

SEPTEMBER 1973

BM/E

BROADCAST MANAGEMENT ENGINEERING

IN 47401

Indiana University
OCT 4 - 1973
Library

The Source

BM/E's guide
to local sales help
for broadcast equipment.

- REPS AND DISTRIBUTORS BY STATE
- MANUFACTURER'S FIELD OFFICES
- PRODUCT LINES HANDLED
- PHONE NUMBERS



Now You'll Know Where It's At.

minithings from Editel

The
ENC-1
Hand Held
Color
Camera



FEATURES

- NTSC output from back pack.
- Interchangeable lenses.
(including 35 mm fixed lenses)
- Battery operation.
- A.C. adaptor available.
- Tri-ax CCU available.
- Color balance controls on camera head.
- High resolution viewfinder.
- Viewfinder waveform display.
- Prism optical block.
- 3-1 inch Plumbicon* tubes.

Total freedom of movement and broadcast quality in one convenient package—that's the Editel ENC-1 hand held color camera. The ENC-1 delivers NTSC video directly from the backpack when operating solely on batteries! *If you want systems integration, we've got that too, with our unique tri-ax camera control.* Interchangeable lenses, from 35 mm wide angle to a variety of zooms make this camera extremely versatile in the field. Cost? Remarkably low. Drop us a line for the full story.



editel
minithings ahead

MONTREAL, QUEBEC
5610 Bois-Franc, St-Laurent (Montreal) P.Q. 514-331-2951

*TM N.V. Philips

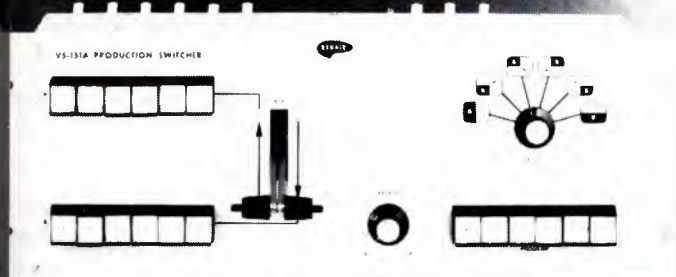
Circle 100 on Reader Service Card

www.americanradiohistory.com

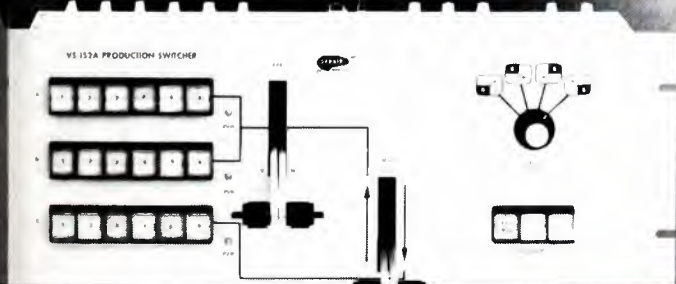
Better performance for less money ...the direct result of high production quantities.



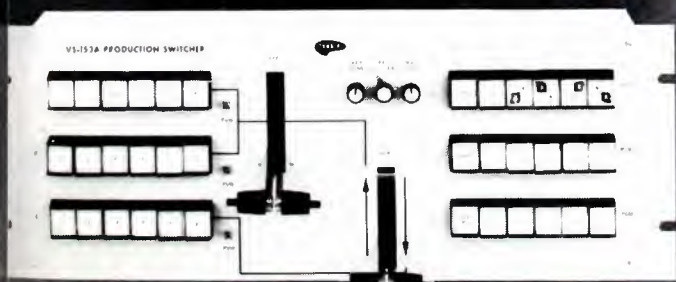
VS-150A VIDEO SWITCHER-FADER



VS-151A PRODUCTION SWITCHER



VS-152A PRODUCTION SWITCHER



VS-153A PRODUCTION SWITCHER

That's right. If you build switchers by the 100's, you can build a better switcher for less. And, DYNAIR produces more switchers in the lower price range than any other manufacturer. We planned it that way.

Proof? You'll find it fast when you check the prices of comparable equipment of other manufacturers. For the same capability, you will pay considerably more. And you probably won't get the quality and reliability of DYNAIR equipment.

You won't find cheap, troublesome sliding fader potentiometers on DYNAIR program switchers; we use quality gear-driven, locking split-lever controls. Nor will you find other inexpensive and unreliable components. The 150 Series uses the latest silicon solid-state devices available — over 80 percent of which are integrated-circuit form — and they are mounted on aerospace quality glass-epoxy circuit boards. Vertical-interval switching and fully color delay compensated too . . . the kind of equipment you can depend on for continuous broadcast quality.

And . . . one of the four units will usually fit your application and your budget. From a basic 5-input self-contained switcher-fader to an 11-input remotely controlled production switcher with special effects . . . that's the 150 Series.

Write today for literature and prices and we'll also send a free copy of our 12-page paper "Facts About Low Budget Video Switching and Special Effects." It contains a wealth of useful information about selecting programming equipment for a small studio or remote van.

DYNAIR ELECTRONICS, INC.

6360 FEDERAL BLVD., SAN DIEGO, CALIF. 92114

PHONE: (714) 582-9211

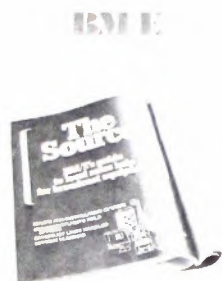
DYNAIR

Circle 101 on Reader Service Card

BM/E

BROADCAST MANAGEMENT/ENGINEERING

SEPTEMBER 1973/VOLUME 9/NUMBER 9



Introducing
a practical
where-to-find-help
guide in buying
broadcast
equipment.

**BROADBAND
INFORMATION SERVICES, INC.**
274 Madison Ave.
New York, N. Y. 10016
212-685-5320

Editor

James A. Lippke

Associate Editor

Robln Lanier

Contributing Editor

M. L. H. Smith

Assistant Editor

A. E. Gehlhaar

Editorial Assistant

Alexandra N. Mills

Art Director

Gus Sauter

Production Manager

Arline G. Jacobs

FCC Counsel

**Pittman Lovett Ford
Hennessey and White**

Advertising Director

Charles C. Lenz Jr.

6 Broadcast Industry News

Video scoreboard offered.

16 Interpreting the FCC Rules and Regulations

Ascertainment: Determining the composition of the community.

24 Videotape Cleaning Saves Headaches, Money

A videotape cleaner will very likely pay for itself.

30 How We Staked Out Our FM Audience

Making FM work in a competitive marketplace.

36 Montreux—World Marketplace for Broadcasting Equipment

New videotape standards are focal points.

42 The Source

Special BM/E guide to broadcast equipment reps and distributors.

57 Broadcast Equipment

New and significant products for broadcasters.

63 New Literature

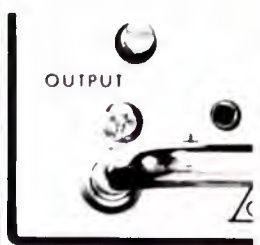
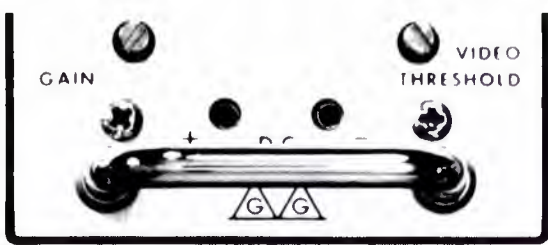
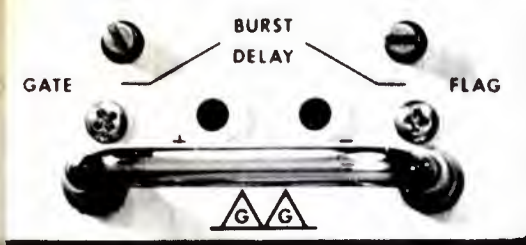
Useful reading materials.

CM/E MAGAZINE: For those with cable interests/following page 56

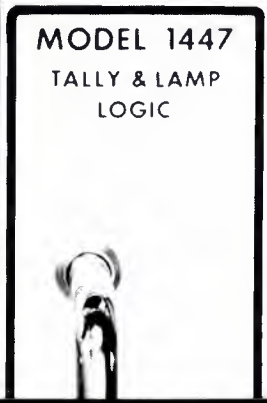
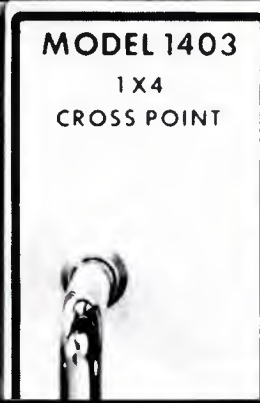
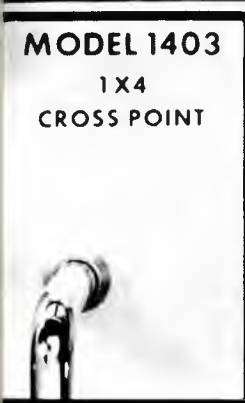
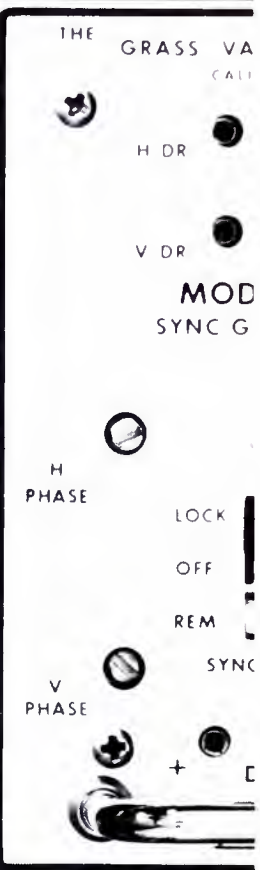


BM/E, BROADCAST MANAGEMENT/ENGINEERING, is published monthly by Broadband Information Services, Inc. All notices pertaining to undeliverable mail or subscriptions should be addressed to 274 Madison Ave., New York, N.Y. 10016. BM/E is circulated without charge to those responsible for station operation and for specifying and authorizing the purchase of equipment used in broadcast facilities. These facilities include AM, FM, and TV broadcast stations; CATV systems; ETV stations; networks and studios; audio and video recording studios; consultants, etc. Subscription prices to others: \$15.00 one year, \$25.00 two.

Copyright © 1973 by Broadband Information Services, Inc., New York City.
Controlled Circulation postage paid at East Stroudsburg, Penna.



VIDEO DISTRIBUTION AMPLIFIERS
PULSE DISTRIBUTION AMPLIFIERS
VIDEO EQUALIZERS
PULSE DELAY AMPLIFIERS
VIDEO INSERT KEYS
COLOR BLACK/BACKGROUND GENERATORS
BORDERLINE GENERATORS
SYNCHRONIZING GENERATORS
VIDEO PROCESSING AMPLIFIERS
SPECIAL EFFECTS GENERATORS
CHROMA KEYS
STUDIO PRODUCTION SWITCHERS
ROUTING SWITCHERS
TELEVISION AUTOMATION SYSTEMS
DIGITAL MACHINE CONTROL SYSTEMS



THE GRASS VALLEY GROUP, INC. 

SOLD EXCLUSIVELY BY GRAVCO SALES, INC.

6515 Sunset Blvd.
LOS ANGELES, CALIF.
(213) 462-6618

Station Plaza East
GREAT NECK, N.Y.
(516) 487-1311

125 South Wilke Road
ARLINGTON HEIGHTS, ILL.
(312) 394-1344

Redbird Airport
DALLAS, TEXAS
(214) 330-1245

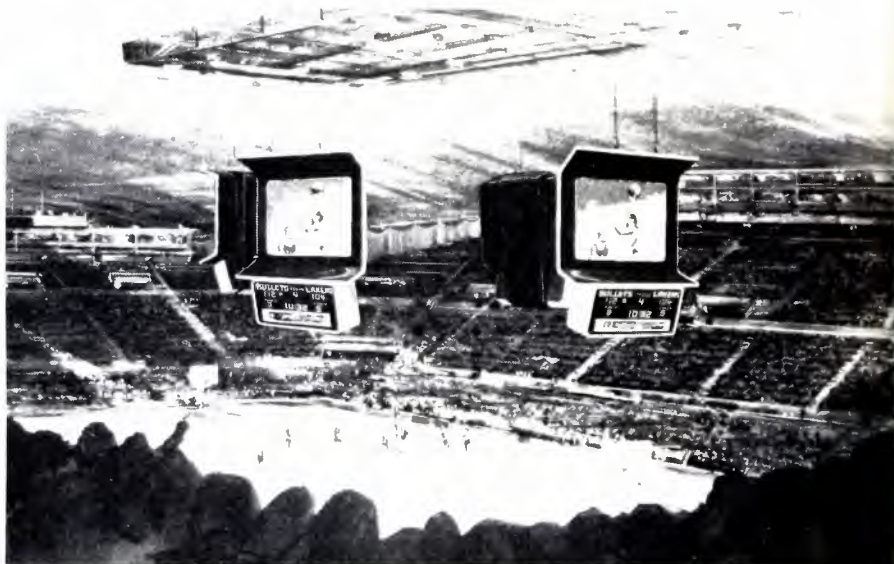
1644 Tullie Circle, N.E.
ATLANTA, GEORGIA
(404) 634-0521

OVERSEAS - GRASS VALLEY INTERNATIONAL - BOX 1114, GRASS VALLEY, CA 95945 - USA

BROADCAST INDUSTRY NEWS

Conrac Video Scoreboards Planned for Washington Arena

A set of four 12-by-16-foot projection telescreens, to be built and installed by Conrac Corporation, will be used for scoreboard information and entertainment in a new sports and entertainment arena being built in Largo, Maryland, just outside Washington, D.C. Using the Eidophor projection system, the screens will allow a great variety of information to be supplied the audience: scores, instant replay, video entertainment, advertising, etc. The screens will hang from the ceiling near the center, in a pattern for best audience coverage.



MESBIC—Aids Indian to Buy Cable Company in Washington



Gene Twiner, center in the photo, is a member of the Lummi Indian tribe who recently bought Olympic TV Cable Company in Port Orchard, Washington, with the help of the Minority Enterprise Small Business Investment Company (MESBIC). Jim Stone, left, is general manager of MESBIC in the state of Washington, and Joseph Lasby, right, is tactical coordinator for MESBIC.

Cable "Pollster" Made By Goldmark

A small "electronic pollster," which can be attached unobtrusively to

premium cable systems to transmit back to headquarters a record of a subscriber's program choices, was announced by Goldmark Communications Corporation of Stamford, Conn. The pollster operates on one-way cable systems, putting an RF carrier on the cable power circuits to send the information upstream. Early models are in operation on a trial basis in Reston, Va., and Pottsville, Pa., with general marketing to come later this year, according to Goldmark.

English FM System Gives "Special Interest" Choices

A radically new FM broadcasting system developed in England sends out two programs simultaneously, one a conventional mono or stereo program, the other a "special interest" program designed for some specified minority taste or audience. Announced by Matrix Enterprises, of 6 Barlby Road, London, with patents held by the director, David Williams, "Hi-Lo" (for High Listener Option Radio) uses a set of pushbuttons on the receiver, each assigned to a specific type of special-interest programming. When a button is actuated and a program of that type is on the air, the receiver automatically reproduces it; otherwise it reproduces the standard

program. The system uses the standard spectrum space for the conventional mono or stereo program. It uses low-frequency modulation on the 19 KHz pilot tone for type-of-program coding, and a single-sideband, sub-carrier-suppressed-system, based on a 76 KHz subcarrier, for the "special" program.

CBS Finds FM Listeners, Sets Both Sharply Increased

Both the FM share of the total radio audience in major markets and the number of FM sets in use have gone up very substantially in recent years, according to a survey reported by CBS/FM Sales. The FM audience share increase in eight of the ten top markets was 152% between 1967 and 1973, said the report. FM and AM/FM set sales reached an all-time high of 27,230,000 in 1972, up 19% from the year before; sets capable of FM reception are now about 50% of all sets in use, the survey found.

NAEB Restructures Top Staff Organization

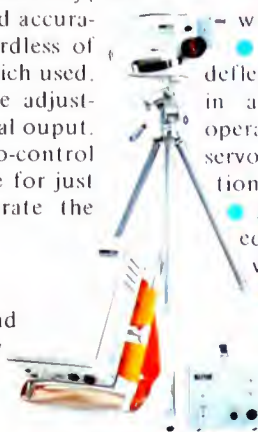
The National Association of Educational Broadcasters has radically revised its top staff structure, as part

continued on page 8

The lightest, most flexible compact color TV camera system for broadcast use yet. A three-tube mini-system, the ASACA ACC-5000 camera and back pack together weigh only 10 kilos (22 lbs). It's a portable designed with emphasis not only on mobility, but also on dependability and accuracy of color output regardless of the conditions under which used. Automatic white balance adjustment. Optimal color signal output. The self-adjust and auto-control systems make it possible for just about anybody to operate the ASACA ACC-5000.

Features . . .

• Diminutive camera head is easy to hold and highly flexible. The unit is par-



ticularly suitable for relaying outdoor news events, interviews and sports programs.

- Self-adjust system facilitates quick set-up. Color adjustment and operation being extremely simple, practically anyone can handle the unit with ease.
- Motor driven 6X zoom lens and deflection optical system integrated in a single body. The electrically operated zoom drive is capable of servo iris control to expedite operation.
- Automatic white balance adjusted merely by pressing the auto-white button.
- Perfect NTSC (PAL) signal output permits direct connection to a VTR.
- Gen-lock capability via

external sync allows parallel camera operation and centralized control

- Camera cable can be extended up to 300 meters from the control box
- Camera can be powered by either a regulated power supply in the control box or by a battery.



ASACA CORPORATION TOKYO JAPAN
 3-2-28, Asahigaoka, Hino-City, Tokyo, Japan
 Phone: 0425-83-1211, Cable, ASACA HINOTOKYO
 ASACA SYSTEMS LIMITED AMERICA
 1289, Rand Road, Des Plaines, Illinois, 60016, U.S.A.
 Phone: 312-298-4380

• PORTABLE COLOR TELEVISION CAMERA SYSTEM ACC-5000

The portable that's really portable...



ACC-5000 has been awarded the 26th MPTES (Motion Picture and Television Engineering Society of Japan, Inc.) Prize.

Circle 103 on Reader Service Card

REQUIRE ACCURACY ?

....THEN BUY BELAR

MONITORS



The least you can afford is the best possible monitoring of your program material. The Belar TV Monitoring System (VHF or UHF) guarantees your getting what you need . . . accurately.

The Belar TVM-1 Modulation Monitor is the most accurate monitor available. Our advanced design starts where others leave off. TVM-1 Monitors both positive and negative modulation simultaneously and registers the higher of the two. Yes, it even tells you whether the modulation is positive or negative and calibration accuracy can be checked from the front panel modulation calibrator at any time.

The TVM-2 and TVM-3 Digital Frequency Monitors will measure TV visual carrier

and aural carrier independently or aural intercarrier. These monitors provide continuous monitoring with inhibited off-frequency alarm drivers, switch settable to either ± 500 or 1000 Hertz. It requires three successive errors to produce an alarm. This means no false alarms for you.

For remote control operations add the RFA-3 for off-air monitoring.

If your TV monitoring requirements include ease of operation, functional checks and ACCURACY, call or write today for more information. We know you'll make the right decision and BUY BELAR.



BELAR
ELECTRONICS LABORATORY, INC.

LANCASTER AVENUE AT DORSET, DEVON, PA. 19333
BOX 826 • (215) 687-5550

Where Accuracy Counts . . . Count On Belar

Circle 104 on Reader Service Card

NEWS

of the transition of the group to a professional society, with membership composed entirely of individuals in all areas of telecommunications, with no divisions on institutional or media lines. Instead, there are five program divisions, each headed by an officer: William T. Dale will head instructional and educational development; J. A. Fellows, membership development projects; S. E. Millard, staff publication and writing projects, including a new professional journal; Mary Lynn Moody, conference and convention planning; and H. H. Riddleberger, Federal regulation and legislation.

NAB Appoints Engineering Committees

The National Association of Broadcasters has appointed new members to its engineering conference committee (to help plan the engineering sessions at Houston, March 1974); and to the engineering advisory committee. To the first went (all directors or managers of engineering at their stations): LeRoy Bellwood, (chairman), KGTV, San Diego; John Bowman, WMAL, Washington, D.C.; Eldon Kanago, KICD, Spencer, Iowa; W. B. Honeycut, KDFW, Dallas; W. C. Hunter, WHAS, Louisville; and Russell B. Pope, KHSL, Chico, Calif. To the second committee NAB added (all vice presidents or managers of engineering): R. W. Flanders (chairman), WRTV-TV, Indianapolis; C. F. Abel, KFMB TV, San Diego; E. L. Adams, Cox Broadcasting, Atlanta; R. F. Batt, WGN, Chicago; and A. R. Hillstrom, KOOL, Phoenix.

New Disc Plastic Said To Double Life

A new polystyrene plastic material with a claimed doubled life span will be supplied for injection molding of phono discs, according to an announcement from the developer, the Richardson Company of Des Plaines, Illinois. Called "R-600," the new material came out of Richardson's research department after a new method of measuring record wear precisely was developed to guide the work on the plastic. William Basile, president of Richardson, whose firm already supplies a major part of the material for injection-molding of phono discs, said

continued on page 10

WE JUST MADE BROADCAST MIXING A LITTLE EASIER. AND A LOT LESS EXPENSIVE.

Get our 30,000-series off-the-shelf broadcast audio consoles. Available in versions from a 5-channel mono mixer to an 8-channel stereo unit, its compact, 12 1/2 x 22" package features big-hard styling and comfort on the outside.

and there are more surprises. IC op-amp circuitry. Stepless, linear-motion faders with cue switches, in all mixing channels. And modular plug-in PC boards, to let you interchange various input, output, monitor and cue amplifiers. Modifying or expanding the console with your needs.

"2-in-1" console operation. While programming "on the air," for instance, you can use the audition channel for pre-listening or recording. Our remote line channels work two-way, as well: for mixing or for cue/talkback. Switched with our monitor inputs are contacts for use with warning lights—or remote control of tape machines and turntables, if you wish.

The list of features is considerably longer. But specs and a discussion will be far more convincing. Send for our data sheet or better yet, call Sales Manager Rick Belmont. You'll see why small news can be big news when it comes from Robins/Fairchild.

*Not available on all models

And state-of-the-art circuitry inside. At an almost-unbelievable price.

Starting at \$750 for a 5-channel mono model, all 30,000-series consoles offer a maximum of performance and reliability at absolute minimum cost.

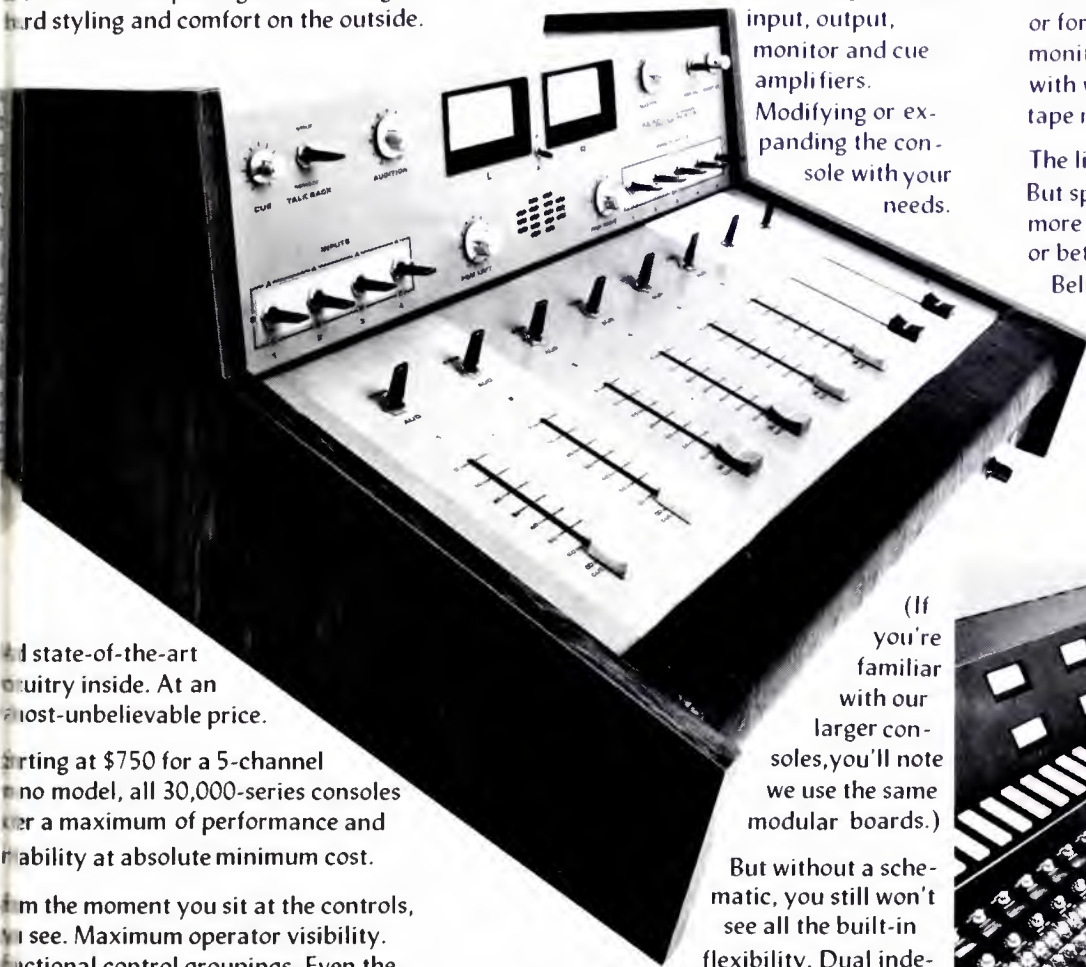
From the moment you sit at the controls, you see. Maximum operator visibility. Functional control groupings. Even the added armrest* you'd expect only on a custom console.

But the outside's only half the story. Swing the easy-access hinged control panel,

(If you're familiar with our larger consoles, you'll note we use the same modular boards.)

But without a schematic, you still won't see all the built-in flexibility. Dual independent outputs, for instance, permitting

We build our small consoles the way we build our big ones.



ROBINS & FAIRCHILD

The first name - and the last word - in broadcast consoles and equipment.

A Robins Industries Corporation

75 Austin Boulevard, Commack, N.Y. 11725 (516) 543-5200

Circle 105 on Reader Service Card

NEWS

that the new material "obsoletes our entire line" and predicted that it would move strongly into the compression-molding of discs, now carried out mainly with the more expensive polyvinyl-chloride.

Wright is TV Chairman, Formby Radio Chairman, for NAB

The National Association of Broadcasters elected as chairman of the Television Board of Directors Rob-

crt F. Wright, president and general manager of WTKR, Meridian, Miss. Vice chairman is Wilson Wearn, president of Multimedia Broadcasting Co., Greenville, S.C. The new chairman and vice chairman of the Radio Board of Directors are, respectively: Clint Formby, president and general manager of KPAN, Hereford, Texas; and H. R. Krelstein, president, Plough Broadcasting Co., Memphis.

ABC To Test Circularly Polarized RCA TV Antenna

A new TV antenna producing a circularly polarized signal, developed

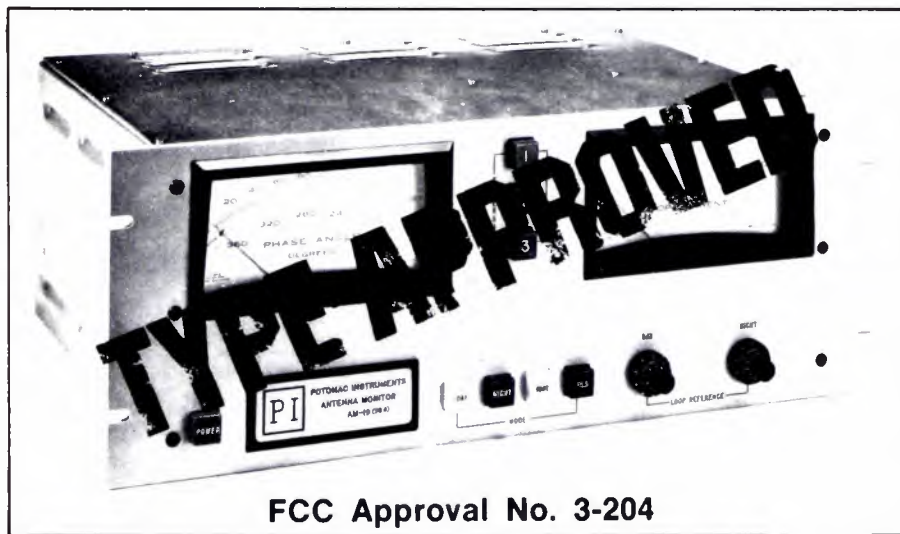
by RCA, will be installed for a test at WLS-TV, ABC-owned station in Chicago. The new antenna, and a comparison antenna of the standard horizontally polarized type, will alternate in rotating the signal from the top of the new 110-story Sears building. Checks will be made at receivers throughout the Chicago area.

Rand To Study Future Of Mass Communications

The Rand Corporation, one of the country's most prestigious "think tanks" and already the producer of important studies on cable television, has four new grants for further major studies on mass communications media. The Markle Foundation has given Rand \$350,000 for a two-year study on general policy issues of mass communications. The Ford Foundation is supplying \$100,000 for a study of regulatory issues in the mass media, such as the "fairness doctrine" in broadcasting. The Federal Communications Commission is giving \$220,000 for an analysis of spectrum requirements for television over the next 15 years. And the National Science Foundation is giving \$146,000 for an analysis of data on the ownership and control of communications media.

Paragraph 73.69 of the FCC's Rules and Regulations states:

... every standard broadcast station employing a directional antenna must use a type-approved phase monitor.



OUR AM-19 (204) IS THE ANTENNA MONITOR THAT MEETS ALL FCC REQUIREMENTS!

WHAT THIS MEANS TO YOU

1. If you're a new station or if you're making significant changes—you must have a type-approved antenna monitor by June 1, 1973.
2. If you operate your station with less than a first class radiotelephone licensed engineer, you must have a type-approved antenna monitor by June 1, 1974.
3. If you are presently operating your station by "remote control", you must have a type-approved antenna monitor Now! Or—you can use a monitor "properly configured", if such a monitor was manufactured after 1965.
4. Every other directional station must have a type-approved antenna monitor no later than June 1, 1977.

YOUR BEST CHOICE?

The AM-19 Antenna Monitor from POTOMAC INSTRUMENTS. The proven instrument for measuring phase and loop current ratio, the AM-19 can monitor up to 12 towers and accommodate DA-1,

DA-2 and DA-3 patterns. Phase meter resolution is 0.5 degrees. Loop current accuracy is $\pm 1.0\%$ with a 0.5% resolution.

AND—the AM-19 (204) is the only type-approved antenna monitor that meets all FCC requirements NOW!

YOU MUST HAVE A TYPE-APPROVED ANTENNA MONITOR—CHOOSE THE AM-19 (204) TODAY!

For complete information, please write or call:



Producers of
NEMO-CLARKE
Broadcast Equipment

POTOMAC INSTRUMENTS, inc.
932 Philadelphia Avenue
Silver Spring, Maryland 20910
Phone: (301) 589-3125

Digital Radio For Telco Link Installed by Avantek

Said to be the first digital radio link for telephone company service authorized under new rules of FCC Docket 19311, a 2 GHz PCM system was recently designed and installed by Avantek, Inc. of Santa Clara, for the Hargray Telephone Company of Hilton Head, California. The radio links telephone subscribers on Daufauskie Island directly to the telephone company's central office at Hilton Head. According to Avantek the entire project, from order to turn-on, was completed in ten weeks.

Field-Sequential-to-NTSC Converter Patented

A system for converting field-sequential video color signals to NTSC color was recently patented to the Gramling Engineering Co. of McLean, Virginia. In a letter to prospective manufacturers accompanying a copy of the patent, William D. Gramling of that firm points out that a field sequential color camera system is far simpler, lighter, and far less in need of set-

continued on page 12

Manual video correction is no longer necessary...



...so why do it?

The TEKTRONIX 1440 Automatic Video Corrector takes the work and the worry out of video signal quality control . . . with FULLY AUTOMATIC CORRECTION of overall video gain, black level, color saturation, burst phase and gain, and sync level.

The quality of your program signal will be stubbornly maintained by the TEKTRONIX 1440 Automatic Video Corrector. And, since signal distortions are automatically

corrected, your engineering people will be freed from the task of continuously readjusting controls.

Attempting to keep up with continuously varying conditions with manual correction is no longer necessary . . . so why do it?

The assurance of signal quality that comes from using the 1440 is something that can't be priced, but the 1440 costs just \$2450.

The VIR Signal is the reference used to assure signal quality.

Your local Tektronix Field Engineer can demonstrate how the 1440 and other VIRsatile products will work for you at incoming network feed, remote feeds, master switcher output, transmitter input and at other key points.

To receive a VIR Signal application note, use the reader service card or write:

TEKTRONIX TELEVISION PRODUCTS
Box 500-A, Beaverton, Oregon
97005.

Circle 107 on Reader Service Card;
For demonstration, Circle 108.

**TEKTRONIX
TELEVISION
PRODUCTS**



TEKTRONIX®
committed to
technical excellence

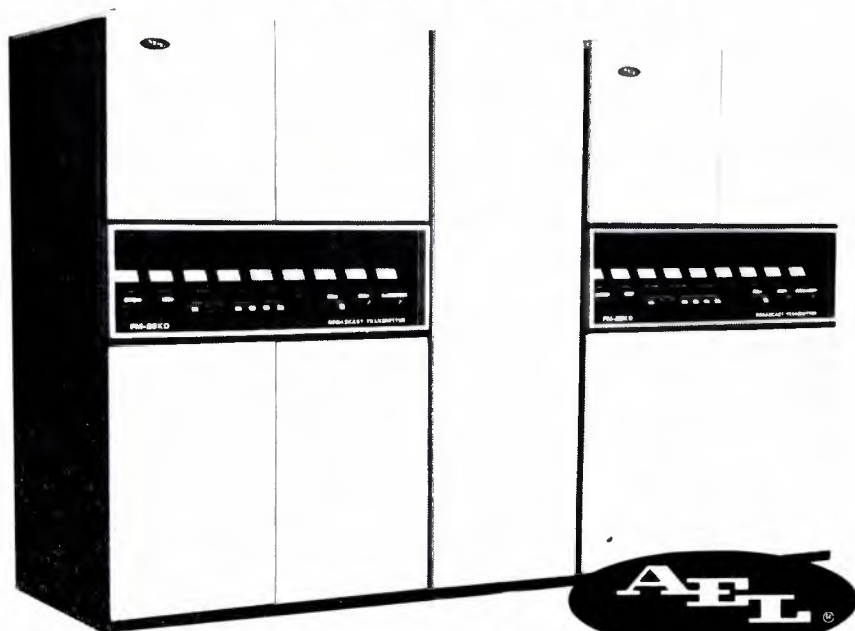
AEL transmitter features: ...five-year warranty ...twenty-year parts availability.

The new AEL FM-25/25KD was designed to provide exceptionally high power FM broadcasting service with a high degree of redundancy and reliability to meet power level requirements of up to 50KW TPO.

To get it, we combined two AEL FM-25KD 25KW FM transmitters, whose combined outputs are connected to the antenna through a true 90° hybrid combiner.

If you're impressed so far, just wait until you see the specs and hear the whole story.

THE NEW AEL FM-25/25KD BROADCAST TRANSMITTER Packs a 50KW TPO Wallop!



American **E**lectronic **L**aboratories, Inc.

P. O. Box 552, Lansdale, Pa. 19446 • (215) 822-2929 • TWX: 510-661-4976 • Cable: AMERLAB

Circle 109 on Reader Service Card

NEWS

up adjustment than the standard NTSC camera system, and would make a very light, rugged, but high-quality portable video pickup unit. Recorded away from the studio in field sequential form, the material could be converted to NTSC at the studio for broadcast.

Local TV Advertisers Increased Spending 28%, First Quarter 1973

The top 20 categories of local advertisers on TV increased their spending 28% in the first quarter of 1973, the Television Bureau of Advertising found in a recent survey. Total spent in the 20 classes was \$141,129,700. "Local advertising has been the fastest growing component of television for several years," said Harvey Spiegel, senior vice president of sales and marketing. "... it is well on the way to passing the billion dollar mark for the first time in 1973."

Berliner To Get Award For Grandfather's Disc Invention

Oliver Berliner, president of Ultra Audio Products, Beverly Hills, California, will be a guest of honor at the celebration of the 75th anniversary of Polydor International in Hamburg, Germany, September 18. Berliner will receive an award on behalf of his grandfather, Emile Berliner, who invented the microphone and flat disc phono record. Polydor is the owner of Deutche Grammophon, Polydor Records, and MGM Records.

Film and Tape To Be Partners, Says Eastman Executive

In a "let's be brothers" gesture toward the videotape industry, Anthony Frothingham, general manager of the Motion Picture and Education Markets Division of Eastman Kodak, told a joint seminar of the Motion Picture Laboratories and the SMPTE in Memphis recently that technical advances will make film and tape "compatible partners in getting the job done." He pointed to new technology in tape-to-film transfers and new products such as the Kodak Super-8 film video player as opening many opportunities for film-tape cooperation. He also gave figures countering the notion that film is declining: there were

continued on page 14

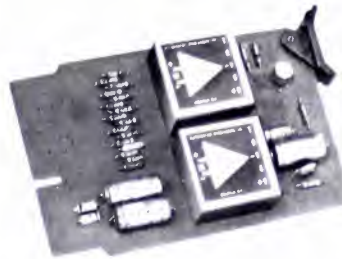
AUTOMATED'S *Comprehensive!* CARD SYSTEM

MICROPHONE PRE-AMPLIFIER Model 312



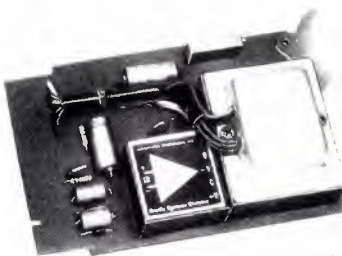
Transformer coupled input and output. Exceptionally low noise (equivalent input -129 dBm) and high output capability with low distortion. Adjustable gain. Input to 0 dBm and output capability +30 dBm. Utilizes Model 2520 operational amplifier.

DISTRIBUTION AMPLIFIER Model 328



Bridging input. 8 identical transformerless balanced 600 ohm outputs. +24 dBm clip level with unity gain. Utilizes two Model 2520 operational amplifiers.

SPECIAL PURPOSE AMPLIFIERS Models 330P, 330T, 330F, 330G



Models available for RIAA Phono, NAB Tape, and Magnetic Film. Low noise, adjustable gain, high output capability. Equalization adjustable. 330F provides both 16 and 35 mm. curves, externally selectable.

Model 330G: Fixed frequency sine wave oscillator with up to +12 dBm transformer coupled output. Utilize Model 2520 operational amplifier.

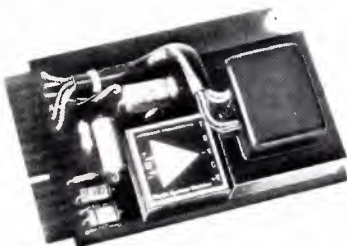
10 WATT POWER AMPLIFIER Model 701



A dynamic power limiting circuit monitors the power being delivered and automatically and instantaneously controls both current and voltage, thus providing complete protection and instant recovery from overload. The Model

701 operates from a bipolar power supply of +16 volts to deliver its full rated power. Up to eleven Model 701's can be mounted in the standard Automated Processes Model 411 Card Frame.

LINE AMPLIFIER • Model 325



Bridging input. Output capability +30 dBm. Adjustable gain, transformer coupled output. Can function as line amp, booster amp or "no loss" combining network. Utilizes Model 2520 operational amplifier.

All PC cards (2 3/4" x 4 1/2" x 1 1/2") permit standard modular use. Power supply decoupling and reverse voltage protection are provided.

CARD FRAMES • Models 411, 405



Eleven amplifiers mount in Card Frame Model 411, 3 1/2" high, 6" deep, and 19" wide. Five amplifiers mount in Card Frame Model 405, which is 10" wide.

DISTRIBUTION AMPLIFIER Model 512D

+22 dBm output from each of 3 transformer isolated outputs. 3 position input switching to provide: 1) -30 dBm bridging input; 2) -30 dBm terminating input; 3) +4 dBm bridging input (unity gain). A 6 dB trim pot on the front panel allows for final gain trim. Gain can be varied from above specs by use of external feedback resistor. A metering jack across the unbalanced output allows for quick amplifier checking.



Automated Processes also manufactures

EQUALIZERS FADERS
COMPRESSORS LARGE POWER AMPLIFIERS
MODULAR
CONSOLES and SYNCHRONIZERS



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

West of Rockies: WESTLAKE AUDIO
Los Angeles, Calif.

Europe: 3M FRANCE
Paris, France

Japan: NISSHO IWA1
Tokyo, Japan

NEWS

nearly 300 motion pictures started in 1972; the number of prints per picture is at a high of around 220; movie theatres are in a net increase of about 400 per year; in television, around 85% of network prime time programs are produced on film, as are roughly 75% of the approximately 20,000 TV commercials each year. He said further that the film used for TV news was more than seven times as much as all the film used for movies, TV series, and commercials put together.

Simons and Levenson Get SCTE Achievement Awards

The first annual Outstanding Technical Achievement Awards of the

Society of Cable Television Engineers went to Kenneth A. Simons, director of research and development at Jerrold Corp., and Donald W. Levenson, president of Wheeling Antenna Co., Wheeling, W. Va. The National Cable Television Association cooperated with SCTE in selecting the engineers for the awards.

People

Robert L. Baker became manager of marketing services for Scully/Metrotech division of Dictaphone . . . **Charles E. Auer** is the new western sales manager for the CATV operation of GTE Sylvania . . . **Glenn Maxwell** was appointed director of engineering for Scully/Metrotech division of Dictaphone

Alvin Balkin became business manager, CBS Radio network sales .

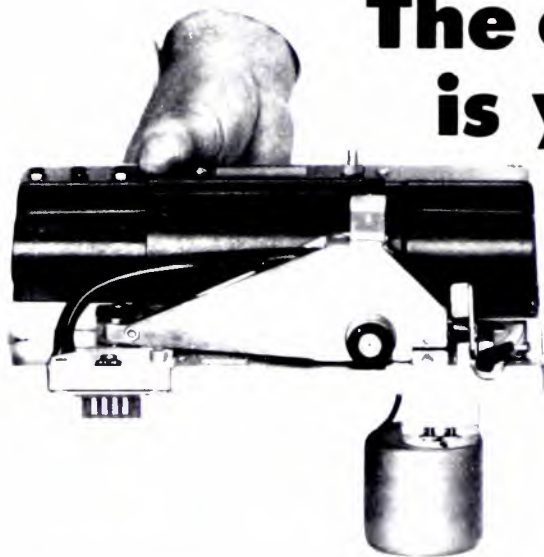
Herbert S. Dordick joined Telecommunications Management Corp. as a member of the firm . . . **John N. Dempsey**, formerly governor of Connecticut, joined Coastal Cable TV Company, Westport, as community affairs advisor . . . **Mike Schwartz** was elected vice president of Tri-State Broadcasting.

James P. Ackerman joined Jerrold Electronic Corp. as technical director of terminal products and services, which includes responsibility for Jerrold's two-way systems.

Stanford G. Cook joined C-Cor Electronics as manager of manufacturing engineering . . . **Mark Pluck** became project engineer in the video engineering department of Conrac Corp. . . . **Robert W. McAll** joined CBS Laboratories as manager of professional products marketing.

continued on page 54d

The choice is yours




**Ampex-rebuilt
VTR quad head.
Good as new.
125 hour warranty.
\$810.00**

Compare and you'll choose Videomax for Mark III and Mark X head rebuilding. A *Certified* Videomax-rebuilt head will actually perform better than when you bought it — on your recorders, by your own standards. That's why networks, independent stations, and major teleproduction facilities are now using Videomax. And as an extra bonus, you get the extended warranty and lower price.

Write or phone (collect) today for details about our NO-RISK trial offer.

videomax™

Corporation—subsidiary of ORROX Corporation.
154 San Lazaro Avenue
Sunnyvale, California 94086 
Phone: (408) 739-5391 Telex: 346-459

South/Central America: Telemation International/TeleMerica, Inc.

Circle 111 on Reader Service Card



PICTURE ROLLS



TEARING



FLAGWAVING



HUE SHIFT



SKEW ERROR



COLOR STREAKING

How do you like them apples?

Like 'em or not, them apples show composite errors in video signals which accumulate every time you use VTR equipment. Errors caused by changing tape geometries, varying tape speeds, fluctuating head velocities. But how do you get rid of the bad apples?

With a standalone Delta Series TBC from Television Microtime.

Delta TBCs give you broadcast quality from every VTR — 2-inch "quads," 1-inch helicals, 4-inch cassettes, 1/2-inch EIAJ — in monochrome, or direct or heterodyne NTSC color. And you can get them with standalone or built-in velocity error correction.

Delta accessories convert V-lock VTRs to 4-lock operation and add automatic skew correction to low cost cassette and EIAJ VTRs. Our new full line brochure, *Meet The Compatibles*, describes over 20 different models . . . covers time base errors, the causes and the solutions. Use the coupon to send for your free copy. Or send for our special tape demonstration. We're available anytime to tell you how we can help solve time base problems.

Dear Sir,

I want to know more about time base error correction and Delta Series TBCs.

- Please send me your new brochure: *Meet The Compatibles*.
- I would like to see your tape demonstration.
- I want to talk with one of your representatives. My application is:

Name _____

Title _____

Company _____

Address _____

City, State, Zip _____



TELEVISION MICROTIME, INC.
1280 Blue Hills Ave., Bloomfield, Conn. 06002



Ascertainment: Determining the Composition of the Community

By Frederick W. Ford and Lee G. Lovett
Pittman, Lovett, Ford and Hennessey, Washington, D.C.

This column has returned frequently to the all-important requirement of ascertainment of community problems, needs, and interests. Broadcasters are required to make an "ascertainment" showing in connection with applications for construction permits, renewals, transfers or assignments, and major changes in authorized facilities. Proper ascertainment methods and procedures are a continuing problem to licensees and appear as a common element in many litigated cases.

This month we consider the basic underpinning of any ascertainment showing: the "Composition of the Community." The Commission's 1971 *Primer on Ascertainment of Community Problems* asks, in Questions and Answers 9 and 10, that the applicant determine the composition of his community of service and submit a showing thereupon with his ascertainment efforts.

The Commission has under consideration the entire scope of its ascertainment requirements for purposes of determining "whether present ascertainment requirements serve the public interest in the most effective way possible and, if not, what improvements could be made to accomplish that objective." In furtherance of its consideration, it issued a "Notice of Inquiry" on March 23, 1973, in Docket No. 19715. Hence, the ascertainment requirements are not static and may be changed or altered somewhat in the near future as a result of this inquiry. Pending possible changes in the Commission's policy, the suggestions and procedures presented hereinafter will be of substantial assistance in complying with present Commission requirements.

Contextual Matters

The determination of the composition of the community is a threshold requirement to validate the main body of the ascertainment effort—a series of consultations with the public and community leaders. Primarily, composition of the community for this purpose refers to the *identification of significant groups* within the community whose leaders should be consulted and whose needs should be served.

Yet, as will be shown, analysis of the composition of the community has a significance beyond its use as a preliminary step in the consultation process. It can serve as a vital tool in providing background for a service proposal, and it can and should be used by the licensee to supplement and illuminate the results of consultations with community leaders and the public. Further, the type of effort appropriate to a determination of the composition of the community is also valuable for the licensee's own use to further establish community needs for his service efforts.

Hearing cases continue to turn on issues involving the adequacy of applicants' ascertainment efforts—whether the nature and scope of the consultations were sufficient, whether too much of the process was delegated to professional services, and the like. Most importantly for purposes of the licensee, many cases have involved applicants' alleged failure to consult significant groups in the community or to relate proposed services of the needs of any specific group. For example, a proposed specialized format, such as foreign language programming, may be vulnerable without a showing of need within the community.

The Commission's *Primer* refers applicants to Census Bureau publications and Chamber of Commerce materials as appropriate sources of information on community composition. Accordingly, an analysis of the kind of data available from these sources is called for.

The Census Bureau

The Census Bureau is best known for its decennial census of the population. However, as the statistical arm of the Department of Commerce, it conducts surveys and publishes data in many other fields as well. In addition to the decennial population count and its accompanying census of housing, formal censuses include agriculture, business, governments, manufacturers, and minerals. Several of these might be appropriate for consideration in the context of a particular community.

"Price List 70" (available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402) gives a current listing of census publications. Many of these, for the state or the city of license, might be ordered on a continuing basis to provide statistical resources when needed.

The 1970 Census publications of interest include publications entitled *Number of Inhabitants, General Population Characteristics, General Social and Economic Characteristics*, and *General Housing Characteristics* for each state, and Census tract reports for 241 metropolitan areas in the U.S. and Puerto Rico. As not all of these may be available when renewal time comes, it might be appropriate to order them at the earliest convenient time.

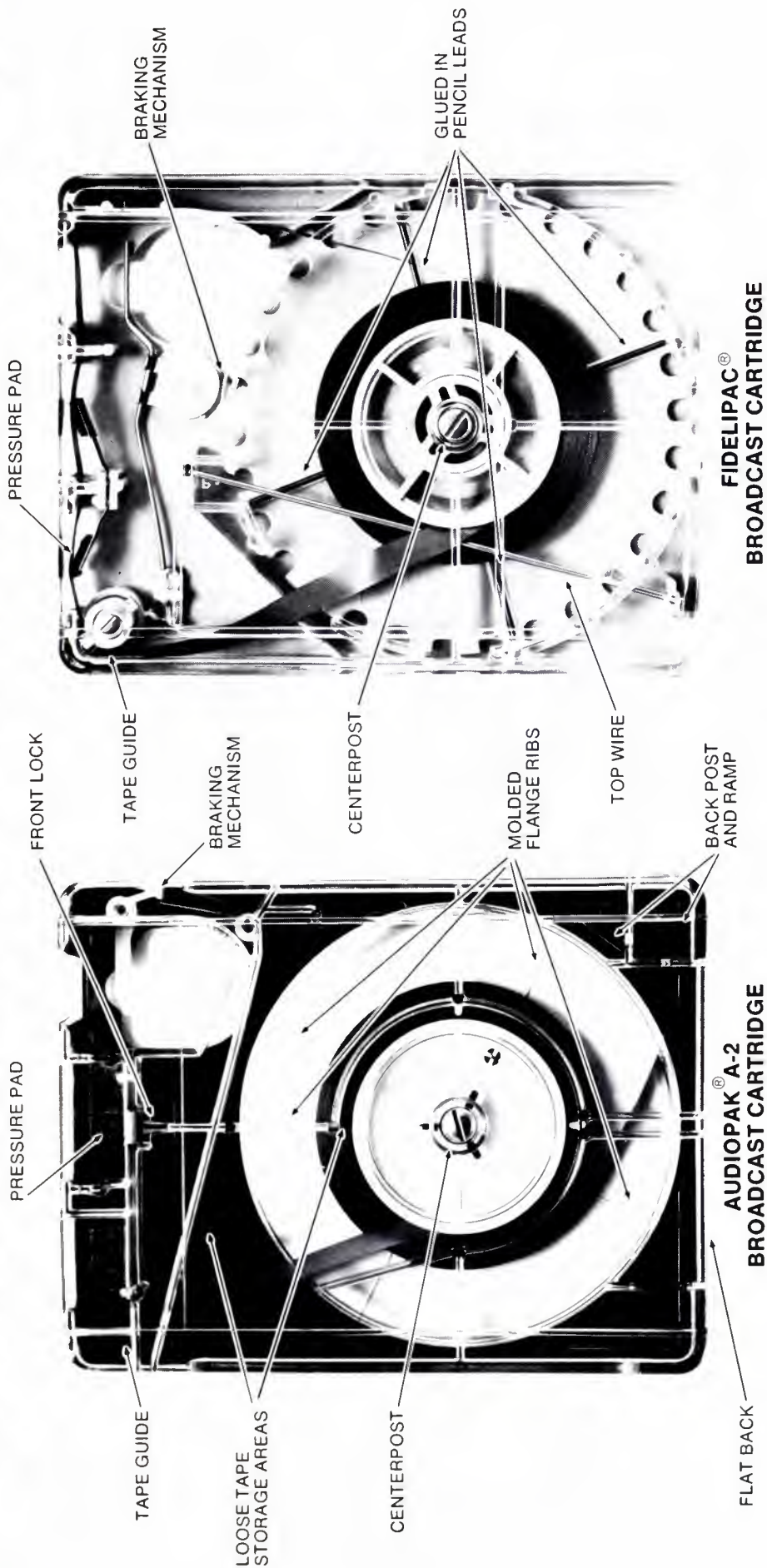
The price list also includes more current reports updating particular aspects of the Census. As many of these may include metropolitan or local statistics, scrutiny of the price list is recommended.

Other Sources of Census Data

If Census publications are out of print when requested or more detailed data than they contain as

continued on page 18

YOU BE THE JUDGE!



**AUDIOPAK® A-2
BROADCAST CARTRIDGE**

**FIDELIPAC®
BROADCAST CARTRIDGE**

For your most critical stereo requirements, ask about our "new" Audiopak A-2SP Stereo Phase Broadcast Cartridge.

FOR MORE INFORMATION AND A FREE SAMPLE OF THE A-2, WRITE TO...
AUDIO DEVICES, INC., A CAPITOL INDUSTRIES CO., 100 RESEARCH DRIVE, GLENBROOK, CONN. 06906 • MANUFACTURERS OF AUDIOTAPE®, AUDIOFILM®, AND AUDIODISCS®.

UNMATCHED CAPABILITY

CHANNEL TWO TELEVISION COMPANY

KPRC TV

July 13, 1972

Mr. Morris T. Covington
Director of Research
Taft Communications Systems, Inc.
4808 San Felipe Road
Houston, Texas 77027

Dear Morris:

This long overdue letter will let you know how very pleased we are with the continuing good service from our Taft Audio Distribution Amplifiers.

As you know, I had six of these amplifiers on the test bench for six weeks and abused them in every way possible. I did not experience a single failure; in addition, they held their specifications in every way.

I had evaluated several "well-known" distribution amplifiers before I tested the Taft DA, and I knew then that this was the DA for us. It is right in every way: size, individual power supply, number of outputs and performance. After several months of hard and continuous service, I am still well pleased with all fifty-two of them.

I will recommend your Model 5002 Audio Distribution Amplifier, and also your Model 4002 Monitor/Power Amplifier without a moment's hesitation.

Yours very truly,



William E. Thomson
Audio Engineer



Note these unique features of the Taft Model 5002 Audio Distribution Amplifier:

- (1) 18 isolated 600 ohm outputs (80 db)
- (2) 20-20 KHZ \pm 0.5 db, 0.5% total distortion (with "EQ" and "Rolloff" in flat position)
- (3) Equalization and Rolloff feature provided for signal conditioning before distribution
- (4) Input and outputs are balanced
- (5) 20 db gain (can be increased to 40 db)
- (6) Noise better than 80 db below 0 dbm signal
- (7) All integrated circuits for very efficient operation—units may be stacked without air spaces
- (8) Output level is continuously monitored
- (9) Two year parts and labor warranty

New Price: \$295.00 (includes input transformer—specify 150, 600 or 15K input impedance)

If you are interested in evaluating the 5002, call us collect or check the information card.

BETHANY INTERNATIONAL, INC.

5750 Bintliff, Suite 201
Houston, Texas 77036
Phone (713) 783-1260

Formerly



COMMUNICATION SYSTEMS, INC.

FCC Rules & Regs

to a particular subject or geographical area is required, several alternative sources may exist.

Local libraries, universities, local government agencies such as planning boards, and state agencies often have copies of relevant publications available for consultation. As to unpublished data—and Census figures go into far more detail than the publication program—computerized records are kept. The Census Bureau will produce appropriate printouts with sufficient advance notice, or will steer you to marketing or statistical firms which can provide the information.

Non-Census Data

In addition to the objective, scientific analysis of population and similar characteristics put out by the Census Bureau, local governments and Chambers of Commerce make surveys and maintain information which can be consulted for details. Information generally available pertains to the history, physical tableau (maps, etc.), employment and transportation statistics, and governmental and institutional characteristics of a particular locality. This information will serve as an excellent tool for the licensee in determining the composition of a community. However, two caveats are in order. First, as materials put out by local governments or local business groups are often tainted with "boosterism," licensees should be careful to sift the wheat of relevant information from the chaff of "promotional" information. Second, such information is generally valuable as a supplement to, not a substitute for, the hard statistical data of the Census Bureau.

Uses of Community Composition Data

Census data provides rich sources for analysis of community composition. The *General Population Characteristics* volumes give age and race breakdowns for all subdivisions of local areas, appropriate to justify specialized programming for youth, women, minorities, and similar identifiable groups. *General Social & Economic Characteristics* can provide basic data on ethnic composition, educational levels, transients, and economic matters such as income, job categories, and employment for places down to the 1000 population level. *General Housing Characteristics* yield valuable data regarding housing conditions—particularly the form of houses (single-family dwelling unit, apartment, trailer) and the economic status of such housing.

The Census term for a central city and surrounding counties is "Standard Metropolitan Statistical Area" (SMSA). The Census divides SMSA's into small, homogeneous areas called "Census Tracts" for the purpose of presenting data for neighborhoods—areas smaller than counties, cities, and places. The typical Census Tract has 4000 residents and, by virtue of this small breakdown, such information is an excellent tool for dividing service areas and ferreting out information from "pockets" within same.

The non-Census data provided by local governments and local business organizations is valuable for determining the *subjective* features of a community's composition. That is, a licensee would be wise to apply such information to a "descriptive tour" feature of his ascertainment exhibit. Also, a sketch of governmental and institutional characteristics which details pertinent information on the local gov-

continued on page 23

Circle 114 on Reader Service Card

RCA

PrimeTime

Special Fall Planning Guide:
Doing the most good with your 1974 equipment dollar.

A survey of today's broadcast station with an eye to helping you
get more overall performance at less overall cost.



In the studio

Toward better production: a new color camera and switching equipment.

A reel of professionally executed local commercials can be one of your station's best salesmen to prospective clients. And two pieces of RCA studio equipment introduced during the past year can help give your production work that attractive professional touch.

The first is our TK-45 Color Camera. It has all the advanced features of previous RCA cameras, plus new automatic production aids that help you get the most out of your equipment dollar by helping you get more production done in the time you have to do it.



Automatic iris, for instance. In the automatic mode it will adjust iris for you. And take care of those lighting vagaries which can often interrupt production. All automatically with little or no operator attention.

To handle differences in colorimetry in the scene there's automatic white balance. White balance can be restored instantly by focusing on an appropriate

white section in the scene and pressing a button. So there's an attractive, natural consistency from scene to scene.

Black balance is even simpler. It's adjusted every time you use the electronic lens cap.

What it all means is fewer *technical manipulations* and greater consistency of performance. Production people pay attention to production values. And you get noticeably better results to please the most demanding client.

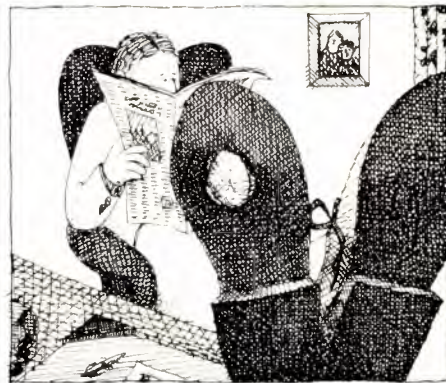
"Our TK-45 Color
Camera...helps you
get more production
done in the time
you have to do it."

Another client-pleaser is the combination we call "The Producer". That's our TA-70 Mixing and Effects Amplifier TE-70 Special Effects System package.

When your budget is smaller than your imagination, there's our lower-cost line.

We believe that smaller stations, or stations with modest investment plans, should have a right to RCA broadcast-quality equipment, too.

So we've developed the midpriced TK-630 Live Color Camera and the new TK-610B Color Film Camera. These cameras don't match the TK-45's automatic features. But they do have many similarities to premium cameras that you won't find on other equipment in the medium price range.



The optics of our TK-630 Live Camera, for example, depend on a sophisticated, easily maintained one-piece sealed prism rather than the usual dichroic mirror arrangement.

Similarly, the TK-610B Color Film Camera was designed to reproduce color film with exceptional quality at moderate cost.

And we made it easy to operate as well.

It all adds up to clear, sharp color at low initial cost, low continuing costs. Either camera is a beautiful way to beat a low budget.

You can add excitement to production work with a virtually unlimited range of special effects, including 24 different wipe patterns.

With an exclusive nonrepeat feature that allows the operator to move a pattern completely off screen, change its shape and/or content, and move it back while on the air.

And a border mode for a halo effect in any color. Border width is adjustable, too.

Result: you can offer your clients the same kind of sophisticated visual wizardry they see in the leading productions.

So if your station is becoming as active in production as most are today, it could pay you to investigate RCA studio equipment for 1974.

In the tape room

'74 should be your year for the automatic station break.

More than a hundred TCR-100 Cartridge Tape Recorders are making the automatic station break a daily reality at scores of stations throughout the country—and the broadcasting world.

The reasons for this are the same reasons why you should consider the Cart Machine for your operation.

Take finance. Not only is the Cart Machine the least expensive equipment of its kind. It can also be expected to save its owner in the neighborhood of

\$30,000 a year. In terms of labor, head costs and other recorder time that it eliminates.

But what the TCR-100 can do for you at station break time is the prime reason for ordering it now. You get a smooth, preprogrammed, professional station break with far fewer make-goods and a lot less hectic activity in the tape room.

“Our Cart/reel-to-reel package can at times replace a whole bank of conventional machines.”

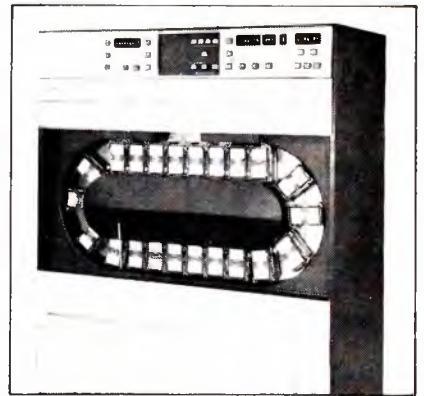
Another advantage that has sold a lot of stations on the Cart Machine is the many ways it can be packaged to serve a user's particular needs.

It can be ordered with its own Signal Processing Unit. Or if you also need a reel-to-reel VTR,

it can be ordered with an RCA TR-60 to time-share that machine's signal-processing electronics. In this case the Processing Unit is not required. Your RCA representative will be happy to point out many other special money-saving aspects of this combination.

Or the TCR-100 can be slaved to the top-of-the-line TR-70C. This package can at times replace a whole bank of conventional reel-to-reel machines.

There are other things to be gained by purchasing a TCR-100 now. Your RCA representative can explain them fully.



In the film room

Plan for better film reproduction, more automation.

Considering all the different sources of programming on film, it's no wonder your film room is presented daily with a whole raft of film problems in trying to see that a quality picture is broadcast: Variations in the film stock itself. Old films. Variations in density and contrast range. Low color saturation. Processing errors. Not to mention the problem of color changes in projector lamps.

These problems are what the TK-28 Color Film Camera is designed to correct. With a number of new features like Automatic Color Balance to correct for printing errors and color

temperature variations. And Chromacomp, which is preset to deal with low saturation, scene-to-scene variations and dye transfer errors at the twist of a knob. Automatic black level and white level to compensate for variations in film density and contrast range.

The next generation of film automation is our new TCP-1624 Cartridge Film Projector.

So you can bring the same degree of automatic operation to short film segments that our TCR-100 brings to video tape.

“The next generation of film automation is our new Cartridge Film Projector.”

Up to 24 film cartridges of up to two minutes in duration can be inserted into its carousel.

Since the cartridge positions are interchangeable in the ca-



rousel, and carousels are interchangeable in the machine, all the splicing and resplicing necessary to maintain a daily spot reel are eliminated.

And the TCP-1624 can be interfaced with other playback equipment for totally automatic film-and-tape station breaks.

Also, when used as part of a TK-28 Telecine System, the Cartridge Projector can take advantage of all of the TK-28's color-correction circuitry.

Ask your RCA representative for details of our “revolution in the film room”.

At the transmitter site

Maybe now's the time to move up to the automated VHF Transmitter.

How old is the transmitter you're now using?

If you can't answer that question precisely, you're not alone. Most managers can't.

That's why a short review of your transmitter situation can be valuable.

For instance, how much space is your present transmitter taking up? An RCA "F-line" Automated Transmitter fits into, on an average, less than 60% of the space taken up by transmitters only a few years old.

And how about that electric power bill? In light of today's rates, a modern, efficient transmitter could result in substantial savings.

How large a tube inventory do you have to keep on hand? F-line transmitters use fewer tubes, model for model, than

any other transmitter. More possible savings.

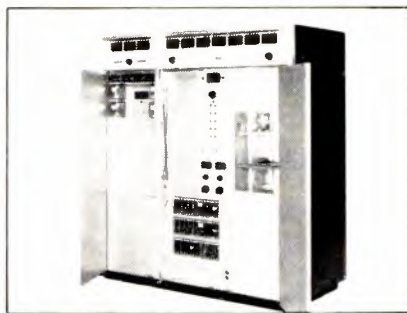
How about remote operation? In the F-line, you'll find the features you need for hands-off operation, with automatic power level control and instant switch-over to the spare exciter.

Your RCA representative can discuss with you these and other ways in which the Automated Transmitter makes a good investment in the future.

For instance, more and more stations are considering the

"An RCA F-line Automated Transmitter fits into, on the average, 60% of the space of older transmitters."

case for dual transmitters in an "alternate main" operation. As they find themselves operating



longer and longer hours (some as many as 24 hours a day), they find little time for preventive maintenance.

In "alternate/main" operation they can service one transmitter while the other is in operation. And switch to full power alternate at any time without service interruption. Preventive maintenance adjustments are made at their convenience. No putting off minor problems until they become expensive emergencies.

In most cases their two new transmitters occupy less space than their former transmitter. And they've had the option to purchase and install the "main" transmitter first and to add the "alternate" at some future date—thus extending their investment over a planned time period.

There are many other transmitter offerings that can be tailored to your station, your operational plans, your future.

Every piece of RCA broadcast equipment is designed to be fully compatible with every other, so you don't make older equipment obsolete by adding new—you update it. And maybe even give it capabilities it never had before.

Your best first step, of course, is a serious talk with your RCA representative.

Action form

Get in touch with the man with a plan.

Your RCA representative is the man with a plan for 1974. He'll be happy to expand on how RCA equipment will fit in with your plans for the future.

In the meantime, we have a
Other interests _____

Name/Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

selection of literature to help you formulate those plans.

Please check off the items which most interest you, and we'll dispatch your literature packet by return mail.

RCA Broadcast Systems
Building 2-5
Camden, N.J. 08102

Attention: Editor, Prime Time
 Please have my local RCA representative call me for an appointment to discuss my equipment needs for the coming year.

Send me more information on the following equipment:

In the studio

- TK-45 Automatic Color Camera
- TA-70 Video Mixing and Effects Amplifier
- TE-70 Special Effects System
- TK-630 Midpriced Color Camera

In the tape room

- TCR-100 Cartridge Recorder
- TR-60 Highband Video Tape Recorder
- TR-70C Highband Video Tape Recorder

In the film room

- TK-28 Color Film Camera
- TK-610B Midpriced Color Film Camera
- TCP-1624 Cartridge Film Projector

At the transmitter site

- RCA "F" Line of Automated VHF Transmitters

FCC Rules & Regs

ernment, police and fire departments, schools and libraries, hospitals, and recreation and historical spots is a valuable supplement to a demographic study.

Conclusion

Each broadcaster is charged with the full knowledge of the composition of his community of service. The ascertainment exhibit is one of the most vital any applicant will submit to the Commission at renewal. A proper determination of the composition of community service is the foundation upon which a truly responsive ascertainment exhibit is based. As a threshold matter, such a determination is a fundamental prerequisite to the selection of interviewees during the survey process. Manifestly, no applicant can survey a representative, cross-section of his community without first determining who the members of the community are. Yet, besides this function, a proper determination of the composition of community of service is also part and parcel of the ascertainment of the community needs. In summation, the broadcaster's primary task is to apply sophisticated thought and comparative analysis to readily available data toward the end of producing a common sense picture of his community of license, buttressed by hard, complete statistical evidence.

Licensees should stay closely attuned to new developments in the Commission ascertainment policy, including changes which emanate from the Commission's current study.

BM/E

THE FULL HOUSE SWITCHER LINE-UP

FROM
RICHMOND HILL LABORATORIES

"the Complete line of Video Switcher products"

- EDITING MODELS
- PORTABLES
- STUDIO PRODUCTION
- MASTER CONTROL

write today for your FREE BOOKLET on Image Changers

by

RICHMOND HILL LABORATORIES INC.

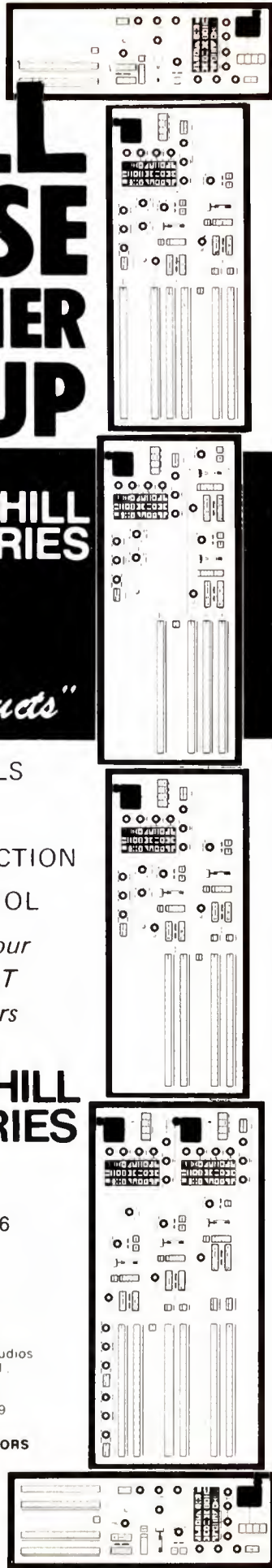
142 Central Avenue,
Clark, New Jersey - 07066

EASTERN U.S.
142 Central Avenue
Clark, N.J. 07066
(201) 381-5955
Telex: 138245

CANADA
1240 Ellesmere Rd.
Scarborough, Ont.
M1P 2X4
(416) 291-7921
Telex: 02-29803

ENGLAND
Pinewood Studios
Pinewood Rd.
Iver, Bucks.
SLO 0NH
Telex: 84 7419

U.S.A. DISTRIBUTORS
Telemation Inc.
P.O. Box 15068
Salt Lake City
Utah 8419



OURS

CAN YOU FIND --

YOU



THEIRS

THE HAPPY ENGINEER



**STONE ARMS
PRE-AMPS**



TURNTABLES



STUDIO FURNITURE



CLOCK SYSTEMS



TAPE CART RACKS

WE CAN MAKE YOU HAPPY

MICRO-TRAK
620 RACE STREET
HOLYOKE, MASS. 01040



Circle 115 on Reader Service Card

Circle 116 on Reader Service Card

Videotape Cleaning Saves Headaches, Money

Cause of dropouts can be reduced drastically, headlife extended and costly VTR operating time cut. You may want to also consider a tape evaluator.

NO MATTER HOW GOOD your tape and recording equipment may be, no matter how careful you are with recording, VTR maintenance, and tape handling, your videotape takes a lot of abuse and develops dropouts. The dropouts can be permanent or temporary in nature; most of the latter are caused by dirt becoming embedded in the oxide. But there's another problem with dirt-caused dropouts, and that is head wear.

One of the most important aspects of tape contamination and head wear is cleanliness. At one extreme of the spectrum was a British videotape user who had a problem with extremely low head life on his quadruplex equipment. The cause was found when it was noticed that an air conditioning intake duct was facing a new building construction site across the street. An enormous amount of contaminated air was circulating through the videotape room, depositing particles of grit on the tape. This not only caused excessive head wear, but also created a severe dropout problem on the tapes.

At the opposite end of the spectrum, a CBC TV station in Calgary, Alberta, was getting extremely long head life, with figures of 700 to 1200 hours of wear per set of heads. A close look at the VTR room in the station showed why—it was virtually a "clean room" with a double air filtration system and very strict maintenance procedures. Obviously, while such clean room conditions can create an ideal atmosphere for videotape use, this is certainly not to be expected in most broadcast facilities. Besides, what do you do about dirty tape that is received from someone else? Indeed, it has not been unknown to receive contaminated tape from the distributor or manufacturer.

Approximately 90% of all tape dropouts are not permanent—or don't have to be. They are caused by bits of dirt and oxide embedded in the surface of the oxide. These particles prevent good recording and intimate head-to-tape contact. This can become serious, especially since these embedded particles stay there and are, for all intents and purposes, permanently part of the tape until removed. The dropout problem can get so bad that eventually a reel of tape may have to be retired from use. Very often, this also entails irreversible damage to a master recording which might mean re-recording the entire program.

Another problem area: flat packs resulting from a lack of constant-tension winding. Without constant tension, protruding rims of videotape occur ("windows" is a common industry term to describe this condition) and the result can be very serious tape damage. Many quad videotape recorders in use today will not pack with constant tension. In fact, reel take-up and supply motors operate as constant torque devices.* Varying tensions are not surprising considering the heavy amount of starting and stopping that occurs during cueing-up periods, particularly when editing.** Several segments of the same reel of tape may have been processed by entirely different recorders. The result of uneven tension is those protruding edges or "rims" of tape which become easily damaged in handling and shipping. Very often such damage makes it impossible to record audio or control tracks on the tape. This damage is permanent; and the tape must be discarded.

Tape conditioners to the rescue

By using either one of two effective tape-cleaning machines on the market—the Recortec videotape conditioner or the Advanced Transducer Systems Magnetek—it's not only possible to clean up a contaminated tape so that it can be reused, it's also possible to eliminate a lot of temporary dropouts on masters or file tapes without impairing any of the recorded material. The Magnetek, for example, according to the Canadian manufacturer, removes up to 70% of videotape dropouts—a fact that has been verified by practically all of the system's customers. Many of them report a very high percentage of recovery on master tapes which had become too contaminated to play or dub.

Both cleaners provide constant-tension winding with a resulting flat pack. With uneven winding, no problem, it's possible to focus all attention on dirt and other tape contamination.

Dust of all kinds is either magnetically or electrostatically attracted to tape, during both recording and playback. This happens mainly because of the static electric charge that tape develops, which in turn attracts tiny particles of airborne dust and par-

*Additional boost torque voltages to accommodate fast start-up contributes to the problem. The Ampex AVR-1 is an exception, operating on a different principle.

**Recortec reports the tape tension between the beginning and the end of a large reel varies from 6 to 14 in-ounces.

icles of oxide. Oxide breakup, particles of grit, and even cigarette smoke are prime offenders. These particles become firmly embedded in the oxide because of the normal pressure between layers of tape when it is wound onto the hub. The embedded particle cannot be wiped away and it cannot be dug out because, if it is removed that way, it will leave a hole or an area of missing oxide. Yet each one of these dirt-embedded locations creates a dropout.

The two manufacturers of tape cleaners have taken different approaches to solving this problem. Recortec, longest on the market, uses two sets of vacuum cleaners which consist of stainless steel surfaces that have a large number of small holes through which suction is applied. The vacuum causes the tape to belly into these tiny holes slightly. The holes have sharp edges, electro-chemically formed, and function much in the manner of a shaving head. Loose foreign particles or loosened oxide are removed from both the front and back tape surfaces and sucked through a vacuum system ending up on a removable filter pad. The process is applied twice during tape passage. Recortec says it is particularly important that the rear Mylar surface be cleaned also, since particles adhering to that surface by electrostatic attraction can easily become embedded in the oxide surface of the adjacent layer of the tape during the winding process.

The Magnetek cleaner wipes the tape with a special silicon-impregnated tissue. The tape is wiped eight times in a cycle, but the real secret of the unit is the tungsten-carbide honing edge which scrapes off embedded dirt on the tape. This cutting edge is not a sharp blade, but is polished so it's perfectly square.

When the tape passes over the honing edge, it's under tension and positioned so that the blade decapitates the protruding part of the embedded particle. Thus, the tape surface leaves the honing edge both smooth and uncluttered. There's no dropout that would be caused by removing the particle entirely. The honing blade does its job by decapitating the embedded particles but has no effect on the tape surface. It does not remove any oxide from the tape. The silicon-impregnated wipers remove loose particles that have been cut and loosened by the honing operation. Wiping action is on both sides of the tape.

Some tapes are so contaminated that it takes more than one pass through the machine to do an adequate cleaning job. Some may require three or four cycles through the unit to return the tape to optimum recording condition.

Cleaning passes do not damage tape. Magnetek (whose system appears to treat tape with more physical force) says tapes have been cycled thousands of times through the cleaner without detriment to either the tape or the recording.

A relatively new cleaning problem has cropped up and has become so widespread among users that reports are still coming in. It's called the "white powder problem." Chemical analysis has found that the white powder is a kind of chemical excretion from the tape's binder. This problem is not limited to any one particular brand, and so far has been reported for several different tape manufacturers.

The problem has come up in a major research and development laboratory and has been noted in several videotape facilities and stations. Magnetek says its tape conditioner has provided 100% recov-



Magnetek tape cleaner is used on all videotape coming into WPIX from the outside. Shown here is Eric M. Heineman, technical director at WPIX.



Early model of Recortec tape cleaner with razor blade attachment does better cleaning than Magnetek, says Reeves Broadcast which has both. But sign says do not use master tape.

ery of tapes that suffer from white powder excretion.

Tape evaluator helps check job

Once the tape is cleaned, how do you know that it's ready to use? Even when it has been reconditioned, the tape may already have been so badly damaged by handling and really gross contamination that it may not be suitable for certain types of video recording applications.

Customarily, an evaluation is done by recording and playing back color bars on a monitor with a technician eyeballing the screen for the entire length of the tape. This is probably the most wasteful and time-consuming part of the whole operation, and certainly isn't necessary when you consider the technology available to us today.

With these conventional techniques, a one-hour tape evaluation would take two hours of VTR time with resulting head wear. It would also take at least one hour or more of operator time; and after all this time and money is spent, you may find out that you can't use the tape anyway because it's in such bad shape. Besides, where are you going to find a technician who will spot every dropout in the color bars without falling asleep in the process?

Post-production houses and TV stations have done accounting on tape evaluation, and they figure the cost of certifying a one-hour tape to be somewhere between \$50 and \$200. Add to this the cost of using equipment for such unproductive work as tape evaluation, and the cost may be increased considerably.

It's in these cases that a tape evaluator or certifier of some kind comes in, but many stations don't want to invest in a full-blown certifier because they are quite costly. The Magnetek tape evaluator is a compact unit and can operate at the same time as the cleaner. The evaluator will go through an entire one-hour reel of tape in about 12 minutes—totally without supervision. It records and reads out test material from every segment of the tape. It uses a special read-and-write head on each of the control and audio tracks, and uses a 14-track stationary head for testing the video portion of the tape (about 50%). This operation is something like the evaluation procedure used in testing computer tape, which must pass similarly stringent requirements.

The evaluator provides a profile on a strip-chart recorder printing three bar curves which show the dropout level in the video portion as well as any degradation of audio and control track. An edge marker on the strip chart shows the elapsed time for pinpointing serious dropout locations, and will also show physical splices along with total playing time. The unit can be set for a threshold level of dropout which the user can adjust to meet his own needs.

Once the tape has been evaluated and a profile of the audio, video, and control tracks has been produced, the operator can study this chart and find at a glance any trouble spots or problems in the tape. These spots can be edited out, leaving a reasonably sound tape. It's quite common, for example, to find that the front end of the tape has problems in all areas and the evaluator would tell

the operator where to chop off the bad part. A tape might develop damage in the audio track at one or more locations, and this damage might be limited to only a few inches or feet of tape. The operator can set the pre-set stop control on the evaluator to whatever location is indicated on the printout, examine the tape in that area, and edit out the bad parts.

Recortec has a Video Tape Evaluator unit that detects dropouts as well as doing a careful cleaning and winding job. First, a longitudinal signal is recorded on the tape. Nine playback heads evaluate results. The tracks are strategically located to provide the maximum amount of information (four tracks are located close to edges, for example). Recording and readback is all accomplished in the forward mode at 120 ips speed.

A companion digital printer prints out locations of surface defects and edge damage precisely, while a bidirectional timer counts the exact tape length and pinpoints tape defect location.

Which to buy?

Is one cleaner or evaluator better than the other? Each has its selling points. Recortec's vacuum system appears to be a gentler approach, but the company does not make quite such strong claims for reducing dropouts as does Magnetek.

Recortec, in a technical paper,* said its cleaning efficiency is high for tape with normal atmospheric dust and loose oxide particles. But it admits efficiency is not as good if the nodules are deeply embedded into the (oxide) surface. Says Recortec, "This latter condition is quite common in tapes during the manufacturing process, but happens very rarely in users' environments if the tapes have been properly cleaned periodically."

To offer equipment which can provide both types of cleaning, the cleaning stations on the Recortec Video Tape Evaluator are constructed in interchangeable modules to permit the customer to switch to razor blade cleaning if the vacuum grid does not reduce the dropouts below a certain desired level.

A tape cleaner costs in the \$4000-\$5000 range; an evaluator in the \$1200-\$1500 range. Various options can raise this price.

Both companies can provide a list of satisfied customers, and can provide documentation on usage. Magnetek's address is Advanced Transducer Systems, 40 Meteor Drive, Rexdale, Ontario (U.S. sales agent is Television Equipment Associates, Box 1391, Bayville, N.Y. 11709). Recortec, Inc. is located at 777 Palomar Street, Sunnyvale, California 94086.

Generally, the cost of a cleaner/evaluator can be earned in saved videotape in the space of a year or less. In normal broadcast station operations, just the time saved in not having to use high-priced videotape equipment for test purposes is worth the investment. There is certainly less head clogging, and chances of head smearing are greatly reduced. It appears to be sound advice to clean all tapes before playback. If a tape is to be used for a new recording, it should first be evaluated. **BM/E**

*Video Tape Evaluator, by Dr. Lester H. Lee, 1971.

What does it really cost to own Collins broadcast equipment?

Less because Collins superior quality reduces cost-of-ownership.

Quality is traditional at Collins. It accounts for Collins being the prime name in space communications.* It accounts for all those 25-year-old Collins transmitters still going strong. It enables Collins to give a two-year warranty. That kind of quality means lower cost-of-ownership.

Our field service engineers are on the job round-the-clock. They never walk away from a customer's

problem. That means faster return to normal – and that means lower cost-of-ownership.

But don't wait for long-term proof. Figure initial costs, too. Check Collins prices. They're competitive.

You can afford Collins equipment. And you'll profit from it.

Contact Collins Radio Company, Broadcast Division, Dallas, Texas 75207 or call 214/235-9511.

*Every American voice from space has been heard over Collins systems.



Circle 117 on Reader Service Card

You can buy "player" for \$ But our ACR- cost you less \$200,000.

ACR-25 is a better investment now and in the future because it's a superior spot player, a sophisticated production machine, and the only cassette VTR with true computer interface.

Unmatched efficiency and flexibility—for your needs today and tomorrow make it the only logical investment choice. Compare

1. Immediate benefits from your investment

The higher your spot and production volume, the faster the ACR-25 will pay for itself

You'll cut headwheel cost up to 80%. You'll cut hours of man-effort, free your VTR staff for production chores. Eliminate the daily spot reel which saves you headwheel and manpower cost.

And if your library numbers only 2000 segments, our reloadable cassettes can save you \$20,000 right there.

2. Exclusive time-saving spot flexibility

The headaches and costly mistakes of multiple spotting are over. ACR-25's fast, shuffle-free sequential or random access makes spot playback equally easy to program.

Cassettes are reloadable. Your inventory cost is lower.

Cassettes are up to 6 minutes long, not 3. Use them not only for spots, but for news, sports inserts, editorials, promos, even complete program segments.

Multiple stop/start cues let you put more than one segment on one cassette, if you like.

Every tape can be verified visually with our positive Identification Data Accessory (IDA), and the identification can be printed out or fed into a computer for logging or billing purposes.

Play 10-second spots back to back. Go instantly from production to on-air operation.

You can record or dub on both transports.

And more.

3. A Complete Production Tool

ACR-25 will free up 3 to 5 reel-to-reel recorders, giving you more options, more flexibility when producing short segments.

Add dealer tags to commercials easily. No need to juggle film, slide, or audio machines.

Use ACR-25 as the master when you make cassettes or reel-to-reel dubs.

Record network news segments for later broadcast. Or other clips, like slides with audio. Promos. ID breaks. Hitchhikers. Open and close billboards for live, one-camera shows. And more.

You can even produce prerecorded, pushbutton shows that mix live shots, film, and tape footage to any length.

No other machine offers so much to the imaginative producer. Create quicker, simpler, better—and get effects you couldn't even try before.

a "spot 150,000. 25 will even at

**Users
worldwide
who have
discovered
ACR-25
is the better
investment**

United States

WWLP, Agawam, MA
WJZ, Baltimore, MD
WBZ, Boston, MA
WIS, Columbia, SC
KDFW, Dallas, TX
WKEF, Dayton, OH
KTVT, Fort Worth, TX (2)
WFBC, Greenville, SC
WTIC, Hartford, CT
ABC, Hollywood, CA (2)
KHVH-TV, Honolulu, HI
KCMO, Kansas City, MO
KHJ, Los Angeles, CA
KTTV, Los Angeles, CA
WTVJ, Miami, FL
WDSU, New Orleans, LA
CBS, New York, NY (2)
WNEW, New York, NY
KTVU, Oakland, CA
WKY, Oklahoma City, OK (2)
KYW-TV, Philadelphia, PA
KDKA, Pittsburgh, PA
KSL-TV, Salt Lake City, UT
KTVI-TV, St. Louis, MO
KENS, San Antonio, TX
KCST, San Diego, CA
KGTV, San Diego, CA
KGO-TV, San Francisco, CA
KPIX, San Francisco, CA
WSYR, Syracuse, NY
WTVT, Tampa, FL (2)
KTEW, Tulsa, OK
WTTG, Washington, DC
WTVI, Winston-Salem, NC

Great Britain

Southern TV, Southampton (2)
Thames Television, Ltd. London (2)
Granada Television, Ltd., Manchester (2)
Rank Video Labs, London
Harlech Television, Ltd., Wales (2)

Canada

CFCF, Montreal
CKCO, Kitchener
CHCH, Hamilton
CBC, Canada (3)

Australia

ATN7, Epping
ABN, Sydney

Mexico

XETV, Tijuana

Hong Kong

TV Broadcast Ltd
RTV, Hong Kong

New Zealand

NZBC, New Zealand

Computer Compatible

Imagine a day like this. Just load all your short segments — taped commercials, promos, off-the-air clips, news inserts, editorials, everything that random into your computer-controlled, automated ACR-25 system. The system can memorize each segment, program it in the order you command, and execute it all reliably with split-second timing. All you do is replace cassettes with new ones (reloading at random), push a button to reset the sequence, and you are free for other duties for another half day or more.

Amazing? Not at all. This futuristic concept is here now. Best of all, this command and control capability comes completely built into your ACR-25.

New dimension in broadcasting and production

ACR-25 is the most complete broadcast/production unit even conceived. No

matter how you use it, it saves money, manpower, and mistakes, making it the only logical choice as a short- or long-term investment.

For details, contact your local Ampex Broadcast Video Sales Engineer, or write for full information.

AMPEX

Ampex Corporation
Audio-Video Systems Division
401 Broadway
Redwood City, California 94063



Our ACR-25

Circle 118 on Reader Service Card

How We Staked Out Our FM Audience

By Thomas Burns

WMCB, Michigan City, Indiana, has quadrupled billings since 1969 when the present management took over and began careful development of a specific audience.

FM RADIO IN RECENT YEARS HAS EMERGED as a major medium. Many say it will surpass AM radio in audience reached and revenue generated during this decade. In some major markets, FM stations have overtaken AM in audience rating. In Michigan City, Indiana, where the writer operates WMCB (FM), our billings have nearly quadrupled since 1969.

Although commercial FM began 31 years ago, it is only recently that marketing concepts have been applied to selling FM. In this paper, I will describe marketing channels for smaller-market FM stations. Since we are selling a non-tangible service, not a physical product, it is necessary to describe the entire marketing program and relate the channels to the other elements of marketing. In addition, two separate, but sometimes overlapping, channels must be considered: audience channels and advertiser channels.

Until about 1966, FM was a dormant medium. Its growth was halted during World War II, and in the post-war period it was bypassed for development of television. In the early 1950s, an engineer at WWS, Champaign, Illinois, forgot to turn on the FM that duplicated AM programming. Hours passed before a listener called to inquire why the FM station was not broadcasting. The few independently-operated FM stations often sold time in blocks of 15 minutes to an hour at very low rates to anyone they could get to buy it. FM receiver ownership was very low and programming, when not a duplication of AM, was the lowest-cost material available. There were no systematic efforts to market FM . . . and no one cared.

But slowly in the 1950s a demand began for program material for hi-fi and later stereo systems. Discs and tapes were expensive, and an alternate, inexpensive source was needed. As a result, FM tuners were added to sound systems, and inexpensive imported FM table radios became available.

Mr. Burns is president and general manager of WMCB, Michigan City, Indiana.

By 1966 a second generation of FM stations came on the air to meet the hi-fi and stereo needs. The same year survey firms began measuring demographic audience structures, and demographically-programmed FM stations, such as WFMT, Chicago, began showing up in these surveys—although with limited audiences at first. The reason appeared to be that hi-fi and stereo enthusiasts were very specific in the types of music they liked, and listened to the stations which came closest to fulfilling their listening tastes. By comparison, the mass-market AM stations, with something-for-everyone formats, did not appeal to the same extent to specific demographic groups.

Today more receivers are sold with FM than without. And consulting firms now offer demographically-structured syndicated programming services designed to reach target audiences. Some have been quite successful: Stereo Radio Productions Ltd., for example, achieved first place ratings among all stations, AM and FM, in Grand Rapids, Michigan, with WOOD-FM, and in West Palm Beach, Florida, with WEAT-FM.

In these cases, and in Miami and Boston too (where FM is in first place), the programmer has selected a specific audience and developed and broadened it to exceed any other demographic audiences in those markets. As Kotler points out in *Marketing Management*, a smaller competitor should attempt to segment the market rather than to compete head-on with dominant firms.

As the programming was being demographically developed, it could be sold on a demographic basis. Recently ABC published a survey of product preferences of persons who listened to stereo rock on FM. The study is being actively used by ABC-FM salesmen in calling on clients whose product types have a high appeal for stereo rock listeners.

In describing marketing channels of small market FM, I will draw upon my experiences in Michigan City and generalize them to this class of station. Although demographic programming has been slower in being applied in smaller markets, I believe

there are advantages to such segmentation. In addition, it is often possible to redefine and expand a smaller market geographically. Thus it is possible to create a new service for a new market.

First we defined the geographic market. Although Michigan City has been traditionally considered an isolated market, a major enclosed shopping mall opened several years ago near two converging expressways at the south edge of the city. Between 40 and 60% of the shoppers were found to come from beyond the Michigan City limits. But the long established mass media in Michigan City, a daily newspaper and an AM station, continued to program and sell primarily to Michigan City.

WMCB-FM reaches most of northwest Indiana and southwest Michigan. There are several hundred thousand potential listeners within 30 miles of Michigan City, who shop both in Michigan City and at the businesses in their local communities. Thus we decided to program our station for this regional market and direct our sales efforts to advertisers within about 30 miles of Michigan City, as well as those within Michigan City. (Thirty miles is a marginal limit for sales and programming.) Since WMCB-FM was a new medium, there were no traditions to alter. We could provide news, weather, sports, and features for listeners throughout the area without offending Michigan City listeners.

Second, we examined the census figures and found there was a large potential audience in the 21-to-45 age category. Our surveys indicated that WLS, Chicago, was dominant among teens, a number of background music FM stations were splintering the older audience for FM, and the Michigan City AM stations reached mostly persons over 45. Thus we structured our selection of music for the 21-to-45 age category by playing contemporary, popular music and directed our regional news, weather reports, sports coverage, and features to persons in that age category. We also discovered that no other station, AM or FM, in our desired coverage area was editorializing. We added that feature.

Prior to these modifications in the audience marketing channels, the station, under previous ownership, had been one of a number of FM stations broadcasting background music to this area. Many of these stations, broadcasting from Chicago, had better programming and better signals throughout much of the regional area we wanted to serve. These facts reinforced our decision to abandon background music. Further, the background music listener tends to listen to the station with the fewest commercials.

While we were developing the audience marketing channels directed to young adult listeners and promoting the audience on-the-air and through newspaper ads, we were simultaneously developing advertiser marketing channels.

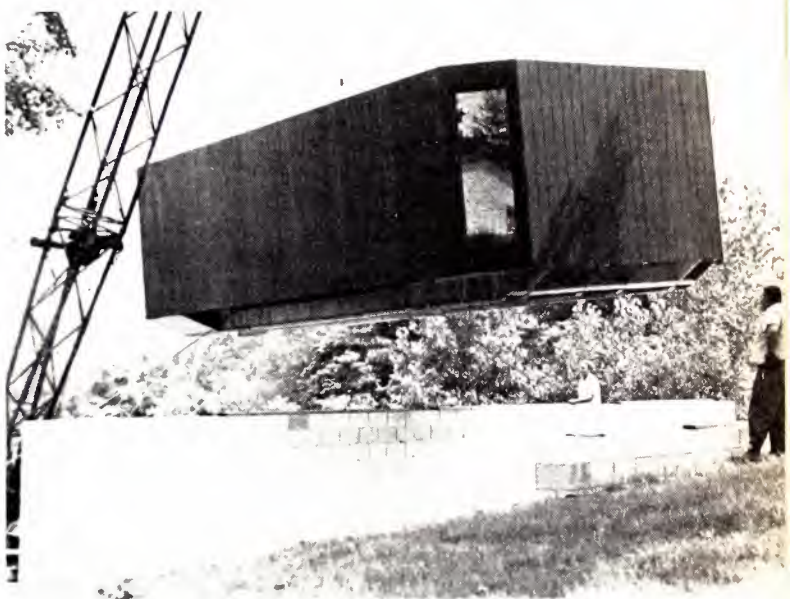
We were actively calling upon clients within 30 miles of Michigan City whose products or services would have strong appeal to young adults. We showed them how our station could fill advertising needs.

We contacted national accounts where there was

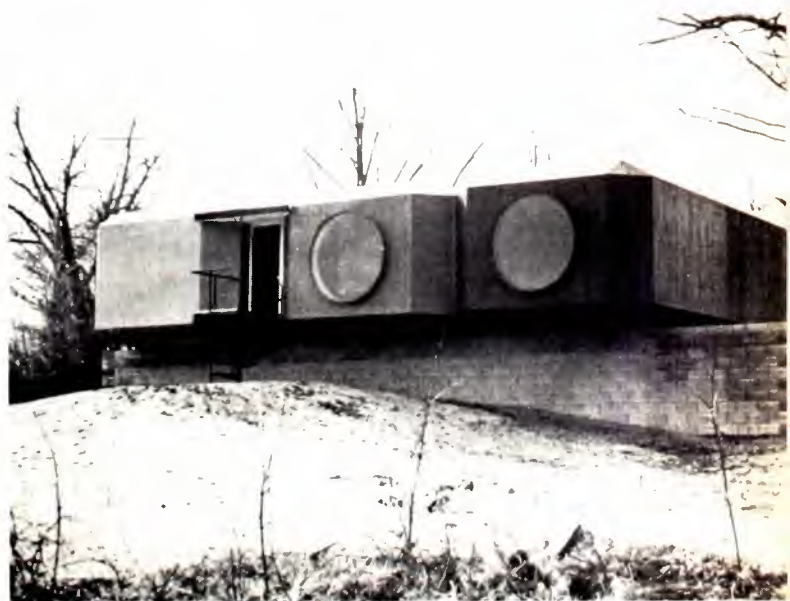
some logical tie-in with our regional area and audience age. We worked through local dealers or distributors. We avoided a shotgun approach.

In the last year we have added a national representative and have joined a group of stations in Michigan and Indiana who sell advertising jointly.

Our local and regional sales efforts have been quite satisfactory. In addition to in-town business, about a third of our business comes from advertisers in the surrounding region. We have gained some national business, but there is still a great deal of prejudice against FM among advertising agencies. They will buy with a strong recommendation from a local dealer. That is the only profitable means to pursue national agency business at this time. One

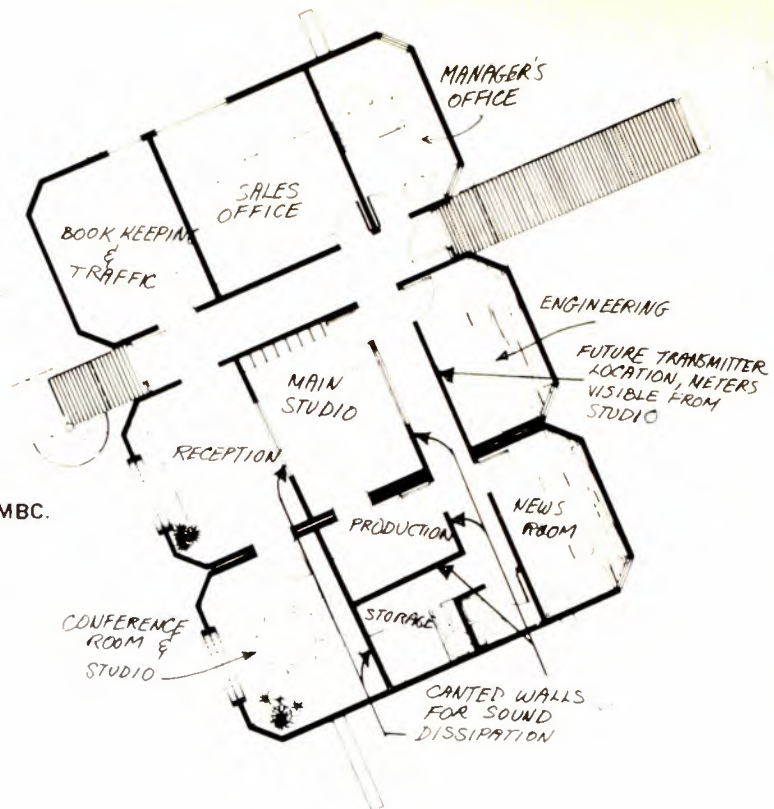


New studio-office building for WMCB came in three prefabricated sections. Each was lowered onto cement block foundation by crane; matching openings formed passages.



Front door of completed building is reached by open metal stairway. Sound isolation for studio is built into module. Round windows carry out architectural style.

Floor plan of station WMBC.



day agencies will discover FM, and it will suddenly become the "in" thing. (My experience with agency people is that most tend to follow the herd.) Our efforts through our national representative and the group of stations has produced little yet, but I believe there is great potential there.

During the time we have been pursuing our defined channels we have been gradually expanding our scope of programming. We have softened and added a larger variety of contemporary music and mixed in lightly some music dating back to the 1950s. In addition our news, editorials, sports and weather coverage has gained response from older people, too. We have developed additional regional programs such as beauty pageants and election night coverage for both Indiana and Michigan, which sold easily to regional advertisers.

When we began in 1969, WMCB-FM had little audience and FM set penetration was about 70% of homes in the area. Our present surveys show we are the dominant FM station with a nearly 50% lead in listener preference over the second place FM station, which broadcasts background music. FM set penetration has climbed to about 90%. As audience loyalty continues to develop and set penetration nears 100%, I believe we can further broaden our audience appeal and advertising sales. We also plan a power increase, not so much to reach farther, but to increase our signal level in the areas we already serve.

We stimulated audience channels through occasional contests such as one in which listeners were rewarded for identifying sounds unique to this area, through saluting on the air a different local person daily, through on-the-air promotion, call-in pro-

grams, newspaper ads and mail directed to community leaders.

Advertising channels are stimulated with yearly demographic surveys of audience, documented success stories in letter form from advertisers, news releases, public appearances of station personnel and by active participation in many community projects.

In smaller markets that have a number of competing radio signals, I believe segmentation of audience is as necessary as it is in a larger market. Only in isolated, single-station markets can a station be all things to all people. Too, I believe there are many markets where an FM station operator has an opportunity to redefine the geographic limits of the market as we did here. FM signal coverage is more constant than is AM coverage and is often greater. If a broader area than the local city can be served, and if there are no long-standing ties of the station to the central city, why confine the service area? In addition to Michigan City, I know of stations in Aurora, Illinois, and Traverse City, Michigan, which have successfully programmed and sold to a broadened geographic market.

In this story I have discussed the marketing channels, audience and advertising channels, and related them to the other elements of the marketing mix. Often the distinction is blurred since we are not transporting and distributing a product or service in the traditional sense. We have no inventory problems, unless you count unsold time; we have no distributors in our local area, unless you count the few local ad agencies; and we have no dealer network. In our business the channels become an inseparable part of the whole. But that is what makes it so interesting, and challenging.

BM/E

Electronic editing so precise you might kiss tape splicing goodbye!



The new Tape-Athon 1001 Recorder/Reproducer has everything the professional studio demands in a precision instrument, plus some exciting innovations we've added to make the 1001 a must-see-it-before-you-invest. Here are the basics: dual capstan, closed loop tape drive for clean, even tape travel with minimum wow and flutter; tach-controlled motion sensing to eliminate tape breakage, stretching or spillage; newly designed tape head section for easy threading, fast lifting; illuminated push button controls, flush mounted.

Now for the innovations, take a look at this control panel.



With the Tape-Athon 1001 you can initiate a "balanced torque mode" on the tape drive by activating the PLAY (or FAST FORWARD) controls simultaneously with the REWIND control. Both drive motors are balancing against one another, allowing the user to manually move the reels in either direction without drag, skipping or tape stretching. You can actually move the tape so precisely for editing purposes that splicing is virtually eliminated.

Call for complete details and specifications on the professional's professional 1001 Recorder/Reproducer (also now available in Reproduce-Only, 14 Inch Reel, and Logger versions for the broadcast industry) or write to:

Tape-Athon Corp.

502 S. Isis, Inglewood, CA 90301 • Tel: (213) 776-6933

Circle 119 on Reader Service Card

The quality that TAV produces is like the camera it uses.

Trans-American Video does great work. They really have an eye for video tape. In fact, they're quite a unique video facilities company. When it started in business over a year ago, it ordered nine of the first Fernseh cameras sold in the U.S. TAV used those cameras to cover the U.S.-Russia track meet and then proceeded to become the world's largest independent mobile color video tape facilities company. Their current credits include NFL Monday Night Football, Young Dr. Kildare series, Burt Bacharach in Shangri-La special, Duke Ellington . . . We Love You Madly special, and Frankenstein, Parts I and II feature.

Today, TAV has over \$8 million worth of equipment. And here's what they have to say about Fernseh cameras:

"It took only a short training period for our operators to learn to use the cameras, and for the cameras to establish themselves as quality pieces of equipment."

"The Fernseh cameras are easy to set up and strike. Once they're registered, they're extremely stable. A video operator does not have to continually ride the pictures."

There's a lot more we can tell you about the family of Fernseh cameras. Interchangeable modules. Small diameter cabling. Performance specifications, etc. For more detailed information, contact your local Fernseh division representative at one of the offices listed below.

- Chicago Hdqts. (312) 681-5000
- Houston (713) 681-8461
- Los Angeles (213) 649-4330
- New York (516) 921-9000
- Ramsey, N.J. (201) 825-1550
- San Francisco (415) 583-9470

Robert Bosch Corporation
Fernseh Division





Montreux—World Marketplace for Broadcasting Equipment

This biennial International Television Symposium draws influential broadcasters from around the world. Their demands are influencing design. A quad II standard may result.

WHAT THE NAB CONVENTION AND EXHIBITION is to broadcasters from the United States, Canada, Mexico and parts of South America, the biennial International Television Symposium, in Montreux, Switzerland, is to the rest of the world.

At the 8th Symposium this last May, some 2000 high-level engineers came from 35 countries to spend a full week studying the equipment offered by more than 90 exhibitors. Large delegations came from South Africa and Australia; there was a small delegation from China.

The European and "world" mar-

kets for broadcasting equipment are indeed substantial. The Middle East alone is a big customer. As much as 20-30% of total sales of several American manufacturers come from these markets. In some product categories, it is 50%. Indeed, at the 8th Symposium it became clear that the European market and proposed new European Broadcasting Union standards for VTRs may well dictate a new generation of equipment that will eventually affect existing quad standards. More about that later.

The world market is large enough to entice new camera manufacturers

into competing. We expected to see EMI, Fernseh, Marconi, Philips, and Thomson-CSF. These established European lines, coupled with strong products from RCA, Gates, IVC and Ampex—and perhaps something from Japan—seemed more than enough competition. But Link Electronics (Walworth Industrial Estate, Andover, Hampshire, England), thought there was room for one more. Link announced at Montreux their Series 110 color camera. It uses ICs, anti-comet-tail Plumbicons, light bias, etc. Through the incorporation of stable circuits, the need for complex automatic correction circuitry was eliminated. Integral monitor facilities afforded fast and accurate lineup. The camera can be rapidly color balanced under changing light conditions and uses a plug-in matrix to match colorimetry for studio or natural lighting. It uses lightweight cable. Link, incidentally, is emerging as a major system producer. It uses extensively equipment from Rupert Neve and Prowest Electronics. Neve is well known in America. Prowest makes advanced TV switching systems and monitors.

On the subject of monitors, a new line (three screen sizes) introduced by the Belgian firm Barco made quite a stir. Units produced good pictures for PAL, SECAM or NTSC systems. Costs were reasonable because of standard modules and screen size-to-volume was good. Barco's special claim to expertise is in the area of deflection circuitry and production.

Several North American companies were trying to line up distribution rights for the Barco line in the



Barco's monitors drew a lot of attention.



There were numerous cable TV exhibits, but none from the U.S.

U.S.A. and Canada, and Conrac may find itself with more competition. Not that Conrac doesn't like competition; it was at Montreux with its 5000 series monitors shown at NAB. C. D. Beintema of Conrac delivered a paper on "Color Television Phosphors and Illuminant D."

The largest exhibits (called stands) at Montreux were those of Thomson-CSF, Fernseh-Bosch, Philips, and RCA. Ampex and Marconi were not far behind. Many stands were generously proportioned and, with four floors of the new Congress Building occupied, the Exhibition appeared to be giant. The actual number of exhibitors was something over 90. Some were agents, so that more than 100 manufacturers were represented.

Products from 15 different countries were on display, including several from the Communist bloc—Austria, Hungary, Czechoslovakia and Poland. There was a new compatible quadraphonic FM system from Elektromechikai Vallalat, Budapest, Hungary, that needed a bandwidth of only 53 KHz (the international standard for stereo). *BM/E* hopes to get more details on this system later. *EMV*, incidentally, is a large transmitter manufacturer (VHF, UHF and FM).

While we saw no revolutionary products, a distinct flavor at Montreux did reflect world interest. For one thing, there were all kinds of mobile vans about, including a semi-mobile variety that stood on stilts after its trailer wheels moved on.

Link, mentioned earlier, is big in the mobile area. So is Ampex, incidentally. Siemens was another.

A clever method of getting fuller use out of the TV spectrum was demonstrated at the RCA exhibit. There the Independent Television Authority, Great Britain, showed how special alphanumeric messages (such as news bulletins, sports scores etc.) could be transmitted during vertical intervals and stored in a TV set for replay at will by the consumer.

We saw very smart-looking styling—Schlumberger, France, in particular—and some quite clumsy, such as Albrecht Elektronik, Germany. The latter, incidentally, was editing equipment which, presumably didn't have to be compact. There was a lot of editing gear

Greetings From Montreux

Address delivered on 18 May 1973 by Mr. Roger Bonvin, president of the Swiss Confederation, on the occasion of the opening of the 8th International Television Symposium, Montreux 1973

I would like to convey to you, Ladies and Gentlemen, the greetings and good wishes of the Swiss Federal Government, and tell you how gratified we are that private initiative together with the active support of Swiss Posts and Telecommunications have made an institution possible which seems to be here to stay and which, I am sure, nobody would like to miss.

With its "Golden Rose" competition, Montreux has not only emerged as a forum for television entertainment during recent years, but has at the same time developed a reputation as a meeting place for outstanding international television experts and as a market for the most advanced television equipment for commercial users. Both the exhibition and symposium fulfill an important communication function in our hectic age marked by growing specialization. Within narrow confines, and at a minimum of time and expense, they offer a unique opportunity of acquaintance with the most up-to-date international television products, as well as with the latest developments and research efforts, thus enabling the specialist to spot trends and—last but not least—to exchange views and establish contacts.

We are of course highly pleased to note that this "Forum of Television Technology" has made its home in Switzerland, and we are surely right in saying that the charm of Montreux and its surroundings has materially contributed to making it so successful.

Those of you who are working in the field of telecommunications, a medium outstanding for its ability to bring people closer together, have a rewarding task to fulfill, but also one involving great responsibility. You are in charge not only of the technical development of the medium, but also of cooperation at the international level, without which telecommunications could not live and prosper. Yours is a field in which mutual understanding has been exemplary and a living reality for over a century now. The Montreux events, with their wide attendance from all over the world, are particularly suitable to contribute to the promotion and deepening of contacts in a free atmosphere, making for better mutual understanding, and facilitating cooperation.



Garden party on May 20 at Montreux Plage. Among those pictured is a heavy contingent from the U.S.A.—part of a two-week group tour organized by *BM/E* to attend this international symposium. Photos courtesy Wm. Kelley, v-p and chief engineer, WNEW-TV.



RCA was one of the largest exhibitors at 8th International TV Symposium. It stressed automation.



Thomson-CSF clearly gave the impression it was a world-force in TV. It showed a full-line of equipment.

FERNSEH



Bosch-Fernseh rivaled others for sheer size, but was low key in its demonstrations.



Fernseh's portable camera was a hit at the show.

stressed at Montreux, indicating clear interest in production.

The liveliest stand was that of Thomson-CSF—the only one to put on a live entertainment demo—a French revue.

The SECAM system produced clear, beautiful color pictures, but the French go overboard, and many of the color interfaces were bordered with black—indicating the French predilection for surrealism (or the bizarre) we were told, and not some peculiarity in the equipment.

The Thomson-CSF stand was packed with a full line of professional equipment for both radio and TV. Its TV equipment is strong in countries that have SECAM (Chile, Iran, Ivory Coast, Algeria, Tunisia, Morocco and others, including Russia), but the transmitters are found in Belgium, Germany, Cyprus and many other places as well. Thom-

son-CSF power tubes (klystrons, tetrodes) have made it a natural transmitter leader. Other Thomson-CSF products include color TV cameras (a full line) using a single coax cable between cameras and CCUs, a black-and-white camera using the "noticon" tube (for low light levels), 16-mm telecine chains, switching units, including automated types, microwave links, and antennas. The highlight this year was the new segmented helical VTR (called a spiral recorder in the English press release) developed by IVC. The French number is TTV3500.

Closely rivaling Thomson was Fernseh-Bosch. Fernseh stressed cameras, including the hand-held KCR and the KCU studio unit. Sixteen-millimeter film scanners and vans outside the exhibit unit were stressed. The Fernseh-Philips BCR discussed elsewhere was demo'd in

a separate stand.

For breadth of line, Philips was outstanding. We were overwhelmed with a press kit that included 15 news releases, not counting one from Central Dynamics Ltd. CDL shared the Philips stand and provided switching, editing, and automation capability. The focus was on cameras. Philips cameras in Europe differed from those produced stateside by Philips Broadcast Equipment. Top of the line is the LDK-5, which is similar to, but not exactly, a PC-100.

Philips, Eindhoven, described the LDK-5 as a new generation device that contains a built-in memory that never forgets its own control settings. All video processing is done in the camera itself—not in the CCU. Commands are sent via digital code so that the only connection is a telephone wire (or radio trans-

continued on page 64

Four New Tape "Standards" Promoted

To the particular consternation of American broadcasters attending Montreux, it was apparent that the 17-year quadruplex VTR standard was under siege. It looked like it might collapse in the face of European demands for a less expensive recording system. Some hint of an intrusion on quad was provided at the 1973 NAB Convention when IVC presented, at a private seminar, details of its two-inch helical unit, the IVC 9000. IVC clearly identified the development undertaken in conjunction with Rank Cintel and Thomson-CSF as primarily for the European market.

But IVC didn't tell its American audience that its system and the Rank/Thomson-CSF alliance was a come-from-behind move to compete with an already demonstrated contender which hoped to become the European standard, the Philips-Fernseh broadcast helical recorder, the BCR 60. The greatest revelation, however, was the realization that both Ampex and RCA were ready to modify existing quad standards to more nearly meet European requirements—and it was apparent that if the quad system could be changed to lower operating costs (less tape, better headlife), such equipment would undoubtedly impact the U.S. market. RCA very aggressively got across the point that a modified quad approach could not be ignored. The company announced it would have a QUAD II system for European evaluation this fall. The declaration was even something of a dramatic move—RCA scrapped a scheduled paper on reconditioning head wheels to put its chief video engineer, A. C. Luther, on the symposium podium to reveal QUAD II.

The delegates had already been primed, in an earlier paper by Charles Anderson of Ampex, to the notion that, rather than embrace helical, maybe quad should be modified. But Anderson wanted dialogue on the subject rather than hardware. He wanted to explore various trade-offs before deciding on a course of action. RCA seemed ready to gamble on building a unit, hoping it would meet the industry's expectations.

Thus the four new standards—helical by Philips/Fernseh, segmented-helical by IVC/Rank/Thomson-CSF, QUAD II by RCA and modified quad by Ampex.

Such a proliferation was a little more action than Europeans bargained for, even though it was the European Broadcast Union that sought something better than existing quad. The EBU subgroup on recorders felt compelled to say that it "confirms its desire to limit to a minimum the number of standards that will be adapted for the international exchange of tape." It added that it "proposes to exert every effort to obtain this goal."

The EBU was not deterred from going ahead on getting an approved helical standard. Based on field experiments to be gained with the BCR 60 and the IVC 9000, the EBU declared its intent to adapt a helical standard by the second half of 1974. The subgroup tested both units* at Montreux and found

*As a relative indication of the EBU requirements, the Ampex 7900 did not measure up on several counts. Notably, it has only one audio track and the audio S/N is not good enough

them to meet previously established criteria. It left the door open to also approve a new quad format at a later date.

The issues at stake and proposals.

What the EBU seeks is straightforward. Operating costs have to be lower than that of existing quad and quality should be better. Desirable machine characteristics were delineated in a December 1971 statement concerning helical-scan-type recorders for 625 line/50 field systems. They were:

- two full-quality audio tracks
- video and signal quality at least equal to quad
- provision for high energy tape
- low operating cost
- compatible low cost equipment.

Europeans using a 625 line standard have a moire problem, resulting from highband frequencies, which suggests the need for superband.

The Philips-Fernseh system at first blush looks like an Ampex 7900 or an IVC 900 one-inch heli-



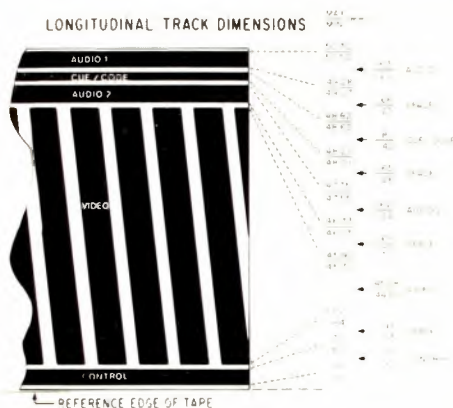
The IVC-9000 two-inch helical VTR, operating on both PAL and SECAM standards was a focal point.



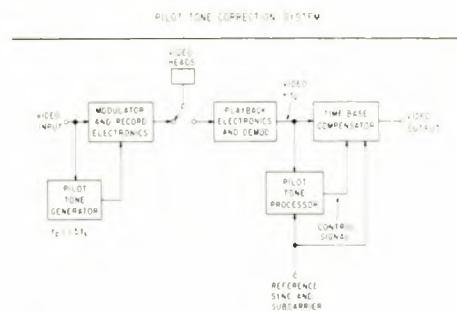
Philips-Fernseh cordoned off its BCR-60 helical VTR to modulate the flow of traffic.

RCA's Approach to a New Quad Standard

Adapted from a paper by A.C. Luther
at the 8th International Television Symposium.



Without changing the vacuum guide ratios, but reducing guard bands, RCA would get two audio tracks.



Block diagram of pilot tone correction system.

I refer to the possible new standard as Quad II although you must recognize that this is not a standards proposal but rather represents our present best thinking on the choices and decisions which must be made before a standard is proposed. The objectives may be summarized quickly by saying that we are trying to provide, at a tape speed of 15 cm/s with 5 cm tape, two high-quality sound channels and a video channel which meet the intentions of the E.B.U. documents. The video characteristics should have improved signal-to-moire (40 dB min.) and no visibility of segmentation errors. The machine should also be capable of using high coercivity tape to achieve higher signal-to-noise ratios. These characteristics should all be achieved in a recorder which would have the capability of being designed in a switchable standards version which would also operate on present quadruplex standards.

The technical approaches we are considering to achieve these ambitious goals are as follows: Utilizing state-of-the-art head technology, we are able to use narrower video tracks, and the latest servo capability allows us to reduce the guard bands between video tracks. These two factors lead to a linear tape speed of only 15 cm/sec for 625-line color recording. Also, because of present-day servo capabilities and mechanical tolerancing ability, we may shorten the video track length, and this provides sufficient space at the edge of the tape for us to add a second full-quality audio track. Within the narrower video tracks, acceptable video performance is obtained by the use of a super highband modulation system and a time base compensator plus chroma compensator which uses a continuous wave pilot tone in the recording signal.

A possible tape track format with dimensions and tolerances for 625-line systems is shown. These numbers are based on using the same vacuum guide radius that is presently on quadruplex systems, but reducing the video track space to a value which can be achieved with present-day tolerancing. Also, the control track is reduced slightly in width. All of the space gained by these moves is located at the top edge of the tape where two high-quality audio tracks (55 dB S/N min.) and a medium-quality cue or time-code track are located. This approach allows a nominal audio track width of 1.4 mm, in which we can achieve 55 dB signal-to-noise ratio with standard tape. The track spacings between audio and cue track are based on the use of a 300 Hz low frequency cutoff for the frequency characteristic of the cue track, with full response to 50 Hz in the audio tracks.

The principal in-band limiter-type interferences for super highband (8.94-to-12.5 MHz) are of fourth-order characteristic, which is essential for achieving acceptable moire performance in the presence of the pilot tone used for the correction system.

A block diagram of a pilot tone correction system is shown. Here you can see that a synchronous pilot signal f_p is generated at exactly 1.5 times the color subcarrier frequency. This signal, at low amplitude, is added to the video signal ahead of FM modulation. The resultant FM spectrum after modulation passes through record and playback functions in the usual manner and is demodulated. At this point the pilot tone is extracted by appropriate filters and it is processed against locally generated references to develop an error signal. This signal is supplied to the time base compensator to assist in precise time base compensation. The bandwidth of the pilot tone processor is great enough to provide essentially continuous correction not limited by the line-scanning frequency. Not shown on this chart, but also a part of a complete system, would be the use of an error signal developed in the pilot tone processor for correction of chroma amplitude errors in the system.

We have experimentally constructed a super highband plus pilot tone system which is operating in our laboratory in Camden.

cal recorder. Its specs however were aimed at the EBU requirements: It had 90 minutes playing time, two audio tracks, plus a control track and cue track, video S/N 44dB; audio 60 dB (weighted), diff gain less than 5%, diff phase less than 5 degrees and moire less than -35dB. Stability was listed at +2.5 ns.

Using chromium dioxide tape,

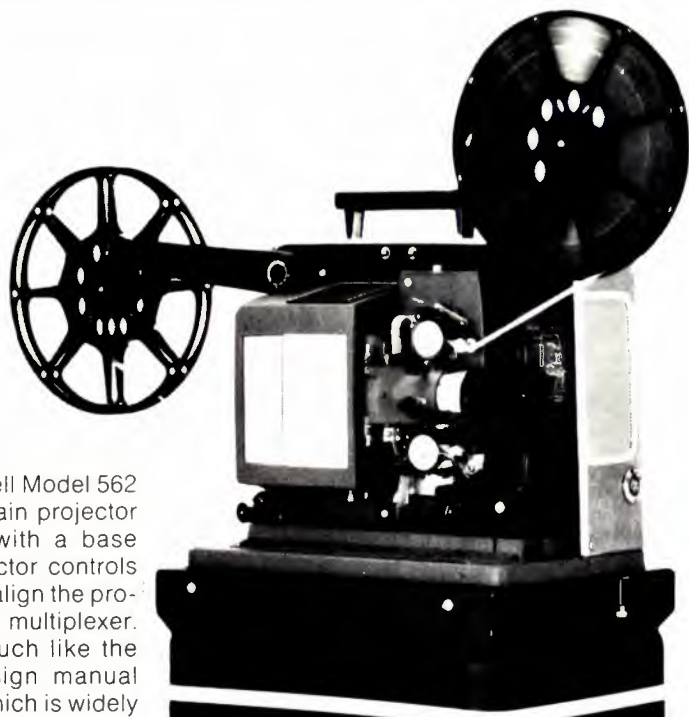
the BCR 60 used a single head (with an Omega wrap). Head-to-tape speed was 23.8 m/s and tape speed of 26.7 cm/s. Tape consumption is less than quad by 60%. Its initial cost is in the \$50-60,000 range.

The IVC/Rank/Thomson-CSF, although helical-segmented, looks like a quad. It uses two-inch tape.

The format results in a tape speed of 20.3 cm/sec and a head life of 3000 hours. Play time is two hours. IVC went to super highband (9 to 12 MHz). Both signal-to-noise and moire were better than quad; other specs equaled quad. The format incorporates longitudinal audio tracks plus a cue, content, and SMPTE

continued on page 67

Filmchain Projection Simplified



The new Bell & Howell Model 562 Optical/Magnetic Filmchain projector is delivered complete with a base which contains the projector controls and height adjustment to align the projector with TV camera or multiplexer. The projector is very much like the reliable 500 series design manual spread 16mm projector which is widely used in industry and education.

The Model 562 utilizes a synchronous motor, chain-driven film transport system including an automatic loop restorer to assist in providing picture and sound into the camera for transmission over closed circuit or antenna-signal distribution. The pedestal includes facility for easily installing remote operation from the control panel.

Other Features You'll Like

Optical or magnetic sound play back. Choose from a wide variety of standard lamps and Bell & Howell lenses to obtain the optimum lumen input to the camera. A special torque release lever is provided when using reels with small hubs.

Other Important Details

Projector reel arms are gear driven, which provides quiet, reliable operation and constant take-up torque. The "Stellite," 3-tooth shuttle and ground and polished aperture plate, provides careful film handling in the projector transport system.

Self-lubricated bearings and other fine engineering details provide long life. The 500 series product design is well known to the hundreds of Bell & Howell service stations across the country, providing a ready facility to service any projector when maintenance or repair is required.

A Final Thought

The instruction books and service manuals provide the details necessary for installation, both electrical and mechanical, as well as remote control. Contact Bell & Howell, Chicago, for technical literature and the name of the local sources who will help you select the best combination of lens, lamp and equipment to project 16mm films for TV program distribution or local display.

AUDIO VISUAL PRODUCTS DIVISION
7100 McCormick Road, Chicago, Illinois 60645

 **BELL & HOWELL**

We simplify things. Life is complicated enough.

The Source

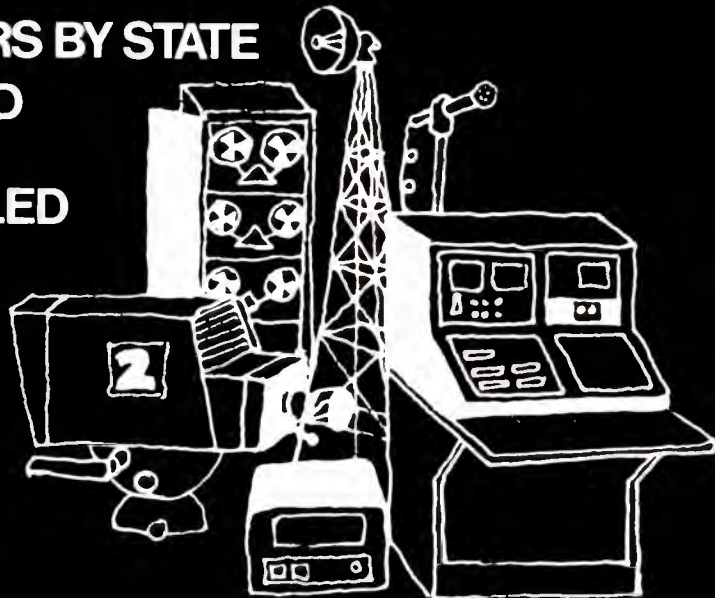
**BM/E's guide
to local sales help
for broadcast equipment.**

■ REPS AND DISTRIBUTORS BY STATE

■ MANUFACTURER'S FIELD OFFICES

■ PRODUCT LINES HANDLED

■ PHONE NUMBERS



Independent Broadcast Equipment Reps, Distributors

Including cross-references to companies whose products are advertised in this issue

ALABAMA

ACK RADIO SUPPLY CO.

3101 Fourth Ave.
Birmingham 35233
205-322-0588
Line: audio components
Micro-Trak see ad p23

JAMES W. CLARY CO.

1713 Second Ave. So.
Birmingham 35233
205-322-2486
Line: audio components
Micro-Trak see ad p23

ELECTRONIC COMMUNICATIONS

P. O. Box 1055
505 Lauderdale St.
Selma 36701
205-874-8296
Line: audio equip, monitors
McMartin see ad p72

FORBES DISTRIBUTING CO.

1522 Fifth Ave. S.E.
Decatur 35601
205-353-4762
Line: audio components
Micro-Trak see ad p23

THE MAZE CORP.

P. O. Box 6636
Birmingham 35210
205-592-9678
Line: Full line broadcast (radio and TV) and
recording equipment
Broadcast Electronics see ad p72
Taber see ad p66

JESS SWICEGOOD

P. O. Box 1741
Dothan 36302
205-794-7944
Line: audio equip; transmitters

ALASKA

HARRY J. LANG & ASSOCIATES

1406 West 47th Ave.
907-279-5741
Line: audio components, equip
Anchorage 99501
McMartin see ad p72

YUKON RADIO SUPPLY, INC.

P. O. Box 406
Anchorage 99501
907-277-1497
Line: audio components
Micro-Trak see ad p23

ARIZONA

TELEMATION ARIZONA, INC.

3315 E. Indian School Road
Phoenix 85018
602-957-2940
Line: full line audio equip, CCTV systems
video proc. equip, switchers, char gen
Richmond Hill Labs see ad p23

ROH'S INC.

4553 East Broadway
Tucson 86711
602-327-5929
Line: CCTV systems

ARKANSAS

CARLTON BATES CO.

6821 Scott Hamilton Drive
Little Rock 72209
501-562-9100
Line: audio components
Audio Devices see ad p17
Micro-Trak see ad p23

CALIFORNIA

ARCAL SOUND & VIDEO

2001 El Camino Ave.
Sacramento 95821
916-927-4502
Line: audio components
Micro-Trak see ad p23

AUDIO INDUSTRIES CORP.

1419 N. La Brea Ave.
Hollywood 90028
213-851-4111
Line: audio components, equip
Quad/Eight see ad p52

TOM AYE ASSOCIATES

796 The Dalles
Sunnyvale 94087
408-738-1406
Line: audio equip; transmitters
AEL see ad p12
Stanton see ad p59
McMartin see ad p72

B&L SALES

4312 Colfax Ave.
Studio City
Line: audio products
Audio Devices see ad p17

JACK BERMAN CO.

P.O. Box 6003
9000 Bellanca St. Sta.
8295 South La Cienega Blvd
Inglewood 90301
213-678-1281
Line: audio components
Shure see ad p56

BROADCAST COMMUNICATIONS

DEVICES INC.

5526 E. La Palma Ave.
Anaheim 92807
714-528-9505
Line: Broad line audio & video equip
Dancoll see ad p50
Datatek see ad p60

BROADCAST COMMUNICATIONS

DEVICES INC.

1368 Arleen Ave.
Sunnyvale 94087
408-739-1941
Line: Broad line audio & video equip
Datatek see ad p60

BROADCAST ENGINEERING

1259 Callens Rd.
Ventura 93003
805-648-1000
Line: audio components
Stanton see ad p59

CARTIER ASSOCIATES

11200 Chandler Blvd.
North Hollywood 91603
213-980-3450
Line: consoles, FM monitoring equip
McMartin see ad p72

DIACOUSTIC LAB.

1063 Vine St.
Hollywood 90038
Line: recording accessories
Taber see ad p66

DYNAMIC ASSOC.

2500 S. La Cienega Blvd.
Los Angeles
213-837-9123
Line: measuring equip, monitors, TBC char.
generators

EDUCATIONAL ELECTRONICS OF CALIFORNIA

Suite #8
90 Glen Way
Belmont 90004
415-592-5713
Line: CCTV video systems

EDUCATIONAL ELECTRONICS OF CALIFORNIA

936 West Florence Avenue
Inglewood 90301
213-674-5595

Line: CCTV video systems

F&B/CECO of CALIF. INC.

7051 Santa Monica Blvd.
Hollywood 90038
213-466-9361
Lines: cameras, lighting equip., photographic
supplies

HANK GABRIEL

600 16th Street
Oakland 94612
415-465-5361
Line: audio components, equipment
Fairchild Sound see ad p9

ADOLPH GASSER, INC.

5733 Geary Blvd.
San Francisco 94121
Line: camera equip
Cinema Products see ad p60, 62, 65

GENERAL PHONOGRAPH

7517 Melrose Avenue
Los Angeles 90046
213-651-4814
Line: audio components
Micro-Trak see ad p23

ALAN GORDON ENTERPRISES, INC.

1430 N. Cahuenga Blvd.
Hollywood 90028
Line: cameras, photographic equip, lighting
Cinema Products see ads pp 60, 62, 65

GRAVCO SALES, INC.

6515 Sunset Blvd.
Los Angeles 90053
213-462-6618
Line: video amps, proc amps, switchers
Grass Valley see ad p5

DAVE HILL

P. O. Box 1589
Burlingame 94010
Line: Video proc amp, switchers

HOLLYWOOD BEVERLY RADIO

7706 Melrose Ave.
Los Angeles 90046
213-655-0400
Line: audio components
Micro-Trak see ad p23

HOLMQUIST SOUND

12912 Venice Blvd.
Los Angeles 90066
Line: audio products
Audio Devices see ad p17

KNIGHT DIACOUSTIC LAB

1063 Vine St.
Hollywood 90038
Line: audio products
Audio Devices see ad p17

MEYER, ROSS & FLEMING

45 Dorman Ave.
San Francisco 94124
Line: audio products
Audio Devices see ad p17

MILO OF CALIFORNIA, INC.

Dow Sound City
1759 East Colorado Blvd.
Pasadena 91106
213-681-8111
Line: audio components
Micro-Trak see ad p23

THOMAS M. MORRIS ASSOC.

1315 El Solyo Ave
Campbell 95008
408-377-6600
Line: sound equip
Tape-Athon see ad p33

MOUTHROP SALES INC.

1530 East 12 St.
Oakland 94606
415-261-7676
Line: audio components
Shure see ad p56

ODETICS VIDEO SYSTEMS INC.

397 N. Anaheim Blvd.
Orange 92668

714-532-3364

Line: video equip., inc. cameras, monitors, lighting

PACIFIC RECORDERS & ENG. CORP.

11760 Sorrento Valley Rd.
San Diego 92121
714-453-3255

Line: full line audio equipment, accessories

McMartin see ad p72

Micro-Trak see ad p23

Quad Eight see ad p52

Stanton see ad p59

PRO-TRONICS COMPANY

2199 South El Camino Real
San Mateo 94403
415-574-8511

Line: audio components, equip

Quad Eight see ad p52

RADIO PRODUCTS SALES

1501 S. Hill St.
Los Angeles 90019

Line: audio products

Audio Devices see ad p17

RECORDING SPECIALTIES

1030 J. East Duane
Sunnyvale 94086

Line: audio products

Audio Devices see ad p17

RIGGINS ELECTRONIC SALES

2331 San Anselme
Long Beach 90815
213-596-6247

Line: audio components, equip

Broadcast Electronics see ad p72

Stanton see ad p59

TELEMATION CALIFORNIA, INC.

349 Beach Road
Burlingame 94010
415-348-3322

8165 Stadler

La Mesa 92041
714-460-3754

11211 South La Cienega Blvd
Los Angeles 90045
213-641-3755

Line: full line audio equip CCTV system, video proc equip, switchers, char gen

Richmond Hill Labs see ad p23

UNITED SOUND

1805 West Magnolia Blvd
Burbank 91506
213-845-7435

Line: audio components equip

Quad/Eight see ad p52

VICOR INC.

7385 Convoy St. Ct.
San Diego 92111

Line: recording accessories

Taber see ad p66

WESTERN BROADCAST SERVICES

1030 West Evelyn
Sunnyvale 94086
408-738-2100

Line: audio equipment, RF monitors

McMartin see ad p72

ZACK ELECTRONICS

1444 Market St
San Francisco 94102

Line: audio products

Audio Devices see p17

COLORADO

HERB N. DIDIER

P. O. Box 158
Evergreen 80439
303-674-6000

Line: broadline audio and video equip

Datatek see ad p60

Television Equip. Assoc see ad p62

J. A. GEDNEY

7909 West 16th Ave.
Denver 80215
303-238-3112

Line: sound systems

Tape-Athon see ad p33

HIGHLAND ASSOCIATES

1380 West Midway Bl.
Broomfield 80020

In the mountains, call

DIDIER / DENVER

HERB DIDIER

BOX 158

EVERGREEN, COLORADO 80439

(303) 674-6000 (303) 674-6853

Full line of peripheral broadcast equipment including Datatek, English Electric Valve, Omnix and Telecommunications Industries.

303-466-3851

Lines: full line audio equipment for broadcaster

Broadcast Electronics see ad p72

McMartin see ad p72

Micro-Trak see ad p23

McLOUD & RAYMOND CO.

2020 South Pontiac Way
Denver 80222
303-756-1589

Line: audio components

Shure see ad p56

ELECTRO-TEK SALES, INC.

P. O. Box 395
8171 Julian St.
Westminster 80030

303-255-4566

Line: audio components

Fairchild Sound see ad p9

TELEMATION COLORADO, INC.

3501 Kalamath Street
Denver 80211
303-433-8603

Line: full line audio equip, CCTV systems, video proc equip, switchers, char gen

Richmond Hill Labs see ad p23

CONNECTICUT

AUDIOTECHNIQUES, INC.

142 Hamilton Ave
Stamford 06902
203-359-2312

Line: full line audio equip., recording accessories

LPB see ad p66

Quad/Eight see ad p52

HERBERT ELECTRONICS

1081 Capitol Ave.
Hartford 06106
203-247-0042

Line: audio components

Micro-Trak see ad p23

FRED LOCKE STEREO

216 West Main St.
Avon 06001
203-678-1797

Line: audio components

Micro-Trak see ad p23

ROBERT SMITH COMPANY

188 Brewster Road
West Hartford 06117
203-523-0512

Line: sound systems

Tape-Athon see ad p33

TELEMATION EAST, INC.

217 Westport Ave.
Norwalk 06851

Line: (as for Telemation Colorado)

203-847-7231

Richmond Hill Labs see ad p23

DELAWARE

CLEARVIEW ELECTRONICS

P. O. Box 326
Newark 19711
302-368-4000

Line: TV systems

Shibaden see ad cover 3

DISTRICT OF COLUMBIA

BRENNER CINE-SOUND

5215 Wisconsin Ave. N.W.
Washington 20015

Line: sound and film equip.

Audio Devices see ad p17

Cinema Products see ads p60, 62, 65

FLORIDA

BCS ASSOC. INC.

940 N. Fern Creek Ave.
Orlando 32802
305-843-1510

Line: measuring equip., monitors

F.T.C. BREWER COMPANY

P. O. Box 8057
Town & Country Plaza
Pensacola 32505
904-433-7932

Line: audio equip.; transmitters

Quad Eight see ad p52

Wilkinson see ad p69

BROADCAST AUTOMATION, INC.

5199 North East 12th Ave
Oakland Park 33308
305-776-4762

Line: full line audio equip

Broadcast Electronics see ad p72

Stanton see ad p59

McMartin see ad p72

BROADCAST ENG. CO.

Box 14444
Ft. Pierce 33450

Line: audio products

Audio Devices see ad p17

CONTINENTAL ELECTRONIC

620 West 32nd Pl.
Hialeah 33010
305-822-1421

Line: audio components

Micro-Trak see ad p23

ELECTRONIC EQUIP. CO.

2701 N.W. 42nd Ave.
Miami 33142

Line: audio products

Audio Devices see ad p17

FLAGLER RADIO CO., INC.

1068 W. Flagler St.
Miami 33130
305-373-6548

Line: audio components, equip.

Audio Devices see ad p17

Stanton see ad p59

GRICE ELECTRONICS

P. O. Box 1911
Pensacola 32502
904-434-2477

Line: audio components

Micro-Trak see ad p23

HUTTO-HAWKINS-PEREGOY, INC.

P.O. Box 1277
139 Candace Dr.

Maitland 32751

Line: audio components

Shure see ad p56

IMAGE DEVICE, INC.

811 N.W. 111th Street
Miami 33168

Line: photo cameras

Cinema Products see ads pp 60, 62, 65

LAUDERDALE ELECTRONIC LABS

16 S.W. 13th Street
Fort Lauderdale 33315
305-525-0478

Line: audio components

Stanton see ad p59

JARRELL C. LESTER

4515 South Hale
Tampa 33611
813-932-4365

Line: video equipment

Television Equip. Assoc see ad p62

MANREP CORP.

P. O. Box 4808
14410 N. W. 60th Ave.
N. W. 60th Ave.

Miami Lakes 33014

305-822-7630

Line: audio components

Micro-Trak see ad p23

PANAMEX CO.

1006 Seybold Bldg.
Miami 33132
305-374-7330

Line: audio components
Micro-Trak see ad p23

PEERSON AUDIO, INC.

509 South Olive Ave.
West Palm Beach 33401
305-832-1921

Line: audio components, equip.
Quad/Eight see ad p52

REPELECT

Box 7102
Tampa 33603
813-227-5051

Line: audio equip.; transmitters
AEL see ad p12

McMartin see ad p72

SOUTHEAST ELECTRONICS

1125 Rosselle Street
Jacksonville 32204
904-356-3007

Line: full line audio components, equip.
Broadcast Electronics see ad p72
Micro-Trak see ad p23

UNIREP

1141 S. E. 2nd Ave.
Ft. Lauderdale 33316
305-527-1556

Line: sound equip.
Tape-Athon see ad p33

VAUGHAN ASSOCIATES

Box 15111
Sarasota 33579

Line: audio products
Audio Devices see ad p17

WORLD WIDE PRODUCTS

P. O. Box 279
Miami 33168
305-754-5475

Line: audio components, equipment, tape re-
corders

GEORGIA**ACK RADIO**

554 Deering Road NW
Atlanta 30309
404-351-6340

Line: audio components & equip.
McMartin see ad p72

AFER—ATLANTA FILM EQUIPMENT RENTALS

1848 Briarwood Rd. N.E.
Atlanta 30329

Line: photo supplier & accessories
Cinema Products see ads pp 60, 62, 65

BROADCAST SUPPLY OF ATLANTA

2971 Flowers Road South, Suite 170
Atlanta 30341
404-458-0815

Line: full line audio equip & supplies
Audio Devices see ad p17
LPB see ad p66

ELECTRONIC EQUIPMENT, INC.

526 Plaster Ave., N.E.
Atlanta 30324
404-873-5841

Line: audio components & equipment
Broadcast Electronics see ad p72
Micro-Trak see ad p23

FIDELICOM, INC.

P. O. Box 80644
Chamblee Station
Atlanta 30341

404-458-3616
Line: audio equip.; test equip.

GRAVCO SALES, INC.

1644 Tully Cir. NE
Atlanta 30301
404-634-0521

Line: video processing equip.; switchers
Grass Valley see ad p5

HOLLINGSWORTH & STILL

16 Perimeter East
Atlanta 30346

Line: audio products
Audio Devices see ad p17

MILLAR ELECTRONICS, INC.

3110 Maple Drive, N.E. Rm. 110
P. O. Box 12137, Northside Sta.
Atlanta 30305

404-261-6160

Line: audio components
Shure see ad p56

LOU RADFORD

3203 Lanier Drive
Atlanta 30319
404-237-6097

Line: full line audio and video equip.; radio
transmitters

Television Equip. Assoc see ad p62

MAITLAND K. SMITH, INC.

110 Robin Road RFD #3
Marietta 30060
404-971-2831

Line: sound equip.
Tape-Athon see ad p33

SPECIALTY DIST. CO.

763 Juniper St. N.E.
Atlanta 30308

Line: audio products
Audio Devices see ad p17

SYSTEMS ENGINEERING CO.

P. O. Box 49224
Atlanta 30329
404-482-2446

Line: audio components
Audio Devices see ad p17
Micro-Trak see ad p23

TELEMATION ATLANTA, INC.

3684 Wilton Ave.
Doraville 30340
404-451-1801

Line: full line audio equip., CCTV systems,
video proc equip., switches, char. gen.
Richmond Hill Labs see ad p23

TELESYSTEMS MARKETING, INC.

2425 Wood Valley Drive
Morrow 30260
404-363-4503

Line: audio components & equip.
McMartin see ad p72

VISUAL SYSTEMS CO.

4475 No. Peachtree Rd.
Atlanta 20341
404-457-1388

Line: video equip.; char. gen.

HAWAII**THE AUDIO CENTER, LTD.**

1020 Auahi Street
Honolulu 96814
808-531-3153

Line: audio components
Micro-Trak see ad p23

BROADCAST SERVICES INC.

2877 Kalakua Ave.
Honolulu 96815
808-533-3877

Line: full line audio equip.; CCTV equip.
McMartin see ad p72

GENE PIETY FACTORS, INC.

P. O. Box 2903
Honolulu 96802
861 Mapunapuna Street

Honolulu 96819
808-839-9059

Line: audio components
Shure see ad p56

IDAHO**FUNLAND PRODUCTIONS**

1300 Hill Road
Boise 83702

Line: audio components & equip.
Broadcast Electronics see ad p72

ILLINOIS**C. C. ABERNATHY**

520 Gates Head N
Elk Grove Village 60007

Line: audio products
Audio Devices see ad p17

B. W. ASSOCIATES

415 W. Fullerton Pkwy., Suite 701
Chicago 60614
312-935-4900

Line: audio components

Stanton see ad p59

VICTOR DUNCAN, INC.

676 St. Clair Street
Chicago 60611

Line: photo equipment and supplies
Cinema Products see ads pp 60, 62, 65

GORDON DUVAL CO.

6838 N. Ottawa St.
Chicago 60631
312-763-6785

Line: audio components
Fairchild Sound see ad p9

BOB FAULKNER

401 E. Prospect Ave.
Mt. Prospect 60056
312-259-8099

Line: video processing equip.; switchers

FREIFELD SALES

2100 Stirling Rd.
Deerfield 60015

Line: audio products
Audio Devices see ad p17

GILL CUSTOM HOUSE, INC.

8813 West 95th Street
Palos Hills 60465
312-598-2400

Line: audio components & equip.; recorders
Quad/Eight see ad p52
Taber see ad p66

GRAVCO SALES, INC.

125 S. Wilke Rd.
Arlington Hts. 60004
312-394-1344

Line: video processing equip.; switchers
Grass Valley see ad p5

LOREN F. GREEN ASSOC.

5218 W. Diversey
Chicago 60639
312-286-6824

Line: sound equip.; test equip.

RAY R. HUTMACHER ASSOC. INC.

6668 Northwest Highway
Chicago 60631
312-631-3248

Line: audio components, communication
equip.; tape recorders

Fairchild Sound see ad p9
Shure see ad p56

MIDWEST ELECTRONICS ASSOCIATES

337 North Dover Street
La Grange 60525
312-354-3124

Line: audio console; RF monitoring
McMartin see ad p72

MILAM AUDIO CORP.

700 W. Main
South Pekin 61564
309-348-3112

Line: audio components, equip.; recorders
Quad/Eight see ad p52
Taber see ad p66

MUSICRAFT

48 East Oak St.
Chicago 60611
312-337-4150

Line: audio components
Micro-Trak see ad p23

EDWARD N. SEVERSEN CO.

11435 Circle Drive
La Grange 60525
312-246-4883

Line: sound systems
Tape-Athon see ad p33

TELEMATION MIDWEST, INC.

3200 W. West Lake Ave.
Glenview 60025
312-729-5210

Line: full line audio equip., CCTV systems,
video proc equip., switchers, char. gen.

Richmond Hill Labs see ad p23

H. E. VAN CLEEF, JR.

2008 Isabella St.
Evanston 60201
312-866-9875

Line: transmitter products
AEL see ad p12

WEBSTER ENGINEERING CO., INC.

1136 Gail Lane
Dundee 60118
312-428-5173

INDIANA

COMMERCIAL ELECTRONICS, INC.

1000 N. ...
Minto Truck see ad p23

GRAHAM ELECTRONICS

1000 N. ...
Minto Truck see ad p23

G. GOETZ SALES

1000 N. ...
M. Martin see ad p12

GRANDVIEW RADIO, INC.

1000 N. ...
Winkler see ad p25

INFORMATION SYSTEMS SERVICES, INC.

1000 N. ...
Winkler see ad p25

RAE'S VIDEO

1000 N. ...
Winkler see ad p25

TELETYPE SERVICE, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

TELEVISION MICHIGAN, INC.

1000 N. ...
Winkler see ad p25

SHAIN & YOUNG ELECTRONICS, INC.

1000 N. ...
Minto Truck see ad p23

SIGHT & SOUND, INC.

1000 N. ...
Minto Truck see ad p23

LOUISIANA

ELECTRIC CIRCUIS

1000 N. ...
Minto Truck see ad p23

INTERSTATE SCHOOL SUPPLY CO.

1000 N. ...
Minto Truck see ad p23

MAR ELECTRONICS

1000 N. ...
Minto Truck see ad p23

NATIONAL BROADCAST EQUIPMENT

1000 N. ...
Minto Truck see ad p23

SCOTT GIBMSBY COMPANY

1000 N. ...
Minto Truck see ad p23

TAN AMERICAN, INC.

1000 N. ...
Minto Truck see ad p23

TELEVISION MICHIGAN, INC.

MAINE

B. G. GARRISON, INC.

1000 N. ...
Minto Truck see ad p23

MARYLAND

BROTHERS & CONNOR ASSOC.

1000 N. ...
Minto Truck see ad p23

REUBEN WILKINSON

1000 N. ...
Minto Truck see ad p23

WATSON ASSOCI.

1000 N. ...
Minto Truck see ad p23

W. M. MENAN, CO.

1000 N. ...
Minto Truck see ad p23

PETERMAC MUSIC

1000 N. ...
Minto Truck see ad p23

Audio Devices see ad p17

RAYTHEON SERVICE CO.

1000 N. ...
Minto Truck see ad p23

RECORDING CONSULTANTS, INC.

1000 N. ...
Minto Truck see ad p23

TELEVISION EAST, INC.

1000 N. ...
Minto Truck see ad p23

WRIGHT VIDEO

1000 N. ...
Minto Truck see ad p23

MASSACHUSETTS

MAR. R. BOUTIER ASSOC.

1000 N. ...
Minto Truck see ad p23

DOAKLEY, BOYD & ARBETT

1000 N. ...
Minto Truck see ad p23

RAMER VIDEO SYSTEMS

1000 N. ...
Minto Truck see ad p23

TELEVISION EAST, INC.

1000 N. ...
Minto Truck see ad p23

INDUSTRIAL COMPONENTS CORP.

1000 N. ...
Minto Truck see ad p23

VIDEO SYSTEMS CORP.

1000 N. ...
Minto Truck see ad p23

TELEVISION EAST, INC.

1000 N. ...
Minto Truck see ad p23

MILLON TECHNICAL SALES CO., INC.

1000 N. ...
Minto Truck see ad p23

TELEVISION EAST, INC.

1000 N. ...
Minto Truck see ad p23

TELEVISION EAST, INC.

1000 N. ...
Minto Truck see ad p23

AUDIO DISTRIBUTORS, INC.

1000 N. ...
Minto Truck see ad p23

Grand Rapids 49507
616-452-1596
Line: audio components
Micro-Trak see ad p23

CHAMPAGNE SALES CO.

25915 W 10-Mile
Southfield 48075
313-354-0270
Lines: audio equip.; transmitters
AEL see ad p12
McMartin see ad p72

VICTOR DUNCAN, INC.

11043 Gratiot Ave.
Detroit 48213
Line: photo supplies and equip
Cinema Products see ads pp 60, 62, 65

H. M. DYER ELECTRONICS

2982 Wixon Road
Milford 48042
313-685-2560
Line: time stds., video products
Television Equip. Assoc. see ad p62

J. MALCOLM FLORA, INC.

P. O. Box 201
165 West Liberty
Plymouth 48170
313-453-4296
313-427-7460 (Detroit Line)
Line: audio components
Shure see ad p56

ROBERT MILSK COMPANY

19375-95 James Couzens Highway
Detroit 48235
313-342-6660
Line: audio components equipment
Fairchild Sound see ad p9

MINNESOTA

GALAXY FILM SERVICE

1511 Hennepin Ave.
Minneapolis 55403
Line: photo supplies and equip.
Cinema Products see ads pp 60, 62, 65

CLARK R. GIBB CO.

1311 West 24th St
Minneapolis 55405
612-377-1200
Line: audio components
Fairchild Sound see ad p9

THE HEIMAN CO.

5603 Lyndale Ave. S.
Minneapolis 55419
Line: audio products
Audio Devices see ad p17

JAYNUS ASSOC. INC.

10700 Lyndale Ave. So.
Minneapolis 55420
612-884-1700
Line: broadcast equip.; transmitters
AEL see ad p12

K&M ELECTRONICS

7360 Ohm Lane
Minneapolis 55424
612-941-1330
Line: video amp.; video switchers

KODO ASSOC., INC.

8100 Penn Ave.
Minneapolis 55431
612-881-1255
Line: sound systems
Tape-Athon see ad p33

MAGNATECH CO.

3601 Park Center Blvd.
Minneapolis 55416
612-920-6677
Lines: audio components and equip.; FM mon-
itor equip., transmitters
Broadcast Electronics see ad p72
McMartin see ad p72
Micro-Trak see ad p23
Wilkinson see ad p69

NORTHERN STATES SALES CO.

1109 West 78 1/2 Street
Minneapolis 55420
612-866-3468
Line: audio components
Shure see ad p56

SOUND 80, INC.

2709 East 25th Street
Minneapolis 55406
612-721-6341

Line: audio components, equip.; recording
accessories
Quad/Eight see ad p52
Taber see ad p66

MISSISSIPPI

BOB McRANEY ENTERPRISES, INC.

P. O. Box 758, Henry Clay Hotel
West Point 39773
601-494-5872
Line: audio components & equip.
McMartin see ad p72

SIVAN ELECTRONICS

324 North Gallatin
Jackson 39205
Line: audio products
Audio Devices see ad p17

SOUTHERN VIDEO SYSTEMS

527 Northside Dr.
Jackson 39205
601-982-8734
Line: CCTV systems
Shibaden see ad Cover 3

MISSOURI

ALEXANDER ELECTRONICS INC.

1820 Wyandotte St.
Kansas City 63108
816-474-6858
Line: broadcast equipment
Broadcast Electronics see ad p72
McMartin see ad p72

DAVID BEATTY STEREO

1616 Westport Rd.
Kansas City 64111
816-531-3109
Line: audio components
Micro-Trak see ad p23

COMMUNICATION SYSTEMS, INC.

Drawer C
Cape Girardeau 63701
314-334-6097
Line: audio; transmitters
AEL see ad p12

FORRISTAL-YOUNG SALES COMPANY, INC.

7110 Oakland Ave.
St. Louis 63117
314-645-2360
Line: audio components
Shure see ad p56

CECIL JACKSON & ASSOCIATES

1111 Harmony
Cape Girardeau 63701
Line: audio components
Stanton see ad p59

K S W ASSOCIATES

7546 Troost Ave.
Kansas City 64131
816-363-5651
Line: audio components
Fairchild Sound see ad p9

MOELLER/PICKETT & ASSOC.

12506 Grandview Rd.
Grandview 64030
Line: audio products
Audio Devices see ad p17

MOELLER/PICKETT & ASSOC.

2260 Grisson
St. Louis 63141
Line: audio products
Audio Devices see ad p17

TELEMATION MIDWEST, INC.

No. 7 American Industrial Drive
Maryland Heights 63043
314-962-5384
Line: full line audio equip., CCTV systems,
video proc. equip., switchers, char. gen.
Richmond Hill Labs see ad p23

NEVADA

PORTER INDUSTRIES

3276 Spring Mountain Road
Las Vegas 89102
702-876-2413
Line: audio components, equip
Quad/Eight see ad p52

NEW HAMPSHIRE

A & H PRODUCTIONS, INC.

38 Everett St.
Manchester 03104
603-669-9999
Line: audio equip.
LPB see ad p66

NEW JERSEY

ASSOCIATED ENTERPRISES

720 Somerset Street
New Brunswick 08903
201-249-1551
Line: CCTV systems
Shibaden see ad cover 3

AUDIO & ELECTRONIC CONSULT. SVCE.

63 Kiel Ave.
Kinnelon 07405
201-838-0080
Line: CCTV systems
Shibaden see ad cover 3

BB PRODUCTIONS

92 Stuyvesant Ave.
Newark 07106
201-373-6603
Line: CCTV systems
Shibaden see ad cover 3

DE PILLIS ASSOCIATES

15 Tanner St.
Haddonfield 08033
Line: audio products
Audio Devices see ad p17

THOMAS DUGGAN SOUND SYSTEMS

374 Sussex Ave.
Morristown 07960
201-538-9047
Line: audio components
Micro-Trak see ad p23

H. M. HOLZBERG ASSOC.

P.O. Box 322
Totowa 07512
201-256-0455
Lines: audio equip., program automation, vid-
eo switchers, proc. amp. monitors, char.
generators, transmitters, STL, microwave
CETEC see ad p54

LANDY ASSOCIATES

12 Buxton Road
Cherry Hill 08034
609-424-4660
Line: audio consoles, video proc. equip.
Datatek see ad p60
McMartin see ad p72

MERRILL LENT

P. O. Box 189
East Hanover 07936
201-887-4849
Line: video equip.; char. gen.

QUALITAPE DUPLICATION LABS

101 Broadway
Runnemede 08078
Line: audio products
Audio Devices see ad p17

RAYTHEON SERVICE COMPANY

5090 A Central Highway
Airport Industrial Park
Pennsauken 08109
609-622-4322
Line: CCTV systems
Shibaden see ad cover 3

SONNY SIMBERKOFF ASSOCIATES, INC.

71 Valley St.
South Orange 07079
201-763-7900
Line: audio components
Shure see ad p56

TELEMEASUREMENTS, INC.

145 Main Ave.
Clifton 07014
201-473-8822
Line: full line audio & video equip.
Shibaden see cover 3

WILRAY AUDIO VISUAL, INC.

P. O. Box 97
Port Murray 07865
201-689-1300
Line: CCTV systems
Shibaden see ad cover 3

WILRAY AUDIO VISUAL, INC.
9170 State Highway 35
Box 113
Middletown 07748
201-671-4600
Line: CCTV systems
Shibaden see ad cover 3

NEW MEXICO

DYMA ENGINEERING
Route 1 Box 51
Taos 87571
505-758-2686
Line: full line audio equipment, transmitters
Broadcast Electronics see ad p72
McMartin see ad p72
Micro-Trak see ad p23
Stanton see ad p59
Wilkinson see ad p69

STALEY COMPANY
2925 Charleston NE
Albuquerque 87110
505-294-2660
Line: sound systems
Tape-Athon see ad p33

TELEMATION NEW MEXICO, INC.
6401 Acoma S.E.
Albuquerque 87108
505-268-6016
Line: full line audio equip., CCTV systems,
video proc. equip., switchers, char. gen.
Richmond Hill Labs see ad p23

WALKER RADIO
102 Granite Ave. N.W.
Albuquerque 87125
Line: audio products
Audio Devices see ad p17

NEW YORK

ARTEK SYSTEMS
275 Adams Blvd.
Farmingdale 11735
516-293-4420
Line: CCTV systems
Shibaden see ad cover 3

AUDIO-VIDEO CORPORATION
55 Delaware Ave.
Delmar 12054
518-439-7611
Line: audio equip.
LPB see ad p66

AVTEL
44 Railroad Ave.
Glen Head 11545
516-671-8010
Line: full line CCTV system
Shibaden see cover 3

DAVID BAIN ASSOCIATES
P. O. Box 1014
Port Washington 11050
516-883-4818
Line: audio equip.; transmitter,
CCTV systems
AEL see ad p12

Broadcast Elect. see ad p72
Viscount Ind. see ad p67

COMPREHENSIVE SERVICE CORP.
250 West 64th St.
New York 10023
Line: recording accessories
Taber see ad p66

MARTY BETTAN SALES, INC.
77-15 164th Street
Flushing 11366
212-969-7600
Line: audio components
Fairchild Sound see ad p9

BROWN RADIO SERVICE
250 East Ave.
Rochester 14604
716-232-5580
Line: audio components
Micro-Trak see ad p23

BURDEN ASSOCIATES

342 Lexington Ave.
Mount Kisco 10549
914-666-3730
Line: audio systems
LPB see ad p66

THE CAMERA MART
456 West 55th Street
New York 10019
212-757-6977
Line: cameras & accessories
Cinema Products see ads pp60, 62, 65

CELEBRATION SOUND
161 Gray Rd.
Ithaca 14850
607-272-8964
Line: audio components
Micro-Trak see ad p23

CHROMACORD CORPORATION
60 Margaret Street
Plattsburgh, New York 12901
Line: audio components
Stanton see ad p59

CIVIONICS DATA SYSTEMS
RD 2 Goode Street
Ballston Spa 12020
518-457-2384
Line: CCTV systems
Shibaden see ad cover 3

C T L ELECTRONICS
86 W. Broadway
New York 10007
212-233-0754
Line: CCTV systems
Shibaden see ad cover 3

FOTO OPTICAL CORP.
88 Harbor Rd.
Port Washington 11050
516-PO7-3960
Line: CCTV systems
Shibaden see ad cover 3

FRAUENHEIM PROCESS CO.
180 S. Park Ave.
Buffalo 14203
716-856-0548
Line: CCTV systems
Shibaden see ad cover 3

SYLVAN GINSBURY, LTD.
425 Park Ave. South
New York 10016
212-695-3768
Line: audio components
Micro-Trak see ad p23

GRAVCO SALES, INC.
Station Plaza E.
Great Neck 11022
516-487-1311
Line: video processing equip.; switchers
Grass Valley see ad p5

HENRY GROSSMAN ASSOCIATES
519 South 5th Ave.
Mount Vernon 10550
914-664-5393
Line: audio components
Stanton see ad p59

HARVEY RADIO CO.
60 Crossways Park W.
Woodbury 11797
212-297-7577
Line: audio components & equip.
Micro-Trak see ad p23

HB ELECTRONICS
100 Thompson Street
New York 10013
212-431-5497
Line: CCTV systems
Shibaden see ad cover 3

ISSCO
1 Station Square
Forest Hills 11375
212-261-3255
Line: CCTV systems
Shibaden see ad cover 3

JOSEPH ASSOCIATES
8 Cove Lane
P. O. Box 307
Port Washington 11050
516-883-1829
Line: audio equipment; RF monitors
McMartin see ad p72

L.S.M. ASSOCIATES
27 Orchard Park
Phelps 14532
315-548-4891
Line: audio components
Fairchild Sound see ad p9

MARTIN AUDIO CORP.
320 West 46th Street
New York 10036
212-265-6470
Line: audio components, equip.
recording accessories
Quad/Eight see ad p52

WENDELL MARTIN CO.
3573 Howlett Hill Rd.
Camillus 13031
315-673-2943
Line: audio equip.; RF monitors
McMartin see ad p72

GILBERT E. MILLER ASSOC.
375 N. Broadway
Jericho 11753
212-895-0429
Line: sound systems, audio products
Audio Devices see ad p17
Tape-Athon see ad p33

MURLYN EDUCATIONAL PRODUCTS
14 Seabro Ave.
N. Amityville 11701
516-598-2500
Line: CCTV systems
Shibaden see ad cover 3

NATIONAL CINE
4140 Austin Blvd.
Island Park 11558
516-889-4600
Line: cameras, CCTV systems
Shibaden see ad cover 3

NORTHEAST BROADCAST LABS
15 Charles St.
South Glen Falls 12801
518-793-2181
Line: audio equipment
McMartin see ad p72

P. M. ELECTRONICS
83 Russell Rd.
Garden City 11530
516-248-4858
Lines: measuring equip.; monitors; TBC

PASTON-HUNTER CO., INC.
2002 Tealle Ave.
Syracuse 13206
315-437-2992
Line: sound equipment
Tape-Athon see ad p33

JOSEPH PLASENCIA, INC.
521 Fifth Ave.
New York 10017
212-867-8084
Line: audio components
Micro-Trak see ad p23

ROSNER CUSTOM SOUND, INC.
11-38 31st Ave.
Long Island City 11106
212-726-5600
Line: audio components & equip.
Micro-Trak see ad p23

F. EDWIN SCHMITT CO., INC.
311 Meacham Ave.
Elmont 11003
516-437-8150
Line: audio components
Shure see ad p56

SOUND & LIGHT PRODUCTIONS
35 West 53rd Street
New York 10019
212-265-5685
Line: CCTV systems
Shibaden see ad cover 3

SOUND SYSTEMS INC.
42-12 28th St.
Long Island City 11101
212-786-4474
Line: CCTV systems

TEL-COM, INC.
1475 East Henrietta Rd.
Rochester 14623
716-442-7900
Line: CCTV systems
Shibaden see ad cover 3

TELEVISION EQUIPMENT ASSOCIATES
Box 1391
Bayville 11709
516-628-8068
Line: brand line radio & TV equip.; accessories

TELSEC SYSTEMS
P. O. Box 3152
Poughkeepsie 12603
914-454-4922

NEW BOOKS OF TIMELY INTEREST TO ALL IN BROADCASTING AND CATV



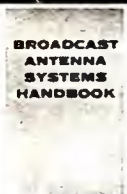
FM RADIO STATION OPERATIONS HANDBOOK—2nd Ed.

This volume has been called the most complete, up-to-date collection of knowledge on FM station operation ever published—and this new, revised second edition contains two-thirds new material, encompassing an even wider range of subjects than the classic first edition. The text,

consisting of articles appearing in *BM/E*, is a complete guide to station planning, engineering, automation, production, stereo and quad techniques, promotion, and management—in short, an encyclopedic work for students, novices or veterans, who can put this invaluable information to work immediately. The material in the book is applicable to both small and large markets, with examples of highly successful stations and the methods they employed to attain their position. Various sections of the text deal with the studio, the control room, transmitting plant design, and dual antenna polarization. Automation is discussed, as is the brand new area of quadrasonic broadcasting techniques. 320 pps. 33 chapters. Hardbound. Partial Contents: The Nation's Most Powerful Station—Building an FM Station From CP to Sign IN—Modern Stereo FM Plant—Improve FM Coverage with Dual Polarization—Directional Antennas for FM—Preparing Engineering Data for FCC Form 301—FM Overmodulation Cause and Cure—Solving the Cast Phase Problem—Getting Into Quad Stereo—Computer Applications, plus MUCH, MUCH MORE!

Order No. T-94 Regular List Price \$9.95 Special Prepub. Price Only \$7.95
This special prepublication price prevails through October 31, 1973

SAVE \$2.00
on this Special
Prepub Offer!



BROADCAST ANTENNA SYSTEMS HANDBOOK—2nd Ed.

This unique volume on broadcast antenna systems contains a wealth of information on AM, FM and TV antenna systems, including directional AM and FM, dual polarized FM and TV. Written for engineers, this book belongs in the library of anyone involved in the design,

operation or maintenance of any broadcast antenna system. This NEW second edition includes a thorough treatment of the design of directional AM systems, from simple two tower arrays to multi tower complexes. The author reveals how such systems operate and how to arrive at a desired pattern. For the TV Engineer, there are guidelines on antenna selection, and a chapter on measuring the performance of existing antenna systems. No longer will the inscrutable FCC form 301 puzzle you, for there are detailed explanations included, with facts and figures for classification. This unique and practical handbook answers problems that have long frustrated engineers. To acquire a similar variety of data by any other means would cost many times the price of this book. 240 pps. 25 chapters. Hardbound. Partial Contents: Preparing Engineering Data for Form 301 for AM, FM and TV—Design & Operation of Directional AM Antennas—Pattern Shape, Pattern Size, Mutual Impedance, Power Distribution and Phasing—Returning the Directional Antenna—TV Antenna Engineering for Effective Coverage—Guidelines for Selecting a UHF Antenna, and MUCH MORE!

Order No. T44 Regular List Price \$9.95 Special Prepub. Price Only \$7.95
This special prepublication price prevails through October 31, 1973

SAVE \$2.00
on this Special
Prepub Offer!



MATV SYSTEMS HANDBOOK. Design, Installation & Maintenance—By Allen Pawlowski

This brand new MATV/CATV handbook tells how to select the right antenna system for any MATV/CATV application and how to squeeze better signals from older systems. From antenna basics through filter and attenuator networks, this volume offers a bedrock background even for readers who may be unfamiliar with the subject. Straight forward text, backed by simple yet invaluable drawings, describes preamplifier amplifiers, bandwidth and gain, distortion problems and solutions, and reveals methods of detection and elimination of MATV interference. One section of text is devoted to system installation and shakedown, with a final chapter dealing with the connection of CATV with MATV systems. 176 pps.

Order No. 657 Only \$7.95



ACOUSTIC TECHNIQUES FOR HOME & STUDIO—Everest

This long needed text is not written for the acoustical engineer with years of math and engineering courses to his credit. It reveals the solutions to problems constantly encountered by the studio technician and the home hifi enthusiast in arranging the environment for the most efficient and faithful reproduction and sound. The author, a recognized acoustics expert, opens this volume with a simplified review, before detailing his specialty—design of recording studios with an eye (and ear) on final reproduction quality. If you can handle simple algebra, and can read a graph, you'll be at ease with the hypothetical examples and the treatment of design Tables, charts, diagrams and the easy-to-follow text. All make this complex subject truly understandable. 208 pps. 149 illus.

Order No. 646 Only \$7.95



BASIC AUDIO SYSTEMS—by Norman Crowhurst

Covers sound systems for every application indoors and out! It is written for the technician, the hifi enthusiast or for literally anyone with an interest in any phase of audio. Covering sound systems from a broad base, this volume explores the technological developments that led to today's world of high quality reproduction of sound. A large section of the book is oriented toward the system design aspect of sound reproduction & covers distortion, acoustic feedback and techniques for minimizing audio interference. The nature of typical problems encountered in sound systems is fully discussed, as are methods for solving them without compromising the effectiveness of the systems. 240 pps. 203 illus. Hardbound.

Order No. 634 Only \$7.95



DON'T LOOK AT THE CAMERA!—Shortcuts to TV Photography and Filmmaking—by Sam Ewing with R. W. (Ozzie) Abolin

This new volume is needed in every TV and CATV library and will prove invaluable to photographers, producers and directors. The authors have produced literally thousands of TV commercials in addition to numerous documentaries and new photo work. The fully illustrated text explains the basic techniques of TV photography, including dozens of tried and proven shortcuts for getting pictures on the air quickly and economically, and emphasizes low cost production. Scores of case histories relating the author's experiences are cited to exemplify practical techniques you can use. Fully covered are such subjects as dealing with difficult advertisers, fresh new methods of filming low cost commercials, continuity writing, production on planning, timing on location, sure fire techniques that overcome field problems, and a 7-point plan to help produce a better commercial film. 274 pps. 46 illus. Hardbound.

Order No. 649 Only \$9.95



PICTORIAL GUIDE TO CB INSTALLATION & REPAIR—by Forest H. Bell

This profusely illustrated volume is your complete guide to proper installation, checkout and maintenance of all types of modern citizen band transceivers and antennas, both mobile and fixed. The text is an ABC approach to setting up a 2-way radio station in the home or car, and the simple techniques are equally applicable to commercial and amateur systems. Common pitfalls of maintenance and installation are discussed to ensure quality performance. A complete chapter on antenna installation, includes information on mounting the system, selecting a site, and utilizing maximum legal height. Two more chapters are devoted to mobile equipment, emphasizing checkout and performance upgrading with the final section of the book covering receiver and transmitter servicing, including the new Synthesis rigs. 256 pps. 299 illus.

Order No. 683 Only \$7.95



INTRODUCTION TO MEDICAL ELECTRONICS—For Electronics and Medical Personnel—Klein

The author, an eminent authority in this field, has prepared a long needed text on all aspects of medical electronics. There is a continuing link between physiological activities and the equipment designed to detect, amplify and analyze it. As an aid to cross discipline understanding, the human body is described in depth, and a full chapter is devoted to electronics for non-electronics personnel. Many types of equipment are examined from both a technical and functional standpoint, including diagnostic machines, transducers (pickups), amplifiers, data readout devices, galvanometers, and oscilloscopes. Maintenance, fault detection, patient and equipment capabilities and limitations, these and more are detailed in depth. 272 pps. 31 illus. Hardbound.

Order No. 630 Only \$9.95



MOBILE RADIO HANDBOOK

This comprehensive volume includes all the fine points of two-way communications, from estimating communications range to maintaining modern equipment. It is truly a well rounded text on the increasingly popular subject of two-way communications. With typical schematics of both tube type and transistor gear, the author guides you through the two-way equipment you will encounter—low band, high band and UHF (with special emphasis on FM). Special formulas and charts assist in estimating antenna height needed and antenna gain required. 192 pps. 175 illus.

Order No. 665 Only \$7.95

PUBLISHER'S GUARANTEE

Put the information in these books to work for you for 10 days. If they don't prove to be worth several times their cost, return them and we'll cancel invoice.

NO RISK COUPON-MAIL TODAY!

TAB BOOKS, Blue Ridge Summit, Pa 17214

Please send me the following books

I enclose \$ _____ Please invoice on 10 day FREE trial

Name _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

Line: CCTV systems
Shibaden see ad cover 3

FTT
141 Manorhaven Blvd
Port Washington 11050
516 883 4440
Line: CCTV systems
Shibaden see ad cover 3

VICOMM TELEVISION SERVICES, INC.
126 Highland Ave
Syracuse 13203
315 474 2865
Line: CCTV systems
Shibaden see ad cover 3

VIDEO ENGINEERING COMPANY, INC.
356 West 40th Street
New York 10018
212 564 7400
Line: CCTV systems

VSM LEASING CORPORATION
6010 Goodrich Road
Clarence Center 14032
716 741-3100
Line: audio components, equip
Stanton see ad p59

WINDSOR TOTAL VIDEO SYSTEMS CORP.
652 1st Ave 5th Floor
New York 10016
212 725 8080
Line: CCTV systems
Shibaden see ad cover 3

NORTH CAROLINA

ADAMS & ASSOCIATES, INC.
P. O. Box 9756
1300 Westover Ter
Greensboro 27408
919 772 6838
Line: audio components
Fairchild Sound see ad p9

BLANCHARD ELECTRONICS
P. O. Box 5
Kenansville 28349

Line: audio components
Micro-Trak see ad p23

A. W. GREESEON, JR.
219 Homewood Ave
Greensboro 27403
919-292-1791
Line: full line audio equipment, RF monitor-
ing equip
Broadcast Electronics see ad p72
McMartin see ad p72
Micro-Trak see ad p23

HAMMOND ELECTRONICS, INC.
2923 Pacific Ave
P. O. Box 21728
Greensboro 27406
919 275 6391
Line: audio components
Micro-Trak see ad p23

HOLLINGSWORTH & STILL
P. O. Box 25344
Charlotte 28215
Line: audio products
Audio Devices see ad p17

STANDARD THEATRE SUPPLY CO.
125 Higgins Street
Greensboro 27420
919 272 6165
Line: cameras and accessories
Cinema Products see ads pp 60, 62, 65

TECHNICAL VIDEO SYSTEMS
1148 Burke Street
Winston Salem 27101
919 722-6181
Line: CCTV systems
Shibaden see ad cover 3

P. D. THOMPSON
2550 Weymouth Road
Winston Salem 27103
919 765 3157
Line: full line broadcast equip (audio &
video)
Broadcast Electronics see ad p72
Television Equip. Assoc. see ad p62

OHIO

JANSON INDUSTRIES
2602 Harrison Ave., N.W.
Canton 44711
216-455-2241
Line: recording accessories
Taber see ad p66

NEAL BEAR CORP.
3435 Streetsboro Road
Richfield 44286
Line: audio products
Audio Devices see ad p17

DOUG COOK
2185 Trent Road
Columbus 45229
614-471-4114
Line: audio equip., transmitters
AEL see ad p12
McMartin see ad p72

DAYTON COMMUNICATIONS CORP.
2971 Bluefield Ave
Dayton 45414
513 278 7937
Line: CCTV systems

ELECTRONIC PRODUCTS CORP.
1231 Main Ave
Cleveland 44113
216-692 3050
Line: video amplifiers, switchers

MCFADDEN SALES, INC.
150 East Broad St
Columbus 43215
614 221 3363
Line: audio components
Shure see ad p56

MANDABACH ASSOCIATES
1350 Crestwood Ave
Columbus 43227
614 235 0265
Line: audio components
Fairchild Sound see ad p9



Spindler & Sauppé TV film chain 2x2 projectors

your widest
and wisest choice

Seven models in all — one of which will fit your needs *exactly*. Color or monochrome, uniplex or multiplex, forward or reverse actuation, sequential or random access, 16- to 96-slide capacity. These are thoroughly proved performers, built to the highest professional standards, and recently updated with advanced electronics.

For complete information, write
Spindler & Sauppé, 13034 Satcoy St.,
North Hollywood, Calif. 91605,
phone (213) 764-1800



SPECTRUM 32B The most advanced film chain slide projector available. For color or monochrome chains. 32 slide capacity. Many exclusives. Operates at 120V 50/60 Hz. Spectrum 32F operates at 220V 50/60 Hz.



MODEL 332 Newest version of the workhorse of the industry. For monochrome chains. 32-slide capacity. Model 332 single turret for 16 slides, monochrome or color.



MODEL SLX-TV 96-slide capacity random access. Model SLS-TV 48-slide random access. Model SLD-TV 96-slide sequential. Model SLR-TV 48-slide sequential forward/reverse. All for monochrome or color chains.

OKLAHOMA

TELEMATION SOUTHWEST, INC.

2212 A. Sheridan Rd.
Tulsa 74115
918-836-6467
Line: full line audio equip. CCTV systems,
video proc equip., switchers, char. gen.
Richmond Hill Labs see ad p23

OREGON

RON MERRIT CO.

2035 S. W. 58th Ave.
Portland 97221
Line: audio products
Audio Devices see ad p17

PENNSYLVANIA

ATLANTIC INSTRUMENT CO.

20 Berwick Road
Philadelphia 19131
215-664-8457
Line: CCTV systems
Shibaden see ad cover 3

BROTHERS & CONNEEN ASSOC.

12 South Newtown St.
Newtown Square 19073
215-353-2241
Line: audio equip.

COLORINATION

William Flynn Highway-Rt. 8
RD 3
Valencia 16059
412-793-5479
Line: CCTV systems
Shibaden see ad cover 3

COMMUNICATION MEDIAS

P. O. Box 54
Allentown 18105
215-437-9447

Line: full line audio equipment
Broadcast Electronics see ad p72
Micro-Trak see ad p23
Stanton see ad p59

EASTERN TELECOM INC.

700 Seco Rd.
Monroeville 15146
412-373-2170
Line: CCTV systems
Shibaden see ad cover 3

MILTON ESHELMAN CO.

2902 Sycamore St.
Harrisburg 17111
717-564-2437
Line: CCTV systems
Shibaden see ad cover 3

GENERAL TECHNICAL PRODUCTS

780 Lorraine Dr.
Warrington 18976
215-343-3000
Line: CCTV systems
Shibaden see ad cover 3

IMPOSSIBLE ELECTRONIC TECHNIQUES

P. O. Box 467
121 Pennsylvania Ave.
Ardmore 19003
215-687-5400
Line: CCTV systems
Shibaden see ad cover 3

SAMUEL K. MACDONALD, INC.

1531 Spruce Street
Philadelphia 19102
215-545-1205
Line: audio components
Shure see ad p56

MARCO VIDEO SYSTEMS, INC.

6114 North 20th Street
Philadelphia 19138
215-849-9500
Line: CCTV systems
Shibaden see ad cover 3

NEBCO ASSOCIATES

P. O. Box 274
Enon Valley 16120
Line: audio products
Audio Devices see ad p17

PENNSYLVANIA EDUCATIONAL AIDS

307-311 East Carson Street
Pittsburgh 15219
412-381-2826
Line: CCTV systems
Shibaden see ad cover 3

PIERCE PHELPS INC.

2000 N. 59th Street
Philadelphia 19131
215-477-9000
Line: audio equipment; CCTV video systems
Micro-Trak see ad p23
Shibaden see ad cover 3

HENRY RHEA

1229 Hunt Club Lane
Media 19063
215-566-6558
Line: audio equip.; transmitters
AEL see ad p12
LPB see ad p66

SOUND SYSTEMS

6 Byshe Ave.
Flourtown 19031
215-242-3500
Line: CCTV systems
Shibaden see ad cover 3

WIEGAND AUDIO LABS

R.D. No. 3
Middlebury 17842
717-837-1444
Line: audio components
Micro-Trak see ad p23

VAL-TRONICS, INC.

Box 666
Avoca 18641
717-457-8886
Line: audio equip.; RF monitors
McMartin see ad p. 72
Stanton see ad p. 59

RHODE ISLAND

LAVINE DISTRIBUTORS

27 Dryden Lane

The Versatile Varotal VRM

The VRM's ZERO MINIMUM OBJECT DISTANCE* gets you in closer than has previously been possible. In fact, you can focus right on the front glass of a VRM lens and then go out to 632mm. (24.9 inches) without refocusing. Two flip-in, split second, range extenders give you vastly more variation in close-up work than any other lens. The potential for dramatic effects with a VRM is limited only by the creative genius of your program director. Close-up dollying is controlled solely by the length of the camera itself. You can aim over the subject's shoulder and shoot gadgetry without changing focus. You can fill the screen with small objects hand-held by the subject. Close tete-a-tete between panelists, contestants and persons being interviewed can be spectacularly portrayed. The VRM is ideal for changing range without re-focusing during outside broadcasts. Unpredictable switches and turnarounds can be covered without changing focus simply by operating the easy flip-in range extenders.

*In rack focus mode

For more information about the VRM and our generous TRADE-UP policy, contact the nearest R.P.I. office.



RANK PRECISION INDUSTRIES, INC.

New York 260 N. Rt. 303 West Nyack, N. Y. 10994 (914) 358-4450
Illinois 411 E. Jarvis Ave., Des Plaines, Ill. 60018 (312) 297-7720
California 5437 E. Sheila St., Los Angeles, Calif. 90040 (213) 722-3221

Providence 02904
401-421-4000
Line: CCTV systems
Shibaden see ad cover 3

WRH PRODUCTIONS
5 Industrial Way
Riverside 02915
401-434-6272
Line: full line audio components, equip. RF monitors
McMartin see ad p72
Micro-Trak see ad p23
Stanton see ad p59

SOUTH CAROLINA

DIXIE RADIO SUPPLY CO.
1900 Barnwell St.
Columbia 29202
803-235-5333
Line: audio components
Micro-Trak see ad p23

TENNESSEE

AUDITRONICS, INC.
207 Summit
Memphis 38104
901-276-6338
Line: recording accessories
Taber see ad p66

BARRY TRADING CO.
P. O. Box 609
Lebanon
615-444-0305
Line: audio components
Micro-Trak see ad p23

BROADCAST DISTRIBUTORS
Bible Place
Cleveland 37311
615-472-8200
Line: audio components and equip.
Broadcast Electronics see ad p72
Micro-Trak see ad p23

BROADCAST EQUIPMENT & SUPPLY CO.
P. O. Box 3141
Bristol 37620
615-764-8032
Line: Full line audio equipment
Broadcast Electronics see ad p72
Micro-Trak see ad p23
Stanton see ad p59

CARTWRIGHT & BEAN
560 South Cooper
Memphis 38014
Line: audio products
Audio Devices see ad p17

ELECTRA DISTRIBUTING CO.
1914 West End Ave.
Nashville 37203
615-329-3971
Line: audio components
Micro-Trak see ad p23

MOTION PICTURE LABORATORIES, INC.
781 South Main St.
Memphis 38102
Line: cameras and accessories
Cinema Products see ads pp60, 62, 65

STUDIO SUPPLY COMPANY
P. O. Box 280
Nashville 37203
615-327-3075
Line: audio component, equip.; recording accessories
Quad Eight see ad p52
Taber see ad p66

WARREN RADIO CO.
190 S. Cooper St.
Memphis 38104
214-630-3600
Line: audio components, equipment
Broadcast Electronics see ad p72
Micro-Trak see ad p23

TEXAS

BOB AMOR & ASSOCIATES
916 Green Hill Road
Dallas 75232

214-371-3233
214-741-3674
Line: audio consoles, FM monitoring equip., audio equip; transmitters
AEL see ad p12
McMartin Industries see ad p72

ARNOLD BARNES CO.
P. O. Box 9748
Austin, 78766
512-454-4371
Line: audio and video products

ARNOLD BARNES CO.
7616 LBJ Freeway, Suite 501
Dallas 75240
214-233-5535
Line: audio & video products

ARNOLD BARNES CO.
3801 Kirby, Suite 834
Houston 77006
713-523-4333
Line: audio and video products

BESCO
8585 N. Stemmons Freeway
Dallas 75247
214-630-3600
Line: recording equip
Broadcast Electronics see ad p72

CAMPION SALES CO.
Addison Airport
P. O. Box 396
Addison 75001
214-239-9196
Line: audio components
Shure see ad p56

CROUSE-KIMZEY COMPANY
2507 West Vickery - Box 9830
Fort Worth 76107
817-737-9911
Line: audio components
Stanton see ad p59

D & J SALES COMPANY
2307 59 Street
Lubbock 79412
806-792-0001
Line: audio products; transmitters
Wilkinson see ad p69



TCS

As the industry has grown, so has the demand for larger and larger tape systems. Unfortunately as the number of tracks increases, the signal to noise, cross-talk, etc., gets worse. And if that's not bad enough, the price of a 24 track machine is almost double that of a 16 track.

A few years ago people started to consider the benefits of synchronizing multi-track machines. The result? The birth of a new generation of tape synchronizing equipment. The advantages are ob-

vious: unlimited track expansion with great audio specs! The cost? About half the price of a 16 track.

Our basic system features SMPTE Generator, Reader, and Synchronizer. Operating in conjunction with the TCS Reader, the TCS Synchronizer provides the requisite speed up or down error signals to capstans that can be either AC Synchronous or DC Servo controlled. The TCS Generator is NTSC

or PAL data rate selectable. A provision for optional data display and lever-wheel code preset allows SMPTE hours, minutes, seconds and frames to be read and/or pre-selected. Optional accessories offered include a Motor Drive Amplifier and "Search and Find" match-up system.

The Synchronization Generation has arrived — and it's about time!

*TCS—Time Code Synchronizing System

QUAD/EIGHT ELECTRONICS

Circle 125 on Reader Service Card

R. A. DIMIER & ASSOC.
Stemmons Tower So., Suite 311
Dallas 75207
214-638-4509

Line: recording accessories
Taber see ad p66

VICTOR DUNCAN, INC.
2659 Fondren Ave.
Dallas 75206
Line: cameras & accessories
Cinema Products see ads pp 60, 62, 65

EL-WILCO
P. O. Box #34466
Dallas 75234
214-242-5321
Line: sound systems
Tape-Athon see ad p33

JOHN FITZGERALD
13844 Peyton Dr.
Dallas 75240
214-631-5470
LINE: video equip.; char. gen.

GRAVCO SALES, INC.
Redbird Airport
Dallas 75221
214-330-1245
Line: video processing equip; switchers
Grass Valley see ad p5

GARANTEE RADIO SUPPLY CORP.
1314 Iturbide St.
Laredo 78040
512-722-3233
Line: audio components
Micro-Trak see ad p23

PROFESSIONAL AUDIO SERVICES
P. O. Box 1953
Fort Worth 76101
817-536-6254
Line: audio components
Stanton see ad p59

R. & R. ELECTRONIC SUPPLY
P. O. Box 1860
Lubbock 79408
806-765-5733
Line: audio components
Micro-Trak see ad p23

J. Y. SCHOONMAKER CO., INC.
P. O. Box 20840
Dallas 75220
214-357-8481
Line: tape recorders, audio equip.

STEWART, STEWART & ASSOC.
3415 Westminster Ave.
Dallas 75205
Line: audio products
Audio Devices see ad p17

STUDIO SOUND SERVICE
12810 Cott Road
Dallas 75250
214-661-5937
Line: audio components, equip.
Quad/Eight see ad p52

E. T. SUDDUTH
2809 Raintree Drive
Carrollton 75006
214-242-2690
Line: full line video equip.
Datatek see ad p60
Television Equip. Assoc. see ad p62

TELEMATION TEXAS, INC.
2609 Tarna Drive
Dallas 75229
214-247-9684
Line: full line audio equip, CCTV systems,
video proc. equip, switchers, char. gen.
Richmond Hill Labs see ad p23

TELEMATION TEXAS, INC.
4800 W. 34th St., Suite C-5
Houston 77018
713-688-5283
Line: full line audio equip, CCTV systems,
video proc. equip, switchers, char. gen

Richmond Hill Labs see ad p23

TERRELL SUPPLY CO., INC.
2848 Cullen Street
Fort Worth 76101
817-336-8731
Line: CCTV systems
Shibaden see ad Cover 3

TEXAS VIDEO SYSTEMS
P. O. Box 533
Richardson 75080

214-235-4945
Line: CCTV systems
Shibaden see ad Cover 3

VIDEO ELECTRONIC SYSTEMS, INC.
3000 Carlisle Street
Dallas 75204
214-741-1440
Line: CCTV systems
Shibaden see ad Cover 3

WHALIN'S PRO AUDIO SALES
2910 Buena Vista
Arlington 76010
214-261-8197
Line: full line audio and recording equip
LPB see ad p66
Stanton see ad p59
Taber see ad p66

WYBORNY SALES CO.
P. O. Box 42080
Houston 77042
918-775-9242
Line: audio components, equip
Fairchild Sound see ad p9

UTAH

TELEMATION SALES, INC.
2195 South 3600 West
Salt Lake City 84119
801-487-5399
Line: full line audio equip; CCTV systems,
video sgn gen., switchers, char. gen.
Micro-Trak see ad p23
Richmond Hill Labs see ad p23

STOCKDALE & CO., INC.
200 East First So.
Salt Lake City 84111
Line: cameras and accessories
Cinema Products see ads pp 60, 62, 65

VIRGINIA

LEE HARTMAN & SONS
P. O. Box 659
3236 Cove Road, N.W.

PERFECT YOUR CCTV SYSTEM WITH COSMICAR® LENSES



TV-COSMICAR-EE 16mm F/1.6

The TV-COSMICAR-EE 16mm f/1.6 is a high-speed lens specially designed for 2/3" vidicon cameras. It maintains image luminance 100 lx against subject brightness between LV11.3 ~ 17 (350 ~ 18,000 cd/m²), about 1,800 ~ 96,000 lx.

The automatic electric-eye diaphragm close down completely provided that subject brightness exceeds approx. LV20 (144,000 cd/m²), 768,000 lx. In case the camera is switched off and not in operation, the automatic diaphragm closes down, completely shutting off the light for protection of the vidicon camera.

The "Change-over Switch" in front of the lens controls the operation of the diaphragm.

When the switch lever is turned on to "EE", the lens diaphragm operates as fully automatic electric-eye, and is brought on to "OPEN", the diaphragm stays fully opened condition.

Be sure to get the finest image recording results with quality Cosmicar lenses.

Also available are scores of other lenses, ranging from 8.5mm to 1,000mm telephoto, zoom and those motordriven among them, for immediate delivery, after being tailored to your specifications.



COSMICAR OPTICAL CO., LTD.

424, Higashi-Oizumi, Nerima-ku, Tokyo, Japan

Cable Address: "MOVIEKINO TOKYO"

Representative & Service Office: Asahi Optical (America) Inc. 15 East 26th Street, New York, N.Y. 10010, U.S.A.

Circle 126 on Reader Service Card

Roanoke 24004
703-366-3493
Line: audio components
Micro-Trak see ad p23

MANN ASSOCIATES
4 Cushing Street
Portsmouth 23702
703-397-8939
Line: CCTV systems
Shibaden see ad Cover 3

PROGRAMMED MATERIALS, INC.
Box 360, RFD #7
Roanoke 24018
703-774-1974
Line: audio equip; transmitters
AEL see ad p12
LPB see ad p66

WASHINGTON

AUDIO CRAFT INC.
208 S. Mead St.
Seattle 98108
Line: audio products
Audio Devices see ad p17

BENNETT ENGINEERING CO.
Box 23
Mercer Island 98040
206-232-3550
Line: audio and video products
McMartin see ad p72

DATA COM ASSOCIATES
111 Tower Pl.
Seattle 98109
208-285-2525
Line: recorders, audio consoles, FM monitors
McMartin see ad p72
Tape-Athon see ad p33

FLEEHART & SULLIVAN, INC.
10109 Aurora Avenue N
Seattle 98133
206-522-1533
Line: audio components
Shure see ad p56

GLAZER'S CAMERA SUPPLY
1923 Third Ave.
Seattle 98101
Line: cameras and accessories
Cinema Products see ads pp60, 62, 65

JOHN McCLAMROCK CO.
127 Southwest 156 St.
Seattle 98166
206-244-9391
Line: audio components, transmitters
Micro-Trak see ad p23
Wilkinson see ad69

RON MERRIT CO.
1320 Prospect Ave
Seattle 98109
Line: audio products
Audio Devices see ad p17

SOUND RECORDING CO.
503 W. Indiana
Spokane 99210
Line: audio products
Audio Devices see ad p17

WEST VIRGINIA

ROBERT L. HARRISON
Route 3, Box 24
Princeton 24740
304-425-4665
Line: transmitters
Wilkinson see ad p69

PREISER SCIENTIFIC
P. O. Box 551
900 MacCorkle Ave., S.W.
Charleston 25322
304-343-5515
Line: CCTV systems
Shibaden see ad Cover 3

WHEELING ANTENNA CO., INC.
P. O. Box 1043
Wheeling 26003
304-233-0919
Line: CCTV systems
Shibaden see ad Cover 3

WISCONSIN

SATTERFIELD ELECTRONICS
1900 South Park St.
Madison 53701
608-257-4801
Line: audio and video processors

TELEMATION MIDWEST, INC.
2400 South Commerce Drive
New Berlin 53151
414-786-1280
Richmond Hill Labs see ad p23

PUERTO RICO

ELECTRONICA FERNANDEZ
208 Eleanor Roosevelt Street
Hato Rey 00919
Line: audio components & equip
Broadcast Electronics see ad p72
Micro-Trak see ad p23

GERMAN ORTIZ, INC.
Darlington Bldg.
Rio Piedras 00925
809-766-4672
Line: CCTV systems
Shibaden see ad Cover 3

PEDRO SANCHEZ
589 Hillside St.
Summit, San Juan
Line: audio products
Audio Devices see ad p17

CANADA

AUDIO SCIENCES LTD.
2110 West 125th Ave
Vancouver 9, B.C.
Line: recording accessories
Taber see ad p66

The composite of all features most asked for in the Broadcast Industry

langevin series 10 Audio Control Center

- 26 Stereo Inputs
- 10 Stereo Mixing Channels
- 10 Stereo Remote Inputs
- Stereo/Mono Input Select Keys
- Digital Time Clock
- Solid State Modular Circuitry
- Conductive Plastic Stepless Faders
- Redundant Fail Safe Power Supplies
- Conjunctional Microphone Foot Switch
- Two 10 Watt Monitor Amplifiers
- Separate Program and Audition Outputs
- Separate Cue Amplifier
- Optional Equalization Controls

\$5365.00 (User's Net)



Cetec INC
a subsidiary of Computer Equipment Corp

MAIN OFFICE: 13035 Satcoy St. • North Hollywood, California 91605 • Phone (213) 875-1900 • TWX 9104992669

NASHVILLE OFFICE: Route 4 • Devens Drive • Brentwood, Tennessee 37027 • Phone (615) 794-0155

EUROPEAN OFFICE: Cetec, U.K. • Shattlesbury St. • High Wycombe, Bucks, England • Phone High Wycombe 37326 • Telex 837329

Circle 147 on Reader Service Card

BIO-ELECTRONICS

P. O. Box 52
Don Mills, Ont.
416-752-3371
Line: audio components
Micro-Trak see ad p23

BROADCAST ENGINEERED SYSTEMS

1466 Kalligan Court
Mississauga, Ont.
416-277-0277
Line: audio equip
Broadcast Electronics see ad p72

CALDWELL A/V EQUIPMENT CO.

1080 Bellamy Rd. North
Scarborough, Ont.
416-291-5595
Line: audio equipment, audio tape, transmitters
McMartin see ad p72
Micro-Trak see ad p23

CENTURY 21 AUDIO

654 King Edward St.
Winnipeg, Man. R 3H OP2
204-775-8231
Line: audio components, equip
Quad/Eight see ad p52

COMMERCIAL ELECTRONICS LTD.

1305 Burrard St.
Vancouver 1, B.C.
604-685-0301
Line: audio components, equip
Quad/Eight see ad p52

JELBEE ASSOCIATES, LTD.

1555 Pitfield Blvd.

Montreal 384, Quebec
514-334-5763

Line: audio consoles, equip
McMartin see ad p72

ELECTRO-TEC MARKETERS, LTD.

1624 West Third Street
Vancouver, BC
604-736-6377
Line: audio consoles, equip
McMartin see ad p72

T. WILF FARROW ASSOC.

P. O. Box 181
Islington, Ont.
Line: audio products
Audio Devices see ad p17

E. S. GOULD SALES CO., LTD.

9429 Cote de Liesse
Montreal 760, PQ
514-636-0220
Line: sound systems
Tape-Athon see ad p33

J-MAR ELECTRONICS, LTD.

6 Banigan Drive
Toronto, 17, Ont.
416-421-9080
Line: audio equip
Broadcast Electronics see ad p72

M.S.C. ELECTRONICS, LTD.

690 Conacher Drive
Willowdale, Ont.
416-221-7546
Line: audio equip
McMartin see ad p72

NORTEC WEST, LTD.

325 West 5th Avenue

Vancouver, 10, B.C.
604 872 8525

Line: audio equip
Broadcast Electronics see ad p72

PINEWAY ELECTRONICS LTD.

1875 Leslie Street Unit 3
Don Mills, Ont.
416 449 1343
Line: audio components, equip
Broadcast Electronics see ad p72
Quad/Eight see ad p52

A. C. SIMMONDS & SONS, LTD.

285 Yorkland Boulevard
Willowdale, Ont. M2J 1S8
416 491 1010
Line: audio components
Shure see ad p56

TELE-RADIO SYSTEMS

301 Superfest
Toronto, Ont.
416 661 3221
Line: time slds

TELE-TECH ELECTRONICS LTD.

15 McCulloch Ave
Rexdale, Ont.
416-248-5647
Line: recording accessories, audio
Broadcast Electronics see ad p72
Taber see ad p66

UNIVERSAL BROADCAST CONSULTANTS

4374 Blvd. St. Laurent
Montreal, PQ
Line: audio equip
Broadcast Electronics see ad p72

Home and Field Offices of Broadcast Equipment Manufacturers, This Issue

Plus manufacturers distributing products of others

AMERICAN ELECTRONIC LABORATORIES INC.

P. O. Box 552
Lansdale, Pa. 19446
610-292-2929
Mfr of AM and FM transmitters
See ad p12

AMPEX CORPORATION AUDIO-VIDEO SYSTEMS DIV.

101 Broadway
Redwood City, California 94063
415-367-4400
Mfr of audio equipment, audio recorders, videotape recorders, tape editors, cameras, tape duplicators
See ad pp28-29
Dstrbr of H.F. Photo Systems equip

Field Offices**CALIFORNIA**

100 Rodier Drive
Glendale 91201
818-240-5000

GEORGIA

680 Tully Circle N.E.
Atlanta 30329
404-633-4131

ILLINOIS

201 Estes Avenue
Oak Grove Village 60007
312-593-6000

MARYLAND

20215 Fernwood Road
Bethesda 20034
301-530-8800

MASSACHUSETTS

91 Totten Pond Road
Walham 02154
617-890-2040

NEW JERSEY

5 Commerce Way
Hackensack 07601
201-489-7400
New York, 736-6116

OHIO

4130 Linden Avenue
Dayton 45432
513-254-6101

PENNSYLVANIA

947 Old York Road
Abington 19001
215-887-7650

TEXAS

1615 Prudential Drive
Dallas 75235
214-637-5100

UTAH

1075 E. Vine St.
Salt Lake City 84121

ASACA CORPORATION

3-2-28, Asahigaoka
Hino-City, Tokyo, Japan
0425-83-1211

1289 Rand Road
Des Plaines, Ill. 60016
312-298-4380

Mfr of portable broadcast TV cameras
See ad p7

AUDIO INTERFACE SYSTEMS INC.

Birmingham, Ala.
205-595-4649
Mfr of audio consoles
See ad p67

AUTOMATED PROCESSES, INC.

80 Marcus Drive
Melville, New York 11746
516-694-9212
Mfr of audio amplifiers, processors, consoles
See ad p13

AUDIO DEVICES INC.

100 Research Drive
Glenbrook, Conn. 06906
203-327-6500
Mfr of audio tape, tape cartridges
See ad p17

Field Offices**CALIFORNIA**

3117 San Fernando Rd.
Los Angeles 90065
213-255-5103

GEORGIA

1670 N. E. Freew'y Access Rd.
Atlanta 30329
404-631-5441

ILLINOIS

6401 Grosse Point Road
Niles 60648
312-583-4161

MARYLAND

12111 Parklawn Dr.
Rockville 20852
301-881-2430

MASSACHUSETTS

149 Elm Street
Dedham 02026
617-329-5777

NEW YORK

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

TEXAS

6730 Oakbrook Blvd.
Dallas 75235
214-638-0784

BETHANY INTERNATIONAL INC.

5750 Bintliff, Suite 201
Houston, Tex. 77036
713-783-1260
Mfr of audio distribution amps
See ad p18

ROBERT BOSCH CORP.

FERNSEH DIVISION
2800 S. 25th Ave.
Broadview II 60153
312-681-5000
Mfr of broadcast cameras and accessories
See ad pp34, 35
Dstrbr of H.F. Photo Systems equip

Field Offices**CALIFORNIA**

6300 Arizona Circle
Los Angeles 90045
213-649-4330

NEW JERSEY

10 S. Franklin Turnpike
Ramsey 07446
201-825-1550

TEXAS

4131-A Directors Row
Houston 77018
713-681-8461

BROADCAST ELECTRONICS INC.

8810 Brookville Road
Silver Spring, Md. 20910
301-588-4983
Mfr of tape cartridge players, distribution amplifiers, audio equipment
See ad p72
Dstrbr of audio equipment, Micro-Trak products

CCA ELECTRONICS

716 Jersey Avenue
Gloucester City, N.J. 08030
609-456-1716

Mfr of audio equip for broadcast use, AM, FM, and TV transmitters, program automation
Dstrbr of Micro-Trak products

CETEC INC.

13035 Satcoy Street
North Hollywood, Calif. 91605
213-875-1900

Mfr of audio components & equip, tape duplicators, Gauss, Langevin, Electrodyne products)
See ad p54

Field Offices**HAWAII**

Warren Birkenhead
P. O. Box 432
Haleiwa

TENNESSEE

Wally Wilson
Rt 4 Devens Drive
Brentwood 37027

CINEMA PRODUCTS CORP.

2044 Cotner Avenue
Los Angeles, Calif. 90025
213-478-0711

Mfr of 16mm cameras, accessories
See ads pp60, 62, 65

COLLINS RADIO CO.

Dallas, Texas 75207
214-235-9511

Mfr of audio equipment and AM
and FM transmitters
See ad p27

Field Offices**ARIZONA**

Route #1, Box 854A
Flagstaff 86001
602-774-8206

ARKANSAS

P.O. Box 119
Limestone 72646
918-587-1491

CALIFORNIA

9351 East Canfield Dr.
LaHabra 90631
213-691-2304

FLORIDA

14018 West Parsley Dr.
Madeira Beach 33708
813-391-8065

LOUISIANA

8427 Ridgemont Dr.
Pineville 71360
318-640-3412

MINNESOTA

200C West Branch Rd.
Maple Plain 55359
612-479-2633

NEW JERSEY

1463 Force Dr.
Mountainside 07092
201-232-6744

OHIO

2430D Waldon Glen Circle
Cincinnati 45231
513-825-3802

TENNESSEE

3205 Walnoke Dr
Knoxville 37921
615-525-4966

TEXAS

1105 High Vista
Richardson 75030
214-234-3602

COSMICAR OPTICAL CO., LTD.

424, Higashi-Oizumi
Nerima-ku, Tokyo, Japan
Mfr of lenses for cameras
See ad p53

DANSCOLL

9721 Cote de Liesse
Montreal 760 Canada
514-631-9884

Mfr of production and routing
switchers, distribution amps
See ad p50

DELTA ELECTRONICS INC.

5534 Port Royal Road
Springfield, Va. 22151
703-321-9845

Mfr of impedance test equip, an-
tenna monitors, FSM
See ad p69

DYNAIR ELECTRONICS INC.

6360 Federal Blvd.
San Diego, Calif. 92114
714-582-9211

Mfr of video processing equip;
video switchers
See ad p3

EDITEL PRODUCTIONS, INC.

5610 Bois Franc. (St-Laurent)
Montreal, Quebec
514-331-2951
Mfr of TV camera and mobile vans
See ad Cover 2

Field Offices**CALIFORNIA**

729 North Island Boulevard
Los Angeles
213-931-1821

ILLINOIS

920 North Lincoln Ave
Chicago 60610
312-649-9707

MICHIGAN

24293 Telegraph Road
Southfield 48075
313-353-1660

CANADA

50 Overlea Boulevard
Toronto, Ontario
416-421-3702

FARINON ELECTRIC

935 Washington Street
San Carlos, Calif. 94070
415-593-8491

Mfr of microwave equip
Distribtr of H.F. Photo Systems
equip

FIDELIPAC

3 Olney Avenue
Cherry Hill, N.J. 08034
609-424-1234

Mfr of tape cartridges, accessories
See ad p65

FORT WORTH TOWER CO., INC.

P. O. Box 8597
Fort Worth, Tex. 76112
817-JE 6-5676

Mfr of antenna towers, buildings
See ad p68

GARRON ELECTRONICS

1216 Kifer Rd.
Sunnyvale, Calif. 94086

Mfr of tape cartridge equip
Dstrbtr of Audio Devices equip

GRASS VALLEY GROUP, INC.

Box 1114
Grass Valley, Cal. 95945
916-273-8421

Mfr of video processing equip;
video switchers
See ad p5

HARRIS-INTERTYPE CORP.

GATES DIVISION
123 Hampshire St.
Quincy, Ill. 62301
217-222-8200

Mfr of full line radio and TV equip
(audio, video, RF)
See ads pp 59, 61, 63, 72
Distribtr of Micro-Trak, HF Photo
Systems, Stanton

Field Offices**ALABAMA**

Birmingham 35215
413 20th Ct. N.E.

CALIFORNIA

Los Angeles 90007
1945 S. Figueroa
213-747-7129

Rancho Cordova 95670
10521 Malvasia Way

DISTRICT OF COLUMBIA

Washington 20005
730 Federal Building
1522 "K" Street, N.W.

FLORIDA

Maccleddy 32063
P. O. Box 958

GEORGIA

Atlanta 30329
1745 Tully Circle, NE

ILLINOIS

Arlington Heights 60004
1810 North Ridge Avenue

IOWA

Waterloo 50705
Box 2397, Station A

MICHIGAN

Adrian 49221
56 S. Crestview Drive
RR #5, Box 240D

MISSOURI

Maryland Heights 63043
12219-A Encanto Lane

NEW YORK

Latham 12110
11 Ridgcrest
518-785-9144

New York 10016
130 East 34th St.
212-889-0790

NORTH CAROLINA

Greensboro 27407
2006 Cedar Fork Drive, Apt. A

OHIO

Canton 44718
5901 Murray Street, NW

Cleveland 44113
55 Public Square

OKLAHOMA

Tulsa 74145
P. O. Box 45107

SOUTH CAROLINA

Columbia 29209
803-776-2059
7209 Stonehaven Drive

TEXAS

Houston 77027
4019 Richmond Avenue
713-666-4333

WISCONSIN

Racine 53402
3320 Ivy Lane

WASHINGTON

Vancouver 98660
P. O. Box 849

HITACHI SHIBADEN**CORPORATION OF AMERICA**

58-25 Brooklyn-Queens Expressway
Woodside, N.Y. 11377
212-898-1261

Mfr of CCTV systems, broadcast-
quality color cameras
See ad Cover 3

**INTERNATIONAL TAPETRONICS
CORP.**

2425 South Main Street
Bloomington, Ill. 61701
309-828-1381

Mfr of tape cartridge and cassette
equip
See ad p63

INTERNATIONAL VIDEO CORP.

675 Almanor Avenue
Sunnyvale, Cal. 94086
408-738-3900

Mfr of video tape recorders, color
cameras, films chairs
See ad Cover 4
Dstrbtr of H.F. Photo Systems equip

Field Offices**CALIFORNIA**

P. O. Box 612
Reseda 91335
213-344-6001

COLORADO

4677 E. Utah
Denver 80222
303-758-8218

GEORGIA

35 Executive Park Drive, N.E.
Atlanta 30329
404-633-1462

ILLINOIS

1920 Waukegan Road
Glenview 60025
312-729-5160

NEW YORK

5 Corporate Park Drive
White Plains 10604
914-694-1234

TEXAS

3710 Gray Drive
Mesquite, Texas 75149
214-270-0949

LPB INC.

520 Lincoln Highway
Frazer, Pa. 19355
215-644-1123

Mfr of audio studio equip
See ad p66

Dstrbtr of Micro-Trak and
Taber products

McCurdy Radio Industry, Ltd.

108 Carnforth Road
Toronto 16, Ontario, Canada

416-751-6262

Mfr of audio consoles
Dstrbtr of Micro-Trak products

McMARTIN INDUSTRIES INC.

4500 S. 76 St.
Omaha, Neb. 68127
402-331-2000

Mfr of audio console equip, FM
exciters, monitors, transmitters
See ad p72

MICRO-TRAK CORP.

620 Race Street
Holyoke, Mass. 01040
413-536-3551

Mfr of turntables, pickups, acces-
sories
See ad p23

MICROWAVE ASSOCIATES

Building W. South Ave.
Burlington, Mass.
617-272-3000

Mfr of microwave equip
Dstrbtr of H.F. Photo Systems
equip

PHILIPS BROADCAST EQUIPMENT

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

Mfr of TV cameras, telecine chains,
accessories
Dstrbtr of H.F. Photo Systems equip

POTOMAC INSTRUMENTS INC.

932 Philadelphia Avenue
Silver Spring, Md. 20910
301-589-3125

Mfr of antenna monitors, FSM
See ad p10

QUAD/EIGHT ELECTRONICS

11929 Vose Street
North Hollywood, Cal. 91605
213-764-1516

Mfr of audio components, process-
ing equip
See ad p52

RCA BROADCAST SYSTEMS

Bldg. 2-5
Camden, N.J. 08102
609-963-8000

Mfr of full line of video and TV
equip (audio, video, RF)
See ad pp 19-22

Dstrbtr of Micro-Trak, Stanton

Field Offices**ALABAMA**

Birmingham 35223
Office Park Bldg. #10
Office Park Circle
205-871-1155

CALIFORNIA

Hollywood 90028
RCA Corp., Suite 531
6363 Sunset Blvd.
213-461-9171

San Francisco 94102
420 Taylor St., Suite 401-408
415-441-2200

COLORADO

Denver 80211
2701 Alcott St., Suite 384
303-433-8484

DISTRICT OF COLUMBIA

Arlington, Virginia 22209
1901 North Moore St.
703-558-4212

FLORIDA

Jacksonville 32207
2747 Art Museum Drive, Suite 5
904-398-4588

West Palm Beach 33403
3900 RCA Blvd.
Palm Beach Gardens, Bldg. 110
305-622-1100

GEORGIA

Atlanta 30329
14 Executive Park Drive, N.E.
404-634-6131

ILLINOIS

Chicago 60606
Gateway II Bldg., Suite 1400
120 S. Riverside Plaza
312-782-0700

KANSAS
Overland Park 66207
5750 West 95th St., Suite 111
913-642-3185, 6, 7

MASSACHUSETTS
Wellesley 02181
Wellesley Office Park
40 William Street
617-237-6050

MICHIGAN
Southfield 48075
24333 Southfield Rd., Suite 209
313-357-0080

MINNESOTA
Minneapolis 55416
4522 Excelsior Blvd.
612-920-6395, 6

MISSOURI
St. Louis 63105
7701 Forsyth Blvd., Suite 455
314-862-3660

NORTH CAROLINA
Charlotte 28210
6230 Fairview Road
Suite 104
704-366-0626

NEW JERSEY
Camden 08102
Bldg. 2-2
Front & Cooper Sts.
609-963-8000

NEW YORK
New York 10036
1133 Avenue of the Americas
212-586-3000

OHIO
Cincinnati 45231
11430 Hamilton Ave.
513-825-1550

PENNSYLVANIA
McMurray 15317
761 N. Washington Road
Nationwide Office Bldg.
412-941-5570

TEXAS
Austin 78758
Northwest Office Park Bldg.
Suite 134, 8330 Burnet Road
512-451-2500

Dallas 75247
3700 Stemmons Freeway
214-638-6200

WASHINGTON
Seattle 98119
408 Second Avenue, West
206-285-2375

RANK PRECISION INDUSTRIES INC.
260 N. Route 303
West Nyack, N.Y. 10994
914-358-4450
Mfr of TV camera lenses, TV monitors
See ad p51
Field Offices

CALIFORNIA
5437 E. Sheila Street
Los Angeles 90040
213-722-3221

ILLINOIS
111 E. Jarvis Avenue
Des Plaines 60018
312-297-7720

RICHMOND HILL LABORATORIES INC.
142 Central Avenue
Clark N.J. 07066
201-381-5955
Mfr of video switching equip
See ad p23

ROBINS-FAIRCHILD
75 Austin Boulevard
Commack, N.Y. 11725
516-543-5200
Mfr of audio consoles, systems
See ad p9

RUSSCO ELECTRONICS MANUFACTURING INC.
1070 Brookhaven Drive
Clovis, Cal. 93612
209-299-2167
Mfr of audio equip
Dstrbr of Micro-Trak products

TABER MANUFACTURING & ENGINEERING CO.
2081 Edison Avenue
San Leandro, Cal. 94577
415-635-3831
Mfr of video tape heads
See ad p66

TAPE-ATHON CORP.
502 S. Isis Avenue
Inglewood, Cal. 90301
213-776-6933
Mfr of audio tape playing equipment, loggers
See ad p33

TAPECASTERS INC.
Box 662
Rockville, Md. 20851
Mfr of tape cartridge equip
Dstrbr of Audio Devices equip

TECHNOLOGY INC., HF PHOTO SYSTEMS DIV.
11801 W. Olympic Blvd.
Los Angeles, Cal. 90064
213-272-4331
Mfr of camera mounts, tripods
See ads pp 64, 68

TEKTRONIX, INC.
P. O. Box 500
Beaverton, Oregon 97005
503-666-0161
Mfr of full line of video and gen purpose test equip
See ads pp.11, 55
Field Offices

ALABAMA
Huntsville 35801
Suite 8, 3322 S. Memorial Parkway
205-881-2912

ARIZONA
Phoenix 85034
2643 E. University Dr.
Suite 113
602-244-9795
Tucson Area: Enterprise 383

CALIFORNIA
Concord 94520
2339A Stanwell Ct.
415-687-8350
From Oakland, Berkeley, Richmond, Albany and San Leandro: 254-5353

Orange 92667
1722 E. Rose Ave.
714-633-3450

Palo Alto 94303
3750 Fabian Way
415-326-8500, Telex 34-8411
(Info. Disp. Prod. 415-321-7728)

San Diego 92111
6841 Convoct Ct.
714-292-7330

San Jose
Suite 1B, 280 Martin Ave.
Santa Clara 95050
408-296-3010

Van Nuys 91406
16930 Sherman Way
213-987-2600
From L.A. call: 873-6868

COLORADO
Denver
6801 So. Yosemite St.
Englewood 80110
303-771-8012

CONNECTICUT
Milford 06460
20 Commerce Park Rd.
203-877-1494

FLORIDA
Fort Lauderdale 33311
1871 West Oakland Park Blvd.
305-731-1220
From Miami: 944-6948

Orlando 32803
Suite 109, 1040 Woodcock Rd.
305-894-3911
From Cape Kennedy Area: 636-0343

Pensacola 32503
Suite 130, 4900 Bayou Blvd.
904-476-1897

GEORGIA
Atlanta 30341
Suite 3, 2251 Perimeter Park
404-451-7241

ILLINOIS
Chicago
1541 Elmhurst Rd.
Elk Grove Village 60007
312-593-2830

INDIANA
Indianapolis 46219
6121 East 30th St.
317-546-2408

KANSAS
Kansas City
Suite 101, 6025 Lamar
Mission 66202
913-432-1003

MARYLAND
Baltimore
1526 York Rd.
Lutherville 21093
301-825-9000

Rockville 20850
1335 Piccard Drive
301-948-7151

MASSACHUSETTS
Boston
244 Second Ave.
Waltham 02154
617-890-4550
From Providence: 401-739-4771

MICHIGAN
Detroit
22132 West Nine Mile Rd.
Southfield 48075
313-358-3122

MINNESOTA
St. Paul 55112
3775 North Dunlap St.
612-484-7255

MISSOURI
St. Louis
11331 Natural Bridge Rd.
Bridgeton 63044
314-731-4696, 7

NEW JERSEY
Springfield 07081
964 South Springfield Ave.
201-379-1670

NEW MEXICO
Albuquerque 87108
1258 Ortiz Drive, S.E.
505-268-3373
Southern N.M. ENterprise 678

NEW YORK
Albany
678 Troy Rd
Latham 12110
518-785-3353

Buffalo 14225
965 Maryvale Dr.
716-633-7861

Endicott
3214 Watson Blvd.
Endwell 13760
607-748-8291

Long Island
125 Mineola Ave.
Roslyn Heights, L.I. 11577
516-484-2300

Poughkeepsie 12603
One Old Mill Rd.
914-462-4670

Syracuse 13211
Room 5112
5858 E. Molloy Rd.
315-455-6666

NORTH CAROLINA
Greensboro 27405
1011 Homeland Ave.
P. O. Box 6526
919-274-4647

OHIO
Cleveland 44129
5689 Pearl Rd.
216-884-6558

Columbus
Suite 5, 12 West Selby Blvd.
Worthington 43085
614-888-4040

Dayton 45439
3309 Office Park Dr., Suite 103
513-293-4175

OKLAHOMA
Oklahoma City 73105
Suite 201
800 N.E. 63rd
405-848-3361

OREGON
Portland
8845 S. W. Center Ct.
Tigard 97223
503-639-7691

PENNSYLVANIA
Ft. Washington 19034
165 Indiana Ave.
215-542-1440, Telex 84-6338

Pittsburgh
3834 Northern Pike
Monroeville 15146
412-351-3345

TEXAS
Dallas 75240
4315 Alpha Rd.
214-233-7791

Houston 77036
5750 Bintliff Dr.
Suite 217
713-783-1910

San Antonio 78228
Suite 100, 4415 Piedras St. West
512-736-2641, 2,
From Austin Area:
ENterprise 9915

UTAH
Salt Lake City 84115
65 West 2950 So.
801-484-8501

VIRGINIA
Hampton 23366
1929 Coliseum Dr.
804-826-4020

WASHINGTON
Seattle 98188
410 Baker Blvd.
Andover Industrial Park
206-243-2494

TELEMATION, INCORPORATED
P. O. Box 15068
2195 South 3600 West
Salt Lake City, Utah
801-487-5399
Mfr of CCTV systems, sync. gen. visual info systems, char. gen. Dstrbr of Richmond Hill switches. broad line of TV equipment

TELEVISION EQUIPMENT ASSOCIATES
Box 1391
Bayville, N.Y. 11709
516-628-8068
Mfr of audio and video equipment. video tape cleaners
See ad p62

TELEVISION MICROTINE INC.
1280 Blue Hills Avenue
Bloomfield, Conn. 06002
203-242-0761
Mfr of time base correctors
See ad p15

TERRA-COM
Div. of Conic Corp.
7865 Balboa Avenue
San Diego, Cal. 92111
Mfr of microwave equip
Dstrbr of HF Photo Systems equip

SHIVELY LABORATORIES INC.
Raymond, Me. 04071
207-655-3841
Mfr of antennas systems
See ad p61

SHURE BROTHERS INC.
222 Hartrey Avenue
Evanston, Ill. 60204
312-328-9000
Mfr of audio mixers, microphones
See ad p56

SPARTA ELECTRONICS CORPORATION
5851 Florin Perkins Road
Sacramento, Cal. 95828
916-383-5353
Mfr of audio equip, program automation and FM transmitters
Dstrbr of Micro-Trak products

STANTON MAGNETICS INC.
Terminal Drive
Plainview, N.Y. 11803
212-445-0063
Mfr of phono cartridges, head-
phones, accessories
See ad p59

ULTRA AUDIO PRODUCTS
Box 921
Beverly Hills, Cal. 90213
213-849-1433
Mfr of waveform and pulse cross
monitors
See ad p64

VIDEOMAX CORP.
154 San Lazara Avenue
Sunnyvale, Calif. 94086
408-739-5391
Mfr. of rebuilt VTR quad heads
See ad p14

Field Offices

New Jersey
552 Wyndham Road
Teaneck 07666
212-947-8031

Maryland
13708 Stoner Drive
Silver Spring 20904
301-384-4733

VISCOUNT INDUSTRIES LTD.
105 East 69th Avenue
Vancouver 15, B.C., Canada
604-327-9446
Mfr of video production and rout-
ing switches
See ad p67

**VISUAL ELECTRONICS
LABORATORIES**
Audio Division,
40 North Daisy Avenue
Pasadena, Cal. 91107
Telephone 213-449-6176
Mfr of audio equip
Distrbtr of Micro-Trak products

WILKINSON ELECTRONICS INC.
1937 West MacDade Boulevard
Woodlyn, Pa. 19094
215-874-5236
Mfr of audio consoles, AM and FM
transmitters, silicon rectifiers
See ad p69
Distrbtr of Micro-Trak products

NEWS

Ampex Turnaround Brings Profit for 1973

After losing almost \$100 million in two disastrous years (those ending in April 1971 and April 1972), the Ampex Corporation, veteran of the magnetic tape industry, showed clear evidence of a turn-around by a new top management with a profit for the year ended April 28, 1973, in the amount of \$3,654,000. Major contributions to the profit, according to the company's annual report, came from successful marketing of the third-generation AVR-1 VTR, the ACR-25 automatic video cassette system, the VR-1200 series video recorders, and the computer core, disc and tape memory systems. Also aiding were improved sales of broadcast videotape and instrumentation tape.

Other Financial News

RCA sales/earnings set records for the first half of 1973, at \$2.05 billion (up 11%) and \$88 million (up 15%), respectively. Eastman Kodak sales and earnings for the first half of 1973 showed substantial increases—sales were \$1.7 billion (up 17%) and earnings \$227 million (up 34%). Tocom Inc. announced its intention to buy 25,000 shares of its common stock in the over-the-counter market, saying that the stock is underpriced.

Gulf and Western Industries, Inc. reported sales of \$1,437 million and earnings of \$66 million for the nine months ended April 30, both substantial increases over year-earlier figures. Scientific-Atlanta, Inc. said preliminary figures indicate record sales of \$20.2 million and earnings of \$680,000 for the year ended June 30, 1973; year earlier figures were \$16 million and \$276,000.

Cablecom General, Inc. showed sales of \$9.6 million and net income

of \$378,378 for the six months ended May 31, 1973. Warner Communications, Inc. reported revenues of \$279 million and income of \$27 million for the six months ended June 30, against \$242 million and \$24 million a year earlier.

TelePrompTer Corporation, which was listed on the New York Stock Exchange in July, has announced that accelerated expansion is expected to result in somewhat lower earnings in the second quarter of 1973, as compared with the first quarter. TelePrompTer is the largest cable firm, with more than 800,000 subscribers.

Business Briefs

Video Expo IV, convention to be sponsored September 19-21 at New York's Commodore Hotel by Knowledge Industry Publications, Inc., will include the first release of findings from the Brush Report, a six-month study of corporate uses of video.

Some recent international sales: Ampex Corp., \$2.6 million for VTRs and editing equipment to Yugoslav television. RCA, a mobile, three-camera color TV unit to Israel; and earth stations for regular satellite communications links in China. Marconi, color TV studio equipment to Lebanon; color cameras to the Peking Television Center in China; a 100-kW medium-frequency sound transmitter to Egypt; and four 10-kW sound transmitters to Libya. International Video Corp., \$100,000 for videotape recorders to extend television programming to outlying locations in rural India. RHG Electronics Laboratory, Inc., portable FM/TV microwave links for remote pickups at a Bogota, Columbia, television station.

Miss American Teen-Ager, Inc., organizer of an annual beauty contest and pageant, is seeking franchisees for local preliminary contests, especially radio and TV stations: address Sol Abrams, 1605 Le Moine Avenue, Fort Lee, N.J. Dac-An Productions is a new com-

pany centered in Carson City, Nevada, for production of entertainment and instructional programs on one-inch and two-inch videotape, 16 and 35mm film, with 16-track audio recording and still photography also available.

Meredith Corporation radio executives met in Washington in June with U.S. Senators and Representatives from their home districts to discuss Federal legislation affecting broadcasters. Theta-Com announced establishment of a Systems Division, responsible for turn-key cable system design and construction and field engineering, with Daniel J. Ryason as manager.

Cinema Beaulieu announced the "News 16" film camera for TV/documentary film production, with built-in automatic power zoom, automatic or semi-automatic threading, modular design, and choice of single or double system sound, synchro-pilot or crystal. Media Horizons of New York, owner of eight radio stations (including KMEO in Phoenix) will build a national radio division headquarters at 3719 N. 32nd Avenue, Phoenix.

Goldmark Communications has given non-exclusive licenses for manufacture of their automatic skew corrector for video cassette systems to Dayton Communications, Dayton, Ohio, and Applied Electronics, Toronto. CCA Electronics Corp. has entered an agreement with CIT Alcatel of Montrouge, France, major French electronics manufacturer, for distribution of Alcatel products by CCA in the U.S., and distribution of CCA products by Alcatel in Europe.

Brand-Rex Company, cable and electrical components manufacturer, has underway a substantial expansion of their cable plant in Siloam Springs, Arkansas. International Video Corp. has contracts totalling more than \$2 million to supply 39 U.S. Navy vessels with CCTV systems for information, training, and entertainment.

BM/E

Color Monitor Setup ...more than meets the eye.



Improve color monitor performance with the TEKTRONIX J16-TV Photometer/Radiometer. Monitor screen color temperatures may be quickly and accurately adjusted or matched, even by unskilled personnel. No individual judgement is required as with visual comparison techniques.

The red, green, and blue guns are individually adjusted to predetermined

intensities, both at 10 and 100 IRE units. Tracking problems between low and high levels are observable and can be corrected before becoming appreciable.

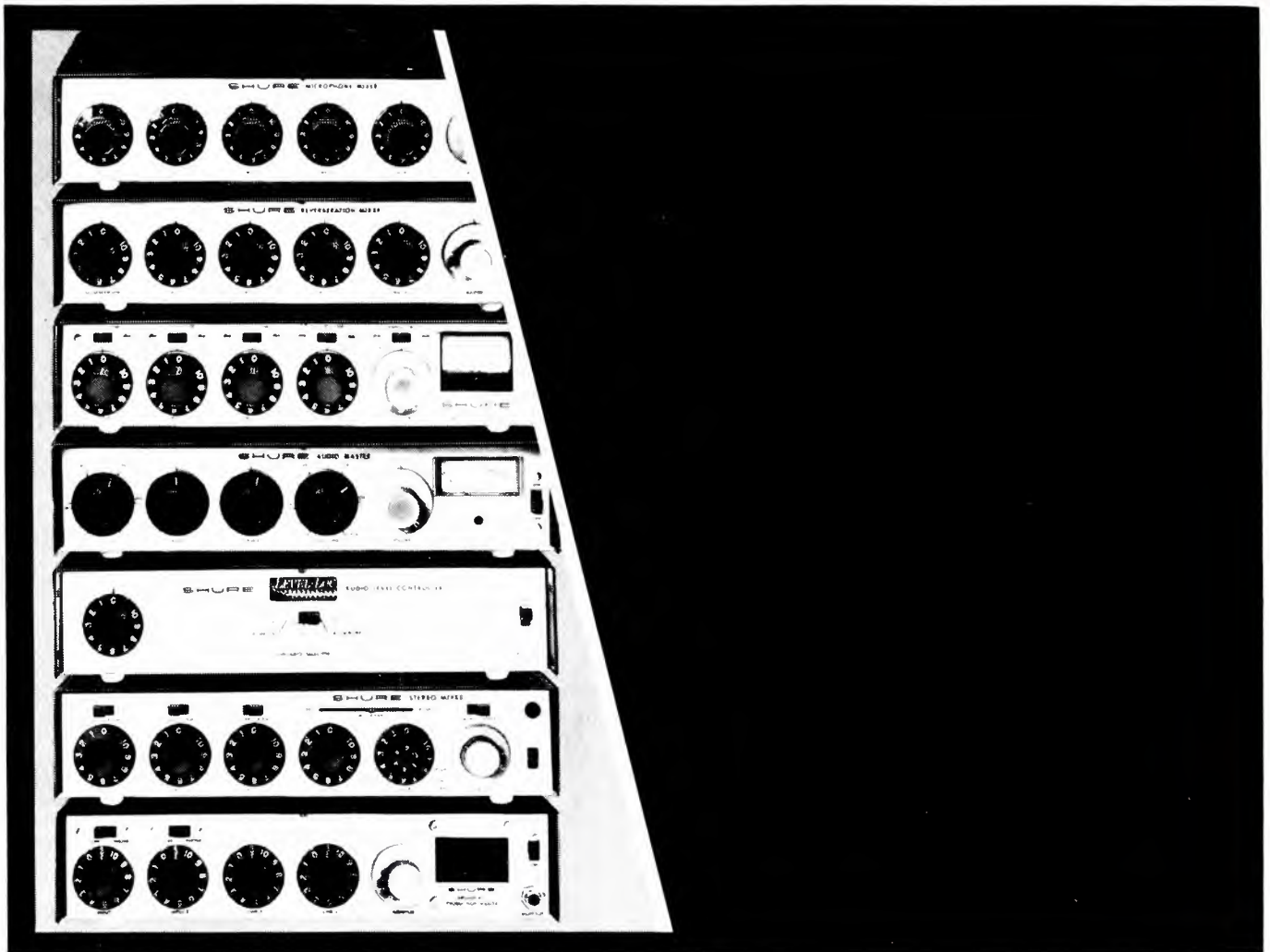
A monitor adjusted today with the J16-TV can be adjusted to give exactly the same color a week, month, or year from now. Two or more similar monitors may be matched for identical color.

With optional accessory probes, the J16-TV can be also used to measure luminance of both color and black and white monitors, and for measurement of studio or remote illumination.

Contact your nearest Tektronix field engineer for a demonstration, or copies of application notes describing the television applications of the J16-TV. Priced at \$895.

the J16 digital photometer
an eye for color





The Magnificent Seven



We've been hearing unsolicited rave reviews from soundmen across the country concerning our seven ingeniously versatile problem-solving audio control components (1) *M68 Microphone Mixer*, vanguard of the low-cost, high-performance portable mixers; (2) *M68-RM Mixer*, with built-in reverb for vocalists and special effects; (3) *M67 Mixer*, the trail-blazing low-cost professional mixer; (4) *M63 Audio Control Center*, that gives you variable response shaping; (5) *M62V Level-Loc*, the audio level controller that automatically limits output level; (6) *M688 Stereo Mixer*, made to order for stereo recording and audio-visual work; and finally, (7) *M675 Broadcast Production Master*, that teams up with our M67 to give a complete broadcast production console (with cuing) for about \$325. Write for the new Shure Circuitry catalog that shows them all:

Shure Brothers Inc.
222 Hartrey Ave., Evanston, Ill. 60204

Circle 129 on Reader Service Card



BROADCAST EQUIPMENT

Series of new test plug-ins for TM-500 scope line includes eleven instruments. Among them: two signal processors, new two-channel 225 MHz digital counter, 11 MHz function generator, a 2 MHz X-Y CRT Monitor, a 250 MHz pulse generator, a high-output 80 volt pulse generator, a crystal controlled time mark generator, others. **TEKTRONIX. 275**

Cable fault detector is battery powered, is used with an impulse generator. Model No. 651111 can detect magnitude and direction of surge current, with earth gradient probe finds faults on direct buried cable, or ground voltage on energized cable. **JAMES G. BIDDLE CO. 276**

Automated hi-fi tester sweeps automatically through four frequency decades from 20 Hz to 20 KHz. Model



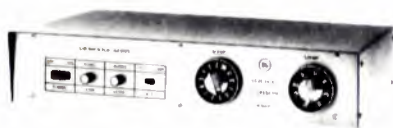
BFK10 shows frequency and distortion on front panel meters and allows X-Y recording of frequency/distortion for a hard-copy record. **THE LONDON COMPANY. 277**

Function generators have full output to 20 MHz. Models 520 and 521 produce sine, triangle, square, pulse, sawtooth. The 521 adds triggering and gating. 520, \$695; 521, \$795. **AILTECH. 278**

Vertical-amplifier plug-in allows four channels, each 200 MHz wide, to be displayed on Model 183A scopes, Model 1834A plug-in inputs have choice of high impedance or 50-ohm termination, triggering from any channel to others. **HEWLETT-PACKARD. 279**

Alignment tape for 1/4-inch reel-to-reel recorders has a series of ten tone sections. Model AT120 checks azimuth, recording level, frequency response, tape speed, flutter, etc. **NORTRONICS. 280**

Monochrome monitors have 6-inch screen, horizontal resolution of 600



lines, single module circuit board. Model 6M917 (single) and 6M917T (triple) monitors are 100% solid state, have depth of 10 in. **SC ELECTRONICS. 281**

Digital multimeter claims 0.001% total accuracy over 24 hours, 10,000 megohm input resistance, five DC ranges, 60% overrange. Model 5900 has two measurement speeds for AC, full auto-ranging, LED readout. \$1795. **DANA LABORATORIES. 282**

Oscilloscope series includes: Model 1040A with 40 MHz bandwidth, dual channel, delayed and mixed sweeps, 1 mV/cm sensitivity; Model 1066B with 20 MHz, AC and DC trigger, TV frame rate and line triggering, 500 ns/cm sweep speed; Model 1010A, aimed at TV servicing, with 10 MHz bandwidth. 1040A, \$1200; 1066B, \$745; 1010A, \$495. **BALLANTINE LABORATORIES. 283**

Loop antenna for RF field measurements in the range of 150 KHz to 32 MHz is 52 x 46 x 5 inches overall. Switched transformers match to frequency bands. Dismantling for storage is rapid. \$423. **SINGER. 284**

Tone generator for audio trouble shooting produces a microphone-level signal to drive low-impedance, balanced inputs. Model A15TG is self-powered, in a 3/4 in. diameter cylindrical case, has a three-pin connector at one end. **SHURE BROTHERS. 285**

Mini-console for surveillance and security systems is custom assembled to match need, from a single source up to 20 cameras, 6 pan and tilts, 6 scanners, 6 motorized lenses, etc. It will accept single or dual 9 in. or triple 5 in. monitors. **VICON INDUSTRIES. 286**

NTSC color encoder is plug-in replacement for the R-Y, B-Y encoder on

IVC Model 90 and Model 150 color cameras. Model CEC-800 uses waveform monitor for alignment of all parameters. Under \$1000. **LENCO ELECTRONICS. 288**

Low-noise preamplifier covers the 3.7-4.2 GHz band. Model AW-4208 has a noise figure of 4 dB, a built-in alarm circuit. Complete failure in a microwave system produces only a small fade on one hop. **AVANTEK, INC. 289**

Automatic slope and gain control units (ASG) stabilize cable systems without thermal equalizers. ASG permits peak amplifier performance from -40° to +150° F. **AEL COMMUNICATIONS CORP. 290**

Audio and video switching buss has eight inputs. Model C-81-AV can be computer or remote driven, has bal-



anced or unbalanced audio inputs and outputs, vertical or non-vertical interval operation. Under \$1200. **OMNIX. 287**

Video/audio switcher has 8 video inputs, 5 busses. Model 2850 has internal and external keying, color matte and



11 wipe patterns, manual and automatic transitions, three-stage audio equalizer and filter, noise gate. **DANSCOLL LTD. 291**

Low-cost demodulator includes tuner for off-air signals, produces composite video, audio, and 4.5 MHz aural sub-carrier outputs. Model DEM919 provides full chrominance signal, has

continued on page 58

RCA's lead-oxide Vistacons make the scene.



They do it by giving you the kind of performance you need for top-quality pictures. Each one delivers the scene virtually 100% free of microphonics. And every Vistacon is pre-tested in an actual TV camera before shipment!

It's easy to replace with RCA Vistacons, too. Types 4591/R, G, B, and L, respectively, are direct replacements for types 55875R, G, B, and L. And RCA's 4592/R, G, B, and L, respectively, are directly interchangeable with the XQ 1020R, G, B, and L.

So next time you need a lead-oxide replacement, check out RCA Vistacons. You'll get the performance you want with the service you've come to expect from the pioneering leader in TV camera tube technology. Call your RCA Camera Tube Distributor for complete information. Or write

RCA, Commercial Engineering, Section 211/G10, Harrison, N.J. 07029.

RCA Electronic Components

Circle 130 on Reader Service Card

PRODUCTS

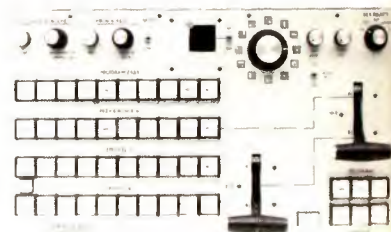
four-stage IF. \$349. SC ELECTRONICS. 292

Distribution amplifier will bridge or match a 600-ohm audio line, provide six completely isolated balanced outputs. Model DA-6 has 25 dB gain,



maximum output, 0.1% or less distortion, is within 0.5 dB, 10 Hz to 20 KHz. Other models have 16 to 32 outputs, up to 8 inputs. \$95 to \$425. RAMKO RESEARCH. 293

Production video switcher has ten composite or non-composite inputs, including blackburst, and four busses. Model 556 provides 12 most-used wipe patterns, including a circle; it has re-



entry of effects key, color blackground, blackburst, color matte generator. Ten inputs, \$7900; 16 inputs, \$10,400. AMERICAN DATA CORP. 294

CATV channel switcher is RF controlled. Model RCS-573 senses any TV signal and switches unwanted channel off, for non-duplication. \$325. FUNG ENGINEERING. 295

Video switcher-special effects generator is remote controlled, has eight synchronous inputs, three busses. Model 7000 provides vertical switching, horizontal, vertical and corner wipes, and keying, matting, mixing, fading, super-imposition. DYNASCIENCES. 297

Video quantizer provides special effects, including keying, tone reduction, outlining, inversion, synthetic color, pattern generation, others. Model 606A slices video signal into eight amplitude levels, with subsequent intermixing. \$2500. COLORADO VIDEO. 298

Low-cost digital sync generator is primarily for single-line pulse distribution systems. Model 800 has separate



Engineer Brian Morgan gets ready for an air disc playback.

Stanton. Everywhere you turn.



Charles Parker, Program Director and Chief Engineer Wayne Mulligan, auditioning discs.

Hartford's "Top 40" WDRC AM-FM (serving the community for a half century!) relies on Stanton cartridges in a variety of operations.

Chief Engineer Wayne Mulligan says,

"Stanton meets our stringent standards for reliability and sound quality in on-air playback and in the production of transfers."

Stanton's Model 681EE cartridge is their choice for auditioning original recordings and making transfers. Its incredible low mass moving magnetic system ($1/5$ to $1/10$ that of ordinary pickups) and its 10Hz to 20,000Hz response, contribute to its exceptional audio quality not only in professional but in home stereo systems, as well.

For on-the-air use, Stanton 500 Series cartridges are the choice for their ability to withstand rugged handling without sacrifice of audio quality, thus assuring high quality sound with minimum maintenance.

The Stanton Dynaphase headsets seen in both photos, enjoy professional acceptance for their true and full-bodied reproduction. They are lightweight and comfortable.

Whether it's recording, broadcasting or home entertainment, enjoy professional audio quality with Stanton products. Write for literature to Stanton Magnetics, Inc., Terminal Drive, Plainville, N.Y. 11803.

All Stanton cartridges are designed for use with all 2 and 4 channel matrix derived compatible systems.



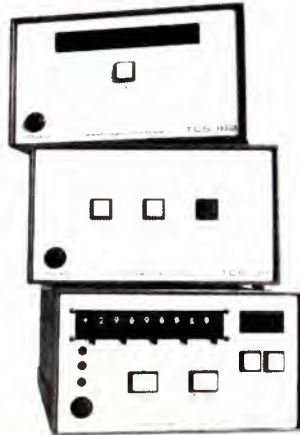
Circle 131 on Reader Service Card

PRODUCTS



modules for programming pulses in 70 ns increments and for horizontal phase. Zero or one-line vertical phase advance. \$1800. CONTROL CONCEPTS CORPORATION. **299**

Synchronizing system locks audio tape machines to slaves, to VTRs, or to sprocketed film interlock. Time Code



Synchronizer includes an SMPTE code generator, reader, and synchronizer. Last unit provides the error signals for speed correction of AC synchronous or DC servo motors. \$9100. QUAD/EIGHT ELECTRONICS. **296**

Digital code generator generates a pulse-position code with from one to five pulses. Model 766 has digiswitch to control repetition time of set. Pulses can be combined in any order at output by toggle switches. VEGA PRECISION LABORATORIES. **300**

FM broadcast transmitter includes two 25 kW units with a hybrid combiner,



for operational output of 40 kW and total capability of 50 kW. If one unit of Model PM-25/25KD fails, combiner sends other signal to antenna for continued on page 60

If you operate an FM station with 3,000 watts E.R.P., there's one transmitter that's best for you.



The Gates FM-2.5H3

Unsurpassed for exceptional mono and stereo transmission, this two-tube, 2,500-watt transmitter features . . .

- Sophisticated broadband circuitry . . . assures maximum stereo separation, minimum crosstalk.
- Stable, easy output tuning.
- Built-in, motor-operated rheostat for adjusting power output. (Automatic output power control optional.)
- Automatic recycling.
- Remote control capability.
- Plug-in stereo and SCA generators.
- Gates-designed harmonic filter.
- Regulated and adjustable filaments on IPA and PA.

Plus a lot more that makes the FM-2.5H3 the finest transmitter available for Class A stations. Write for more information.

HARRIS
GATES DIVISION
Quincy, Illinois 62301, U.S.A.

Circle 132 on Reader Service Card

SYSTEM
CP-16

NEW from **Cinema products**



Shown above is the CP-16/A camera (with built-in Crystasound Amplifier), equipped with Angenieux 12-120mm zoom lens and built-in Automatic Iris Control (with manual override) Also shown is the CP-16 optional 24 fps/36 fps film speed selector switch.

Automatic Iris Control for CP-16 & CP-16/A Cameras...

... with Angenieux 9.5-95mm or 12-120mm zoom lenses equipped with the new and improved Angenieux-designed **AUTOMATIC IRIS Control System.**

CP-16 camera models and Angenieux zoom lenses with *Automatic Iris* — an ideal combination to meet the rapidly changing lighting requirements encountered in news/documentary filming. Instant and precise positive control response eliminates "hunt-and-peek" exposure errors. The Angenieux-designed Automatic Iris is powered by the same compact nicad battery powering the entire CP-16 camera system.

For further information, please write to:

Cinema E products
CORPORATION

Technology In The Service Of Creativity

2044 Cotner Avenue, Los Angeles, California 90025
Telephone (213) 478-0711 ■ Telex 69-1339 ■ Cable Cinedevo

Circle 133 on Reader Service Card

exclusive!!!



THE DATATEK D-701

WAVEFORM CORRECTOR AND TRANSMITTER PHASE EQUALIZER SYSTEM

Now Used by Many Leading Stations

Other advanced Datatek products:

- Envelope Delay Measuring Sets
- Video-Audio Routing Switchers
- Audio Distribution Amps
- Video & Pulse D.A.s

Unique features provide superior color picture quality...

- Direct waveform correction by incremental time method
- Phase and amplitude equalizing
- Corrects errors left by existing phase equalizers
- Removes smearing, streaking, antenna reflections
- On Air adjustments using VITS

D
DATATEK
CORP

1200 W. CHESTNUT ST., UNION, N.J. 07083
(201) 964-3656

Circle 134 on Reader Service Card

PRODUCTS

25 kW output. Each final amplifier includes a 4CX1000K driver and a 3CX15000A7 grounded-grid final. AMERICAN ELECTRONIC LABORATORIES. **301**

High-speed duplicating system for ¼-in. eight-track cartridge tape has fully automated operation for reel-to-reel duplication. Pro-Series 2800 can duplicate 8-track cartridges directly onto pancakes, or onto cartridge hubs. PENTAGON INDUSTRIES. **302**

Video cassette ¾-in. tape line is added to audio cassettes. IRISH MAGNETIC TAPE. **303**

Self-powered intercom headphones use single cable to interconnect stations. Model T4/1C has built in transistor amplifier with battery, includes a boom mounted microphone. Up to ten sets can be a "party-line," up to 1500 feet between users. \$95. R-COLUMBIA PRODUCTS. **304**

Accessories for Norelco videocassette include solenoid operated remote control, frame sync of two or more units, capstan servo vertical interval editing for one-camera production, and 12-volt battery operation. IMAGE COMMUNICATIONS. **305**

Phono pickup cartridge aimed specifically at broadcast and studio use has a cutaway stylus grip, and bright orange dot on stylus tip for easier cueing. Model SC35C is within 1 dB to 15 KHz, rolls off to 20 KHz to minimize high frequency splatter in FM broadcasts. Rugged stylus allows back-cueing. SHURE BROTHERS. **306**

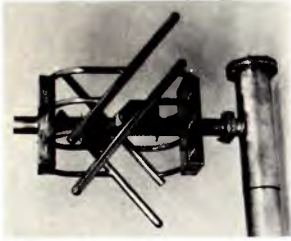
Three-head cassette system allows off-the-tape monitoring. Model 700 Tri-Tracer has closed-loop double capstans



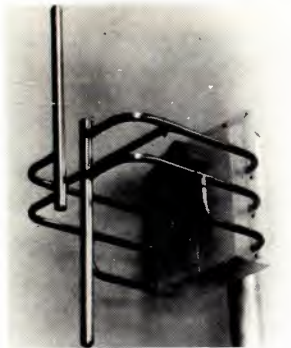
for less than 0.1% flutter and wow (DIN 45507), response within 3 dB, 35-20,000 Hz. It has built-in azimuth alignment system, Dolby B noise reduction for 60 dB s/n ratio, solenoid controls. \$690. NAKAMICHI RESEARCH. **307**

SEPTEMBER, 1973—BM/E

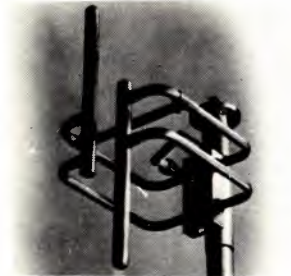
**SHIVELY LABORATORIES
ANNOUNCES A NEW GENERATION
OF CIRCULARLY POLARIZED
FM ANTENNAS**



TYPE 6814 • 25 KW PER BAY



TYPE 6810 • 10 KW PER BAY



TYPE 6813 • 3 KW PER BAY



TYPE 6811 • 1 KW PER BAY

**RADOMES OR DEICERS
AVAILABLE FOR ALL MODELS**

WRITE FOR INFORMATION ON
ANTENNAS
TRANSMISSION LINE
FILTERS
RF LOADS
COAXIAL SWITCHES
POWER COMBINERS



**SHIVELY LABORATORIES,
INC.
RAYMOND, MAINE 04071
PHONE 207 655-3841
Circle 135 on Reader Service Card**

PRODUCTS

Recording console has 9-frequency graphic input equalizer and channel-assign switch module with up to 24 assignment positions. Series 2000 consoles have 4 echo-send selections, program and echo quadrasonic pan pots, 8, 16, or 24 output busses, separate quad bus, and 3 mono busses, independent quad mixdown monitor. CETEC (ELECTRODYNE BRAND). **308**

Unidirectional microphone for rock groups, public address, paging etc. is available in low or high impedance, with or without switch in cable connector. 857 series has ball-head filtering to minimize wind effects. \$66. ASTATIC CORP. **309**

Integrated circuits provide most of electronic functions of FM/AM stereo receivers. Included are: A758 phase-locked loop FM stereo decoder; A753 FM gain block; 3075 FM IF amplifiers (with ceramic filters), limiter, detector and audio preamplifier; A720 AM radio subsystem. In 100 to 999 quantities: A758, \$3.95; A753, \$1.27; 3075, \$1.18; A720, \$1.35. FAIRCHILD CAMERA AND INSTRUMENT. **310**

Lightning arrestor elements protect diodes and transistors from surge damage when added to circuitry. Models M2P-90 and M2P-230 have shock wave spark voltage of less than 800 volts; maximum AC current, 6 A in one second; shock wave maximum, 6000 amps. DOWELL INDUSTRIES LTD. **311**

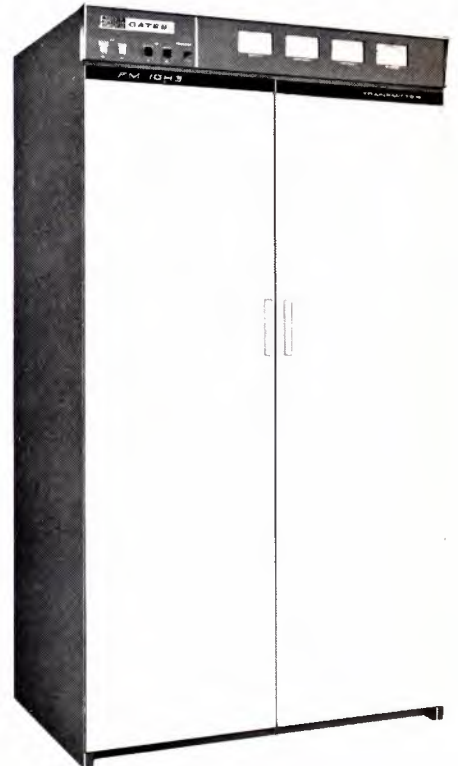
Solid-state TV image impresser processes video signal to improve contrast. "Cris-Pic" is aimed primarily at projection TV systems, also improves picture quality with VTRs, cameras, off the air, and in computer video displays. KALART VICTOR. **312**

Neon voltage regulator holds voltage to within 1 volt in regulated supplies, DC amplifiers, and similar applications. Model is in standard T-2 neon bulb, ZR1R10 has maximum stability at 91 volts, ignition voltage of 135 vdc maximum, operating current 12 ma, shunt regulator current 0.25 ma minimum. SIGNALITE. **313**

Airborne transponder antenna has a VSWR of less than 1.25 in the range 1030 to 1090 MHz. Model KC-89-95 is 3 1/4 in. overall, has quick-connect BCN receptacle, is weatherproof. KINGS ELECTRONICS CO. **314**

One-chip calculator IC includes complete 8-digit calculator, with three registers for the four arithmetic functions. continued on page 62

**If you operate an
FM station with
50,000 watts E.R.P.,
there's one
transmitter that's
best for you.**



The Gates FM-10H3

Designed for exceptional fidelity and maximum reliability, this 10,000-watt transmitter features . . .

- Only two tubes in RF amplifiers and highly-efficient amplifier circuits.
- Long-life, ceramic-type amplifier tube.
- Dependable Gates "Vari-Line" silver-plated tank for greater reliability.
- HV silicon, three-phase power supply with excellent protection.
- Automatic recycling.
- Motor driven output control. (Automatic output power control optional.)
- Plug-in stereo and SCA generators.
- Gates solid-state TE-3 exciter that's unsurpassed for stability and fidelity.

Plus a lot more that makes the FM-10H3 the finest transmitter available for Class B FM stations. Write for more information.

HARRIS
GATES DIVISION
Quincy, Illinois 62301, U S A

Circle 136 on Reader Service Card

WHEN SHOULD YOU THROW OUT A \$200 TAPE?



Dropouts, audio and control track damage, missing oxide and excessive splices all contribute to early retirement of expensive video tapes. Tape evaluation in real time is too expensive (accountants estimate \$50 - \$100 per hour), but the Magnetek video tape cleaner and evaluator will clean and evaluate a one hour tape in ten minutes.

Magnetek cleaning reduces up to 70% of video dropout, and our 16-head evaluator inspects 50% of video plus separate analog evaluation of audio and control tracks.

Magnetek's three-pen graphic profiler identifies tape problems and damaged sections can be extracted on the evaluator. With careful handling, cleaning and extraction of damaged sections, the life of a \$200 tape could be extended many times.

Next visit to your tape library, consider costs for tape evaluation in real time versus Magneteking. Then contact:

Bill Pegler phone (516) 628-8068



Television Equipment Associates

BOX 1391 • BAYVILLE, N. Y. 11709

Magnetek is a product of Advanced Transducer Systems, division of Hermes Electronics

Circle 137 on Reader Service Card

PRODUCTS

tions, 16-place decimal point register, oscillator and clock driver. Model MM5725 also has latches and interlocks for a scan period for keyboard entry, other calculator functions. \$18 in quantities of 100. NATIONAL SEMICONDUCTOR CORP. **315**

Fixed-tuned inductor for pocket-sized paging receiver IF combines miniaturization, low DC resistance, and high Q. Unit uses gapped ferrite pot core. MAGNETICS. **316**

Card frame systems have module front panels for frame heights of 5/4, 7, 8 3/4 inches. Model 3D supplies widths of 1/2 and 1 inches. Model 3E widths are 1, 2, 4, 5, 6, and 8 inches. All modules are retained by one push-pull lock. \$57.40, in quantity of one. VERO ELECTRONICS. **317**

Laser for facsimile and other recording applications has high efficiency, uses helium-cadmium gas. The HeCd system has nominal output of 15 milliwatts, operates at 442 and 325 nanometers, records with high resolution on inexpensive papers. Approx. \$2500. RCA. **318**

Band-pass filter for adjacent TV channel rejection has sound carrier rejection of 45 dB and picture rejection of 50 dB. Model BPF-2000 comes in eight- or ten-pole design, is for rack mounting. CATEL. **319**

Speed selector switch, 24/36 fps, is available as option on CP-16 and CP-16/A 16mm cameras. \$250. CINEMA PRODUCTS CORP. **320**

Mounting device for studio lights and cameras fits any stand tip, 3/8 to 5/8 in. Adaptall accepts lights with 3/8 to 5/8 in. yoke mounts, and also has 1/4-20 thread screw mount for cameras. \$5.95. BERKEY-COLORTRAN. **321**

Line of half-inch, one-inch, and 3/4 inch cassette videotapes has conductive back coating, virtually no dropouts. "Silverchrome" tapes claim high chroma response, low noise, high sensitivity. KAREX. **322**

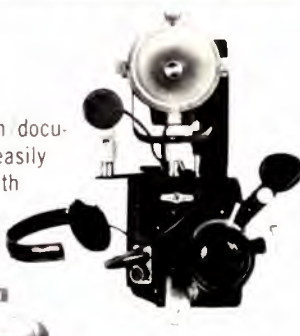
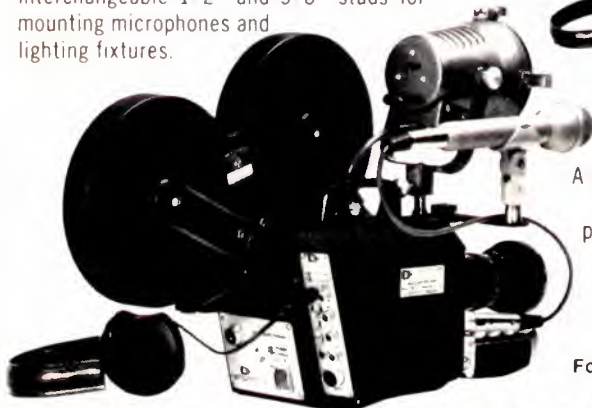
TV titler produces pressure-sensitive lettering attachable to almost any surface. "Leteron" titler requires no special operator skill, and all words and sentences are aligned automatically. REYNOLDS/LETERON CO. **323**

Two-inch broadcast videotape is capable of 50% extension of playing time. Fuji H-706 tape is packaged on standard 8-inch reels, but runs 33 minutes per reel, rather than the standard 22 minutes. COLTAPE. **324**

SYSTEM CP-16 NEW from cinema products

Mike/Lite Bracket for CP-16 & CP-16/A Cameras...

An ideal accessory for the "one-man-band" TV-newsfilm documentary cameraman. The new Mike Lite Bracket is easily mounted on all CP-16 camera models, and is supplied with interchangeable 1 2" and 5 8" studs for mounting microphones and lighting fixtures.



A specially designed locking pivot-arm on the bracket permits maximum flexibility in positioning the microphone and light fixture in relation to each other.

For further information, please write to:

cinema E products
CORPORATION

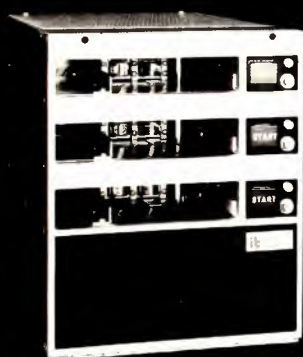
Technology In The Service Of Creativity

2044 Colner Avenue, Los Angeles, California 90025
Telephone (213) 478-0711 ■ Telex 69-1339 ■ Cable Cineveco

CP-16/A camera is shown with Mike/Lite Bracket, RE50 microphone, and Cinema Products' new Sturdy-Lite quartz focusing spot (operating at 600 watt-120 volt AC/DC or 250 watt-30 volt DC)

Circle 138 on Reader Service Card

**No. 1 number for
tape cartridge
equipment
309-828-1381**



3D SERIES REPRODUCER

A collect call to the above number will bring you all the facts you need to know about tape cartridge equipment. One call will establish a working relationship between you and our broadcast oriented people...a relationship that delivers dependable performance at a truly competitive price. The relationship will last as long as you use ITC equipment...in the selection of equipment, proper servicing, and adaptation of machines to your broadcast requirements. If you're thinking tape cartridge equipment, find out why hundreds of stations depend on ITC.

VRA SERIES RECORDING AMPLIFIER



**Call collect for
information on
free trial and
leasing plans**

it INTERNATIONAL
TAPETRONICS
CORPORATION
2425 South Main Street,
Bloomington, Illinois 61701

Circle 139 on Reader Service Card

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

Data sheet covers **semiconductor protective fuses** with ratings of 250 volts, 10 to 600 amps, the SF25X series, with graphs, dimensional drawings and complete specifications. International Rectifier Corp. **200**

"**Copyright and Audio-Visual Media**" is a booklet issued by the Educational Media Producers' Council to give its views on this topic; other related material is an article, "Video Piracy," from **Educational and Instructional Television**, sounding the alarm about copying of video materials sent out to educators for "review." Data: EMPC, 3150 Spring St., Fairfax, Va., 22030.

Operations and Costs: A Study of Educational Public Television Stations" reports a study by the National Association of Educational Broadcasters, showing program and expansion plans of PTV stations over the next several years. Address: NAEB, 1346 Connecticut Ave. N.W. Washington, D.C. 20036.

"No Loose Ends," a **proof-of-performance procedure for CATV systems**, is aimed at showing technicians exactly how to satisfy FCC #76:605, with a minimum of technical discussion Tektronix. **201**

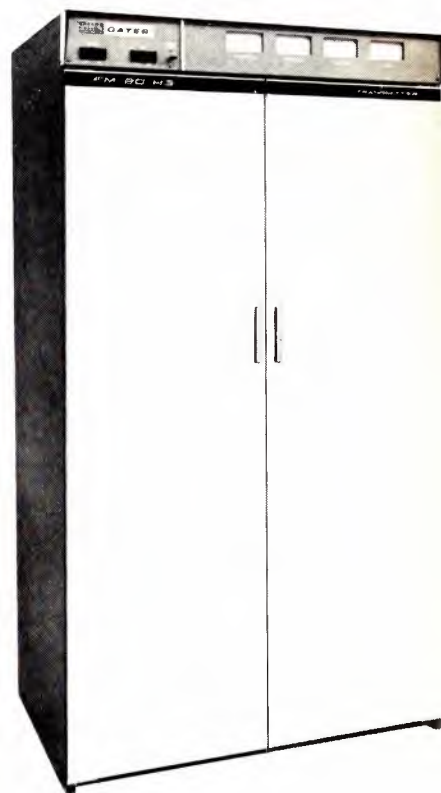
Brochure describes **domestic satellite communications services**—voice, data, TV—to come on line in a planned construction program. American Satellite Corp. **202**

The "NCTA Cablecasting Guidebook" is a 250-page compendium of **programming ideas, suggestions and tips**, available to NCTA members for \$15 and to others for \$30. Address: NCTA, 918 Seventh St. N.W., Washington, D.C. 20006.

Catalog of 282 pages covers equipment for **CCTV, CATV and sound**. Alexander Electronics. **203**

Six-page technical bulletin covers specifications and applications of **Model 1500 color film camera with new Black Paint**, allowing adjustment to poor film with instant return to normal colorimetry. Cohu. **204**

**If you operate an
FM station with
100,000 watts E.R.P.,
there's one
transmitter that's
best for you.**



The Gates FM-20H3

Designed for maximum efficiency and minimum operating cost, this three-tube, 20,000-watt transmitter features

- Highly efficient amplifier circuits and conservatively-rated components for economy.
- Dependable Gates "Vari-Line" silver-plated tank.
- HV silicon power supplies
- Automatic recycling.
- Full metering
- Motor-driven output control. (Automatic output power control optional.)
- Plug-in stereo and SCA generators.
- Gates solid-state TE-3 exciter that's unsurpassed for fidelity and stability.

And a lot more that makes the FM-20H3 the finest transmitter available for Class C FM stations. Write for more information.

HARRIS
GATES DIVISION
Quincy Illinois 62301 U S A

Circle 140 on Reader Service Card



HF STILL MAKES THE BEST HEAVY DUTY TRIPOD.



TECHNOLOGY INCORPORATED
HF PHOTO SYSTEMS DIVISION
 mfr. of HOUSTON FEARLESS Products
 11901 West Olympic Blvd., Los Angeles, California 90064
 Tel. 213/472-4331

ASK FOR OUR NEW
 COMPLETE CATALOG
 & PRICE SHEET.

Circle 141 on Reader Service Card

ceiver). The actual cable is triaxial (as the PC-100) which also carries power. As mentioned, all camera control settings are automatically retained in the camera head in the form of IC circuitry.

The camera is ideally suited for remote-control work and, in fact, Philips had one unit on a motor boat out on Lake LeMans, sending pictures back to the studio which were mixed and switched at will without a glitch.

Philips was quite proud of its LDK-15, billed as a portable LDK-5, useful in all light-level conditions.

Also given prominent attention was the continuous "in-transmission" analysis of TV picture distortion provided by the PM5578. This new system inserted signals that could be checked along the signal chain to determine loss, tilt, static and chrominance non-linearity and other tests. Alarms went off if a parameter didn't measure up. Other Philips products included cassette recorders and CATV equipment (including an interactive home terminal).

RCA stressed "automatic" performance much as it did at NAB. Automaticity was highlighted by the new TCP-1624 film cartridge projector, the TCR-100 video-tape cartridge and automatic correction in the TK-28 film chain and the TK-45A camera. New from RCA was the TPR-10 portable recorder.

Ampex showed its full line of VTRs and put on a news show to demonstrate the capability of the ACR-25. Featuring humorous British commercials,* the show was more interesting to watch than that at NAB. Editing capability was also stressed.

RCA made a good point on the flexibility and utility of this new class of recorder. The program "London Weekend" uses the TCR-100 to show sports clips and other short segments that would otherwise tie up four reel-to-reel machines—or a lot of time cutting, editing, and dubbing.

Marconi stressed cameras plus the new integrated telecine which it

Mister, Have I Got

- **PULSE CROSS MONITOR***
WITH AUDIO — \$595
- **WAVEFORM AND VIDEO MONITOR**
COMBO — \$995
- **WAVEFORMONITOR™***
INT. or EXT. SYNC — \$595

* PORTABLE AND RACKMOUNTABLE

Something for You!

Particularly for CCTV, CATV, ETV and ITV

Ultra Audio Products
 BOX 921
 BEVERLY HILLS
 CALIFORNIA 90213
 (213) 849-1433

REQUEST BULLETIN NO. BM973

Circle 142 on Reader Service Card

introduced at the NAB. It also highlighted its transmitter monitoring system described in *BM/E* in April. Gates took to Montreux color cameras (the TE-201 adapted to PAL), transmitters, and its digital touch-control programmer for radio automation.

Other American manufacturers at Montreux, showing pretty much the same equipment displayed at NAB, were Broadcast Electronics,** Dynair, EMCEE (including Bogner), Grass Valley, Moseley, Quick-Set and Telemet.

Memorex, 3M, TeleMation, and Tektronix were present, but listed as companies from Great Britain or elsewhere. Intertec, S. A. from Switzerland showed a line of American products including Datatran, Datavision, and Recortec. Schafer automation equipment was shown by EMI.

We already mentioned the heavy emphasis on test equipment and, of course, Tektronix was a leader. A small British company has an attractive line of equipment which paralleled many Tektronix products. Systems Video, Inc. (24

Guildford St., Chertsey, Surrey, England), had waveform monitors and vectorscopes with good specs, in compact size and at low prices. This company was talking to several who were interested in exporting it to the U.S. and these may be seen in the American market soon.

Closed-circuit TV equipment was prominent at Montreux, reflecting increased interest in this sphere. Thus, Dynair and TeleMation found interest in their products. There was ample competition, however, from Grundig (VTRs) and Schlumberger.

Audio consoles on display were exceedingly attractive in design—particularly those by Schlumberger. Its digitally programmable sound mixing console was a knockout. Program level, position, equalization and other functions are controlled in BCD code. Attenuators used MOS analog switches and were digitally controlled. Each

*Although British commercials are outstanding, there was a lot of terrible slap-stick comedy, vintage Morey Amsterdam, shown.
**Interesting sidelight—In this Swiss land of timepieces, Broadcast Electronics found keen interest in its large-dial American-made clock.

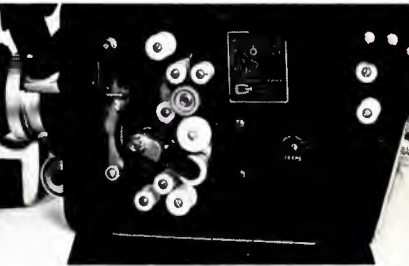
continued on page 66

SYSTEM
CP-16 **NEW** from
cinema products

CRYSTASOUND 3XL Magnetic Record/Playback Head



■ Three times the life expectancy of standard Auricon-type mag heads. 3XL mag heads are built with a special hard alloy which provides extra long wearing time. ■ No adjustments are required. 3XL record and playback heads are mounted on a common pivot arm assembly which guarantees positive azimuth alignment for the entire life of the 3XL module. ■ 3XL mag heads are compatible for use with all 16mm single system sound cameras which accept Auricon-type mag heads (such as CP-16 and CP-16/A cameras).



3XL mag head shown installed in CP-16/A camera.

For further information,
please write to:

cinema

E Technology In The
Service Of Creativity

products
CORPORATION

2044 Colner Avenue, Los Angeles, California 90025
Telephone (213) 478-0711 ■ Telex 69-1339 ■ Cable Cinedevco

Alignment Problems?



Not with Fidelipac's
new easy to use Automatic
Tape Cartridge alignment aids! Keep
your cart equipment in perfect working order with:

- Fidelipac's 350 STA Alignment Cartridge
- Fidelipac's 350 STF Wow and Flutter Cartridge
- Fidelipac's Head Insertion Gage
- Fidelipac's Height Gage

Each one available individually or combined in a money saving kit with bonus booklet, ALIGNING YOUR CARTRIDGE SYSTEM.

Available through your Fidelipac Distributor. Order them now so you'll be broadcasting the perfect cart sound your listeners deserve.

Aligning
Your
Cartridge
System

FIDELIPAC®

3 Olney Avenue, Cherry Hill, N.J. 08034
(609) 424-1234

Fidelipac is a registered trademark of TelePro Industries Incorporated

Circle 143 on Reader Service Card

Circle 144 on Reader Service Card

READY!

LPB's **dj** mini-studio systems come complete and ready for on-air, recording studio or remote operation. Every system is tops in value...unmatched even by higher priced systems! Included are:

- Console.
- 2 Professional 3-speed 12-inch Turntables.
- 2 12-inch Tone Arms.
- 2 Stanton Cartridges with styli.
- Turntable Equalizer/Preamplifier... 2 for stereo.

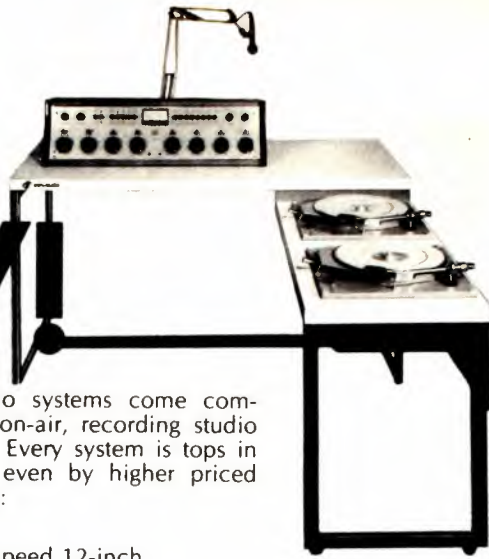
There's a full range of complete systems to choose from... each with sturdy, handsome, white Formica® top furniture over blue textured finish steel legs and supports.

LPB offers a complete line of broadcast audio equipment. Call or write us for all your audio needs, from mike stands to headphones.

LPB

LPB Inc.
520 Lincoln Highway, Frazer, Pa. 19355
(215) 644-1123

Circle 145 on Reader Service Card



MONTREUX

channel can be controlled by a pre-recorded program. A display on the console provided a direct indication of gain, source, etc.

Soundcraft of Switzerland showed some impressive audio mixing consoles for video.

It's not possible to run down every exhibit in this report, but another that stood out by virtue of impressive design (and size of exhibit) was Siemens. The company showed sound mixing desks, a portable mixing desk, instruments, magnetic film units, carrier wave systems for the German Federal Post Office, microwave equipment and other items, including CATV equipment.

There were specialty items on display: An electronic subtitler from Tore Seem and modular TV switching and distribution equipment from Norway; a color-from-black-and-white scheme by GX Holding Co., Ltd.

We saw Bild-Ton-Senders by AEG (a giant transmitter) and Color Image Sensing Equipment (a TV camera) from another company. Such terminology variances and language barriers probably caused us to miss other interesting items!

Cable TV was big at Montreux

The only two American manufacturers present were Coral/Vikoa, which had licensed its technology to ACEC, the Belgian firm; and Times Wire, through an affiliate. But European firms had impressive displays. These included Siemens, Robert Bosch, Philips, EMI, and Hans Kolbe & Co. (Spiegel). European design did reflect a different approach to the market. Basically, the Europeans are less concerned about shielding integrity. This could be a serious flaw. Reason for the European casual approach to connections and shielding (and greater interest in simple-to-install design) lies in less crowding of the spectrum and not much use of midband to date. Europe sees little need for more than 15 or so channels and are less concerned about co-channel interference, ghosts, etc.

There was some new technology in evidence, however. EMI had a long-reach trunk amplifier that could cascade 84 amplifiers in 35

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 install three new heads in your full track Ampex assembly for only \$112.00... Scully at \$222.00. Or, wear permitting, an Ampex or Scully three head reconditioned assembly for only \$45.00.

VTR audio is priced at only \$350.00 for four new heads installed, or \$100.00 for four reconditioned heads. (Add \$35.00 if monitor post needs lapping.)

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 146 on Reader Service Card

km; and Bosch showed a system that converted trunk signals to UHF at the feeder line, thus avoiding the need for set-top converters.

NEW TAPE cont. from page 40

address track. Price is in the \$70,000 to \$90,000 range.

The RCA QUAD II approach now being constructed expects to have a tape speed of 15 cm/s (with two-inch tape), two high quality audio tracks and video which meets EBU objectives. Signal-to-moire will be improved and segmentation errors low. The machine will be able to use high energy tape for improved signal-to-moire ratios. RCA expects to be able to use narrower video tracks and to reduce guard bands to get room for a second audio track. This is possible with the state-of-the-art head design and servo capability according to Luther. Video performance is upheld by use of a super highband modulator and a time base component plus a chroma compensator which uses a continuous inner pilot

tone in the recording signal.

RCA says the QUAD II machine will be switchable to play standard quad and therefore calls it a compatible new standard. (See box for more details.)

Ampex contemplated the following changes: "as a small adjustment of several parameters." It is running experiments to test:

1. Reduction of the headwheel radius by about 1.5 mm.
2. Reduction of the vacuum guide radius by a slightly smaller amount from 26.24 mm to about 24.8 mm. This reduces the head-to-tape pressure and allows the use of ferrite heads and thus longer life.
3. Modify the entrance geometry of the vacuum guide to minimize disturbances caused by the entry of the video head onto the tape.
4. Reduce the longitudinal tape speed to at least 19 cm/sec and possibly to 12.5 cm/sec. This would require an improved capstan and servo to achieve the necessary tracking stability.
5. Consider the addition of a pilot tone to achieve improved correction of velocity errors and cheaper

time base stabilization.

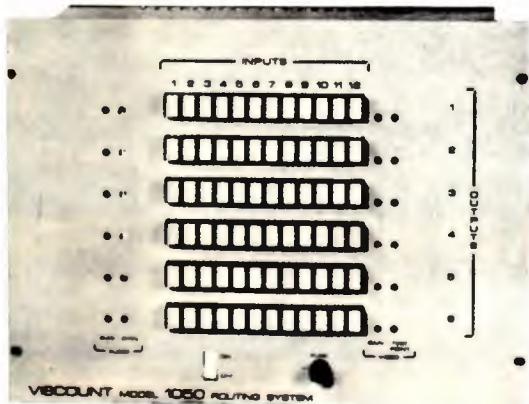
Because the headwheel and vacuum guide radius have been reduced, room is now available for the addition of a second, good quality audio track. Noise reduction schemes may be used. Anderson (of Ampex) said the new format could reduce tape costs by two-thirds and head cost could be halved. Because Ampex would change headwheel dimensions, the machine could not play conventional quad unless the headwheel systems were interchangeable, an approach Ampex is considering.

Both Anderson and Luther looked at various parameters that could be changed—tape, writing speed, tape speed, heads, track widths and format—and the outcome was a case against helical as we shall shortly see.

High energy tape in the 450-500 Oerstad range allows for narrow tracks and lower writing speed and thus less tape usage, even though the cost of high-energy tape is greater.

continued on page 68

PRICES SLASHED



MODEL 1050 ROUTING SYSTEM
THE MOST RELIABLE, LOW-COST SWITCHING MODULE YET

FACTORY ASSEMBLED		PRICE EXAMPLES		
INPUT	OUTPUT	VIDEO	AUDIO	AUDIO/VIDEO
12	X 3	\$ 1200	\$ 860	\$ 1490
12	X 6	1710	1370	2150
12	X 9	2380	1980	3000
12	X 12	2920	2520	3720

VISCOUNT INDUSTRIES LTD.



105 EAST 89th AVE.,
VANCOUVER 15, B. C.

TELEPHONE: (604) 327-9446

Circle 148 on Reader Service Card



We spell quality and excellence another way... INEXPENSIVE!

HERE'S A WAY TO KEEP A LARGE PERCENTAGE OF YOUR MONTHLY BILLING, AND STILL HAVE A FINE QUALITY AUDIO CONSOLE:

M-52 - 5 CH MONO
DUAL OUTPUT
\$675.00

M-82 - 8 CH MONO
DUAL OUTPUT
\$995.00

S-52 - 5 CH STEREO
\$995.00

S-82 - 8 CH STEREO
\$1,895.00

DEALER INQUIRIES INVITED



Audio Interface Systems, Inc.

BIRMINGHAM, ALABAMA

Circle 149 on Reader Service Card

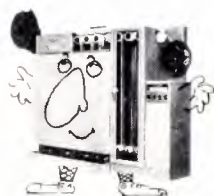
MAXI OUTPUT MINI BUDGET



Little Max, the compact color film processor that performs quality, small volume processing for a small amount of money. Little Max fits the bill without bankrupting whoever foots the bill. Using 8, 16 and/or 35mm film, Little Max automatically processes with CR-100 chemistry in 15 minutes dry-to-dry, as well as the standard ME-4 Process in 28 minutes. And when it comes to quality, Little Max can stand shoulder-to-shoulder with the big guys. Small size. Small price. Big value. Little Max.

That's me

He's the
Personality
Processor



For further information call or write:
Marketing Department.



TECHNOLOGY INCORPORATED
HF PHOTO SYSTEMS DIVISION
Mfr. of HOUSTON FEARLESS PRODUCTS
11801 W Olympic Blvd
Los Angeles Calif 90064 (213) 272-4331

LITTLE MAX

Circle 150 on Reader Service Card

NEW TAPE

Anderson said there may be trouble doing high speed tape duplication if the writing speed is too fast—wavelength should be more than 2.5μ meters. Ferrite heads currently cannot be used with the quadruplex format because the head-to-tape pressure is too high—although, as Luther points out, this pressure minimizes dropouts and thus is some compensation for the shorter quad head life.

One of the greatest advantages of the helical format is the need for fewer heads, and thus overall circuitry is reduced. The disadvantages, however, are the time base error caused by perturbations in longitudinal tape speed since the track lies close to the direction of travel. Tape tension control is a critical factor, otherwise the length during playback and recording is different, producing hooking.

Anderson cautioned that there might be tension problems when wrapping tape around a guide, head, or scanner. He warned against relying on air flotation (to reduce friction), since changes in tension, humidity, condition of tape, and temperature could cause tape to cinch.

He also warned against long lengths of tape being wrapped around the scanner since tracking problems are magnified.

Because segmented helical lies in between helical and transverse, it is something of a compromise. No vacuum guide is necessary and because of lower pressures head life is long. But the segmented approach is more susceptible to time base disturbances and tension factors than is quad. Because the scan is broken, picture segmentation may be a problem.

Neither helical nor segmented helical tape can be mechanically spliced. Accordingly, quad is still an attractive format. Vacuum guiding is troublesome both in automatic threading and in the high head pressure that results. Ampex, accordingly, would change the vacuum guide radius as noted earlier to reduce pressure.

If pressure is reduced enough to permit ferrite heads to be used, operating costs will be lower. Thus the only advantage helical would have

over quad is the fewer number of heads and associated circuitry. On a total cost effectiveness/performance analysis, this is a saving of only 10% according to RCA. Anderson analyzed some ten cost factors and drew the same conclusion. He concluded: "The most successful format will be the one resulting from a careful engineering consideration of the technical trade offs when considered against the overall requirements." **BM/E**

THE LEADER IN CATV TOWERS

"Quality—Service
and Price!"



Yes, quality, service and price on CATV systems are the reasons for Fort Worth Tower's position as the industry's leading supplier. Experience gained as a pioneer supplier of CATV enables Fort Worth Tower to provide you with a quality product at a price that is reasonable and attractive.

Take advantage of our experience. For assistance in systems planning, engineering and complete systems quotations . . .

CALL OR WRITE TODAY

Fort Worth Tower

COMPANY, INCORPORATED

P.O. Box 8597, Fort Worth, Texas
(817) JE 6-5676

—Associated Companies—
Tommy Moore, Inc.
Big State Engineering, Inc.
Tower Construction Finance, Inc.

Circle 151 on Reader Service Card

A NOISE FREE AGC AMPLIFIER WITH A DYNAMIC RANGE PRESERVER



WILKINSON ELECTRONICS GCA-1
STEREO OR MONO

- * Noise - -75db even with loss of input. Automatically "rides" gain without regard to peaks. Exclusive RMS Detector preserves dynamic range. Will not adjust gain if signal removed.
- * Distortion - 0.1% all gain settings.
- * Frequency Response - $\pm 1/4$ db 50HZ to 20KHz any gain setting.

For complete details write:

**WILKINSON
ELECTRONICS, INC.**

1937 MacDADE BLVD.
WOODLYN, PA. 19094
PHONE (215) 874-5236 874-5237

Circle 152 on Reader Service Card

A LIMITER WITH INSTANTANEOUS ATTACK--LESS THAN 1% DISTORTION



WILKINSON ELECTRONICS LA2-C/S
STEREO OR MONO

- * Distortion - $1/4$ % for 6db of limiting. 1% or less to 20db of limiting.
- * Attack Time - $5/4$ Radians for gain control before clipping.
- * Overlimit Attack Time - Instantaneous.
- * Compression Ratio - More than 35:1.
- * Frequency Response - + 1db 50Hz to 35KHz with full limiting.

For complete details write:

**WILKINSON
ELECTRONICS, INC.**

1937 MacDADE BLVD.
WOODLYN, PA. 19094
PHONE (215) 874-5236 874-5237

Circle 153 on Reader Service Card

TWO NEW TEST INSTRUMENTS FOR DIRECTIONAL ANTENNAS



**FSM-1
FIELD STRENGTH METER**
Frequency: Any frequency in the
AM band
Field Strength Range: 100 μ V/m
to 1V/m
Power: Internal battery
Calibration certificate supplied
Size: 5-1/2" x 8" x 5"
(closed); Weight: 4-3/4
lbs. with batteries

DAM-1 DIGITAL ANTENNA MONITOR

Frequency: Any frequency in
the AM band; Phase Range: $\pm 180^\circ$;
Phase Accuracy: $\pm 1.0^\circ$; Phase Resolu-
tion: $\pm 0.1^\circ$; Ratio Range: 0.100 to 2.000;
Ratio Accuracy: $\pm 2.0\%$; Ratio Resolution:
 ± 0.001 ; Input Impedance: 50 or 75 ohms



Delta's new Field Strength Meter and Digital Antenna Monitor will help keep your directional antenna system within FCC specifications.

The DAM-1 Antenna Monitor meets the new FCC requirements for remote control. It is a true digital instrument using the latest integrated circuit and TTL techniques. Reads phase and true current ratio for up to six towers with different reference towers and different powers for DA-2. Monitors for larger arrays available on special order.

Delta also offers remote panels and interface units for controlling and reading the DAM-1 Phase Meter over multiconductor, two wire, UHF, or microwave circuits with no reduction in accuracy.

The FSM-1 Field Strength Meter is smaller and much simpler to operate than other field strength meters because it is fixed tuned to your frequency by plug-in modules. If you have to check more than one station, order the FSM-1 with additional frequency modules. For monitor point checks and extensive proof of performance work the FSM-1 will minimize errors and speed up field measurements.

DELTA ELECTRONICS, Department B
5534 Port Royal Rd., Springfield, Va. 22151
703/321-9845

DELTA ELECTRONICS



Exporter: DELTA ELECTRONICS, INC.
International Division, 154 E Boston Post Rd.
Mamaroneck, N. Y. 10543. Telex 1 37327, Art Rocke

Circle 154 on Reader Service Card

BM/E CLASSIFIED MARKETPLACE

CLASSIFIED ADVERTISING RATES

DISPLAY CLASSIFIED ADVERTISING: \$22.50 per inch 1x; \$22.00 per inch 3x; \$21.00 per inch 6x; \$20.00 per inch 12x. ALL OTHER CLASSIFIED ADVERTISING 25¢ per word; minimum \$3.00. BLIND BOX NUMBER: No extra charge. Replies sent to address below will be forwarded to you. PAYABLE IN ADVANCE; send check with order. CLOSING DATE: 5th of 2nd month preceding issue date.

BM/E, Monterey and Pinola Avenues, Blue Ridge Summit, Pa. 17214 Phone 717/794/2191

EQUIPMENT FOR SALE

Ready for Video—painlessly??

We are offering at a fraction of the original cost, a complete 90-line monochrome video facility. Includes: 2 HD A, PK 200, line cameras; 10 V 8 input video switcher with Ball Room special effects; 2 Ampex 400B VTR with E-floors and full audio mixing facilities; complete mix and waveform monitoring. Everything in working order. Shipped in 2 interrupted 10' containers with full length "production" deck. All you need do is supply A.C.

Detailed list and/or visual inspection upon request. Original cost, approx. \$5,000. Make us your best bid.

Norm Friedman
Visual Information Systems
15 Columbus Circle
New York, N.Y. 10023
(212) 511-8000

IVC-960 & I-IVC-900—Both with NEW TMI Time Base Correctors

VTRs are rack mount, base D004 & D100. Supplied with 1 stereo camera each. New VTRs 20K on with TMI link or without VTR in excellent condition. THICK NEW Call J. Ivy (305) 423-8280 or write 617 West Central, Orlando, Fla. 32801

ATTENTION CHIEF ENGINEER!

Update your old Ampex with our Solid State Electronics OR trade it in against our LB 250 Receiver. Clear Glass and Ampex Electronics and Dual assemblies off your maintenance deck. Send them to us for money.

Lang Electronics, 11 East 99th St. New York City 10016
(212) 725-8110

FIELD STRENGTH METER, 540 KHz to 5MHz, Ten microvolts to 10 volts per meter. New solid state design, long battery life. Stable accurate calibration. Free literature. Solar Electronics, 901 No. Highland Ave., Hollywood, Cal. 90038

Sennheiser MKH 405 Package, 5 MKH 405 Condenser Microphones, 5 MZA 6.2 battery adapters, 2 M2N 5-1 AC power supply, cables, \$1400 SHURE M-67 mixer remote amp \$70 Scotch 101" aluminum reels new, \$2.00. With Boxes \$2.25. Limited quantity. Write to box 773-1, c/o BM/E, Blue Ridge Summit, PA. 17214.

AMERICA'S LARGEST STOCK AND ASSIGNMENT LISTING of new and used broadcast and recording equipment. We trade-sell and buy. THE MAZE CORPORATION, P.O. Box 6636, Birmingham, Ala. 35210

CAPSTAN IDLERS for AMPEX 300, 35 440 Series, self aligning with replaceable ball bearings, \$22.50 net. VIE INTERNATIONAL, Box 1555, Mtn. View, Ca. 94040.

Surplus Audio Patch Panels All Standard Configurations. Gulf Telephone & Electronics, Inc. 6235 Beverly Hill, Houston, Texas 77027.

FOR SALE—Scully 270-2 Half-Track Stereo Reproducer, 3 years old. Excellent condition for \$1200. Contact Radio Station KSMI-M, P.O. Box 631, Salem, Oregon 97308. Phone: (503) 364-8433.

Two, General Electric PE-250 Color Camera Chains less mounting and monitoring equipment, \$9000 each. WKNO-TV, c/o Memphis State University, Box 80,000, Memphis, Tenn. 38152. (901) 458-2521.

PROFESSIONAL RECORDING AND TEST EQUIPMENT for recording studios and broadcast—Altec, Ampex, 3M, G.R., HP, Tektronix—new and used. Free equipment list or drop in. Chas. F. Washburn Co., 6114-M Santa Monica Blvd., Hollywood, Ca. 90038

EQUIPMENT FOR SALE (Cont'd)

APECO VIDEO VALUES
Below O.E.M. importer's cost — a complete product line close out, including camera monitors and accessories. Order now and save! Equipment in any quantity while monitor was \$110. Now \$95. A position Panovue Switcher was \$35. Now \$29. Viewfinder Camera Was \$229. Now \$149. 25 MM 5:14 Lens Was \$10.50. Now \$9.

CALL FOR MORE INFORMATION
APECO VIDEO SYSTEMS
2100 Dempster Street
Evanston, Ill. 60204
(312) 869-9000

BROADCAST AND RECORDING EQUIPMENT—Sully, V.I.E. International, Metrotech, Langevin, Electrodyne, Q.R.K., Micro-Trak, MRI, Nortronic, McMartin, U.F.E.L., Neumann, J.V., A.K.G., Sennheiser, Tascam, Atlas, Ferrigraph, HAFCO, Stevenson, Gately, D.B.N., Advent, Altec, Fairchild, Audio Designs, 3M, Magnecord, Telex, Inovonics, Nagra, Uher, Lutz-Athlon, Package Deals, Installations, Service, Request Flyer Weigand Audio, Middleburg, PA 17842 (717) 837-1444.

PARTS—for SPOTMASTER & TAPECASTER cartridge units. IN STOCK. Immediate delivery, overnight to Penna, New York and New Jersey. Pressure rollers for all machines. LOW PRICES. Some used parts in stock. COMMUNICATION MEDIAS, Box 54, Allentown, PA 18105. (215) 437-0607 or 437-9447.

QUALITY AUDIO CONSOLES are our specialty. Modern styling with slide faders. We manufacture eight standard consoles at very competitive prices. However, if you prefer, we'll manufacture a custom system to your specifications. Also, plug-in audio modules including distribution amplifiers, pre-amplifiers, monitor amplifiers, etc. Write or phone for prices and specifications. SYSTEMS ENGINEERING COMPANY, P.O. Box 49224, Atlanta, GA. 30329. (404) 482-2446.

Texas, an Model 9300A Sweep Spectrum Analyzer for sale complete with variable Impedance bridge, connector adaptor kit, Harmonic markers and instruction manuals. Only one year old and just returned from factory for complete check-up. \$3500. George F. Gardner, Box 38, Carlisle, PA 17013.

COLLINS finest 26U-3 AUTO-LIMITERS and 26I-3 AUTO-LEVEL amplifiers. Two of each. Mint condition. Perfect for stereo FM. Less than 1 year's use. The four units cost \$200. Will take \$75 for the four. You pay shipping. Box 119, Salem, Ill. 62881. (618) 548-2000.

If you can name the original owner, call letters, Street location, City, Power, Frequency, etc. of your station, then a profile from Broadcast Pro-File isn't for you. Send for free catalog listing profiled stations. Broadcast Pro-File, P.O. Box 982, Hollywood, CAL. 90028.

The complete and reliable source for new and used broadcast equipment. Request our free listings. Broadcast Equipment and Supply Co., Box 3141, Bristol, Tennessee 37620.

MICA AND VACUUM transmitting capacitors. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 1147 Venice Blvd., Los Angeles, Cal. 90015 (213) 382-6985.

4—650 ft. towers \$6500 each. Many more. Ground wire 85¢ per xx. lb. Bill Angle, Box 55, Greenville, N.C. 27834. Tel. 919-752-3040.

One stop for all your professional audio requirements. Bottom line oriented. F.T.C. Brewer, Box 8057, Pensacola, Fla. 32505.

WE BUY TUBES, TRANSISTORS & CAPACITORS. Send your lists of sale items. Specialty Supply Ltd., P.O. Box 22391, Denver, Colo. 80222.

EQUIPMENT FOR SALE (Cont'd)

CARTRIDGE TAPE EQUIPMENT—Rebuilt. New paint, heads, flywheel, pressure roller, belts etc. Spotlessly clean and thoroughly tested. 30 day money-back guarantee, 90 day warranty. Also contact us for possible discounts on new equipment and accessories.
AUTODYNE, Box 1004,
Rockville, Maryland 20850
(301) 762-7626).


MOTORS FOR SPOTMASTERS
NEW Papst hysteresis synchronous motor HSZ 20.50-4-470D as used in series 400 and 500 machines. Price \$39.00 each, prepaid while they last. 90 day warranty. Terms check with order only, no COD's. Not recommended for Tape-caster series 600 or 700.
TAPECASTER TCM, INC., Box 662
Rockville, Maryland 20851

Solid-state audio modules-console kits, power amplifier kits, power supplies, Octal plug-in-mic, eq. line, disc, tape play, tape record, amplifiers. Audio & tape bias oscillators. Over 50 audio products. Send for free catalog and applications. Opamp Labs, Inc., 172 So. Alta Vista Blvd., Los Angeles, Calif. 90036. (213) 934-3566.

MOVIOIA 35 MM. Mint condition. US-20-CS. Original Owner. Reply to Box 973-1, c/o BME, Blue Ridge Summit, PA. 17214.

PROGRAM SERVICES

TAPES FOR AUTOMATION



THE **CnB** STUDIOS
Specializing in Custom Services
3415 BERESFORD AVENUE
BELMONT, CALIFORNIA 94002
415 / 592-6149

"Free" Catalog . . . Everything for the deejay! Comedy, books, airchecks, wild tracks, old radio shows, and more! Write: Command, Box 26348-A, San Francisco 94126.

Deejays! 11,000 classified gag lines. \$10.00. Unconditionally guaranteed. Comedy catalog free. Edmund Orrin, Box 679-M, Mariposa, Cal. 95338.

OLD RADIO PROGRAMS FOR SALE. Send \$1.00 for a fabulous catalog listing 25 years of radio's greatest shows. Vintage Radio, P.O. Box 2392, Culver City, CAL. 90230.

INSTRUCTIONS

FCC FIRST CLASS RADIOTELEPHONE LICENSE IN SIX WEEKS. Classes in Dallas, Atlanta, Denver, Ft. Worth, Hartford, Houston, Memphis, Nashville, New Orleans, Oklahoma City, and San Antonio. For information contact Elkins Institute, 2727 Inwood Rd., Dallas, Tex. 75235 214/357-4001.

ATTENTION VETERANS! First class license in five weeks with complete theory and R.C.A.-equipped laboratory training. Approved for veterans Tuition \$333.00. Housing cost \$16.00 per week. American Institute of Radio, 2622 Old Lebanon Road, Nashville, Tenn. 37214. 615-889-0469.

First phone through tape recorded lessons at home plus one week personal instruction in Washington, D.C., Atlanta, Boston, Detroit, New Orleans, Minneapolis, Seattle, Denver, Portland, Los Angeles. Proven results. Our 17th year teaching FCC license courses. Bob Johnson Broadcast License Training, 1060D Duncan, Manhattan Beach, Calif. 90266. 213-379-4461.

Engineers

FIELD SERVICE ENGINEERS

International Video Corporation, the leading manufacturer of videotape recorders and television color cameras, is expanding its aggressive marketing effort in the Central and Eastern regions.

Experienced field engineers are required to install, demonstrate, and service IVC products in the field as well as service maintenance at the regional office.

Positions require individuals with 2 years technical school and 2 years experience in service maintenance of videotape recorders and/or television color cameras.

For immediate consideration, please write or call: Mr. Charles M. Nowell, IVC, 1920 Waukegan Road, Glenview, Ill. 60025, (312) 729-5160, or Mr. John A. Bollo, IVC, 5 Corporate Park Drive, White Plains, N.Y. 10601, (914) 694-1234. We are an equal opportunity employer m/f.



ENGINEERING ASSISTANTS: with SONY® VIDEO VIDEO CASSETTE opportunities

Due to continuous expansion, the product planning group of a large closed circuit television equipment manufacturing firm is seeking qualified television engineers.

These positions involve technical interfacing with dealers, distributors and end users of our television systems, together with installation of semi-professional broadcast equipment and systems applications.

A strong background in color broadcasting equipment or closed circuit video systems is essential, including all technical aspects of color cameras and helical scan recorders. Several years of directly related experience is a prerequisite for these challenging positions. BSEE degree helpful.

Salaries for these positions are in the \$13,000 range.

These are outstanding opportunities to enter vital segments of the electronics industry, with a world leader in the field. Excellent benefits and opportunities for growth. Travel 30% to 50%.

Send resume, including salary history, in complete confidence to:

Sony Corporation of America

c/o Box 0819BME, Suite 502, 555 Fifth Avenue, New York 10017

Due to growth, this leader/innovator in the electronics industry is in need of additional personnel for its video cassette operations.

Will supervise the troubleshooting of all video cassette tape printing duplicator systems (small to very complex systems), and allied accessories. Will also supervise the installation of these Printing Systems at customer locations as well as assist in the training of customer personnel in the operation of these systems.

BSEE degree preferred. Related experience most helpful.

Experienced salesman of sophisticated video systems to industrial, educational, medical markets or into broadcast and CATV industries. Excellent opportunity with one of the nation's leading suppliers representing top lines. High income potential with all fringes Philadelphia area. Respond in confidence to Pierre Phelps Inc. 2000 N. 59th Street, Philadelphia, Pa. 19131. (215) 477-9000 (Attn: Henry Grove) An Equal Opportunity Employer.

CHIEF ENGINEER—MSO, 90,000 subscribers, pioneer in two-way, dedicated to growth. BSEE minimum, CATV experience desired. Resume to: D. A. Purcell, V.P. TeleCable Corporation Box 720, Norfolk, VA. 23501.

PROFESSIONAL CARDS

COHEN & DIPPOLL
CONSULTING ENGINEERS
Formerly GEO. C. DAVIS
527 Munsey Bldg.
(202) 783-0111
Washington, D. C. 20004
Member AFCCCE

JANSKY & BAILEY
TeleCommunications Consulting
Department
CATV & CCTV
Phone 703/354-3400 ext. 722 or 2400
Shirley Hiway at Edsall Road
Alexandria, Virginia 22314
Atlantic Research Corporation

CHU ASSOCIATES, INC.
Telecommunications Division
AM—FM—TV—CATV
Applications—Facilities Planning
Field Surveys and Proofs
Appraisals
800 Fesler St., El Cajon, Ca. 92020
(714) 442-9459
TWX 910 331 1178

VIR JAMES
CONSULTING RADIO ENGINEERS
Applications and Field Engineering
Computerized Frequency Surveys
345 Colorado Blvd.—80206
(303) 333-5562
DENVER, COLORADO
Member AFCCCE

BROADCAST STUDIO DESIGN
Control Systems, Facilities Planning,
Plant Layout & Manufacturing
DYMA ENGINEERING, INC.
Route 1, Box 51, Taos, New Mexico 87571
Phone: 505/758-2686

RALPH E. EVANS ASSOCIATES
Consulting Radio Engineers
AM - FM - TV - CATV - ITFS
3500 North Sherman Blvd.
MILWAUKEE, WISCONSIN 53216
Phone: 414-442-4210

McCLANATHAN & ASSOCIATES
Consulting Engineers
APPLICATIONS & FIELD ENGINEERING
TURNKEY INSTALLATIONS — RADIO & TV
Domestic and Foreign
P. O. Box 750
PORTLAND, OREGON 97207
Phone: 503/246-8080

USE BM/E's CLASSIFIED MARKETPLACE TO REACH OVER 28,000 BROADCASTERS!

From 500-watt to 50-kW models, all Gates AM transmitters offer 125% positive peak modulation capability. At full output power.



Now you can increase the impact of your signal without increasing distortion or transmitter carrier power. With 125% capability, you get 2 dB more audio power in the positive peak. An important edge in highly competitive markets.

From the 50,000-watt to the 500-watt model, Gates AM transmitters now offer 125% positive peak modulation capability at full power.

Write for more information on the transmitter for your operation.



HARRIS
GATES DIVISION
Quincy, Illinois 62301, U.S.A.

Circle 155 on Reader Service Card

"8" CHANNEL AUDIO CONTROL

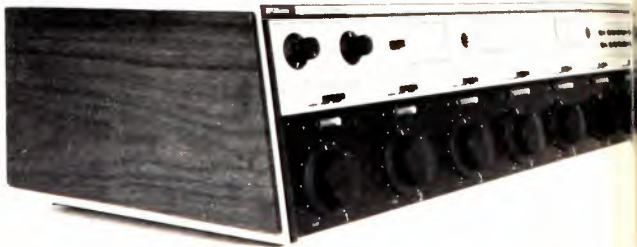
B-800 series

the B-801 monaural \$2350
the B-802 stereo \$3200
B-803 dual channel \$2650

for complete information please contact the Director of Sales Dept B-80

McMartin

console



McMartin Industries Inc. 4500 South Seventy-sixth Street
Omaha, Nebraska 68127 Phone (402) 331-2000 Telex 048-485
Circle 156 on Reader Service Card

ADVERTISERS' INDEX

AEL Communications Corp	CM/E-17
American Electronic Laboratories, Inc.	12
Amperex Electronic Corp	CM/E-5
Ampex Corp.	28, 29
Asaca Corp.	7
Audio Devices Inc.	17
Audio Interface Systems, Inc.	67
Automated Processes, Inc.	13
Belar Electronic Laboratory Inc.	8
Bell & Howell, Audio Visual Products Div.	41
Bethany International, Inc.	18
Blonder-Tongue Laboratories Inc.	CM/E-16
Bosch Corp., Robert, Fernseh Div.	34, 35
Broadcast Electronics Inc.	72
Cetec Inc.	54
Cinema Products Corp.	60, 62, 65
Collins Radio Co.	27
Cosmicar Optical Co., Ltd.	53
Datatek Corp.	60
Delta Electronics	69
Ditch Witch	CM/E-10
Dynair Electronics Inc.	3
Eastman Kodak Co.	CM/E-6, 7
Editel	Cover 2
Electronic Industrial Engineering	CM/E-21
Fidelipac Div. of Telepro Industries	65
Fort Worth Tower Co., Inc.	68
Gates Division, Harris	59, 61, 63, 72
General Cable Corp.	CM/E-12, 13
Grass Valley Group Inc., The	5
Handley Industries Inc.	CM/E-22
Hitachi Shibaden Corporation of America	Cover 3, CM/E-24
International Tapetronics Corp.	63
International Video Corp.	Cover 4
Jerrold Electronics Corp.	CM/E-2
LPB Inc.	66
McMartin Industries Inc.	72
Micro-Trak Corp.	23
Oak Industries Inc. CATV Div.	CM/E-24
Potomac Instruments, Inc.	10
Quad-Eight Electronics	52
RCA	19, 20, 21, 22
RCA Electronic Components	58
Rank Precision Industries, Inc.	51
Richmond Hill Laboratories Inc.	23
Robins/Fairchild	9
Shively Laboratories Inc.	61
Shure Brothers Inc.	56
Spindler & Sapppe	50
Stanton Magnetics Inc.	59
Tab Books	49
Taber Manufacturing & Engineering Co.	66
Tape-Athon Corp.	33
Technology Inc., HF Photo Systems Div.	64, 68
Tektronix Television Products	11, 55
Television Equipment Associates	62
Television Microtime Inc.	15
Treise Engineering Inc.	CM/E-23
Ultra Audio Products	64
Videomax Corp., Sub. of Orrox Corp.	14
Viscount Industries Ltd.	67
Wilkinson Electronics, Inc.	69

SALES OFFICES

Broadband Information Services, Inc.
274 Madison Avenue
New York, New York 10016

EASTERN STATES
274 Madison Avenue
New York, New York 10016
212-585-5320
Charles C. Horner

MIDWESTERN STATES
New York Office

WESTERN STATES
1111 Hearst Building
San Francisco, California 94130
415-362-8547
William J. Healey
16400 Ventura Blvd.
Encino, California 91316
213-981-4721
Art Mandell

JAPAN
Nippon Keisoku Inc.
P.O. Box 410
Central Tokyo, Japan
Tokyo (03) 667-7681
Yoshi Yamamoto

BE Spotmaster

Compressor-Limiter Amplifier



(The Great Leveler)

\$465!

You can stop riding gain now, even when a shouter and whisperer are on the same talk show. The Model CLA 20 40 Compressor-Limiter Amplifier does it automatically . . . instantaneously . . . for both AM and FM. Switchable controls permit symmetrical (FM) or asymmetrical (AM) peak limiting; pre-emphasized or flat response; compress limit, compress only, or compress limit off. Automatic gain control range is 40 dB dynamic, and the compression ratio is better than 10:1. All solid state, plug-in modular construction assures trouble-free reliability. Write for details.

BROADCAST ELECTRONICS, INC.

A Filmways Company

8810 Brookville Rd. Silver Spring Md 20910
(301) 588-4983 • TWX 710-825-0432

**It's not a lot of money
for the camera...**

**it's a lot of camera
for the money**



Hitachi Shibaden's FP-1200 Plumbicon*... the broadcast-quality color camera with the down-to-earth price tag.

Excellent color fidelity and sensitivity, plus three-tube efficiency are just two of the many outstanding features that will make the FP-1200 a valuable addition to your studio operation.

Especially for broadcast, cable, medical, training and educational applications

Consider this feature: low-light-level capability with switchable 6 db gain. Several other reliable TV cameras offer an acceptable, studio-originated picture at 150 foot candles. The FP-1200 is the only low-cost color camera with bias-light. It produces quality color at 10 foot candles.

Another important plus. Serviceability and stable performance mean minimum maintenance.

Add in the many other features you'd expect from a camera like this: 10-1 zoom lens with automatic iris control, built-in encoder, color bar generator, color temperature compensator, horizontal aperture correction, optional extended red, solid state design... to name just a few.

For a live demo, specs and pricing, call or write Hitachi Shibaden... "The Image Makers."

We think you'll agree that the FP-1200 is a lot of camera for the money.



HITACHI SHIBADEN
Corporation of America

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

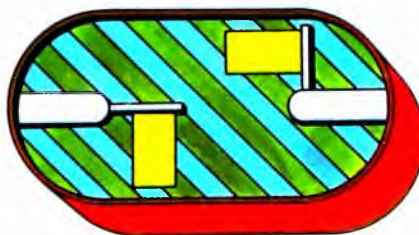
Here are five good reasons to buy IVC's fully-automatic broadcast 240 Film Chain Camera and 4000A Multiplexer. We have dozens more.



Money. We put the latest solid-state circuitry and some clever design techniques into the IVC-240 and the 4000A—not just to make them more reliable, but to give them the industry's finest price/performance ratio. Example: we use costly precision fixtures, like other manufacturers, to align the 240's dichroic mirrors, but to give them the industry's finest price/performance ratio. Unlike other manufacturers, however, we set the mirrors permanently in optical epoxy. The expensive fixtures stay here—but the precise optical alignment stays with the 240—permanently. Features like this hold the price of the 240/4000A combination to less than \$30,000.



A free-standing camera cabinet. Ordinarily, if you accidentally bumped into a film-chain camera, you'd disturb the picture. But when the IVC-240's cabinet is accidentally bumped or nudged, picture positional stability, as viewed on a picture monitor, is virtually unaffected. The reason: the optical system and Vidicon/yoke assemblies are mounted on a separate rigid backbone that is lagged directly into the floor through the sheet metal of the cabinet. The effect is the mechanical isolation of optics and cabinet.



A better mirror system. The IVC-4000A's mirrors swing vertically, like the flag on a taxi meter. This approach makes it difficult for dust to settle on the reflective surfaces and provides a smooth on-air transition; the special tapered mirrors are positioned by self-braking motors in just one fifth of a second. Audio-follow logic is built into the system.



Money again: Having a single neutral-density filter wheel inside the camera for automatic white level is a special cost-saving bonus from the IVC-240. This unique arrangement can save you up to \$4200 by eliminating the usual separate disc for each projector. The lightweight disc and high-torque motor, which are built into the camera enclosure, respond to light level changes up to 100 to 1 in 0.6 second (maximum). And typical changes are compensated for much faster.

An automatic black level circuit complements the automatic white level control. Result: hands-off operation—all day.



It makes your studio look nicer. But we can't tell you all about the 240 and the 4000A here—there isn't room to talk about their minimal maintenance requirements, their exceptional stability, their hands-off operation, their automatic features. We suggest you write to Camera Product Manager at the address below.

We'll be glad to give you all the reasons why choosing IVC is a good move.



IVC
International Video Corporation

International Video Corporation
990 Almanor Avenue
Sunnyvale, California 94086
Telephone: (408) 738-3900