittings, terminations, accessories, tools

GLASSMAN HIGH VOLTAGE INC
124 W Main St High Bridge NJ 08829
201 735-8800

DC power supplies, power displays, TV, flying spot scanners VS

GLOBE BATTERY
5757 N Green Bay Ave Milwaukee WI 53201
414 228 1200

Batteries

GOLDMARK COMMUNICATIONS CORP
98 Commerce Rd Stamford CT 06904
203 327-7270

Film to video transfer systems; tape duplication VS

GORMAN-REDLICH MFG CO
6 Curtis St Athens OH 45701
614 593-3150

Antenna monitors, phase meters, EBS two tone systems VS

GOTHAM AUDIO CORP
741 Washington St New York NY 10014
212 741-7411

Condenser mics (Neumann); audio & stereo consoles (Faylon); audio disc cutting equip (EMT); test records; reverberation units (EMT); audio recorder/players (Telefunken); compressor/limiters (EMT); broadcast turntables (EMT); headsets (Beyer); tape timers; flutter meters (Woelke); 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 DATAMETRICS
340 Fordham Rd Wilmington MA 01987
617 658-5410

Videotape editing, time code gens, time code reader VS

GOULD INC
467 Calhoun St Trenton NJ 08607
609 392-3175

Power inverters; battery chargers, batteries VS
See ad pg. 165—refer to rep/dist section

GRALEX INDUSTRIES DIV
155 Marine St Farmingdale NY 11735
516 694-3600

Digital voltmeters VS

GRANDY INC
1275 Bloomfield Ave Bldg #1 Fairfield NJ 07006
201 575-1433

Magnetic heads, relapping service-heads VS

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

Master control switchers, automated switchers, technical operations automation, digital video effects devices, colorizers; video production & routing switchers; pulse & distribution amps, chroma keyers, processing amps; sync generators, special effects generators; colorizers; equalizers VS

See ad pg. 5—refer to rep/dist section

CA	GVG 4419 Van Nuys Blvd Suite 307 Sherman Oaks 91403.....	213 990-6172
GA	GVG 1644 Tullie Cir NE Suite 102 Atlanta 30329.....	404 634-0521
IN	GVG 810 W Bristol St Suite E Elkhart 46514.....	219 264-0931
NY	GVG Station Plaza E Great Neck 11021.....	516 487-1311
TX	GVG PO Box 482 Mabank 75147.....	214 887-1181

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

GRUBER PRODUCTS CO
5254 Jackman Rd Toledo OH 43613
419 476-7200

Mobile ENG carts, A/V carts, projection tables
See ad pg. 160

continued on page 92

Circle 154 on Reader Service Card

Why Panasonic's Series 9000

We started with an annealed aluminum die-cast chassis.

Up to now selecting the right VCR deck or system left you with one major problem: To get the features you wanted, you had to pay a small fortune. Now there's Panasonic's new generation VCR. Series 9000. Two standard-performance decks. Two high-performance decks. And a high-performance, direct-drive editing system. Each with the kind of features and performance you may not find even in the most expensive 3/4" decks.

Like an annealed aluminum die-cast chassis. For better stability of alignment, greater strength and long-term durability. Like individually removable cabinet panels on the outside. And low-density circuit boards on the inside. There's also a new jam-proof gear tape loading system. Less jitter. A high S/N ratio of 45 dB. And more.

For those who want a meaningful alternative in standard VCR performance, Panasonic offers the NV-9100 player. And the NV-9300 player/recorder

with VHF and UHF tuners. Both decks include high resolution: 330 lines mono and 240 lines color. A VTR/TV antenna switch. An optional RF modulator. And just about everything else you need for the kind of picture you want.

There are also two high-performance, direct-drive decks. The NV-9200 player/recorder and the NV-9500 editing recorder. The NV-9200 gives you outstanding performance at a very affordable price. Because it gives you a direct-drive video head cylinder. Patented HPF video heads. Chroma level adjustments. As well as the capstan servo system.

The results: Highly stable color and black and white pictures with less jitter. High resolution: 330 lines mono and 250 lines color. And dubs that look more like masters than copies. But whether you use it as a high-quality master recorder, a CCTV studio deck or a dubbing deck, the NV-9200 will give you the performance you expect at a price you don't.



NV-9100

NV-9300

NV-A152*

should be your next 3/4" VCR.

We finished with a direct-drive editing system for under \$10,000.

With the NV-9500 editing recorder, you also get frame-by-frame insert and assembly edits that are crisp and clear. Without tear, roll or loss of chroma information. And with its two independently selectable audio channels, you can also edit audio without affecting video.

But perhaps the best part about the NV-9200 and the NV-9500 is what goes between them—the NV-A950 editing controller. With its five-minute memory for entry and exit points of video and audio inserts, the NV-A950 will let you perform insert and assembly edits automatically. What's more, at a complete system price of under \$10,000 you can also achieve considerable savings over comparable editing systems.

And for complete 3/4" mobility, Panasonic also offers the NV-9400 portable VCR, as well as the WV-2210 portable color camera. Both are compact, lightweight and operate on rechargeable

Panalooid™ batteries.

But the best way to be convinced about our new VCR's is to see them in action. Ask your Panasonic dealer for a demonstration. He'll show you how to get the 3/4" VCR system you want at a price you can afford. Series 9000 by Panasonic.

For more information write: Panasonic Company, Video Systems Division, One Panasonic Way, Secaucus, N.J. 07094. In Canada, contact Panasonic Video Systems Department, 40 Ronson Drive, Rexdale, Ontario M9W 1S5.

*Optional remote control for all Series 9000 decks shown below.

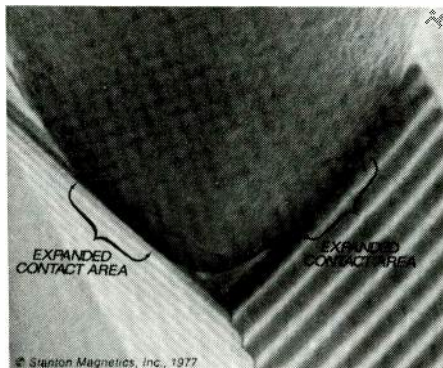
All cabinetry is simulated wood.

Panasonic®

just slightly ahead of our time.



Better stereo records are the result of better playback pick-ups



Scanning Electron Beam Microscope photo of Stereohedron Stylus, 2000 times magnification.

Enter the New Professional Calibration Standard, Stanton's 881S

The recording engineer can only produce a product as good as his ability to analyze it. Such analysis is best accomplished through the use of a playback pick-up. Hence, better records are the result of better playback pick-up. Naturally, a calibrated pick-up is essential.

There is an additional dimension to Stanton's new Professional Calibration Standard cartridges. They are designed for maximum record protection. This requires a brand new tip shape, the Stereohedron®, which was developed for not only better sound characteristics but also the gentlest possible treatment of the record groove. This cartridge possesses a revolutionary new magnet made of an exotic rare earth compound which, because of its enormous power, is far smaller than ordinary magnets.

Mike Reese of the famous Mastering Lab in Los Angeles says: "While maintaining the Calibration Standard, the 881S sets new levels for tracking and high frequency response. It's an audible improvement. We use the 881S exclusively for calibration and evaluation in our operation".

Stanton guarantees each 881S to meet the specifications within exacting limits. The most meaningful warranty possible, individual calibration test results, come packed with each unit.

For further information write to Stanton Magnetics, Terminal Drive, Plainview, New York 11803.



Circle 158 on Reader Service Card

The Source '77

GTE LENKURT INC

1105 Country Rd San Carlos CA 94070
415 591-8461
Microwave equip; remote control systems; remote pickups & STL systems; demodulators; program subcarrier equip VS

GTE SYLVANIA CATV EQUIPMENT & INSTALLATION OPERATION

114 S Oregon St El Paso TX 79901
915 544-7550
Passive devices, convertors (channel), drop line filters, power supplies, stand-by supplies, system design services

GTE SYLVANIA (LIGHTING PRODUCTS GROUP)

100 Endicott St Danvers MA 01923
617 777-1900
Studio, theatre & TV lights, accessories

GULTON INDUSTRIES INC ENGINEERED MAGNETICS DIV

13041 Cerise Ave Hawthorne CA 90250
213 679-0111
CATV standby power & amp protection systems

H

HAMLIN INTERNATIONAL CORP

126 SW 153rd St Seattle Wa 98166
206 246-9330
CATV band-pass filters; converters; passive head-end processing devices; couplers; receivers

HAMMOND INDUSTRIES

155 Michael Dr Syosset NY 11791
516 364-1900
Stereo disco mixers (Meteor); power amps (Meteor); speakers (Heco, Meteor), speaker overload protectors (Meteor); sound-to-light controllers, lighting units, light projectors (Meteor); headphones, mics (Beyer Dynamic); equalizers (Klark-Teknik); audio test unit; audio response analyzer (Ferrograph); shelving (Click Systems) VS

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; mics, turntables, arms, limiting amps; tape cartridge player/recorders; tape accessories; monitor speakers; video monitors; sync generators, waveform monitors; videotape recorder/players; phase modulation, frequency monitors; RF amps; transmission lines & accessories; remote control equip, SCA equip, services VS

See ad pg. 21

Field offices

CA Harris Corp BE/Div 10960 Wilshire Blvd Los Angeles 90024 213 477-2577
DC Harris Corp BE/Div 1522 K St NW Washington 20005 202 223-5508
NY Harris Corp BE/Div 130 E 34th St New York 10016 212 889-0790
TX Harris Corp BE/Div 4019 Richmond Ave Houston 77027 713 623-6655
PQ Gates Div Harris 212 Brunswick Blvd Pointe-Claire H9R 1A6 514 695-3751
ON Gates Div Harris 19 Lesmill Rd Don Mills M3B-2T3 85-1-716-856-5579

District managers, radio

AL W Bone 1866 Gatewood Dr Montgomery 36106 205 277-4377
CA R Stevens 10960 Wilshire Blvd Los Angeles 90024 213 477-2577
D Evans PO Box 6566 San Jose 95150 408 998-8222

FL I Raulerson PO Box 958 Macclenny 32063 904 791-0108
G Bidun 10729 Midsummer Ln Columbia 21044 301 730-4373
MO K Jones PO Box 1173 Maryland Heights 63043 314-837-0504
NE G Hassinger 1479 19th Ave Waverly 68462 402 786-2431
NC J Menefee Jr PO Box 1149 Hillsborough 27278 919 732-7980
NY R Hallenbeck 11 Ridgecrest Latham 12110 518 785-9144
H Kneller 139 Milligan Rd W Babylon 11704 516 422-0588
OH T Cook PO Box 1015 Lancaster 43130 614 687-1072
OK 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 5210 Kinglet Houston 77035 713 723-5117
WA G Lake PO Box 61524 Vancouver 98666 206 256-7455
WI R Gorjanice 3320 Ivy Lane Racine 53402 414 639-8325

District managers, television
CA W Deen PO Box 41 Morrow 30260 404 961-6099
T O'Hara 2836 E Panamint Ct Westlake Village 91360 805 497-8325
IL V Russell 710 E Cherry Ln Arlington Heights 60004 312 255-9230
MI T Schoonover 1802 Cottonwood Holt 48842 517 694-1223
MO C Patterson PO Box 14037 Kansas City 64152 816 741-9221
MD L Page 8800 Oxwell Laurel 20811 301 490-7097
NY J Preston 130 E 34th St New York 10016 212 889-0790
TX V Killion 707 Rosewood Conroe 77302 713 637-4179

HARRISON SYSTEMS

Box 22964 Nashville TN 37202
615 834-1184
Consoles, audio components VS

HARWALD CO

4700 Chase Lincolnwood IL 60646
312 677-3000
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 VS

HELWICK AUDIO

2409 23rd St Gulfport MS 39501
601 863-0304
CATV test equip

HEWLETT-PACKARD CO

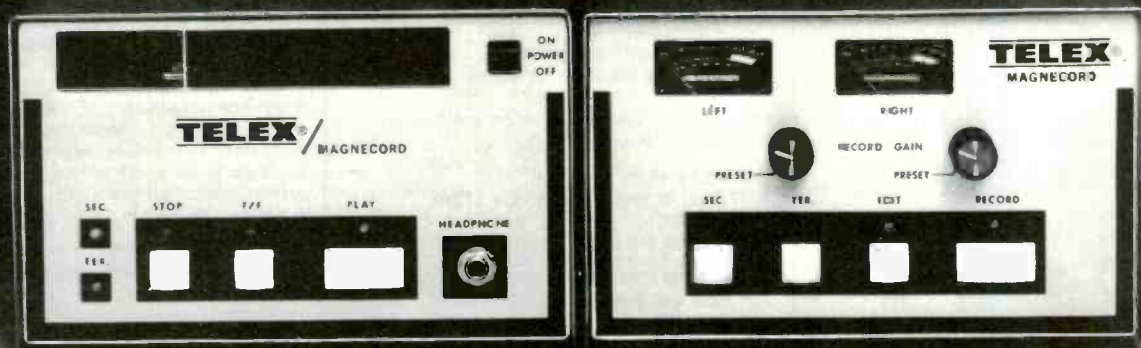
1501 Page Mill Rd Palo Alto CA 94304
415 493-1501
Oscilloscopes, frequency counters, waveform analyzers, digital multimeters, signal generators, sweep oscillators, spectrum analyzers, other test equip for broadcast and CATV; bulk erasers, automatic date acquisition systems VS

HICKOK INSTRUMENT CO

10514 DuPont Ave Cleveland OH 44108
216 541-8060
Frequency monitors & counters, generators, audio, RF, impedance bridges, voltmeters, multimeters, RF wattmeters, oscilloscopes, video test generators for servicing VS

continued on page 94

At Last, a Cart Machine that keeps its cool



Telex/Magnecord broadcast cart machines run cool and steady. So cool no ventilation is required, so steady not even voltage or frequency fluctuations will alter their speed. Thanks to our dc servo flutter-filter drive.

The MC series offers broadcasters a host of options, including field convertability from mono to stereo or play to record and, of course, end of message, secondary/tertiary cue tones.

Designed for type A or B carts, the MC

series meets all NAB specifications, offers full immunity to EMI and RFI, is remote controllable and automation compatible with CMOS digital logic. Audio muting, air damped low voltage dc solenoid and fast forward are standard features on every MC unit.

Four broadcast cart machines to choose from in the Telex/Magnecord MC series. Running cool and steady. With a pleasant surprise—they're affordable.

For detailed information please write:

PRODUCTS OF SOUND RESEARCH
TELEX[®]
COMMUNICATIONS, INC.

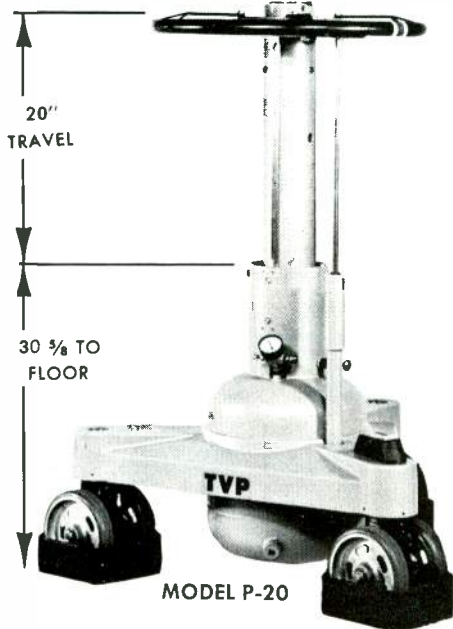
9600 ALDRICH AVE. SO. • MINNEAPOLIS, MINN. 55420 U.S.A.
Europe: 22 rue de la Legion-d'honneur, 93200 St. Denis, France
Canada: Telak Electronics, Ltd., Scarborough, Ontario

Circle 159 on Reader Service Card

CAN YOU MATCH THIS NEW TVP P-20 PEDESTAL?

**PNEUMATIC-BALANCE CAMERA
PEDESTAL WITH 20" VERTICAL
TRAVEL FROM A LOW OF 30 3/8" TO
A HIGH OF 50 3/8"**

- 15 to 300 lb. capacity — takes large camera or compacts.



- 4 1/2" camera column balanced pneumatically, with floating action — no weights or crank.
- Vernier control drag/brake on camera column
- Vertical motion controlled by steering wheel — raises or lowers with camera. Will glide through 32" doorways.
- Crab and tricycle steering with foot pedal mode selector
- 8" Resilient tired, ball bearing wheels offer easy, smooth roll
- Fully adjustable cable guards
- Weighs only 150 lbs. — Raised Base For Easy Portability
- Minimum maintenance requirements.
- Provides the same dependability, simplicity, versatility that has characterized our larger units through ten years in the three major networks without overhaul.

Made in U.S.A.

Priced under \$3000.00

Pedestals since 1952

Write or phone for complete data

Phone (213) 776-3276

Television Products Co., Inc.
9016 AVIATION BLVD., INGLEWOOD, CA 90301

Circle 160 on Reader Service Card

The Source '77

HITACHI DENSHI AMERICA LTD

58-25 Brooklyn-Queens Expy Woodside NY

11377

212 898-1261

Studio & portable color & mono video cameras; video monitors; pulse distribution amps; sync generators; special effects generator; videotape recorder/players; video cartridge recorder/players; microwave equip; semi-conductors VS

See ad pg. 65

CA Hit 21015-21023 S Figueroa St Carson 90745 213 328-2110

GA Hit 3610 Clearview Pkwy Doraville 30340 404 451-9453

IL Hit 1725 N 33 Ave Melrose Pk 60160 312 344-4020

TX Hit 14169 Proton Rd Dallas 75240 214 233-7623

CAN Hit 922 Dillingham Rd Pickering Ontario L1W 1Z6 416 839-5134

HM ELECTRONICS INC

6151 Fairmont Ave San Diego CA 92120

714 280-6050

Wireless mic systems..... VS

HOLLAND ELECTRONICS INC

970 E 92nd St Brooklyn NY 11236

212 649-7330

Modular audio systems; op amps, pre-amps; equalizers; intercom systems VS

HOLMES FRANK LABS INC

1947 First St San Fernando CA 91340

213 365-4501

Lab, filmstrip and slides

HOLLOGON OPTICAL SYSTEMS CORP

225 Park Ave S New York NY 10003

212 260-2150

Film projectors (motion pic, flickerless), film TV video transfer

HOUSTON PHOTO PRODUCTS INC

655 E 20th St Yuma AZ 85364

602 782-3677

Film processors VS

VS MEANS IT'S VERIFIED

HUGHES MICROWAVE COMM PRODUCTS

PO Box 2999 Torrance CA 90509

213 534-2146

STL & remote pickups, intercity, portable, ENG satellite grand stations, AML microwave equip VS

HUGHEY & PHILLIPS INC

3050 N California St Burbank CA 91505

213 849-1104

Tower lighting, beacons, de-icers VS

See ad pg. 163

HUNT-PIERCE CORP

230 Old Gate Lane Milford CT 06460

203 878-7491

Aerial platforms; cable handling; pulling equip

IDEAL INDUSTRIES

1780 Becker Pl 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 See ad pg. 181—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 equip, production switchers, monitors VS

See ad pg. 11—refer to rep/dist section

ILC TECHNOLOGY INC

164 Commercial St Sunnyvale CA 94086

408 738-2944

CATV tower lighting systems

IMAGE MAGNIFICATION INC

739 Airway Cir New Smyrna Beach FL 32069

904 427-5294

Large screen TV projection systems VS

IMAGE TRANSFORM INC

4142 Lankershim Blvd N Hollywood CA 91602

213 985-7566

Videotape film transfers, scene by scene video correction, chroma keying/matting, standards conversions

INDUSTRIAL AUDIO/VIDEO INC

2617 Bissonnet Houston TX 77005

713 524-1956

See ad pg. 00

INDUSTRIAL ELECTRIC REELS INC

10102 F St Omaha NE 68127

402 339-9300

Cable reels & collector rings

INDUSTRIAL SCIENCES INC (ISI)

3521 SW 42 Ave PO 1495 Gainesville FL 32602

800 874-7590

Chroma keyers, processing amps, pulse and distribution amps; audio distribution amp production switchers; routing switchers; sync generators; VIRS generators; spec effects generators; colorizers; automatic telecine light control; signal equalization system; intercom (Farrtronics) VS

See ad pg. 152—refer to rep/dist section

INNOVATIVE TELEVISION EQUIP

Box 681 Woodland Hills CA 91364

213 888-9421

Heads for TV cameras, pedestals, stands; remote control mounts VS

INOVONICS INC

1630 Dell Ave Campbell CA 95008

408 374-8300

Audio limiters, audio optimizer; multiband audio processor; noise suppressor; solid state replacements for tube-type recorder electronics VS

See ad pg. 108

INSTRUMENT LABORATORIES CORP

350 N Eric Dr Palatine IL 62067

312 358-8850

Test equip; cable locators; fault finders

INTECH LAB

4175 Veterans Hwy Ronkonkoma NY 11776

516 858-6574

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

INTERNATIONAL AUDIO INC

2934 Malmo Dr Arlington Heights IL 60005

312 956-6030

Audio tape duplicators VS

INTERNATIONAL INSTRUMENTS DIV SIGMA

INSTRUMENT INC

88 Marsh Hill Road Orange CT 06477

203 795-4711

Analog, VU & peak indicators, voltmeters, DB meters VS

INTERNATIONAL MICROWAVE CORP

33 River Road Cos Cob CT 06807

203 661-6277

Microwave equip; STL & remote pickups, intercity, portable, ENG VS

See ad pg. 106

INTERNATIONAL NUCLEAR CORP

608 Norris Ave Nashville TN 37204

615 254-3365

Chroma keyers; video processing amps; video switchers; routing switchers, pulse distribution amps, burst phase corrector, audio distribution amp, line equalizer amp

continued on page 96



the FUJINON WIDE-GUY with E.B.C.*

TOTAL COVERAGE for the average to small size studio. Our "wide-guy" will give you wall to wall coverage without putting your back to the wall.

P10 x 15 RW-2 f/2.8 If you light your studio for f/4 to f/5.6 you'll never need to use the full speed of this remarkable lens.

59°23' HORIZONTAL PICTURE ANGLE that makes a small studio look like Carnegie Hall. You'll cover an entire choral group or dance troupe.

13" CLOSE FOCUSING This is the only studio lens that allows such close focusing without

attachments or losing full zooming capability.

***E.B.C. (Electron Beam Coating)** This most advanced coating method provides high modulation and contrast, plus excellent transmission with extraordinary flare control. We invite you to compare it to any lens.

R10 x 11 RW-2 f/2.1 This lens is the brother of the "wide-guy" for 1 inch plumbicons. (There is no studio lens wider or closer focusing for 1" plumbicon cameras.)



FUJINON

FUJINON OPTICAL INC.,

672 WHITE PLAINS ROAD, SCARSDALE, NEW YORK 10583
18248 INDEX ST., NORTHRIDGE, CALIFORNIA 91326

914-472-9800
213-360-0206

Circle 164 on Reader Service Card

The Source '77

INTERNATIONAL RECTIFIER CORP
233 Kansas St El Segundo CA 90245
213 322-3331

High power cartridge rectifiers columns; solid state tube replacements **VS**

INTERNATIONAL TAPETRONICS CORP
2425 S Main St Bloomington IL 61701
309 828-1381

Tape cartridge equip; reel-to-reel; multi-cart machines, audio recorder/players **VS**
See ads pgs. 16,178

INTERNATIONAL VIDEO CORPORATION (IVC)
990 Almanor Ave Sunnyvale CA 94086
408 738-3900

Video color cameras; color encoders; helical, segmented-helical videotape recorder/players **VS**

IONIC INDUSTRIES INC

128 James St Morristown NJ 07960
201 539-1040

Music synthesizers, sound effects **VS**

IRISH ELECTRONIC ENTERPRISES INC
270 Newtown Rd Plainview NY 11803
516 293-5582

Videotape **VS**

ITI ELECTRONICS INC

369 Lexington Ave Clifton NJ 07015
201 546-3900

CCTV video leveler; audio amps and processing equip **VS**

ITT CANNON ELECTRIC

666 E Dyer Rd Santa Ana CA 92702
714 557-4700

CATV connectors and plugs **VS**

VS means it's verified

ITT JENNINGS 970 McLaughlin Ave San Jose CA 95122
408 292-4025

Coaxial switchers, variable vacuum capacitors; RF voltmeters; vacuum relays, coaxial relays & switchers **VS**

ITT SUPRENANT

172 Sterling St Clinton MA 01510
617 365-6331

CATV wire, cable

J

J&D ELECTRONICS DIV J&D INTERNATIONAL
402 S Main St Williamstown NJ 08094
609 629-1224

Production switchers **VS**

J&D INTERNATIONAL INC

Suite 624 Lewis Tower Bldg Philadelphia PA 19102
215 922-5633

Monitor, distribution amps; chroma keyers, processing amps, pulse & distribution amps, video production switchers, black burst generators, special effects generators, colorizer, equalizer

JACOBSEN MFG CO SOD MASTER DIV

3456 Washington Ave N Minneapolis MN 55412
612 529-9566

Vibratory plows for cable burial **VS**

JAMES B. LANSING SOUND INC (JBL)

8500 Lansing Blvd Northridge CA 91329
213 893-8411

Audio amps (line, pre-amps, monitor, power, public address); speakers **VS**

See ad pg. 7—Call factory for nearest distributor

JAMIESON FILM COMPANY

6911 Forest Park Rd Dallas TX 75235
214 350-1283

Color film processors; film processor accessories **VS**

JAMPRO ANTENNA CO

6939 Power Inn Rd Sacramento CA 95828
916 383-1177

AM, FM, TV antennas; antenna accessories; towers **VS**

THE JANSON INDUSTRIES

1200 Garfield Ave SW Canton OH 44706
216 455-7029

Lighting equip heads, stands & fixtures, manual dimmer controls; scenery, seamless materials; facility turnkey installations **VS**

JAVELIN ELECTRONICS

6357 Arizona Circle Los Angeles CA 90045
213 641-4490

Camera lenses & accessories, picture monitors, production switcher, helical videotape recorder/players

JEFFERSON DATA SYSTEMS

Executive Plaza 501 Archdale Dr Charlotte NC 28208
704 374-3631

Business data systems for radio & TV **VS**

JERROLD ELECTRONICS CORP

PO Box 487 Byberry Rd & PA turnpike Hatboro PA 19040
215 674-4800

Cable trunk, distribution & line extender amps; 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 amps; transmission line end connectors

continued on page 98

Split Second Time Machine

The Telex/Magnecord 1400 recorder. Split second timing with a grid of 524 lines passing a quartz crystal control reference each capstan revolution. This senses, and corrects the speed of the DC servo drive some 4000 times per second*. Speed stability is so accurate the National Weather and the Environmental Satellite Services selected Telex/Magnecord 1400's over all others to record meteorological display data.

Of course, broadcasters also favor the 1400 for the rugged stability of the die cast main frame, DTL logic and exceptionally clean electronics. Compare our speed, specs, and price. We invite you to make a split second decision.

*At 7½ ips, adjustable ± 1% to compensate for tape thicknesses and mechanical wear.

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 162 on Reader Service Card

Cohu's 1550 Series

Telecine System

Now with **AUTO-GAMMA BALANCE**

Just because Cohu Telecines have looked the same outside since we first introduced our Model 1500, don't let that fool you. Inside where it counts, they have been continually updated each year to incorporate new design improvements to keep pace with changing technology and needs of the broadcaster.

Here are just a few of the major design improvements that have been incorporated in Cohu Telecines:

1974
INSTANT PAINT

1975
AUTO BALANCE

1976
COLOR COMP

1977
**AUTOMATIC
DIFFERENTIAL GAMMA
BALANCE SYSTEM**

Contact a Cohu Sales Engineer at any office listed below and let him tell you personally why the Cohu 1550 is the best telecine available.

SEE US AT SMPTE BOOTH 29-30

**You expect
more from Cohu
...and you get it.**

SALES OFFICES

NORTHEAST Florham Park, NJ 201-377-6636 • **WASHINGTON, DC** 301-656-3061 • **SOUTHEAST** Orlando, FL 305-896-4891; Huntsville, AL 205-881-6220; Greensboro, NC 919-273-191E • **PENNSYLVANIA** Wayne 215-688-7325 • **GREAT LAKES** Sterling Heights, MI 313-739-5444 • **TEXAS** Houston 713-488-0817; Richardson 214-235-4643 • **ROCKY MOUNTAIN** Denver, CO 303-623-6447 • **NORTHWEST** Seattle, WA 206-363-8600
CALIFORNIA San Diego 714-278-8931; Anaheim 714-772-5211; Palo Alto 415-326-0280 • **COHU Factory** 714-277-6700

Circle 163 on Reader Service Card

COHU
INC.
ELECTRONICS DIVISION
SAN DIEGO, CALIFORNIA

The Source '77

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
SCA equip; power amps, amp modules;
antennas VS

VS means that BM/E has reviewed this manufacturer's supporting literature

JRF CO
PO Box 833 Sparta NJ 07871
201 827-4855
Stereo power amps VS

JVC INDUSTRIES INC
58-75 Queens Midtown Expy 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, mics VS
See ad pg. 67-70
CA JVC 1011 W Artesia Blvd Compton
90220 213 537-8230
IL JVC 3012 Malmo Dr Arlington Hts
60005 312 593-8997

K

K&H PRODUCTS LTD
PO Box 246 N Bennington VT 05257
802 442-9118
ENG camera mounting braces, dollies, ENG equip
carts, shipping cases VS
See ad pg. 127

KAHN COMMUNICATIONS INC
74 N Main St Freeport NY 11520
516 379-8800
AM stereo exciter, passive equalizers and filters

KAITRONICS CORP
870 Mahler Rd Burlingame CA 94010
415 697-9102
SMPT E time code equip, tape evaluators VS
See ad pg. 173

KALART VICTOR CORP
Hultenius St Plainville CT 06062
203 747-1663
Large screen TV projectors; TV image enhancer;
optical multiplexer; TV film chain; 16mm movie
projector, film editing equip, accessories VS

KALLMAN ASSOCIATES INC
2525 Hyperion Ave Los Angeles CA 90027
213 660-4900
Alpha-numeric character generators

**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

KANSAS STATE NETWORK INC
833 N Main St Wichita KS 67203
316 265-5631
Time base correctors; character generators;
information systems for CATV

KAPCO ENTERPRISES INC
947 Janesville Ave Fort Atkinson WI 53538
414 563-8441
Pulse and distribution amps; subcarrier; small
production switches; sync, black burst, generator
systems; spec effect generator for CCTV VS

KAPPA NETWORKS INC
165 Roosevelt Ave Carteret NJ 07008
201 541-1600
Delay lines, networks

KAREX INC
1262 Lawrence Station Rd Sunnyvale CA 94086
408 734-3341
Videotape

KAY ELEMETRICS CORP
12 Maple Ave Pine Brook NJ 07058
201 227-2000
CATV test instruments; spectrum analyzers; rotary
attenuators, slide attenuators; RF generators

KAY INDUSTRIES INC
604 N Hill St South Bend IN 46617
219 234-0171

Rotary phase converters (single phase to three
phase)

KLEIN TOOLS INC
7200 McCormick Rd Chicago IL 60645
312 588-6820
Hand tools; safety equip for CATV VS

KLIEGL BROS INC
32-32 48th Ave Long Island City NY 11101
212 786-7474
Lighting hardware, fixtures, heads, stands;
automatic dimmer controls; patch terminals, plugs
& connectors VS

KLINE IRON & STEEL CO
PO Box 1013 Columbia SC 29202
803 779-7080
Towers, tower hardware & construction equip,
tower lighting

KNOX LTD
1601 Industrial Dr Gaithersberg MD 20760
301 840-1930
Graphic art and character generators VS
See ad pg. 158—refer to rep/dist section

KMS ELECTRONICS
13733 Glenoaks Blvd Sylmar CA 91342
213 362-2566
Portable battery-operated audio mixers for film &
TV

KOLLMORGEN CORP PHOTO RESEARCH DIV
3000 N Hollywood Way Burbank CA 91505
213 843-6100
Exposure meters, color temperature meters VS

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; speakers VS

KREONITE INC
PO Box 2099 Wichita KA 67201
316 263-1111
Film lab and graphics studio design and turnkey
installations; film processors

**KTI MICROELECTRONICS DIV OF BEI
ELECTRONICS**
PO Box 1222 Campbell CA 95008
408 371-5880
Filters for telephone signals

continued on page 100



SYSTEM D STUDIO COMPACT

The Master Wood Carver uses tools of the finest steel. The Industrial Model Maker uses the best machine tools. Rembrandt was fussy about his paint brushes. Micro-Trak's 'D Systems' are the tools of the trade for today's audio and news production professionals. Whether your installation is live air, or building money-making spots, Micro Trak has a 'D System' to give you knife edge performance.

Contact your local Micro-Trak dealer or call our Marketing Department at (413) 536-3551.

MICRO-TRAK CORPORATION
620 RACE ST., HOLYOKE, MASSACHUSETTS 01040



SYSTEM D NEWSDESK



Still manually monitoring VITS?



NEW • mi 2914A
• Tighter Specs
STILL \$10,500
U.S. Domestic Price Only

mi has the **AUTOMATIC** answer
whether your system is **NTSC**, **PAL** or **SECAM**

Adaptable to all national VIT waveforms including NTC #7 and FCC, the **mi** 2914A Insertion Signal Analyzer has proven performance with broadcasters and common carriers throughout the world. For unattended operations the Analyzer interfaces directly with telemetry control systems. Combine the **mi** 2914A with the optional Limits Comparator, **mi** 2915, and the **mi** 2917 Data Selector for a complete monitoring, measuring and alarm system. You can control or print out at a local or remote terminal, and, our print-out is now available in

English, French or American. As a stand alone unit, the **mi** automatic VITS Analyzer replaces Waveform Monitors, Vectorscopes, Color Gain and Delay test sets and Random Noise Measuring sets. Even the most complex VITS measurement is performed at the push of a button and the result displayed with digital accuracy on the front panel meter.

So if you are still manually monitoring VITS . . . we have the immediate solution . . . contact **mi** today for the new **mi** 2914A specifications.

mi **MARCONI INSTRUMENTS**
DIVISION OF MARCONI ELECTRONICS INC.

100 Stonhurst Court, Northvale, New Jersey 07647 • (201) 767-7250 • TWX: 710-991-9752

Circle 165 on Reader Service Card

a permanent 2 for 1 SALE is something to really get EXCITED about . . .

particularly when we're offering two QEI Type 675 FM Exciters plus a Type 679 Switcher for just \$4,390* . . . much less than the cost of a modular exciter plus spares. Totally fail safe — in the event of exciter failure, switcher automatically transfers all functions to the other exciter in less than 5 seconds. Manual switching available as well as remote control tie-in. With proven performance in over 300 installations world-wide, the Type 675 Exciter is the one to specify for both new and replacement situations.



*F.O.B.,
Kresson, NJ



Quality-Excellence-Integrity

Find out about QEI's permanent 2 for 1 sale. While you're at it, ask for details of the most advanced, most reliable ATS now on the market. Call your QEI representative or the factory today.

CORPORATION

Route 73 Kresson, NJ 08053 (609) 767-8052

Circle 166 on Reader Service Card

The Source '77

KVC INC
770 Lexington Ave New York NY 10021
212 752-3690

Portable video camera shoulder braces; camera mounts, heads, tripods, equip rental services, video repair services, studio design

L

LAIRD TELEMEDIA INC
2125 SW Temple Salt Lake City UT 84115
801 487-6251

Character generators; telecine multiplex equip; slide projectors; time/date generators **VS**

LAMPKIN LABS INC
PO Box 9048 Bradenton FL 33506
813 792-5566

FM deviation meters; communication service monitors for mobile radio **VS**

LANDY ASSOCIATES INC
1890 E Marlton Pike Cherry Hill NJ 08003
609 424-4660

TV production equip; rental service, full line **VS**

LEAR SIEGLER INC BOGEN DIV
Box 500 Paramus NJ 07652
201 343-5700

Speakers, intercom system; audio amps (distribution, line, pre-amps, monitor, power, public address); power supplies, ALC & AGC amps, compressor/limiters AM & FM equalizers & filters (passive & active) **VS**

LEBOW LABS INC
424 Cambridge Allston MA 02134
617 782-0600

Radio and TV studio design and installation

LECTROTECH INC.
5810 N Western Ave Chicago IL 60659
312 769-6262

Frequency monitors & counters, RF generators, oscilloscopes, vectorscopes, waveform monitors & analyzers

LEITCH VIDEO LTD UNIT
46 705 Progress Ave Scarborough Ontario M1H 2X1
416 438-5060

Video synchronizing and timing systems, sync gens, video pulse and proc amps; pulse assignment switchers; video test equip **VS**

LENCO ELECTRONICS
300 N Maryland St Jackson MO 63755
314 243-3147

Color encoders, processing amps; pulse distribution amps; sync generators; black burst generators; video presence detector; changeover switch; helical genlock; video noise meters, test generators; CATV test equip; equip rental service video camera (mono) **VS**

See ad pg. 33
TX L Caput 13620 Littlecrest Dr Dallas 75234 214 241-0976

LENZAR OPTICS CORP
210 Brant Rd Lake Pk FL 33403
305 844-0263
Camera lenses

LEXICON INC
60 Turner St Waltham MA 02154
617 891-6790

Audio digital delay system; variable speed tape recorder; speech compressor/expander **VS**

LIGHTNING ELIMINATION ASSOC
12412 Benedict Ave Downey CA 90212
213 923-1268

Dissipation array system; transient and surge eliminators; warning lights **VS**

FIDELIPAC® Accessories and 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 \$ 15.10
MR-200 \$156.55

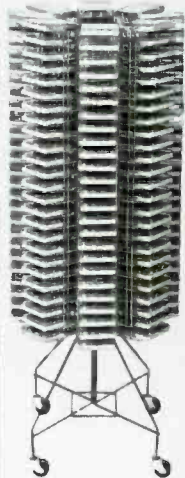
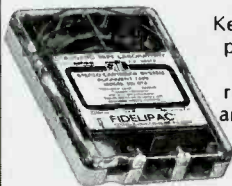


TABLE TOP CARTRIDGE RACK (not shown)

Model TR-96 holds 96 Type A cartridges.
Model TR-48 holds 48.

TR-96 \$73.85
TR-48 \$42.55



ALIGNMENT PROBLEM?

Keep your cart equipment in perfect working order with:

- 350STA Alignment Cartridge \$38.50
- 350STF Vow and Flutter Cartridge \$23.40
- 350STQ Cue Test Cartridge \$35.00
- Head Insertion Gage \$3.35
- Height Gage \$17.85
- Right Angle Zenith Gage \$21.75



CART-E-RASE DEMAGNETIZER

Can be used for erasing cartridges, reel-to-reel tape, film sound striping, etc. \$39.95



STUDIO ON AIR LIGHT

Brilliant red lettering on jet black background can be seen in the brightest ambient light conditions. \$29.95



Contact your Fidelipac Distributor or

FIDELIPAC®

109 Gaither Drive · Mt. Laurel, NJ 08057 · (609) 235-3511

® Trademark

Circle 260 on Reader Service Card

LINDSAY SPECIALTY PRODUCTS INC
 50 Mary St W Lindsay Ontario K9V 4S7
 705 324-2196

CATV headend antennas; cable connectors; trunk & distribution amps; distribution accessories **VS**

LINES AUDIO-VIDEO SYSTEMS

219 S Jefferson Springfield MO 65806
 417 862-5533
 Small video switcher/fader

LIPSNER-SMITH CORP

4700 Chase Lincolnwood IL 60646
 312 675-8473
 Film cleaners

LISTEC TELEVISION EQUIPMENT CORP

39 Cain Dr Plainview NY 11803
 516 694-8963

Video camera heads, pedestals, tripods, dollies (Vinten and TVP); audio consoles (Richmond); video signal gen (System Video Ltd); video delay line (BAL); prompting systems (Autocue) **VS**

LOGITEK ELECTRONIC SYSTEMS

PO Box 25304 Houston TX 77005
 713 523-7878

RF remote control system, EBS two tone systems amps consoles, monitor; mono, stereo **VS**

THE LONDON CO

811 Sharon Dr Cleveland OH 44145
 216 871-8900

AM and FM modulation meters, signal generators, automatic distortion analyzers, chart recorders (Radiometer, Copenhagen) **VS**

LONG ENGINEERING CO

961 Burke St Winston Salem NC 27101
 919 729-2306

Radio & TV studio design, facility turnkey installation; custom mixers and consoles (Deltronix); amp modules, transformers (Deltronix); intercom systems (Deltronix) **VS**

LOWEL-LIGHT MANUFACTURING INC

421 W 54th St New York NY 10019
 212 245-6744

TV studio & location lights; light stands, light accessories

LPB INC

520 Lincoln Highway Frazer PA 19355
 215 644-1123

Stereo and mono consoles; modular studio furniture; turntables; audio distribution amp; compressor/limiter; LED peak level indicator; low power FM transmitter; carrier current system **VS**

See ad pg. 127—refer to rep/dist section

CA Richard W. Burden 20944 Sherman Way
 Canoga Park 91303..... 213 340-4590
 CAN MSC Electronics 254 Wildcat Rd Downsview
 Ontario M3J 2N5..... 416 661-4180

LRC ELECTRONICS INC

901 South Ave Horseheads NY 14845
 607 739-3844

Cable TV connectors; CATV distribution passives; cable tools & accessories; RF connectors **VS**

L-W INTERNATIONAL

6416 Variel Ave Woodland Hills CA 91367
 213 348-8614

TV film chain projectors (flickerless) **VS**
 See ad pg. 150

L-W PHOTO INC

15451 Cabrito Rd Van Nuys CA 91406
 213 348-8614

16mm film chain projectors

M

VS means that BM/E has reviewed this manufacturer's supporting literature

3M CO MAGNETIC AUDIO/VIDEO PRODUCTS DIV

3M Center Bldg 223-5N St Paul MN 55101
 612 733-1662

Full line of recording tape for audio & video, magnetic film **VS**
 See ad pgs. 34-35

3M CO MINCOM DIV

3M Center Bldg 223-5E St Paul MN 55101
 612 733-7603

Video character generators, data/time generators, titling and graphics systems, random access disc memory; video production switchers, VI bridging switcher; sync generators; distribution amps; processing amps; helical drop out compensator; video encoder **VS**

See ad pg. 75—refer to rep/dist section

CA Mincom 688 Wasatch Dr Fremont
 94536..... 415 791-8344
 IL Mincom 6723 Meadow Dr Crystal Lake
 60014..... 615 455-0202
 MD Mincom 15932 Shady Grove Rd
 Gaithersburg 20760..... 301 948-0460

MACKENZIE LABS INC

5507 Peck Road Arcadia CA 91006
 213 579-0440

Single-, dual-, multiple tape-, cartridge player/recorders; film projectors (motion pic, slide); automatic light dimmer control

MAGNASYNC/MOVIOLA CORP

5539 Riverton Ave N Hollywood CA 91601
 213 877-2791

Film editing equip; field & studio tape recorders
 See ad pg. 119

MAGNA-TECH ELECTRONIC CO INC

630 Ninth Ave New York NY 10036
 212 586-7240

Magnetic film recorder/players; synchronizers for magnetic film recorders & motion picture film equip; telecine projectors; digital counters

continued on page 102

Since you're already aware of RCA quality, it makes sense to find out how to buy these famous microphones.

How? Easily. By mail or phone. There's no need to settle for less.

In ribbon microphones, our polydirectional 77DX is virtually the symbol of broadcasting. From sub-to super-audibility, the 77DX delivers smooth response from 30 to 20,000 Hz. The cardioid ribbon BK-5 is the ideal directional subminiature offering excellent speech balance. The subminiature BK-12 dynamic microphone is ideal for tv talk shows. The slim BK-14 and BK-16 are omni cartridge types with 40 to 20,000 Hz response. BK-14 includes a wind screen and integral "pop" resistance.

Order yours with this coupon. Or call Ray Potts or Dude Dudenbostel at RCA (A/C 609) 963-8000, Ext. PC-3115 or PC-2089.



RCA Broadcast Systems, Radio Products
 Building 2-5, Camden, NJ 08102

Dear RCA: Here's my check for RCA microphones. Prices include shipment. (In NJ, add 5% sales tax, other states where applicable.)

Name _____ Title _____

Station _____ Address _____

City _____ State _____ ZIP _____

Please send (quantity):

_____ 77DX @ \$425.00 ea.
 _____ BK-5 @ \$330.00 ea.
 _____ BK-12 @ \$150.00 ea.
 _____ BK-14 @ \$125.00 ea.
 _____ BK-16 @ \$120.00 ea.

Please send literature only.
 Send details on servicing my present RCA microphones

The Source '77

MAGNAVOX CO CATV DIV

133 W Seneca St Manlius NY 13104
315 682-9105

CATV trunk & distribution amps, distribution passives, connectors, terminals, accessories, convertors

VS

MAGNAVOX VIDEO SYSTEMS

1700 Magnavox Way Ft Wayne IN 46804
219 482-4411

Studio & portable video color cameras; video monitors, educational TV receivers

MAGNECRAFT ELECTRIC CO

5575 N Lynch Chicago IL 60630
313 282-5500

Coaxial and RF switches/relays

VS

VS MEANS IT'S VERIFIED

MAGNUM TOWERS INC

PO Box 419 Fair Oaks CA 95670
916 985-7727

Tower & antenna supports; portable equip, RF cables, antennas, tower, transmission lines

VS

MARCONI ELECTRONICS INC

100 Stonehurst Court Northvale NJ 07647
201 767-7250

TV cameras; telecines; switchers; transmitters; audio consoles; intercoms; video pulse & distribution amps

VS

See ad pg. 81—refer to rep/dist section

MARCONI INSTRUMENTS DIV

100 Stonehurst Ct Northvale NJ 07647
201 767-7250

Modulation monitors; TV sideband analyzers, spectrum analyzers, video test generators; automatic TV monitors, digital synchronizers, noise

test sets; sweep generators; other TV test gear; frequency counters; audio & RF signal generators; distortion meters

VS

See ad pg. 119—refer to rep/dist section

MARCO VIDEO SYSTEMS INC

6114 N 20th St Philadelphia PA 19138
215 849-9500

Video routing switchers

VS

MARTI ELECTRONICS INC

PO Box 661 Cleburne TX 76031
817 645-9163

Remote pick-up & aural STL equip; audio amps; remote control telemetry & automatic digital transmitter logging equip; RF amps; SCA equip; FM transmitter; audio line amps; audio compressor/limiters

VS

See ad pg. 156

MATSUSHITA

See Panasonic

MATTHEY PRINTED PRODUCTS LTD

See Television Equipment Associates

MAXELL CORPORATION OF AMERICA

130 W Commercial Ave Moonachie NJ 07074
201 933-4200

Audio tape, helical video tape

VS

McBEE LABORATORIES

5151 Wisconsin Ave NW Washington DC 20016
202 244-2345

Automatic digital logger, digital remote control equip

McCURDY RADIO INDUSTRIES

1711 Carmen Dr Elk Grove Village IL 60007
312 640-7077

Audio consoles; audio distribution, line & preamps; audio controls & attenuators; audio processing units; intercom systems; patch panels; turntables, pickup arms; telephone coupling equip, monitor speakers; racks; cabinets, console assemblies; audio tape cartridges; complete studio

installations

VS

See ad pg. Cov 3—refer to rep/dist section

NJ McCurdy 223 W Saddle River Rd Saddle River 07458..... 201 327-0750

NY McCurdy 1051 Clinton St Buffalo NY 14206..... 716 854-6700

MCG ELECTRONICS INC

160 Brook Ave Deer Park NY 11729
516 586-5125

Surge protectors

VS

McGRAW-EDISON CO EDISON ELECTRONICS DIV

PO Box 96 Temple TX 76501
817 773-3901

Audio line amps, audio attenuators & potentiometers; intercom systems; RF attenuators; field calibration meters, IM distortion meters; RF watt meters; AF & RF signal generators; audio level meters

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 ads pgs. 26-27—refer to rep/dist section

McKAY DYMEK

PO Box 2100 Pomona CA 91766
714 623-1236

High fidelity AM receiver, shielded loop antenna, audio monitors

McMARTIN INDUSTRIES INC

4500 S 76th Omaha NE 68127
402 331-2000

Audio & TV consoles; audio mixers; line amps; audio limiters; PA amps; turntables; arms, intercom systems; RF amps; AM & FM transmitters; exciters; remote control equip; remote pickup & STL; SCA equip; FM antennas; antenna monitors;

Since you're already aware of RCA quality, it makes sense to find out what's inside this custom audio console.



RCA Broadcast Systems
Radio Station Equipment Product Management
Building 2-5, Camden, N.J. 08102

Dear RCA: Okay, I'm ready to put everything I want into an audio console except lots of money. Send my BC-50 workbook immediately.

Have your representative call.

Name _____

Title _____ Station _____

Address _____

City _____

State _____ Zip _____

I'm interested in:

RCA assembled console Assemble-it-myself console

RCA Broadcast Systems

What's inside is what you want inside. After all, the RCA BC-50 is a custom console. But at an off-the-shelf price, because of our unique interconnecting Unimodules.

Each Unimodule has 5 inputs, not 2 or 3. Unimodules can function as input mixers, submaster mixers or echo send/return level controls. Input facilities are almost unlimited. And BC-50 provides a wide range of outputs—mono, stereo, even quad or multi-channel—all with easy expansion. In a configuration you design.

We'll build your BC-50 for surprisingly little. Or you can assemble it for even less.

To design one, just ask your RCA Representative for our 20-page workbook. It has complete BC-50 specs and work sheets. If you prefer, send the coupon.

frequency monitors; signal generators; modulation monitors; EBS two-tone equip **VS**
See ad pg. 163—refer to rep/dist section
 AK T Butler PO Box 119 Limestone 72646 501 428-5257
 AL H Lang 1406 W 47th Ave Anchorage 99503 907 279-5741
 CA K Blake 5589 Carte Sonora Pleasanton 94556 415 846-9000
 CA B Switzer 9025 Maza Circle Fountain Vly 92708 714 842-8422
 FL R Henry 1 Key Capri Apt 609E Treasure Is 33706 813 360-9402
 HA Pacific Media Consultant 1001 Dillingham Blvd Suite 207A Honolulu 96817 808 841-4021
 IL J Tollefson 914 S Lynn Champaign 61820 217 356-5436
 NY J Grey 4 F Underhill Rd Middletown 10940 914 342-5113
 TX D Jones 2608 Mollimar Planc 75074 214 423-9540
 VA P Timple 10405 Hunt Country Ln Vienna 22180 703 938-9120
 WA J Schneider PO Box 6278 Bellevue 98007 206 641-6161
 WI D Kelly 1967 Orrie Lane Grean Bay 54304 414 497-1193

MEMOREX CORP
 1200 Memorex Dr Santa Clara CA 95052
 408 987-1169
 Audiotape; audiotape accessories; videotape for all video record formats; videotape accessories **VS**
MERLIN ENGINEERING WORKS
 1880 Embar Cadero Palo Alto CA 94303
 415 329-0198
 Rebuilt VTR machines, high band color systems, air systems, TBCs, VTR tape timers
MERRILL CABLE EQUIP (MCE) CORP
 PO Box 13741 2949 W Usborn Phoenix AZ 85017
 602 271-9181
 Trunk, distribution, line extenders, connectors, filter, trap, passive, addressable tap head processors, news service, test equip CATV, maintenance **VS**

MICMIX AUDIO PRODUCTS INC
 2995 Ladybird Ln Dallas TX 75220
 214 352-3811
 Reverberation units **VS**
See ad pg. 126—refer to rep/dist section

MICRO COMMUNICATIONS INC
 RFD 3 Grenier Field Manchester NH 03103
 603 624-4351
 RF transmitting/receiving equip, diplexers, ENG microwave equip waveguides, remote control systems, RF filters, RF loads, FM and TV antennas, transmission lines and components **VS**

MICRO CONSULTANTS INC
 PO Box 10057 Palo Alto CA 94303
 415 321-0832
 Dropout compensators, standards converters, framestone synchronizers, time base correctors, repositioners, compressors, A/D converters, digital effects systems **VS**

MICRO CONTROL ASSOCIATES
 PO Box 13250 Arlington TX 76013
 817 265-2912
 STL, remote control and SCA subcarrier equip

MICROFLECT 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**

MICROPROBE ELECTRONICS INC
 Suite 1532A 875 N Michigan Ave Chicago IL 60611
 312 440-3111
 Automatic sequencers, complete automation systems **VS**

MICROTIME INC
 1280 Blue Hills Ave Bloomfield CT 06002
 203 242-0761

Time base correctors; velocity error correctors, automation video control equip, image enhancers, skew correctors **VS**
See ad pg. 121—refer to rep/dist section
 CA J Harris 10760 Minette Dr Cupertino 95014 408 446-4418
 FL F Dubs 9771 NW 24th Ct Sunrise 33322 305 741-9191
 MN W Baird 637 Aldrich Ave S Minneapolis 55423 612 861-6228

MICRO-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. 98—refer to rep/dist section

MICROTRAN CO INC
 145 E Mneola Ave Valley Stream NY 11582
 516 561-6050
 Bulk tape erasers; tape spot erasers; head and tape degaussers, telephone pick-up coils **VS**

MICROVISION SYSTEMS
 800 No El Camion Real #2 San Mateo CA 94401
 415 348-1344
 Videotape editor controller **VS**

MICROWAVE ASSOC INC
 63 Third Ave Burlington MA 01803
 617 272 3100
 Microwave TV equip for STL; spurs; intercity, ENG systems; air-to-ground microwave TV relay systems, antennas
See ad pg. 87—refer to rep/dist section

CA MA 850A Stewart Dr Sunnyvale 94086 206 232-3550
 GA MA 14 Perimeter Pk Atlanta 30341 404 455-3815
 MA MA South Ave Burlington 01803 617 272-3000
 MO MA Ambassador I Suite 119 Ambassador Dr Kansas City 64153 816 891-8895
 TX MA 13771 N Central Expy Dallas 75243 214 234-3522

continued on page 104

Since you're already aware of RCA quality, it makes sense to find out what's inside this AM Superphase transmitter.

"Superphase," our unique extra modulation capability, provides full 125% positive peak modulation economically without overload. The result is today's loud sound, with low distortion, and frequency response from 30 to 15,000 Hz. It's the closest thing yet to FM sound in AM radio.

Our Superphase 5 KW and 10 KW transmitters are all solid state below the IPA stage, and use only two tube types. No costly modulation transformer, no chancy carrier-peak amplifiers. Two Superphases make an ideal alternate-main or parallel system.

Your RCA transmitter will be backed by technical assistance at every stage of specifying, installation and changeover. And by 24-hour RCA parts service. For the facts, send the coupon.

RCA
 RCA Broadcast Systems
 Radio Station Equipment Product Management:
 Building 2-5, Camden, New Jersey 08102
 Dear RCA:
 Yes, I'd like to learn all about what's inside your AM Superphase transmitters. Please send literature immediately.
 Have a representative call.
 Name _____
 Title _____ Station _____
 Address _____
 City _____
 State _____ Zip _____
 I'm interested in
 5 kw AM transmitter, Type BTA-5L2
 10 kw AM transmitter, Type BTA-10L2
RCA Broadcast Systems

MICROWAVE ASSOCIATES INC (LAND MOBILE COMMUNICATIONS DIV)

850 A Stewart Dr Sunnyvale CA 94086
408 736-9330

UHF/VHF transmitter combiners, receiver combiners, isolators, circulators; RF filters, loads, terminations, power meter panels

MICROWAVE POWER DEVICES INC

Adams Court Plainview NY 11803
516 433-1400

Microwave power amps; RF amps; FM, TV transmitters

VS

MID-STATE COMMUNICATIONS INC

174 S First St Beech Grove IN 46107
317 787-9426

Frequency measurement equip; signal level meters; installer's meters

MILLER-STEPHENSON CHEMICAL CO INC

PO Box 628 Danbury CT 06810
203 743-4447

Degreaser, head cleaner; contact cleaner

MINNEAPOLIS MAGNETICS INC

8125 Pleasant Ave South Minneapolis MN 55420

612 884-7393

Magnetic tape recorder heads; replacements for leading recorder brands

MINOLTA CORP

101 William Dr Ramsey NJ 07446
201 825-4000

TV crt color analyzer; light measurement equip; color temperature meter, lenses, photo equipment

MODULAR AUDIO PRODUCTS INC

50 Orville Dr Bohemia NY 11716
516 567-9620

Modular audio components; modular line amps, equalizers, compressor/limiters; pre-amps; power supplies, etc

VS

See ad pg 181—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

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

MOOG MUSIC INC

2500 Walden Cheektowaga NY 14225
312 675-2000

Music synthesizers

CHARLES MOORE

PO Box 2023 Rocky Mount NC 27801
919 442-1284

Audio amps (distribution, line, pre-amps, op-amp models), monitor amps; consoles, mixers, mono, stereo, audio for TV, video pulse & distribution amps

VS

MOSELEY ASSOCIATES INC

111 Castilian Dr Goleta CA 93017
805 968-9621

ALC and AGC amps, 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. 85

MOUNTAIN WEST ALARM

4215 N 16th St 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 Ln Silver Spring MD 20910
301 587-6087

RF amps; RF attenuators & multicouplers; band-pass filters

VS

MULTIPLIER INDUSTRIES CORP

464 S 10th Ave Mt Vernon NY 10550
914 699-0990

Vehicle (aerial bucket), lineman safety equip, surge suppressors, batteries

VS

MULTI-TRACK MAGNETICS INC

1 Ruckman Rd Closter NJ 07624
201 768-5037

Equip 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

MXR PROFESSIONAL PRODUCTS GROUPS

277 N Gordon St Rochester NY 14607
716 412-5320

Digital delay system with special effects; graphic equalizers, compampdor

VS

Since you're already aware of RCA quality, it makes sense to find out what's inside this FM transmitter.

We believe you'll be impressed.

Because RCA quality can be seen as well as heard. Our high power 5/10/20 and 40 kW Tetrode Transmitters are full of conservatively rated components for longer life. Exclusive linear power adjust of the IPA and PA make for low distortion at all power levels. Other features such as VSWR and under-power protection, filament adjust and extensive metering—all standard.

The low power 3/5 kW grounded grid transmitters are simple to operate and include many of the features found in the higher power units, such as vacuum capacitors, a large H.V. transformer, circuit-breakers, to minimize maintenance and down time.

Of course, all RCA FM transmitters are backed by 24-hour service on technical advice and parts distribution system that's a credit to the RCA name.

And if the RCA name means long-term quality to you, an RCA FM transmitter will confirm it. Send the coupon, today.



RCA Corporation
Radio Station Equipment Product Management
Building 2-5, Camden, New Jersey 08102

Dear RCA:
I'd like to find out what's inside this FM Transmitter. Send me complete details immediately.

Have your representative call.

Name _____

Title _____ Station _____

Address _____

City _____

State _____ Zip _____

I'm interested in:

3 kW BTF-3E1 FM transmitters

5 kW BTF-5E2 FM transmitters

5, 10, or 20 kW "expandable" FM transmitter systems

40 kW BTF-40E1 "Powerhouse" FM transmitters

RCA Broadcast Systems

**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,
hand-held mixers; lavalier mics, tape reels, tape
timers VS

NAGY RESEARCH PRODUCTS
PO Box 289 Mclean VA 22101
703 356-3963
Splicing blocks

NAKAMICHI RESEARCH (USA) INC
220 Westbury Ave Carle Place NY 11514
516 333-5440
Audio pre-amps, power amps, stereo pickups,
headphones, mics, speakers, cassette tape, head
degaussers, audio cassette recorder/players VS

NASCO TELEVISION SYSTEMS
901 Janesville Ave Ft 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 amps

NATIONWIDE ELECTRONIC SYSTEMS INC
1536 Brandy Parkway Streamwood IL 60103
312 289-8820

Automation equip, sequencers, controllers,
memory units, auto loggers, complete systems;
telephone coupling equip; VU meters; STL &
remote pickups. SCA equip; time systems,
frequency monitors and counters, voltmeters,
multimeters, phase meters, status and alarm
indicators VS

NEC AMERICA INC BROADCAST EQUIP DIV
130 Martin Lane Elk Grove Village IL 60007
312 593-8750
TV cameras, portable, color, mono; frame & field
synchronizers; time base correctors (full line),
videotape recorder/players, helical; video cassette
player/recorders; digital & video effects system;
transmitters, AM, FM, & TV VS
See ad pg. 132—refer to rep/dist section

NEFF ELECTRONICS INC
11511 Maryland Ave Beltsville MD 20705
301 937-4776
Audio amps; 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,
rewinder; film storage equip VS

NEVE RUPERT INC
Berkshire Ind Park Bethel CT 06801
203 744-6230
Full line audio consoles, audio amps, disc cutting
systems VS

**NORTH AMERICAN PHILIPS CORP—See AKG
DIV & PHILIPS AUDIO VIDEO SYSTEMS**

NORTH AMERICAN TURBINE CORP
PO Box 40510 11500 Charles St Houston TX
77040
713 466-6200
Emergency power supplies

NORTHEAST BROADCAST LAB INC
Box 1176 15 Charles St S Glens Falls NY 12801
518 793-2181
Radio facility turnkey installations VS

NORTH HILLS ELECTRONICS INC
Alexander Pl Glen Cove NY 11542
516 671-5700
Telephone coupling, RF amps, RF attenuators, RF
filters, hum bucking coils, RF inductors,
transformers VS

NORTRONICS CO INC RECORDER CARE DIV
8101 Tenth Ave N Minneapolis MN 55428
612 545-0401
Magnetic tape recorder heads; tape erasers; tape
editors; test tapes; recorder care accessories for
audio & video machines; VTR head cleaners VS

NORVER CO INC
7300 N Crescent Blvd Pennsauken NJ 08110
609 665-2020
SCA receiver VS

NOVA CORP
Box 2121 Canoga Park CA 91306
213 888-5122
Videotape cleaner attachment for VTR; audio
record assy for VR-1200/2000 VS

NTI AMERICA INC
1680 N Vine St Suite 202 Los Angeles CA 90028
213 462-8945
Digital signal generators for color & mono video;
color time coder VS
See ad pg. 176—refer to rep/dist section

NURAD INC
2165 Druid Park Dr Baltimore MD 21211
301 462-1700
Quad polarized antennas for remote-TV
broadcasts; helical ENG antenna, microwave
equip, satellite earth stations, transmission line and
connectors VS
See ad pg. 109—refer to rep/dist section
continued on page 106

**Since you're
already aware of
RCA quality,
it makes sense
to find out
what's inside this
Audio Processing
System.**

Behind those dials and light-emitting diodes is the reason for RCA quality: RCA technology. And it's pretty impressive. The system shown here, for example, is our BA-145AGC amplifier and the BA-146/147 Limiter. All tops in AM, FM and TV Audio Control. Both have our unique Program Modulated Release (PMR) with automatic reset—for the latest approach to fast attack, with inaudible AGC or limiting action. And with RCA, fast limiting without a "thump" is certain—our non-temperature sensitive insulated-gate field-effect transistor (IG/FET) controlling element simply designs the thump out. Of course, there's plenty more to see in an RCA audio processing system. And you're backed by RCA technical service, and RCA parts distribution, all the way. Send the coupon, today.

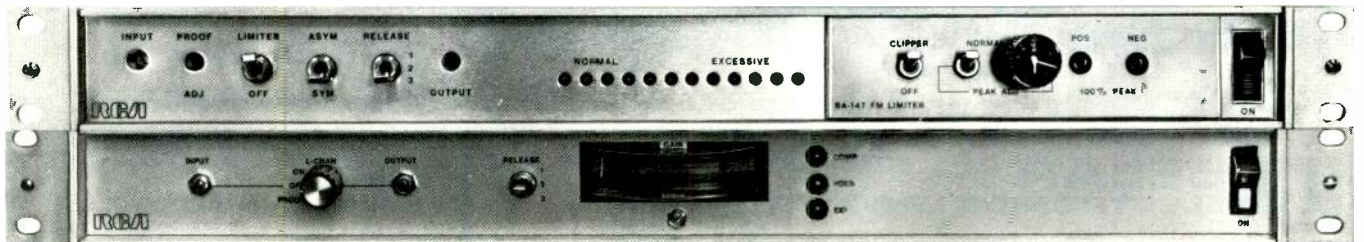
RCA Broadcast Systems
Radio Station Equipment Product Management, Building 2-5, Camden, N.J. 08102

Dear RCA: Okay. Tell me more about what's inside your audio processing systems. Send literature immediately. Have your representative call.

Name _____
Title _____ Station _____
Address _____
City _____ State _____ Zip _____

I'm interested in:
 BA-145 AGC Amplifier for AM, FM, or TV BA-146 Limiter for AM
 BA-147 Limiting Amplifier for FM or TV (use 2 for stereo)

RCA Broadcast Systems



The Source '77

O

OAK INDUSTRIES INC CATV DIV
Crystal Lake IL 60014
815 459-5000
Converters; pay-TV devices; CATV amps VS

OAK INDUSTRIES INC SWITCHER DIV
Crystal Lake IL 60014
815 459-5000
Rotary and push button switchers VS

O'CONNOR ENGINEERING LABS INC
100 Kalmus Dr Costa Mesa CA 92626
714 979-3993
Camera tripods and heads

ODETICS
1859 S Manchester Ave Anaheim CA 92802
714 750-2111
Time elapse VTR

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
Hinsdale Olean NY 14760
716 372-0700
Vulcanized fiber & wood covered case for audio & video equip; film shipping

OLESEN
1535 Ivar Ave Hollywood Ca 90028
213 461-4631
Lighting hardware, lighting equip, filters, dimmer controls; fabrics, cycloramas; rental service VS

ONAN DIV ONAN CORP
1400 73rd Ave NE Minneapolis MN 55432
612 574-5000
Emergency stand-by power generators

OPAMP LABS INC
1033 N Sycamore Ave Los Angeles CA 90036
213 934-3566
Full line production consoles; portable mixers; operational amps, audio components; basic amp kits VS

OPTEK
5526 E La Palma Ave Anaheim CA 92807
714 528-2321
Bulk erasers, demodulators, head degaussers VS

OPTIMA ENCLOSURES DIV SCIENTIFIC-ATLANTA
2166 Mountain Industrial Blvd Tucker GA 30084
404 939-6340
Racks, equip enclosures VS

ORANGE COUNTY ELECTRONICS CORP LTD
1125 Empress St Winnipeg Manitoba R3E 3H1
204 775-8151
Monitor amps and speakers, audio switchers, audio processors, pre-amps, equalizers and filters VS

ORBAN ASSOCIATES
459 Bryant St San Francisco CA 94107
415 957-1067
Compressor/limiters/filters, FM & AM, equalizers & filters (active), reverb units, stereo synthesizer, sibilance controller VS

ORBAN/BROADCAST
459 Bryant St San Francisco CA 94113
415 957-1063
FM modulation controller
See ad pg. 111—refer to rep/dist section

VS MEANS IT'S VERIFIED

ORBAN/PARASOUND
680 Beach St Suite 411 San Francisco CA 94109
415 673-4544
Equalizers & filters-active, special effects, reverb units VS
See ad pg. 148—refer to rep/dist section

OREGON MAGNETICS
PO Box 13374 Portland OR 97213
503 233-9295
V-lock adaptor for helical scan VTRs

OTARI CORPORATION
981 Industrial Rd San Carlos 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

PACKAGED LIGHTING SERVICES INC
PO Box 285 Walden NY 12586
914 778-3515
Lamps, lighting hardware & accessories, dimmer controls, kits, Lucite floors VS

PACIFIC RECORDERS & ENGINEERING CORP
1110 Roselle St San Diego CA 92121
619 453-3255
Headphone, mic amps; audio switcher; compressor/limiter; digital timing systems; custom audio consoles; preamps; line & distribution amps VS
See ad pg. 125

PAKO CORP
6300 Olson Memorial Hwy Minneapolis MN 55410
612 540-6300
Film processors VS

PALMER (WA) FILMS INC
611 Howard St San Francisco CA 94105
415 986-5961
Motion picture film projectors; color TV film recorders, video/film transfers and lab services VS

PANASONIC VIDEO SYSTEMS
One Panasonic Way Secaucus NJ 07094
201 348-7000
Complete line of cameras color and mono (portable and studio); videotape recorders; tape duplicators; studio equip including telecines; audio recorders/players, amps, turntables VS
See ad pgs. 90-91—refer to rep/dist section

CA	Newcraft 8383 Wilshire Blvd 90211	213 655-1111
GA	Pan #2 Meca Way Duluth 30136	404 448-5683
IL	Pan 1098 Greenleaf Ave Elk Grove 60007	312 593-0710
NJ	Pan 50 Meadowlands Pkwy Secaucus 07094	201 348-7620
TX	Pan 1825 Walnut Hill Ln Irving 75062	214 256-1388

PANDUIT CORP
17301 Ridgeland Ave Tinley Park IL 60477
312 532-1800
Nylon cable ties, accessories; plastic wiring duct; terminals

PAPERWORK SYSTEMS INC
2000 "A" St PO Box 38 Bellingham WA 98225
206 733-8510
Automated business systems for radio and TV VS

PEIRCE-PHELPS INC
2000 N 59 St Philadelphia PA 19131
215 879-1717
TV studio design; information systems VS

PENTAGON INDUSTRIES INC
4751 N Olcott Chicago IL 60656
312 867-9200
High-speed tape duplicators VS

continued on page 108

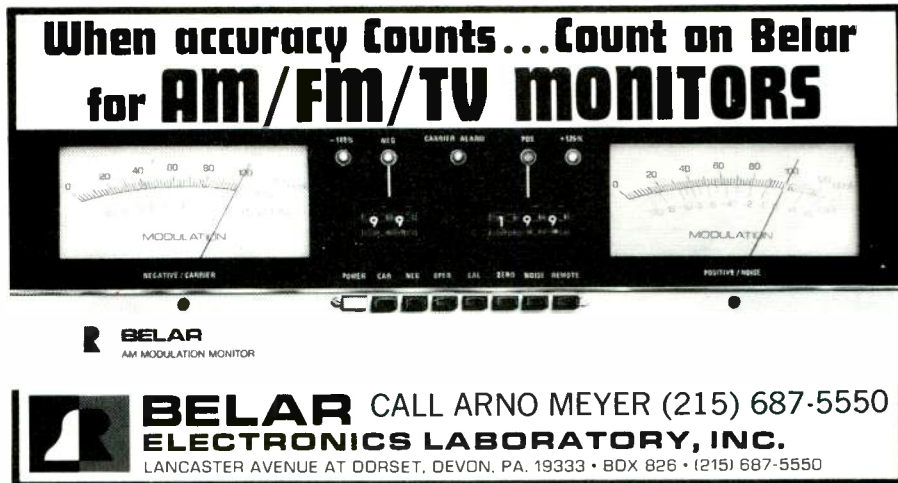


ALL SOLID STATE PORTABLE MICROWAVE SYSTEM
SELF CONTAINED IN TWO IDENTICAL BATTERY/AC POWERED UNITS

INTERNATIONAL MICROWAVE CORP.
33 River Road, COS COB, CT. 06807
(203) 661-7655 TWX: 710-579-2925

Circle 167 on Reader Service Card

When accuracy Counts... Count on Belar for AM/FM/TV MONITORS

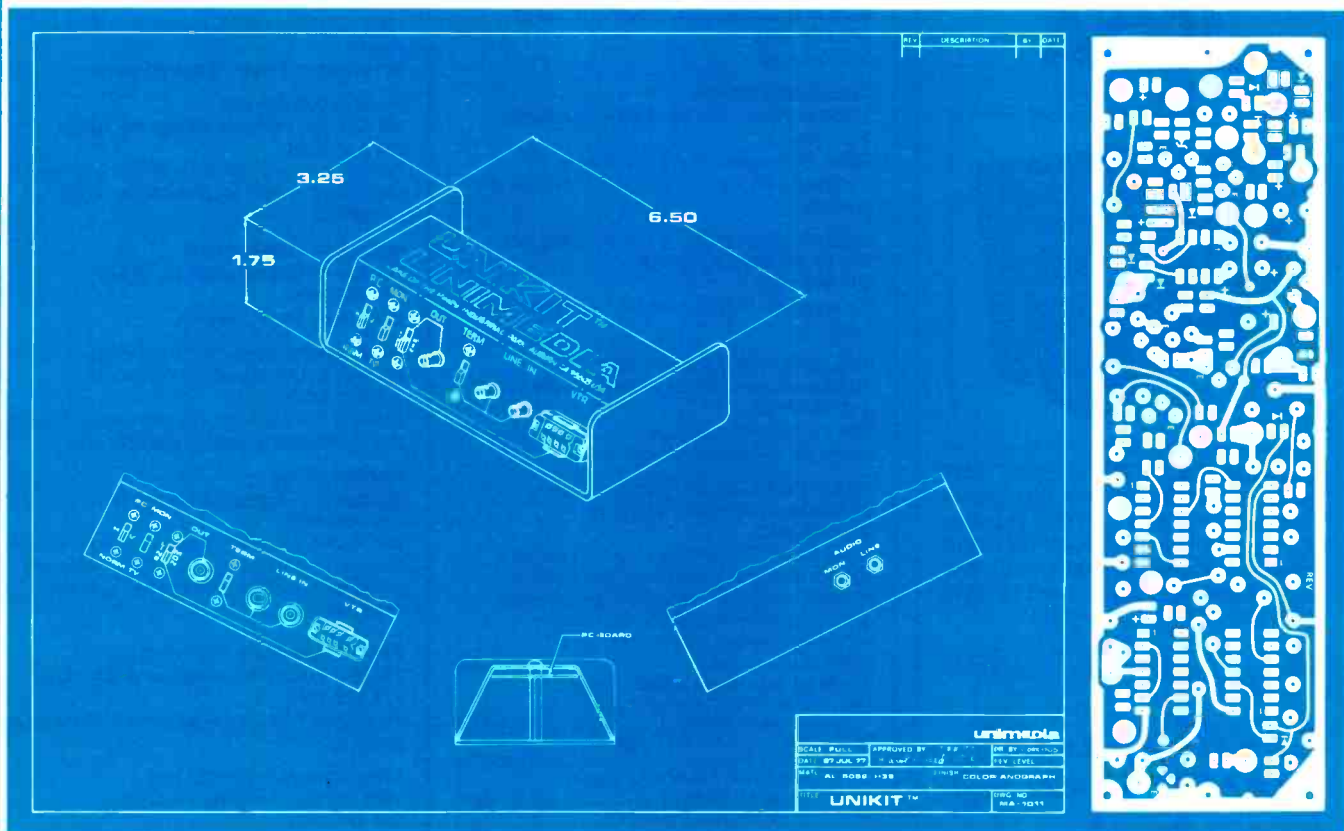


BELAR
AM MODULATION MONITOR

BELAR CALL ARNO MEYER (215) 687-5550
ELECTRONICS LABORATORY, INC.
LANCASTER AVENUE AT DDRSET, DEVON, PA. 19333 • BOX 826 • (215) 687-5550

Circle 168 on Reader Service Card

Announcing THE UNIKIT™*



A MONEY-SAVING IDEA FROM UNIMEDIA !

- SELECTABLE INPUTS-LINE-VTR-TV
- TV VIDEO AND AUDIO OUTPUTS
- 8 PIN VTR CONNECTOR
- COMPATABLE WITH NTSC, PAL, AND SECAM
- PULSE CROSS WITH AUTO BRIGHT-UP (BINARY PULSE CROSS SELECTION)
- POWER LINE ISOLATION 120/240V; 50/60Hz
- LATEST STATE-OF-THE-ART "MOS" CIRCUITRY

The Unimedia Unikit mounts easily on all present production Sony receivers including the new SONY AC/DC KV-8000.

Illustrated step-by-step instructions make installation simple and fast.

Booklet includes receiver/monitor performance optimization procedures.

SONY RECEIVER	UNIKIT
KV-800G	UMK-8
KV-1204G/KV-1204AG	UMK-12
KV-1512G	UMK-15
KV-1711DG/KV-1712DG	UMK-17
KV-1910DG/KV-1920DG/KV-1921DG	UMK-19
KV-2101G	UMK-21

ACCESSORIES	PRICE
YOKE MOUNT KIT (Specify Sony Model #)	\$49.95
RACK MOUNT KIT (12" Only)	\$29.95

All Unimedia Unikits \$225.00 F.O.B. Auburn, California
Other kits upon request: write or phone for details.

The popular Unimedia UMT Series monitor/receiver is now being built by Unimedia with Unikits.

*Patent Pending

unimedia
unimedia
unimedia
unimedia

22525 KINGSTON LANE, AUBURN, CA 95603 (916) 878-1250 (916) 272-1971

IMAGINATIVE IDEAS, SYSTEMS AND PRODUCTS FOR THE WORLD OF AUDIOVISUAL COMMUNICATIONS

Circle 169 on Reader Service Card

QUALITY TALKS FOR KOA

Denver, Colorado



Continental's 317C is the best measure for any 50 kW AM transmitter purchase. Performance, 125% positive modulation and reserve power capabilities are unbeatable. Today's best sound in 50 kW AM is Continental.

Write for brochure: Continental Electronics Mfg. Co. Box 270879 Dallas, Texas 75227 (214) 381-7161

Continental Electronics

Circle 170 on Reader Service Card

The Source '77

PERMADYNE ELECTRONICS CORP
2929 N Southport Ave Chicago IL 60667
312 525-5559
SCA receiver

PHASECOM CORP
13130 S Yukon Ave Hawthorne CA 90250
213 973-4191
Cable TV headend signal processors; RF modulators & demodulators; CATV information systems VS

PHELPS DODGE COMMUNICATIONS CO
Rte 79 Marlboro NJ 07746
201 462-1880
FM antennas; transmission lines; RF filters, coaxial cable

PHILADELPHIA RESINS CORP
20 Commerce Dr Montgomeryville PA 18936
215 855-8450
Non-metallic antenna guys VS
See ad pg. 154—refer to rep/dist section

PHILIPS BROADCAST EQUIP CORP
91 McKee Dr Mahwah NJ 07430
201 529-3800
Audio for TV; TV cameras, studio & portable; camera lenses & accessories; film telecine systems, production switchers, special effect generators, videotape recorders/players, segmented-helical, helical cassette; TV transmitters, exciters VS

See ad pg. 83—refer to rep/dist section

CA	PBEC 3760 Cahuenga Blvd. N Hollywood 91604.....	213 766-8185
GA	PBEC 3300 NE Expy Suite 1G Atlanta 30341.....	404 458-0171
IL	PBEC 7530 Frontage Rd Norelco House Skokie 60076.....	312 679-8600
NM	PBEC 801 Branding Iron SE Albuquerque 87123.....	505 299-0583
TX	PBEC 412 Roy Ct Keller 76248.....	817 379-5484

VS MEANS IT'S VERIFIED

PHILIPS ELECTRONICS LTD AKG DIV
200 Consumers Rd # 105 Willowdale Ontario M2J 4R4
416 449-1453
Audio amps (distribution line, monitor, power, public address); compressor/limiters, AM & FM, equalizers & filters (active, passive), reverb unit; full line audio consoles; disc playing equip; pickups, stereo turnable pre-amps & controls, complete disc consoles; mics (dynamic condenser, electret, shotgun, lavalier, accessories); speakers VS

PHILIPS TEST & MEASURING INSTRUMENTS INC
85 McKee Dr Mahwah NJ 07430
201 529-3800
Color encoders; sync generators; color video; signal & pattern generators; pulse generators; video level meter; decoder; monitor calibrator; RF generators; modulator; frequency counters; audio generators; video test equip; multi-meters oscilloscopes VS
See ad pg. 39—refer to rep/dist section

PLASTIC REEL CORP OF AMERICA
640 S Commercial Ave Carlstadt NJ 07072
201 933-9125
Reels for video & audio tape, carrying cases VS

POLYLINE CORP
1241 Rand Rd Des Plaines IL 60016
312 298-5300
Plastic reels

PORTA-PATTERN TELECOMMUNICATIONS INDUSTRIES LTD
6335 Homewood Ave Suite 204 Los Angeles CA 90028
213 461-3561
Test materials, video test charts & slides VS

POTOMAC INSTRUMENTS INC
932 Philadelphia Ave Silver Spring MD 20910
301 589-2662

Antenna monitors; field strength meters antenna impedance bridges; video & RF jack panels; intermodulation meters harmonic distortion meters VS
See ads pg. 133—refer to rep/dist section

POWER-OPTICS INC
PO Box 266 Fairview Village PA 19409
215 539-5300
Remote control systems for TV camera mounts; scene sync system for chroma key; color comparator

PRECISE POWER CORP
PO Box 1905 Bradenton FL 33506
813 792-5900
Emergency power systems

PREFORMED LINE PRODUCTS CO
PO Box 91129 Cleveland OH 44101
216 461-5200
Antenna tower accessories; preformed metal & plastic deadends, lashing, guywires, etc VS

PRODELIN INC
PO Box 131 Hightstown NJ 08520
609 448-2800
VHF & UHF antennas; flexible & rigid transmission line; transmission line connectors; microwave antennas, reflectors, waveguides; satellite antennas

PROGRAMMABLE SYSTEMS INC
13130 S Yukon Ave Hawthorne CA 90250
213 973-4275
Automated video player systems; CATV cassette player systems VS

PROJECTION SYSTEMS INC
1005 Clifton Ave Clifton NJ 07013
201 473-0180
TV projection systems (Amphicon)

PULSE TECHNIQUES INC
1411 Palisade Ave Teaneck NJ 07666
201 837-2525
Equalizers & filters VS

PWH ELECTRONICS LTD
637 College St Toronto Ontario M6G 1B6
416 533-6331
Remote control systems; digital master clock system, status & alarm indicator; auto equip; controllers, computer/microprocessors, read out/display, data input devices, tone generator, complete systems VS

PYRAMID INDUSTRIES INC
PO Box 23169 Phoenix AZ 85063
602 269-6431
Coaxial cable; cable connectors

Q

Q-E MANUFACTURING CO
New Berlin PA 17855
717 966-1017
Cable stringing blocks & aerial construction tools for coaxial cable

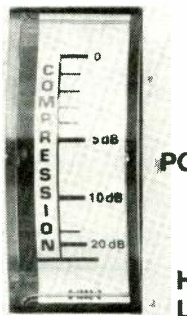
QEI CORP
Rte 73 Kresson NJ 08053
609 767-8052
Audio processors; RF transmitting TV AM & FM monitoring equip, exciters, stereo generators, SCA generators; STL systems, ATS systems, AM & FM monitors, stereo monitors, AM & FM RF amps; VHF TV monitor, AM/FM/stereo peak maximizers, stereo average maximizers VS
See ad pg. 100

QRK ELECTRONIC PRODUCTS (DIV OF CCA)
1568 N Sierra Vista Fresno CA 93703
209 251-4213
Studio turntables; pre-amps VS

continued on page 110

Turn on a better idea

Eight independent, individually adjustable bands of average compression. Increase average carrier modulation; contain program peaks without clipping. For AM and FM.



AND 7

BAND 8

7.5 - 20 kHz

Inovonics' Multiband Audio Processor

Model 230 - \$1500

Inovonics Inc.

503-B Vandell Way
Campbell, CA 95008
(408) 374-8300

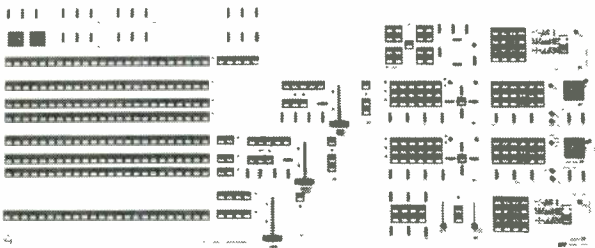


SEE US AT NRBA BOOTH #95



Central Dynamics. International pacesetter in television broadcast equipment.

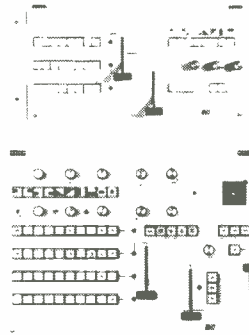
Video switchers.



New, Super Powerful CD 480 The Smart Switcher

Revolutionary modular switchers with unprecedented production power. They outperform the largest conventional switchers, yet are extremely simple to operate. Their power and ease of operation are due to CDL's new Sequential Effects (SFX) Amplifier, which can cut, mix or wipe between two Background Sources and two separate Key Sources either individually or in any combination. Models with one or two SFX Amplifiers provide all the standard and optional features you need, including Rotary & Random wipes, RGB Shadow keys, Hard and Soft Color Border wipes, Color Border keys, Quad with Color Borders, Encoded Chroma keying, Key Mask generator, and 16, 24 or 32 inputs. A variety of modular accessories will continue to keep your switcher smarter than the rest as new technology develops.

The CD-480 is now being shipped.



VS-10

An inexpensive broadcast quality 8-input switcher that features flexibility and ease of operation. Self-contained electronics for rapid installation in ENG and other small mobiles.

VS-14

Sophisticated enough for large studio production, yet compact and inexpensive enough for small mobiles. Soft wipes and keys — even a Downstream keyer — are standard. Self-contained and remote versions available.

VSP-1260S

An amazing value

Now the smallest station can afford a conventional 20 input mix effects switcher of the highest quality and reliability.

All features, including an Encoded Chroma keyer and Bordered keys are standard (not optional, as is often the case). And the price is astonishingly affordable.

Automation.



System 100

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

Master Control Switchers

Ranging from CDL's new CD 480 MC to a 2 Bus MCS-829 or a 3 Bus MCS-770. All 3 can be interfaced to System 100 Technical Automation System.

Tape editing systems.



PEC-120

Video Tape Editor
A computer editing System with 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.



EDS-200 Video Tape Editor

A two machine Time Code microprocessor Editor that interfaces to Quad or Helical VTR's.

Also a complete line of production and TV terminal equipment, including:

- SMPTE Time Code Generators and Readers
- Video and Pulse Distribution Amplifiers
- Chroma Keyers RGB and Encoded
- Processing Amplifiers
- Audio/Video Routing Switchers
- Pulse Assignment Systems
- Machine Control Systems

Request our Short Form Catalog



CENTRAL DYNAMICS LTD

U.S.A.

Chicago
331 West Northwest Highway,
Palatine, IL 60067
Phone—312-991-4720
TWX—910 693 4805

New York City
230 Livingston Street,
Northvale, NJ 07647
Phone—201-767-1300
TWX—710 991 9753

Los Angeles
15130 Ventura Blvd.—Suite 307,
Sherman Oaks, CA 91403
Phone—213-789-0574
TWX—910 495 1713

CANADA

Montreal
147 Hymus Blvd.,
Montreal, Quebec H9R 1G1
Phone—514-697-0811
TWX—610 422 3906

Circle 171 on Reader Service Card

Bulbs, Sockets to go.

We're now national distributor of sensational new OSRAM HMI bulbs.

And still the country's biggest in-stock source of GE and Sylvania bulbs and sockets for studio, theater, tv and A/V. Now plus Leecraft sockets, too.

We specialize - we've got it all for you!

Send for 108-pg. stage/tv Lighting Handbook (50¢ mail and handling, please).

Nationwide service for over 25 years.
Same-day shipment anywhere in US.
Rush delivery in Manhattan.

(212) JUDSON 6-1620
BARBIZON ELECTRIC
426 W. 55, NYC 10019

Circle 172 on Reader Service Card

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

Circle 173 on Reader Service Card

The Source '77

QSI SYSTEMS INC

993 Watertown St W Newton MA 02165
617 969-7118

TV clock systems/calendars; timers, video/field frame counters; video source identifier; test monitoring switchers VS

Q-TV/TELESYNC

33 W 60th St New York NY 10023
212 765-4200

TV prompter systems VS

QUAD EIGHT ELECTRONICS CORP

11929 Vose St N Hollywood CA 91605
213 764-1516

Audio preamps, line & power amps, equalizers; audio controls; audio consoles & mixers; reverberation units; LED peak indicators; noise gates; audio digital delay unit; compressor; attenuators; tone oscillators; cabinets, racks

VS MEANS IT'S VERIFIED

QUANTUM AUDIO LABS

1905 Riverside Dr Glendale CA 91201
213 841-0970

Audio consoles, mixers, stereo and quad VS
See ad pg. 110—refer to rep/dist section

QUICK-SET INC

3650 Woodhead Dr Northbrook IL 60062
312 498-0700

Tripods, stands; heads, mounts; dollies for TV, ENG camera braces VS
See ad pg. 118

R

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 VS

RAMKO RESEARCH INC

11355 A Folsom Blvd Rancho Cordova CA 95670

916 631-3600
Distribution amps, preamps, mic/line amps, monitor amps; ALC & AGC amps, compressor/limiters, AM & FM; mixers, LED VU meters; controllers; cartridge & cassette loaders; consoles VS
See ads pgs. 130-131—refer to rep/dist section

RANK OPTICS TAYLOR HOBSON

260 N Rte 303 W Nyack NY 10994
914 358-4450

Film & video camera lenses, Varotol lens repair service VS

RANK PRECISION IND INC

411 E Jarvis Ave Des Plaines IL 60018
312 297-7720

Video & film camera lenses; color correctors, encoders, film telecine equip, image enhancers, Varotol lens repair service VS

RAPID-Q

See Edco Products Inc

RAVEN SCREEN CORP

124 E 124th St New York NY 10035
212 534-8408

Front & rear projection screens VS

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 Tnpk Norwood MA 02062

617 762-6700

Microwave communications equip

RCA AMERICAN COMMUNICATIONS INC

201 Centennial Ave Piscataway NJ 08854
201 885-4400

Satellite transmission services VS

RCA CORP BROADCAST SYSTEMS

Front & Cooper St Bldg 2-5 Camden NJ 08102
609 963-8000

Audio line, power, distribution amps; radio automation equip; consoles, mixers; automatic tape cartridge recorder/players, audio & video; headsets; intercom systems; mics; 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; editing systems, frame synchronizers, chroma keyers, drop-out compensators, color encoders; telecine chains; production & routing switchers, pulse distribution amps, processing amps, 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, 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 VS

See ads pgs. 101-105—refer to rep/dist section

AL	RCA 2244 Center Point Rd Suite 208 Birmingham 35223	205 854-3096
CA	RCA 330 Primrose Rd Suite 305 Burlingame 94010	415 343-2741
	RCA Suite 531 6363 Sunset Blvd Hollywood 90028	213 461-9171
CO	RCA 2695 Alcott St Suite 231-S Denver 80211	303 433-8484
FL	RCA 3900 RCA Blvd Palm Beach Gardens W Palm Beach 33410	305 622-1100
GA	RCA 3395 NE Expy RCA Bldg Atlanta 30341	404 455-3400
IL	RCA 120 W Eastman St Suite 303 Arlington Hts 60004	312 255-2202
IN	RCA 2511 East 46th St Suite Q01 Indianapolis 46205	317 546-4001
KS	RCA 5750 West 95th St Suite III Overland Park 66207	913 642-3185
MA	RCA 40 William St Wellesley Office Pk Wellesley 02181	617 237-6050
MI	RCA 24333 Southfield Rd Suite 209 Southfield 48075	313 569-5880
MN	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 5200 Park Rd Suite 125 Charlotte 28209	704 525-4870
NJ	RCA Front & Cooper Sts Bldg 2-2 Camden 08102	609 963-8000
NY	RCA 731 James St Rm 200 Syracuse 13203	315 478-4195
	RCA 1133 Ave of the Americas 3rd Flr New York 10036	212 598-5900
OH	RCA 11430 Hamilton Ave Cincinnati 45231	513 825-1550
PA	RCA 761 N Washington Rd McMurray 15317	412 941-5570
TX	RCA 3409 Executive Ctr Dr Suite 213 Austin 78731	512 345-2224
	RCA 8700 Stemmons Freeway Dallas 75247	214 638-6200
VA	RCA 1901 North Moore St Arlington 22209	703 558-4166
WA	RCA 1818 Westlake Ave N Suite 222 Seattle 98109	206 285-2375
WI	RCA Grafton State Bank Bldg Suite 403 101 Falls Rd Grafton 53204	414 377-8430

RCA/COMMUNITY TELEVISION SYSTEMS (EIE)

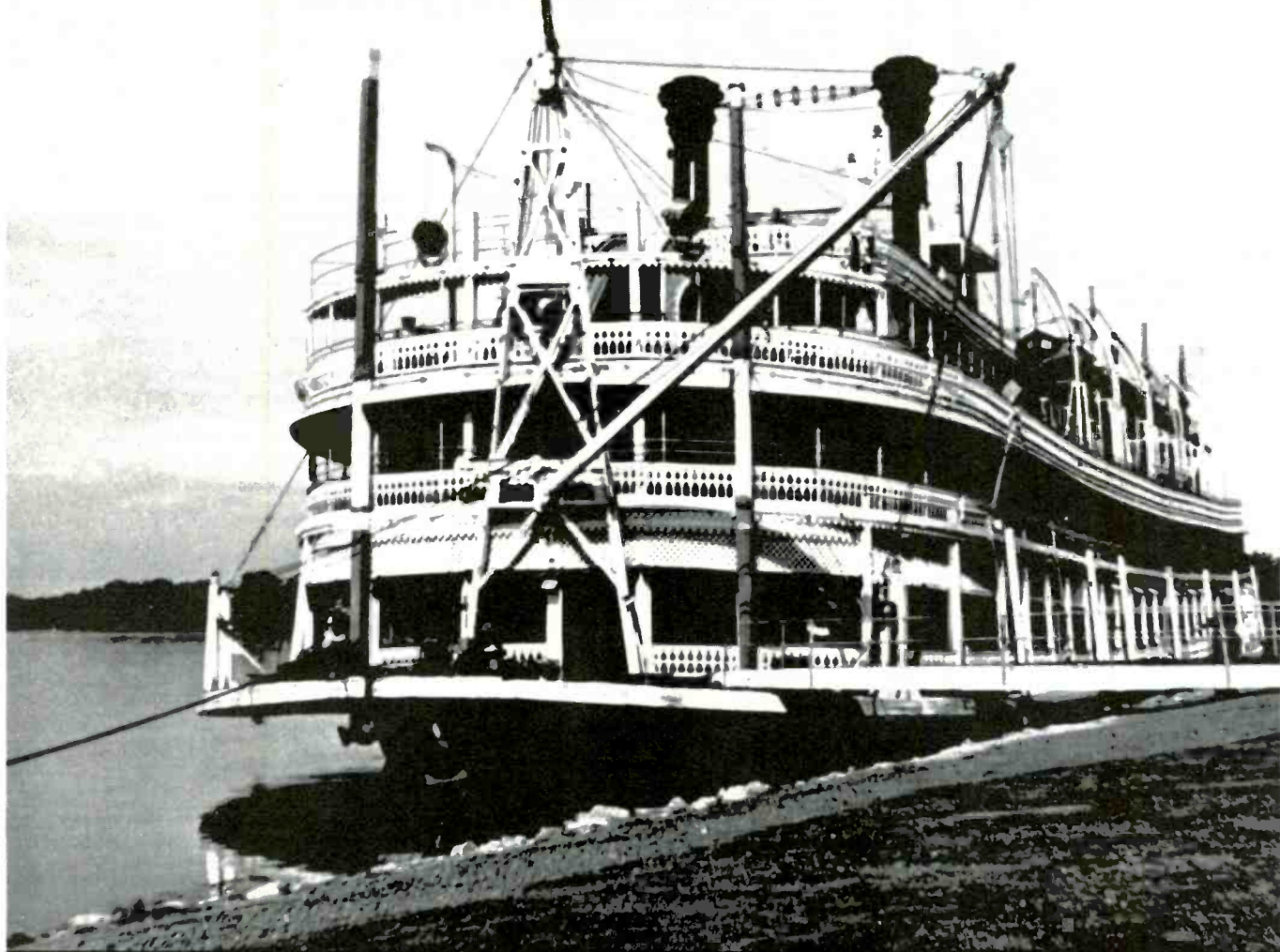
7355 Fulton Ave N Hollywood CA 91605
213 764-2411

Distribution amps, headend signal processors, modulators & demodulators; microwave for CATV

continued on page 112

WBYU WEZB WQUE WNOE WRNO WTUL WWL WYLD

New Orleans Moves Up To OPTIMOD-FM!

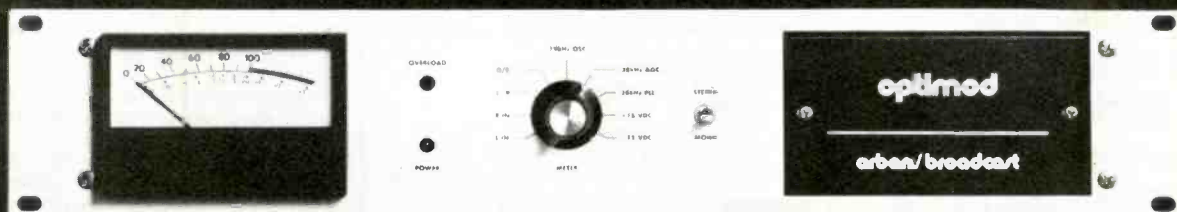


In New Orleans the FM dial is dominated by the cleaner, brighter, louder sound of OPTIMOD-FM. Eight out of nine FM's licensed to New Orleans have purchased OPTIMOD-FM. Like hundreds of other broadcasters, they recognize OPTIMOD-FM as the easy-to-install, cost effective breakthrough to better FM audio.

Call us toll-free (800)227-4066, in California (415) 441-0666, and we'll tell you how to move up to OPTIMOD-FM and put its unique advantages to work for your station.

orban / broadcast

Eric Small and Associates, Marketing and Sales Agent, 630 Beach St., San Francisco CA 94109
Orban/Broadcast products are manufactured by Orban Associates Inc., San Francisco, CA.



See us at NRBA NEW ORLEANS (Booths 15 and 16) October 9-12 and listen to OPTIMOD-FM.

Circle 174 on Reader Service Card

QUALITY TALKS FOR KWKH

Shreveport, Louisiana



Continental's 317C is the best measure for any 50 kW AM transmitter purchase. Performance, 125% positive modulation and reserve power capabilities are unbeatable. Today's best sound in 50 kW AM is Continental.

Write for brochure: Continental Electronics Mfg. Co. Box 270879 Dallas, Texas 75227 (214) 381-7161

Continental
Electronics

Circle 175 on Reader Service Card

**Finest
16mm cine
camera
ever!**

with or
without
FREZZI
side-mounted
amplifier

MADE IN U.S.A.

**"Frezzi-Flex"® FR-16
now shooting
commercials,
documentaries
& TV newsfilm
world-wide.**

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



Frezzolini Electronics Inc.
7 Valley St. Hawthorne, N.J. 07506 USA

Circle 176 on Reader Service Card

The Source '77

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

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 SERVICE CO
Dept 2615 Cherry Hill Offices Camden NJ 08101
609 779-5157
Videotape duplicating service; live & film camera installation & service, TV tape, TV antenna measurement installation & service; teleproduction system design & implementation VS
See ad pg. 128

R-COLUMBIA PRODUCT CO
2008 St Johns Ave Highland Park IL 60035
312 432-7915
Self-powered electrostatic headphones, dynamic & condenser mics VS

RECORDING SUPPLY CORP
1233 Rand Rd Des Plaines IL 60016
312 297-0955
Empty reels, magnetic tape, leader tape VS

VS MEANS IT'S VERIFIED

RECORTEC INC
777 Palomar Ave Sunnyvale CA 94086
408 735-8821
Videotape recorders, videotape evaluators; videotape conditioners; quad upgrade kits; videotape editors; tape cassettes, audio cassette duplicator, loader, feeder VS
See ads pgs. 142-147—refer to rep/dist section

REDDING RADIO
Box 344 Fairfield CT 06430
203 579-0284
Mic station identification plates; phone loop induction pickups VS

REGMO DATA CORP
6992 Oxford St Minneapolis MN 55426
612 925-3800
Time-code controlled sequencer; A/V tape head cleaner & anit-static disc spray (Kontakt Chem.) VS

REK-O-KUT
See QRT

REPCO PRODUCTS
7400 State Rd Philadelphia PA 19136
215 338-1110
CATV closures, for above & below ground VS

RE-PLAY VIDEO CARTRIDGE SERVICE
328 Merritt Ave Pittsburgh PA 15227
412 881-9172
Reloaded quad VTR cartridges VS

RESEARCH TECHNOLOGY INC
4700 Chase Lincolnwood IL 60646
312 677-3000
Tape cleaning & evaluating equip, storage, film cases, film cleaners, film editing equip, automatic 16, 35 & Super 8mm inspection equip VS

REUTERS
1700 Broadway New York NY 10019
212 582-4030
News service, stock & commodity quotations

REVOX
See Studer-Revox

REYNOLDS/LETERON CO
9830 San Fernando Rd Pacoima CA 91331
213 899-5281
TV titlers

REX RHEOSTATS CO INC
149 Babylon Tpke Roosevelt NY 11575
516 379-1030
Dummy loads to 2kW

RF SYSTEMS INC
PO Box 428 Rte 441 St Cloud FL 32769
305 892-6111
Microwave antennas, receiving antennas; RTV stations; satellite terminals

RHG ELECTRONICS LABORATORY INC
161 E Industry Court Deer Park NY 11729
516 242-1100
Microwave relay links including portable systems, RF amps

RICHMOND HILL LABORATORIES LTD
1240 Ellesmere Rd Scarborough Ontario Canada M1P 2X4
416 291-7921
Automation equip; chroma keyers; video processing amps; video production & routing switchers; pulse & distribution amps; sync generators; special effects generators

RICHMOND SOND DESIGN LTD
1234 W 6th Ave Vancouver BC V6H 1A5
604 736-7207
Audio amps, 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 equip, 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 amps, controls; ALC and AGC amps, compressor/limiters AM and FM, equalizers and filters, passive; audio consoles, tape cleaners, bulk erasers, audio connectors VS
See ad pg. 165—refer to rep/dist section

ROCKLAND SYSTEMS CORP
230 W Nyack Rd W Nyack NY 10994
914 623-6666
Equalizers/filter (active), generators, audio & RF, sideband analyzers, spectrum analyzers VS

RODELCO ELECTRONICS CORP
365A Comac Rd Deer Park NY 11729
516 643-5110
TV & FM translators

ROH CORPORATION
107 Technology Park Norcross GA 30071
404 449-0873
Audio preamps, line & power amps; audio attenuators; distribution amps, audio routing switchers (all foregoing in modular form); bridging switcher/live monitor; intercoms VS

ROHDE & SCHWARZ SALES CO (USA) INC
14 Gloria Ln 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, stereo vectorscope, monitor receivers; sideband analyzers; TV translators, video monitors (Barco); antennas, AM, FM and TV, microwave, transmission lines and connectors

continued on page 114



Belden/Lee Compact Source iodide discharge lamps with instant restrike. Doesn't exactly sound like a synonym for Scrooge. Until you discover how much they can do, for how little.

More flux for your bucks. Efficient CSI singles ask only 1,000 watts, but give you output comparable with 3-5,000 conventional watts. Or more. Drawing only 1/3-1/2 the current of any comparable daylight-corrected source. (Double unit actually delivers 5,000 fc at 20' and full spot!)

Won't waste weight (or space). Single-unit head weighs only 20 lbs.; measures just 17x13 1/2 x 12 1/2". Double unit is a mere 35 lbs.; measures 17x25x12". Cool operation and weatherproof head design lets you use them anywhere. And, you can operate them up to 500' from their compact ballast.

Pennypinching PAR's. PAR 64 CSI bulbs deliver lowest per-hour operating cost of any large-source lamp.

Value-stretching versatility. With CSI you can change patterns without relamping. Use output as-is for video. Filter up for daylight. Filter down for tungsten with 1/4-stop loss. For more information about purchase or rental, please write or call.

Exclusive U.S. Distributor:

B Belden Communications, Incorporated

25 West 45th Street, New York 10036.
(212) 730-0172.

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 178 on Reader Service Card

The Source '77

ROHN MFG DIV UNARCO IND INC

PO Box 2000 Peoria IL 61601
309 697-4400

Antenna tower builders & erectors; microwave reflectors

ROLL-A-REEL CO

PO Box 37381 Cincinnati OH 45222
513 761-8500

Cable installation tools

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

ROSS BROADCAST PRODUCTS INC

(GLETRONIX)

160 Duncan Mill Road Don Mills ON M3B 1Z5
416 444-8497

Video production switchers

RTS SYSTEMS

4167 Fair Ave No Hollywood CA 91602
213 980-0511

Audio pre-amps, intercom systems, interruptible feedback systems

VS

RUPERT NEVE INC (See NEVE)

RUSSCO ELECTRONICS MFG INC

1070 Brookhaven Dr Clovis CA 93612
209 299-2167

Compact audio consoles; mixers; audio amps; monitors; turntables; speakers

RUST CORP (See DATA LOGIC/RUST)

RYAN F B MFG CO

PO Box 451 Chariton IA 50049
515 774-5981

Underground cable plows

S

SADELCO INC

299 Park Ave Weehawken NJ 07087
201 866-0912

CATV test equip; field strength meters, calibrators

VS

SAKI MAGNETIC INC

1649 12 St Santa Monica CA 90404
213 451-8611

Audio and video magnetic tape heads, new and refurbished

See ad pg. 156

VS

SANSUI ELECTRONICS

55-11 Queens Blvd Woodside NY 11377
212 779-5300

4-channel & stereo encoder; turntables; preamps; power amps; reverb units

SANYO ELECTRIC INC

1200 W Artesia Blvd Compton CA 90220
213 537-5830

Audio tape recorders; helical VTRs, video cassette players; TV camera color & mono

SAWYER CAMERA CO

6820 Santa Monica Blvd Hollywood CA 90038
213 466-6112

Film editing equip

VS

SAWYER INDUSTRIES INC

5649 Peck Rd Arcadia CA 91006
213 442-5981

CATV stand-by power supplies; uninterruptible power supplies; surge protectors

VS

SC ELECTRONICS

530 Fifth Ave NW New Brighton MN 55112
612 633-3131

B&W and color monitors

See ad pg. 141

VS

SCALA RADIO

1970 Republic Ave San Leandro CA 94577
415 351-3792

Broadcast antennas

SCHAFFER ELECTRONICS CORP

75 Castilian Dr Goleta CA 93017
805 968-0755

Radio automation equip; multicart machines, automatic logging equip, open-reel tape machines

SCHAFFER INTERNATIONAL

5801 Soledad Mtn Rd La Jolla CA 92037
714 454-1154

SCHARFF COMMUNICATIONS

261 W 261 St Riverdale NY 10471
212 548-1439

Video & audio equip rental service

VS

SCHNEIDER CORP OF AMERICA

185 Willis Ave Mineola NY 11501
516 747-5100

Video camera lenses; motion picture camera lenses; lens accessories

VS

SCIENTIFIC-ATLANTA INC

3845 Pleasantdale Rd Atlanta GA 30340
404 449-2000

CATV TV systems; headend modulators, demodulators, signal processors; satellite ground stations; microwave antennas; transmission line, CATV trunk, distribution amps; CATV antennas; cabinets, racks

VS

SCIENTIFIC RADIO SYSTEMS INC

367 Orchard St Rochester NY 14606
716 458-3733

FM transmitters, RF receivers, comm & monitors

SCIENTIFIC SYSTEMS INC

191 Westfield Ave Clark NJ 07066
201 381-1088

Audio distribution amp

HH SCOTT INC

20 Commerce Way Woburn MA 01801
617 933-8800

Loudspeakers; digital FM tuner

SCOTT INSTRUMENTS LABORATORIES

533 Main St Acton MA 01720
617 263-3263

Sound level meters

L J SCULLY MANUFACTURING CORP

138 Hurd Ave Bridgeport CT 06604
203 368-2332

Tape deck reproducers, disc cutting equip, tape duplicators

SCULLY RECORDING INSTRUMENTS (AUDIO ELECTRONICS DIV OF DICTAPHONE CORP)

475 Ellis St Mountain View CA 94043
415 968-8389

Tape recorders/players (reel-to-reel), portable studio; playback equip for automation; time code for loggers; loggers; underground cable locators; time code generator; repair service

VS

See ad pg. 18

CA	P Flad 548 S Kingsley Dr Los Angeles 90020	213 380-7980
IL	G Nelson 3434 W Peterson Ave Chicago 60645	312 583-7878
NJ	B Hamilton 285 County Rd Tenafly 07670	201 568-4414
TN	W Shute 1005 8th Ave S Nashville 37203	615 244-1546

SEACOR INC

598 Broadway Norwood NJ 07648
201 768-6070

Capacitors, switchers

VS

SENCORE INC

3200 Sencore Dr Sioux Falls SD 57107
605 339-0100

Field intensity meters; sweep generators for VHF, UHF, FM, & chroma; field effect meters; dual-trace oscilloscopes; AM/FM stereo analyzer; power supplies; CATV test equip, voltmeters, multimeters, oscilloscopes

VS

SENNHEISER ELECTRONIC CORP
10 W 37th St New York NY 10018
212 239-0190

Mics, headsets, impedance bridges, speakers,
portable mixer VS
See ad pg. 179—refer to rep/dist section

SEQUERRA CO
143-11 Archer Ave Jamaica NY 11435
212 297-5000

Broadcast monitor; FM intensity meters,
modulation monitors VS

SESCOM INC
12931 Budlong Ave Gardena CA 90247
213 770-3510

Audio amps; audio equalizers;
compressors/limiters VS

SGL WABER ELECTRIC
300 Harvard Ave Westville NJ 08093
609 456-5400

Plugs and connectors, multiple outlet electrical
fixtures, utility carts VS

SHARP ELECTRONICS CORP
10 Keystone Place Paramus NJ 07652
201 265-5600

Headsets; tape decks; video cameras; picture
monitors; sync generators; waveform monitors;
phase shifters VS

SHIBADEN
See Hitachi Denshi

SHINTRON CO INC
144 Rogers St Cambridge MA 02142
617 491-8700

Video consoles, special effects generators, sync
generators, video & audio distribution amps,
sequential video switchers, character generators,
mic mixer, gen lock generator

SHIVELY LABS INC
Rt 302 Raymond ME 04071
207 655-3841

Broadcast antennas; transmission line; filter, RF
loads; coaxial switches, power combiners

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SHURE BROTHERS INC
222 Hartrey Ave Evanston IL 60204
312 866-2200

Mics, mic accessories; audio mixers & preamps;
feedback controllers; phono pickup cartridges;
audio level controllers; PA systems; column
speakers; audio consoles; compressor/limiters;
reverb units VS
See ad pg. 53—refer to rep/dist section

SIEGEL ELECTRONICS
PO Box 66 Ft Hamilton Sta Brooklyn NY 11209
212 836-6938

Image enhancers, proc-amps, colorizers VS

SIEMENS CORP
186 S Wood Ave Iselin NJ 08830
201 494-1000

Gas-filler surge voltage lighting protectors for cable
amps & power supplies

SIGMA ELECTRONICS INC
1830 State St E Petersburg PA 17520
717 569-2681

Video amps, pulse, distribution, subcarrier; sync &
black burst generators VS

SIMPAC INTERNATIONAL INC
5472 Kenilworth Dr Huntington Beach CA
92649

714 846-0765
Storage systems for carts VS

SIMPSON ELECTRIC CO
853 Dunbee Ave Elgin IL 60120
312 697-2260

Analog & digital voltmeters & multimeters;
oscilloscopes

continued on page 117

The Mod One Is The Flexible One

Start With The Console Format You Need Now, Expand Later.

Modular design lets you select a wide range of input modules and plug-in amplifier cards as you grow. 10 mixing positions with up to 30 inputs. Modern vertical faders; silent operating switches; state-of-the-art circuitry.

Custom features and options with off-the-shelf availability. Monaural, stereo, or quad. Meets all FCC - AM and FM standards. UREI quality, of course.

Available through your UREI dealer.



UREI "Instrumental in Audio"

8460 San Fernando Road, Sun Valley, California 91352 (213) 767-1000

Exclusive export agent: Gotham Export Corporation, New York

MICROWAVE ANTENNA SYSTEMS FOR EVERY REMOTE TV REQUIREMENT

ENG/EJ-STL'S-TSL'S-PORTABLES-MOBILE VANS



QUADS



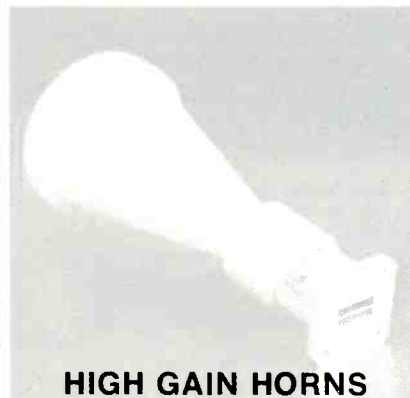
SUPERQUADS



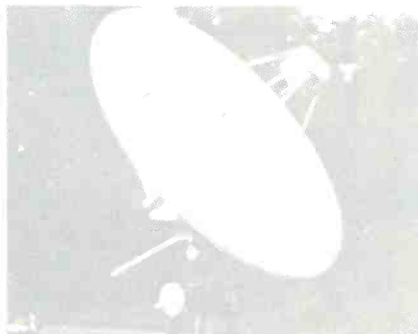
GOLDENRODS

**ANTENNAS FOR
ALL BANDS**

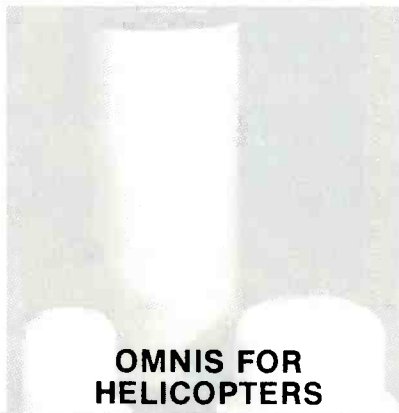
2.0 GHz
2.5 GHz
7.0 GHz
13.0 GHz
2.0 + 7.0 GHz
7.0 + 13.0 GHz



HIGH GAIN HORNS



**CIRCULARLY & QUAD
POLARIZED REFLECTORS**



**OMNIS FOR
HELICOPTERS**



DIGITAL REMOTE

1	2	3	4
5	6	7	8
9	0	A	B
C	D	EX	CL

CONTROL SYSTEMS

nURAD, inc.

2165 Druid Park Drive
Baltimore, Md. 21211

• 301-462-1700

The Source '77

SINGER EDUCATION SYSTEMS

3750 Monroe Ave Rochester NY 14603
716 586-2020
16mm TV projectors

SINGER INSTRUMENTATION

5340 Alla Rd Los Angeles CA 90066
213 822-3061
RF amps, RF attenuators, frequency monitors & counters

VS

SINGER PRODUCTS CO INC

1 World Trade Center Suite 2365 New York NY 10048
212 432-1400

Transmitters AM & FM; consoles; cart machines; turntables; reel-to-reel recorders; FM antennas

VS

SINTRONIC CORP

212 Welsh Pool Rd Lionville PA 19353
215 363-0444

AM & FM broadcast transmitters; exciters; line surge protectors, antenna monitors

VS

SITCO ANTENNA CO

10330 NE Marx St Portland OR 97220
503 253-2000

Cable TV antennas; antenna preamps; antenna towers & accessories; wired cable; connectors

SKIRPAN LIGHTING CONTROL CORP

31-39 61 St Woodside NY 11377
212 274-7222

Studio lights, light systems, solid state dimmers, light accessories

VS

VS MEANS IT'S VERIFIED

SKOTEL

PO Box 310 Station Rosemont Montreal
Quebec H1X 3B8
514 728-2285

Time code generators and readers

VS

SMITH-VICTOR CORP

Lake & Colfax St Griffith IN 46319
219 838-6136

Lighting systems, heads, stands, fixtures, diffusion material

THE WARREN R SMITH CO

809 Fern St Fairlawn NJ 07410
201 797-2579

Camera lens adaptors (motion picture lenses to video cameras); telecine positioner; film to video transfer; custom optical mechanical systems

VS

SOD-MASTER DIV JACOBSEN MFG CO

3456 N Wash Ave Minneapolis MN 55412
612 529-9566

Oscillating plows for cable burial

SOLA ELECTRIC

1717 Busse Rd Elk Grove Village IL 60007
312 439-2800

CATV power supplies; CATV transformers

SOLADYNE INTERNATIONAL INC

7447 Convoy Ct San Diego CA 92111
714 279-7872

Microwave communications equip

SOLID ELECTRONICS LABORATORIES

49 Fairfield Rd Havertown PA 19083
215 446-4799

FM transmitters, exciters, SCA equip, service Gately professional audio products

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 Alameda Blvd Burbank CA 91505
213 843-7484

Chroma keys; luminance keys

SONO-MAG CORP/SMC

1005 W Washington St Bloomington IL 61701
309 829-6373

Tape decks, single, dual, multiple, sequencers, time insertion, controllers, memory units, reel decks, multi-cart machines, auto loggers, tone generators, auto time/weather announcers, complete system

VS

SONTEC ELECTRONICS

10120 Marble Court Cockeysville MD 21030
301 628-2282

Audio line amps, preamps; audio limiter/compressors; equalizers

VS

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 code generators, time base correctors

VS

See ad pgs. 14-15

CA Sony 700 West Artesia Blvd Compton
90220

213 537-4300
IL Sony 6801 West Jarvis Street Niles
60648

SONY CORP OF AMERICA

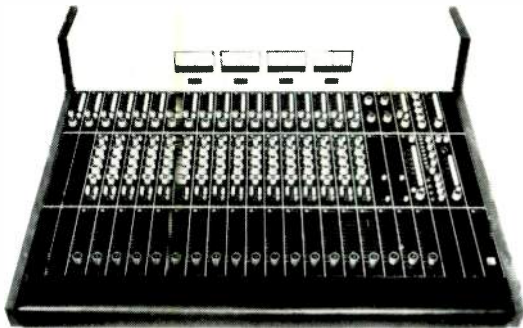
9 W 57th St New York NY 10019
212 371-5800

Video cassettes, video cassette recorder/players; videotape recorder/players; quad matrix equip; headsets; mics; audio tape; audio carts & cassettes; tape accessories; audio tape recorders; audio consoles (TV); video cameras; video switches; sync generators; special effect generators; videotape editing equip

VS

continued on page 118

OKAY, YOU ASKED FOR IT AND GRANDSON HAS IT



"It" is more. That's what broadcasters have been asking for in production consoles. Flexibility. Capability. And totally unique Grandson has it all.

There is nothing else like it anywhere!

Equalization at each input position. Don't laugh. If you don't think it's needed, that's because you haven't tried it. EQ is only the most useful, creative tool in audio. And Grandson's EQ is something special. One major network has bought a bunch. That's special.

Monitoring and foldback flexibility to let you and the talent have separate monitor mixes! And changes of monitor mode at the push of a single button. Here's the key to fast, creative production.

Internal patch point, after mic preamp before fader, brought out to permit inserting special devices. How about plugging in a limiter just ahead of the pot for the screamer, or mic swallower. Think that would be neat? So do we. Grandson will let you do it!

Four reasons Grandson was selected by ABC-TV, Hughes Sports Network and WWL in the Superdome. There are more. None accidental. Because you said it's needed.

Grandson is "it." A totally unique approach. Want more details? Write or phone today

 **auditronics, inc.**

3750 Old Getwell Rd. Memphis, Tn. 38118

The closer you look, the better we look.

Circle 181 on Reader Service Card

The Source '77

SOUND TECHNOLOGY

1400 Dell Ave Campbell CA 95008
408 378-6540

Audio generators; RF generators; harmonic distortion meters, intermodulation meters VS
See ad pg. 25—refer to rep/dist section

SPARTA ELECTRONICS CORP

5851 Florin-Perkins Rd Sacramento CA 92828
916 383-5353

AM & FM transmitters, audio amps, 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

SPECTRA SONICS

770 Wall Ave Ogden UT 84404
801 392-7531

Audio consoles; full line of audio amps, slide attenuators, pan controls, tone generators, speakers, compressor/limiters; variable equalizers, electronic crossover filters; audio attenuators & accessories VS

See ad pg. 166

CA 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 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 amps, equalizers VS

SPINDLER & SAUPPE INC

13034 Satcoy St N Hollywood CA 91605
213 764-1800

Slide projection screen for film chains

SPIN PHYSICS INC

11633 Sorrento Valley Rd San Diego CA 92121
714 453-5410

Videotape recorder/players; replacement heads for VTRs

STAINLESS INC

Third Street N Wales PA 19454
215 699-4871

AM antennas; antenna towers; tower lighting, tower accessories VS
See ad pg. 124

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; loggers

STANDARD ELECTRIC TIME

89 Logan St Springfield MA 01101
413 732-1141

Electronic master clocks; tape timers

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 VS
See ad pg. 92—refer to rep/dist section

VS MEANS IT'S VERIFIED

STANTRON DIV WYCO METAL PRODUCTS

6914-6918 Beck Ave N Hollywood CA 91605
213 875-0800

Racks, cabinets, furniture VS

STOREEL CORP

PO Box 80523 Atlanta GA 30341
404 458-3280

Cabinets & racks for equip; storage racks & enclosures for tape reels

STRAND CENTURY INC

20 Bushes Ln Elmwood Park NJ 07642
201 791-7000

Lighting hardware & accessories; light dimmer controls; patch terminals; plugs & connectors VS

See ad pg. 61—refer to rep/dist section

STUDER REVOX AMERICA INC

1819 Broadway Nashville TN 37203
615 329-9576

Audio tape recorder/players; audio consoles; power amps, amp power supplies; condenser mics VS

See ad pg. 51

CA SRA 14046 Burbank Blvd Van Nuys

91401..... 213 780-4234

NY SRA 155 Ave of the Americas 11th Floor

NY 10013..... 212 295-4462

STUDIO FILM EXCHANGE

366 W 46th St New York NY 10036
212 265-3740

Film stock at reduced prices

STUDIO TAPE EXCHANGE

6424 Santa Monica Blvd Hollywood CA 90020
213 466-8101

Reconditioned videotape VS

continued on page 120

QUICK-SET IS FEARLESS

...Houston-Fearless, that is.

Introducing, from Quick-Set, the professional champs in television and microwave support equipment. We've acquired the Houston Fearless product line of studio pedestals, heads, tripods and dollies. These popular heavy duty units accommodate a complete range of studio/remote requirements.

Stability, smooth action and quality are the key ingredients in every Quick-Set product. This is why we can offer a lifetime guarantee against defects in materials and workmanship. We back this with worldwide distribution and service to give you the professional support you deserve.

Send for our complete catalog.

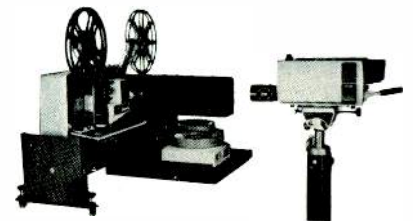


instrument positioning equipment

3650 Woodhead Drive, Northbrook, Illinois 60062
312/498-0700 Telex: 72-4362

BUHL

SEE BUHL'S MOBILE MULTIPLEXER IN YOUR OWN STUDIO!



That's right!

See Buhl's filmchain without a dedicated camera on tape in your own facility. We use the "MM" to produce a program demonstrating its own capabilities. Watch fade-dissolve, quick-cuts, animation with two slide projectors.

Simply send us your own 10 minute, 3/4" cassette. We'll transfer our program onto your tape and return it to you, postpaid, within a few days.

Be sure to include your name and address!

BUHL OPTICAL
1009 Beech Avenue
Pittsburgh, Pa. 15233
Phone: 412-321-0076

BUHL

Circle 182 on Reader Service Card

Circle 183 on Reader Service Card

The First Name in Film Editing Brings You The Last Word in Console Editors



See us at SMPTE
Booths 37 thru 40

...The MOVIOLA M-35AH

The company that pioneered motion picture editing more than half a century ago now brings you the latest addition to its line of console editors . . . the M-35AH, six-plate 35mm Console Editing Table.

Designed and engineered to the most demanding requirements of the motion picture and television industries, the M-35AH offers these outstanding advancements:

- Six Plates
- One Picture Transport with Magna Scope Hollow Flickerless Prism
- Two Separate Sound Transports with ASA Single-Track Magnetic Heads
- Pushbutton Advance/Retard Control
- Manual Inching on All Transports
- Crystal-Controlled Sound Speed
- Independent Torque Motor Control for Each Platter
- Heavy Duty Torque Motors with Positive Braking System
- Multiple Picture Capability
- Footage/Time Readout System with Memory

The Moviola M-35AH is your answer to the increasing demands for fast, accurate and creative editing. Ask for a demonstration today. See for yourself the future of things to come in editing.

magnasync

moviola

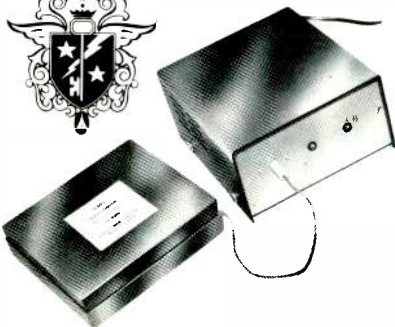
magnasync/moviola corporation

A Subsidiary of Cray Corporation

5539 RIVERTON AVE. / NORTH HOLLYWOOD, CALIFORNIA 91601 / (213) 877-2791

Circle 184 on Reader Service Card

NICKEL CADMIUM ENG. BATTERIES AND ONE HOUR AUTOMATIC CHARGERS



For **ALEXANDER** Nickel-Cadmium **REPLACEMENT BATTERIES** For...

SONY (BP20) – JVC (PBP-1) AKAI (PACK) – etc.

CHARGERS WILL AUTOMATICALLY CHARGE IN 1 TO 4 HRS. DEPENDING ON CAPACITY... (SWITCHES TO TRICKLE)

Write Wire or Phone

ALEXANDER manufacturing co.

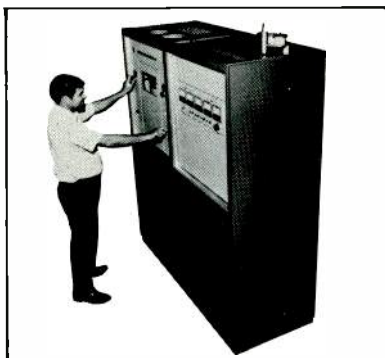
Box 1645 Mason City, Iowa 50401

Phone (515) 423-8955

Circle 185 on Reader Service Card

QUALITY TALKS FOR KTSA

San Antonio, Texas



Continental's new 5/10 kW AM transmitter is setting records for acceptance. It has performance and efficiency, with the cleanest sound around. Listen to Continental: quality talks.

Write for brochure: Continental Electronics Mfg. Co. Box 270879 Dallas, Texas 75227 (214) 381-7161

Continental
Electronics

Circle 186 on Reader Service Card

The Source '77

SUMMIT SYSTEMS INC

171 W Orangethorpe Ave Placentia CA 92670
714 528-0700

Automated videotape systems; video cartridge-cassette equip

SUPERSCOPE INC

20525 Northoff Chatsworth CA 91311
213 998-9333

Tape recorders; tape; tape accessories; headphones; speakers; mics

SURCOM ASSOCIATES

305 Wisconsin Ave Oceanside CA 92054
714 722-6162

RF inductors, vacuum capacitor, capacitors VS

SWITCHRAFT

PO Box 215 Elston Chicago IL 60630
312 792-2700

Audio plugs, jacks, connectors; cable assemblies, tester, tape deck comparitors, mixers VS

SWR INC

PO Box 215 Goffstown NH 03045
603 497-3000

Transmission line accessories; RF equip & service; TV antennas

SYSTA-MATICS INC

510 N Sheridan Tulsa OK 74115
918 835-2368

Automatic video cassette player system, automation controllers; time base correctors

VS MEANS IT'S VERIFIED

SYSTEM CONCEPTS INC

395 Ironwood Dr Salt Lake City UT 84115
801 486-3833

Character generators VS

See ad pg. 43

OH System Concepts 16006 Waterloo Rd
Cleveland 44110..... 216 692-3050

SYSTEMS MARKETING CORP

See Sono-Mag Corp

SYSTEMS WIRE AND CABLE INC

3500 So 30th St Phoenix AZ 85040
602 268-8744

CATV distribution and drop cable

SYSTRON-DONNER CORP

10 Systron Dr Concord CA 94518
415 676-5000

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 equip

T

TABER MFG & ENG CO

2081 Edison Ave San Leandro CA 94577
415 635-3831

Replacement audio heads for VTR & audio recorder/players; test tapes; tape erasers VS

See ads pgs. 10,167

CA Taber 1227 N Vine Hollywood
90038..... 213 464-5108

JOEL TALL—See ELPA MARKETING

VS

TANDBERG OF AMERICA INC

Labriola Court Armonk NY 10504
914 273-9150

Open reel recorder/players, cassette recorder/players, speakers, amps VS

TAPE-ATHON CORP

502 S Isis Ave Inglewood CA 90301
213 776-6933

Tape recorders/players (reel-to-reel); playback equip for automation, timers; mono & stereo music service

TAPECASTER TCM INC

PO Box 662 12326 Wilkins Ave Rockville MA
20851

301 881-8888

Tape cartridge equip; digital timers; programmers; clocks; amps

TAPEHEADS

4020 Beecher St NW Washington DC 20007

202 338-6510

A/V programming equip

TDK ELECTRONICS

755 Eastgate Blvd Garden City NY 11530

516 746-8880

Open reel, cartridge, cassette, test audio tape VS

TEAC CORP OF AM

7733 Telegraph Rd Montebello CA 90640

213 726-0303

Audio-tape recorders/reproducers, mics, mixers audio monitors, pre-amps, power amps, stereo and mono consoles; studio systems VS

TECH ELECTRONICS INC

6000 Peachtree Rd NE Atlanta GA 30341

404 455-7626

Videotape editing controller

TECH LABS INC

Bergen Blvd Palisades Park NJ 07650

201 944-2221

Audio and gain controls, RF and video attenuators; electronic switches VS

See ad pg. 160—refer to rep/dist section

TECHNICS BY PANASONIC

One Panasonic Way Secaucus NJ 07094

201 348-7000

Turntables; direct-drive tape decks; cassette players; pre-amps, power amps; equalizers; mics; peak/average meters; speakers VS

TECHNISPHERE CORP

215 E 27 St New York NY 10017

212 889-9170

Equip rental; post production services

TECHNOLOGY INC HF PHOTO DIV

11801 W Olympic Blvd Los Angeles CA 90064

213 479-3941

8-, 16-, 35mm film processors, pollution control and silver recovery systems

TEKTRONIX INC

PO Box 500 Beaverton OR 97007

503 644-0161

Oscilloscopes, video & picture monitors, sideband analyzers, spectrum analyzers, demodulators, sideband analyzers, RF correctors, waveform monitors, video test generators, sync generators, automatic video correctors, VTR equip, vectroscopes, monitor photometers video processing amps; repair service VS

TELAUTOGRAPH CORP

8700 Bellanca Ave Los Angeles CA 90045

213 776-5022

Fascimile equip

TELCIN INC

2604 Malt Ave Commerce CA 90040

213 726-2811

CATV cable; trunk & distribution amps; head-end signal processors; passive cable units

TELE-CINE INC

5434 Merrick Rd Massapequa NY 11758

516 798-2828

Motorized pan & tilt heads; pan heads; tripods; pedestals; motorized lenses (Schneider); camera housing; remote camera control systems; equip rental services VS

continued on page 124


Picture Improvement for Any Video Signal

Microtime's unique Image Plus™ Image Correction System is now available as a standalone for use with any TBC. Reduce color errors, crispen chroma, reduce video noise, increase picture detail, and more. Image Plus™, to improve any video signal.

MICROTIME

Power

Threshold

Variable  Preset

H Image

Variable  Preset

V Image

Variable  Preset

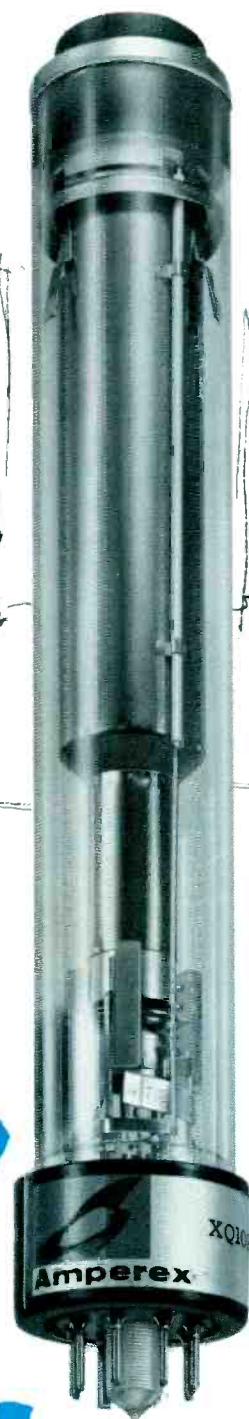
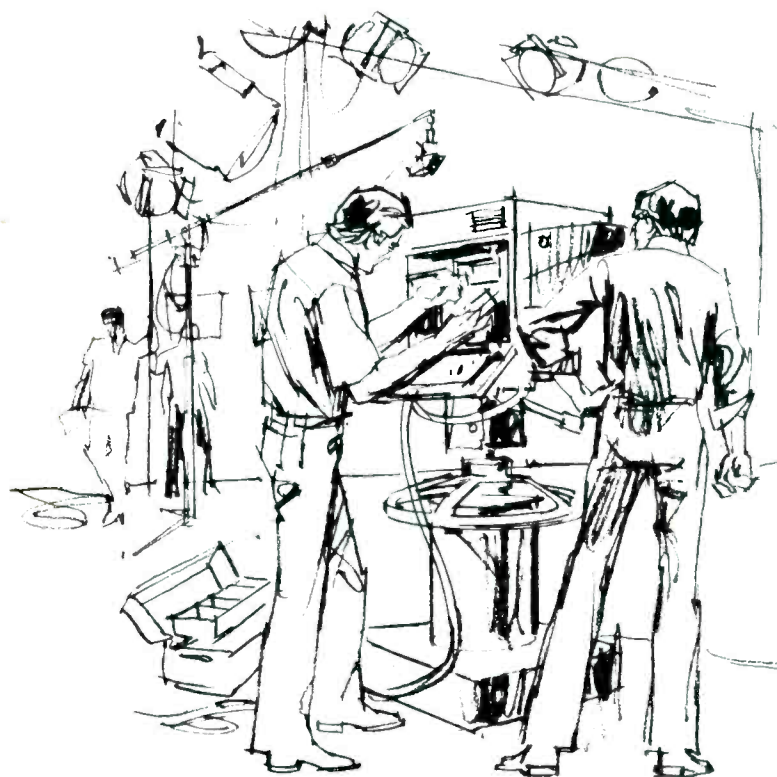
Image Plus

Image Correction System

Licensed by Yves Faroudja

Microtime
1280 Blue Hills Avenue
Bloomfield, Ct. 06002
(203) 242-4242 TWX 710-425-2390
Circle 187 on Reader Service Card

MICROTIME



**Some day,
somebody
may imitate
the Product...**

...but nobody will ever duplicate the Service!



And in TV Broadcasting, it's the service behind the product...that keeps the product out front

On the way to selling more than 50,000 Plumbicon* TV camera tubes, we learned how important Service is to the broadcaster. The first thing we learned was about availability — No TV station, commercial or educational, can ever afford to shut down an operation while "waiting for parts." Plumbicon tubes are instantly available, at all times, through local franchised distributors and through Amperex factory sales representatives.

And we learned the importance of the name Plumbicon to TV stations who have come to depend on it as their assurance of consistent performance and quality.

Because no product is ever "good enough," we taught ourselves to build smaller and smaller Plumbicon tubes that provide performance standards similar to the original (we're down to $\frac{2}{3}$ inch tubes now,) and we learned to produce tubes with reduced comet tailing, with higher resolution and modulation depth, with extended-red response, and with minimum lag. Contemporary camera tubes outperform the original Plumbicon by a wide margin.

We learned that the TV camera user is concerned about the operation of his camera . . . not merely about the performance characteristics of our tubes. So we provide him with a wide range of expert and valuable information, in print and via our field engineers, to help him get the most out of his TV camera-system. Plumbicon users who are about to install a new camera need only give our

field engineering staff a call and we'll have an expert there to help with the job.

Our franchised distributors, (your own local businessmen,) are carefully selected for their ability to support Plumbicon TV camera systems with on-the-spot customer support and service. We, in turn, support our distributors with two kinds of "seminars" for Plumbicon camera users. One is on video tape, the other is presented "live" by an Amperex field engineer. The purpose of both is to maximize the value of Plumbicon camera systems.

Finally, we learned that the best way to deal with warranty questions was to design the warranty for the customer's benefit — not to protect ourselves . . . and even then, to interpret the warranty in the customer's favor whenever possible. For example, a customer may return any Plumbicon tube for testing (even one that's technically out of warranty) and we'll subject it to a complete technical evaluation at our expense . . . and send the customer a detailed engineering report on the tube.

Yes, we've learned a lot about the importance of Service in the 13 years, in the more than 50,000 tubes sold, in the 600-plus TV stations served, since the Plumbicon tube won the Emmy award. Little wonder, then, that the Plumbicon, after all this time, still offers the best all-around package of performance, price, reliability and service available. Little wonder, then, people keep on saying, "There's only one Plumbicon."

Amperex Electronic Corporation, Slatersville Division, Slatersville, Rhode Island 02876, Telephone: 401-762-3800

Amperex®

A NORTH AMERICAN PHILIPS COMPANY

There is only one Plumbicon

Circle 188 on Reader Service Card

The Source '77

TELECTRO SYSTEMS CORP
9618 43 Ave Corone NY 11368
212 651-8900

Public address systems, single & dual tape recorder/players for instrumentation; speakers VS

TELEDYNE BIG BEAM
290 East Prairie Crystal Lake IL 60014
814 459-6100
Emergency lighting

VS MEANS IT'S VERIFIED

TELEDYNE CAMERA SYSTEMS
151 N 5th Ave Arcadia CA 91006
213 359-6691
Video to film recording systems VS

TELEDYNE ENERGY SYSTEMS
110 W Timonium Rd Timonium MD 21093
301 252-8220
Power supplies for remote applications

TELEMEDIA INC
PO Box 15068 Salt Lake City UT 84115
801 972-8000
Telecine chains; character gens; encoders, sync gens; routing switchers; source identifiers, frame synchronizers, VTRs, helical (cassettes); audio consoles, processing amps; pulse & distribution amps; 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 & program guide VS
See ad pg. 77—refer to rep/dist section.
CA J Kubit 575 Middlefield Rd Suite C Palo Alto 94301..... 415 328-8800
CT A Schoenberg R2 Matbie Rd Newton 06470..... 203 426-8566
MD G Bates 3930 Knowles Ave Kensington 20795..... 301 933-5250
MN L Ehnstrom 4681 170th St N Hugo 55038..... 612 426-4519

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; TV equip rental/repair; studio/van design VS

TELEMEDIA ELECTRONICS
2553 Darwin Haywood CA 94545
415 783-3311
Automatic videocassette playback equip; tone generators; digital clock VS

TELEMET
185 Dixon Ave Amityville NY 11701
516 842-2300
Multiburst, stairstep, window, waveform generators; video distribution amps; envelope delay measuring equip; VITS keys; video switching systems; TV demodulators, cable TV modulator & demodulators; chroma keys; image enhancers; video processing amps; audio distribution amp, audio monitors VS

TELEPHONICS
770 Park Ave Huntington NY 11743
516 549-6000
Cordless stereo headphones

TELESCRIPT INC
20 Irsley St Demerest NJ 07627
201 567-2220
Prompters, titling equip

TELEVISION EQUIPMENT ASSOCIATES
Box 260 S Salem NY 10590
914 763-8893
Audio amps; headsets; intercom systems; mics; color corrector; videotape cleaners; video delay lines; video envelope correctors; VITS/equip; color monitor comparator; video test slides VS

TELEVISION PRODUCTION SERVICES CORP
30 W Maple Ave Boundbrook NJ 08005
201 469-5743
Set design VS

TELEVISION PRODUCTS CO INC
9016 Aviation Blvd Inglewood CA 90301
213 776-3276
Booms & dollies VS
See ad pg. 94—refer to rep/dist section

TELEVISION RESEARCH INTERNATIONAL INC
1007 Elwell Ct Palo Alto CA 94303
415 961-7475
Videotape editing equip; portable production switcher; time code generator; TBC, trichroma VS

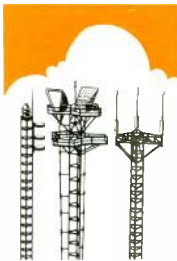
TELEVISION TECHNOLOGY CORP
5970 W 60th Ave Arvada CO 80003
303 423-1652
TV & FM translators; RF amps, converters, filters; tv combiners; solar power systems VS

TELEX COMMUNICATIONS INC
9600 Aldrich Ave S Minneapolis MN 55420
612 884-4051
Headsets, tape recorders/players, tape cartridge recorder/players, tape duplicators, preamps, power amps VS
See ads pgs. 93,96—refer to rep/dist section
CAN Telak Electronics, Ltd 690 Progress Ave Unit 3, Scarborough, Ontario M1H 3A6..... 416 438-3804

TELONIC 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

performance-proven towers by
Stainless . . .

the Leader!



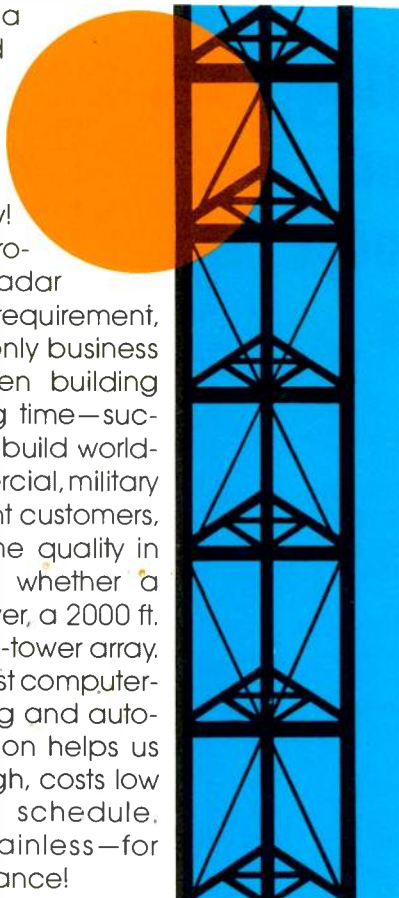
Stainless has a proven record for building towers that withstand all types of weather and stresses—reliably!

■ For TV, micro-wave, AM/FM, radar or whatever the requirement, towers are our only business and we've been building them for a long time—successfully! ■ We build worldwide for commercial, military and government customers, putting the same quality in every structure, whether a 200 ft. radio tower, a 2000 ft. TV tower or an 8-tower array.



■ Using the latest computerized engineering and automated fabrication helps us keep quality high, costs low and jobs on schedule.

■ Choose Stainless—for proven performance!



S Stainless, inc.

North Wales, Pa. 19454 U.S.A. • Phone 215/699-4871 • TWX: 510-661-8097

CO177

Circle 189 on Reader Service Card

VS MEANS IT'S VERIFIED

TENTEL
50 Curtner Ave Cambell CA 95008
408 377-6588
Magnetic tape tension gauge VS

TEPCO CORP
PO Box 680 Rapid City SD 57701
605 343-7300
TV translators; receivers, comm. and monitors,
microwave equip

TERRACOM DIV OF CONIC CORP
9020 Balboa Ave San Diego CA
714 278-4100
Microwave equip VS
See ad pg. 137

TEXAS ELECTRONICS INC
PO Box 7225 Inwood Sta Dallas TX 75209
214 631-2490
Meteorological (weather) monitoring equip

TEXSCAN CORP
2446 N Shadeland Ave Indianapolis IN 46219
317 357-8781
RF switchers, filters; signal generators, sweep
generators, oscilloscopes, spectrum analyzers,
impedance bridges, cable TV system analyzers,
tunable filters, VHF/UHF tuner test equip, test
accessories & terminators

THE TEXWIPE CO
51 Prospect Place Hillsdale NJ 07642
201 664-0555
Cleaners for tape heads

THALNER ELECTRONIC LABS
7235 Jackson Rd Ann Arbor MI 48103
313 761-4506
Character generators; special effect generators;
pulse & distribution amps; sync generators, screen
splitters, slave clocks

THEATRE TECHNIQUES INC
60 Connolly Pkwy Hamden CT 06514
203 281-6111
Audio mixers, portable mixer, intercom system,
patch panel, manual & automatic light dimmer
control VS

THERMODYNE INTL LTD
12600 Yukon Ave Hawthorne CA 90250
213 679-0411
Reusable shipping & handling containers VS

THETA-COM
PO Box 9728 Phoenix AZ 85068
602 944-4411
Microwave equip

THOMSON-CSF ELECTRON TUBES
750 Bloomfield Ave Clifton NJ 07015
201 779-1004
Power tubes, transmitter tubes, UHF/VHF
Tetrodes

THOMSON-CSF LABORATORIES
37 Brownhouse Rd Stamford CT 06902
203 327-7700
Video cameras, video discs; color flying spot
scanner; flying spot telecine; camera telecine
chain; TV transmitters, A/D converters, pulse and
distribution amps, sync generator systems,
character generators, complete telecine systems,
wireless mics, ALC and AGC amps,
compressor/limiters, AM and FM, equalizers and
filters VS

See ad pg. 158—refer to rep/dist section
CA J Smith 2016 Tondolea Ln Lacanada
91011 213 790-4393
CO J Vondergeest 1801 E Girard Ave
Englewood 80110 303 781-4502
CT T Hindle 37 Brownhouse Rd Stamford
06902 203 327-7700
J Ewansky 37 Brownhouse Rd Stamford
06902 203 327-7700
IL J Houman PO Box 95031 Woodfield
60195 312 882-1678
MO H Caplan 4220 H Casa Brazilia St Louis
63219 314 487-2450
VA A Audick 6407 Brewster Dr Alexandria
22308 202 296-9189

THOR ELECTRONICS CORP
321 Pennsylvania Ave Linden NJ 07036
201 486-3300
Power tubes & rectifiers

TIME & FREQUENCY TECHNOLOGY INC
3000 Olcott St Santa Clara CA 95051
408 246-6365
Digital clocks, master clocks; frequency counters;
remote digital displays; frequency monitors;
modulation monitors; SCA monitors; standard time
& frequency receivers VS
See ad pg. 169—refer to rep/dist section

TIMES WIRE & CABLE CO
358 Hall Ave Wallingford CT 06492
203 265-2361
CATV cable & wire; fiber optic cables

TM SYSTEMS INC
25 Allen St Bridgeport CT 06604
203 366-4571
Line amps, amp power systems, VU meters, dB
meters

TOCOM INC
3301 Royalty Row Irving TX 75062
214 438-7691
CATV trunk, distribution amps; head-end
processors; connectors; distribution passives;
two-way cable communication systems

TOMCO COMMUNICATIONS INC
1077 Independence Ave Mountain View, CA
94043
415 969-3042
Pre-amps, converters for CATV

continued on page 126

THE SYSTEMS APPROACH

...at last, AGC/Processing and Peak Control in the proper packages.



MULTIMAX—the AGC/Processor with exceptional input headroom, low noise, and low distortion. Multimax is the 3 band processor which employs unique energy based, open-loop compressors as the active gain control elements. A special gated release circuit insures smooth gain control and band tracking performance. Separate cross-over frequencies are designed for AM and FM bandwidths.

MULTILIMITER—the limiter that features an input "gain riding" compressor, a variable compression ratio fast limiter and a ultra fast peak control limiter which provides modulation protection without relying on clippers.

The Multimax, Multilimiter "package" concept puts your processor and limiter where they belong...in separate boxes. Multimax and Multilimiter are available for AM or FM application.

Call, write or telex today...



PACIFIC RECORDERS AND ENGINEERING CORPORATION
11100 ROSELLE ST., SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255 TELEX 695008

Circle 190 on Reader Service Card

The Source '77

TONER CABLE EQUIP INC
969 Horsham Rd Horsham PA 19044
800 523-3947

Amps, cable, pay TV, filter trap passive, addressable taps, head end processors, weather scan, non-duplication switchers, power supplies, CATV cable installation tools, enclosures & pedestals, maintenance, racks, surge protectors

TOPAZ ELECTRONICS
3855 Ruffin Rd San Diego CA 92123
714 279-0111

Power supply converters, uninterruptible power systems, power isolators, surge protectors

TOWNSEND ASSOCIATES INC
PO Box 484 W Springfield MA 01089
413 736-7180

Demodulators, diplexers, exciters, RF amps, HV power supplies for TV transmitters, TV transmitters, TV transmitter repair service VS

TRACOR INC
6500 Tracor Lane Austin TX 78721
512 926-2800

Automatic, crystal frequency standards, visual carrier generator, remote subcarrier systems, countdown unit

TRANSIST-O-SOUND INC
1728 Yosemite Dr Indianapolis IN 46217
317 897-1549

ALC and AGC amps, portable mixer amps, recording amps for mag sound on film VS

TRANS-LUX CORP
625 Madison Ave New York NY 10022
212 751-3110

Rear projection screens

TREISE ENG INC
1941 First St San Fernando CA 91340

213 365-3124
Motion picture color and B/W film processors; film cleaners; film processor accessories VS

TREPAC CORP OF AMERICA
30 W Hamilton Ave Englewood NJ 07631
201 567-8310
Audio/video automatic line program alarm VS

TRI-EX TOWER CORP
7182 Rasmussen Ave Visalia CA 93277
209 732-8383
Self-supporting, guyed towers; portable towers

TRIPLETT CORP
286 Harmon Rd Bluffton OH 45817
419 358-5015
VU & dB meters; voltmeters; multimeters VS

TRI-TRONICS INC
4019 Tujunga Ave N Hollywood CA 91604
213 877-9912
Production equip rental, post-production services, studio design, radio and TV; mobile van construction, facility turnkey installation, color video monitor

TROMPETER ELECTRONICS INC
8936 Comanche Ave Chatsworth CA 91311
213 882-1020

Coax, twinax, triax cable patching equip; coax, twinax switching matrices, RF attenuators, switchers, cables, connectors

TRUE TIME INSTRUMENT CO
429 Olive St Santa Rosa CA 95401
707 528-1230
Clocks, time systems; frequency monitors and counters VS

TT ELECTRONICS INC
2214 Barry Ave Los Angeles CA 90064
213 478-8224
RF inductors, RF filters, audio & video filters, intermodulation distortion measurement filters VS

2005AD INC
2005 Naudain St Philadelphia PA 19146
215 545-3488
Audio consoles, VU meters

UHF ASSOCIATES
6037 Haviland Ave Whittier CA 90601
213 693-2506
RF modulators, CCTV switcher VS

ULTRA AUDIO PRODUCTS PIXTEC
BOX 921 Beverly Hills CA 90213
213 276-2726
Audio consoles; rewinders; video picture monitors; videotape cleaners; prompters, titling equip; waveform monitors; pulse cross monitors, vectorscopes VS

UMC ELECTRONICS CO SENSTROL DIV
460 Sackett Pt Rd North Haven CT 06473
203 288-7731
Tape erasers, multi-cart machines, splice finder, audio heads VS
See ads pgs. 8,164—refer to rep/dist section

UNARCO-ROHN DIV OF ROHN IND INC
PO Box 2000 Peoria IL 61601
309 697-4400
Antennas, TV; towers, hardware and construction equip VS

UNIDYNE CORP RADONIC DIV
981 Scott St Norfolk VA 23513
804 855-1089
Business automation systems for radio & TV

UNIMEDIA
Rte 2 PO Box 2574 E Auburn CA 95603
916 272-1971
Color picture monitors VS
See ad pg. 116—refer to rep/dist section

Broadcast/Recording Equipment from MICMIX



TIME WARP
Audio Delay/Effects Generator
Wide ranging variable time translation of audio signals for uniqueness in commercials and special programming.

MASTER AUDIO METER
Panel Instruments
Led-bar displays of both peak and rms (vu) levels for establishing excellence in audio performance.



MASTER-ROOM
Reverberation Units
The spring-free sounds of Natural reverberation for quality production work and line application.



MIX MICMIX AUDIO PRODUCTS, INC.
2995 Ladybird Lane, Dallas, Texas 75220 214/352-3811

Circle 191 on Reader Service Card

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

News wire service; cable news wire

UNITED RECORDING ELEC IND (UREI)
8460 San Fernando Rd Sun Valley CA 91352
213 767-1000

Compressors/limiters, amps, modules, audio consoles; equalizers; speakers

See ad pg. 115—refer to rep/dist section

VS

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; rebuilds 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

US PIONEER ELECTRONICS CORP
85 Oxford Dr Moonachie NJ 17074
201 440-8100

Tape recorders; head sets; mics; stereo monitor receivers

UTILITY BODY CO
91 Gilman St Berkeley CA 94710
415 524-9333
Aerial lifts

VS MEANS IT'S VERIFIED

UTILITY PRODUCTS CO
6665 N 60 St Milwaukee WI 53223
414 353-1010
Buried cable closures, pole hardware

UTILITY TOOL CORP
46 Nooks Hill Rd Cromwell CT 06416
203 635-2200
Hand & machine powered tools for cable preparation

VS

UTILITY TOWER CO
PO Box 12027 Oklahoma City OK 73112
405 946-5551
Antennas & towers for AM, FM, TV & microwave

V

VACUUM TUBE INDUSTRIES
35 Pecuit St Box 358 Canton MA 02021
617 828-1650
Vacuum power tubes, rebuilt

VALAD ELECTRIC HEATING CO
160 Wildey St Tarrytown NY 10591
914 631-4927
Electric heaters for mobile vans & stations

VS

VAMCO ENGINEERING
Box 7512 Tulsa OK 74105
918 252-4142

Digital tape timers; clock systems; A/V distribution amps; videotape timer (also for ENG & TVC); A/V routing switcher; chroma-key kit

VS

VAN LADDER INC
Box 709 Spencer IA 51301
800 831-5051
Aerial lifts

VS

VARIAN ASSOC ELECTRON DEVICE GROUP
611 Hansen Way Palo Alto CA 94303
415 968-7630

See also EIMAC

Power vacuum tubes; RF switches; sockets, klystrons; TWTs; microwave components; xenon lighting; cooling equip

VS

VARIAN/BEVERLY MICRO-LINK PRODUCTS
8 Salem Road Beverly MA 01915
617 922-6000

ITFS & MDS microwave & systems; microwave RF components, assemblies & subsystems; exciters, modulators, TV translators

VS

VEGA ELECTRONICS DIV OF CETEC
9900 Baldwin Pl El Monte CA 91731
213 442-0782

Wireless mic systems; wireless mic accessories

See ad pg. 140—refer to rep/dist section

VERMEER MFG CO
PO Box 200 Polla IA 50219
515 628-3141
Trenchers

VS

VERSA COUNT ENGINEERING
553 Lively Blvd Elk Grove Village IL 60007
312 593-0208

Video processing amps; FM and TV translators; FM transmitters; exciter; emergency power equip, batteries

VS

VICON INDUSTRIES
125 E Bethpage Rd Plainview NY 11803
516 293-2200

CCTV monitor console; camera lenses; pan & tilt & scan drives; motion detector

VS

VIDEO AIDS CORP OF COLORADO
325 E 7th St #G Loveland CO 80537
303 667-3301

Sync generators; cross pulse generators; gen-lock; burst phase meter; monitors; videotape editors; intercom

VS

See ad pg. 153—refer to rep/dist section

continued on page 128

HUGGER

PORTA-BRACE "GRIP"

CALL US - WE CAN MEET YOUR TRANSPORT NEEDS

K and H Products, Ltd.
Main St., North Bennington
Vermont 05257 802-442-9118

Circle 192 on Reader Service Card

SEPTEMBER, 1977—BM/E

4, 5, 8, 10-Mono, Stereo!

LPB has 7 models of audio consoles to suit your individual requirements. Since space won't permit us to list all their features and specifications in this ad, we've prepared a series of data sheets which show why our Signature II Console Series is the practical choice of the discriminating Broadcaster. Call or write today for your copies.

LPB® LPB Inc.
520 Lincoln Highway, Frazer, PA 19355 (215) 644-1123

147

Circle 193 on Reader Service Card

127

The Source '77

VIDEO COMPONENTS INC
601 S Main St Spring Valley NY 10977
914 356-3700

Video synthesizer and colorizer (BJA), CCTV and broadcast camera lenses (Canon USA), modulators and demodulators (CATEL), mobile carts (Gruber Products), mounting equip (Quick-Set), 16mm TV projectors (Singer), lighting equip (Smith-Victor), sync generators, burst phrase meters, electro optical isolators (Video Aids Corp), sequential switchers (Portac), shipping cases (Thermodyne), optical multiplexers (Zei-Mark)

VS

VIDEO DATA SYSTEMS
40 Oser Ave Hauppauge NY 11787
516 231-4400

Character generators; TV titling & data display systems

VIDEO ELECTRONICS LTD
Gibfield Works Atherton Manchester M29 0RH ENGLAND
Atherton 2332

Time code generator; alpha-numeric character generator; chroma keyers; pulse, distribution & subcarrier amps; sync generator systems; videotape editing systems; colorizer

VS

VIDEOMAX/DIV OF ORROX CORP
3303 Scott Blvd Santa Clara CA 95050
408 988-2000

Rebuilt video recording heads & headwheel assemblies, replacement heads

VS

See ad pg. 133—refer to rep/dist section
CA R Murphy 1350 12th St Manhattan Beach 90266..... 213 980-7927
GA F Benson 11520 Bowen Rd Roswell 30075..... 404 992-4490
VA L Hunt 14216 Chesterfield Dr Woodbridge 22191..... 212 947-8031

VIDEO OPTICS
1916 Old Middlefield Way Mountain View CA 94043
415 965-4298
Low light level camera

VS

VIDEO SENTRY SYSTEMS
1080 Rte 46 Clifton NJ 07013
201 777-7600
Video/audio TV program loggers

THE VIDEO TAPE CO
10545 Burbank Blvd N Hollywood CA 91601
213 985-1666
Videotape; post production services

VIDEOTEK INC
640 E Vine St Stowe PA 19464
215 367-6977
Color monitors
See ad pg. 157—refer to rep/dist section

VS

VIDREEL INC
42 Central Dr Farmingdale NY 11735
516 420-1470
Plastic reels & boxes for video & audio tape

VIDTRONICS
855 N Cahuenga Blvd Hollywood CA 90038
213 466-9741
Film to tape transfer

VIF INTERNATIONAL
Box 1555 Mt View CA 94042
408 739-9740
Background music systems; automatic program intermix units; tape recorder/players; tape heads; plug-in amp adaptors for Ampex recorders; audio amp; video program timers, compressor/limiters/filters, FM

VS

VS means that BME has reviewed this manufacturer's supporting literature

VIKRON
520 Blanding Wood Rd S St Croix Falls WI 54024
715 384-3233
Magnetic tape heads

VS

VINTEN—See LISTEC

VISCOUNT INDUSTRIES LTD
105 E 69th Ave Vancouver BC V5X 2W9
604 327-9446

Video production switchers; pulse & distribution amps; routing switchers; special effects generators; chroma keyers

VS

VISUAL EDUCOM INC
4333 S Ohio St Mich City IN 46360
219 879-8311

CCTV cameras; surveillance video cameras; picture monitors; video switchers, distribution amps; sync generators, special effects generators; tape duplicators; pulse amps; wire & cable; connectors

VISUAL INFORMATION INSTITUTE INC
PO Box 33 Xenia OH 45385
513 372-8637

Test equip for CCTV, sync generator systems, video test materials and generators

VISUAL METHODS INC
5 Wortendyke Ave Montvale NJ 07645
201 391-7383

TV surveillance cameras; camera lenses

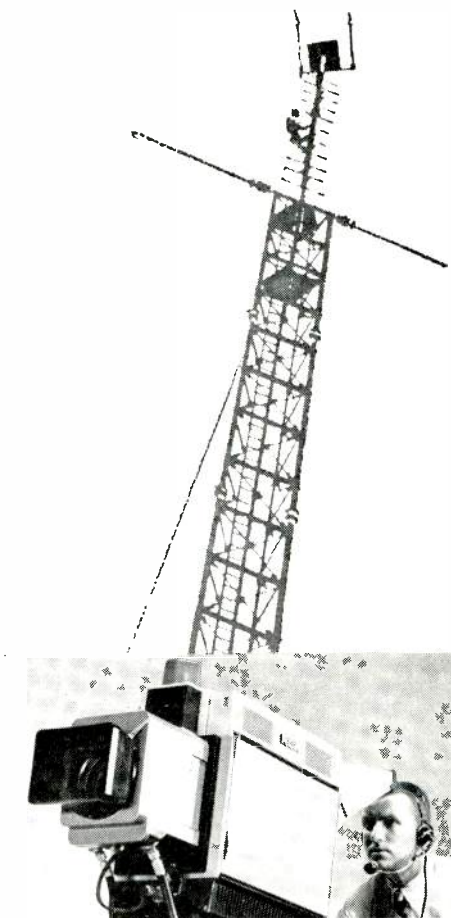
VITAL INDUSTRIES INC
3700 NE 53rd Ave Gainesville FL 32601
904 378-1581

TV automation equip; video processing amps; video production & routing switchers; video & audio distribution amps; pulse distribution amps; special effects generators; chroma keyers

VS

See ad pg. 9
CA G. Peters 7960 W Beverly Blvd Los Angeles 90048..... 213 653-9438

continued on page 130



Command Performance? RCA SERVICE DELIVERS Expert Repair and Overhaul Service

FOR:

- Video tape recorders
- TV Cameras
- Antennas
- Microphones
- Transmitters
- Installation
- Console
- TV Projectors
- Microwave

Dial either of these offices for full information about fast, dependable broadcast equipment maintenance service from RCA:

Chicago (312) 298-7980
Philadelphia (215) 467-3300

Or contact:

RCA Service Company
A Division of RCA
Technical Products Service
Bldg. 204-2, Camden, N.J. 08101
Phone (609) 779-5924

RCA

Circle 194 on Reader Service Card

QUALITY TALKS FOR KEYH

Houston, Texas



Continental's new 5/10 kW AM transmitter is setting records for acceptance. It has performance and efficiency, with the cleanest sound around. Listen to Continental: quality talks.

Write for brochure: Continental Electronics Mfg. Co. Box 270879 Dallas, Texas 75227 (214) 381-7161

Continental 
Electronics

Circle 195 on Reader Service Card

120

In the Last ~~90~~ Days

17 STATIONS

23 Have Chosen

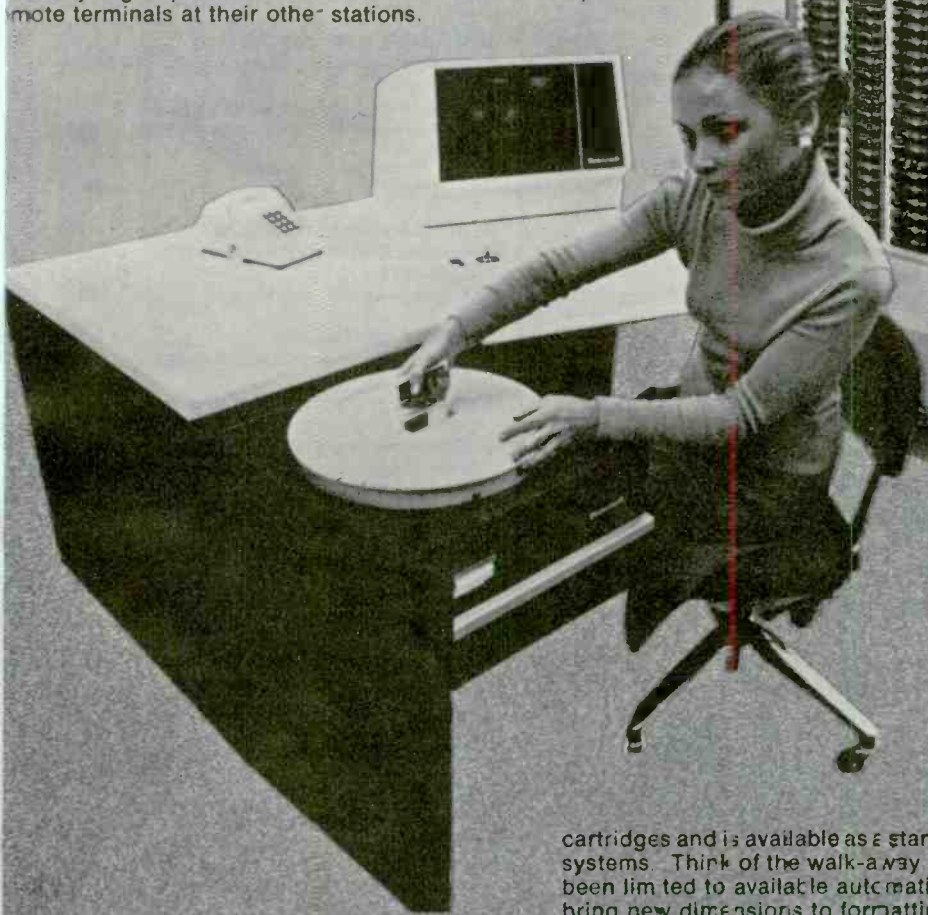
Autotron systems

Some have Autotron I, the complete automatic traffic and billing system, that provides several terminals, for several of your stations, doing several tasks all at the same time...

Others have selected Autotron IV, which does traffic and billing, but also does payables, general ledger and payroll, and is operated by one employee in a normal work week for the busiest AM/FM...

Still others have chosen Autotron VI, the only total automation system made, adding program automation control and memory (not just interface, CONTROL) to traffic, billing, payables, general ledger and payroll; and, throws Automatic Transmitter Logging in for no extra charge, while even automatically rescheduling discrepancies...


Finally a group or two has chosen one central computer with remote terminals at their other stations.



And now, we're proud to introduce the ultimate program automation system—(CUERAC)—Automation Division of Automation Electronics, Inc. exclusively presents Cuerac and Cue master reel-to-reel and cartridge players and recorders, all automation ready. Cuerac features 500 "on-line"

cartridges and is available as a stand-alone system or as a part of the Autotron business systems. Think of the walk-away possibilities. Until now programming formats have been limited to available automation equipment; now, at last a total system that can bring new dimensions to formatting. Economical when automation alone, but when combined with the Autotron system—it's absolutely great! The Autotron Systems and Cuerac are on display...ask about them and then see them in action...you'll wonder how you got along without them so long.

One turn-key purchase or lease/buy—no fees, no percentage of billing, no add-on expenses, no line charges—
—completely in-house.

 automation electronics inc.

Call Allen Collier or Rusty Gold at Autotron-Dallas... 214-233-7629
or Larry Zaiser at Autotron-Lafayette... 317-423-2572
or just put your business card in the mail, we'll know you want a brochure.

Autotron, Cuerac, Cue master and Automation Division are products and services of Automation Electronics, Inc.

001 south street • po box 1343 • lafayette, indiana • 47902 • (317) 423-2572

Circle 196 on Reader Service Card

NEW

19 ALL NEW Technics professional audio products in stock at RAMKO RESEARCH!



Just introduced! Turntables, reel to reel recorders, portable and fixed cassette R/P units, power amps, parametric equalizers, tuners and speakers.

The RS1500 reel to reel recorder that outperforms anything in its class. A new turntable, SL-1500 MK2, designed specifically for the broadcaster. A new portable cassette unit that gives the best portable reel to reel

units a run for their money. Power amplifiers, parametric equalizers and a series of studio monitor speakers that will astound you with their amazingly faithful reproduction.

Panasonic pulled out all stops on their research and development program for this series. Undoubtedly, with the performance, quality, and reasonable prices exhibited by this audio gear the "Technics" name will be a major consideration in your future purchasing decisions.

Whatever your needs, RAMKO RESEARCH offers a full line of the highest quality audio equipment available. Turntables, Tape Cartridge machines, a wide variety of distribution, mic, line, power and turntable preamps. Cassette record/play units & reel to reel recorders. And of course the most advanced broadcast consoles in the industry.

If it's for the studio we have it. Write or call collect today for our newest catalog and further information on the all new Technics "Professional series" audio equipment. You'll be dollars and performance ahead.

RAMKO RESEARCH

11355 "A" Folsom Blvd.
Rancho Cordova, Calif. 95670
(916) 635-3600

Circle 197 on Reader Service Card

For Tape Heads Head for TABER

At Taber you get precision work, quality results and low price . . . unmatched by any other audio head manufacturer.

We will recondition your three head assembly . . . F/T \$45.00 . . . 2 TRK \$60.00. Three new 2 TRK heads installed and aligned in your AG-440B for \$264.00 . . . Scully 280 at \$270.00.

Ampex VTR audio is priced at only \$385.00 for four new heads installed, or \$110.00 for four reconditioned heads. (Add \$38.50 if monitor post needs lapping.) RCA VTR audio heads are available for only \$475.00.

Loaner assemblies are available.

For heads, head for Taber . . . the best source available.

Send for free brochure.

TABER Manufacturing & Engineering Company
2081 Edison Ave. • San Leandro, Ca. 94577 • (415) 635-3831

Circle 198 on Reader Service Card

The Source '77

IN	M. Beavers 2644 North 7th Street Terre Haute 47804	812 466-3212
NY	R. McAll 34 Autumn Lane Hicksville 11801	516 735-0055
TX	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; filter traps

VS

VS MEANS IT'S VERIFIED

W

WABASH TAPE CORP
2720 Des Plaines Ave Des Plaines IL 60018
312 298-8585

Helical-scan video magnetic tape; audio magnetic tape

WARD BECK SYSTEMS LTD
841 Progress Ave Scarborough ONT M1H 2X4
416 438-6550

Audio consoles; modules; TV intercom, audio amps, audio processing equip, dB meters

VS

See ad cover 4

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

VS

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

WEAVER J A CO
8676 Pennel 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

WESTON INSTRUMENTS INC
614 Frelinghuysen Ave Newark NJ 07114
201 242-2600

Analog VU meters, voltmeters, multimeters, dB meters

WHIRLWIND MUSIC & AUDIO INC
100 Boxart St Rochester NY 14612
716 663-8820

Cabinets, connectors, wire & cable mobile van construction, RF cables, patch terminals, plugs & connectors, complete studio construction

VS

See ad pg. 174

continued on page 133

FREE!

Your planning guide to a better sound

See Us At Booth 80
**N.R.B.A.
CONVENTION**

Whether you're in engineering or management our newest catalog will prove indispensable when planning your audio requirements.

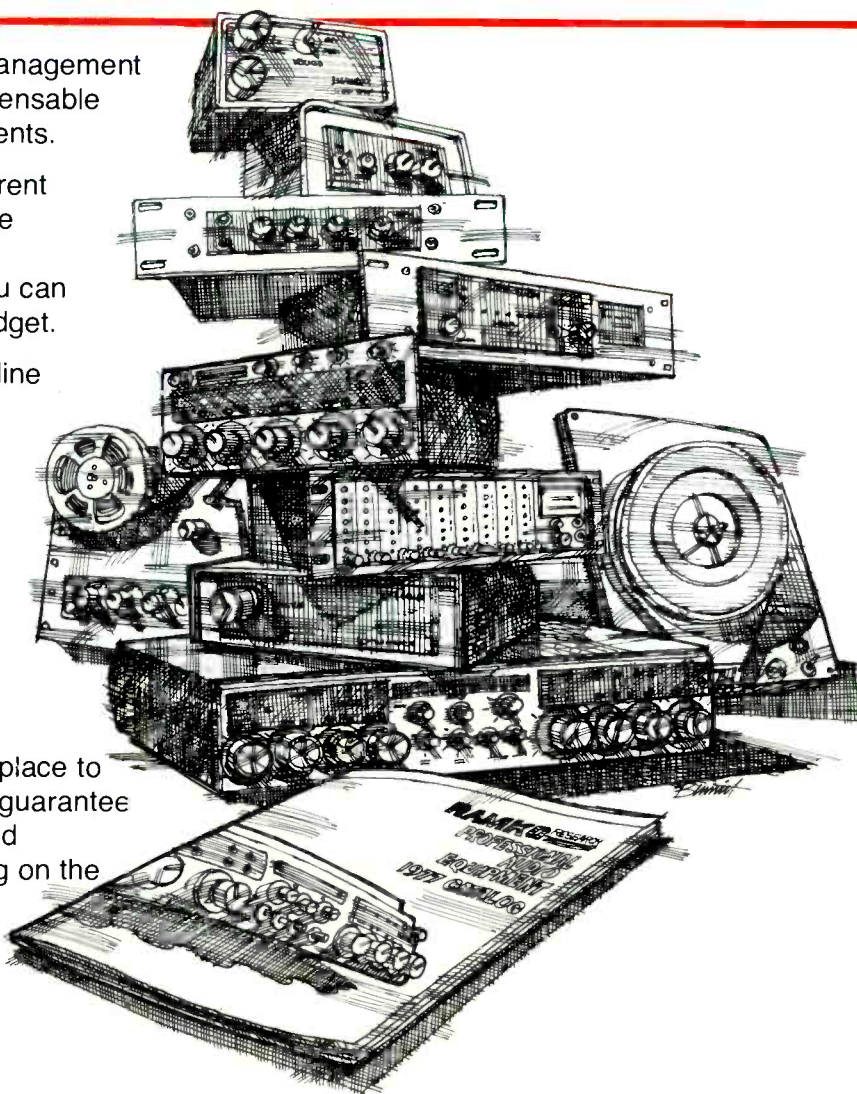
RAMKO manufactures over 70 different products designed specifically for the Broadcaster and those engaged in Professional Sound. All at prices you can afford, no matter how small your budget.

Audio consoles, audio DA's, mic. & line amplifiers, turntable preamps, limiter/compressors, equalizing amplifiers, tape winders, solid state meters and much more. We also distribute some of the finest names in turntables, tape recording accessories and other broadcast products.

In addition to the vast array of products, you'll find quality of design and performance that takes second place to none and is ahead of most. And we guarantee it with our 2 week free trial period and warranties of 2 & 4 years (depending on the item).

Call, write, or circle the bingo card today for your free copy of our newest 24 page catalog. The technical descriptions, specifications and illustrations will show you why RAMKO designed equipment offers the best cost/performance ratio in the industry.

Ramko understands your needs. After all, we're broadcast engineers too!



RAMKO RESEARCH

11355 "A" Folsom Blvd.
Rancho Cordova, CA 95670
(916) 635-3600

Circle 199 on Reader Service Card

NEC

The Broadcast Equipment Company you'll be hearing a lot more about.

You'll hear about us, because we're making it a practice to listen to you. As the world's second largest maker of broadcast equipment, we're not in a position to dictate; and we won't — even when we're number one.

We have a line of equipment in the U.S., that's well worth your investigation: VTR's, TBC's, frame synchronizers, etc. And we're ready to expand it. When you're ready.

Just let us hear from you.

NEC

NEC America, Inc.

Broadcast Equipment Division
130 Martin Lane
Elk Grove Village, Illinois 60007
(312) 640-3792

Circle 200 on Reader Service Card

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) 589-2662

Circle 201 on Reader Service Card

WOLF COACH INC
200 Bartlett St Northboro MA 01532
617 393-2551
Mobile van construction

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

YAMAHA INTERNAT'L CORP MUSICAL INSTRUMENT DIV
6600 Orangethorpe Ave Buena Park CA 90620
714 522-9011
Audio consoles, mixers, audio for TV; power amps; speaker system; frequency crossover networks VS
See ad pg. 135

YARDNEY ELECTRIC CORP
82 Mechanic St Pawcatuck CT 02891
203 599-1100
Silver, zinc & cadmium batteries; chargers, high intensity lights VS

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 16mm & super-8mm film projectors, lap dissolve slide chain, telecine accessories VS

ZOOMAR INC
55 Sea Cliff Ave Glen Cove NY 11542
516 676-1900
Optics; optical instruments

The Source '77

WHITE INSTRUMENTS INC
PO Box 698 Austin TX 78767
512 892-0752
Equalizers & filters (passive & active), real time spectrum analyzers VS

WIDE BAND ENGINEERING CO INC
PO Box 21652 Phoenix AZ 85036
602 254-1570
RF amps, analyzers; impedance bridges; directional couplers; power dividers VS

THE WIDGET WORKS INC
PO Box 79 Medina OH 44256
216 336-7500
ATS equip, radio and TV

WILKINSON ELECTRONICS INC
PO Box 738 Trainer 19013
215 497-5100
AM & FM broadcast transmitters; audio consoles; audio compressor/limiters; distribution amps, equalizers, line amps; demodulators, exciters, RF amps; modulation & frequency monitors; AC line surge protectors; rectifier stacks VS

WINEGARD CO
3000 Kirkwood St Burlington IA 52601
319 753-0121
CATV antennas, amps, drop and distribution equip; accessories; home system amps VS
See ad pg. 138

WINSTED CORP
8127 Pleasant Ave S Minneapolis MN 55420
612 888-1957
Racks, cabinets, shipping cases, storage trucks, consoles, tape storage VS

The AUTOMATIC Audio Test System

That Measures. . .



MODEL AT-51
AUDIO TEST SYSTEM

- Harmonic Distortion
- Intermodulation Distortion
- Volts
- dB
- Signal + Noise / Noise Ratio
- Wow and Flutter
- Stereo Phasing
- Differential Gain in Stereo Channels

Contact Us Now For Complete Details And Descriptive Literature.

POTOMAC INSTRUMENTS

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

Circle 202 on Reader Service Card

Independent Broadcast Reps/Distributors

**Including cross reference to companies
whose products are advertised**

Information regarding the representatives and distributors listed in this section was supplied by the manufacturers listed in the preceding section. Some others are listed by virtue of their reputations within the localities they do business. The use of this section is affected by a number of hints: 1. The product line attributed to each representative is very general. In most cases these reps/distributors carry the products of a number of manufacturers and may carry a

broader range of products than the "line" may imply; 2. The advertiser's name which appears below the listing can be used as a guide both to the dealer handling a specific product you seek, and as a guide to more information on the product(s) referred to in the advertisement; 3. If no local dealer can be found, a call to the manufacturer of the product you want, may be the quickest way to identify a local source.

To make an impression that lasts use GE large screen TV projection

GE large screen television projectors are at work, today, presenting video information to audiences in Education, Business and the Arts.

At Universities, lectures, science demonstrations and off-campus programs are being presented in bright, color video, on screens up to 20 feet wide. At live seminars, overflow attendance is being accommodated in nearby facilities with large screen television projection.

At medical schools, surgical techniques and medical procedures are projected in images larger than life, with clarity and impact which facilitates subject retention and learning.

In addition to use at stockholder's meetings, seminars and training programs, business management also employs GE large screen television projection to present computer bank data. Coupled to computer facilities through interface equipment, it projects alpha numeric data, graphic displays, and computer generated images in real time.

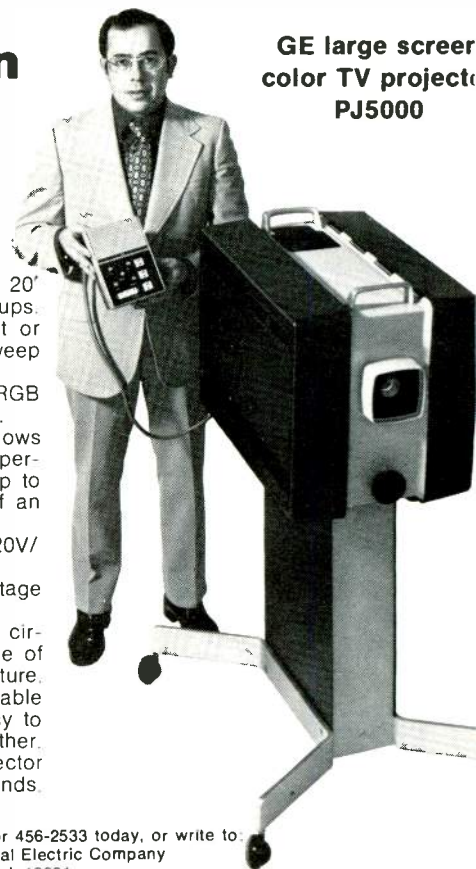
The GE Solid-state PJ5000 is reliable and designed to deliver projected pictures with high contrast, brightness and resolution, with simple remote control operation. Here's why:

- GE's exclusive single gun, simple optical path system generates the complete range of colors simultaneously.

No fussy alignment of three separate images.

- Single optical path provides the same color picture to everyone in the audience, regardless of his angle of view.
- Variable picture size from two to 20' wide for both large and small groups.
- Simple image changeover for front or rear screen projection, with sweep reversal switches.
- For easy set-up, internal sync and RGB Color Bar generators are provided.
- Convenient remote control unit allows picture set-up adjustments and operating control, at the projector or up to 200 feet away with the addition of an accessory control cable.
- Only power required is standard 120V/20 amp appliance outlet.
- No radiation hazard. Highest voltage used is 7,200V.
- High efficiency power conditioning circuits permit operation over a range of line voltages without affecting picture.
- Versatile projector mounting on table top or accessory rolling base. Easy to transport from one location to another.
- Compact in size and weight; projector and tilt mechanism weigh 135 pounds.

For more information call (315) 456-2562 or 456-2533 today, or write to: Video Display Equipment Operation, General Electric Company, Electronics Park—6-206, Syracuse, New York 13201



**GE large screen
color TV projector
PJ5000**

GENERAL  ELECTRIC

Circle 203 on Reader Service Card

ALABAMA

BARKER & TAYLOR EDUCATIONAL PRODUCTS

240 Gilmore Circle Suite 102
Birmingham 35209
205 942-2012
Line: video equip
Unimedia see ad pg 109

BCS ASSOCS

3322 S Memorial Pkwy
Huntsville 35803
205 881-6220
Line: full line video equip
Cohu see ad pg 97

CALHOUN CO INC

711 Garymac Dr
Birmingham 35226
205 822-7926
Line: full line video equip
, lighting equip
Strand Century see ad pg 61

CHEROKEE SUPPLY

103 Bibb St
Alexander 35010
Line: audio components
Micro-Trak see ad pg 98

JAMES W CLARY CO

1713 Second Ave So
Birmingham 35233
205 322-2486
Line: audio components
Micro-Trak see ad pg 98

GULF COAST ELECTRONICS

2613 Cameron St
Mobile 36607
205 476-7690
Line: full line TV
Microtime see ad pg 121

LEE ASSOCS

817 Wheeler Ave
Huntsville 35801
205 533-5896
Line: test instruments
Marconi see ad pg 99

THE MAZE CORP

PO Box 6636
Birmingham 35233
205 591-4800
Line: full line broadcast (radio & TV) &
recording equip
Micro-Trak see ad pg 98

SIGNAL ENGINEERING

720 S 23rd St
Birmingham 35202
205 328-6431
Line: video equip
Unimedia see ad pg 107

SONICS ASSOC

2601 A Warrior Rd
Birmingham 35208
205 787-8609
Line: audio equip
Auditronics see ad pg 117
Micro-Trak see ad pg 98

UNITED ASSOC

823 City Federal Bldg
Birmingham 35203
205 252-3079
Line: video & lighting equip
Strand Century see ad pg 61

ALASKA

HARRY J LANG & ASSOCS

1406 W 47th Ave
Anchorage 99501
907 279-5741
Line: audio & video equip
McMartin see ad pg 163

R F CASSADY

PO Box 2743
Fairbanks 99707
Line: radio equip

JOHN T CURRAN SOUND CO

PO Box 1239
Haymont Station
Anchorage 99510
Line: audio equip
Micro-Trak see ad pg 98

NORTHERN VIDEO SYSTEMS INC

4600 Business Park Blvd
Anchorage 99503
907 279-5571
Line: full line audio & video equip,
lighting equip
Microtime see ad pg 121
Strand Century see ad pg 61

TEAMCO INC

DBA TEAM ELECTRONICS
404 E Fireweed Ln
Anchorage 99543
907 277-6522
Line: audio equip
Micro-Trak see ad pg 98

ARIZONA

MORRIS COURTRIGHT

1450 W Arroyo Dr
Yuma 85364
602 783-6380
Line: radio equip

FISHER-BURKE

120 E Willetta St
Phoenix 85004
602 257-0225
Line: audio equip
MICMIX see ad pg 126

HP MARKETING

917 W Heatherbrae

Phoenix 85013
602 279-4883
Line: radio & audio equip
Orban/Parasound see ad pg 148

LARRY McMILLAN

5607 E Horseshoe Rd
Paradise Valley 85251
602 991-1077
Line: video components
Video Aids see ad pg 153

MEASUREMENT CONSULTANTS

PO Box 966
Scottsdale 85252
602 994-9519
Line: test instruments
Marconi see ad pg 99

OMNITRONICS INC

711 Indian School Rd
Phoenix 85016
602 956-6803
Line: audio equip
Auditronics see ad pg 117

ROH'S INC

4553 E Broadway
Tucson 85711
602 795-8573
Line: full line video equip, CCTV
systems
Microtime see ad pg 121
Unimedia see ad pg 107

SPECTRUM ASSOCIATES INC

1944 W North Lane
Phoenix 85029
602 997-6324
Line: audio components

VIDCOM

1908 E McDowell
Phoenix 85006
602 253-2103
Line: video lighting equip
Strand Century see ad pg 61

continued on page 136

The strong, silent type.



Just one glance at the Yamaha P-2200 power amp tells you the whole story. The case, the handles, the whole exterior relate a single, powerful message — rock-solid reliability, stability and high performance. The P-2200 is no hi-fi retreat. It's designed for a wide variety of professional applications.

Strong! With 200 watts of continuous average sine wave power into 8 ohms, you've got plenty of punch to handle the high peaks essential to clean studio monitoring, as well as all-night cooking in "live" concert reinforcement or disco sound systems. (You can easily

convert it into a monaural super amp and/or 70-volt line output capability for distribution systems.)

Silent! With a 110dB S/N ratio and .05% THD from 20Hz to 20kHz, the P-2200 satisfies even the most critical ears.

How pro can you go? The P-2200's dB-calibrated input attenuators and 50dB peak reading meters are flush mounted. Inputs to each channel have XLR connectors with a parallel phone jack, plus a phase reversing switch. Speaker connectors are five-way binding posts that take wire or "banana" plugs.

There's not enough room to give you all the facts here, so send this ad along with six dollars. (Please, certified check or money order only. No cash or personal checks.) We'll send you the P-2200 operation manual filled with facts. Or better yet, see your Yamaha dealer.



Musical Instrument/Combo Division
6600 Orangethorpe Avenue,
Buena Park, CA 90620.
Write: P.O. Box 6600, Buena Park, CA 90622

ARKANSAS

CARLTON BATES CO
69th and Scott Hamilton Dr
Little Rock 72209
501 562-9100
Line: audio equip
Micro-Trak see ad pg 98

CUSTOM PRODUCTS
107 East Calhoun
Magnolia 71753
501 234-7399
Line: audio components & equip
Micro-Trak see ad pg 98
Ramko see ad pg 130, 131

PAUL JAMESON
PO Box 247
Magnolia 71753
501 234-3778
Line: attenuators
Tech Labs see ad pg 160

TECHNICAL INDUSTRIES
3520 W 69th St Suite 306
Little Rock 72209
501 568-2294
Line: full line video equip

CALIFORNIA

A-1 AUDIO RENTALS
1420 N Beachwood Dr
Hollywood 90028
213 465-1101
Line: audio consoles
Auditronics see ad pg 117

ACCURATE SOUND CO
114 5th Ave
Redwood City 94063
415 365-2843
Line: full line of audio equip

Auditronics see ad pg 117
MICMIX see ad pg 126

ACEY-DECY INC
1123 N McCadden Pl
Hollywood 90028
213 464-0201
Line: video & lighting equip
Strand Century see ad pg 61

ANIXTER-PRUZAN
2228 S Ritchey
Santa Ana 92705
714 556-6270
Line: 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
Micro-Trak see ad pg 98

AUDIO INDUSTRIES CORP
1419 N LaBrea Ave
Hollywood 90028
213 851-4111
Line: audio components, equip
MCI see ad pg 26, 27
MICMIX see ad pg 126

BERNARD & ASSOC
Crenshaw Blvd
Hawthorne 90250
213 973-5050
Line: antennas, RF, & test equip

JOHN BAUMANN
5526 East La Palma Ave
Anaheim 92807
714 528-9505
Line: video switchers, animation equip
Duca Richardson see ad pg 89

JACK BERMAN CO INC
PO Box 6003
Inglewood 90301

213 649-6111
Line: audio equip

BROADCAST CART SERVICE
11917 Laurelwood Dr
N Hollywood 91604
213 245-7708
Line: audio tape & accessories
Aristocart see ad pg 24

BROADCAST CARTRIDGE SERVICE
1227 N Vine St
Hollywood 90038
213 985-3959
Line: audio components & cartridges

BROADCAST COMMUNICATIONS DEVICES INC
5526 E LaPalma Ave
Anaheim 92807
213 628-9590
1850 Warburton Ave Suite 203
408 984-6614
Line: full line audio & video equip,
lighting equip
Auditronics see ad pg 117
Duca Richardson see ad pg 89
Microtime see ad pg 121
NEC see ad pg 132
Strand Century see ad pg 61

BURBANK SOUND CO
3300 W Olive Ave
Burbank 91505
Line: audio equip
Auditronics see ad pg 117
MICMIX see ad pg 126

GM BURKHARDT CO
26311 Marina Rd
San Juan Capistrano 92675
714 495-4047
Line: multi-cart equip & tape equip

CARA PACIFIC SALES CO
4145 Via Marina No 120
Marina Del Ray 90291
213 821-7898

Line: audio components, test equip
Amber see ad pg 136
Modular Audio see ad pg 159
Orban/Parasound see ad pg 148

JACK CARTER ASSOC INC
11200 Chandler Blvd
No Hollywood 91603
213 980-3450
Line: audio recorders & equip

CINEMA SERVICES
3866 Bayshore Blvd
Brisbane 94005
415 468-5220
Line: film, video, lighting equip
Strand Century see ad pg 61

DUNLOP ELECTRONICS
3030 Bechelli Lane
Redding 96001
916 243-6513
Line: video equip
Unimedia see ad pg 107

EDUCATIONAL ELECTRONICS OF CALIFORNIA
Suite #8
90 Glen Way
Belmont 90004
415 592-5713
213 N Cedar
Inglewood 90301
213 677-8167
Line: CCTV video systems
Unimedia see ad pg 107

BRYANT W ELLIS
1227 North Vine Street
Hollywood 90038
213 464-5108
Line: audio equip

EVANS MARKETING CO
1438 Rollins Rd
Burlingame 94010
415 342-3030
Line: audio equip

continued on page 138

Next to your Oscilloscope, perhaps the most powerful test instrument you can own.



Amber model 4400 Multipurpose Audio Test Set
US list \$3650. Oscilloscope not included.

The Amber model 4400 Multipurpose Audio Test Set—a powerful, comprehensive test instrument combining in a single package almost all the test and measurement facilities needed for professional audio testing.

Use it to plot the frequency response of a tape recorder, a microphone or a speaker. Look at the slope characteristics of a filter or equalizer. Equalize a monitor system, measure the crosstalk in a console, check the gain of an amplifier or plot the phase response of a preamp—the 4400 will give you a fast, concise and accurate picture of the performance of a piece of equipment.

It incorporates a function generator with low sine wave distortion, 10 octave log

sweeper, tone burst generator, noise generator and high power (over +30 dBm) output amplifier. It has an auto-ranging digital dBm meter with over 150 dB measurement range, a frequency counter, a multifunction filter that can be used as a spectrum analyzer and four digital memories that give you X Y frequency and phase response plots on any non-storage oscilloscope.

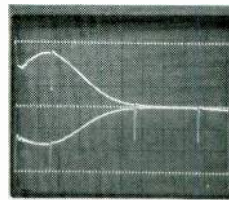
A fantastic time saver both in new product development and regular equipment maintenance. If you're involved in professional audio—acoustics, studio equipment, tape recorder maintenance, whatever—find out what the incredible Amber 4400 can do for you.

Amber Electro Design Limited
1064 Golf Road
Montreal, Canada H3E 1H4
Tel: (514) 769-2739
Telex: 05-25451

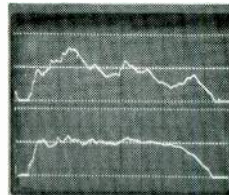
amber

Exclusive Export Agent
Gotham Export Corporation
741 Washington Street
New York, New York 10014
Tel: (212) 741-7411
Telex: 12-9269

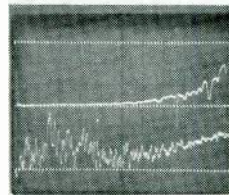
Oscilloscope photographs of some typical examples of plots made using the 4400 and an oscilloscope.



Swept sine wave frequency response plot of the reciprocal action of a low frequency equalizer. The small negative spikes are markers at 62Hz, 1kHz and 8kHz. The amplitude window between the top and bottom reference lines is 30dB, the horizontal axis is log 20Hz to 20kHz.



Frequency response of the speaker and room in a monitor system. The top trace, with 40dB window between reference lines, is before equalization, the bottom trace after equalization. The source is pink noise and the plots were made using the spectrum analysis mode with a 1/3-octave bandwidth.



Spectral analysis of the noise floor of a tape recorder playing back erased tape. A 2% filter bandwidth was used. Bottom reference line is -90dBm, top -30dBm. Second trace is phase shift versus frequency between two reproduced tracks. Top reference line is +180°, middle 0° and bottom -180°. The marker is at 4kHz in the 20Hz to 20kHz sweep.

TerraCom has closed the loop for Electronic News Gathering

The TCM-7 "Miniwave" Transmitter and receiver and the TCM-3 Programmable Receiver have joined the TerraCom team. They close the loop for highest performance microwave . . . from ENG camera, to O.B. van, to repeater, to studio.

Now you can enjoy the satisfaction and cost benefits of using an integrated family of equipment from one source. TerraCom.

The new TCM-7 and TCM-3 along with the field proven and time tested TCM-6 Series, tunable or fixed tuned transmitters and receivers, will meet all

of your microwave requirements at any frequency—2, 7, and 13 GHz.

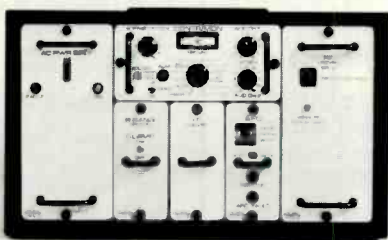
TCM-7 "Miniwave" is TerraCom's camera located transmitter and matching portable receiver. It is lightweight, easy to carry, simple to operate, and fast to set up. And it costs less. Designed for broadcast quality transmission with plug-in circuit cards for maintainability, the "Miniwave" is a new dimension in ENG.

TCM-3 Series Programmable Receivers are an important innovation for ENG systems. Imagine the flexibility of a receiver that can be remotely switched to any channel within the band . . . instantaneously. You are able to make the maximum use of frequen-

cies assigned, or those with least interference, at any one time. All from local control, remote control, or with a telephone circuit.

TerraCom portable microwave equipment won user plaudits at the recent Olympics (both Montreal and Innsbruck), primary elections, the Democratic and Republican conventions, Rose Parade, Rose Bowl, Super Bowl and in thousands of other daily events. And we're in satellite earth stations too!

You can close the loop now by calling Bruce Jennings or Bob Boulio at (714) 278-4100. And get the best service in the industry while you're at it.



DIVISION OF CONIC CORP.
A LORAL SUBSIDIARY

9020 Balboa Avenue, San Diego, CA 92123

TCM-3
programmable
receiver



ENG
camera

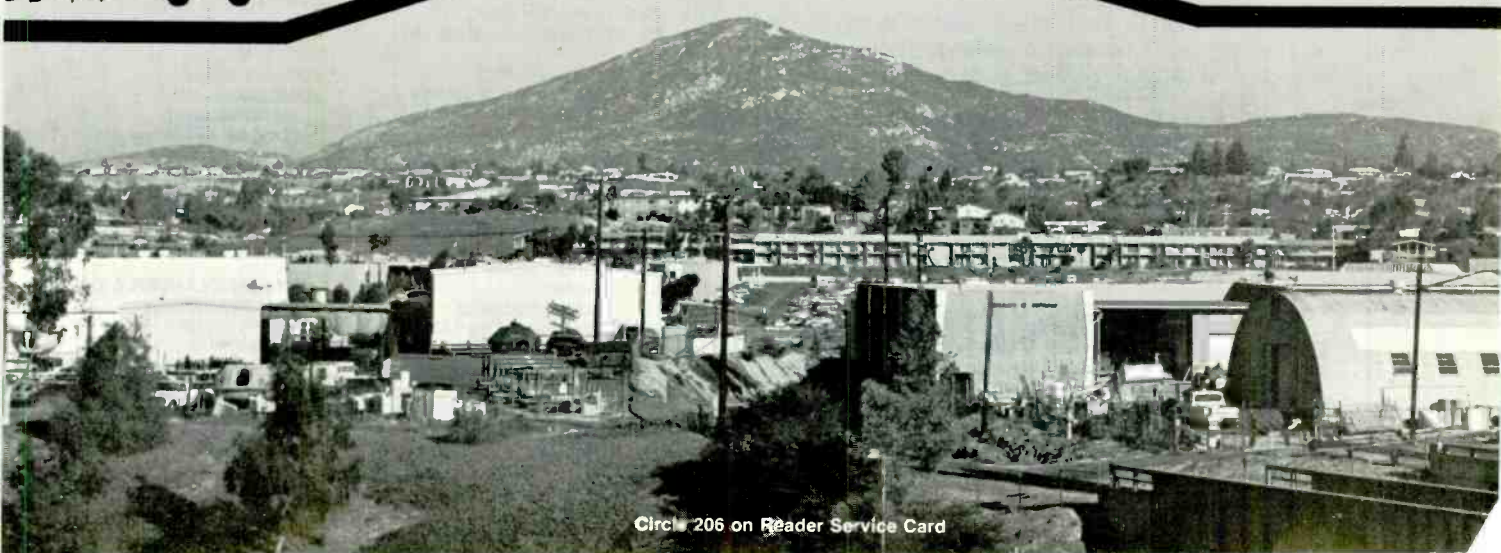
TCM-7
transmitter

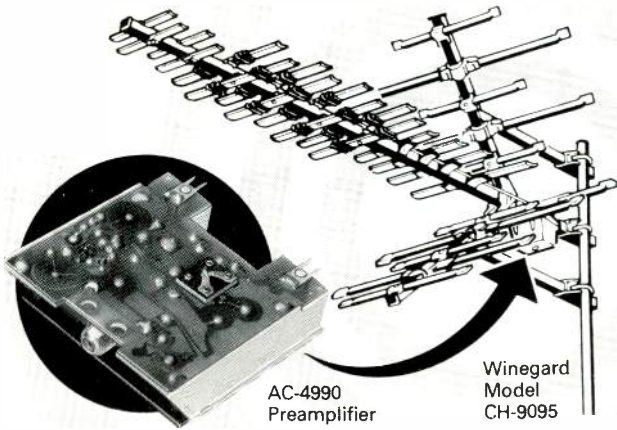


O.B.
van



studio





UHF Station Managers and Chief Engineers...

This remarkable low-noise preamp and new antenna make poor UHF pictures good, and fair UHF pictures excellent.

You might have read about the new Winegard AC-4990 preamplifier combined with the Winegard CH-9095 antenna, in the "UHF Equality" article in the November, 1976 BROADCAST MANAGEMENT/ENGINEERING. The article stated:

"CUB (Council for UHF Broadcasting) members who have tried the new combination say that it has excellent characteristics. It seems to be another worthwhile aid to the improvement of UHF broadcasting. It seems likely that many UHF fringe-area viewers will be willing to make the fairly large investment—\$65.95 list for the antenna and \$78.50 list for the preamplifier—for what will give them in many cases a very substantial improvement, lifting them out of the "fringe" category."

Actual home installations, presently in use, have brought about significant results with good reception of UHF stations extended up to 30 additional miles, nearly doubling the stations' effective range.

This means that TV households barely receiving you can now get good, watchable pictures. Those with only fair reception can now get excellent reception.

We want you to know about these extraordinary Winegard UHF reception products so you can help your viewers improve their reception while increasing your audience and reach.

If you would like more information and a copy of our "UHF Tips" booklet, please write us on your letterhead.

WINEGARD
The Winegard Company
Dept. UHF, 3000 Kirkwood Street, Burlington, Iowa 52601

REPS/DISTS

EVERYTHING AUDIO
14045 Sherman Way
Van Nuys 91405
213 873-4447
Line: audio equip

EXPRESS SOUND CO
1833 Newport Blvd
Costa Mesa 92627
714 645-8501
Line: audio equip
MICMIX see ad pg 126

F&B CECO of CALIF, INC
7051 Santa Monica Blvd.
Hollywood 90038
213 466-9361
Line: full time film & video equip

FERCO
363 Brannon St
San Francisco 94107
415 957-1787
Line: TV production equip
Strand Century see ad pg 61

GREAT AMERICAN BROADCAST CO
853 E Main Street
Ventura 93001
805 648-7761
Line: audio components

GRU ASSOC
302 B S Brand Blvd
Glendale 91204
213 244-8441
Line: video equip

BILL HAHN
688 Wasatch Drive
Fremont 94536
415 791-8344
Line: video proc equip

HECKERMAN CORP
814 W Hyde Park Blvd
Inglewood 90302
213 678-2264
PO Box 20745
San Diego 92120
714 449-2227
Line: tower hardware
Philadelphia Resins see ad pg 154

HELD & MOLLARD INC
3995 E Bayshore Rd Suite 104
Palo Alto 94303
415 965-9321
Line: audio components
Tech Labs see ad pg 160

DAVID A HILL
20 Laureldale Rd
Hillsborough 94010
415 573-2157
Line: video switchers and proc equip

HOLLYWOOD SOUND SYSTEMS
1526 Ivan Ave
Hollywood 90028
213 466-2416
Line: audio equip
Audionics see ad pg 117
Modular Audio see ad pg 159

MARTY JACKSON
1400 Coleman Ave Suite H14
Santa Clara 95050
408 984-6614
Line: automation & video switching equip
Duca Richardson see ad pg 89

JAYLIN ENGINEERING
332 Peppertree Rd
Walnut Creek 94598
415 933-0755
Line: audio components
Video Aids see ad pg 153

KDH ELECTRONICS
4233 W Sierra Madre #205
Fresno 93705
Line: audio & video equip

KOESSLER SALES CO
2010 W Burbank Blvd
Burbank 91506
213 849-5716
Line: audio equip
Telex see ad pg 93, 96

LIGHT & POWER SALES AG
3366 Hancock Suite B
San Diego 92110
714 461-0352
Line: lighting equip
Strand Century see ad pg 61

DAVID LINT ASSOCS
2444 Old Middlefield Way-Suite M
Mountain View 94043
415 964-5344
Line: audio equip

MacPHERSON SALES CO
PO Box 5212
Walnut Creek 94596
415 937-1482
Line: audio equip
Vega see ad pg 140

METROVONICS INC
3808 Catalina St
Los Alamitos 90720
714 827-4580
Line: video equip
Unimedia see ad pg 107

CHARLES MICHAEL
13400 Mulholland Dr
Beverly Hills 90210
213 274-4903
Line: camera lenses, full line CCTV video equip, video camera accessories, video editors
Video Aids see ad pg 153

WILLIAM A MOODIE
10415 Yolanda
Northridge 91324
213 363-1952
Line: lighting equip
Strand Century see ad pg 61

MOUTHROP SALES INC
1530 East 12 St
Oakland 94606
415 261-7676
Line: audio components, equip
Telex see ad pg 93, 96

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 pg 99

MUNDAY & COLLINS
270 Willow St
PO Box 5669
San Jose 95150
Line: video equip
Unimedia see ad pg 116

NEWCRAFT INC
8383 Wilshire Blvd
Beverly Hills 90211
213 655-1111
Line: full line of CCTV, video equip

ROLAND OLANDER & CO
540 Hollywood Way
Burbank 91505
213 843-5200
Line: audio equip
Robins see ad pg 165

continued on page 140

YOU NEVER HAD IT SO EASY.

The things you're asked to do! Now that people have discovered how valuable and flexible video can be, there's no limit to the things they want you to do with it. Which creates some terrific opportunities...and more than a few production problems as well. At Cine 60, we're specialists in designing new products to help you get more of the former. With less of the latter.



Take power, for instance. Our rechargeable Powerbelts mean you *can* take it with you. More ampere-hours than ever before. Evenly distributed around your waist to give you the same kind of mobility TV film cameramen have relied on for years. Our fast-charge versions are at full capacity in just one hour,



to give you more shooting and less waiting. □ For more light on the go, compact Cine 60 Sun Guns fill the bill. Color-balanced for video, they give you lots of fresnel-soft lumens in the smallest spaces. Plus wide angle and focusing, too. □ And if you prefer your Sun-Gun power packaged differently, we can give you

Cine 60 NiCad reliability in a Powerpak/Sun Gun combination. □ Our rechargeable Powerpaks are also available separately. In a variety of



sizes, voltages and capacities

to power just about any-

thing you have in mind. Video. Audio. You-name-it. Just slip

it on your belt or into a pocket... and go! □ While our

rugged, reliable power systems take a load off your mind, we

can take a load off your shoulders, as well. With a complete

line of comfortable shoulder

pods and body braces that let you concentrate on what you're shooting... instead of your aching sacroiliac.

Whatever the configuration of your camera, we've got a

pod to match. □ Cine 60 has a lot of other valuable

tools to make life easier for video people. Like our

Snaplok, to let you snap-on, snap-off cameras and other equipment

from tripods, stands, pods, etc. — in less time

than this sentence took to read. Plus suction mounts, compact quartz lighting...

and that's just the beginning. With all

the things you're asked to do these days, it pays to have all the

help you can get. Why not call or write for our catalog today?



CINE 60

I N C O R P O R A T E D

Film Center Building/630 Ninth Avenue
New York, N.Y. 10036/Tel: (212) 586-8782

REPS/DISTS

OMEGA ASSOC

14326 Isis Ave
Lawndale 90260
213 679-9021
Line: video equip, lighting equip
Strand Century see ad pg 61

PACIFIC RECORDERS & ENG CORP

11760 Sorrento Valley Rd
San Diego 92121
714 453-3255
Line: full line audio equip accessories
See ad pg 125
Auditronics see ad pg 117
MCI see ad pg 26, 27

PACIFIC VIDEO PRODUCTS

1128 E Chestnut St
Santa Ana 92705
714 547-8834
Line: video equip
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152
Unimedia see ad pg 107

PERSPECTIVE MEASUREMENT

7370 Convoy Ct
San Diego 92111
714 278-8931
2141 W La Palma Suite 1
Anaheim 92801
714 772-5211
Cohu see ad pg 97

GORDON PETERS

7960 W Beverly Blvd
Los Angeles 90048
213 653-9438
Line: video switchers, equip

LARRY PETERSON

989 Oakland St
Lafayette 94549
415 938-5127
Line: audio consoles

RDX DIST DIV

1287 Lawrence Station Rd
Sunnyvale 94086
408 734-4500
Line: electronic components

THE REP COMPANY

8361 Vickers St
Suite 305
San Diego 92111
714 292-9001
Line: electronic components, tubes

REGGINS ELECTRONICS

3272 E Willow St
Long Beach 90806
213 598-7007
Line: audio components, equip
Micro-Trak see ad pg 98

ROLLS ELECTRONICS

4260 Lankerskim Blvd
N Hollywood 91602
213 877-4424
Line: audio equip
Sennheiser see ad pg 179

RUSSCO ELECTRONICS MFG

1707 Brookhaven Dr
Clovis 93612
209 299-2167
Line: audio equip
Micro-Trak see ad pg 98

SCHAFFER ELECTRONICS CORPORATION

75 Castilian Drive
Goleta 93017
805 968-0755
Line: audio components

JOHN SCHNEIDER

PO Box 725
Diablo 94528
415 820-3811
Line: radio and TV equipment

BILL SEIDEL

7020 Delco Ave

Canoga Park 91306

213 980-7927

Line: video heads, components

SIERRA AUDIO

621 S Glenwood Pl
Burbank 91506
213 843-8115
Line: audio equip
MICMIX see ad pg 126

R E SNADER & ASSOC

216 E Strawberry Dr
Mill Valley 94941
415 383-4263
Line: video & lighting equip
Strand Century see ad pg 61
Unimedia see ad pg 107

DAN J SOFIE

7119 Pomelo Drive
Canoga Park 91307
213 884-6269
Line: video proc equip

SOUND DYNAMICS INC

PO Box 32055
San Jose 95152
408 926-3588
Line: audio components
Micro-Trak see ad pg 98

SOUND DYNAMICS, INC

PO Box 1335
Sunnyvale 94088
408 926-3588
Line: audio components
see ad pg 182

SOUND GENESIS INC

445 Bryant St
San Francisco 94107
415 391-8776
Line: audio equip
Auditronics see ad pg 117
MICMIX see ad pg 126

SOUND UNLIMITED SYSTEMS

14724 Ventura Blvd Suite 1204

Sherman Oaks 91403

213 995-1125

Line: audio equip

Micro-Trak see ad pg 98

SPARTA ELECTRONICS CORP

5851 Florin Perkins Rd
Sacramento 95828
916 383-5353
Line: audio equip
Micro-Trak see ad pg 98

SPECTRA SONICS

6430 Sunset Blvd Suite 1117
Hollywood 90028
213 461-4321
Line: audio components, equip
Spectra Sonics see ad pg 166

SPECTRUM ASSOCIATES, INC

1823 E 17th St
Santa Ana 92711
213 323-0603
Line: audio components
Tech-Labs see ad pg 160

STUDER REVOX AMERICA INC

14046 Burbank Blvd
Van Nuys 91401
213 780-4234
Line: full line audio
Studer Revox see ad pg 51

STUDIO MAINTENANCE SERVICES

12438 Magnolia
N Hollywood 91607
213 877-3311
Line: audio equip
MICMIX see ad pg 126

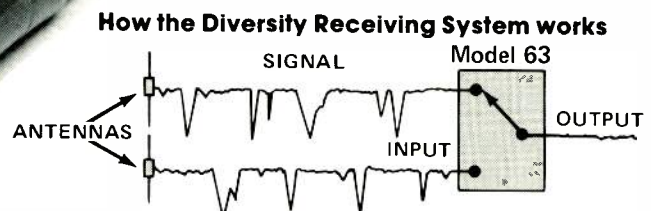
TABER MFG & ENG

2081 Edison Ave
San Leandro 94577
415 635-3831
1227 N Vine Street
Hollywood 90038
213 464-5108
Line: audio components

continued on page 142

The Ultimate in Wireless Microphone Systems

Vega's new Model 63 Diversity Receiving System virtually eliminates problem noise and signal dropouts that are occasionally encountered when a wireless microphone system is used on a set, in studios, and in theatres. Moreover, because excellent soundtracks can be obtained from fully concealed wireless mics, much of the tedious dialogue looping on taped programs is no longer necessary. When used with any of Vega's fine wireless transmitters, the audio is like a hardwired connection. Of course, Vega's Diversity Receiving System will improve the performance of any brand VHF wireless mic. It's no surprise that the Model 63 Diversity Receiving System is being used by all major network studios. Try one, and see what it can do for you.



The Model 63 Diversity automatically switches electronically to the strongest signal, i.e. eliminating signal dropouts.

Vega

a division of Cetec Corporation
9900 Baldwin Place, El Monte, CA 91731 • (213) 442-0782 • TWX, 910-587-3539

Circle 209 on Reader Service Card

Your best buy in small screen monitors



Everyone makes large monitors-but we're the leader in small screen units.

Setchell 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 Setchell 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 Setchell Carlson.
Made in America.

SC ELECTRONICS, INC.
A SUBSIDIARY OF AUDIOTRONICS CORPORATION

530 5th AVE. NW. NEW BRIGHTON, MN. 55112 (612) 633-3131

Circle 210 on Reader Service Card

REPS/DISTS

TECH-REP ASSOC

PO Box 6103
Hayward
415 785-4531
Line: audio components

TELAUDIO CENTER

7471 Meerose Ave
Los Angeles 90046
213 276-2726
Line: full line video equip
Microtime see ad pg 121

TELERGY

2412 Charleston Rd
Mountain View 94043
415 067-6281

TELEVISION ASSOCIATES

2410 Charleston Rd
Mountain View 94043
415 967-6040
Line: full line video & audio equip
Dynasciences see ad pg 170

TOTAL VIDEO SERVICE

405 Chester Ave
Bakersfield 93301
805 324-7239
Line: video equip
Microtime see ad pg 121

TREGO SALES CO

2239 Benedict Canyon Dr
Beverly Hills 90210
213 274-8351
Line: audio equip

TRI TRONICS INC

4019 Tujunga Ave
N Hollywood 91604
213 985-6616
Line: video equip
Ikegami see ad pg 11
Unimedia see ad pg 107

UNITED MEDIA INC

1571 Parkway Loop Unit D
Tustin 92608
714 431-3011
150 Old Adobe Way
Los Gatos 95030
408 866-9484
Line: audio equip
Unimedia see ad pg 107

VARIAN ASSOC

2901 Wilshire Blvd Suite 102
Santa Monica 90403
213 828-5588
4940 El Camino Real
Los Altos 94022
415 968-7630
611 Hansen Way
Palo Alto 94303
415 493-4000

Line: full line components & tubes; microwave
Varian see ad pg 17

VEGA

9900 Baldwin Pl
El Monte 91731
213 442-0782
Line: mics
Vega see ad pg 140

VIDEO EQUIPMENT CORP

7377 Convoy Ct
San Diego 92111
714 278-4400
Line: audio & video equip, lighting equip
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152
Strand Century see ad pg 61
Unimedia see ad pg 107
Videotek see ad pg 157

VIDEO LOGIC SERVICES INTL

PO Box 1434
Los Gatos 95030
408 356-1031
Line: full line video equip
Dynasciences see ad pg 170

VIDEO MEDIA

250 Wolfe Rd
Sunnyvale 94086
Line: video & lighting equip
Strand Century see ad pg 61
Unimedia see ad pg 107

VIDEO SYSTEMS INC

12530 Beatrice St
Los Angeles 90066
213 871-0677
Line: video equip, lighting equip
Dynasciences see ad pg 170
Strand Century see ad pg 61
Unimedia see ad pg 107

VIF INTERNATIONAL

1151 Viscaino Ave
Sunnyvale 94038
408 739-9740
Line: audio components & proc equip

WESTATES ELEC

20151 Bahama St
Chatsworth 91311
213 341-4411
Line: electronic components

WESTERN AV SYSTEMS

122 Cajon St
Redlands 92373
714 793-2905
Line: video equip
Unimedia see ad pg 107

WESTLAKE AUDIO

6311 Wilshire Blvd
Los Angeles 90048
213 655-0303
Line: full line audio equip

Auditronics see ad pg 117
MICMIX see ad pg 126

YH ASSOCIATES

15352 Stanford Lane
Huntington Beach 92647
714 893-9487
Line: audio equip

COLORADO

AUDIO-VIDEO SYSTEMS INC

Robt Pechar
3390 Peoria Suite 306
Aurora 80010
303 341-9994
Line: audio & video equip
Knox see ad pg 158
Unimedia see ad pg 107

B&B ELECTRONICS

884 S. Lipan
Denver 80223
303 934-2123
Line: sound systems

B&B ELECTRONIC PRODUCTS INC

500 Quebec S
Denver 80237
303 733-6700
Line: audio equip
Vega see ad pg 140

CEAVCO AUDIO VISUAL

7475 W 16th Ave
Denver 80215
303 238-6493
Line: video equip
Microtime see ad pg 121

CENTENNIAL ENTERPRISES

711 Vallejo St
Denver 80204
303 534-2228
Line: video equip
Video Aids see ad pg 153

DAVIS AUDIO-VISUAL INC

1801 Federal Blvd
Denver 80204
303 455-1122
Line: video & lighting equip
Strand Century see ad pg 61

DIDIER/DENVER

PO Box 1599
Evergreen 80439
303 674-6000
Line: full line audio & video equip
3M Mincom see ad pg 75
Kodak see ad pg 13
TFT see ad pg 169

TFT TIME & FREQUENCY
TECHNOLOGY INC.

**TRANSMITTER
REMOTE CONTROL
SYSTEMS**

DIDIER/DENVER

674-6000

Evergreen, CO 80439

DIMENSIONS ELECTRICAL

PO Box 531
Denver 80201
303 893-3313
Line: lighting equip
Strand Century see ad pg 61

ELECTRO TEK

Box 395
Westminster 80030
303 623-3370
Line: audio components, systems
Robins see ad pg 165

GRIFCO

PO Box 1171
Suite 102 W Littleton Blvd
Littleton 80210
303 795-1989
Line: recorders and audio components

HIGHLAND ASSOC

80 Garden Office Ctr.
1380 W. Midway Blvd
Broomfield 80020
303 854-2003
Line: full line audio & video equip
Ramko see ad pg 130, 131
Micro-Trak see ad pg 98

HP MARKETING

2530 W Church Ave
Littleton 80120
303 794-8367
Line: audio & test equip
Orban/Parasound see ad pg 148

INTER-MOUNTAIN VIDEO SYSTEM

2635 S Santa Fe Dr
Denver 80223
303 744-2724
Line: video & lighting equip
Strand Century see ad pg 61



Still the industry's MOST WANTED

VIDEO TAPE TIMER

- Bright LED display
- More accurate tape time
- Optional remote display
- Hold button freezes display
- Available for all 2-inch VTRs



RECORTREC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

Circle 211 on Reader Service Card

McCLOUD & RAYMOND CO

2020 S Pontiac Way
Denver 80222
303 756-1589
Line: audio equip
Telex see ad pg 93, 96

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 pg 160

PAR ASSOC

7305 Spring Ct
Boulder 80303
303 499-4736
Line: test instruments
Marconi see ad pg 99

RIA CORPORATION

430 Garland St
Lakewood 80226
303 238-2593
Line: TV broadcast equip
Duca Richardson see ad pg 89

SCIENTIFIC INSTRUMENTS

5765 Logan Suite 206
Denver 80216
303 623-6447
Line: video equip
Cohu see ad pg 97

VIDEO SERVICES

1805 S Bellaire St #100
Denver 80222
303 753-0887
Line: full line video equip
Dynasciences see ad pg 170

CONNECTICUT**JOHN B ANTHONY**

922 High Ridge Rd
Stamford 06905
203 322-9202
Line: full line audio equip
Amber see ad pg 136
Orban/Parasound see ad pg 148

AUDIO/TECHNIQUES INC

142 Hamilton Ave
Stamford 06902
203 359-2312
Line: full line audio equip, recording accessories imported and domestic
MCI see ad pg 26, 27
MICMIX see ad pg 126

BURNS ELECTRONIC SECURITY INC

735 Route 5
S Windsor 06074

203 528-2186

Line: full line audio & video equip
Dynasciences see ad pg 170
Unimedia see ad pg 107
Videotek see ad pg 157

CONCORD COMMUNICATIONS DIV

Auvitel Systems Corp
76 Main St Box 825
Norwalk 06852
203 846-9575
Line: video & audio equip
Unimedia see ad pg 107

DENSON ELECTRONICS CORP

Longview St
Rockville 06066
603 434-0731
Line: video equip
Unimedia see ad pg 107

ENTERTAINMENT PRODUCTS

PO Box 11129
Newington 06111
Line: audio components
Micro-Trak see ad pg 98

H&B SYSTEMS

21 Audio Ln
New Haven 06519
203 777-5301
Line: video & lighting equip
Strand Century see ad pg 61

FRED LOCKE STEREO

60 Woodiawn Rd.
Berlin 06370
Line: audio components
Micro-Trak see ad pg 98

McRAE PATTON INC

28 Gravel St
PO Box 2175
Meriden 06450
203 238-1965
Line: lighting equip
Strand Century see ad pg 61

NBS ASSOCIATES

PO Box 179
106 Main St
Thomaston 06787
203 283-5959
Line: audio components
Tech Labs see ad pg 160

VIDEOPLAY INDUSTRIES

Kinsbury Ave
Rockville 06066
203 872-9195
Line: video equip
Microtime see ad pg 121

DISTRICT OF COLUMBIA

BALATON MARKETING INC
PO Box 17435

Washington 20041

703 471-1764
Line: audio equip

BRENNER CINE-SOUND

5215 Wisconsin Ave NW
Washington 20015
Line: sound & film equip
Strand Century see ad pg 61

COMREX CORP

PO Box 17011
Dulles Intl Airport
Washington 20041
Line: full line video equip
Dynasciences see ad pg 170

ENGINEERING SERVICE ASSOC

1500 Massachusetts Ave NW
Washington 20005
202 659-5800
Line: tower hardware
Philadelphia Resins see ad pg 154

McBEE LABORATORIES

5151 Wisconsin Ave NW
Washington DC 20016
202 244-2345
Line: TV systems, equip
NEC see ad pg 132
Unimedia see ad pg 107

PROFESSIONAL PRODUCTS INC

4964 Fairmont Ave
Bethesda 20014
301 933-3451
Line: full line video equip

FLORIDA**AUDIO VISUAL SERVICES**

5484 Jet Port Industrial Blvd
Tampa 33614
813 884-1461
Line: audio components

BCS ASSOC INC

940 N Fern Creek Ave
Orlando 32803
305 896-4881
Line: measuring equip, monitors, audio & video equip
Cohu see ad pg 97

RG BEATTIE

6300 15th St No
St Petersburg 33702
813 525-4206
Line: radio equipment

BREIT TOWER SERVICE

Dinner Key Marina
Miami 33133
305 858-3143
Line: tower hardware
Philadelphia Resins see ad pg 154

FTC BREWER CO

PO Box 8057
Town & Country Plaza
Pensacola 32505
904 433-7932
Line: audio equip, transmitters
Micro-Trak see ad pg 98

BROADCAST EQUIPMENT CORP

744 Nest Church St
Orlando 32805
305 423-8299
Line: full line broadcast equip
Microtime see ad pg 121

CONTINENTAL ELECTRONICS WHOLESALE CORP

2922 N State Rd 7
Margate 33063
305 971-4950
Line: electronic components
Micro-Trak see ad pg 98

CONTROLLED TECHNOLOGY INC

2513 Tortugas Lane
Ft Lauderdale 33312
305 587-2716
Line: full line audio & video equip

FLAGLER RADIO CO

1068 W Flagler St
Miami 33130
305 373-6548
Line: audio components, equip
Micro-Trak see ad pg 98

FLORIDA VIDEO SYSTEMS

14422 NW 7th Ave
Miami 33168
305 688-6618
5089 NE 12th Ave
Ft Lauderdale 33334
305 771-4784
Line: video & lighting equip
Microtime see ad pg 121
Strand Century see ad pg 61

GRA-MAR INC

McCrary Pl
Orlando 32814
305 894-3351
Line: antennas, RF & test equip

GRICE ELECTRONICS

320 E Gregory
Pensacola 32501
904 434-2481
Line: full line audio/video equip
Micro-Trak see ad pg 98

HARRIS CO

633 Shenandoah
Miami 33145
305 854-2003
Line: audio equip
Micro-Trak see ad pg 98

continued on page 144



Still the industry's MOST POPULAR

VIDEO TAPE CONDITIONER

- Cleans and winds tapes
- Prolong tape life and reduce dropouts
- Extend VTR head life
- Hundreds installed worldwide
- Leasing program available

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

Circle 212 on Reader Service Card

REPS/DISTS

LP HENCH CO
9900 Richmond Ave
SW 168th St
Miami 33157
305 251-4343
Line: audio products

HUTTO-HAWKINS-PEREGOY INC
PO Box 1277
Maitland 32751
305 831-0256
Line: audio equipment

IMAGE DEVICES INC
1825 NE 149th St
Miami 33181
305 945-1111
Line: video & audio equip
Vega see ad pg 140

J&J ELECTRONICS
5855 Johnson St.
Hollywood
305 989-7111
Line: video production switchers, pulse & distribution amps, routing switchers, special effects generators
Unimedia see ad pg 107

LAUDERDALE ELECTRONICS LABS
16 SW 13th St
Ft Lauderdale 33315
305 764-7755
Line: audio components
Micro-Trak see ad pg 98
Ramko see ad pg 130, 131

LEE FLORIDA INC
PO Box 672
Winter Haven 33880
813 294-5815
Line: full line broadcast equip
Marconi see ad pg 99

LYKES ELECTRONICS CORP
1800 NW 23rd St
Miami
5426 W Crenshaw
Tampa 33622
813 886-6621
Line: full line audio & video equip
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152
Unimedia see ad pg 107

MANREP CORP
PO Box 4808
Miami Lakes 33014
Line: audio components
Micro-Trak see ad pg 98

MIDWEST TELECOMMUNICATIONS
3331 NW 82nd Ave
Miami 33122
305 592-5355
Line: audio & video equip, lighting equip

Strand Century see ad pg 61
Unimedia see ad pg 107

MORT PRESS
1800 San Souci Blvd Suite 305
N Miami 33161
305 895-2262
Line: video components, equip
Video Aids see ad pg 153

JERRY NORDSIEK
705 Bowie Blvd
Orange Park 32073
904 269-2544
Line: video equip

PANAMEX CO
1006 Seybold Bldg
Miami 33132
305 374-7330
Line: audio equip
Micro-Trak see ad pg 98

PHOTOMART
6237 S Orange Ave
Orlando 32809
305 851-2780
Line: video equip, lighting equip
Strand Century see ad pg 61

ORBEX CORP MIAMI
9719 S Dixie Hwy S-12
Miami 33156
Line: audio components
Micro-Trak see ad pg 98

REPELECT
Box 7102
Tampa 33603
813 277-5051
Line: audio & video equip, transmitters
Robins see ad pg 165
Sound Technology see ad pg 25
TFT see ad pg 169

REYNOLDS & ASSOC
476 North A1A-Suite 1A
Satellite Beach 32937
305 773-4700
Line: audio components
Tech Labs see ad pg 160

SAVE PRODUCTIONS INC
218 Willowick Ave
Temple Terrace 33617
Line: audio components
Micro-Trak see ad pg 98

SOUTHEAST ELECTRONICS
1125 Rouselle St
Jacksonville 32203
904 356-3007
Line: full line of audio/video equip
Auditronics see ad pg 117
Micro-Trak see ad pg 98
Ramko see ad pg 130-131
Unimedia see ad pg 107

STEREO SONICS LABORATORIES
117 Robin Road

Altamonte Springs 32701
305 831-2575
Line: audio components
Micro-Trak see ad pg 98

TECHNOLOGY MKTG ASSOC
1010 E Atlantic Blvd
Pompano Beach 33061
305 942-0774
Line: electronic components tubes

UNITED ASSOC
2945 Bay St
Gulf Breeze 32561
904 932-5670
2925 Seminole St
Miami 33133
305 856-6749
320 W Park Dr
PO Box 2454
Ft Lauderdale 33315
305 523-0308
5020 Cypress St Suite 214
Tampa 33607
813 877-6091
PO Box 2308 J
119 Seewald St
Jacksonville 32203
904 354-5985
Line: video & lighting equip
Strand Century see ad pg 61

TOOL-TRONICS
PO Box 1611
Zephyrhills 33359
813 782-7177
Line: tower hardware
Philadelphia Resins see ad pg 152

WORLD ELECTRONICS INC
18917 NE 5th Ave
Miami Beach 33160
305 949-8918
Line: audio equip
MCI see ad pg 26,27
MICMIX see ad pg 126

JIM WOOLWORTH
2513 Tortugas Ln
Ft Lauderdale 33312
305 587-2716
Line: radio equip

WORLD WIDE PRODUCTS
PO Box 279
Miami 33168
305 754-5475
Line: audio components, equip, tape recorders
Telex see ad pg 93,96

GEORGIA

ANIXTER-PRUZAN
4303 Pleasantdale Rd
Atlanta 30340
404 449-6533

Line: Sony studio video equip, full line of CATV equip, cable construction accessories, tools, head end, passives, test equip, power supplies

ATLANTA FILM EQUIP RENTALS
1848 Briarwood Rd NE
Atlanta 30329
404 633-4101
Line: film & lighting equip
Strand Century see ad pg 61

BCS ASSOCS
2522 Tanglewood Rd
Atlanta 30033
404 321-0980
Line: full line video equip

FRANK BENSON
11520 Bowen Road
Roswell (Atlanta) 30075
Line: video heads, recorder components

CALHOUN COMPANY
121 Forrest Ave NE
Atlanta 30303
404 659-0750
6000 Peachtree Rd NE
Atlanta 30329
404 636-3096
Line: full line video/audio & lighting equip
Dynasciences see ad pg 170
Strand Century see ad pg 61
Unimedia see ad pg 107
Videotek see ad pg 157

CAVENDISH SALES CO
2737 Fountainbleau Dr
PO Box 47331
Atlanta 30360
Line: audio & video equip
Robins see ad pg 165
Video Aids see ad pg 153

DEAN COOPER CO
2387 Interstate 85 Suite 2
Access Rd
Norcross 30071
Line: audio equip

D&O SALES INC
3819 Oakcliff Industrial Court
Atlanta 30340
404 448-1701
Line: recorders, equip

GEORGIA BROADCASTING
Box 13646
Savannah 31406
912 354-4000
Line: audio components
Ramko see ad pg 130,131

GRADY DUCKETT SALES
PO Box 20967
Atlanta 30329
404 451-3529
Line: audio systems, components



RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

Still the industry's MOST USEFUL

VIDEO TAPE ADDRESSOR

- Off line time code writer
- Records at 8 times speed
- Writes both control and cue
- Saves VTR time and heads
- Cleans and rewinds tape

Circle 213 on Reader Service Card

ELECTRONIC EQUIPMENT INC
526 Plaster Ave NE
Atlanta 30324
404 873-5841
Line: audio components & equip
Industrial Sciences see ad pg 152
Micro-Trak see ad pg 96
Unimedia see ad pg 107

FIDELICOM INC
PO Box 80644
Chamblee Station
Atlanta 30341
404 458-3616
Line: audio equip, test equip
Sound Technology see ad pg 25

GRAY COMMUNICATIONS
1709 Stuart Ave
Albany 31707
912 435-8386
Line: audio & video equip, video systems
Dynasciences see ad pg 170
Ikegami see ad pg 11
Unimedia see ad pg 107

GRADY DUCKETT SALES
Box 29067
Atlanta
404 451-3529
Line: audio & video components
Tech Labs see ad pg 160

C HARRISON ASSOCS
6695 Peachtree Blvd #107
Atlanta 30341
404 449-7696
Line: audio & video equip
Vega see ad pg 140
Videotek see ad pg 157

PAUL HAYDEN ASSOC
PO Box 90668
1530 Mabel Ave
East Point 30364
404 766-0261
Line: video equip
Video Aids see ad pg 153

CHARLES JOHNSON
1213 Lake Hearn Pl NE
Atlanta 30319
404 255-2202
Line: video & lighting equip
Strand Century see ad pg 61

AIRE LANDRUM
2390 Tiffany Circle
Decatur 30032
404 289-8928
Line: video equip

MILLAR ELECTRONICS INC
PO Box 12137
Northside Station
Atlanta 30305
404 261-6160
Line: audio equip
Shure see ad pg 53

RADFORD ASSOCS
Lew Radford
3203 Lanier Drive
Atlanta 30319
404 237-6097
Line: full line audio & video equip
Micro-Trak see ad pg 98
TFT see ad pg 169

SYSTEMS ENGINEERING CO
PO Box 49224
Atlanta 30329
404 482-2446
Line: audio components
Micro-Trak see ad pg 98

TECHNICAL SYSTEMS REPS
2065 Peachtree Ct
Chamblee 30341
404 457-0426
Line: audio equip
Orban/Parasound see ad pg 148
Telex see ad pg 93,96

TRACKSIDE ENGINEERING
661 San Fernando Dr
Smyrna 30080
404 436-3024
Line: audio equip
MICMIX see ad pg 126

D TUTTLE
Marietta 30062
404 433-1570
Line: video equip

VISUAL SYSTEMS
3870 N Peachtree Rd
Atlanta 30341
404 457-1388
Line: video equip
Microtime see ad pg 121

HAWAII

ATTCO
2855 Koapaka St
Honolulu 96819
808 841-0991
Line: video & lighting equip
Strand Century see ad pg 61

MATT CABOT & ASSOC
PO Box 3780
1210 Auahi St #120
Honolulu 96814
808 533-1867
Line: video & lighting equip
Strand Century see ad pg 61

JAMES CHANG
190 S King St
Honolulu
808 531-2165
Line: audio and video equip

ELECTRONIC SYSTEMS INC
875 Waimana St Suite 500
Honolulu 96813
808 533-3848
Line: full line of audio/video equip
Microtime see ad pg 121
Unimedia see ad pg 107

EMC CORP
Dave Caldwell
2979 Ualena St
Honolulu 96819
808 847-1138
Line: video equip
Knox see ad pg 158

LEE GABER CO
PO Box 8237
Honolulu 96815
808 839-9059
Line: full line audio equip
Robins see ad pg 165
Vega see ad pg 140

HAWAII BROADCAST ASSOCS
PO Box 1344
Honolulu 96807
Line: broadcast equip
Microwave Assoc see ad pg 87

JC ELECTRONICS
190 S King St
Suite 976
Honolulu 96813
808 537-6787
Line: audio equip

OMEGA ASSOCS INC
10700 Lyndale Ave S
Honolulu 96813
808 533-7655
Line: measuring equip

PACIFIC MEDIA CONSULTANTS
1001 Dillingham Blvd Suite 207A
Honolulu 96817
808 841-4021
Line: audi & video equip
McMartin see ad pg 163

ILLINOIS

ALL MEDIA SALES CO
6-S-130 Park Meadow Dr
Naperville 60540
312 420-0429
Line: video equip
Video Aids see ad pg 153

J D ALYN
419 S Bruner St
Hinsdale 60521
312 325-0495
Line: audio & broadcast equip
Modular Audio see ad pg 159

ANCHA ELECTRONICS
189 Gordin Street
Elk Grove Village 60007
312 437-7712
Line: audio components
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152
Ramko see ad pg 130,131
Unimedia see ad pg 107

BW ASSOCIATES
55 West Erie Suite 1E
Chicago 60611
312 266-2086
Line: audio components

BELL & HOWELL
2411 Howard St
Evanston 60645
312 869-9393
Line: full line film & video equip
Microtime see ad pg 121

BSC INC
2932 River Rd
River Grove 60171
312 452-5551
Line: audio equip
Modular Audio see ad pg 159

CRIMSON ENGINEERING CO
PO Box 286
Glenview 60025
312 724-1780
Line: audio equip
Tech Labs see ad pg 160

VICTOR DUNCAN INC
676 St Clair St
Chicago 60611
312 321-9406
Line: photo equip & supplies, lighting equip
Strand Century see ad pg 61

EMD
3722 W North Ave
Chicago 60647
312 486-0062
Line: electronic components

HELIX LTD
679 N Orleans
Chicago 60610
312 944-4400
Line: video & lighting equip
Strand Century see ad pg 61

RAY R HUTMACHER ASSOC INC
7205 W Pratt Ave
Chicago 60631
312 631-3248
Line: audio components, communications equip; tape recorders
Robins see ad pg 165

M LANG
Hoffman Estates 60195
312 882-3336
Line: video equip

continued on page 146

R-MOD for Your VTR

Still the industry's MOST IMPROVED

available

VR-1200 TR-22
VR-2000 TR-70
AVR-2 TR-600

VIDEO TAPE RECORDER

- Faster and gentler shuttling
- Faster lockup, consistently
- Auto-Cue for exact cueing
- Auto-Edit for simple edits
- Prolongs head and tape life

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

Circle 214 on Reader Service Card

REPS/DISTS

WILLIAM M LINZ ASSOC

6526 N Lincoln Ave
Lincolnwood 60645
312 677-2000

Line: audio equip; components
Telex see ad pg 93,96

McCURDY RADIO IND INC

1711 Carmen Dr
Elk Grove Village 60007
Line: audio tape & accessories
Aristocart see ad pg 24

MEADE ELECTRONICS CO INC

3100 S 25th Street
Broadview 60153
312 278-2800
Line: audio components
Dynasciences see ad pg 170

MIDWEST SOUND CO

4346 W 63rd St
Chicago 60629
312 767-7272
Line: Audio equip
Auditronics see ad pg 117

MILAM AUDIO CORP

1504 North 8th Street
Pekin 61554
309 346-3161
Line: audio components, equip;
recorders
MCI see ad pg 26,27
MICMIX see ad pg 126

KENNETH MEYERS

7442 N. Harlew
Chicago 60648
312 774-6440
Line: test instruments
Marconi see ad pg 99

THEODORE PAPPAS & ASSOC

5218 W Diversey Ave
Chicago 60639
312 685-2338
Line: audio equip
Orban/Parasound see ad pg 148
Vega see ad pg 140

PRO AUDIO LTD.

PO Box 730
Barrington 60010
312 381-4559
Line: audio equip

PROFESSIONAL AUDIO SYSTEMS

PO Box 335
Lisle 60523
312 381-4559
Line: audio equip
Auditronics see ad pg 117

QUALITY CONTROL SOUNDS

1 N 44th St

Belleville 62223

Line: audio components
Micro-Trak see ad pg 98

IRVING ROSE ASSOCS

8137 Ridgeway Ave
Skokie 60076
312 674-6790
Line: audio and video equip
MICMIX see ad pg 126
Sound Technology see ad pg 25

ROSCOR CORP

6160 W Oakton St
Morton Grove 60054
312 539-7700
Line: full line video equip
Duca Richardson see ad pg 89
Ikegami see ad pg 11
Industrial Sciences see ad pg 152
Microtime see ad pg 121
Unimedia see ad pg 107

HOWARD SPRACKLEN

905 S Neil St
Champaign 61820
Line: video equip
Unimedia see ad pg 107

SWIDERSKI ELECTRONICS

5456 N Milwaukee Ave
Chicago 60630
312 775-3232
Line: audio & video equip, lighting
equip
Dynasciences see ad pg 170
Strand Century see ad pg 61
Unimedia see ad pg 107

UNITED ILLUMINATION INC

6232-40 Oakton St
Morton Grove 60052
312 583-8844
Line: lighting equip
Strand Century see ad pg 61

ZIMMER SALES, INC.

PO Box 723
1984 No Brighton Lane
Hoffman Estates 60172
312 885-3438
Line: audio equip, recorders

ZENITH CINEMA

3252 W Foster
Chicago 60625
Line: full line audio equip
Auditronics see ad pg 117

INDIANA

ALLIED BROADCAST EQUIP

124 S 6th St
Richmond 47374
317 962-8596
Line: audio equip for radio
Ramko see ad p 130,131

PR ANGRICK ASSOC

523 E 39th St
Indianapolis 46205
317 925-3567
Line: lighting equip
Strand Century see ad pg 98

AUDIO EQUIPMENT CO

526 E Indiana Ave
South Bend 46613
Line: audio components
Micro-Trak see ad pg 98

COMMUNICATIONS SYSTEMS

1338 Mishawaka Ave
South Bend 46615
219 289-6709
Line: video equip
Unimedia see ad pg 107

GRAHAM ELECTRONICS

133 South Penn St
Indianapolis 46204
Line: audio components
Micro-Trak see ad pg 98

HUTCH AND SON INC

300 N Main Street
Evansville 47711
812 425-7155
Line: electronic components

INDIANAPOLIS VIDEO

6226 LaPas Trail
Indianapolis 46268
317 293-3313
Line: video equip, lighting equip
Strand Century see ad pg 61

JACKSON KEITH AND

ASSOCIATES, INC
PO Box 65
365 Walnut
Zionsville 46077
318 873-4079
Line: audio and test equip
Sound Technology see ad pg 25

KLOPF AUDIO/VIDEO CO

3901 N Meridian St Suite 235
Indianapolis 46208
317 926-3919
Line: audio/video & lighting equip
Strand Century see ad pg 61

MAISH SALES

PO Box 186
500 Madison Steet
Mulberry 46058
217 296-2322
Line: audio & test equip
Sound Technology see ad pg 25

MEADE ELECTRONIC CO

1825 Summer St
Hammond 46320
219 932-2100
Line: audio & video products
Dynasciences see ad pg 170
Unimedia see ad pg 107

MEPCO/ELECTRA

PO Box 2207
Fort Wayne 46802
219 432-8567
Line: electronic components, tubes

KENNETH MEYERS CO

3512 Rockville Rd
Indianapolis 46222
317 243-6681
Line: test equip; TV & radio equip
Marconi see ad pg 99

DALE A MILLER & ASSOC

124 E Main St
Crawfordsville 47933
317 362-6348
Line: electronic components, tubes

RA-DIS-CO, INC

814 N Senate Ave
Indianapolis 46202
317 637-5571
Line: full line broadcast equip
Micro-Trak see ad pg 98

SUKUP & COX INC

2070 E 54th St
Indianapolis 46220
317 253-5501
Line: audio components & equip
Telex see ad pg 93,96

PAUL STONE SALES CO

5257 W Tacoma Ave Suite 6
Indianapolis 46220
317 257-4277
Line: audio components; test equip
Amber see ad pg 136

IOWA

BEAMS INC

2318 (14B) Harding Rd
Des Moines 50314
515 255-1148
Line: audio equip
Vega see ad pg 140

IOWA AUDIO VISUAL

2740 30th St
Des Moines 50310
515 279-3672
Line: video equip
Unimedia see ad pg 107

KIMIAN SALES CO

1804 Sycamore St
Atlantic 50022
712 243-1626
Line: audio components; equip
Telex see ad pg 93,96

LORENZ SALES INC

Suite 302
Executive Plaza
Cedar Rapids 52402



Still the industry's MOST DESIRED

VIDEO TAPE EVALUATOR

- Tape evaluation at 16 times speed
- Cleans and winds tapes
- Standard in the industry
- World wide customer base
- Leasing program available

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

Circle 215 on Reader Service Card

319 393-6912
Line: electronic components, tubes

MASTERTONE CO
1105 Maple St
West Des Moines 50285
515 274-2551
Line: full line audio equip; transmitters, monitors
Micro-Trak see ad pg 98

PACER CORP
1714 Beaver Ave
Des Moines 50310
515 274-3224
Line: video equip
Video Aids see ad pg 153

VIDEO MIDWEST
3814½ Douglas Ave
Des Moines 50310
515 244-1447
Line: video & lighting equip
Microtime see ad pg 121
Strand Century see ad pg 61

KANSAS

B C ELECTRONIC SALES
11495 Lenaxa Dr
Olathe 66061
913 888-6680
Line: electronic components, tubes

BEAMS INC
11503 W 75th St
Shawnee Mission 66214
913 631-0301
Line: audio equip
Vega see ad pg 140

CENTREX AUDIO VISUAL
1234 Lane
Topeka 66602
913 232-7701
Line: audio & video equip
Microtime see ad pg 121

A K ELLIOTT CO
PO Box 6129
Leawood 66206
913 649-0654
Line: audio products

WILLIAM MENEZES & ASSOCS
9604 Nall St
PO Box 7070
Overland Pk 66207
913 649-2680
Line: audio and video equip
Sound Technology see ad pg 25

MERCER-ZIMMERMAN
1024 Hoel Pkwy
Kansas City 66102
913 621-5405
Line: lighting equip
Strand Century see ad pg 61

PACER CORP
8511 W 69th St
Shawnee Mission 66204
816 358-6638
Line: video equip
Video Aids see ad pg 153

KENTUCKY

AMERICAN SOUND & ELECTRONICS
675 W Third St
Covington 41011
606 261-9024
Line: video and audio equip
Unimedia see ad pg 107

CENTURY SOUND & RECORDING
3029 Oregon St
Paducak 42001
502 554-2722
Line: audio equip
Auditratics see ad pg 117

BRUCK L DAWSON
7105 Greenlawn Rd
Louisville 40222
502 426-4022
Line: video equip, cameras, lenses
Knox see ad pg 158
Video Aids see ad pg 153
Videotek see ad pg 157

SHELDON STORER AND ASSOC
1402 Highland Pike
Covington 41011
606 331-4470
Line: lighting equip
Strand Century see ad pg 61

LOUISIANA

AUDIOMEDIA ASSOCS
PO Box 29264
New Orleans 70189
504 586-0140
Line: audio components, radio transmitters
Micro-Trak see ad pg 98

JASPER EWING & SONS INC
1904 Poydras
New Orleans 70112
504 525-5257
Line: lighting equip
Strand Century see ad pg 61

FAUST-FISHER ASSOC
1328 Dante St
New Orleans 70118
PO Box 13621
New Orleans 70185
504 861-3656
Line: lighting equip
Strand Century see ad pg 61

INTERSTATE SCHOOL SUPPLY
2918 Neal Dr
Pineville 71360
2901 Earhart Ave
New Orleans 70131
1835 River Rd N
Baton Rouge 70821
504 387-5131
Line: audio & visual equip
Unimedia see ad pg 107

LYKES ELECTRONICS
5745 Jefferson Hwy
New Orleans 70123
Line: audio & video equip
Dynasciences see ad pg 170

MAR ELECTRONICS
3521 E Louisiana State Dr
Kenner 70062
504 729-4524
Line: full line audio & video equip
Micro-Trak see ad pg 98

W J MONROE
8427 Ridgemont Drive
Pineville 71360
318 640-3412
Line: radio equip

MAINE

DON STOCKLESS
104 Hillside Ave
S Portland 04106
207 799-6050
Line: lighting equip
Strand Century see ad pg 61

DOW HEBERT & PLOURDE
PO Box 969
Downtown Mall
Carribou 04736
Line: audio components
Micro-Trak see ad pg 98

MAINE VIDEO
713 Congress St
Portland 04102
207 773-2355
Line: video equip
Microtime see ad pg 121

MG ASSOC
Box 4245 Station A
Portland 04101
Line: video equip
Dynasciences see ad pg 170

MARYLAND

BARTLETT ASSOCIATES, INC
4405 East-West Highway
Bethesda 20014
301 656-3061

Line: video equip, switchers
Cohu see ad pg 97

DAVID H BROTHERS CO
6302 Lincoln Ave
Baltimore 21209
301 764-7189
Line: audio equip; components
Robins see ad pg 165
Telex see ad pg 93,96

C M BEVERAGE
10104-M Woodlake Drive
Cockeysville 21030
301 666-7059
Line: radio equip

JAMES HALE
9026 A Town & Country Blvd
Ellicott 21043
301 465-2556
Line: lighting equip
Strand Century see ad pg 61

HABCO ELECT
603 Alleghany Ave
Towson 21204
301 825-9637
Line: audio, video components
Tech Labs see ad pg 160

INTERNATIONAL SOUND CORP
7102 Milford Industrial Rd
Pikesville 21208
301 484-2244
Line: video equip
Dynasciences see ad pg 170

KNOX LTD
16021 Industrial Dr
Gaithersburg 20760
301 840-1930
Line: video equip
Knox see ad pg 158

LUMAR ASSOC
5801 Annapolis Rd Suite 306
Bladensburg 20710
301 864-0997
Line: video equip
Unimedia see ad pg 107

MIDWEST TELECOMMUNICATIONS
7851 Air Park Dr Unit 210
Gaithersburg 20760
301 840-0050
Line: video & lighting equip
Strand Century see ad pg 61

PIERCE PHELPS INC
10215 Fernwood
Bethesda 20034
301 530-9580
Line: full line video equip, lighting equip
Duca Richardson see ad pg 89
Industrial Sciences see ad pg 152
Strand Century see ad pg 61

continued on page 148



Still the industry's MOST NEEDED

VIDEO CASSETTE EVALUATOR

- High speed cassette tester
- Edge damage counter
- Gross error counter
- Measures cassette length
- Still useful as recorder/player

RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

Circle 216 on Reader Service Card

REPS/DISTS

PROFESSIONAL PRODUCTS INC

4964 Fairmont Ave
Bethesda 20014
301 933-3451
Line: full line video products, lighting equip
Industrial Sciences see ad pg 152
Strand Century see ad pg 61
Unimedia see ad pg 107
Videotek see ad pg 157

RECORDING CONSULTANTS INC

7912 Georgia Ave
Silver Spring 20910
301 565-2270
Line: full line of audio equip
Micro-Trak see ad pg 98

SELINGER & ASSOC

5415 Butler Rd
Bethesda 20016
Line: audio & video equip
Dynasciences see ad pg 170

S&S ASSOCS

4924 Hampden Lane
Bethesda 20014
301 654-1434
Line: test instruments
Marconi see ad pg 99

TE CORP

701 E Gude Dr
Rockville 20850
301 340-0303
Line: video equip

TECHNIARTS

8555 Fenton St
Silver Spring 20910
301 585-1118
Line: audio equip
Modular Audio see ad pg 159

VIDEO SHOWCASE INC

7148 Ambassador Rd
Security Industrial Pk
Baltimore 21207
Line: video equip
Dynasciences see ad pg 170

VPI INC

Light St
Baltimore 21202
301 465-4060
Line: antennas, RF & test equip

WILTRONIX INC

5504 Waterway
Rockville 20853
301 460-1454
Line: broadcast equip & access

MASSACHUSETTS

CRAMER VIDEO

120 Hampton Ave
Needham 02194
617 449-2100
Line: video equip
Unimedia see ad pg 107

CRIMSON CAMERA

60 Landsdown St
Cambridge 02139
603 434-0731
Line: video equip
Unimedia see ad pg 107

JACK FAY INC

270 E Main St
Avon 02322
Line: lighting equip
Strand Century see ad pg 61

GEDER ASSOC

Cross St
Reading 01867
617 944-3105
Line: antennas, RF & test equip

DAN GREEN

3 Buckingham Rd
Newton 02160
617 653-8300
Line: electronic tubes, components

TERRY HANLEY AUDIO

329 Elm St
Cambridge 02139
Line: audio components
Micro-Trak see ad pg 98

HETHERINGTON SALES CO

97 Bogle St
Weston 02193
617 235-5323
Line: audio equip

IMMEDIA SOUND

11 Catherine St
Worcester 01608
Line: audio components
Micro-Trak see ad pg 98

INDUSTRIAL COMPONENTS CORP

2551 Boston Rd
N Wilbraham 01067
413 596-3854
Line: audio components
Micro-Trak see ad pg 98

INTERSTATE RENTAL SERVICE

384 Amory St
Boston 02130
Line: audio equip, components
Micro-Trak see ad pg 98

JOHNSON ASSOCIATES

148 Linden St
Wellesley 02181
617 235-3977
Line: audio equip

KEN CORP

38 Montvale Ave
Stoneham 02180
617 438-5464
Line: test instruments
Marconi see ad pg 99

LAKE SYSTEMS CORP

55 Chapel St
Newton 02160
617 244-6881
Line: full line audio & video equip, lighting equip
Strand Century see ad pg 61
Unimedia see ad pg 107

LEBOW LABS

424 Cambridge St
Allston 02134
617 782-0600
Line: full line audio & video equip
Auditronics see ad pg 117
Dynasciences see ad pg 170
MICMIX see ad pg 126
Microtime see ad pg 121
Micro-Trak see ad pg 98
NEC see ad pg 132
Videotek see ad pg 157

MALCO ELECTRONICS

5 Wolcott Ave
Lawrence 01843
617 685-4383
Line: video equip
Unimedia see ad pg 107

FRANK McCABE

7 Cobb Terrace
Walpole 02081
617 668-6736
Line: audio components, test equip
Sound Technology see ad pg 25

W McFADDEN

755 Washington St
Annisquam 01930
617 283-7507
Line: radio equip, audio
Ward-Beck see ad pg Cov 4

MULLIN TECHNICAL SALES CO INC

945 Great Plain Ave
Needham 02192
617 444-4780
Line: audio equip

continued on page

Another Limiter?

So ask the cynics. That's why we made the Orban/Parasound 418A special. It's a stereo compressor/limiter/high-frequency limiter system that compresses the dynamic range of complex program material with astonishing subtlety and freedom from side-effects. It simultaneously and independently controls the high frequency energy to protect preemphasized media (like disc, cassette, and optical film) from high frequency overload distortion. It's cleaner than most linear amplifiers (THD at 1 kHz is typically 0.02% for any degree of gain reduction), and stereo tracking is locked-in for life without adjustments.

The 418A is highly "smart" and automatic. There are only three controls that affect the sound quality. This means that the 418A can speed the process for budget-conscious customers (like commercial producers) and bring them back again and again. The 418A is also ideal in the broadcast production studio ahead of the cart recorder, where it guarantees clean carts, free from over-

load and high frequency saturation due to excessive EQ.

The recording studio can use the 418A to generate master tapes which will transfer to disc and cassette gracefully and cleanly. The subtle, dynamic high frequency control means that high frequency equalization can be used more freely than ever before without danger of overload. The cassette duplicator and optical film recorder can condition problem masters to maximize signal-to-noise and eliminate high frequency splatter in these touchy and demanding media.

The Orban/Parasound 418A isn't "just another limiter"—it's a time-saving system that handles chores ordinary limiters can't touch. It's available at your Orban/Parasound dealer.

orban/parasound

680 Beach Street, San Francisco, CA 94109 (415) 673-4544



Circle 217 on Reader Service Card

From the World's largest producer of custom video controllers... new STANDARDS of excellence.



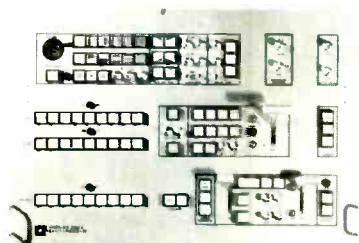
DK 8000

DK8000/VIDEO CONTROLLER

This new system offers features and value unique among video switchers. The DK8000 incorporates a number of advancements including multiplexing, L.E.D. indicators and readouts and keyboard M/E programming for efficient operations. The DK Series has been pre-designed to incorporate a small memory, thus allowing storage and re-call of complex production set-ups. Keyboard M/E programming offers remote operation in which all M/E functions (such as transition mode, time selection, pattern selection and key selections) may be quickly and efficiently entered via the key board. The DK8000 combines aesthetic appearance with optimum control panel operation to produce a powerful video production tool.



SL 5000



SL 3000

SL VIDEO CONTROLLER SERIES

Models are available for single or dual audio editing applications, plus master control, mobile or studio production/post production and on-air applications.

New features include the addition of dual audio to editing models, Rho-Tery wipes, a dual fader arm DSK (with internal color gen and key PVW), *integrated image compression, independent chroma key buffer amplifiers and controls, up to five levels of keying, torque adjustable fader arms, and for the larger production switchers, quad split with input selector.

Other significant features of the SL Series include up to 85 wipe patterns each with adjustable borders (softness, width, color), 10-18-26 inputs including color black and background, provisions for up to 12 external key sources, hybrid format that maximizes the performance to cost ratio, and packaging with front loaded PC boards for ease of access.

Also new in the series this year is the SL1000, "stand alone" downstream mixer-keyer. This device will offer broadcasters the capability to upgrade existing switching systems to include such features as full pattern effects with soft edge and color borders, Rho-Tery wipes, linear chroma keyer, external keying with border/dropshadow effects, program fade to black, etc. The SL1000 DMK is compatible with up to two (2) standard NTSC color signals (1 volt p-p composite) and up to four (4) key sources (0.7 volt p-p non-composite or 1 volt p-p composite).

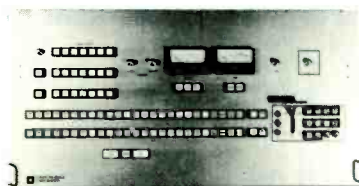
*MCI/Quantel



7243B
custom built for KOTV Tulsa, Ok.

CUSTOM AUDIO/VIDEO CONTROLLERS

The Computer Image Custom Video Controller line provides 36 different basic configurations varying from a simple 10 input 2 bus model to the top of the line 26 input 7 bus model. Each basic system can be equipped from a list of 45 defined options offering a wide choice of effects and system "expanders". These can be supplemented further by special user defined options and configurations, e.g., the addition of custom machine controls or other ancillary monitors and controls. The custom design approach allows the discriminating buyer to design to his own exacting requirements.



SL 2000MC

TECHNICAL AUTOMATION

The A/MC 440 Series automation system is a sophisticated broadcast operation controller offering significant advancements in reliability and simplicity. Because of its modular design, should failure occur, a self diagnostic feature expedites servicing. Other advantages include better system throughput and performance capabilities, such as an optionally available terminal to support production automation. The A/MC 440 Series can be interfaced with a business computer system.

Computer Image
Video Controllers
products of

DIYTEK

DYTEK INDUSTRIES INC.

2475 West Second Ave.
Denver, Colorado 80223
(303) 934-5804

REPS/DISTS

JAMES PIPER & ASSOC
33 Marsh St
Needham 02192
617 449-1144
Vega see ad pg 140

SANDY'S MUSIC & SOUND PROD
1985 Main St
Springfield 01103
Line: audio components
Micro-Trak see ad pg 98

MICHAEL SCOTT CO
20 Walnut St
Wellesley Hills 02181
617 235-0102
Line: audio components; equip
Telex see ad pg 93,96

F M VALENTI
16 Saddle Club Rd
Lexington 02173
617 861-0089
Line: audio equip, video equip, camera lenses
Video Aids see ad pg 153

VALLEY CINEMA/VALLEY SOUND
20 First Ave
Chicopee 01020
Line: audio components
Micro-Trak see ad pg 98

V F SALES, INC
181 Worcester Rd
Route #9
Natick 01760
617 237-6544
Line: audio & video products
Orban/Parasound see ad pg 148

WRIGHT RADIO CO
329 East St
Hingham 02043

Line: audio components
Micro-Trak see ad pg 98

WAHLBERG ASSOC
79 Mystic St
Arlington 02174
617 646-5394
Line: video equip
Videotek see ad pg 157

MICHIGAN

R A ALBRECHT & COMPANY
PO Box 470
4379 Orion Rd
Rochester 48063
313 652-2520
Line: audio components, test equip
Sound Technology see ad pg 25

ALTAIR CORP
PO Box 34 722 Brooks St
Ann Arbor 48103
313 663-8558
Line: audio equip
Micro-Trak see ad pg 98

AUDIO DISTRIBUTORS
2342 Division Ave S
Grand Rapids 49507
616 452-1596
Line: full line of radio equip
Audio Distributors see ad pg 166
Auditronics see ad pg 117
Ramko see ad pg 130,131
Micro-Trak see ad pg 98

COWIE ASSOCIATES INC
1174 E Big Beaver Rd
Troy 48064
313 689-7252
Line: audio equip

CRUSE COMMUNICATIONS CO
4903 Dawn Ave
E Lansing 48823
517 332-3579

Line: video & lighting equip
Strand Century see ad pg 61
Unimedia see ad pg 107

VICTOR DUNCAN INC
11043 Gratiot Ave.
Detroit 48213
313 371-4920
Line: photo supplies & equip, lighting equip
Strand Century see ad pg 61

H M DYER ELECTRONICS
31185 Ten Mile Rd
Farmington Hills 48024
313 478-2157
Line: time stds, audio & video products
Knox see ad pg 158
TFT see ad pg 169

J MALCOLM FLORA INC
PO Box 201
Plymouth 48170
313 453-4296
Line: audio equip

GENERAL TELEVISION NETWORK
13225 Capital Avenue
Oak Park 48237
313 548-2500
Line: audio components, lighting equip, video equip
Microtime see ad pg 121
Strand Century see ad pg 61
Unimedia see ad pg 107

R P HERMES CO
9600 Whittien St
Detroit 48224
313 886-4567
Line: audio & video equip
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152

TOM HOUGHTON
4106 Edgeland
Royal Oak 48073
313 549-6679
Line: audio equip

K L A LABS INC
6800 Chase Rd
Dearborn 48126
313 846-3800
Line: audio equip
Auditronics see ad pg 117

ROBERT MILSK CO
22420 Telegraph Rd
Southfield 48075
313 354-3310
Line: audio components
Robins see ad pg 165

DAN PRICE
4101 Oak Park Drive SE
Grand Rapids 49508
616 455-5529
Line: video equip

RIELY & PETCHELL SALES
25700 Plymouth Rd
Detroit 48239
313 937-3000
Line: audio components; equip
Telex see ad pg 93,96

NORWOOD SCROGGS CO
2221 Arbor Hills Rd
Jackson 49201
517 750-1170
Line: audio components
Tech Labs see ad pg 160

SHALCO INC
23716 Woodward Ave
Pleasant Ridge 48069
313 547-4771
Line: audio products

SOUND PRODUCTIONS INC
5929 Schaefer Rd
Dearborn 48126
313 559-8303
Line: audio equip
Micro-Trak see ad pg 98

V F SALES INC
8244 Dear Creek Ln

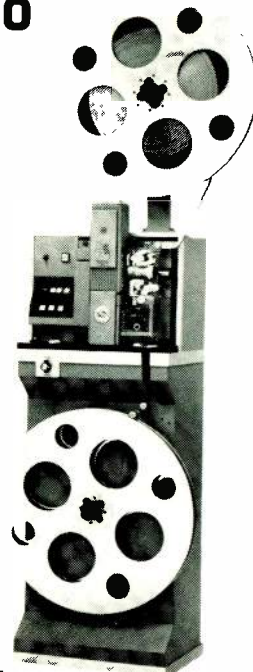
Should you play the same Old Numbers Game? ...or the now generation numbers?

ATHENA® 4000 * ATHENA® 5000

The Athenas give you six more features
than the RCA TP-66 or the EK CT-500:

AT LOWER COST!

1. Freeze-frame, instant start/stop, animation, slo-mo —all direct from film to tape by TV film chain.
2. Digital control CMOS circuitry for complete low-voltage remote control and/or computer control.
3. 115V 60 HZ or 220V 50 HZ
4. Modular digital design for easy service.
5. Extended 2-3 year warranty.
6. Insured against obsolescence—retrofitable to new design improvements and options.



Call or write Pat Smith, Dave Stern or Bob Lawrence
for additional information and/or name of nearest dealer.



L-W INTERNATIONAL
6416 Variel Avenue
Woodland Hills, CA 91367 U.S.A.
Telephone: 213/348-8614 • TWX 910/495-1714

Canton 48187
313 453-8720
Line: audio equip

WOLF ASSOC
15843 Seven Mile Rd W
Detroit 48235
313 835-5190
Line: lighting equip
Strand Century see ad pg 61

MINNESOTA

JOHN E M ANDERSON CO
5231 Humboldt Ave So
Minneapolis 55419
612 823-6459
Robins see ad pg 165

AUDIO KING INC
7101 France Ave S
Minneapolis 55435
612 920-4272
Line: audio equip
MICMIX see ad pg 126

WILLIAM E BAIRD
6317 Aldrich Ave
S Minneapolis 55423
612 861-6228
Line: video proc equip, TBCs

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
Aristocart see ad pg 24
Duca-Richurson see ad pg 89
TFT see ad pg 169

FMI/MAGNATECH CO
3601 Park Center Blvd
Minneapolis 55416
612 920-6677
Line: audio components & equip, FM
monitor equip, transmitters
Micro-Trak see ad pg 98

MEL FOSTER CO INC
7389 Bush Lake Rd
Edina 55435
612 835-2252
Line: audio equip

CLARK R GIBB CO
1311 W 25th St
Minneapolis 55405
612 377-1200
Line: audio, test equip

HMR INC
7200 Frances Ave S
Minneapolis 55434
612 920-8200
Line: video equip
Video Aids see ad pg 153

INTERNATIONAL COMM SUC
235 Borden Ave
Minneapolis 55405
612 335-6812
Line: video equip
Unimedia see ad pg 107

K&M ELECTRONICS
7360 Ohm Lane
Minneapolis 55435
612 835-3080
Line: full line audio & video equip

KODO ASSOCIATES, INC
8100 Penn Avenue S
Minneapolis 55431
612 881-1255
Line: audio components, equip
Sound Technology see ad pg 25

J L LITTLEJOHN
200C West Branch Road

Maple Plain 55359
612 479-2633
Line: radio equip

LUMA SALES ASSOC
3313 N Hwy 100
612 533-8600
Line: lighting equip
Strand Century see ad pg 61

KENNETH MEYERS CO
3601 Park Central Blvd
Minneapolis 55416
612 920-7080
Line: test equip
Marconi see ad pg 99

J NASH
2640 Northdale Blvd
Coon Rapids 55433
612 574-1794
Line: video equip

QUANTUM SALES
7710 Computer Ave
Minneapolis
612 831-8583
Line: video & audio components
Tech Labs see ad pg 160

R C SALES
7127 Willow Rd
Maple Grove 55369
612 425-5543
Line: audio products

RESOURCE MARKETING ASSOC
2636 Humboldt Ave S
Minneapolis 55408
612 374-2832
Line: audio test equip
Amber see ad pg 136

SIEDARE ASSOCS
8836 7th Ave
Minneapolis 55427
612 545-5663
Line: audio components, tubes, elec-
tronic components

SKOR
1821 University Ave
St Paul 55104
612 645-6461
Line: audio products
Vega see ad pg 140

SOUND 80, INC
2709 E 25th St
Minneapolis 55406
612 721-6341
Line: audio components, equip; record-
ing accessories
MCI see ad pg 26,27
MICMIX see ad pg 126

TELEX COMMUNICATIONS
9600 Aldrich Ave S
Minneapolis 55420
612 884-4061
Line: audio equip
Telex see ad pg 93,96

TODD ELECTRONICS
7360 Ohms Ln
Minneapolis 55435
612 835-3080
Line: video equip
Unimedia see ad pg 107

VCI
7601 Washington Ave S
Minneapolis 55435
612 941-6596
Line: video equip
Industrial Sciences see ad pg 152

VIDEO MIDWEST
1907 Hiawatha
Minneapolis 55404
612 338-6825
Line: video & lighting equip
Microtime see ad pg 121
Strand Century see ad pg 61
Unimedia see ad pg 107

continued on page 152

STOP GROUND-LOOP HUM!

VIDEO HUM STOP COIL...HSC 1

Will ELIMINATE HUM and
other INTERFERENCE in
Video Lines caused by dif-
ferences in Ground Potential.

- For Color and Black and White.
- FLAT-DC to 6.5 MHz.
- No Low-Freq. or Hi-Freq. Roll-off.
- No Differential Phase Distortion.
- No Differential Gain Distortion.
- No Envelope Delay.
- Passive Device - Failure Free-Low Price.
- Small Compact Package 4" x 4" x 2-1/4".

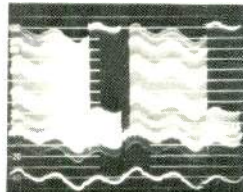
ELIMINATES HUM AND INTERFERENCE:

IN STUDIO

- Between Buildings
- On long runs in Buildings
- Between Studio and Transmitter
- On Incoming Telco circuits
- On Outgoing Telco circuits

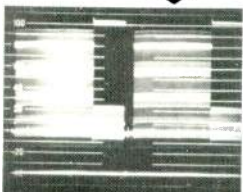
IN FIELD

- Betw. Remote Truck and Telco
- Betw. Remote Truck and Microwave
- For Intertruck Hookup
- For VTR Units
- For Monitoring Lines



NEW!

\$140
F.O.B.
N.Y.



Available on
10 day free trial

AUDIO-VIDEO ENGINEERING COMPANY
65 Nancy Blvd., Merrick, N.Y. 11566
Tel. (516) 546-4239

Circle 220 on Reader Service Card

SEPTEMBER, 1977—BM/E

Video Tape Dupes in a Hurry!

Because we are geared to
turn out eight video cassettes
in the time it takes most folks
to do one, we can give you
a 12-hour turnaround on
most orders for 3/4" video
dupes.

And we give you more than
speed. Our equipment can make
time base corrections that actually improve
the quality of your cassette.

Send for our highly competitive price list
on duplicate cassettes, or just send your
order with master or original tape or film for
C.O.D. shipment.

 **Industrial Audio/Video, Inc.**
Dept. BME
2617 Bissonnet, Houston, Tex. 77005
(713) 524-1956

Circle 221 on Reader Service Card



1-800-874-7590

**YOU CAN DEPEND ON ISI
FOR IMMEDIATE TECHNICAL
AND SALES ASSISTANCE
WHEN YOU NEED IT.**

ISI produces custom video and audio systems built to customer requirements. We encourage the use of our assistance and invite inquiries.

We manufacture quality equipment, reasonably priced, which includes:

**Video Production Switchers
Video Terminal Equipment
Routing Switchers
Audio Consoles
Audio Terminal Equipment
Intercom Systems
Master Control Systems**



INDUSTRIAL SCIENCES, INC.

3521 Southwest 42nd Avenue/P.O. Box 1495
Gainesville, Florida 32602/(800) 874-7590
Florida Only (904) 373-6783

Circle 222 on Reader Service Card

REPS/DISTS

MISSOURI

ALEXANDER ELECTRONICS INC
1820 Wyandotte Street
Kansas City 64108
816 474-6656
Line: audio and video equip

ANIXTER/PRUZAN
9449 Aerospace Dr
St Louis 63134
314 423-9555
Line: Sony studio video equip, full line of CATV equip, headend, passives, test equip, power supplies

BEAMS, INC
689 Craig Rd
St Louis 63141
314 649-1060
Line: audio equip
Vega see ad pg 140

DAVID BEATTY STEREO
1616 Westport Rd
Kansas City 64111
Line: audio components
Micro-Trak see ad pg 98

BURNSTERN APPLERY CO
3199 Mercier
Kansas City 64111
816 756-2525
Line: video equip
Unimedia see ad pg 107

COMMUNICATIONS SYSTEMS INC
1001 Perry Ave
Cape Girardeau 63701
314 334-6097
Line: audio components, full line radio equip
Ramko see ad pg 130,131

DELCOM CORP
10752 Indianhead Industrial Blvd
St Louis 63132
214 428-4200
Line: video equip
Microtime see ad pg 121

FORRISTAL-YOUNG SALES CO INC
7110 Oakland Ave
St Louis 63117
314 645-2360
Line: audio equip

KSW ASSOC
6314 Overton St Suite 202
Kansas City 64133
816 358-5240
Line: audio components
Robins see ad pg 165

LIGHTING EQUIP INC
763 New Ballas Rd S
St Louis 63141
314 569-2003
Line: lighting equip
Strand Century see ad pg 61

PAC
11920 Grandview Rd
Brandview 64030
816 763-4155
338 Brooks Dr Suite F
Hazelwood 63042
314 731-2331
Line: full line broadcast equip
Marconi see ad pg 99

PACER CORP
7300 Raytown Rd
Raytown 64133
Line: video equip
Video Aids see ad pg 153

RADONICS
4445 Gustine
St Louis 63116
314 481-2222
Line: video equip
Industrial Sciences see ad pg 152
Microtime see ad pg 121

J C SHIDLER
Route #1 Box 217B
Oak Grove 64075
816 443-2080
Line: radio equip

TV ENGINEERING
519 Rudder Rd
Fenton 63026
314 343-5605
Line: broadcast equip
Auditronics see ad pg 117

VIDEO MASTERS INC
1820 Wyandotte St
Kansas City 64108
816 474-8530
Line: video equip
Unimedia see ad pg 107

NEBRASKA

DON S JONES
3524 S 104th Street
Omaha 68124
402 397-2866
Line: radio equipment, video

SECO LABS INC
206 S 44th St
Omaha 68131
402 553-1166
Line: audio equip
MICMIX see ad pg 126

SOUND MANUFACTURING
2536 La Mar
Grand Island 68801
Line: audio equip
Micro-Trak see ad pg 98

VIDEO ASSOC INC
324 N 115th St
Omaha 68154
402 333-2288
Line: video equip
Microtime see ad pg 121

NEVADA

A-1 AUDIO RENTALS
537 E Sahara Suite 210
Las Vegas 89105
702 735-3407
Line: audio equip
Auditronics see ad pg 117

ACEY-DECY INC
3049 Rijel Ave
Blvd C-S10
Las Vegas 89102
702 873-3115
Line: lighting equip
Strand Century see ad pg 61

COMMUNICATIONS SPECIALISTS
3111 S Valley View Blvd
Las Vegas 89102
702 876-8068
Line: video equip
Unimedia see ad pg 107

NEW HAMPSHIRE

CHURCHILL MILLER
PO Box 333
Londonderry 03053
603 434-0890
Line: video equip
Asaca see ad pg 19

MACRAE CHARRON INC
RFD 3 George Ave
Grenier Industrial Village
Manchester 03013
603 624-4827
Line: lighting equip
Strand Century see ad pg 61

NEW JERSEY

BI STATE MARKETERS

753 Bergen Blvd
Ridgefield 07657
201 943-5888

Line: audio components
Robins see ad pg 165

BOB CAMERON INC

2352 Linwood Ave
Ft Lee

201 461-2595

Line: audio equip

Tech Labs see ad pg 160

FLOYD CHURCHILL

PO Box 43
50 Upland Way
Haddonfield 08033
609 429-7871

Line: audio components

Tech Labs see pg 160

ELDISERCO

12 Estal Place
Greenbrook 08812
201 968-0344

Line: audio and broadcast products

Amber see ad pg 136

Orban/Parasound see ad pg 148

EMCEE VIDEO SALES

PO Box 2546
1087 Plainfield Ave
Plainfield 07060
201 561-6876

Line: video equip

Video Aids see ad pg 153

JERRY CUDLIPP

24 Addison Terr
Old Tappan 07675
212 947-8031

Line: video heads, components

SYLVAN GINSBURY LTD

Queen Anne Rd
Teaneck 07666

Line: audio components

Micro-Trak see ad pg 98

H M HOLZBERG ASSOCS

PO Box 322
Totowa 07511

201 256-0455

Line: full line audio, video, microwave equip

Microtime see ad pg 121

Nurad see ad pg 116

TFT see ad pg 169

INTERNATIONAL VISUAL PRODUCTIONS

333 Rte 46
Fairfield 07006
201 575-6260

Line: video & lighting equip

Strand Century see ad pg 61

Unimedia see ad pg 107

LANDY ASSOCS

12 Buxon Rd
Cherry Hill 08003
609 424-4660

1890 E Marlton Pike
Cherry Hill 08003

Line: audio consoles, video proc equip, audio components, video equip

Ikegami see ad pg 11

Micro-Trak see ad pg 98

Unimedia see ad pg 107

Videotek see ad pg 157

JULES LEVENSTEIN

2150 Center Ave
Fort Lee 07024
201 461-2709

Line: lighting equip

Strand Century see ad pg 61

LIGHTING ELECTRIC CO

40 E Willow St
Millburn 07041

Line: audio equip

Micro-Trak see ad pg 98

L&M ASSOCS

511 Victor St
Saddle Brook 07662
201 843-8700

Line: test instruments

Marcconi see ad pg 99

NILESCO INTERNATIONAL LTD

382 Springfield Ave
Summitt 07901

Line: audio components

Micro-Trak see ad pg 98

OPTIMEDIA SYSTEMS INC

1080 Rte 46
Clifton 07013
201 777-7600

Line: audio & video products

Dynasciences see ad pg 170

Microtime see ad pg 121

Unimedia see ad pg 107

P J SALES CO

PO Box 326
Mountain Lake 07046
201 334-3465

Line: lighting equip

Strand Century see ad pg 61

PROFESSIONAL A/V CORP

342 Main St
Patterson 07505
201 523-3333

Line: audio equip

Auditronics see ad pg 117

MICMIX see ad pg 126

SHEA SALES

522 Prospect Street
Maplewood 07070
201 762-2382

Line: audio equip, test equip

Sound Technology see ad pg 25

WALLY SMITH CO

152 Cropwell Dr
Maple Shade 08052
609 234-1754

Line: video equip

Industrial Sciences see ad pg 152

SONNY SIMBERKOFF ASSOCS INC

71 Valley St
S Orange 07079
201 763-7900

Line: audio equip

TECH LABORATORIES INC OFFICE

Bergen & Edsall Blvds
Pallisades Park 07650
201 944-2221

Line: audio components

TELE-QUIP INC

PO Box 211
Bridgeport 08014
609 467-2500

Line: audio components

NEW MEXICO

CARRULT CUNNINGHAM

PO Box 1697
Taos 87571
505 758-2686

Line: radio equip

IGM see ad pg 181

DYMA ENGINEERING

Rt 1 Box 51
Taos 87571
505 758-2686
Line: full line audio equip, transmitters

G C VIDEO

9624 Gutierrez Rd NE
Albuquerque 87111
505 296-5653
Line: audio & video products, lighting equip

Dynasciences see ad pg 170

Strand Century see ad pg 61

continued on page 154

some inventions SAVE you TIME, WORK & MONEY



THIS ONE DOES ALL THREE

Color sub-carrier burst phase requires close attention to prevent visible color faults (objectionable hue shifts) during a production or duping. Especially if you want to keep normal fleshtones when using special effects, supers and chroma key during color productions. Phase shifts greater than 5 degrees can distort normal fleshtones creating visible color faults. This can result from mis-adjusted video equipment or from various cable lengths and amplifiers which create delays and different burst angles according to their location in a color video system. Phase shifts could also result from normal aging of various components throughout the video system. You can check for phase shift the old way or the VACC way.



phase shift checked **the old way**



phase shift checked **the VACC way**

VACC's Burst Phase Meter (model BPM-1) is a \$599.00 replacement for most vectorscope applications. The unit requires only ac power, video and subcarrier inputs. An easy-to-read analog meter indicates phase shift in the video burst relative to the subcarrier over a full 180 degree range with 1/2 degree accuracy. (360 degrees phase range can be obtained with a coax delay line).

NEW! You saw it at NAB...now available for immediate delivery.

H-Phase Meter

Option 02...includes Burst Phase and H-Phase...all in one unit!
\$729.00 list.



USA (303) 667-33C1
Canaca (Toll Free) (800) 261-4088
VIDEO AIDS corporation of colorado
327 E. 7th St.
Loveland, Colorado 80537

Circle 223 on Reader Service Card

PHILLYSTRAN®

The Tough Guys

Far surpassing steel guys in strength and durability, PHILLYSTRAN is manufactured from impregnated KEVLAR* and polyurethane. Completely non-metallic, PHILLYSTRAN eliminates electrical problems and the usual problems of RFI.

- **Non-interference**
Outstanding dielectric properties
- **Minimum Stretch**
New designs substantially reduce creep
- **Corrosion Proof**
Non-metallic construction: polyurethane jacket
- **Non-Conducting**
Outstanding insulation properties

PHILLYSTRAN . . . The Tough Guys in more ways than one.

®PHILLYSTRAN . . . proprietary resin impregnation process of Philadelphia Resins Corp.

*duPont registered trademark

manufacturers of Chockfast®, Phillystran®, Phillybond®, Wearax™



PHILLYSTRAN®

ROPES AND CABLES

PHILADELPHIA RESINS CORPORATION

20 Commerce Drive, Montgomeryville, Pa. 18936, U.S.A.
215/855-8450 • Telex: 84-6342 • Cable: PHILRES MMLL

REPS/DISTS

INTEGRATED SYSTEMS INC

133 Jackson St NE
Albuquerque 87108
505 255-8127
Line: video equip
Unimedia see ad pg 107

LIGHTING WEST INC

PO Box 30186
Albuquerque 87110
505 266-9830
Line: lighting equip
Strand Century see ad pg 61

MEASUREMENT CONSULTANTS INC

PO Box 951
Las Cruces 88001
505 526-2491
142 Monroe NE
Albuquerque 87108
505 265-6471
Line: test equip
Marconi see ad pg 99

VIDEO-MON INC

222 Truman NE
Albuquerque 87108
505 265-8335
Line: video equip
Knox see ad pg 158

NEW YORK

BERTRAM D ARRON

Northern Blvd
Greenvale 11548
516 621-0630
Line: antennas, RF & test equip

AHSTON COMMUNICATIONS

140 Glendale Dr
Endicott 13760
607 748-3331
Line: video equip
Microtime see ad pg 121
Unimedia see ad pg 107

ANIXTER-PRUZAN

180 Dupont St
Plainview 11802
516 822-8585
Line: Sony studio video equip, full line of CATV equip, cable construction accessories, tools, head end, passives, test equip, power supplies

AUDIO-VIDEO CORP

55 Delaware Ave
Delmar 12054
518 439-7611
Line: full line of audio/video equip

DAVID BAIN ASSOCS

PO Box 1014
Port Washington 11050
516 883-4818
Line: audio equip, transmitters, CCTV systems, video equip

BARBIZON ELECTRIC CO INC

426 W 55th St
New York 10019
Line: lighting equip & supplies
See ad pg 110

BETTAN SALES INC

77-15 164th St
Flushing 11366
212 591-7600
Line: audio equip
Telex see ad pg 93,96

BOYNTON STUDIOS

Melody Pines Farm
Morris 13808
607 263-5695
Line: audio components
MICMIX see ad pg 126
Micro-Trak see ad pg 98

BROWN RADIO SERVICE

250 East Ave
Rochester
716 232-5580
Line: audio components & equip
Ramko see ad pg 130,131

W G BROWN SOUND EQUIPMENT CO

701 Erie Blvd E
Syracuse 13210
315 475-5161
Line: audio/video equip
Unimedia see ad pg 107

CALVERT ELECTRONICS INTL

220 E 23rd St
NY 10010
212 679-1340
Line: tubes, components

THE CAMERA MART

456 W 55th St
New York 10019
212 757-6977
Line: full line TV production equip
Dynasciences see ad pg 170
Ikegami see ad pg 11
Microtime see ad pg 121
Strand Century see ad pg 61

CELEBRATION SOUND

157 Gray Rd
Ithaca 14850
607 272-8964
Line: full line of audio equip
Micro-Trak see ad pg 98

CHROMACORD CORP

60 Margaret St.
Plattsburgh 12901
518 561-2900
Line: full line of audio equip
MICMIX see ad pg 126

COMMERCIAL RADIO & SOUND CORP

304 E 45th St
NY 10017
Line: video equip
Unimedia see ad pg 107

MAC PHERSON CONNER ASSOC

111 Red Hill Rd
New City 10956
914 638-1976
Line: electronic components, tubes

DIVERSIFIED LIGHTING SYSTEMS

116 Town Line Rd
PO Box 57
Syracuse 13211
315 455-5811
Line: lighting equip
Strand Century see ad pg 61

PHIL M DUBS

385 Salem Ct
Hauppauge 11787
516 234-5252
Line: video proc equip

FAIRMONT ELECTRONIC SALES

35 S Service Rd
Plainview 11803
516 694-8200
Line: electronic components

F&B/CECO INC

315 W 43rd St
New York 10036
212 586-1420
Line: cameras & accessories, lighting equip
Strand Century see ad pg 61

FERCO

419 N 54th St
NY 10019
212 581-5474
Line: TV production equip
Strand Century see ad pg 61

GBC CORP

74 5th Ave
NY 10011
212 989-4435
Line: video equip
Unimedia see ad pg 107

GENERAL CAMERA
471 11th Ave
NY 10018
212 594-8700
Line: TV production equip
Strand Century see ad pg 61

GOTHAM AUDIO CORP
741 Washington St
New York 10014
212 741-7411
Line: audio components, test & equip
Amber see ad pg 136

B GRIFFITHS
185 Dixon Ave
Amityville 11701
914 279-3231
Line: video equip

L K HANER ASSOCS
PO Box 101
Commack 11725
516 864-2220
Line: audio components
Tech Labs see ad pg 160

ITOH AVIATION
270 Park Ave
NY 10017
Line: video equip
Dynasciences see ad pg 170

OSCAR E KRAUT
530 D Grand St
New York 10002
212 228-5511
Line: video equip
Knox see ad pg 158

L&M
175 W 12th St
NY 10011
212 243-6155
Line: test equip
Marconi see ad pg 99

LANG ELECTRONICS INC
14 E 39th St
NY 10016
Line: audio products
Auditronics see ad pg 117
MICMIX see ad pg 126

LIGHTSTONE CORP
Tuttle Rd
Bridgeport 13030
315 699-5747
Line: antennas, RF & test equip

LISTEC TELEVISION EQUIPMENT CORP
35 Cain Drive
Plainview 11803
516 694-8963
Line: video equip

LSM ASSOCIATES
27 Orchard Park
Phelps 14532
315 548-4891
Line: audio components
Robins see ad pg 165

MARTIN AUDIO/VIDEO CORP
320 W 46th St
New York 10036
212 548-4891
Line: audio components, equip,
recording accessories
Auditronics see ad pg 117
MICMIX see ad pg 126
Ramko see ad pg 130,131

MEYERS & MERL ASSOC
76 Meacham Rd
Elmont 11003
212 341-3928
Line: lighting equip
Strand Century see ad pg 61

NET SALES INC
Box 7485 W Ridge Station
Rochester 14615
716 467-4538
Line: audio components
Tech Labs see ad pg 160

NORTHEAST BROADCAST LABS
15 Charles St
South Glen Falls 12801
518 793-2181
Line: audio equip
Micro-Trak see ad pg 98

JOSEPH PLACENCIA CO
521 Fifth Ave
New York 10017
Line: audio components
Micro-Trak see ad pg 98

PROFESSIONAL AUDIO MARKETING
PO Box 153
Jackson Heights 11372
212 898-0200
Line: audio equip

PROFESSIONAL ELECTRONICS CO
2820 Curry Rd
Schenectady 12303
518 355-3120
Line: audio/video products, lighting equip
Dynasciences see ad pg 170
Strand Century see ad pg 61

QAR
621 South Columbus Ave
Mt Vernon 10550
914 699-2224
Line: electronic components

JOHN H RING
RR #2 Westport 12993
518 962-4567
Line: radio equip
Collins see ad Cov 2

ROSNER CUSTOM SOUND
11-38 31st St
Long Island City 11106
Line: audio components
Micro-Trak see ad pg 98

ALAN SARFATY & ASSOC
83-15 98th St
Woodhaven 11421
212 846-1952
Line: audio equip
Telex see ad pg 93,96

SAVAGE SALES
PO Box 95
Fayetteville 13066
315 682-2131
Line: test instruments, equip
Marconi see ad pg 99

F EDWIN SCHMITT CO INC
311 Meacham Avenue
Elmont 11003
516 437-8150
Line: full line radio equip

SENECA COMMUNICATIONS
112 Killewald St
Tonawanda 14150
716 693-8446
Line: audio & video products

SIGMA COMMUNICATIONS
150 E Sunrise Hwy
W Lindenhurst 11757
516 226-1880
Line: video equip
Unimedia see ad pg 107

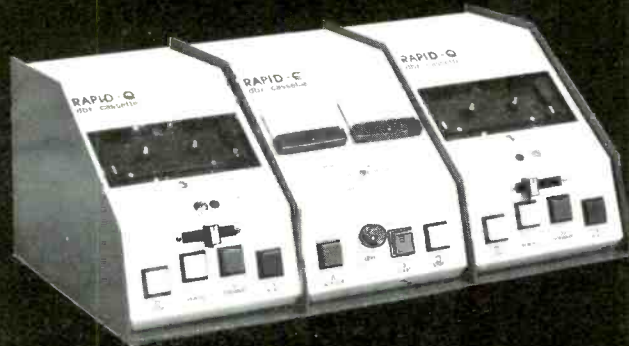
SINGER PRODUCTS CO
One World Trade Center
Suite 2365
New York 10048
212 432-1400
Line: audio components
Micro-Trak see ad pg 98

SONOCRAFT CORP
29 W 36th St
New York 10018
Line: audio & video equip
Unimedia see ad pg 107
Videotek see ad pg 157

SOUND SYSTEMS INC
42-12 28th St
Long Island City 11101
212 786-4474

Ready for RENG?

SAVE TIME and COST with



CA-77 SERIES

RAPID-QTM

dbx[®] CASSETTE

Now you can fast search, assemble edit and play direct to air on the RAPID-Q. Responds to 1 KHz stop cues and 150 Hz rewind cues. Variable speed.

All silicon solid-state record and playback decks to fit any broadcast requirements. Mono or stereo. Variable search control, forward and reverse. DBX noise reduction system can be switched in or out at choice.

Extremely accurate speed control with excellent wow and flutter characteristics.

Desk top or rack mount — up to three decks can be fitted into a case.

EDCO

EDCO PRODUCTS, INC.

680 Bizzell Dr., Lexington, Ky. 40504
Outside Kentucky, call toll free:
800/354-9593
In Kentucky: 506/259-0434

REPS/DISTS

Line: full line of audio/video equip
Unimedia see ad pg 109
Videotek see ad pg 157

TECH-MARK INC

101 Jefferson Ave
 PO Box 120
 Endicott 13760
 607 748-7473
Line: electronic components, tubes

TECHNISPHERE

215 E 27th St
 NY 10016
 212 889-9170
Line: full line video equip
Micro-Trak see ad pg 121

TELECOMMUNICATIONS

111 N Strong Ave
 Lindenhurst 11757
 516 842-5000
Line: camera tubes, equip

TELESCO INTERNATIONAL SALES CO

#1 Dupont Street S
 Plainview 11803
 516 433-6210
Line: audio components, transmitters, test equip
Micro-Trak see ad pg 98

TELEVISION EQUIPMENT ASSOCIATES

Box 260
 South Salem 10590
 914 763-8893
Line: full line radio & TV production equip

TEMTRON ELECTRONICS LTD

138-69 Francis Lewis Blvd
 Rosedale 11422
 212 978-5896
Line: full line broadcast equip

VARIAN

6489 Ridings Rd
 Syracuse 13206
 315 437-2568
Line: tubes, RF components, microwave
Varian see ad pg 17

VERAXON ELECTRONICS

1319 Mecklinburg Rd
 Ithaca 14850
 607 272-3344
Line: audio components
Micro-Trak see ad pg 98

VICTOR INTERNATIONAL CORP

13 W 46th St
 New York 10036
 212 246-4410
Line: audio components
Micro-Trak see ad pg 98

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
Video Aids see ad pg 153

WESTEC AUDIO/VIDEO

100 Riverside Drive #5B
 New York 10024
 212 873-1166
Line: audio components

WINDSOR TOTAL VIDEO

565 Fifth Ave
 NY 10017
 212 725-8080
Line: videotape equip
Unimedia see ad pg 107

NORTH CAROLINA

BCS ASSOCS

1310 Beamon Pl
 Greensboro 27408
 919 273-1918
Line: video products
Cohu see ad pg 97

BROADCAST SERVICES CO

PO Box 85
 Selma 27576
 919 284-2102
Line: full line of radio equip
Auditronics see ad pg 117

JOE CAMPBELL

PO Box 30092
 4613 Lindsay Dr
 Raleigh 27612
 919 782-4936
Line: lighting equip
Strand Century see ad pg 61

ELECTRONICS MERCHANDISING ENTERPRISE

112 Buena Vista
 High Point 27260
 919 869-3335
Line: SCA & test equip
TFT see ad pg 169

A W GREESON JR

219 Homewood Ave
 Greensboro 27403
 919 292-1791
Line: full line audio & video equip, RF monitoring equip
Micro-Trak see ad pg 98

HAMMOND ELECTRONICS

2923 Pacific Ave
 Greensboro 27128
 919 275-6391
Line: audio components

KIRKMAN ELECTRONICS

901 W Second St
 Winston-Salem 27108
Line: video equip
Unimedia see ad pg 107

LEE ASSOC

PO Box 18633
 Raleigh 27609
 919 787-5818
Line: test equip
Marconi see ad pg 99

LONG ENGINEERING CO

961 Burke St
 Winston-Salem 27101
 919 725-2306
Line: lighting equip
Strand Century see ad pg 61
Unimedia see ad pg 107

PAUL MAYO JR

3011 Stratford Dr
 Greensboro 27408
 919 373-8530
Strand Century see ad pg 61

HAROLD METCALF

1305 Maple Ave
 Apex 27502
 916 362-7445
Line: lighting equip
Strand Century see ad pg 61

QUALITY SOUND ENTERPRISES

1221 Hay St
 Haymont Station
 Fayetteville 28305
 919 483-1212
Line: audio equip
Micro-Trak see ad pg 98

SOUTHEASTERN SIGHT & SOUND

1717 S Sanders St
 Raleigh 27603
 919 828-2311
Line: lighting & video equip
Strand Century see ad pg 61
Unimedia see ad pg 107



SAKI SAKI MAGNETICS, INCORPORATED

Precision Recording Heads

Think Ferrite 10-15 times life.
 Minimum down time.
 Refit your Cart Machine with new Saki hot pressed glass bonded ferrite heads.
 Ferrite heads available for most professional recorders.

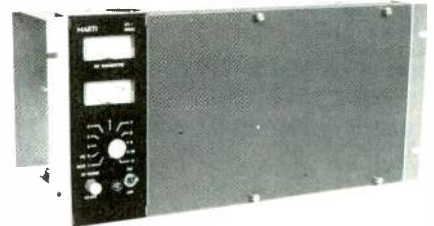
1649 12th Street • Santa Monica, California 90404 • (213) 451-8611

Circle 226 on Reader Service Card

Broadcasters

GET UN-HOOKED FROM
 THE TELEPHONE COMPANY
 — PROVIDE YOUR OWN
 "PROGRAM LINES" WITH

MARTI STL



STL-8 TRANSMITTER • All Solid State • Direct FM Modulator • Modular Construction • Test Meter Built In • Proven Reliability in hundreds of installations • Unsurpassed for Dual Channel Stereo STL, Single Channel AM STL or Inter City Relay.

SPECIFICATIONS - STEREO

Stereo Cross Talk	—65 DB
Noise	—65 DB or less
Response	±0.5 DB 30-15000 Hz.
Distortion	Less than 0.5%

MARTI Electronics, Inc.
 Box 661 • 1501 N. Main • Cleburne, TX 76031 • 817/645-9163

Circle 227 on Reader Service Card

GENE SUDDUTH
 PO Box 15263
 Charlotte 28210
 704 527-2489
 Line: video equip
Duca-Richardson see ad pg 89

TECHNICAL VIDEO SYSTEMS
 245 Olson St
 Winston-Salem 27101
 919 768-9536
 Line: full line audio/video equip
Dynasciences see ad pg 170
Ikegami see ad pg 11
Industrial Sciences see ad pg 152
NEC see ad pg 132

P D THOMPSON
 2550 Weymouth Rd
 Winston-Salem 27103
 919 765-3157
 Line: full line broadcast equip (audio & video)
Industrial Sciences see ad pg 152
Knox see ad pg 158

UNITED ASSOCIATES
 Suite 250
 One Charlottetown Center
 Charlotte 28204
 704 334-4776
 Line: lighting equip
Strand Century see ad pg 61

NORTH DAKOTA

OMF AUDIOVISUAL
 1818 E Broadway
 Bismark 58501
 701 258-6360
 Line: video equip
Microtime see ad pg 121
Unimedia see ad pg 107

OKLAHOMA

DELCOM CORP
 6106 E 32nd St
 Tulsa 74135
 918 663-9416
 Line: video & lighting equip
Industrial Sciences see ad pg 152
Microtime see ad pg 121
Strand Century see ad pg 61

DIMENSION PRODUCTS CO
 7321 N Broadway
 Oklahoma City 73116
 405 848-8579
 Line: lighting equip
Strand Century see ad pg 61

DOUG BROWN ENTERPRISES
 Box 7494
 Tulsa 74105
 918 747-5045
 Line: audio components
Auditronics see ad pg 117

SYSTEMATICS
 510 N Sheridan
 Tulsa 74115
 Line: video equip
Dynasciences see ad pg 170
Unimedia see ad pg 107

OHIO

APPALACHIA SOUND
 Rte 8 Box 525
 Chillicothe 45601
 614 663-2544
 Line: audio equip
Auditronics see ad pg 117

A/V MEDIA INC
 3344 W Broad St
 Columbus 43204
 Line: full line video/audio products
Industrial Sciences see ad pg 152
NEC see ad pg 132
Videotek see ad pg 157

BOLLER ELECTRONICS
 181 Fairway Blvd
 Columbus 42213
 Line: audio components
Micro-Trak see ad pg 98

N BROWNING & CO
 3120 Far Hills Ave
 Dayton 45429
 513 298-5973
 Line: audio equip

CAIN & COMPANY
 201 S Broad St
 Lancaster 43130
 614 654-4800
 Line: microwave equip

CAM NORTON CO
 1303 Prospect Ave
 Cleveland 44115
 216 696-1044
 1520 Bark Lane Dr
 Fremont 43420
 419 332-7654
 2990 Millboro Rd
 Cuyahoga Falls 44224
 216 928-3121
 Line: video & lighting equip
Strand Century see ad pg 61

DOUG COOK & ASSOCS
 2185 Trent Rd
 Columbus 43229
 614 471-4114
 Line: audio & video equip, transmitters
Micro-Trak see ad pg 98
TFT see ad pg 169

DAYCOM
 2971 Bluefield Ave
 Dayton 45414
 513 278-7939
 Line: video equip, CCTV systems
Industrial Sciences see ad pg 152

ELECTRONIC ENGINEERING
 362 W Bowery
 Akron 44307
 Line: audio components
Micro-Trak see ad pg 98

EDWARD H HUBER
 Rte 3 Rhinehart Rd
 Belleville 44813
 419 886-4445
 Line: radio equip, full line

ELECTRONIC PRODUCTS CORP
 16006 Waterloo
 Cleveland 44110
 216 692-3050
 Line: audio & video equip
Auditronics see ad pg 117
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152
Ikegami see ad pg 11
Unimedia see ad pg 107

IMTECH INC
 6862 Engle Rd
 Cleveland 44130
 216 826-3400
 Line: audio equip
Telex see ad pg 93,96

KLOPF A/V CO
 3381 Successful Way
 Dayton 45414
 513 236-5500
 Suite 201 6659 Pearl Rd
 Cleveland 44130
 Line: audio & video products, lighting equip
Auditronics see ad pg 117
Dynasciences see ad pg 170

A Single Source for Video Equipment, ENG duPont Tape, DVS TBC's, NEC, Lenco, Shintron, Rapid Q, PLS Lighting, Amtron, Spotmaster, Buhl, Sparta, Videotek, Laird, Syste-Matics automation, Capitol Audio and many others

Call us First


CRV Systems Inc

2370 Vinton St
 Huntington, WV 25701
 304-525-2633

There's No Substitute for Experience

Circle 228 on Reader Service Card

VIDEOTEK, FEATURE PRESENTATIONS



REGULAR VIII
VM-8 \$710



SUPER VIII
RM-8 \$760

RATED
Xcellent

Now playing at your Local Video Dealer, two smash hits starring the all new Exciting Eight Series of monitor/receivers by VIDEOTEK, INC.

Featuring

- Trinitron plus® CRT
- AC-DC Operation
- TV-Line-VTR Selection

- Solid State Switching
- E to E
- DC Restoration

- Chassis completely isolated
- 8-pin Connector
- Loop-thru audio and video
- VM-8 (17 lbs.) RM-8 (19 lbs.)

Optional

- Pulse-Cross
- Underscan
- Blue-Gun
- Battery-Pack

For local listings of VIDEOTEK dealers call or write . . .
VIDEOTEK, INC. • 640 E. Vine St. • Stowe, Pa. • 215-367-6977

Circle 229 on Reader Service Card

REPS/DISTS

Industrial Sciences see ad pg 152
 Microtime see ad pg 121
 Micro-Trak see ad pg 98
 Strand Century see ad pg 61
 Unimedia see ad pg 107
 Videotek see ad pg 157

MANDABACH-LEHNER CO
 1221 Temple Trail
 Stow 44221
 216 686-1965
 Line: radio equip, components
 Robins see ad pg 165

McFADDEN SALES INC
 150 E Broad St
 Columbus 43215
 614 221-3363
 Line: audio components

MIDWEST TELECOMMUNICATIONS
 1516 Northland Blvd
 Cincinnati 45250
 513 742-2300
 Line: audio components, equip
 Ramko see ad pg 130,131

T R MOORE ASSOC
 8513 Springboro Pike
 Miamisburg 45342
 513 433-0762
 Line: test equip
 Sound Technology see ad pg 25

OHIO INSTRUMENTS
 7180 Brundage Road
 Waldo 43356
 614 726-4242
 Line: test instruments
 Marconi see ad pg 99

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 pg 140
 Orban/Parasound see ad pg 148

RIXAN ASSOCIATES
 5062 Wadsworth Rd
 Dayton 45414
 513 278-4216
 Line: audio equip
 Modular Audio see ad pg 159

UNITED TRANSFER
 PO Box 42272
 8095 Village Dr
 Cincinnati 45242
 513 793-3426
 Line: video equip
 Video Aids see ad pg 153

A C WAHL & ASSOCS
 135 Williams St
 Cincinnati 45215
 513 821-3270
 Line: audio components
 Tech Labs see ad pg 160

WARREN RADIO
 1002 Adams St
 Toledo 43697
 Line: audio components
 Micro-Trak see ad pg 98

WINTERADIO CO
 5363 Ridge Rd
 Parma 44129
 216 886-5536
 Line: audio equip
 Auditronics see ad pg 117
 MICMIX see ad pg 126

OREGON

BCD
 7100 SW Hampton St Suite 121
 Tigard 97223

503 639-8223
 Line: video equip
 Auditronics see ad pg 117
 Microtime see ad pg 121

T T CAUTHERS
 1215 SE 73rd Ave
 Portland 97215
 503 254-2818
 Line: radio equip

EARL & BROWN CO INC
 PO Box 19406
 Portland 97219
 503 245-2283
 Line: audio equip

ROGER MINTHORNE
 7643 SW 33rd Ave
 Portland 97219
 503 246-4556
 Line: audio components
 Robins see ad pg 165

MOORE'S AUDIO VISUAL CENTER
 234 SE 12th Ave
 Portland 97214
 503 233-5821
 Line: video equip
 Unimedia see ad pg 107

JOHN ODGERS
 7100 SW Hampton St Suite 118
 Tigard 97223
 503 639-8223
 Line: video equip
 Duca-Richardson see ad pg 89

OREGON A/V SYSTEMS INC
 117 SW Front Ave
 Portland 97204
 503 224-4313
 Line: audio & video products
 Ramko see ad pg 130,131
 Unimedia see ad pg 107

OREGON SOUND
 665 Wilson
 Eugene 97401

503 344-2333
 Line: audio equip
 MICMIX see ad pg 126

SPS ELECTRONICS
 12025 NW Thompson Rd
 Portland
 503 645-3769
 Line: audio components
 Tech Labs see ad pg 160

STAGE CRAFT INDUSTRIES
 1302 NW Kearney
 Portland 97208
 503 226-7351
 Line: lighting equip
 Strand Century see ad pg 61

VIDEO SONICS
 1412 SE Morrison St
 Portland 97214
 503 232-4632
 Line: video/audio, lighting equip
 Strand Century see ad pg 61
 Unimedia see ad pg 107

PENNSYLVANIA

AUDIO INNOVATORS INC
 216 Blvd of the Allies
 Pittsburgh 15222
 412 391-6220
 Line: audio equip
 Auditronics see ad pg 117

BARCLAY RECORDING & ELEC
 503 Haverford Ave
 Narberth 19072
 215 667-3048
 Line: audio equip
 MICMIX see ad pg 126

BARTLETT ASSOCIATES INC
 130 West Lancaster Ave
 Box 72
 Wayne 19087

One (or two) for the road.

Thomson-CSF Laboratories keeps breaking conventional sound barriers (cords and bocms) with RF microphone systems that offer reliable transmission with excellent range and true high fidelity.

First, the RM-102 single channel portable system provides one full diversity channel for field and remote broadcast use. Or, if multiple channels are needed, where no AC power is available, the RM-104 solves the problem. Two full diversity channels can capture action dialog on the set or in the field, making it fully usable for filming or taping. 950 MHz diversity reception achieves drop-out free performance, and both systems come with transmitters and antennae so they're complete and completely portable.

Now Portability Plus. Thomson-CSF takes portability a step



Model ENG 101 transmitter and receiver.

further with its new ENG 101 single channel miniature, portable diversity microphone system, specifically designed for use with today's miniature ENG cameras.



RM-102 transmitter and receiver.

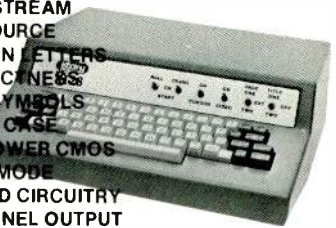
THOMSON-CSF LABORATORIES, INC.

37 Brownhouse Rd., Stamford, CT 06902
 (203) 327-7700/TWX (710) 474-3346



A CHARACTER GENERATOR SHOULD HAVE:

SMOOTH LETTERS
 AUDIO INTERFACE
 VERSATILITY
 DOWNSTREAM
 OR SOURCE
 FOREIGN LETTERS
 COMPACTNESS
 MATH SYMBOLS
 LOWER CASE
 LOW POWER CMOS
 ITALIC MODE
 PRINTED CIRCUITRY
 2 CHANNEL OUTPUT
 SOPHISTICATED
 2 SIZE LETTERS
 PLUG-IN CARDS
 COLOR COMPATIBLE
 FULL YEAR WARRANTY



THE **K128** OFFERS THE
 ABOVE FOR **\$3250**

OPTIONS AVAILABLE: INDEPENDENT
 PREVIEW, AUTO CENTER, ROLL AND
 CRAWL, MEMORY EXPANSION

KNOX, Ltd.
 16021 Industrial Drive
 Gaithersburg, Maryland 20760
 (301) 840-1930

Circle 230 on Reader Service Card

Circle 231 on Reader Service Card

215 688-7325

Line: video equip, switchers
Cohu see ad pg 97

CAM NORTON CO

30 Sigrid Dr
Carnegie 15106
412 276-7723

Line: lighting equip
Strand Century see ad pg 61

CLAIR BROTHERS AUDIO

PO Box 596
Lititz 17543
717 733-1211

Line: audio equip
MICMIX see ad pg 126

COMMUNICATION MEDIAS

PO Box 54
Allentown 18105
215 437-0607
Line: audio components, full line audio & video equip
Micro-Trak see ad pg 98

JERRY CONN & ASSOC

550 Cleveland Ave
Chambersburg 17201
717 263-8258
Line: CATV electronic units; coaxial cable, cable connectors; broadcast antennas; TV and FM modulators, processors; microwave systems

GEORGE M CONNEEN CO INC

24 S Newtown St Rd
Newtown Square 19073
215 353-2241
Line: audio equip
Telex see ad pg 93,96

CONTROL ASSEMBLY CORP

1339 Sylvan Dell Dr
Pittsburgh 15243
Line: video equip
Knox see ad pg 158

D&H DISTRIBUTING

2525 N 7th St

Philadelphia 19133
717 236-8001

Line: lighting equip
Strand Century see ad pg 61

HOLT TECHNICAL SERVICE

428 Broadhead Ave
Bethlehem 18016
215 865-3775
Line: audio & video products
Micro-Trak see ad pg 98

LERRO ELECTRICAL CORP

3125 N Broad St
Philadelphia 19132
215 223-8200
Line: full line video equip
Microtime see ad pg 121
Unimedia see ad pg 107

L&M ASSOCS

965 A Bristol Pike
Andalusia 19020
215 639-3100
Line: test instruments
Marconi see ad pg 99

LOFSTRUM ELECTRONICS

Empire Bldg
Glassport 15045
Line: video equip
Dynasciences see ad pg 170
Videotek see ad pg 157

MARCO VIDEO SYSTEMS, INC.

6114 North 20th St
Philadelphia 19138
215 849-9500
Line: CCTV systems

RICHARD S PASS ASSOC

9003 Eastview Rd
Philadelphia 19152
215 464-9444
Line: audio equip
Robins see ad pg 165

PEIRCE PHELPS INC

2000 N 59th St

Philadelphia 19131
215 879-7000

Line: full line TV production equip
Duca-Richardson see ad pg 89
Dynasciences see ad pg 170
Ikegami see ad pg 11
Industrial Sciences see ad pg 152
Micro-Trak see ad pg 98
Strand Century see ad pg 61
Unimedia see ad pg 107
Videotek see ad pg 157

PENN LIGHTING ASSOC

739 N 24th St
Philadelphia 19130
215 765-6300
Line: lighting equip
Strand Century see ad pg 61

MARK PITKOW COMPANY

1580 Buck Hill Drive
Huntington Valley 19006
215 464-8921
Line: audio equip, components
Sound Technology see ad pg 25

RO-CEL ELECTRONICS INC

731 Voice of the Theatre Bldg
Rt 8 North
Pittsburgh 15223
412 781-2326
Line: audio components

RPC ELECTRONICS

620 Alpha Drive
Pittsburgh 15238
412 782-3770
Line: full line of audio/video equip, lighting equip
Strand Century see ad pg 61
Videotek see ad pg 157

S&S ASSOC

Boro Line Rd
King of Prussia 19406
215 265-3450
Line: test equip
Marconi see ad pg 99

D SMITH

Southampton 18966
215 355-6642
Line: video equip

TELE EQUIPMENT & CO

11559 Frankstown Rd
Pittsburgh 15235
Line: video equip
Unimedia see ad pg 107

VAL-TRONICS INC

111 E Market St
York 17401
717 755-5937
Line: audio & video equip, RF monitors
Micro-Trak see ad pg 98

WAGGONER-VERHILL ASSOCS

3550 Laketon Rd
Pittsburgh 15235
412 241-5205
Line: audio components
Tech Labs see ad pg 160

WARREN RADIO

1313 Peach St
Erie 16512
814 454-5285
Line: video equip
Unimedia see ad pg 107

RHODE ISLAND

WRH PRODUCTIONS

5 Industrial Way
Riverside 02915
401 434-6272
Line: full line audio components, equip
RF monitors
Micro-trak see ad pg 98

SOUTH CAROLINA

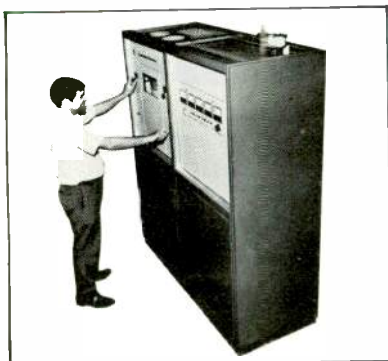
R.L. BRYAN CO

301 Greyston Blvd

continued on page 160

**QUALITY TALKS
FOR
KPUG**

Bellingham, Washington



Continental's new 5/10 kW AM transmitter is setting records for acceptance. It has performance and efficiency, with the cleanest sound around. Listen to Continental: quality talks.

Write for brochure, Continental Electronics Mfg. Co. Box 270879 Dallas, Texas 75227 (214) 381-7161



Circle 232 on Reader Service Card

Before you settle for an inexpensive and inflexible off-the-shelf console... Or go to the great expense of having one custom designed... look at MAP's new IMPAC™ Series!

Modular Broadcast Consoles... For AM/FM and TV

- Truly outstanding performance specs
- More features
- More flexibility
- Exceptional value — surprisingly affordable
- Readily expandable to meet your growing needs.



This Model 6022, 16 Channel, Dual Output TV Audio Control Center is one of 3 new main frame configurations. Available fully wired. Or in do-it-yourself kit form.



For complete details contact Rick Belmont

MAP MODULAR
AUDIO PRODUCTS, Inc.
A Unit of Modular Devices, Inc.

50 Orville Drive
Airport International Plaza
Bohemia, N.Y. 11716
(516) 567-9620

Circle 233 on Reader Service Card

REPS/DISTS

Columbia 29210
803 779-3560

Line: audio & video products

CALHOUN A/V CO

1234 St Andrews Rd
Columbia 29210
803 772-9130

Line: audio & video products, lighting equip

Strand Century see ad pg 61
Unimedia see ad pg 107

CANDOR CO

PO Box 2220
Myrtle Beach 29577
803 448-8361

Line: electronic components; tubes

DIXIE RADIO & SUPPLY CO

1900 Barnwell St
Columbia 29202

Line: audio components
Micro-Trak see ad pg 98

ELECTRONIC SYSTEMS INC

PO Box 11208
Columbia 29211
803 779-4774

Line: video equip
Unimedia see ad pg 107

ILLUMINATING EQUIP SALES

2900 Delvine Ave
Columbia 29205
PO Box 6773
803 799-8973

Line: lighting equip
Strand Century see ad pg 61

TENNESSEE

ALLIED SOUND-VISUAL EDUCATION DIV

2741 Nonconah Blvd S Suite 320

Memphis 38132

901 396-4747

401 Spence Lane

Nashville 37210

615 254-6473

Line: audio & video equip

Dynasciences see ad pg 170

AMERICAN LIGHTING & ELECTRIC SUPPLY

909 Gleaves St

Nashville 37203

615 254-1937

Line: lighting equip

Strand Century see ad pg 61

AUDIO CONSULTANTS INC

1200 Beechwood Ave

Nashville 37212

615 256-6900

Line: audio equip

MCI see ad pg 26,27

BAKER & TAYLOR EDUCATIONAL PRODUCTS

2910 Craft Dr

Nashville

800 251-8575

Line: video equip

Unimedia see ad pg 107

BARRY TRADING CO

105 W Market St

Lebanon 37087

Line: audio components

Micro-Trak see ad pg 98

BONDURANT BROS

PO Box 20695

906 Sevier Ave SE

Knoxville 37901

Line: lighting equip

Strand Century see ad pg 61

BROADCAST DISTRIBUTORS

Bible Place

Cleveland 37311

615 472-8200

Line: audio components and equip

Micro-Trak see ad pg 98

BROADCAST EQUIPMENT & SUPPLY CO

Rt 1 Weaver Pike

Bluff City 37620

635 968-7342

Line: full line audio equip

Micro-Trak see ad pg 98

Ramko see ad pg 130,131

CENTEL SYSTEMS

1444 Shelby Dr

Suite 107

Memphis 38116

901 396-7273

Line: monitors

Industrial Sciences see ad pg 152

CLW BROADCASTERS

6815 Shallowford Rd

Chattanooga 37421

Line: full line of radio equip

Micro-Trak see ad pg 98

ELECTRA DISTRIBUTING CO

1914 West End Ave

Nashville 37203

Line: audio equip

Micro-Trak see ad pg 98

GENERAL COMM & ELECS

536 Expy Park Dr

Nashville 37210

615 242-2467

Line: audio equip

Auditronics see ad pg 117

NASHVILLE STUDIO SYS

16 Music Circle S

Nashville 37203

615 256-1650

Line: audio equip

MICMIX see ad pg 126

PHASE AUDIO

2008 Madison Ave

Memphis 38104

901 726-1900

Line: audio equip

Auditronics see ad pg 117

RADFORD ASSOC

1331 Otter Creek Rd

Nashville 37215

615 373-0231

Nurad see ad pg 116

SPHERE AUDIO SALES

478 Devens Drive

Brentwood 37027

615 794-0155

Line: audio equip

MICMIX see ad pg 126

STUDIO SUPPLY CO

PO Box 280

Nashville 37202

615 327-3075

Line: audi components, equip;
recording accessories

Auditronics see ad pg 117

MICMIX see ad pg 126

TECHNICAL INDUSTRIES

274 Moncannah Blvd

Memphis 38131

901 396-4747

401 Spence I

Nashville 37210

615 254-6473

Line: video & lighting equip

Strand Century see ad pg 61

TV & AUDIO ENGINEERING CORP

149 Wilson Pike Circle

Brentwood 37207

615 373-9545

Line: audio & visual equip

Auditronics see ad pg 117

VALLEY AUDIO SERVICES

2101 June Dr

Nashville 37214

615 889-7603

MICMIX see ad pg 126

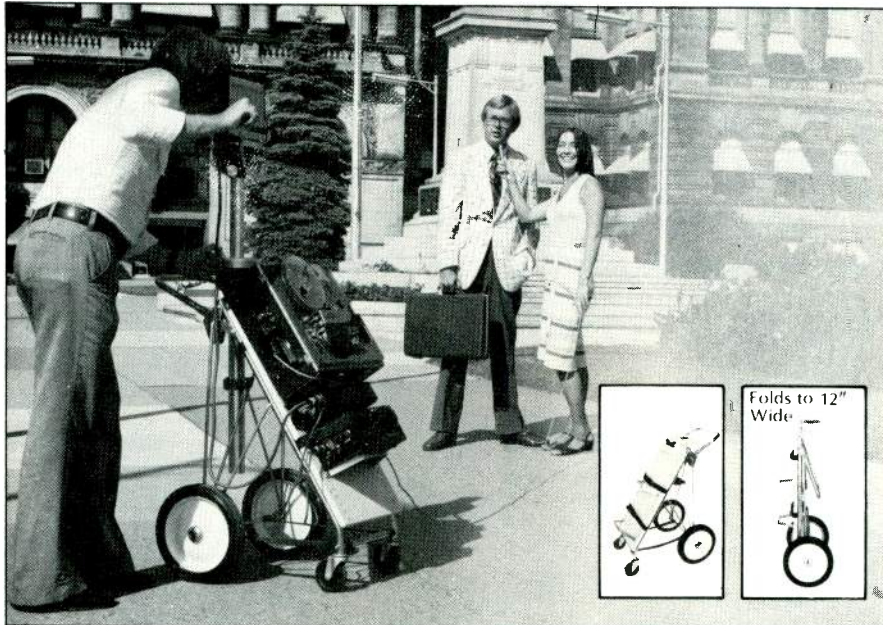
WARREN RADIO CO

190 S Cooper St

Memphis 38104

Line: audio components

Micro-Trak see ad pg 98



New wheelit ENG-1 Folding Camera Cart

Suggested Retail \$195.00

Features

- Fast, ready ENG operation
- Operate camera from cart
- Safe transportation
- 14" x 29" equipment board
- Adjustable equipment mounts for control unit, recorder, battery
- 5 3/4" x 14" camera platform
- Light weight, heavy duty
- 12" wheels & locking swivel casters
- Folds to only 12" width
- Elevator and universal head, optional
- Receptacle and cord reel, optional

For immediate ENG operation, Wheelit, don't pack it.

Write or Telephone for Information & Prices.

Gruber Products Co.
5254 Jackman Road
Toledo, Ohio 43613
(419) 476-7200

Circle 234 on Reader Service Card

FREE FROM

Tech Labs



INDUSTRY'S MOST COMPLETE
TECHNICAL INFORMATION ON

- ROTARY SWITCHES
- PROGRAMMING SWITCHES
- THUMBWHEEL SWITCHES
- ATTENUATORS

Call or Write For Free Catalog

TECH LABORATORIES, INC

Bergen & Edsall Bldgs., Palisades Park, N.J. 07650
Tel. (201) 944-2221

Circle 235 on Reader Service Card

WALLACE WILSON & ASSOC
478 Devens Dr
Brentwood 37027
615 794-0155
Line: audio equip
Vega see ad pg 140

TEXAS

ABADON/SUN INC
PO Box 6520
San Antonio 78209
512 824-8781
Line: audio equip
Auditronics see ad pg 117

ACCENT AUDIO-VIDEO
6712 Oakbrook Blvd
Dallas 75235
214 637-5660
Line: audio components

BOB AMOS & ASSOCS
916 Green Hill Rd
Dallas 75232
214 823-7820
Line: full line broadcast equip

ARNOLD & MURGAN
510 S Garland Rd
Garland 75040
214 272-1552
Line: audio equip
MICMIX see ad pg 126

ARNOLD BARNES ASSOCIATES INC
PO Box 9748
Austin 78766
512 454-4371
7616 LBJ Freeway Suite 401
Dallas 75240
214 233-5535
1275 Space Pk Dr
Houston 77048
713 488-0817
1300 E Arapaho Rd Suite 107
Richardson 75081

214 235-4543
Line: audio, video, broadcast products
Cohu see ad pg 97

AUDIO SPECIALTIES CO
13416 Brookgreen
Dallas 75240
214 239-2230
Line: audio equip
Auditronics see ad pg 117

AUSTIN PROFESSIONAL AUDIO INC
308 W 6th Street
Austin 78701
512 477-3706
Line: audio equip
MCI see ad p 26,27

BARR-BENNISON
2909 Lemmon Ave
Dallas 75204
214 528-4227
Line: lighting equip
Strand Century see ad pg 61

BRADENCO
2646 Andjon Drive
Dallas 75220
214 358-3278
Line: test instruments
Marconi see ad pg 99

CAMPION SALES CO
PO Box 88
Richardson 75080
214 238-8145
Line: audio equip

CLOSE ASSOCIATES
604 Roberts St
Houston 77003
713 236-0316
Line: lighting equip
Strand Century see ad pg 61

COLLINS RADIO GROUP
1225 North Alma
Richardson 75080
214 690-5000
Line: full line broadcast equip

MICMIX see ad pg 126
Micro-Trak see ad pg 98
Ramko see ad p 130,131

GARY COOPER
371 Oakview Drive
Lewisville 75067
817 430-1373
Line: electronic components, tubes

CROUSE-KIMZEY CO
3507 W Vickery Box 9830
Ft Worth 76107
817 737-9911
Line: audio components
Micro-Trak see ad pg 98

B CULBERTSON
Suite 1 at the Registry
6350 LBJ Fwy
Dallas
214 387-1389
Line: video equip

VICTOR DUNCAN INC
2659 Fondren Ave
Dallas 75206
214 369-1165
Line: full line TV production equip
Strand Century see ad pg 61

DUNKEL ELECTRONIC ASSOCS
PO Box 35353
Houston 77035
713 729-1670
Line: audio components

ECI VIDEO
2613 Ross Ave
Dallas 75201
Line: microphones
Videotek see ad pg 157

GUARANTEE RADIO SUPPLY CORP
1314 Iturbide St
Laredo 78040
512 722-3233
Line: audio components
Micro-Trak see ad pg 98

HOUSTON CINEMA & SOUND
3732 Shepard St
Houston 77018
Line: audio equip
Micro-Trak see ad pg 98

INDUSTRIAL AV INC
2617 Bissonnet
Houston 77005
Line: video equip
See ad pg 151
Unimedia see ad pg 107

BOB LANDINGHAM
2121 Santa Anne Blvd
Dallas 75028
214 327-7311
Line: video proc amp switchers

CHARLES LUCAS SALES CO
PO Box 24632
Dallas 75224
4424 Mint Way
Dallas 75236
214 330-8181
Line: audio equip, test equip
Sound Technology see ad pg 25

LYKES ELECTRONICS
PO Box 26816
Houston 77207
Line: audio & video equip
Dynasciences see ad pg 170

MARTIN ZIENKOSKY BROWNE & ASSOCS
3801 Kirby, Suite 834
Houston 77006
713 523-4333
13731 Omega Rd
Dallas 75240
214 233-5535
PO Box 9748
Austin 78766
512 454-4371
Line: full line of audio & video equip
Ikegami see ad pg 11
TFT see ad pg 169

continued on page 162

swintek

The Leading Name In
Cordless Microphone Systems



Transmitters small enough to be hidden almost anywhere, tiny microphones that are so unobtrusive that they probably won't even be noticed, hand-held microphones without the encumbrances of hundreds of feet of wire — that's what cordless microphone systems are all about. But there's one more factor of prime importance — reliability. If you're in television, radio or film and you want a cordless microphone system that not only offers the most advanced state-of-the-art electronics but the highest reliability rating in the industry, Swintek is the answer. There's a Swintek transmitter and receiver to fit your specific needs, no matter what your requirements. Check with us today about the greatest name in cordless microphone systems — Swintek.

alan gordon enterprises inc.

1430 N. Cahuenga Blvd., Hollywood, CA 90028
Telephone: (213) 465-3551 • (2-3) 935-5500
TWX: 910-321-4528 • Cable: GORDENT

Circle 236 on Reader Service Card

NEW

ADAPTA-LENS MODEL 16-66N

FOR ANY 3 TUBE, PRISM CAMERA

ADAPTS 16mm MOTION PICTURE, 35mm SLR LENSES
TO ENG/EFP COLOR TV CAMERAS

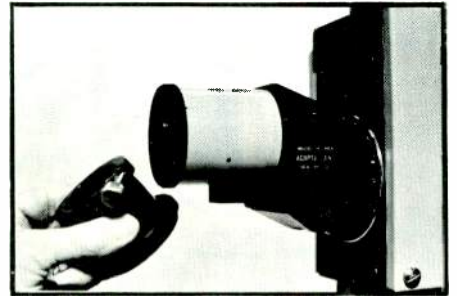
NO SWEEP REVERSAL REQUIRED!

USES FIXED OR ZOOM LENSES
FOR EXTREME CLOSE-UP, WIDE
ANGLE OR TELEPHOTO

CREATE MOTION PICTURE TYPE
OPTICAL EFFECTS

BACK-UP FOR TV ZOOM LENS
DOUBLES AS DIASCOPE

INTERFACES WITH MICRO-
SCOPES AND OTHER OPTICAL
SYSTEMS



FEATURES - Full range internal optical focus, Removable field lens for cleaning or registration slides, Built-in manual iris, Interchangeable lens and camera mounts, Mounts on camera in seconds — requires no camera adjustment, Rugged mechanical design for long operation.

OTHER PRODUCTS

- ZOOM BLOW-UP POSITIONER FOR TELECINE
- ADAPTA-LENS 35-100 for 1" CAMERAS,
16-66 for MICROSCOPES
- ACCESSORIES FOR TK-76 and HITACHI SK-80 CAMERA

the WARREN R. SMITH co.

8-09 FERN ST., FAIR LAWN, N.J. 07410 — 201/797-2579

Circle 237 on Reader Service Card

REPS/DISTS

D McLANE

6704 Talmadge Ln
Dallas 75230
214 387-3777

Line: audio equip
Ward-Beck see ad Cov 4

McLAUGHLIN INDUSTRIES

5824 Cheswood
Houston 77017
713 641-1266

Line: tower hardware
Philadelphia Resins see ad pg 154

MIDWEST TELE COMMUNICATIONS

3000 Carlisle Plaza
Dallas 75235
214 741-1440

Line: audio components, lighting equip,
video equip
Industrial Sciences see ad pg 152
Strand Century see ad pg 61
Unimedia see ad pg 107
Videotek see ad pg 157

DARRYL PARKER

13731 Omega Rd
Dallas 75240
214 233-5535

Line: radio equip
IGM see ad pg 181

BOBB PARTRIDGE

410 Elizabeth St
Irving 75060

Line: audio equip

PROFESSIONAL AUDIO SERVICES

PO Box 1953
Ft Worth 76101
817 536-6254

Line: audio components

SAVCO

PO Box 427

Richardson 75080

214 234-1841

Line: wide range of products for radio,
TV & sound recording
Ramko see ad pg 130,131
Unimedia see ad pg 107

JY SCHOONMAKER CO

2995 Ladybird Lane
Dallas 75220
214 357-8481

Line: tape recorders, audio equip
Telex see ad pg 93,96

SOUND IDEAS ASSOCS

6123 Spruce Forest
Houston 77018
5641 Yale Blvd
Dallas

Line: video equip
Video Aids see ad pg 153

SOUTHWEST AUDIO CONSULTANTS

1903 Apollo
Richardson 75081

Line: audio/video equip
MCI see ad pg 26,27

SOUTHWEST ELECT

9226 Markville Dr
Dallas 75231
214 690-9881

Line: audio components
Tech Labs see ad pg 160

SPECTRA SALES CORP

S Central Expy
Richardson 75080
214 234-3600

Line: antennas, RF & test equip

GENE SUDDUTH

845 39th SE
Paris 75460
214 785-5764

Line: full line video equip
Duca-Richardson see ad pg 89
Knox see ad pg 158

TEXAS VIDEO SYSTEMS

10209 Plano Rd #3
Dallas 75238
214 341-1771

Line: video equip
Microtime see ad pg 121

TEXPORT CO

140-KS Floyd
Richardson 75081
214 238-7177

Line: audio components
Robins see ad pg 165

TOTAL ASSOC

8706 La Brom St
Dallas 75209
214 351-3664

Line: monitors
Videotek see ad pg 157

RUSSELL TREVILLIAN

2908 Mulberry
Pasadena 77502
713 941-7272

Line: video equip

VIDEO ASSOC

8301 Balcones
Suite 313
Austin 78759

512 345-8864
211 E Seventh
Suite 1121 Austin 78701
Line: full line video & lighting equip
Industrial Sciences see ad pg 152
Strand Century see ad pg 61
Unimedia see ad pg 107

VIDEO SYSTEMS

2123 W Governors Circle
Houston 77092
2741 34 St Lubbock 79400

806 792-2325
3817 Ross Ave
Dallas 75204
8801 Tradeway St
San Antonio 78217
Line: full line TV production equip

Dynasciences see ad pg 170

Microtime see ad pg 121
Strand Century see ad pg 61
Unimedia see ad pg 107

WHALIN'S PRO AUDIO SALES

2910 Buena Vista
Arlington 76010
817 261-8197

Line: full line audio & recording equip
Ramko see ad pg 130,131

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 pg 140

UTAH

B&B ELECTRONICS PRODUCTS

2605 E 3300 So
Salt Lake City 84109
801 486-3943

Line: audio equip
Vega see ad pg 140

J&R CHRISTENSEN & ASSOC

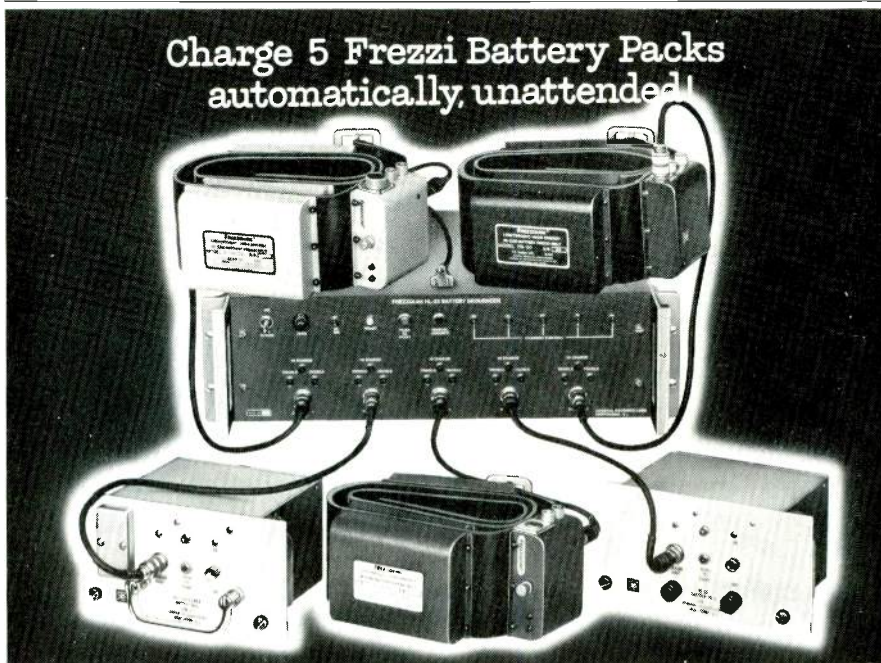
851 W 17th S
Salt Lake City 84104

Line: lighting equip
Strand Century see ad pg 61

JE HALL COMPANY

2330 So Main #8
Salt Lake City 84115
801 466-6105

Line: audio equip



Charge 5 Frezzi Battery Packs automatically, unattended!

Only one Frezzi Sequencer Charger does the job. It brings each Frezzi Battery Pack in sequence to full-charge. Just unhook 1 or more Packs & go! Circle 238 on Reader Service Card

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



Frezzi Electronics Inc.

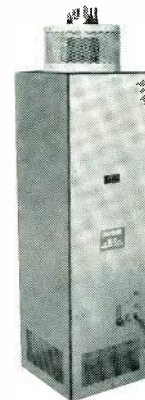
Made in U.S.A.

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

See FREZZOLINI® at SMPTE Conference, Booths 4 & 5, L.A. Oct. 16-21

ELECTRO IMPULSE

Thanks You for Making Our
Model DPTC-20KFM Dummy Load
One of our Most Successful Products!



MODEL
DPTC-20KFM
Rated 25KW
DC-110MHz
VSWR 1.15:1

Load is Dry,
Forced Air Cooled,
Fully Interlocked and
WARRANTED
FOR 25 MONTHS

Our New General Catalog 890 is now available upon request covering:

- Dummy Loads • Baluns • Calorimeters
- Power Meters/Attenuators



OUR 28th
YEAR OF
GROWTH

116 Chestnut St., Red Bank, N.J. 07701
Telephone: 201-741-0404

Circle 239 on Reader Service Card

HP MARKETING
2361 S Main
Salt Lake City 84115
801 466-6105
Line: audio equip

INTERMOUNTAIN VIDEO SYSTEM
658 Wilmington Ave
Salt Lake City 84106
801 486-8417
Line: full line lighting & video equip
Ikegami see ad pg 11
Strand Century see ad pg 61

LAIRD TELEMEDIA
2125 SW Temple
801 487-6251
Line: video equip
Industrial Sciences see ad pg 152

MEDIA WEST INC
187 West 3100 South Box 458
Bountiful 84010
801 295-3308
Line: audio components & radio equip
Micro-Trak see ad pg 98
Ramko see ad pg 130,131

PARTRIDGE ELECTRONIC SALES
PO Box 21205
Salt Lake City 84121
801 943-0127
Line: audio test equip, generators
Sound Technology see ad pg 25

RIA CORP
50 East Malvern Ave
Salt Lake City 84115
801 486-8822
Line: TV broadcast and microwave equip
Nurad see ad pg 116
Duca-Richardson see ad pg 89

TELEMERICA INC
PO Box 15068
2195 S 3600 W
Salt Lake City
Line: audio & broadcast products
Micro-Trak see ad pg 98

TV SPECIALISTS
170 E 21st S
Salt Lake City 84115
801 485-8171
Line: TV production equip
Microtime see ad pg 121

VIRGINIA

AVEC ELECTRONICS
2002 Staples Mill Rd
Richmond 23230
804 359-6071
2009 Williamson Rd
Roanoke 24012
703 344-6288
711 Granby St
Norfolk 23510
804 627-3502
Line: video equip
Microtime see ad pg 121

BROADCAST CONSULTANTS CORP
21 N Wirt St
Leesburg 22075
703 777-8660
Line: audio equip & broadcast products
Micro-Trak see ad pg 98

BROADCAST ENGINEERS & EQUIP REPS
Box 4777
Richmond 23229
804 285-8888
Line: full line of radio equip
Micro-Trak see ad pg 98

ROBERT H DAVIS
3434 Wedgewood Rd
Roanoke 24015
Line: lighting equip
Strand Century see ad pg 61

ENGINEERING SERVICE ASSOC
1508 Wakefield Dr
Virginia Beach 23455
804 464-6437
Line: tower hardware
Philadelphia Resins see ad pg 154

DAVID GREEN
21 N Wirt
Leesburg 22075
703 777-8660
Line: audio components & equip
Aristocrat see ad pg 24
Ramko see ad pg 130,131

HABCO ELECTRONICS INC
3116 Sedgewick Dr
Lynchburg 24503
703 384-5236
Line: audio components

TP HARRIS & CO
7627 Brook Rd
PO Box 9195
Richmond 23227
804 266-3185
Line: lighting equip
Strand Century see ad pg 61

JOHN A JORDAN
PO Box 813
400 Holly Rd
Virginia Beach 23451
804 422-1461
Line: lighting equip
Strand Century see ad pg 61

LEE HARTMAN & SONS INC
PO Box 659
3236 Cove Rd NW
Roanoke 24004
703 366-3494, 3493, 3713
Line: full line audio & video equip
Micro-Trak see ad pg 98

MEPCO/ELECTRA
5700 Old Richmond Ave
Richmond 23226
804 282-6515
Line: electronic components; tubes

MIDWEST CORP
1395 Air Rail Ave
Virginia Beach 23455
804 855-1056
Line: audio & video products, lighting equip
Micro-Trak see ad pg 98
Strand Century see ad pg 61
Videotek see ad pg 157

MIDWEST TELECOMMUNICATIONS
1395 Air Rail Ave
Virginia Beach 23455
804 464-6256
Line: audio, video, lighting equip
Micro-Trak see ad pg 98
Strand Century see ad pg 61
Unimedia see ad pg 107
Videotek see ad pg 157

continued on page 164

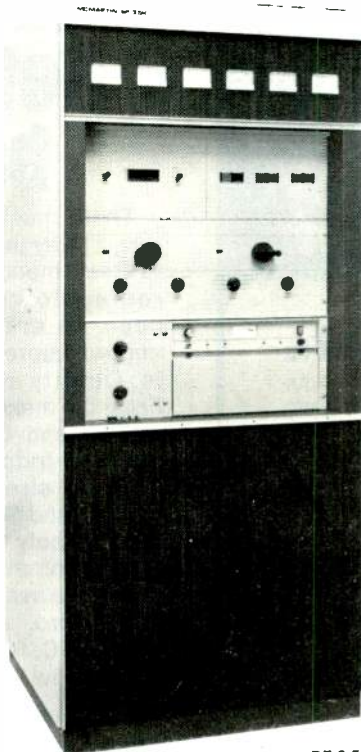
WARNING! HAZARD LIGHTING



Meets all FCC/FAA regulations.
Technical support provided.
Complete kits, 300 MM beacons,
flashers, obstruction lights, photo
controls, isolation transformers, lamp
failure alarm systems, plus many
special features.

HUGHEY & PHILLIPS

Tower Obstruction Lighting
3050 N. Calif. St., Burbank, CA 91504
Circle 240 on Reader Service Card



BF-3.5-K

in the *DESIGN* of
AM/FM TRANSMITTERS,
McMARTIN
considers
the *DECISION MAKERS*

- the *LISTENER*
for accurate sound reproduction
- the *ADVERTISER*
for consistent audience penetration
- the *ENGINEER*
for reliable operation and
ease of maintenance
- and the *OWNER*
for a very efficient and
profitable business

THE CHOICE IS YOURS

Call or see it all at NRBA, New Orleans, booth 70-71-72.

MCMARTIN

4500 South 76th St. • Omaha, Nebraska 68127 • (402) 331-2000 Telex 484485
Circle 241 on Reader Service Card

REPS/DISTS

ROBERT SLYE ELECTRONICS

3415 N Washington Blvd
Arlington 22201
Line: video equip, lighting equip
Auditronics see ad pg 117
Microtime see ad pg 121
Strand Century see ad pg 61

SPHERE ASSOC

11250-14 Roger Bacon Dr
Reaston 22090
703 471-1230
Line: audio equip
MICMIX see ad pg 126
Vega see ad pg 140

HC SMITH

PO Box 167
Burke 22015
703 978-4433
Line: lighting equip
Strand Century see ad pg 61

WASHINGTON

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, lighting
equip, microwave

Ikegami see ad pg 11
Nurad see ad pg 116
Microwave Associates see ad pg 87
Strand Century see ad pg 61
TFT see ad pg 169

BROADCAST SPECIALTIES

3163 Ocean Beach Hwy
Longview 98632
206 557-1671
Line: radio & audio equip

BROADCAST SUPPLY CO

2711 Locust Ave West
Tacoma 98466
206 565-2301
Line: broadcast products
Aristocart see pg 24
Micro-Trak see ad pg 98
Modular Audio see ad pg 159
Ramko see ad pg 130,131

CENTRAL VIDEO

3806 Woodland Pk Ave N
Seattle 98103
206 632-8900
Line: video equip
Microtime see ad pg 121

DAVE CHAMPLIN

12528 22nd Ave NE
Seattle 98125
206 362-0401
Line: audio products

CUSTOM VIDEO SYSTEMS

8320 Lake City Way NE
Seattle 98115
206 524-1026
Line: video lighting & equip
Strand Century see ad pg 61
Unimedia see ad pg 107

DATACOM ASSOCIATES

111 Tower Place
Seattle 98109
206 285-2525
Line: recorders, audio consoles, FM
monitors, video equip

RUSH S DRAKE

6133 6th Ave S
Seattle 98108
206 763-2755
Line: test instruments

EARL & BROWN CO INC

PO Box 9285
Seattle 98109
206 284-1121
Line: audio equip

FLEEHART & SULLIVAN INC

10109 Aurora Ave N
Seattle 98133
206 522-1533
Line: audio equip
Telex see ad pg 93,96

W J HANSEN & ASSOC

W 216 Pacific Ave
Spokane 99204
509 624-3209
Line: lighting equip
Strand Century see ad pg 61

JON B JOLLY INC

5416 California Ave SW
Seattle 98136
206 938-4166
Line: tower hardware
Philadelphia Resins see ad pg 154

HENRY JONCAS CO

12058 Lake City Way NE

Seattle 98125
206 363-9200
Line: audio equip, test equip
Sound Technology see ad pg 25

JOHN McCLAMROCK CO

11206 Des Moines Way S
Suite #108
Seattle 98168
206 244-9391
Line: full line radio equip
Micro-Trak see ad pg 98

MEPCO/ELECTRA

14040 NE 8th St
Suite 103
Bellevue 98007
206 746-1212
Line: electronic components, tubes

NORTHSHORE MARKETING

(NOR-MARK)
PO Box 865
Bellevue 98007
206 641-5687
Line: audio equip
MICMIX see ad pg 126

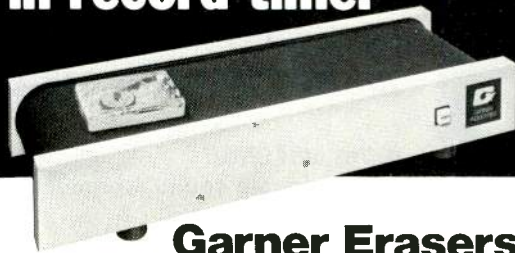
NORTHWEST ELECTRONICS

730 E First Ave
Spokane 99220
Line: video equip
Industrial Sciences see ad pg 152
Unimedia see ad pg 107

NORTHWEST INDUSTRIES

5518 Empire Way-S
Seattle 98118
Line: full line video equip
Dynasciences see ad pg 170

Wipe tapes clean in record time.



Garner Erasers

provide clean erasures in only four seconds — with no noise residue. Tapes are wiped cleaner than new. Our simple, safe, continuous belt operation handles all sizes of reels, cartridges and cassettes from 10½" on down.

Garner Erasers are now fulfilling the exacting requirements of many major organizations around the world... yet are so low priced that the smallest studio or station can afford one.

User reports...

"It is a big improvement over what we used to use, or anything else on the market today."

— Ric Hammond
KNX Radio (CBS)
Hollywood, Calif.

Call today. Or write for
a brochure and names of users.

GARNER INDUSTRIES

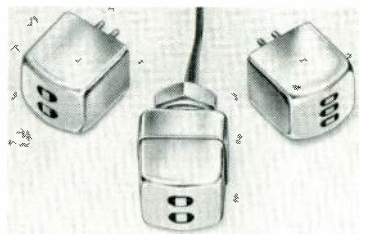
4200 N. 48th St., Lincoln, NE 68504
Phone: 402-464-5911



Circle 242 on Reader Service Card

Audio Heads? Get on the Beau bandwagon.

There must be some reason why the reaction to Beau mono and stereo audio heads has been so enthusiastic and widespread. There is: Quality and price. From the maker of Beau motors and Beucart®



audio cartridge tape machines, Beau heads are equal to anything else on the market. But at \$19.00 for mono models and \$69.50 for stereo units, Beau heads are unquestionably the biggest bargain around. Heads either with no mounts or threaded studs with leads, right from stock, are available for all popular cart machines, including Ampro, ATC, Beucart, Collins, Garron, Harris/Gates, ITC, RCA, Sono-Mag, Sparta, and Spotmaster, to name a few.

For a listing of all Beau audio heads, please request our new head brochure. Call (203) 288-7731 or write today.

UMC

BEUCART DIVISION UMC ELECTRONICS CO.

460 Sackett Point Rd. North Haven, CT 06473
SEE US AT NRBA BOOTH 30-31
Circle 243 on Reader Service Card

NUCOM ASSOCIATES
19415 36th Court NE
Seattle 98155
206 364-9911
Line: video & audio equip
Video Aids see ad pg 153

PANOR MARKETING
815 Ewig St
Seattle 98119
206 284-8020
Line: video equip
Knox see ad pg 158

DON ROSE
19001 40th Place NE
Seattle 98115
206 363-2200
Line: electronic tubes, components

KEN C SANDERS
4001 Sixth Ave South
Seattle 98108
206 622-7376
Line: lighting equip
Strand Century see ad pg 61

SCIENTIFIC INSTRUMENTS INC
326 N 100th St
Seattle 98133
206 783-6888
Line: video equip
Cohu see ad pg 97

SEA-TAC PRODUCTIONS
20103 Des Moines Way S
Seattle 98148
206 624-1111
Line: audio & broadcast equip

SPS ELECTRONICS
545 Lake St So
Kirkland 98033
206 827-5811
PO Box 11066
Parkwater Station
Spokane 99211
503 297-3862
Line: audio components

TASCO
12835 Bellevue-Redmond Rd
Bellevue 98005
206 453-1414
Line: test equip, broadcast equip
Marconi see ad pg 99

TRACK AUDIO
2134 South 295th
Federal Way 98003
206 941-2233
Line: audio components
Aristocart see ad pg 24

WM J WOLFENBARGER
1100 SW Florida St
Seattle 98134
206 522-2522
Line: audio equip
Ramko see ad pg 130,131

WEST VIRGINIA

CRV SYSTEMS INC
2370 Vinton St
Huntington 25701
304 525-2633
Line: audio & video equip
See ad pg 157

MIDWEST TELE COMMUNICATIONS
300 First Ave
Nitro 25143
304 722-2921
Line: full line TV production equip
Strand Century see ad pg 61
Unimedia see ad pg 107

WISCONSIN

AVIONIX DIVISION
AV ELECTRONICS INC
PO Box 505
21675 Doral Rd
Brookfield 53005
Line: video systems

CAMERA CORNER
525 S Military Ave
Green Bay 54303
414 494-1151
Line: video, film, lighting equip
Strand Century see ad pg 61
Unimedia see ad pg 107

E A DICKINSON ASSOCS INC
3612 N Green Bay Ave
Milwaukee 53212
414 264-1080
Line: electronic components, tubes

ELECTRONIC INDUSTRIES INC
19 E Irving Ave
PO Box 266
Oshkosh 54901
Line: audio equip
Micro-Trak see ad pg 98

FRANK INBUSCH LGT SALES
W 160 N
6249 Edgemont Dr
Menomonee Falls 63051
414 252-3311
Line: lighting equip
Strand Century see ad pg 61

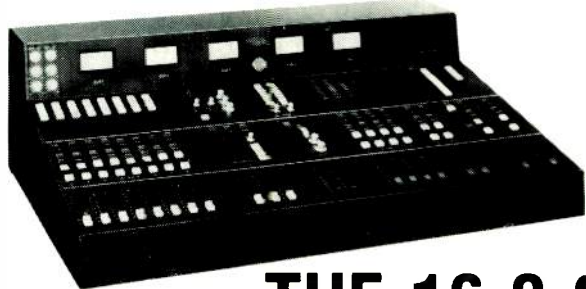
K&M ELECTRONICS OF TODD COMM
Professional Bldg Suite 202A
310 N Midvale Rd
Madison 53705
608 238-0271
Line: video equip
Unimedia see ad pg 107

SATTERFIELD ELECTRONICS
1900 S Park St
Madison 53701
608 257-4801
Line: audio & video equip

VIDEO IMAGES
12200 W Adler Lane
W Allis 53214
414 475-0111
811 Mayfair Ave
Madison 53714
Dynasciences see ad pg 170
Industrial Sciences see ad pg 152
Microtime see ad pg 121

VIDEO SYSTEMS
RR #1 Box 235
Lodi 53555
608 592-3272
Line: video equip
Microtime see ad pg 121

continued on page 166



THE 16-3-2 PRODUCTION T.V. MIXER

The numbers in the Robins 1632 TV Audio Mixing Console tell you why it is the right mixer for you . . .

16 inputs, for **64** sources **3** submasters
2 output channels

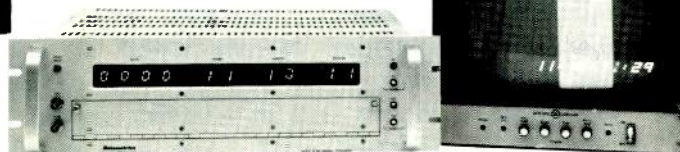
Plus, plug-in IC circuitry, illuminated meters and switching, room for expansion and many custom options to improve your audio. For details, call or write Steven Friedman, V.P.

ROBINS

BROADCAST & SOUND EQUIPMENT CORP.
75 Austin Blvd., Commack, N.Y. 11725
516-543-5200
Circle 244 on Reader Service Card

Generator - Reader - Video Generator

Datametrics Model SP-722 Generates / Translates SMPTE Code and Displays Time on Video Monitor along with Subject Matter.



Generate

- Time Code/User Bits
- Video Synchronization
- Jam Synchronization

Translate

- 0.25 to 10 Volt Sensitivity
- 1/4 to 40 Times Speed
- BCD Outputs

Time Display

- Infinitely Positionable
- Size and Style Selectable
- Intensity Variable

GOULD

Gould Inc., Control and Systems Division
340 Fordham Road, Wilmington, Mass. 01887 Phone 617-658-5410 • TWX-710-347-7672

Circle 245 on Reader Service Card

REPS/DISTS

CANADA

ADCOM ELECTRONICS LTD
29-16 Connell Court
Toronto, Ont.
Line: audio & video equip
Dynasciences see ad pg 170

APPLIED ELECTRONICS
299 Evans Ave
Toronto M8Z 1K2
416 252-3761
Bay No 1
4519 12th St NE
Calgary, Alberta
403 277-8600
Line: full line radio & TV equip

ARBUTHNOT ELECTRONICS
307-400 Tache Ave
Winnipeg Manitoba R2H 3C3
204 233-4941
Line: audio, video equip, components

BIO-ELECTRONICS
1883 Lawrence Ave E
Scarborough Ont
Line: audio equip
Micro-Trak see ad pg 98

CALDWELL A/V EQUIP CO
1080 Bellamy Rd N
Scarborough Ontario
416 438-6230
Line: full line audio & video equip
Micro-Trak see ad pg 98
Ramko see ad pg 130,131
TFT see ad pg 169

CHROMOCORD CORP
2343 43rd Avenue
Lachine Quebec H8T 2K1

514 636-8183
154 Vaughan Road
Toronto Ontario M6C 2M2
416 653-7722
Line: audio equip, components
MICMIX see ad pg 126
Micro-Trak see ad pg 98

COMAD COMMUNICATIONS LTD
1770 Albion Rd Unit 7
Rexdale Ont M9V 1C2
416 745-6494
Line: audio components & video equip
Knox see ad pg 158

ALAN CRAWFORD ASSOC
800 Windmill Rd
Dartmouth Nova Scotia B3B 1L2
902 469-7865
1330 Marie Victoria Blvd
Longueville Quebec J4L 1A2
514 670-1212
1299 Richmond Rd
Ottawa Ont K2B 7Y4
613 829-9651
6503 Northam Dr
Mississauga Ont L4V 1J5
416 678-1500
3829 12th St NE
Calgary Alberta T2E 6M5
403 276-9658
116 E 3rd St
N Vancouver BC
604 980-4831
Line: audio components & test equip
Amber see ad pg 136

ELECTRO & OPTICAL SYSTEMS LTD
3015 Kennedy Rd
Scarborough Ont M1V 1E7
416 291-4492
Line: video equip
Duca Richardson see ad pg 89

GLENTRONIX LTD
160 Duncan Mills Rd
Don Mills Ont
416 444-8497
Line: full line audio & video equip

GORDON ENGLISH WESTRONICS
7 W 74th Ave
Vancouver BC
604 872-0636
Line: radio equip
IGM see ad pg 161

E S GOULD MARKETING
109 Montee De Liesse
St Laurent Quebec
514 342-4440
Line: radio, TV broadcast equip

J-MAR ELECTRONICS LTD
6 Banigan Drive
Toronto 17 Ont
416 421-9080
Line: audio equip

LEADER SOUND
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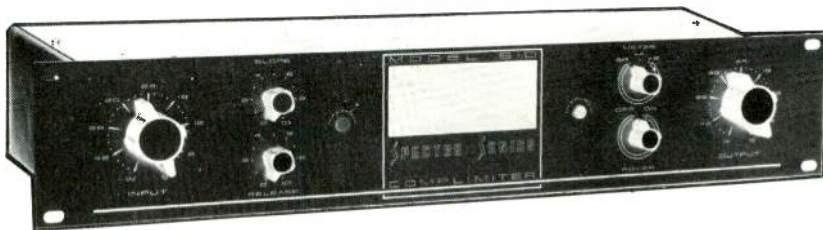
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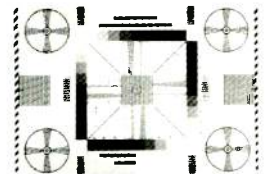
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' INTERPRETING THE FCC RULES & REGULATIONS

Radio Operator Licensing Rules May Change; UHF's Given Boost On Cable

By Frederick W. Ford and Lee G. Lovett; Pittman, Lovett, Ford and Hennessey, Washington, D.C.

IN TWO DIFFERENT ACTIONS, the Commission has (1) proposed easing rules for AM and FM licensed operating personnel and (2) boosted UHF television station carriage on some cable TV systems. In the former action,¹ the Commission proposed amending radio operator licensing rules to delete the need for examinations for certain operators. In the latter action,² the Commission amended its rules to permit carriage of UHF television stations by any cable television system within the stations' predicted Grade B contour.

Possible Radio Operator Licensing Rule Changes

Presently, persons holding a Radio Telephone Operator Permit³ endorsed for broadcast operations are permitted to perform routine operation of AM and FM stations (where specifically permitted by the Commission's Rules). Operators with this type of permit can generally do the following:

- (1) Turn the AM or FM broadcast transmitter on and off;
- (2) Compensate for voltage fluctuations in the primary power supply;
- (3) Make routine changes in operating power which are required as part of the AM or FM station's license;
- (4) Maintain transmitter modulation levels within license-prescribed limits; and
- (5) Switch between (a) directional and nondirectional or (b) different radiation patterns for AM stations (at dawn and dusk) if such changes can be made by activation of switches (as opposed to manual tuning).

Applicants for the Radio Telephone Operator Permit endorsed for broadcast operations are required to take and pass an FCC exam.

The Commission's proposed rule would permit routine operation of AM and FM stations (where permitted by the rules) by persons holding a Restricted Radio Telephone Operator Permit *instead* of the Radio Telephone Operator Permit endorsed for broadcast operations. *No examination is required for the Restricted Radiotelephone Operation Permit.*

The Commission suggested additional changes, too. One noteworthy proposal is for a *dual license* structure for radio operators. One group of licenses would apply to control of routine broadcast operations, such as those listed above. Another group of licenses would apply to (1)

technical operation and (2) maintenance of the different classes of radio stations. The Commission is also contemplating changing the names of all the various radio operator licenses.

Another noteworthy proposal is for creation of a new class of radio operator license that would apply *only* to the operation of television transmitters. Some have said that this is long overdo.

The Commission is not proposing to ease the license examination requirement without "asking" for something in return from broadcasters. Tightening up the current Commission Rules relating to operator responsibility is proposed. A licensed technician or a licensed operator responsible for maintaining a broadcast transmitter would (if the changes are adopted) have to be sure of the following:

- (1) That the station has a valid FCC authorization;
- (2) That the operator or technician or any other person will make *no* transmitter modification that would *void* type-approval or type-acceptance of the equipment by the FCC;
- (3) The licensed operator or technician would also have to make required log entries in the broadcast station records.

The proposed rules would also require that the maintenance technician, ". . . upon completion of his duties, enter a signed statement in the station record that the station is operating in compliance with FCC rules and authorization . . ." When any aspect of station operation is not in compliance, the technician would have to (1) log in specific details of the noncomplying operations and (2) notify the licensee in writing of these details. Although this latter requirement seems duplicative, the Commission apparently feels that requiring written notification would be the best means of insuring that the licensee, with ultimate responsibility for station operation, would be fully apprised at all times of non-compliance with the Commission's Rules.

Finally, the Commission is proposing to combine two portions of the Limited Radio Telephone Operator Permit examination into one. This is happy news for prospective applicants.

UHF's May Be Carried Throughout The Grade B Contour

UHF television stations have been given a break by the Commission in a recent action.⁴ Cable television systems located within the predicted Grade B contour of any UHF television station may now carry that station's signal.

In 1975, the Commission amended its Rules⁵ to make more accurate the procedures applicable to calculating the

¹Notice of Proposed Rulemaking in Docket No. 20817, Public Notice released: July 22, 1977.

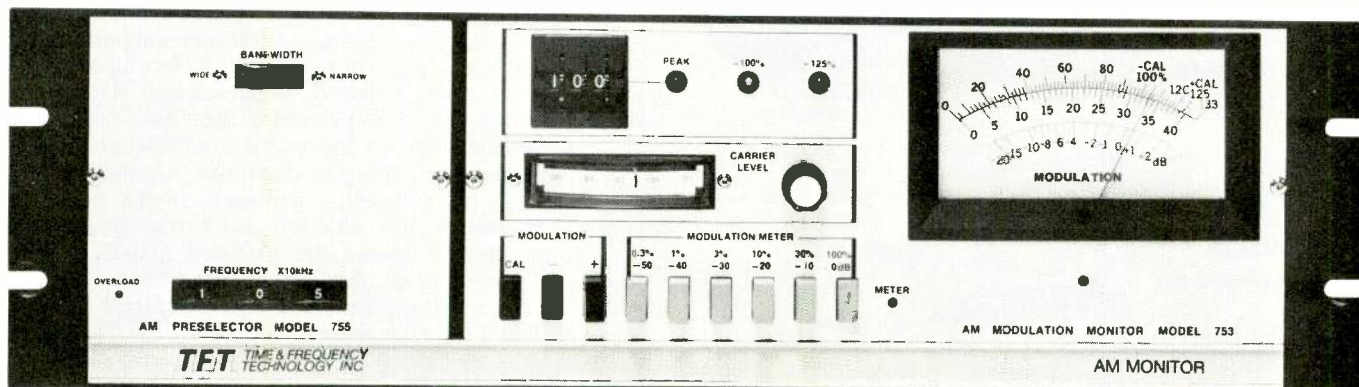
²Report and Order in Docket No. 20496, FCC 77-480, adopted: July 7, 1977; released: July 15, 1977.

³Formerly, termed "Radiotelephone Third Class Operator Permit".

⁴Report and Order in Docket Nos. 16004 and 18052, FCC 75-636, 53 FCC 2d 855 (1975).

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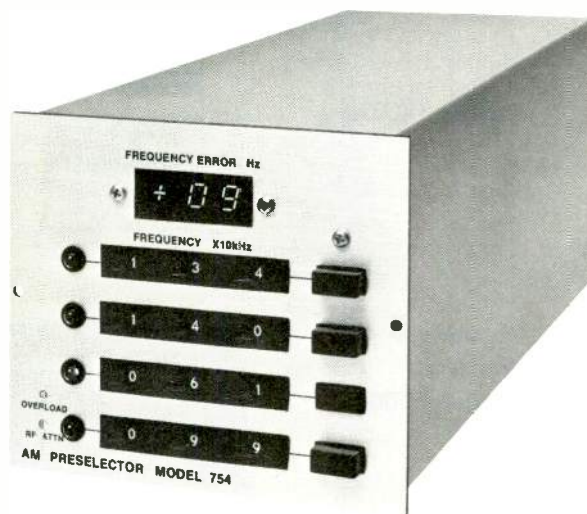
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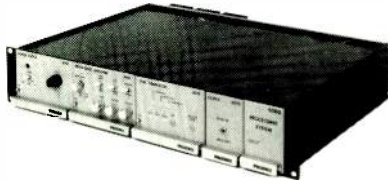
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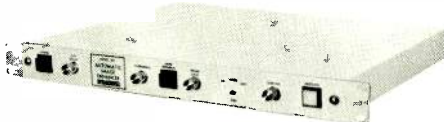
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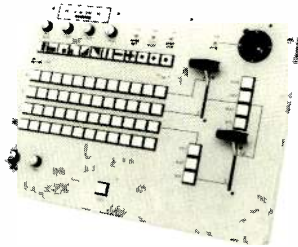
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predicted locations of Grade A and Grade B contours. (Depending upon the television channel number, the predicted Grade A contour is 68-74 dbu and the predicted Grade B contour is 47-64 dbu.) The "new" method of calculating predicted contours will have little effect upon VHF television stations. Predicted Grade B contours will shrink very little; the most egregious cases appear to be 7 percent of the "old" contour. The effect upon UHF television stations, however, is substantial. Reductions may approximate 24-28 percent of the "old" contour in some instances. For this reason, the Commission initiated a rulemaking proceeding to determine whether or not, because of this substantial shrinkage in the predicted Grade B contour, the cable television rules based upon contours should, instead, be amended to utilize *fixed mileage zones*.⁶ In all, the Commission utilizes *contours* (versus fixed mileage zones) in seven different areas.⁴

Previously, a *major market* (top 100) UHF TV station could only be carried in two circumstances: (1) if the community in which the cable television system was operating was within 35 miles of the "reference point" of the major market or (2) the UHF station was recognized as a "significantly viewed" TV signal in the county in which the cable system was located. Now, a major market UHF station may be carried by a cable system operating in any community located outside of the major market's 35 mile zone but within the UHF station's Grade B contour (predicted under the new method).

In the past, *smaller market* UHF stations could be carried on a cable system, based on the station's Grade B contour, only if the cable system was located (1) outside of all television markets or (2) in another smaller television market. The Commission's rule revision now permits carriage of smaller market UHF's on cable systems located in major markets. *This is an important rule change which could add significantly to the audience of many UHF television stations.*

(Since this rule revision permits carriage of the UHF station within its Grade B contour regardless of whether the station has "mandatory" carriage rights, some cable systems may now be able to import an additional TV signal. This will occur where a UHF station had been carried as a distant signal, but now, pursuant to this rule change, can be carried as a local signal.)

In conjunction with this rule change, it should be noted that the Commission does not require television stations to utilize the new procedures for calculating predicted Grade A and Grade B contours until June 1, 1978. Until that time, the Commission will review signal carriage proposals based upon whichever contours are presently being used. It is up to an objecting party to show that the contours would be based upon the new prediction method. For example, assume that a cable television operator seeks to carry a UHF as a local signal. Assume that the cable system is at the outer fringes of the UHF station's "old" predicted Grade B contour. If another television station being carried by the cable system objects to addition of the UHF as a local signal, it is the burden of the cable operator or the UHF to submit a showing that the UHF's predicted contour under the *new* method results in authorized carriage. **BM/E**

⁴See fn. 3.

⁶Notice of Proposed Rulemaking in Docket 20496, FCC 75-635, 53 FCC 2d 1009 (1975).

⁴(1) Certification application notification requirements [§76.13 (a) (6)] and (c) (4); (b) Cable-broadcast cross-ownership [§76.501 (a) (2)]; (c) One technical standard [§76.605 (a) (9)]; (d) non-duplication protection for translator stations [§76.92 (d)]; (3) duplicate signal carriage where translator or satellite station is involved [§76.55 (c)]; (f) non-commercial television station carriage [§76.57 (a) (1)]; §76.59 (a) (2) and §76.61 (a) (2); (g) commercial TV station carriage on cable systems in smaller TV markets and outside all markets [§76.57 (a) (1) and §76.59 (a) (3)].

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The "vu meter" Is The Best Documented Program Level Meter In The World Today Says Stephen F. Temmer

In the June issue of BM/E, Hans Schmid spoke out against vu meters advocating instead more use of peak program meters for reading audio levels. This evoked a strong response from Stephen F. Temmer, president of Gotham Audio Corp. an active AES member who believes vu meters are a proper standard. We invited Temmer to Speak Out and offer rebuttal to Schmid's arguments. Temmer accepted this invite.

Prior to the appearance of Schmid's Speak Out, but after it had gone to the printer, Eric Small, well-known broadcast consultant, said he, too, was anxious to voice his opinion on the same subject. We therefore supplied Small with Temmer's response and we include in this issue his comments on both articles. Finally, we offered Schmid a chance to comment on Temmer's charge that his strip recorder charts scalings published in June were misleading. Schmid's reply is included.

We are not sure that this current exchange will satisfy all concerned. We do intend to run a feature article on "Trends In vu Meters" in October written by Dr. Ronald Gubish of Weston. At that time, we'll report on how you readers respond to it all.

Again, we invite all our readers to Speak Out on subjects of deep concern to them. We expect that what you have to say might be controversial. That is our purpose: to get opinion makers to sound off on what they think "ought to be".

THE "FAIRNESS DOCTRINE", if nothing else, requires that I answer my old pal Hans Schmid's often heard pleas about peak program meters and their "clear advantage". Oh if it were only as simple as Hans intimates. It is hard to know where to begin: let's talk about those strip recorder excerpts he printed in Fig. 1 and 2. It is regrettable that these are based on both an antiquated and inaccurate assumption: namely that vu meters are to be aligned 10 dB in level below their quasi peak reading counterparts. As a company which has been selling disc-cutting consoles featuring vu meters alongside one of the numerous standard quasi peak indicators (the German DIN 45 406), we have garnered over 10 years of experience. It is clear that the number of dB most satis-

factory to all operating engineers is 6 dB; quite a difference from the 10 dB which got Hans in such trouble with those comparisons. It's too bad that his vu meter recordings (incidentally vu is always spelled lower case per ANSI C16.5) are clipped at +3 or you would soon see that you only have to realign the PPM to about a +14 dB and the "obvious" error would evaporate. Don't be fooled by the fact that Hans has the distance from the alignment line to the -5 dB and +3 dB line only half as wide for the PPM as for the vu meter so as to greatly expand the apparent error in both figures. But that's only the beginning.

There are no fewer than ten different peak indicating meter standards in use throughout the world! There is only one *standard volume indicator standard*, and the author of this rebuttal has been assigned the task of revising this standard for the Audio Engineering Society to bring it up to date. This will not, however, in any way alter the basic ballistic characteristics of that venerable instrument.

It is not surprising that Europe, the birthplace and haven of PPMs (I don't know where Hans got that PPG abbreviation from), is increasingly using vu meters and that for many reasons. Let me give you but a few: 1. It is inexpensive. 2. It is reliable since it has no meter amplifier to fail. 3. It clearly produces program material of mixed music, speech and sound effects which are subjectively better matched. Just drive your car in Europe and listen to the radio. Your hands are constantly on the volume control knob—turning the music down and the announcements up. The relatively high noise threshold tells you very quickly how well balanced the levels are. Their equipment, their transmitters and their broadcasting authorities are happy as a pea in a pod. It all depends on whom you are devoted to serving—the listener or the equipment. 4. The vu meter is recognized throughout the world and will

soon be accepted by the IEC in Geneva as IEC 268-10B. Even IEC 268-10, the standard which deals with PPMs lists no fewer than three types which are sufficiently different to produce considerable discrepancies in readings.

But the vu meter isn't all roses either. Peak Indicating Program Meters have their advantages: 1. They have a greatly expanded scale, some to as much as 55 dB (vs 23 dB for the vu meter), making it possible to supervise low levels as well as high. 2. They are more "idiot proof" than vu meters: it takes less experience to run a program using a PPM—even a deaf person could do a creditable job—not so with a vu meter. 3. They do not exaggerate the level of long duration modulation, nor do they understate very short duration spikes. But they cost many times as much as vu meters, consume power, are subject to amplifier failure and do not entirely eliminate the need for "interpretation", much as their proponents want us to believe. Fig. 2 of Hans' article clearly proves this. Simply "realign" the vu meter by assuming the +3 line to be the proper alignment level rather than the "8 vu" one (I'm still old fashioned enough to insist that it be "+8 vu"), readjust the -5 and +3 dB lines to the same spacing, and you'll see that both graphs are just the same relationships for the different types of program material.

Let's keep this one fair! Anybody want to help us rewrite the vu meter standard? Please get in touch with me. We need all the help we can get.

(Note: The latest IEC Standard 268-10 *Programme Level Meters* lists several PPMs but is awaiting submission of the USA's Sole Standard Volume Indicator.)

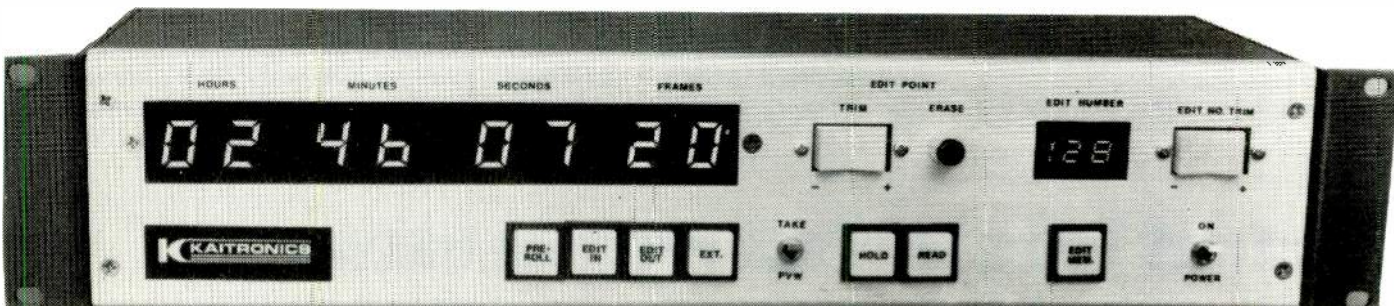
Schmid's Reply To Temmer

I can not help thinking that Mr. Temmer is hoist upon his own petard. Mr. Temmer's comments indicate that he misunderstands all my strip chart recordings (and I cannot

continued on page 174

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Speak Out

imagine what he thinks they are).

Let me describe the strip chart recordings. As I have stated in the text and in the figures' captions, the strip chart recordings represent the meter deflections of the PPM. Envision a pen mounted to the tip of the meter needle and let the pen write on a chart paper that is moving upwards over the meter. The would-be resultant strip chart recording is curved but otherwise identical to the straight scale strip chart recordings presented in my papers.

The interested reader may wish to refer to

my paper on the subject in the IEEE Transaction on Broadcasting of March 77. Fig. 1 in this paper shows the complete sinewave calibration of both recorders. Those can be compared with the actual meter scales shown in Fig. 7 of the IEEE paper. He will find that the scales of the strip chart recording are the same (albeit straight and vertical) as those on the respective meters.

Thus, when Mr. Temmer finds it "too bad that his vu meter recording are clipped at +3", it really means that the vu meter needle is pinned.

When Mr. Temmer cautions the reader "not to be fooled" by the fact that I showed differing scales so as to "greatly expand the

apparent error in both figures", it really means that Mr. Temmer fooled himself. He did not recognize that this difference is that of the actual meter scales, and his conclusion is therefore unwarranted. Moreover his suggestion "to realign the PPM to +14 dB and you would see how the 'obvious' error would evaporate" is tantamount to my statement that the use of a PPM meter results in a 3-5 dB higher level capability...

I will stand by my earlier remarks and writings on the subject and try to reduce the matter to a simpler statement: the vu meter lies and anyone who wishes to find out need only put both meters side by side on the same program and observe the results.

Eric Small Votes For Peak Program Meters

NOT HAVING THE SAME CREDENTIALS as those of Hans Schmid and Steve Temmer in the matter of peak program meters (PPM) vs. vu meters, it is with some trepidation that I add my comments*, but I find myself compelled to try.

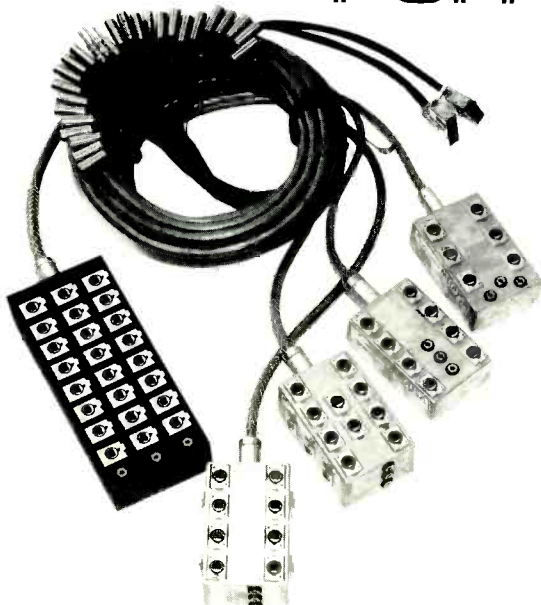
*I do not wish to comment on Temmer's criticism of Schmid's methodology. I found the graphs interesting, although secondary to his argument. Any serious discussion of the methodology would have to refer to Schmid's original IEEE paper.

I have worked in both the recording and broadcasting industries, and feel that most of the differences of opinion between my two learned associates come from differences in recording and broadcast practice in the United States. If this exchange had taken place in a periodical devoted primarily to recording, I would give greater weight to Temmer's comments on the usefulness of the meter.

I must, however, strongly side with

Schmid when he states that a change from the vu meter to the PPM would be a tremendous step toward improving the overall audio quality of radio and television in this country. For broadcast operation and production as they really exist in the U.S., PPMs do, in my opinion, hold a "clear advantage". (By the way, I agree with Temmer that PPM is a clearer reference to the peak program meter than PPG.)

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Speak Out

Controlling levels in broadcasting poses very unusual technical and human problems. What I mean is that compared to recording engineers, broadcast operators appear "sloppy" and "inattentive" when it comes to audio levels. This is because they have lots of other things happening—usually all at once. Watching some kind of level meter is just not as important to them as rapidly juggling carts, records, and live copy without error.

In recording, especially disc mastering where one side of a stereo LP may cost \$100 or more, the level meters receive a great deal of the engineer's attention. He or she is a skilled artisan and generally has a great intuitive understanding of the equipment and the process of mastering. Careful listening and an experienced "eye" for vu meters helps them do a better job.

Temmer himself makes the strongest argument for PPMs in broadcasting: "They are more "idiot proof" than vu meters: it takes less experience to run a program using a PPM—even a deaf person could do a credible job—not so with a vu meter."

I cannot imagine a better endorsement for replacing vu meters with PPMs than the above. I have met very

few broadcast operators who are either deaf or idiots, but have certainly heard a lot of them accused of being both, especially when it comes to controlling audio levels.

There is certainly a cost difference between vu meters and PPMs. But again, I must ask, recording or broadcasting? A typical 24 track recording or mixdown console might use 30-50 level meters. How many radio consoles have you seen with more than four meters? A few, but not many. And what is this vast cost difference? I would estimate that between a PPM meeting the requirements of the British Broadcasting Corporation and a vu meter meeting the ANSI standard, it would cost four or five times as much for a PPM—a lot of money if 30-50 meters are involved. But is that such a great price to pay for only a few instruments, especially if the result is improved audio control?

With today's technology, it's much simpler to select the parameters of an electronic circuit to comply with a PPM ballistic standard than it is to maintain the kind of mechanical tolerances that are required of meter movements to comply with the vu standard.

Consider the phrase "a vu meter meeting the ANSI standard". I am sure that Temmer is correct in stating that there are at least ten PPM standards and

only one volume indicator standard. The problem arises when one starts testing the ballistics of various vu meters found in typical professional audio equipment. It is rare to find compliance with the ANSI standard. I am not referring to cheap "vu type meters" found on some hi-fi gear; I mean \$20-30 meters that say "vu" on them and are substantially different from the ANSI standard.

I do not think that the vu meter is a useless device that should be banished from the face of the earth in favor of any PPM. For use in some situations and by people who understand its operation, the vu meter provides valid, reliable information. It should be noted that many of the PPM standards provide for an optional "slugging" capacitor to slow the movement of the PPM. This is to permit "the comparison of two distantly situated PPMs by discussion over a telephone circuit." This is one of the intended purposes for the vu meter. Interestingly, the action of a "slugged" PPM is very much easier to follow than that of a vu meter.

I, too, feel that a conversion of U.S. broadcasting from the vu meter to the PPM would be a step forward for the industry. My vote is for a British Broadcasting Corporation peak program meter (British Standard 4297.1968) with a B scale. **BM/E**

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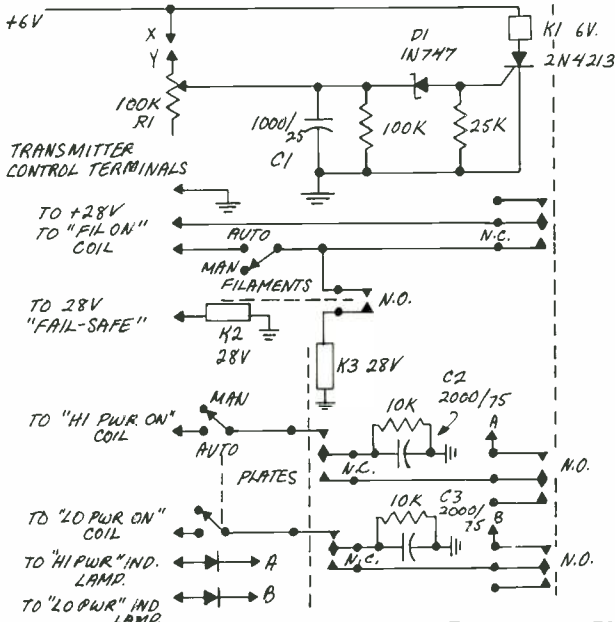


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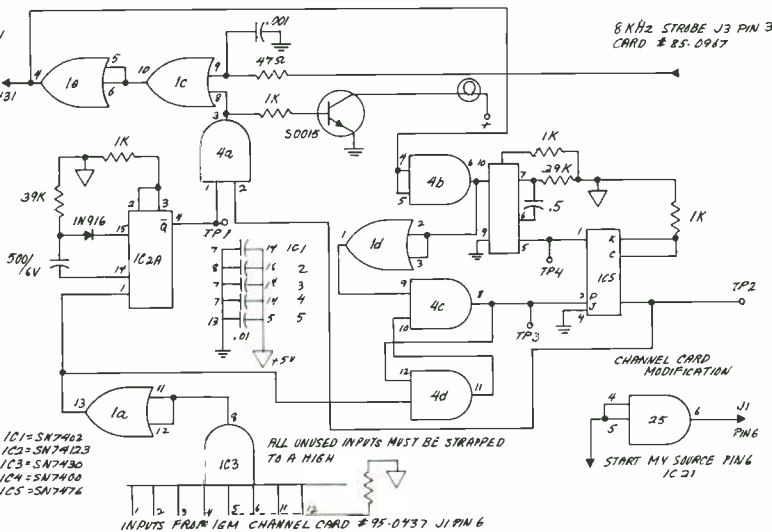
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Device for restoring power safely to transmitter by Busch. Text on page 178 Great Idea #23.



Counter and disable for increased reliability of automated voice tracks by Shields.

shown below. They are a differential in, single ended out, 20K bridging amp using the new RCA CA31140S. See fig. #2.

Using this system you will find that your stereo spots as heard in mono (everything else being set up properly) will take a pronounced turn for the better.

21. Increasing Reliability of Automated Voice Tracks.

Robert N. Shields, Jr., technical supervisor, WCAU-FM, Philadelphia, PA.

ability of automated voice tracks. We have had this problem since we started using voice tracks with our IGM 770 system.

Solution: The solution is in the accompanying diagram. It consists of a counter and a disable. A start pulse is received from each music channel of the IGM system and is combined in IC3 inverted by IC2 to trigger the one shot IC2z, a 7 second pulse is used to disable the 8 kHz strobe to prevent tripping of the voice tracks during the logging process. The start pulse from each channel also resets the counter, IC5. Sometime during the record should an 8 kHz pulse occur, it will trigger the 8 kHz strobe starting the voice track and also setting the

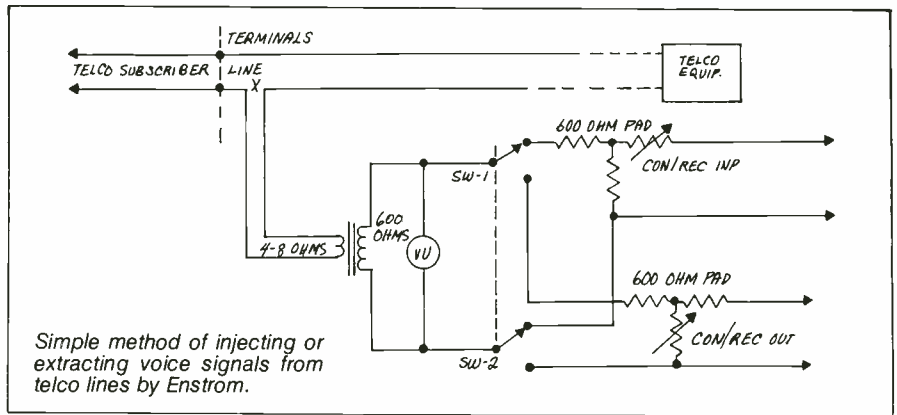
Problem: How to increase the reliability of automated voice tracks.

continued on page 178

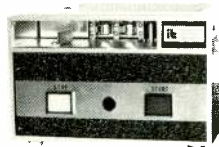
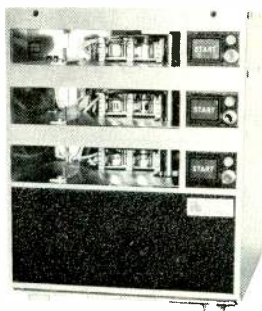
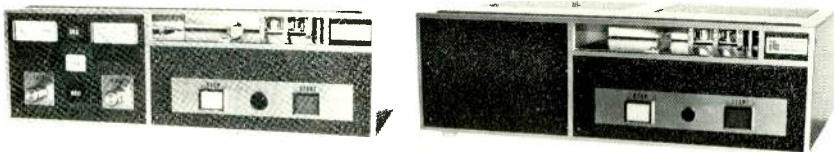
Great Ideas

counter. About a half a second later, IC2b will clock the counter and its output will go low forcing 4a to go high, which prevents 1c from allowing any more 8 kHz pulses to strobe the computer. With this circuit only one voice track per event can occur, keeping the voice tracks in sync.

A lamp is used to indicate that the voice tracks have been disabled, either during the initial logging and start-up



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process or because of a false start of the voice track machine.

22. Simple Injection Or Extraction Of Voice Signals From Regular Telco Lines.

Howard L. Enstrom, Broadcast Engineering Services, Black Hawk, SD

Problem: Devise a simple method of injecting or extracting voice signals from regular telephone subscriber line, without introducing shunt capacity or loading which, in some cases, with telco selective ringing, might cause problems. Use if only for need to record weather, reports, etc., or to send DDS feeds for sports, etc.

Solution: Simply open one side of line (at any point, preferably at telco terminal block) and connect low impedance (low resistance) side of transformer in series. Secondary output is switched for either receiving or sending, with separate T pads to adjust required levels for recording or direct airing through console. When sending into line, care must be used not to exceed telco line levels, so VU meter will display proper and consistent levels of feed. Recommended transformer is 8 ohm secondary and 600 ohm primary, but any may be used provided low impedance only is wired in series with line. Big advantage: no telco coupler is needed. Not recommended for general talk show two way telephone conversations.

23. Returning To The Air After Momentary Power Outages And Transfers.

Tom Busch, general manager, KNOM, Nome, Alaska

Problem: To automatically restore 1) filaments, and 2) carrier at proper level, after momentary power failures. Frequent mains outages would lead to either a very cold transmitter at sign

on, or minutes of unnecessary down time, as flustered operators fussed to recycle the remote control.

(circuit drawing on page 177)

Solution: A device was built with two functions in mind: upon power restoration, 1) momentarily engage the transmitter's FILAMENT ON contacts, and 2) simultaneously engage the LO or HI POWER ON contacts, if those circuits had been energized when mains power was lost. It takes about three seconds for our auxiliary generator to come on line, and with the component values chosen, the device will not restore carrier after an outage longer than five seconds.

The carrier restoration function was simplified by an automatic feature of our Collins 820F-1 transmitter, which allows an operator to activate the plate circuits from a dead cold condition.

When power is restored, +28 volts from the transmitter's own supply is routed back to its FILAMENT ON relay coil through K1's normally closed contacts. About a second later, the timing circuit of C1, R1, D1 and the SCR energizes K1, opening the connection. This allows an operator to turn off filaments manually any time.

C2 and C3 charge off the LO and HI POWER indicator lamp circuits, through K1 and K3 contacts. These caps are isolated when power is lost, and slowly bleed. When power returns, K3 energizes (only if the FAIL SAFE is already energized) and the appropriate cap discharges into its transmitter control relay, restoring carrier. When K1 energizes, the caps are returned to the indicator circuits, to charge for next time.

The device does not affect normal operator functions, like PLATE ON/OFF, power changes, etc, and will not turn up carrier if remote control has been lost.

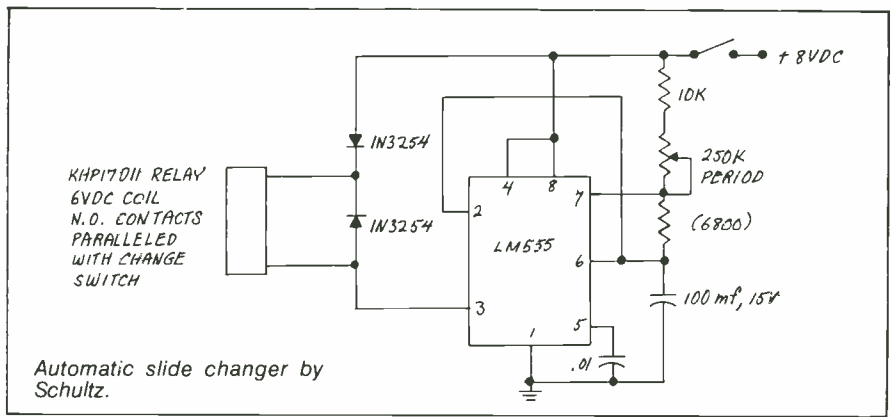
The device was designed and built around surplus parts. It has worked faithfully, returning us to the air within seconds of a power failure, and keeping filaments burning during those long thirty-below winter nights.

24. Automatic Slide Changer

Tom Schultz, engineer, WGHP, High Point, NC

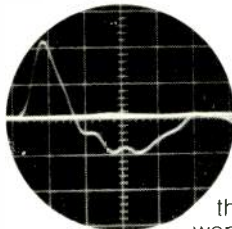
Problem: Automatically change an RCA TP-7 slide projector once every ten seconds for purpose of airing telephone number slides during a telethon. Project suggested by Chief Engineer, Jerry Blankenbeker after being informed of a timing motor system at

continued on page 180



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*Outdoor test with Tektronix scope, set for 10V/division vertical. 01 μsec/div. horizontal 22 cal. starter's pistol mounted 15 cm from MD 421 measured pressure of 111,000 dynes/cm² (175 dB SPL). Smooth, rounded scope trace indicates total lack of distortion.

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WRAL.

Solution: The dry N.O. contacts of the relay in the attached circuit are connected in parallel with the change switch contacts for the slide projector. If more than one slide projector is involved, a two pole multi-position rotary switch can select which change switch contacts are paralleled. The period between changes is adjustable from three seconds to thirty seconds. The 15K resistor was changed to 6.8K to produce a contact closure time of approximately one third second. This results in smoother operation of an RCA TP-7 slide projector. If the power switch is used for start-stop as in the original, the first change period is about 50 percent longer than following periods due to the charging action of the 100 UF timing capacitor. Power supply voltage should be approximately 1 volt above the voltage required by the relay but not above 18 volts. When an external power supply is used, a steering diode should be placed in one of the supply lines to prevent accidental reversal of power. This circuit is a labor saver when phone number slides must change every ten seconds for 24 hours.

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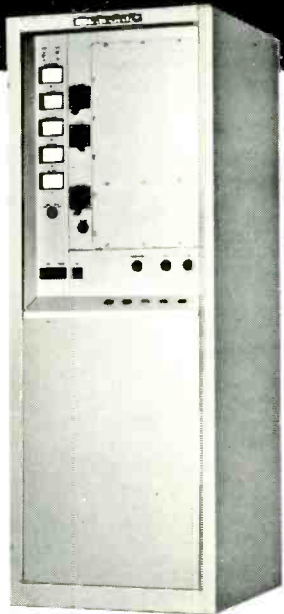
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Business Briefs cont. from pg. 18

RCA has sold \$1.2 million worth of television broadcast equipment to **Gilmore Broadcasting Corp.** for use in its stations, WREX-TV, Rockford, IL; KODE-TV, Joplin, MO; and WEHT-TV, Evansville, IN **Metro-media** began an upgrading of its facilities with a \$1.6 million purchase of RCA broadcast equipment. Metro-media stations, KMBC-TV, Kansas City, WNEW-TV, New York, KTTV, Los Angeles, and WXIX-TV, Cincinnati, will receive the new equipment **Kaiser Broadcasting Co.** has decided to equip all of its five group stations with RCA TCR-100 videotape cartridge recorders.

WSOC-TV, Charlotte, NC, commemorated its twentieth anniversary with the unveiling of a new 50-kw color TV transmitter, a **Harris BTD-50H2.** Other Harris transmitters are due to be installed at other Cox Broadcasting stations in Pittsburgh and at **WSOC-FM** **KWIT began construction** on its new facility on the campus of Western Iowa Tech Community College. The 100,000 watt station will go on air from its new 3940 square foot plant sometime in January, 1978.

Video Expo '77 will be held from October 11-13, 1977 at Madison Square Garden, New York City. Some 7000 people are expected to attend The Society of Broadcast Engineers, **Chapter 22,** will hold its regional convention and equipment show September 30, at the Syracuse Hilton Inn, Syracuse, New York **Chapter 20 of SBE** will have its regional convention and equipment show at the Howard Johnson's Motor Lodge in Monroeville, PA, October 21, 1977.

RCA American Communications, Inc. has begun construction of a new microwave link to serve the midwestern states. The \$1 million facility will link the company's earth station at Lake Geneva, WI, with RCA Americom's central office in downtown Chicago

Scientific-Atlanta announced a series of sales of its earth station communications systems. RCA has purchased \$5 million worth of equipment for its **Alascom** communications network; **Liberty Communications** has purchased three 5-meter earth stations and **Total TV** of Dodge County has ordered a single 5-meter earth station.

Herbert M. Perkins, general manager of the Editing Division of **Data-tron, Inc.,** has been elected president of the company **Edward M. Mullin** has been appointed president of **Ampro Broadcasting Inc.,** and **Joseph Novik** has been named sales manager.

PLOUGH BROADCASTING'S WHRK, Memphis, picks a new format and IGM's RAM to make it go!

The new "disco" sound at WHRK requires the capability to program three or four times as many events as the previous format. So, the 100,000-watt, 24-hour station went to IGM with the problem.

The solution is a RAM (Random Access Memory) Control System, three 48-tray Instacarts and four reel-to-reel playback units with time announce capability.

Now, WHRK can program 4096 events—enough for seven days—and, at the same time, "flag" certain events to insert spot changes quickly.

WHRK is only one of five Plough Broadcasting stations to install RAM systems.

The whole story is in IGM News, No. 2-77. Send for it today.

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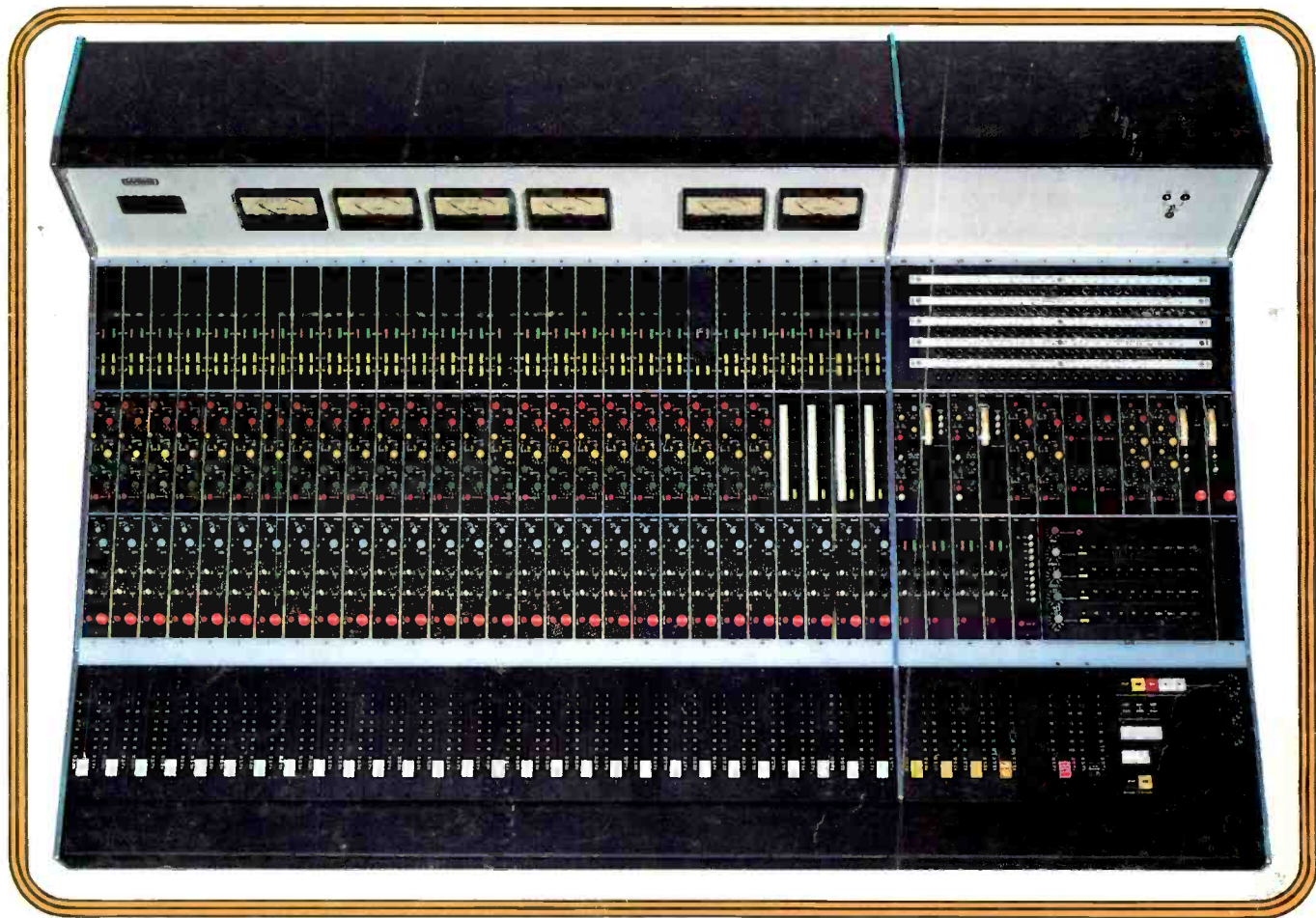
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