

SEPTEMBER 1973

BM/E

BROADCAST MANAGEMENT ENGINEERING

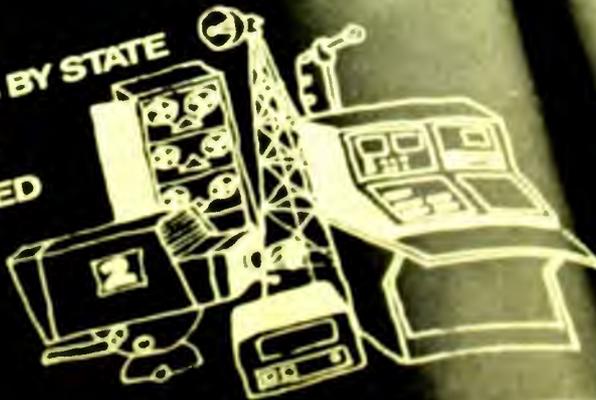
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The Source

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

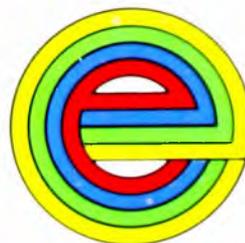
The ENC-1 Hand Held Color Camera



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.



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minithings ahead

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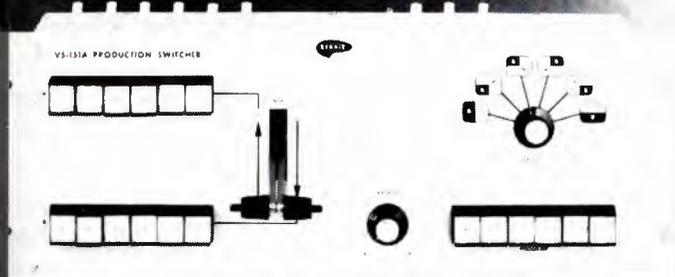
*TM N.V. Philips

Circle 100 on Reader Service Card

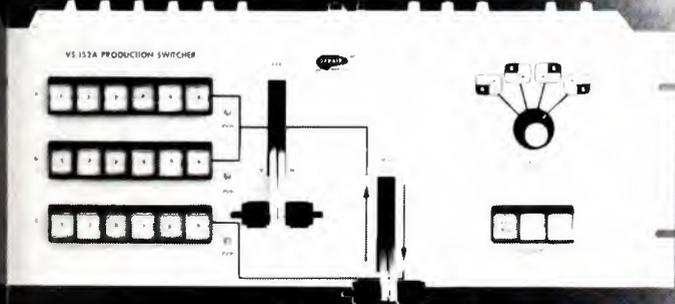
Better performance for less money ...the direct result of high production quantities.



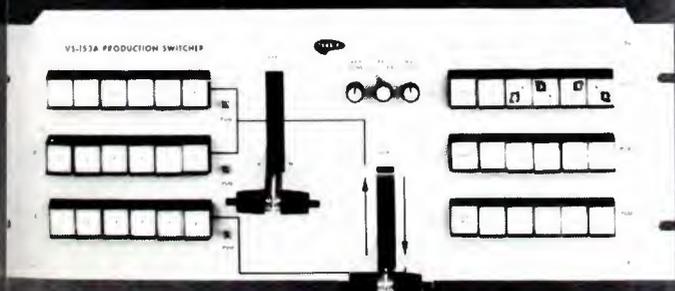
VS-150A VIDEO SWITCHER-FADER



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.

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PHONE: (714) 582-9211

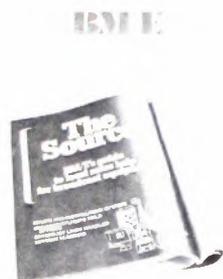
DYNAIR

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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.**
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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

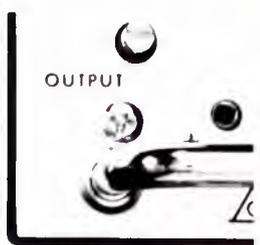
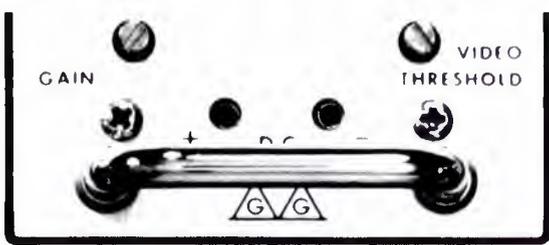
Useful reading materials.

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

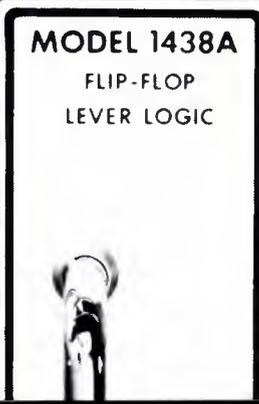
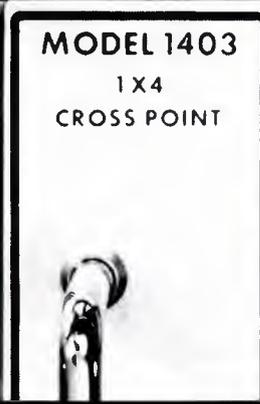
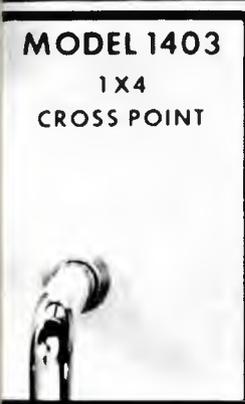
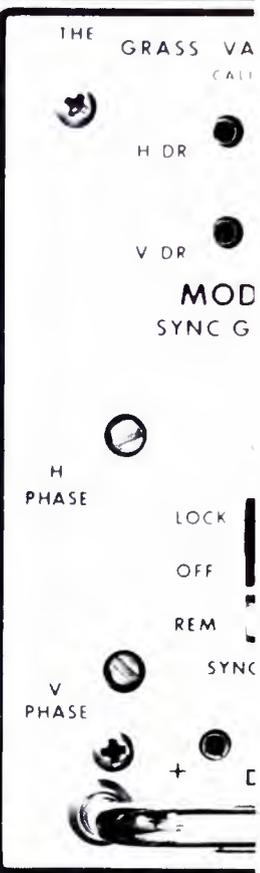


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BROADCAST INDUSTRY NEWS

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

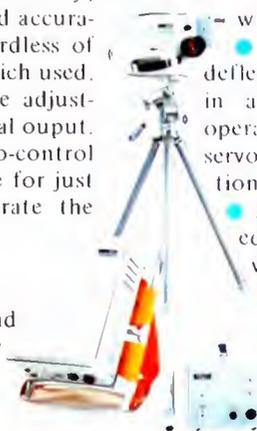
The National Association of Educational Broadcasters has radically revised its top staff structure, as part

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
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• 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.

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....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.



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Where Accuracy Counts . . . Count On Belar

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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.

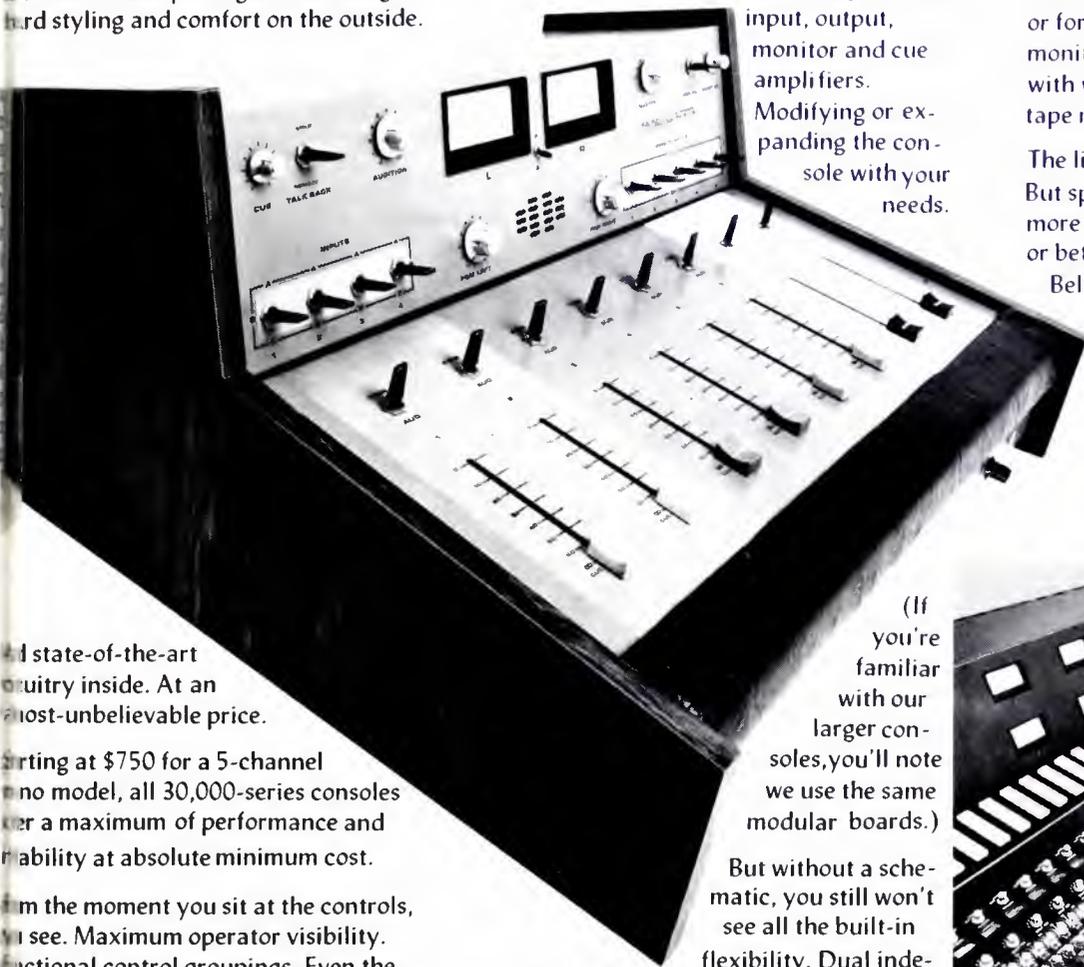
From the moment you sit at the controls, you see. Maximum operator visibility. Functional control groupings. Even the added armrest* you'd expect only on a custom console.

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.



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

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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

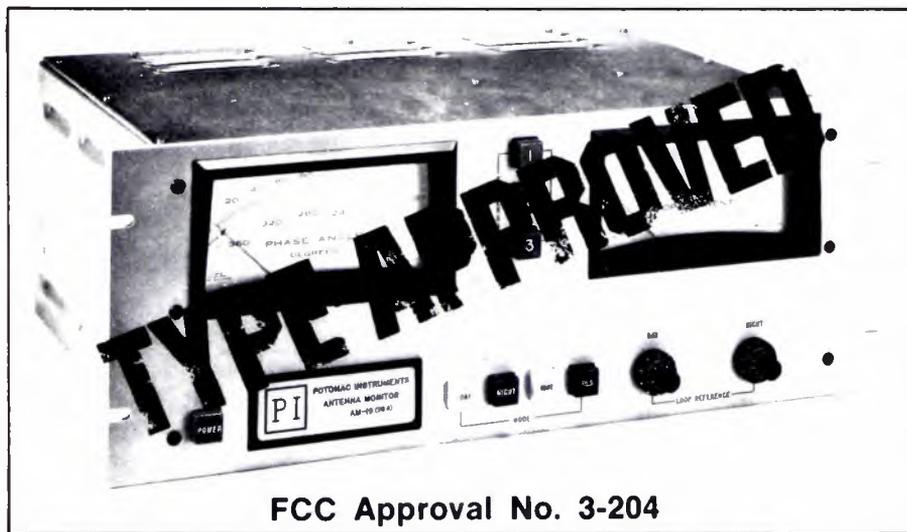
by RCA, will be installed for a test at WLS-TV, ABC-owned station in Chicago. The new antenna, and a comparison antenna of the standard horizontally polarized type, will alternate in rotating the signal from the top of the new 110-story Sears building. Checks will be made at receivers throughout the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

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97005.

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For demonstration, Circle 108.

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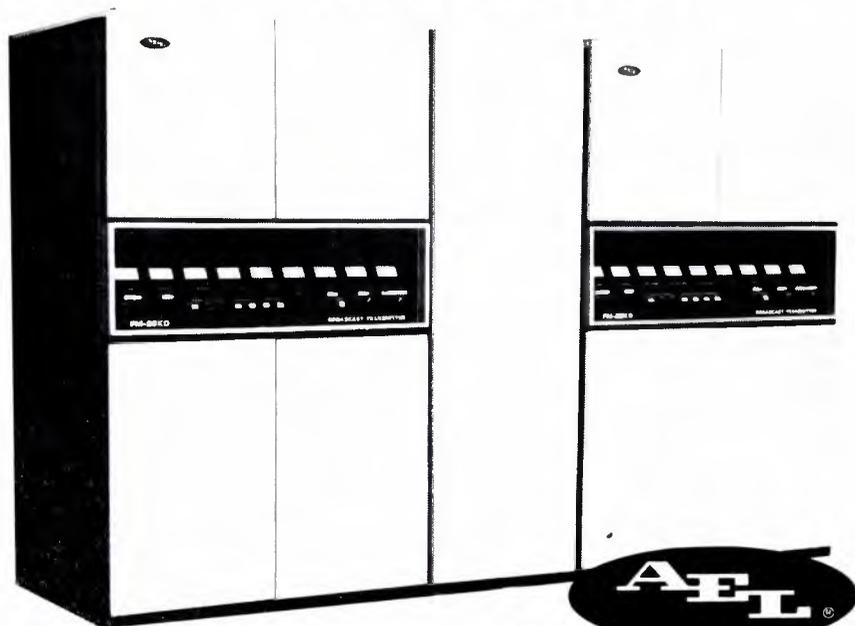
AEL transmitter features: ...five-year warranty ...twenty-year parts availability.

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!



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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

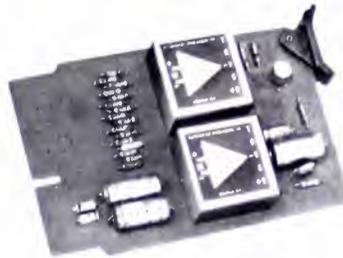
AUTOMATED's *Comprehensive!* CARD SYSTEM

MICROPHONE PRE-AMPLIFIER Model 312



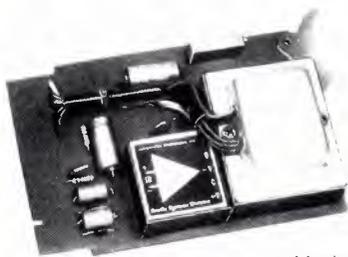
Transformer coupled input and output. Exceptionally low noise (equivalent input -129 dBm) and high output capability with low distortion. Adjustable gain. Input to 0 dBm and output capability +30 dBm. Utilizes Model 2520 operational amplifier.

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.

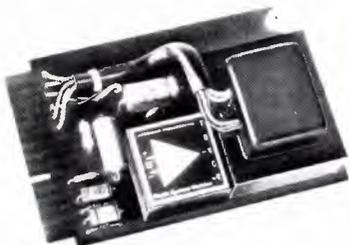
10 WATT POWER AMPLIFIER Model 701



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.

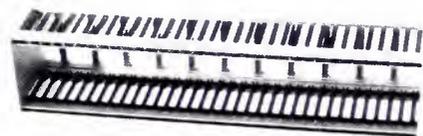
LINE AMPLIFIER • Model 325



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

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COMPRESSORS LARGE POWER AMPLIFIERS
MODULAR
CONSOLES and SYNCHRONIZERS



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Paris, France

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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.

**Videomax-rebuilt
VTR quad head.
Better than new.
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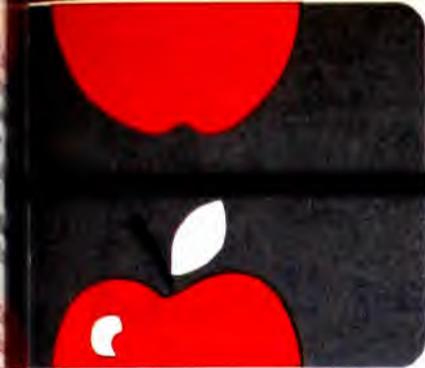
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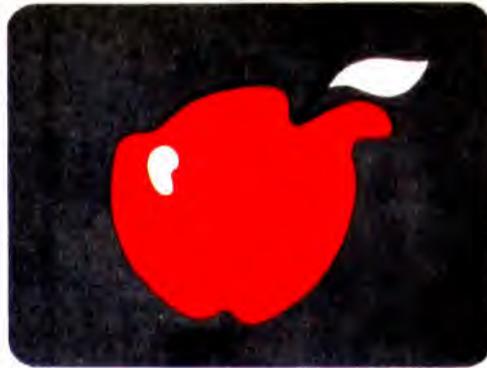
Circle 111 on Reader Service Card



PICTURE ROLLS



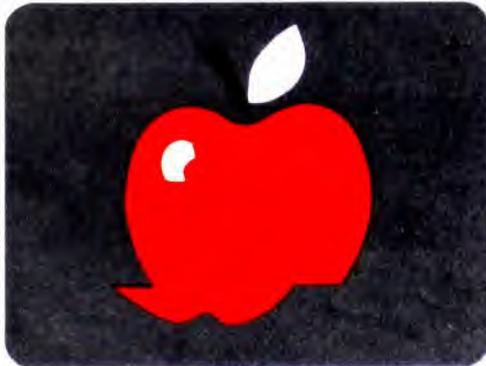
TEARING



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 _____



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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.

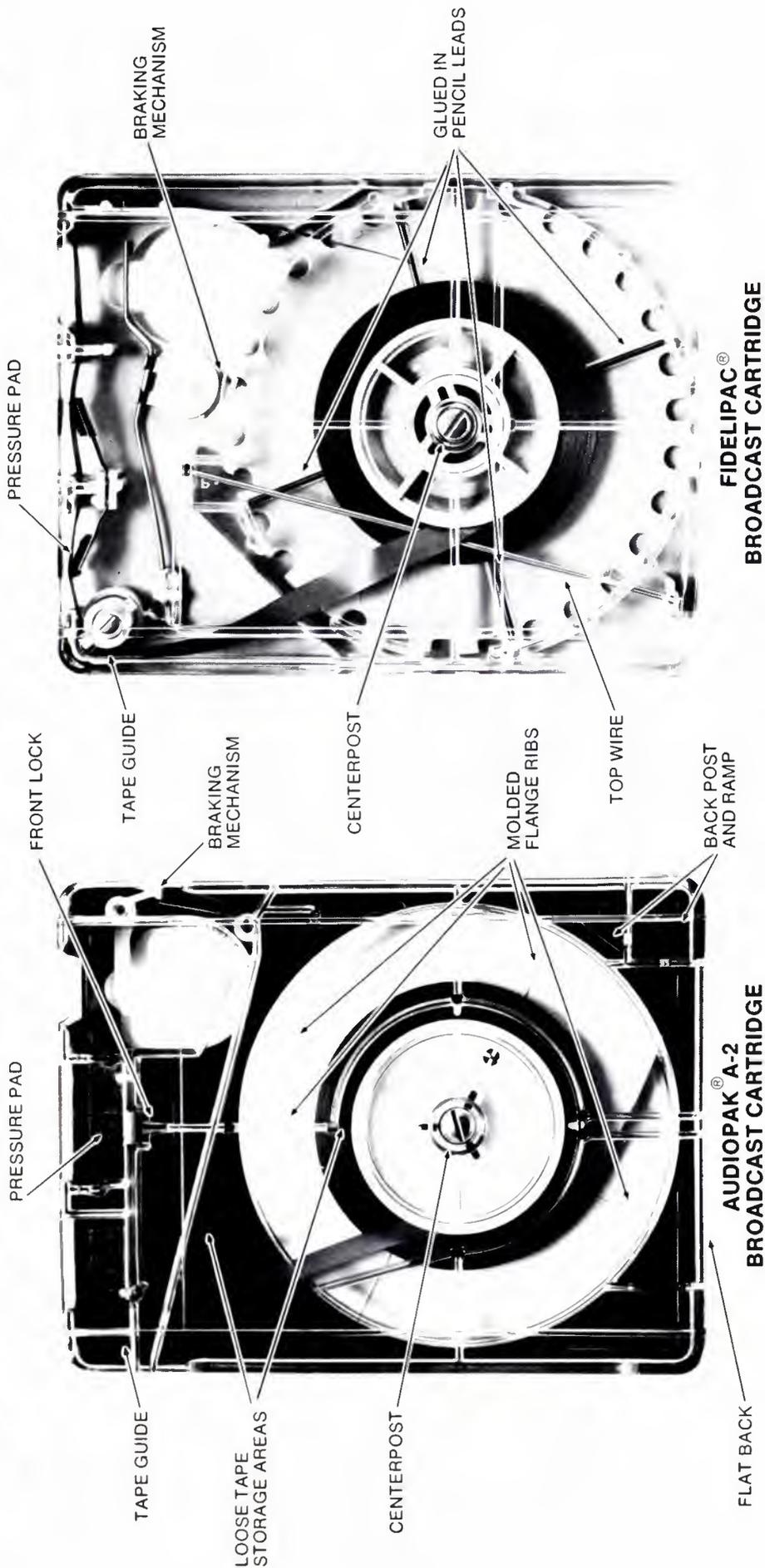
The price list also includes more current reports updating particular aspects of the Census. As many of these may include metropolitan or local statistics, scrutiny of the price list is recommended.

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!



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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.

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Houston, Texas 77036
Phone (713) 783-1260

Formerly



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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.

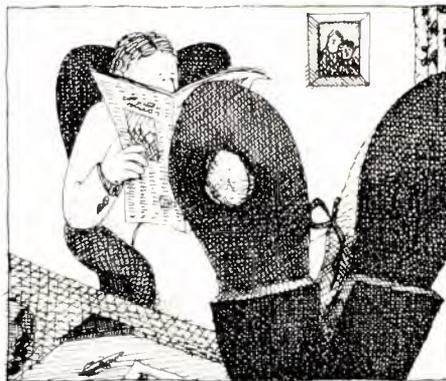
"Our TK-45 Color
Camera...helps you
get more production
done in the time
you have to do it."

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.”

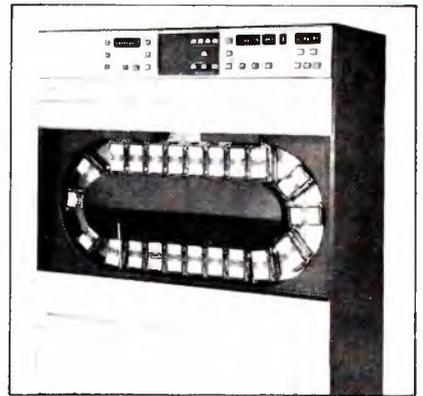
Another advantage that has sold a lot of stations on the Cart Machine is the many ways it can be packaged to serve a user's particular needs.

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

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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.

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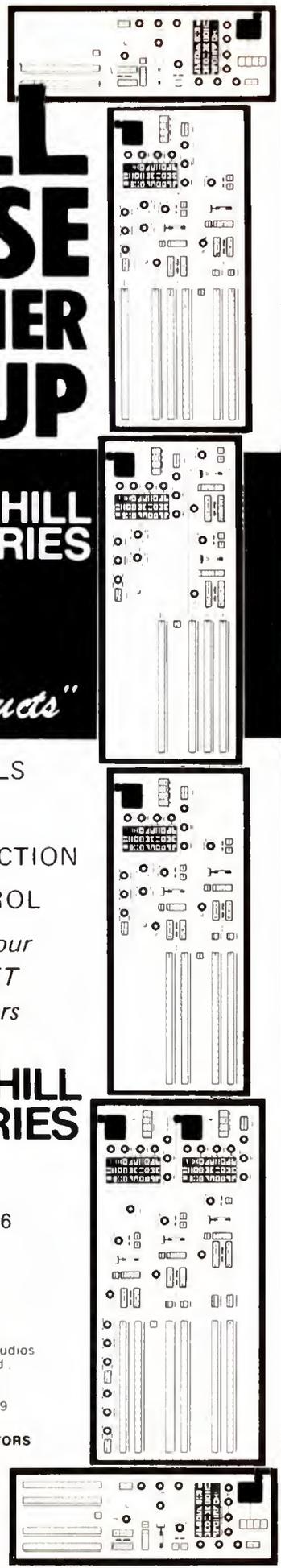
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Circle 116 on Reader Service Card



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CAN YOU FIND --

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THEIRS

THE HAPPY ENGINEER



**STONE ARMS
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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

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
WTII, 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 —
teleshop commercials, promos, off-the-air
spots, 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.

A new dimension in broadcasting and production

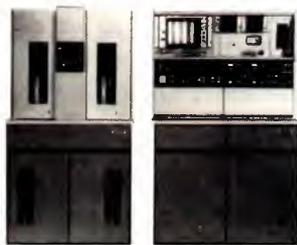
ACR-25 is the most complete broadcast/
production unit even conceived. No

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
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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.

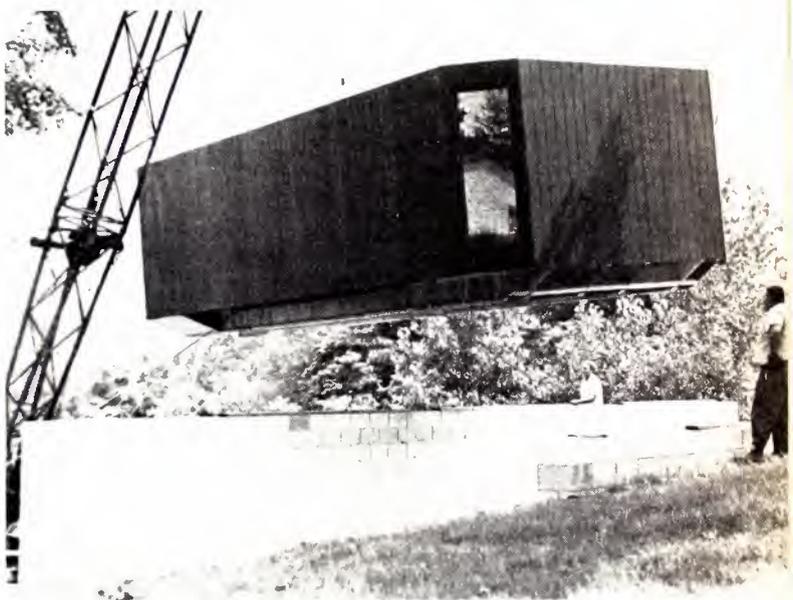
We were actively calling upon clients within 30 miles of Michigan City whose products or services would have strong appeal to young adults. We showed them how our station could fill advertising needs.

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

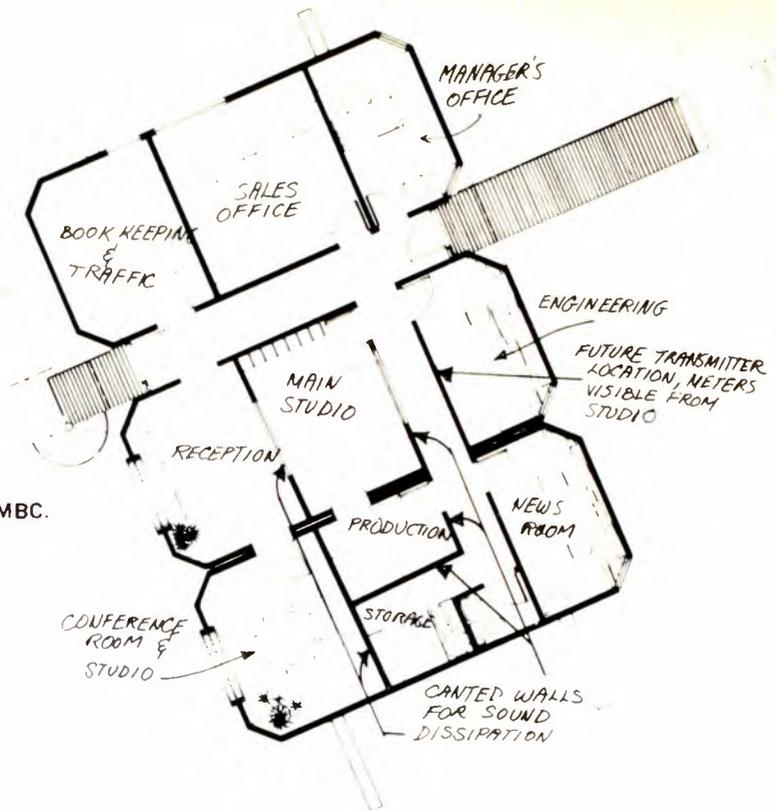


New studio-office building for WMCB came in three prefabricated sections. Each was lowered onto cement block foundation by crane; matching openings formed passages.



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:

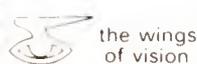
"It took only a short training period for our operators to learn to use the cameras, and for the cameras to establish themselves as quality pieces of equipment."

"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

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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.

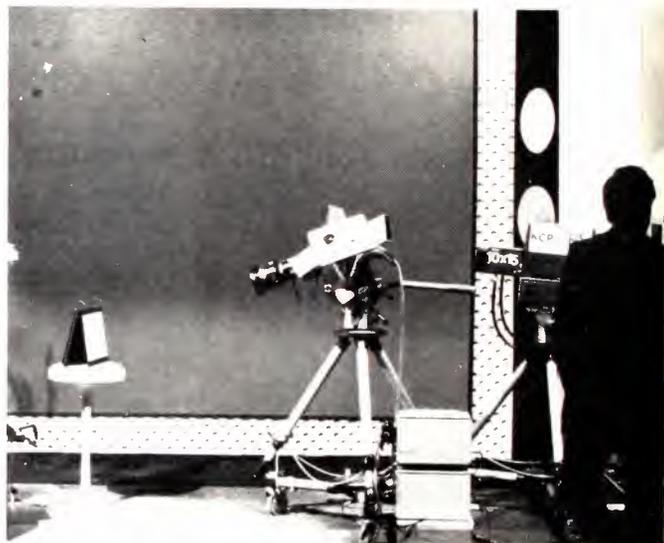


Thomson-CSF clearly gave the impression it was a world-force in TV. It showed a full-line of equipment.

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-



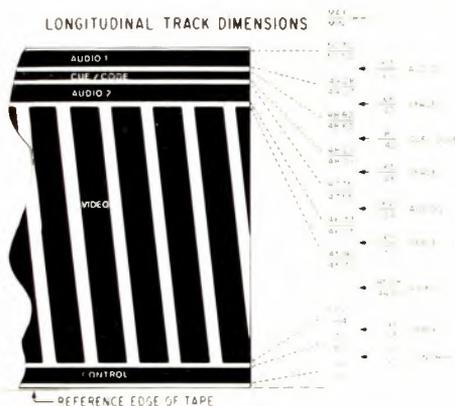
The IVC-9000 two-inch helical VTR, operating on both PAL and SECAM standards was a focal point.



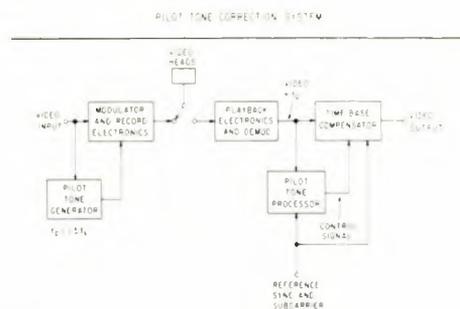
Philips-Fernseh cordoned off its BCR-60 helical VTR to modulate the flow of traffic.

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.

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- MANUFACTURER'S FIELD OFFICES
- PRODUCT LINES HANDLED
- PHONE NUMBERS



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

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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

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

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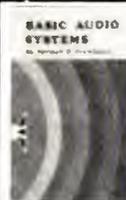
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Hato Rey 00919
Line: audio components & equip
Broadcast Electronics see ad p72
Micro-Trak see ad p23

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

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- Optional Equalization Controls

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a subsidiary of Computer Equipment Corp

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

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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

DELBEE 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 stds

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
Waltham 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**

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413 20th Ct. N.E.

CALIFORNIA

Los Angeles 90007
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213-747-7129

Rancho Cordova 95670
10521 Malvasia Way

DISTRICT OF COLUMBIA

Washington 20005
730 Federal Building
1522 "K" Street, N.W.

FLORIDA

Macclenny 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
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Racine 53402
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WASHINGTON

Vancouver 98660
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CORPORATION OF AMERICA**

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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 5-112
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.

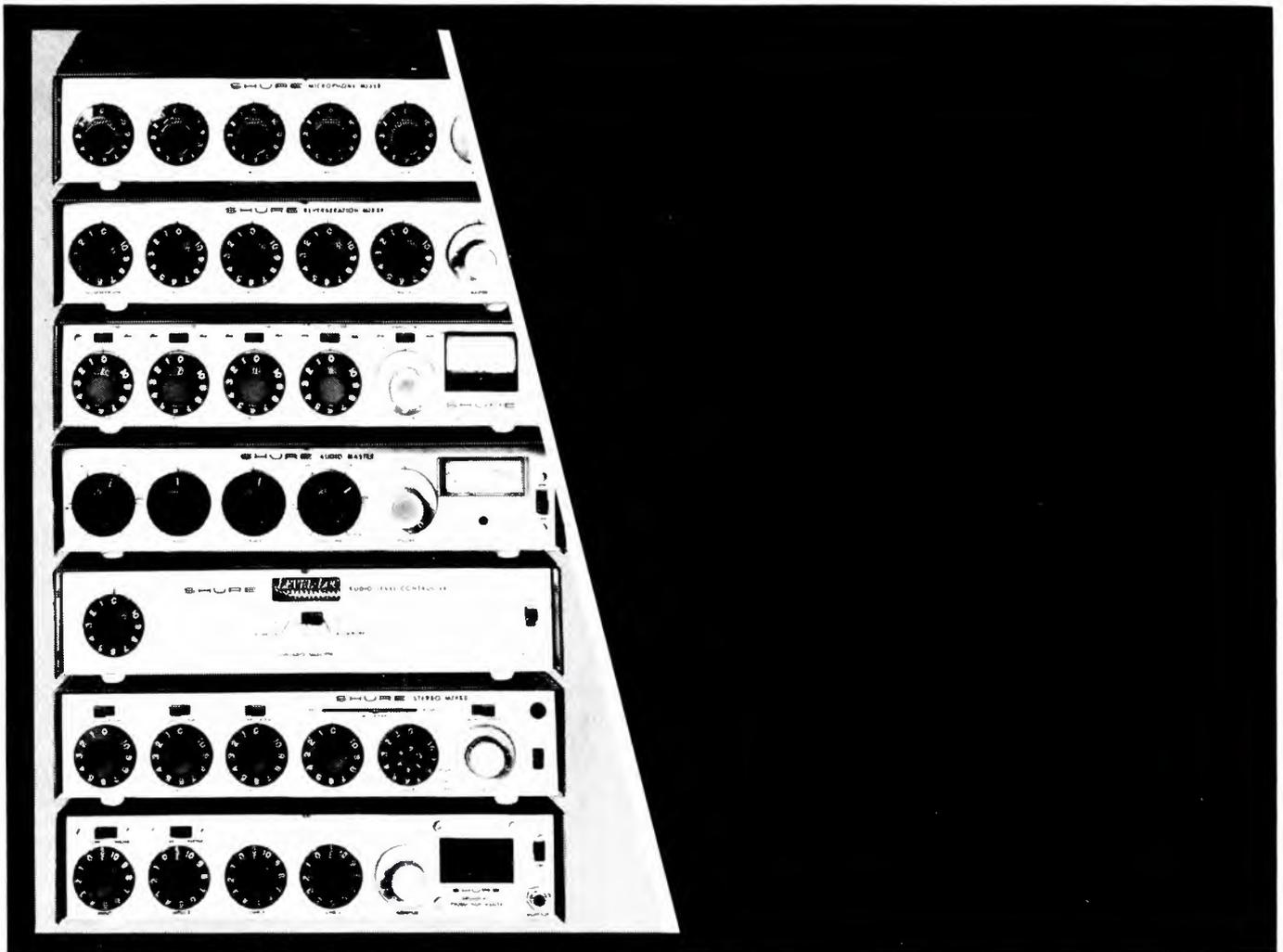
A monitor adjusted today with the J16-TV can be adjusted to give exactly the same color a week, month, or year from now. Two or more similar monitors may be matched for identical color.

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



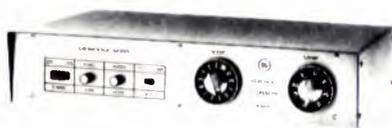
BFK10 shows frequency and distortion on front panel meters and allows X-Y recording of frequency/distortion for a hard-copy record. **THE LONDON COMPANY. 277**

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.

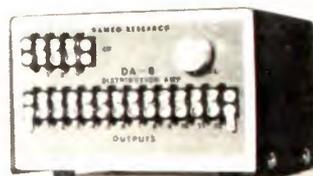
RCA Electronic Components

Circle 130 on Reader Service Card

PRODUCTS

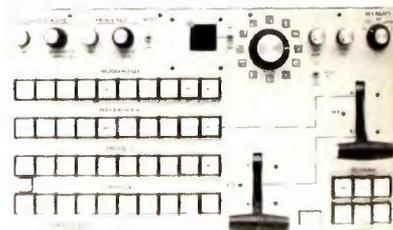
four-stage IF. \$349. SC ELECTRONICS. 292

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 on-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.

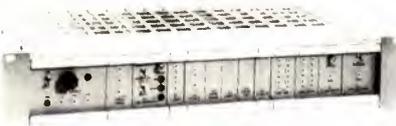
Whether it's recording, broadcasting or home entertainment, enjoy professional audio quality with Stanton products. Write for literature to Stanton Magnetics, Inc., Terminal Drive, Plainville, N.Y. 11803.

All Stanton cartridges are designed for use with all 2 and 4 channel matrix derived compatible systems.



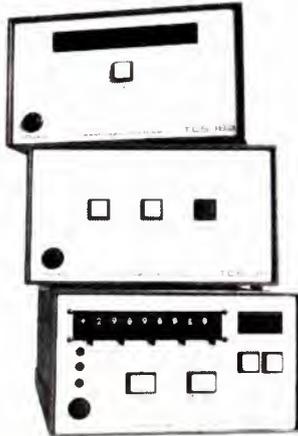
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PRODUCTS



modules for programming pulses in 70 ns increments and for horizontal phase. Zero or one-line vertical phase advance. \$1800. CONTROL CONCEPTS CORPORATION. **299**

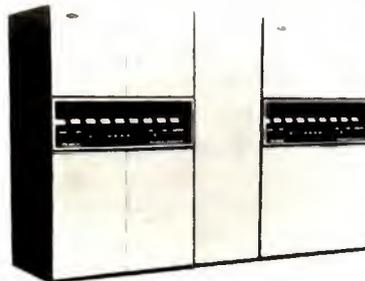
Synchronizing system locks audio tape machines to slaves, to VTRs, or to sprocketed film interlock. Time Code



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.

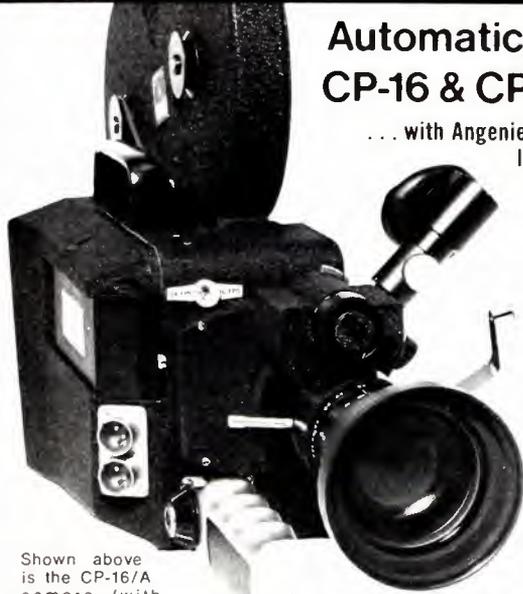
Plus a lot more that makes the FM-2.5H3 the finest transmitter available for Class A stations. Write for more information.

HARRIS
GATES DIVISION
Quincy, Illinois 62301, U.S.A.

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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

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THE DATATEK D-701

WAVEFORM CORRECTOR AND TRANSMITTER PHASE EQUALIZER SYSTEM

Now
Used by Many
Leading Stations

Unique features provide superior color picture quality...

- Other advanced Datatek products:
- Envelope Delay Measuring Sets
 - Video-Audio Routing Switchers
 - Audio Distribution Amps
 - Video & Pulse D.A.s

- 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

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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**

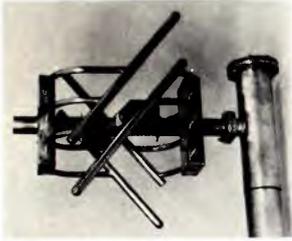
Three-head cassette system allows off-the-tape monitoring. Model 700 Tri-Tracer has closed-loop double capstans



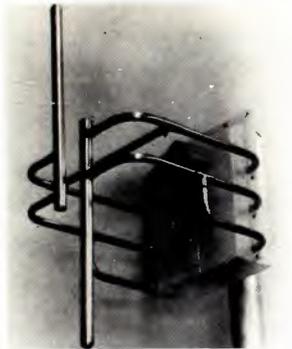
for less than 0.1% flutter and wow (DIN 45507), response within 3 dB, 35-20,000 Hz. It has built-in azimuth alignment system, Dolby B noise reduction for 60 dB s/n ratio, solenoid controls. \$690. NAKAMICHI RESEARCH. **307**

SEPTEMBER, 1973—BM/E

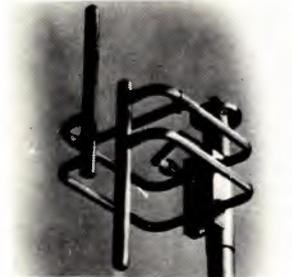
**SHIVELY LABORATORIES
ANNOUNCES A NEW GENERATION
OF CIRCULARLY POLARIZED
FM ANTENNAS**



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
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**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**

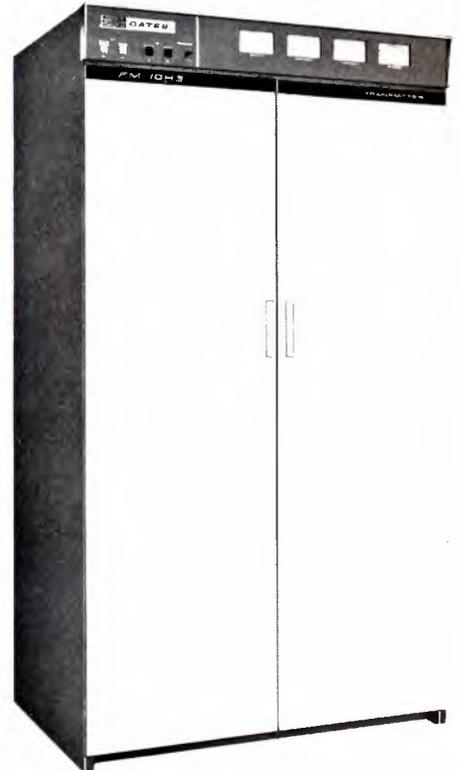
Solid-state TV image impresser processes video signal to improve contrast. "Cris-Pic" is aimed primarily at projection TV systems, also improves picture quality with VTRs, cameras, off the air, and in computer video displays. KALART VICTOR. **312**

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

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Magnetek is a product of Advanced Transducer Systems, division of Hermes Electronics

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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**

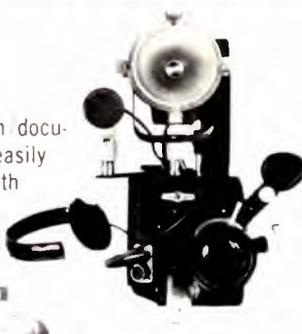
Two-inch broadcast videotape is capable of 50% extension of playing time. Fuji H-706 tape is packaged on standard 8-inch reels, but runs 33 minutes per reel, rather than the standard 22 minutes. COLTAPE. **324**



NEW from cinema products

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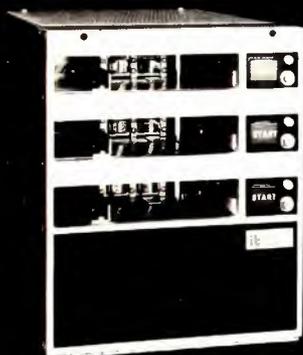
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CP-16/A camera is shown with Mike/Lite Bracket, RE50 microphone, and Cinema Products' new *Sturdy-Lite* quartz focusing spot (operating at 600 watt-120 volt AC/DC or 250 watt-30 volt DC)

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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**

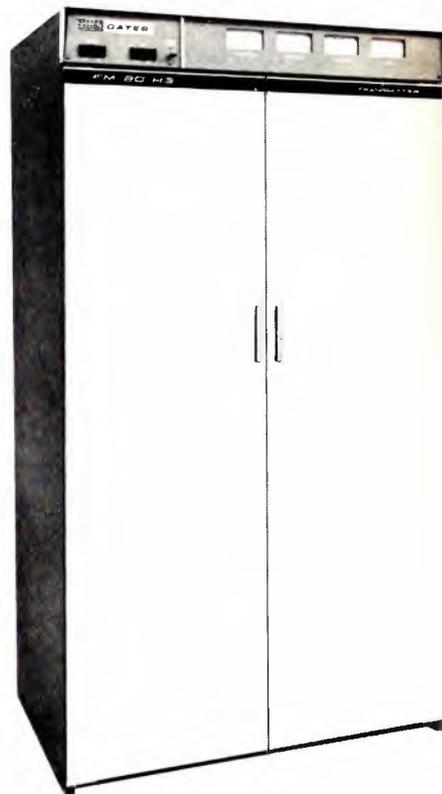
Brochure describes **domestic satellite communications services**—voice, data, TV—to come on line in a planned construction program. American Satellite Corp. **202**

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**

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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

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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.

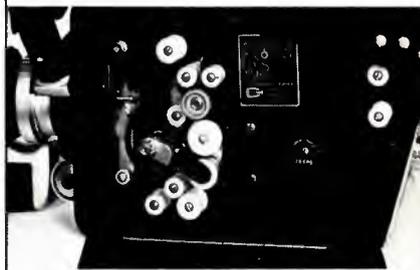
continued on page 66

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3XL mag head shown installed in CP-16/A camera.

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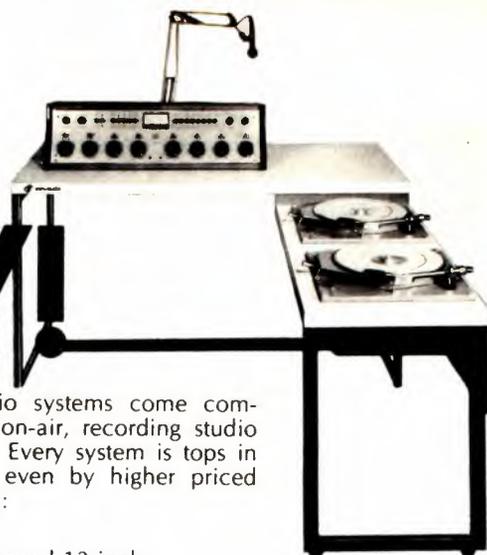
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MONTREUX

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

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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.

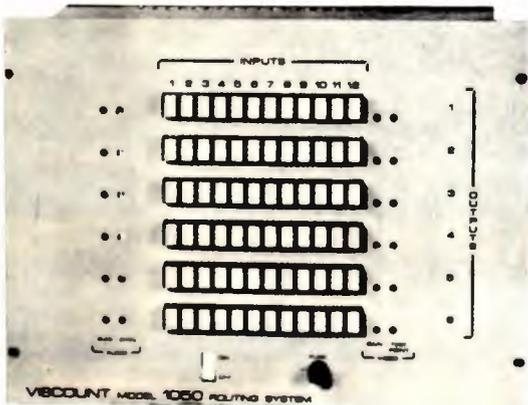
Because the headwheel and vacuum guide radius have been reduced, room is now available for the addition of a second, good quality audio track. Noise reduction schemes may be used. Anderson (of Ampex) said the new format could reduce tape costs by two-thirds and head cost could be halved. Because Ampex 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

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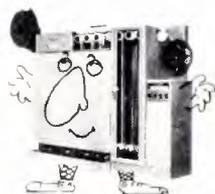
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LITTLE MAX

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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.

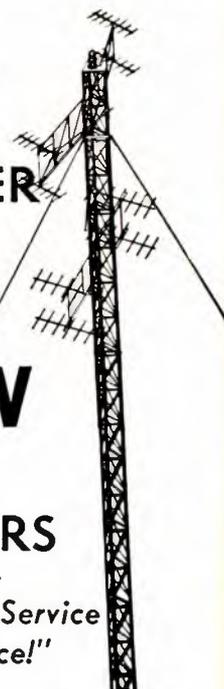
Neither helical nor segmented helical tape can be mechanically spliced. Accordingly, quad is still an attractive format. Vacuum guiding is troublesome both in automatic threading and in the high head pressure that results. Ampex, accordingly, would change the vacuum guide radius as noted earlier to reduce 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**

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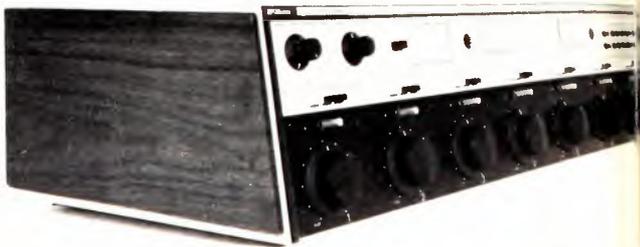
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ADVERTISERS' INDEX

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

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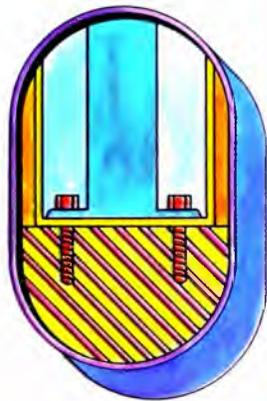
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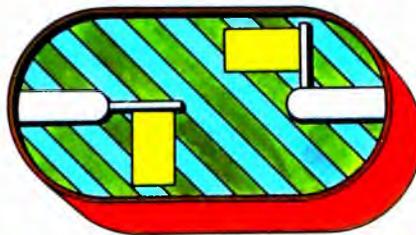
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