

FEBRUARY 1975

BME

BROADCAST MANAGEMENT/ENGINEERING



**The New
Tape Machines:
They Save Time
And Money.**

INNOVATIONS in coaxial cables

guarantees mechanical and electrical performance.

The choice is yours at Cablewave Systems . . . 0.180" to 3 1/8" outer conductors of smooth wall aluminum or corrugated copper; dielectric insulators of air (extruded spiral polyethylene or special helix designs), foam polyethylene center conductors of copper or copper clad aluminum . . . each engineered to excel in its area of application whether it be phasing lines for broadcasting, microwave antenna feeders, or delay line applications and each with a full range of connectors and accessories.

By giving you the widest selection of cable types, connectors, sizes and lengths through new and patented manufacturing techniques, plus a complete selection of compatible connectors, you are assured of getting the ideal cable assembly for your specific application — there's no compromising. Cablewave Systems Inc., 60 Dodge Avenue, North Haven, Conn. 06473, 203-239-3311.

Call or write for catalog 401A and get all the details on our complete line of Coaxial Cables and accessories.



now, that's **INNOVATION**

See us at NAB Booth 611S

Cablewave Systems Inc.

A Corporation owned by Phelps Dodge & Kabelmetal

Circle 100 on Reader Service Card

NOW . . . we've added crystal-controlled off-the-air UHF tuning.

For those critical UHF requirements, DYN AIR's new crystal-controlled VT-4BU plug-in tuner assures frequency stability of 0.005% on any specified UHF channel. In addition, all channels from 14 through 83 may be manually tuned. An AFC lock may be used, if desired, for additional stability on these channels.

BROADCASTERS find the new UHF tuner and the RX-4B DYNA-TUNE Demodulator an ideal

combination for remote broadcast monitoring, especially so when an optional video chopper is added for checks of modulation percentage.

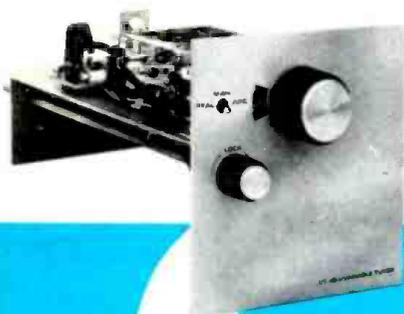
Adjustable color compensation results in a nearly ideal response curve . . . particularly important in client room applications where color quality is critical.

CATV OPERATORS find the RX-4B/VT-4BU an excellent choice for off-air UHF pick-ups and for measurements of systems performance.

Separate visual and aural IF strips, unique trapping circuitry to eliminate the possibility of 920 kHz beats, low differential phase and gain characteristics, standard receiver envelope delay response are a few of the performance features.

And, of course, there's the overall operational stability which results from DYN AIR's high-quality and solid-state reliability. Conservative design, liberal use of integrated circuitry and glass-epoxy etched boards make it so.

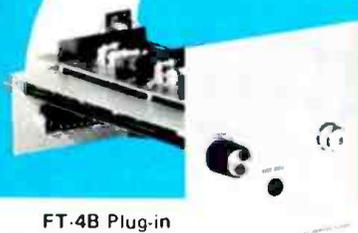
Write today for complete details to home office or eastern region office — P. O. Box 17342, Dulles International Airport, Washington, D. C. 20041; telephone (703) 471-4078.



VT-4BU
Plug-in UHF
Tuner



VT-4B-1 Plug-in
Variable VHF/UHF Tuner



FT-4B Plug-in
Fixed VHF Tuner



PRICES:

VT-4BU Tuner	\$ 300.00
RX-4B/VT-4BU	1750.00
RX-4B/FT-4B	1820.00
RX-4B/VT-4B-1	1720.00
Optional Chopper (CK-4B)	150.00

Also available for export standards.



DYN AIR Electronics, Inc.
6360 Federal Blvd., San Diego, Ca. 92114
Phone: 714-582-9211; TWX: 910-335-2040

Circle 101 on Reader Service Card

BM/E

BROADCAST MANAGEMENT/ENGINEERING

BM/E



There are plenty of options in tape recorders available as this month's cover suggests. Tape reels were made available to Art Director Sauter, by 3M.

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

Editor

James A. Lippke

Associate Editor

Robin Lanier

Washington Editor

M.L. Hollowell

Contributing Editor

Robert Wollins

Assistant Editor

Djuna Zellmer

Art Director

Gus Sauter

Production Manager

Helen Horan

FCC Counsel

**Pittman Lovett Ford
and Hennessey**

Publisher

Charles C. Lenz Jr.

FEBRUARY 1975/VOLUME 11/NUMBER 2

- 6 Broadcast Industry News**
TV news feed via satellite

- 22 FCC Rules & Regulations**
Two New CATV Rules: Access Equipment Availability; Late-Night TV Program Carriage

- 32 NAB Preview:**
The "Greatest Show" Set To Open in Las Vegas

- 40 Reel to reel Audio Machines:**
High performance, the easiest operation in history

- 44 Recent Advances in Videotape Recorders**
Two new helical VTRs

- 50 Mastering U-Matic VTR Adds Edit Capability to Cassette Convenience**
Cassette machine for news gathering and teleproduction

- 56 Tulsa Cable: The Making of a Super System**
Cable TV sales have reached 50% penetration

- 62 Innovative Techniques Described at NAEB Convention**
Two new methods of getting more out of a TV channel

- 66 Broadcast Equipment**
New and significant products

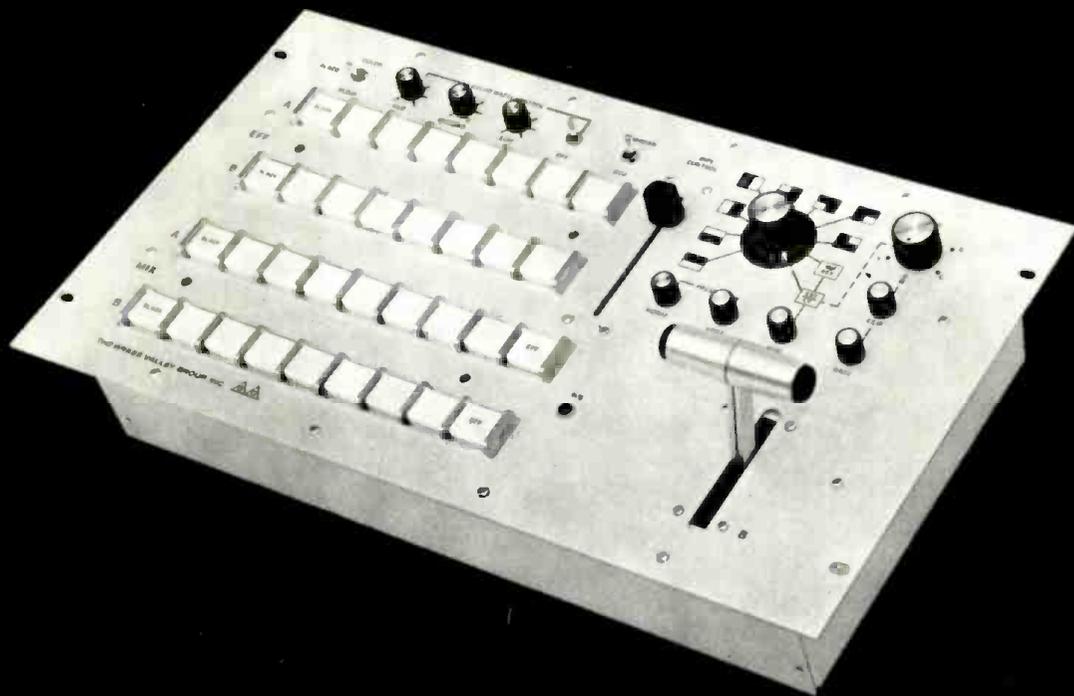
- 72 New Literature**
Useful reading materials

- 74 Letters/Feedback**
Transmitters are weak link in broadcasting chain

- 78 Cable News**
Unfinished cable TV Business on '75 Agenda



BM/E, BROADCAST MANAGEMENT/ENGINEERING, is published monthly by Broadband Information Services, Inc. All notices pertaining to undeliverable mail or subscriptions should be addressed to 274 Madison Ave., New York, N.Y. 10016. BM/E is circulated without charge to those responsible for station operation and for specifying and authorizing the purchase of equipment used in broadcast facilities. These facilities include All, AM, FM, and TV broadcast stations; CATV systems; ETV stations; networks and studios; audio and video recording studios; consultants, etc. Subscription prices to others: for U.S., U.S. possessions and Canada: \$15.00 one year, \$25.00 two years. Foreign: \$20.00 one year, \$35.00 two years. Foreign Air Mail: additional \$24.00. Copyright © 1975 by Broadband Information Services, Inc., New York City. Controlled circulation postage paid at Easton, Penna.



MODEL 1400-12 VIDEO SWITCHER

*PROFESSIONAL PERFORMANCE
IN SMALL FORMAT*

With over 100 switchers now in service, the reputation of Grass Valley Group's Model 1400-12 switching system is now firmly established. The switcher provides the same type of features you expect in a high-quality studio system. For example: Clamped vertical interval switching, remote controlled matrix, internal/external keying and matte, bordered wipe patterns, and accurate color timing.

Available options include chroma key, color black/matte generator, Borderline, non-sync inhibit, automatic sync-add inputs, and an AFV system. Model 1400-12 is available in NTSC, PAL, and PAL-M versions.

For additional information, call or write the Grass Valley Group, Inc.

THE GRASS VALLEY GROUP, INC. 
A TEKTRONIX COMPANY

Station Plaza East
GREAT NECK, NY 11021
(516) 487-1311

4419 Van Nuys Blvd, Ste 307
SHERMAN OAKS, CA 91403
(213) 990-6172

1644 Tullie Cir, NE
ATLANTA, GA 30329
(404) 634-0521

P.O. Box 482
MABANK, TX 75147
(214) 887-1181

810 W Bristol Street
ELKHART, IN 46514
(219) 264-0931

BROADCAST INDUSTRY NEWS

TV News, Inc., Will Operate Via Satellite To Earth Station At Each Subscriber

Giving every indication of a strong reconstitution after its recently publicized difficulties, Television News, Inc., independent news-gathering agency, announced in New York in mid-January a break-through plan, with large implications for TV program dissemination in general, for using satellite transmission to an individual earth station at each subscriber to the news service. The plan appeared to be well advanced, with TvN Inc. in process of choosing a supplier for the earth stations and Western Union, whose Westar satellite will be used, joining in the announcement.

TvN, Inc., also announced the equipping of their New York and Washington news bureaus with full facilities for video program origina-

tion; enlargement of the news staffs at both locations; and early expansion of the news coverage from the present one hour per day to several hours daily. In answer to questions from newsmen, Jack G. Wilson, president, and other officers of the company said that 36 stations had already contracted for the satellite delivery system, and negotiations were underway with a number of others. The company plans to have about 20 earth stations installed by July 1st of this year, and a total of 75 earth stations by the end of 1975.

Each earth station will eventually be owned by the broadcaster installing it and will be available for receiving other satellite transmissions—there is no restriction to the TvN service. Western Union representatives said that tariffs for the service, then in process of development, would be aimed to make it less expensive than other delivery services, either land-hop microwave or cable. The saving, the spokesmen indicated,

should make the purchase of the earth station "cost effective" within a reasonable period.

Some general parameters given for the earth stations were: cost, very roughly \$100,000 each; installed weight, 10,000 to 15,000 pounds; electronics and controls can be put under the antenna, or remotely within a control room; aside from severe icing of the antenna (preventable by deicing equipment), weather would be no problem; reliability of overall system generally better, and signal degradation lower, than with multi-hop microwave or cable systems, because far less equipment is involved.

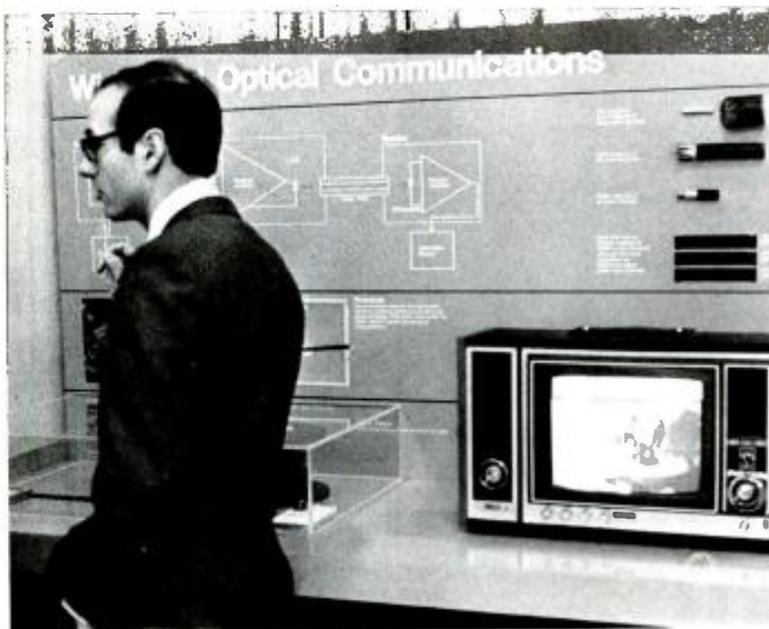
Rich Program Announced For Montreux Symposium

Program of the International Television Symposium and Technical Exhibition set for Montreux, Switzerland, May 23rd through 29th of this year, covers an extremely wide spectrum of vital technical and management subjects, according to plans announced as this issue went to press. Among the major sessions are: a round table conference on future technologies and techniques; another titled "Dialog between manufacturers and users on future evolution of video equipment"; and an address by R. J. Clayton, Technical Director for GE of Great Britain, on "Television Broadcasting from Satellites." More than twenty other major topics will be covered in the technical sessions. A few are: automation; digital transmission; fibre tv transmission; image sensors; organs or conversion; special techniques. Speakers and participants in the panels include managers and technical directors of television manufacturing and broadcasting companies from all of Western Europe, the US, Canada, Japan, the USSR, South Africa.

As announced in the December issue, BM/E has again organized a group tour to the Symposium, with a fee that includes transportation, registration, stay at a first-class hotel, with provisions for side trips. For information: write or call International TV Tour, BM/E, 274 Madison Ave-

continued on page 8

Wideband Optical Communications



Among the exhibits at the SMPTE 116th Technical Conference at Toronto was this exhibit by Northern Bell showing how TV could be transmitted via a fibre optics system.

New Sony U-matic news team... from action to broadcast in 30 minutes.



Or even less time. With less equipment. And at less total cost than you're probably paying now for news-gathering and teleproduction.

The major networks, ABC, CBS, and NBC, and many stations nationally are using the new Sony U-matic VO-3800/2850 Videocassette System.

All your work is done on economical, reusable videocassettes. After location taping, either microwave the signals or send the cassette to the studio for quick and accurate editing. Or go right on the air with the use of a time base corrector.

You eliminate film cost and processing time, especially when important events break close to air-time deadlines.

You start with the Sony VO-3800 portable VideoRanger™ recorder and a color camera, such as the Sony hand-held DXC-1600. The VO-3800 can record three 20-minute cassettes on a single battery charge. It has NTSC color and EIA monochrome standard signals, remote control, two separate audio tracks, automatic power shut-off, and on-the-scene playback capability.

Accurate electronic editing is achieved with two Sony VO-2850 mastering recorder/editors and the Sony RM-400 Remote Automatic Editing Controller. The RM-400 provides search, pause, and automatic back-spacing. The VO-2850 has a signal-to-noise ratio in excess of 45 dB for video and audio, also separate editing capability for video and two audio tracks.

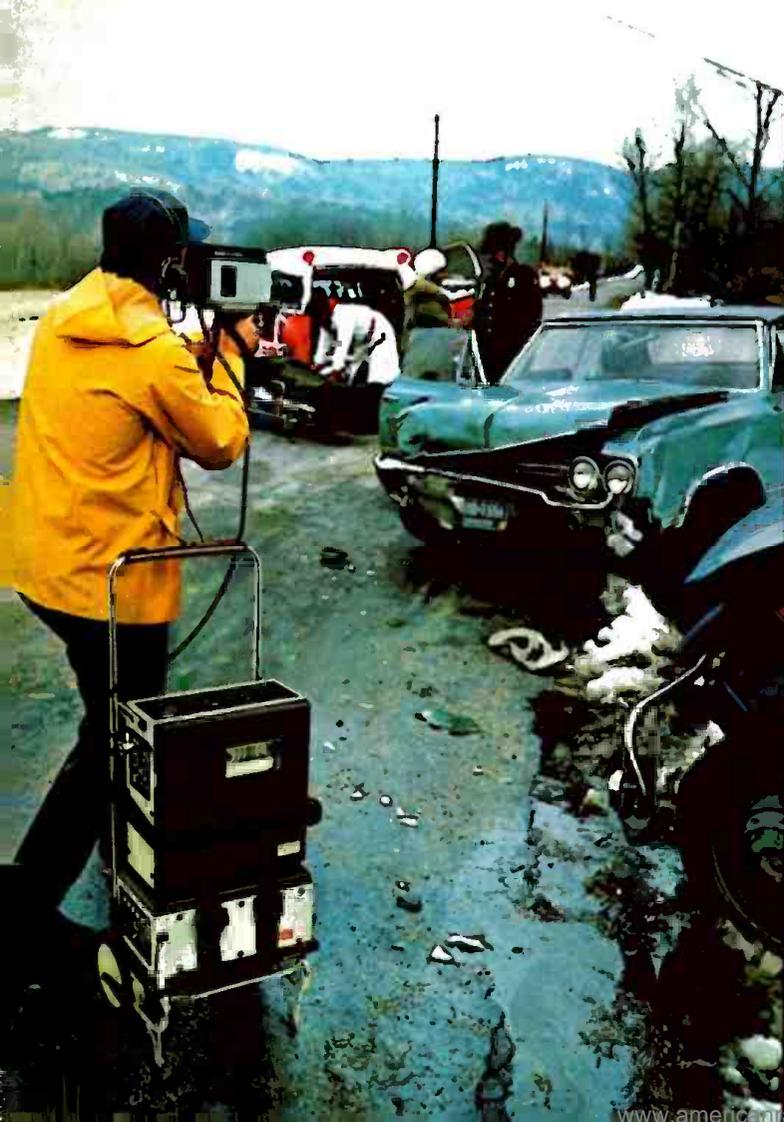
Of course, the VO-3800 portable VideoRanger™ or the VO-2850 editor can be used independently of each other. In addition to electronic news gathering, these versatile new videocassette units can add new capability and economy in production of documentaries, on-site retail spots, and general studio use.

For complete information and/or a demonstration write us today.
Sony Corporation of America
Video Products Dept. BME-025-210
9 West 57th Street
New York, New York 10019

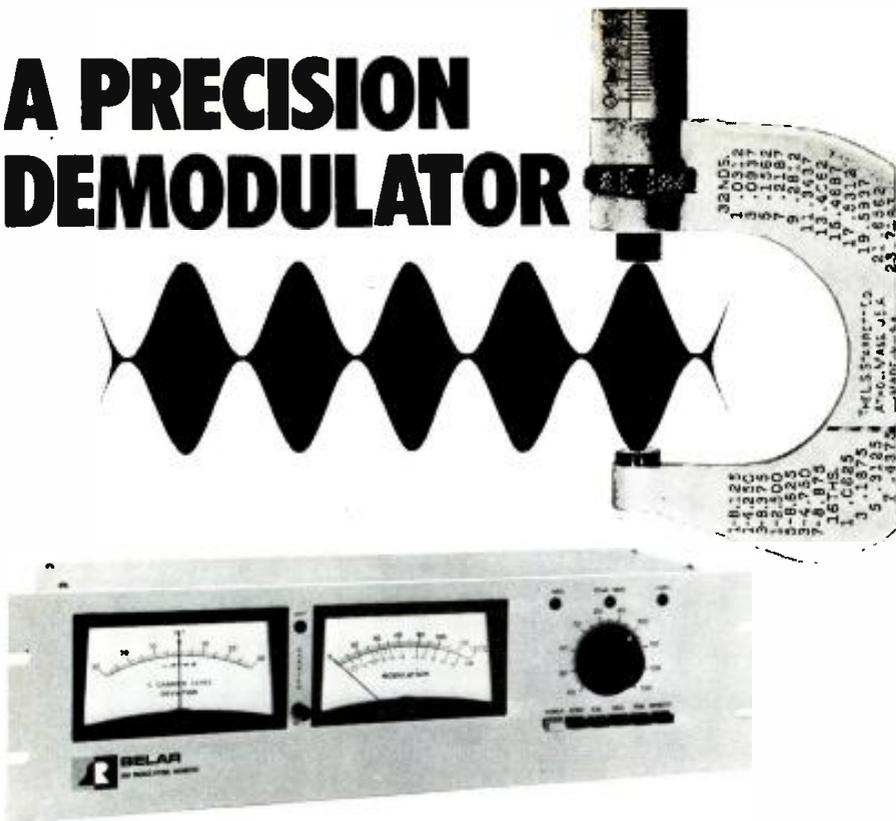
Sony. The proven one!

**Sony U-matic Color
Videocassette System**

TV reception simulated.



A PRECISION DEMODULATOR



The AMM-2 AM Modulation Monitor

- RF frequency range — 200 kHz to 160 MHz
- 100% negative peak modulation light — independent of input carrier level
- 125% positive peak modulation light — independent of input carrier level
- Peak modulation light adjustable from 40 to 130%, calibrated in 1% increments — independent of input carrier level
- True peak reading modulation meter — responds to shortest duration program peaks
- Carrier level meter — indicates true carrier shift
- Phase-linear filter — no overshoots from clipped modulation peaks
- Remote outputs — outputs for both meters and peak lights
- Built-in modulation calibration
- Built-in carrier-off alarm
- Outputs for listening as well as test functions
- 115/230 volts, 50/60 Hz operation
- FCC Type Approved

The AMM-2 Modulation Monitor sets new standards in accurate AM monitoring — the first AM monitor to incorporate true ratio-type peak indicators. The AMM-2 contains a unique modulation cancellation scheme to recover unmodulated carrier to reference the modulation peaks to. Thus the instantaneous program peaks are referenced to the instantaneous carrier without the need of time-constants, as with AGC devices. True carrier is indicated even with the asymmetrical modulation encountered in today's high positive peak modulation, and the peaks are automatically referenced to this true carrier to give the most accurate indication of program peaks.

The AMM-2 incorporates a phase-linear filter that does not produce overshoots when a negative peak clipper is used in the transmitter. The true modulation peak is measured instead of a false, higher peak introduced by the non-linear phase filters found in other monitors.

With the AMM-2, you can turn up your level to where it belongs for maximum loudness.

\$850 DELIVERY FROM STOCK

There are well over 3000 Belar AM, FM and TV monitors currently in use worldwide.



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

Where Accuracy Counts . . . Count on Belar
Circle 103 on Reader Service Card

NEWS

nue, New York 10016, tel. 212-685-5320.

CCA Sold To New Group; Bernard Wise Resigns

CCA Electronics Corporation, maker of radio and TV broadcast transmitters, automation equipment, and studio equipment, has been sold to a group of investors, according to an announcement from the company. Included in the sale is the controlling interest of Bernard Wise, president and founder, who has resigned as an officer and director of the company. New co-chief executive officers, at the time of the announcement, were Bruce Emonson and Jean-Paul Renoir.

Reuters Announces Retrieval System For Cable TV Subscribers

A new, high-speed information retrieval system capable of serving the investment community and the cable TV viewers at home was announced late in December by Reuters.

Called the IDR system—after the Reuter subsidiary set up to develop it—it utilizes the high-speed transmission capacity of coaxial cable along with television and computer technology to make retrieval services available to a wide variety of subscribers. Fast access time of about 2 1/2 seconds is possible.

The system is already operating on channel 26 of Manhattan Cable Television, Inc., which serves a great many commercial buildings in the midtown area and financial district in New York City.

Gerald Long, Managing Director of Reuters, described the system as “in effect permanently delivering to a display terminal the answer to almost any question most people would be likely to ask of a news service.”

The central computer continuously retransmits the entire information file every few seconds. The transmission is one way. The subscribers' equipment allows him to “capture” and hold on his video screen the information as it flows through the cable at high speed. Initially the system is being used to deliver information from Reuters' existing specialized services to the investment and banking communities, but long added that “about a year from now we plan to take it into the home, using that electronic display termi-

continued on page 10

KDKA

KGO

KING

KMOX

KOB

WABC

WGN

WINS

Now nine more stations..

*KCBS
KFRE
KQRX
KSTP
WBBM
WCAU
WHDH
WINZ
WNOE*

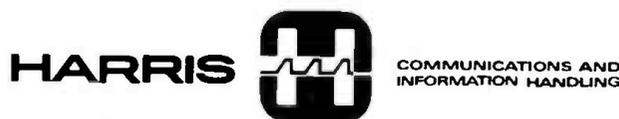
Harris' 50,000-watt MW-50 keeps some very fine company

The pace-setting AM stations listed above are now broadcasting, or soon will be, with Harris' MW-50, 50 kilowatt PDM (Pulse Duration Modulator) transmitters. With good reason.

The MW-50 signal is strong and clear—backed by a 125% positive peak modulation capability that allows higher average modulation levels.

Overall transmitter efficiency is greater than 60%! And the MW-50 employs only five tubes (just three tube types). Compact design saves space, simplifies installation.

Find out why the MW-50 is at home in so many of the country's top stations. Write Harris Corporation, Broadcast Equipment Division, 123 Hampshire Street, Quincy, Illinois 62301.



Circle 104 on Reader Service Card

SPORTSCASTERS —

ISN'T IT TIME YOU GAVE YOURSELF A HELPING HAND ???



Hands-free communication is within your reach. Television Equipment's well-proven Sportscaster headset, with integral dynamic boom mike, gives you complete freedom of movement — just right for those tense moments when you need to consult your references.

The headset has a . . .



Price: \$ 75.00
Delivery from stock

Dynamic Boom Microphone; 400 OHMs, frequency range 50-15,000 Hz, sensitivity 2mV (loaded) for close speech.

Double Headphones: independently wired, 200 OHMs each, frequency range 50-15,000 Hz.

Ventilated foam cushions eliminate perspiration and let you hear ambient sound (optional ear-enveloping cushions).

Weight: 6½ oz. Practically unbreakable components. Optional cough switch.

For your helping hand phone today. . .

In Canada call:

Conway Electronics Enterprises, Ltd.
416 • 742-0063
See it at NAB.
Booth 701,
South Hall

Television Equipment Associates, Inc.

BILL PEGLER 516 • 628-8068

Box 1391 • BAYVILLE, N.Y. 11709

Circle 105 on Reader Service Card

THE NEW STANDARD COVERS AM BAND PLUS HARMONICS TO 5 MHz



The Model FIM-41 Field Strength Meter has many more features —

- Measures Harmonics to -80 dB
- High Adjacent Channel Rejection
- Ganged Oscillator/Receiver Tuning
- Stable Operation over wide Temperature Range
- Low Battery Drain Circuits
- Front Panel Speaker
- Large illuminated Meter and Tuning Dial
- Indicates field strength accurately down to 10 μ volts/M
- RF input jack for tuned voltmeter applications

CONTACT US NOW FOR COMPLETE DETAILS
ON OUR LINE OF FIELD STRENGTH METERS

POTOMAC INSTRUMENTS

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

Circle 106 on Reader Service Card

NEWS

nal that is sitting in everyone's living room—the television set."

In addition, Manhattan Cable has started marketing special services based on the IDR system to investors and racing enthusiasts. (Manhattan Cable currently has 60,000 subscribers). Outside of New York City Reuters has signed or is negotiating similar agreements with other carriers. Development of a mass market requires the availability of a low cost terminal. Present terminal costs \$275. This can drop to \$25-\$35 in mass quantities.

Because coaxial cable is used, transmission of data is at a much higher speed than on conventional telephone lines. Rate is five million bits per second, or about 70,000 words a second. The information bank demonstrated containing commodity and money rates data contains about 300,000 words at any one time.

Consortium Will Push For "Public Sector" Satellite Services

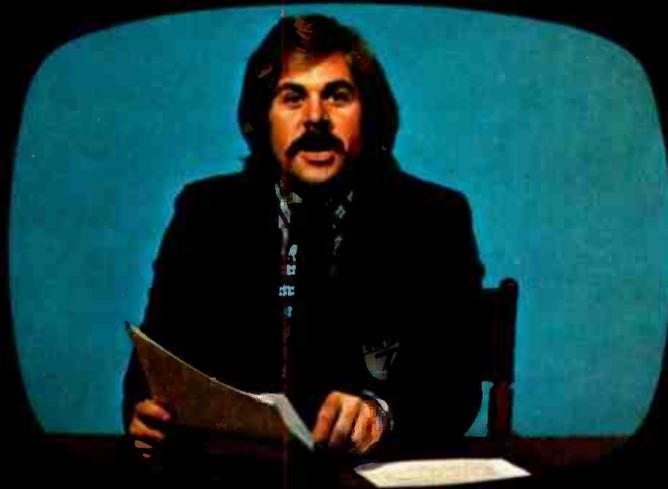
The success of the ATF-6 satellite experiments (BM/E November) has encouraged a large group of users and potential users in health, education, government, and other parts of the "public sector" to join forces for a strong effort to establish regular satellite services for such users. At meetings held in November and December, a "Public Service Satellite Consortium" was organized, charged with finding and getting the support of potential users; promoting the technical development of the needed satellite systems; coordinating the telecommunications planning of public groups and offering them technical assistance; acting as "group agent" for public users, to get low-cost bulk services for them; and seeking financing to help in the program. The Consortium will not deal with programming as such. Additional meetings are set for February 19-21, at San Diego State University.

Among organizations acting as founding members of the Consortium are: the Federation of Rocky Mountain States; the State of Alaska, Telecommunications Department; the Corporation for Public Broadcasting; National Public Radio; Mountain States Regional Medical Program. Chairman is H. Rex Lee, former FCC Commissioner and now Visiting Professor at San

continued on page 12

The 10:10 knockout on the 11 o'clock news:
Channel 7.

The 10:10 knockout on the 11 o'clock news:
Channel 4.



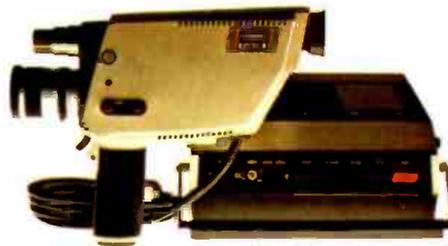
"...we expect to have a filmed report for you later on."

The Akai VTS-150. It can make the difference between news you can only talk about and news you can show:

Ray Karpowicz, General Manager KSD-TV "One afternoon the Fairmont Racetrack in Illinois burned to the ground and KSD sent a crew out in a helicopter. Over the site, we moved slowly as possible and held the Akai VTS-150 to our chest to reduce vibration. The system worked to perfection and we had the story on at 6 o'clock."

Steve Currie, Director of Broadcasting WCBD-TV "When

Gen. Alexander Haig visited "The Citadel" in South Carolina, his press conference began at 4:30 P.M. We took an Akai VTS-150 with us and returned in plenty of time with the story edited and ready to be televised



on our 6:00 P.M. News."

Ray Miller, News Director KPRC-TV "The prison break attempt in Huntsville occurred in late afternoon nearly 100 miles from Houston. We flew the Akai to Huntsville, got some pictures, talked to a prison official, and got back to Houston in time for our 6:00 P.M. News."

The VTS-150. It weighs only 22 pounds. It costs only \$6995. It can go anywhere. Shoot anything. Edit anything. In minutes. Ready for airing. We think it's revolutionizing broadcast journalism. Just watch.

AKAI™

People watch the news to see the news.

2139 EAST DEL AMO BLVD. COMPTON, CALIF 90220

Simulated television reception

www.americanradiohistory.com

Circle 107 on Reader Service Card

NEWS

Diego State University. Additional data can be had from the Executive Secretary, F. W. Norwood, Joint Council on Educational Telecommunications, 1126—16th St., N.W., Washington, D.C.

FCC Approves SDS Pay TV System

In late November the Federal Communications Commission approved the pay TV system of System Development Corporation, Santa Monica, California, the fourth scramble-unscramble system to get the Commis-

sion's nod.

Jointly developed by SDC and Pay TV Corporation of New York, the system will be marketed by the two firms for use by others starting early in 1975. Pay TV Corp. may in addition operate some over-the-air systems of its own. System Development Corp. was negotiating with hardware suppliers as this was written.

The other three pay TV systems approved to date are: Zenith's "Phonevision;" Blonder-Tongue's "BTVision;" and Teleglobe's "Number 410." Blonder-Tongue was the first on the air with a full-scale test of a pay TV system, starting in October, 1974, with their own station,

WBTB, Channel 68, in Newark, N.J.

First FM Channels Go To Eleven Communities

The Federal Communications Commission has amended the table of FM assignments to give eleven communities their first FM channels. In each case the petitioner for the change has announced an intention to apply for the channel. Included are: Fairfield, Iowa; Maysville, N. Dak.; Eldon, Mo.; Crete, Neb.; Hurricane, W. Va.; Patterson, N.Y.; Sauk Center, Minn.; Appomatox, Va.; Warren, Ark.; Gatesville, Texas; and Otsego, Mich.

TV Remote Control Inspection

Reduced To Once Weekly

The Commission has changed its rules to reduce the requirement for inspection, calibration and testing of television remote control equipment and transmitters from five days a week to once each week. The new rule, which went into effect December 30, 1974, will bring the TV remote control inspection requirements into line with those for AM and FM radio stations, the FCC pointed out.

Two-Tone EBS Interstation Signals Approved by FCC

Acting on a recommendation of a National Industry Advisory Committee, the Commission has adopted a two-tone attention signal for interstation alerting in the Emergency Broadcast System. This new signal will replace, on January 15, 1976, the current attention signal which consists of two five-second breaks, followed by a 1000-Hz tone for 15 seconds. The FCC said that the possibilities for misunderstanding with the present signal, plus the advance of the art which has made two-tone generating equipment less expensive and more reliable, led to the change in the prescribed signal.

New Rules For Changes In FM, TV Assignments

Organizations and individuals petitioning for a change in the table of FM or TV assignments now have the responsibility for sending copies of the petition to licensees or permittees who may be affected by the proposed change, under new rules adopted by the Commission, effective December 20, 1974. Aiming to speed action on such petitions, the new rule elimi-

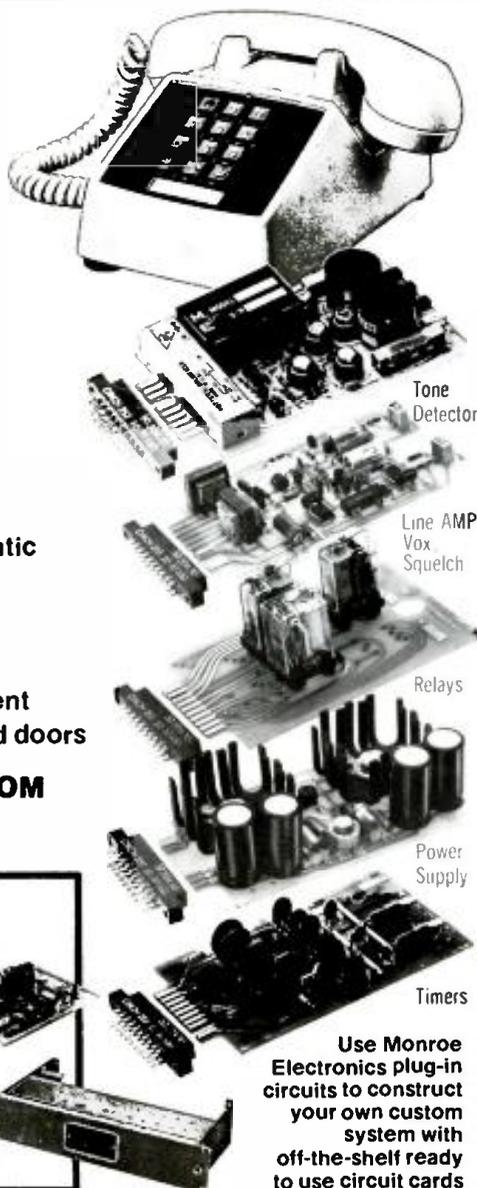
continued on page 14

control by phone

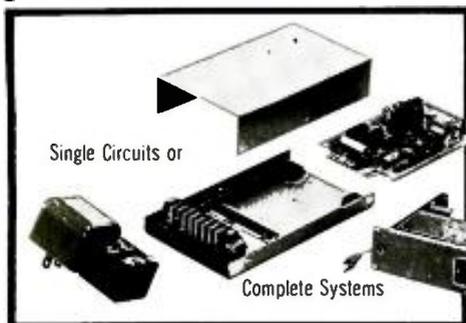
Use a regular touch button telephone to control:

- Cable TV circuits
- Pollution sampling equipment
- Microwave transmitters
- Call diverters and automatic answering devices
- Antenna systems
- Telephone equipment
- Radio/telephone interconnection equipment
- Pumps, motors, overhead doors

**CIRCUIT CARDS FROM
\$49 TO \$99**



Use Monroe Electronics plug-in circuits to construct your own custom system with off-the-shelf ready to use circuit cards



MONROE ELECTRONICS, INC.
INSTRUMENTS & SYSTEMS

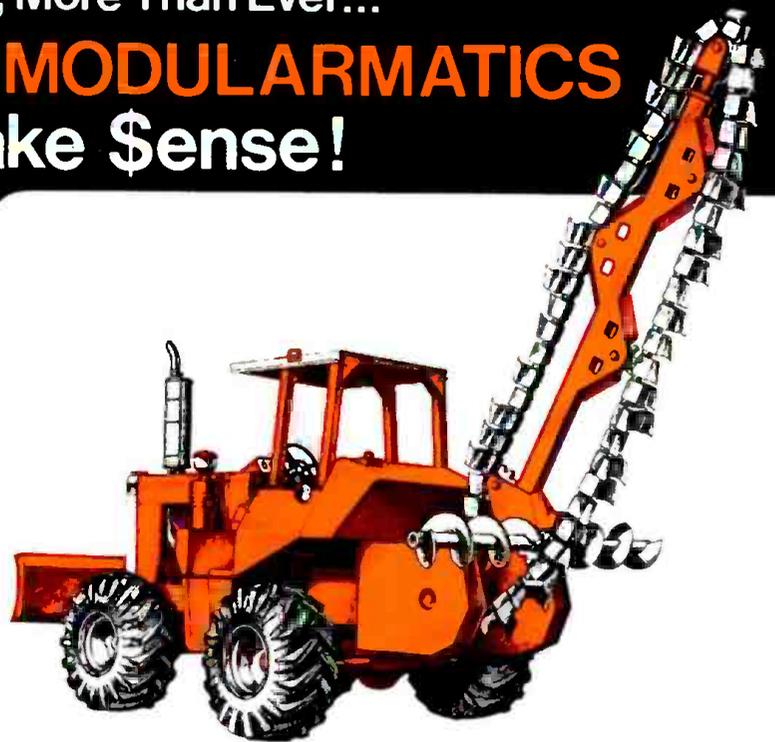
100 HOUSEL AVENUE • LYNDONVILLE, N. Y. 14098 Area Code 716 765-2254

Circle 108 on Reader Service Card



Today, More Than Ever...

DITCH WITCH MODULARMATICs Make \$ense!



One piece of equipment for a variety of underground job requirements — that's what the Ditch Witch Modularmatic concept is all about. Interchangeable modules can equip Modularmatic vehicles to perform up to 11 different underground and related job assignments. And since one machine can do more, overall equipment costs are obviously reduced. You get more for your equipment dollar and you get more equipment potential and flexibility. There are four Modularmatic models to choose from, in power ranges from 30-HP to 100-HP. You also have a choice of power plants — gasoline or diesel. Modules allow you to equip your basic vehicles for selected trenching requirements, restoration, vibratory plowing, combination trenching and plowing capability, backhoe work, loading, horizontal boring and pavement breaking work. Buy the Modularmatic vehicle and modules you need now; add other modules as needed. Today, it's more important than ever to get the most for your money. And, that's why, today, the Modularmatics make more sense than ever!

Ditch Witch . . . equipment from 7- to 195-HP.

CHARLES MACHINE WORKS, INC.

P. O. Box 66
Perry, Oklahoma 73077®



Circle 109 on Reader Service Card

A QUESTION OF IMAGE

TV Cooke Varotals are designed by Taylor-Hobson to meet operational requirements of directors and cameramen with minimum technical compromise. Varotals 17A and 30 operating side by side offer horizontal angular coverage from 56° wide to less than .075° narrow.

Large diameter front optical elements (135mm for Varotal 17 and 159mm for Varotal 30) combined with

unique wide band anti-reflection coatings provide maximum light grasp.

Superior resolution and color fidelity are assured by years of Taylor-Hobson zoom lens design and manufacture for professional broadcasters. Self-aligning servo or manual drive modules are interchangeable between lens models and drive functions.

Write for our bulletin, "The Performing Lenses."



RANK PRECISION INDUSTRIES, INC.

411 E. Jarvis Ave., Des Plaines, Illinois 60018
(312) 297-7720



RO274R

Circle 110 on Reader Service Card

NEWS

nates the earlier two-tier proceeding in which the FCC, after receipt and preliminary acknowledgement of the petition, notified others who would be affected and invited comments, and does the same again in a later notice of proposed rule-making. Also under the new rule, parties opposing the proposal must submit counter-proposals with their initial comments. The changes were adopted in response to recommendations on the subject by Joint Re-Regulation Committee of the Federal Communications Bar Association and the Communications.

Cable Franchisors Must Set Up Complaint Procedure

Local franchising authorities granting cable franchises after August 1, 1975, must set up procedures for handling customer complaints about service, and must designate an official or office to receive complaints, under amended rules recently adopted by the Commission. The rules had previously included a provision that a cable franchise must include "procedures for investigation and resolu-

tion of all complaints regarding the quality of service . . ." The FCC, announcing the amendment, said the intent was to clarify the intent of this rule, which should impose the obligation on the franchising authority as well as on the cable operator.

EIA Submits Report to FCC on Rules and Regulations for Unattended TV Transmitters

The Broadcast Equipment Section of the Communications Division, Electronic Industries Association, has submitted a report to the FCC supporting the position for revised unattended operation of television broadcast transmitting systems. The report, "Toward Rules and Regulations for Unattended TV Transmitters," also affirms the feasibility of systems for unattended operation using current technology and readily available equipment.

The report, prepared by the Communications Division's TR-4.1 Engineering Subcommittee on Television Broadcast Transmitters, makes spe-

continued on page 16

FIDELIPAC® Broadcast Tape Cartridges



... the standard of the industry for quality, durability and flexibility are now obtainable worldwide. Available in three size configurations:

- ▶ Model 300 (NAB Type A) in lengths to 10½ minutes @ 7½ ips (19.05 cms)
- ▶ Model 600 (NAB Type B) in lengths to 16 minutes @ 7½ ips (19.05 cms)
- ▶ Model 1200 (NAB Type C) in lengths to 32 minutes @ 7½ ips (19.05 cms)

Heavy-duty tensilized Polyester Tape used throughout. Compatible with all standard Broadcast Cartridge Recorder/Reproducers.

For complete information, contact your Fidelipac Distributor or

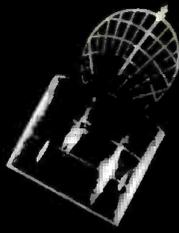


FIDELIPAC®

A Division of TelePro Industries Incorporated
109 Gaither Drive • Mt. Laurel, NJ 08057
(609) 235-3511

® Trademark of TelePro Industries Incorporated

See us at NAB-Booth #221, North Hall
Circle 111 on Reader Service Card



THE FIRST 400 DAYS.

A progress report on the RCA Satcom System. America's first operational domestic communications satellite system.

On December 21, 1973, RCA Globcom's Satcom System became operational and substantially reduced the cost of coast-to-coast communications.

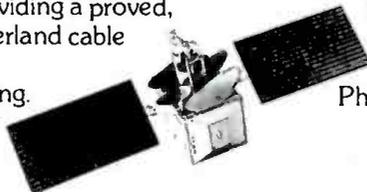
Today, the Satcom System's private, voice-grade leased channels are providing a proved, cost-effective alternative to overland cable and microwave circuits.

This is only the beginning.

Later this year, RCA Satcom Phase II will begin

with new earth stations, an advanced design, high-capacity satellite (shown below), and extended service to the entire United States. This service will include applications for TV and CATV transmission, full transponder systems and special services for government and industry.

For information on how the RCA Satcom System can benefit your company, contact Satcom Marketing, RCA Global Communications, Inc., 60 Broad Street, New York, New York 10004. Phone: (212) 363-3986.



RCA Global Communications

Circle 112 on Reader Service Card

Canon IOX UNIVERSAL ZOOM

One-Inch Plumbicon Color Camera Zoom



PV 10X15

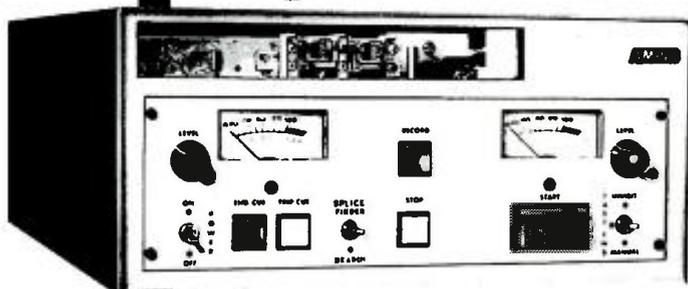
15 mm to 150mm; f/2.0

- Wide Angle
- Close Focusing 3.9'
- Bayonette Mount
- Adjustable Back Focus
- "Macro Focus" Operation
- Small Size
- Lightweight
- Light Transmission Over 80%
- For All One-Inch Color Cameras

Canon CANON U.S.A., INC., 10 NEVADA DRIVE, LAKE SUCCESS, N.Y. 11040
 BROADCAST OPTICS (516) 488-6700

Circle 113 on Reader Service Card

tougher than you are



... AMPRO Automatic Tape Cartridge Recorder/Reproducers are the rugged ones ... the ones with heavy-duty head mounts, die cast deck and front panel, self-aligning pinch roller and direct drive 4" motor. Silent, both mechanically and over your program line (-58 dB snr, ref. 400 Hz 3% THD), air-damped solenoid operation assures positive stop/start, gentle tape handling and long cart life. Electronic splice finder available as an option on recorders. 34 standard stereo/mono models to choose from, non-slip desk enclosure and rack mount. Priced from \$650 to \$1,775.

AMPRO also manufacture a complete line of mono, dual mono, stereo and dual stereo/simulcast consoles and multi-cartridge units. Financing available to qualified buyers. Call Alex Meyer collect or write today for details.

AMPRO CORPORATION

2220 Maplewood Ave., Willow Grove, Pa. 19090 • (215) 657-3100
 Professional Equipment for Broadcasting Professionals

See us at NAB Booth #910, South Hall
 Circle 114 on Reader Service Card

NEWS

cific recommendations regarding what features, characteristics, and rules should be required to insure that licensees will implement and operate a station with an unattended transmitter plant. The recommendations include: a feature to test the automatic shut-down circuits; a requirement for automatic control of aural and visual modulation levels; a requirement to automatically shut down the transmitter if the carrier frequency error or the maximum power output exceeds the tolerance set by the rules; the singling out of seven TV transmitter system performance parameters that should be electronically monitored.

NCTA Adopts Resolution Against Proposed FCC Pay Cable Rules

The National Cable Television Association Board of Directors has adopted a resolution which criticizes expected FCC regulations covering pay cable TV. The NCTA Board acknowledges that the FCC has not yet formally issued the new rules. The resolution states that 'contrary to its own statutory mandate, the FCC seems unwilling to permit the full development of innovative communications services desired by the public where it is alleged those services might be competing with the established order.' ... The FCC, continued the NCTA resolution, appears to have created an illusion of meaningful relief. We believe, however, that the FCC's program only strengthens broadcasting's hold on the means of distributing programming to the American public.

NAB President Takes Aim at Pay Cable

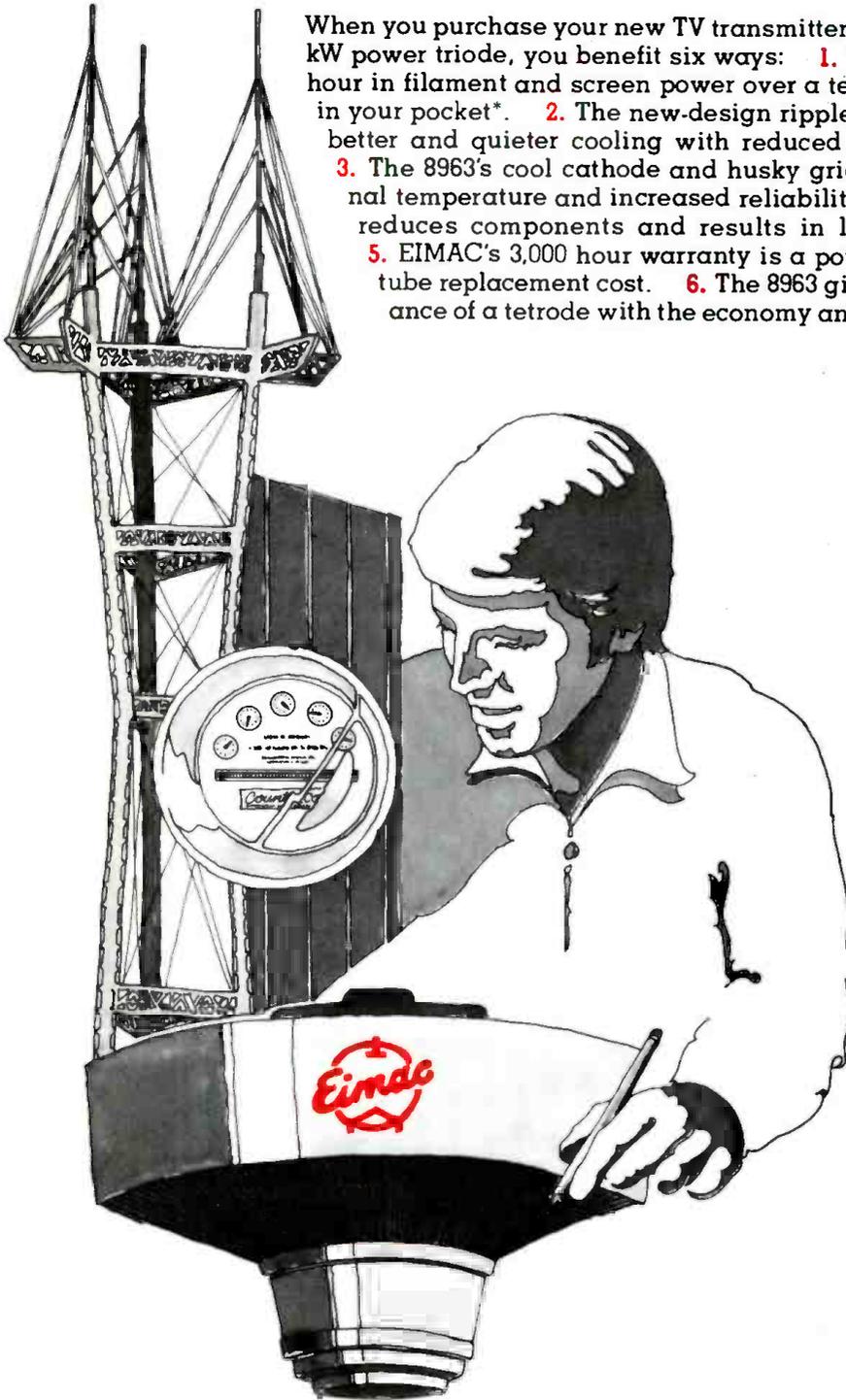
In a speech presented to the Arizona Broadcasters Association, National Association of Broadcasters President Vincent T. Wasilewski declared that "the time has come for some plain talk about the National Cable Television Association and the pay-cable entrepreneurs it represents." The NAB president traced previous cable interest positions such as in-home educational, medical and shopping services and minority programming, to the NCTA's present efforts.

continued on page 18

TV Station Executives...

EIMAC's 1975-model 8963 TV triode saves you money six ways.

When you purchase your new TV transmitter with EIMAC's 8963 the new 25 kW power triode, you benefit six ways: **1.** The 8963 saves 1200 watts per hour in filament and screen power over a tetrode. That's over \$250 a year in your pocket*. **2.** The new-design ripple fin radiator of the 8963 gives better and quieter cooling with reduced blower power requirements. **3.** The 8963's cool cathode and husky grid structure mean lower internal temperature and increased reliability. **4.** Simple triode circuitry reduces components and results in less downtime and failures. **5.** EIMAC's 3,000 hour warranty is a potential savings on tomorrow's tube replacement cost. **6.** The 8963 gives you the gain and performance of a tetrode with the economy and circuit stability of a triode.



Put dollars in your pocket and enjoy improved transmitter reliability with the EIMAC 8963. For complete details, ask your TV equipment distributor or write EIMAC, Division of Varian, 301 Industrial Way, San Carlos, California 94070. Or contact any of the more than 30 Varian/EIMAC Electron Device Group Sales Offices throughout the world.



*Based on an 18 hour transmitting day at 3¢ per kWh—and rates are going up (Business Week, Oct. 5, 1974).

Circle 115 on Reader Service Card

Our CP-16 Camera/Lens Package Deals Are Guaranteed To Give You More.



Figure it out yourself.

Take for example the package deal illustrated in this ad. You get a CP-16 reflex camera — the most outstanding news/documentary camera on the market today — *plus* a set of three superb Angenieux lenses. The extreme wide angle 5.9mm f/1.8; the high speed 28mm f/1.1; and the all around favorite “workhorse” 12-120mm f/2.2 zoom. All CP reflex mounted. A perfect combination for the news/documentary cameraman on the go.

And you save \$600 on the package.

Or, you can choose any of our other CP-16 reflex and non-reflex camera/lens package deals designed to save you hundreds of dollars.

Without compromising on quality.

So, visit your local CP-16 dealer. Ask for our new CP-16 illustrated price list. Pick the one package deal that suits you best. And save!

For further information, please write to:

cinema E products
CORPORATION

Technology In The Service Of Creativity

2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 ■ Telex: 69-1339 ■ Cable: CineDevco

Circle 116 on Reader Service Card

NEWS

Mr. Wasilewski emphasized that radio has much to lose if pay cable achieves its goals, since radio would be “excluded from sports coverage under pay-TV’s grand plan.” He said cable’s present position was best put in focus by Geoffrey Nathanson, head of a pay cable firm, in commenting on the FCC’s 1972 rules to implement the “consensus agreement.” At that time, he said, Mr. Nathanson was quoted as saying: “The wraps are off. What we’re really talking about is pay-TV, here and now, this year. We used to bury it and talk about meter-reading and education for the kids and two-way communications, and all the rest . . . But let’s face it—we’re really talking about the potential of first-run movies and Super Bowls on a pay basis.”

Mike Award Honors Loudspeaker Inventor

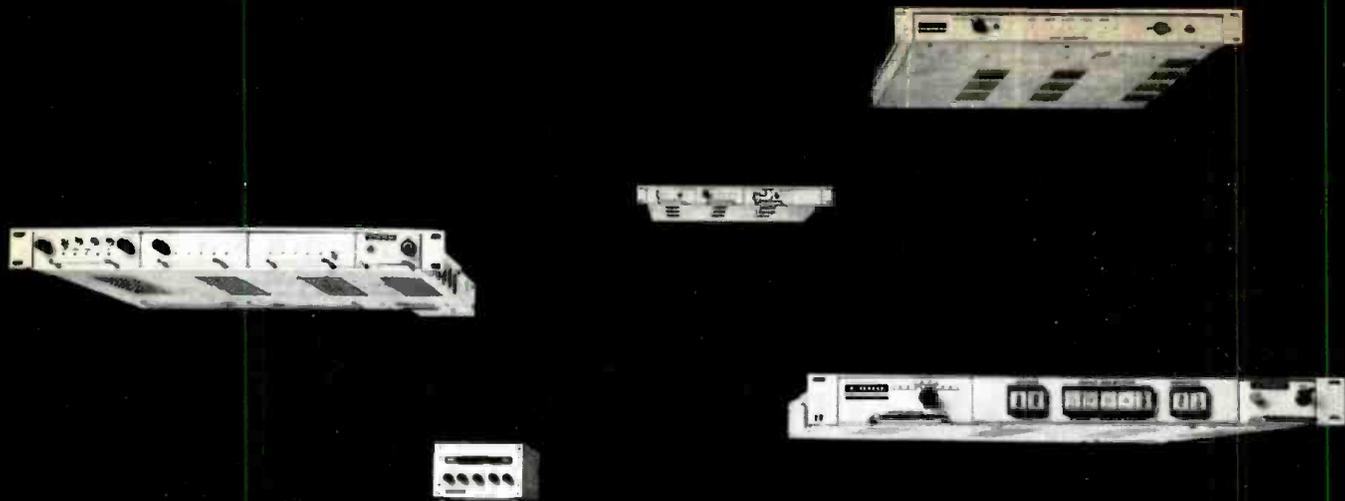
The Maker Of The Microphone Award for 1974 has been presented to Edgar Villchur for his work on the acoustic suspension loudspeaker. The engraved plaque was presented by Oliver Berliner, Audio-Video expert and grandson of Emile Berliner, inventor of the disc record and player. The award is presented annually for “an outstanding contribution to the world of sound.” The award will be awarded only 25 times, symbolizing the fact that Emile Berliner was 25 years old when he invented the telephone microphone.

Church Helps Community Groups Organize for Better Programming, Employment Opportunities

A national program, sponsored by the Office of Communication of the United Church of Christ, helps community organizations seek better television and radio programming, fair employment in broadcasting stations, and attention to the needs of minorities. The program, has enlisted the aid of the FCC, broadcasting industry figures, education and civil rights groups, and foundation support.

The project, called “Check Your Local Stations,” is intended to arouse viewers to the need to take a

continued on page 69



COHU IS MORE THAN CAMERAS

For those who don't already know it, besides manufacturing color and monochrome television cameras for a variety of end-user markets for nearly a quarter century, Cohu also produces a broad line of Studio Processing Equipment including—Sync Generators • Dot Bar Generators • Pulse Distribution Amplifiers • Video Distribution Amplifiers • Subcarrier Distribution Amplifiers • Video Encoders

**YOU expect
more FROM**



**and you
get it**

• Encoder Enhancers and Video Switchers

Let us serve your processing equipment needs as well as provide you the TV camera to do the job.

For further information please contact your local Cohu Sales Engineer or Cohu, Inc., Electronics Division, P.O. Box 623, San Diego, California 92112. Telephone: (714)-277-6700. TWX: 910-335-1244

See us at NAB Booth 219

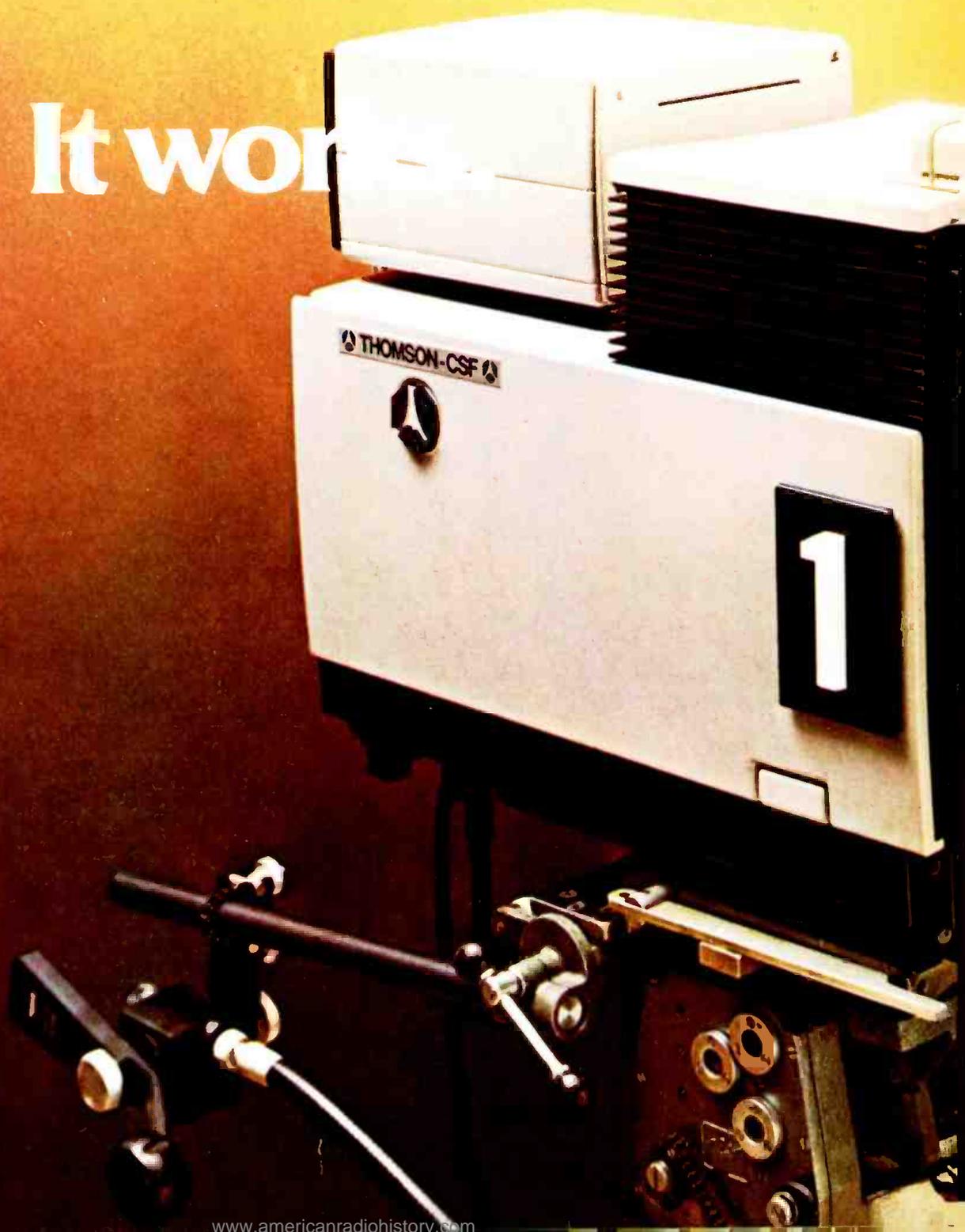
COHU SALES OFFICES:

NEW ENGLAND Bedford, MA 617-275-0370 • **NEW YORK** Florham Park, NJ 201-377-6636 • **WASHINGTON, DC** 301-656-3061 • **GREAT LAKES** Des Plaines, IL 312-824-4422 • **NORTH CENTRAL STATES** Lincoln, NE 402-467-2900 • **SOUTHEAST** Orlando, FL 305-896-4881 • **ROCKY MOUNTAIN** Denver, CO 303-573-8835 • **TEXAS** Arlington 817-461-1707 • **NORTHWEST** Mercer Island, WA 206-232-3550 • **CALIFORNIA** San Diego 714-278-8931, Thousand Oaks 805-492-1896, Cerritos 213-926-7002, Palo Alto 415-326-0280

Circle 117 on Reader Service Card

**Now, triax color
with one little
difference:**

It works



THOMSON-CSF TTV 1515, Now used in CBS mobile units

Triax color cameras have promised you enormous savings in man-hours and cable costs. But it takes a really reliable camera to turn those savings into a practical reality. Now there is one.

The TTV 1515 has been delivering trouble-free service in the field ever since 1971. Over 300 are now in use. It's the triax color camera that proved it works.

Why it works Thomson patents on circuits on this camera go back to 1964. We've been perfecting it ever since. The TTV 1515 wasn't introduced until every last "bug" had been thoroughly eliminated.

We also made 99% of maintenance a matter of minutes. Nearly all circuitry is in plug-in circuit boards . . . changed or adjusted instantly, 100% solid state. And there are no multi-layer

circuits to frustrate maintenance technicians. All wiring is in the open.

Quietest picture yet

Perfected pre-amplifier designs advanced processing and contouring techniques, and the adjustable comb filter all cut noise. Time-proved 30 mm. separate-mesh tubes are mounted parallel to the optical axis. Head amplifiers surround the targets for full shielding. Result: to an exceptional degree, noise is eliminated at the source.

The thinking man's CCU

A real miniature sync generator is built into the CCU for automatic synchronization. It restores, from mixed sync only, all signals usually derived from external sync . . . blanking, drives, etc.

Also built into the CCU: contour correction, adjustable comb filter, color masking, amplitude modulated shading, automatic cable compensation. All these logically belong in the CCU (not the camera). Thomson puts them there.

More unique features

1) Built-in dioscope eliminates front-of-lens "black boxes". 2) Superb low-light pictures due to built-in bias light. 3) Converts from triax to multiconductor cable with a five-minute switch of plug-in circuit boards. 4) Communication from camera head to CCU is maintained with power switch off. 5) Power supply is safe when shorted. 6) Viewfinder tilts, swivels, locks

and operates remotely. 7) Portable: camera 77 lbs., viewfinder 11 lbs. 8) Automatic continuous registration provided by optical markers in the optical assembly. 9) Ultra-stable digital multiplexing in 46 remote channels. 10) Separate multiplexed analog RGB outputs: compatible with existing Chroma-Key systems; permit use of NTSC, PAL and SECAM encoders.

Thomson-CSF: Leader in triax color

Since the early 1960's, the facilities of France's largest manufacturer of professional electronic equipment have been hard at work on triax color. Thomson-CSF has over 48,000 employees. The parent corporation, Thomson-Brandt, has over 98,000.

It all adds up to the most perfectly-developed camera in triax color TV. The field-proven one. The successful one. The one that works. TTV 1515 by Thomson-CSF.

THOMSON-CSF, Inc.
Broadcast Products Division
750 Bloomfield Ave., Clifton, N. J. 07015
Phone (201) 779-0216

Executive Offices:
THOMSON-CSF, Inc.
75 Rockefeller Plaza, New York, N.Y. 10019



THOMSON-CSF

Circle 118 on Reader Service Card



INTERPRETING THE **FCC** RULES & REGULATIONS

Two New CATV Rules

By Frederick W. Ford and Lee G. Lovett

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

1. Access Equipment Availability

The Commission has repealed its mandatory local origination cablecasting rule¹ which was applicable to all cable television systems with 3,500 or more subscribers. The Commission based the action upon its conclusion that mandatory origination was not the most effective means of fostering local expression in programming.

Origination by cable operators is now strictly voluntary. Local franchising authorities may continue to require provision of an origination channel by the franchisee, but may not dictate the manner of operation of that channel.

Cablecast Equipment Availability Rule

Instead of mandatory origination, all cable systems with 3,500 or more subscribers, and all

conglomerate[s] of commonly owned and technically integrated systems having a total of 3500 or more subscribers

This column periodically reviews important new CATV rules adopted by the Commission. A recent flurry of CATV rule additions, modifications and deletions prompts discussion of two important such rules.

[must make equipment available] for local production and presentation of cablecast programs other than automated services and permit local non-operator production and presentation of such programs.²

A cable system or conglomerate serving 3,500 or more subscribers must comply with the new rule even if it was granted a waiver of the former mandatory origination rule.

Although hesitant to detail what types of equipment would be adequate to comply with the rule, the Commission outlined the following "minimum":

... the operator must have at least the capacity to afford live programming with one or more black and white cameras, the capacity to video tape remote programs, edit, and play them back, and the capacity to modulate the resulting video and audio product on a cable channel.

"Minimum" compliance with the cablecast equipment availability rule is estimated (by the Commission) at under \$10,000 with annual equipment maintenance costs of less than \$1,000.

Top 100 Market CATV's Not Affected

Cable systems located, in part or in whole, within the top 100 television markets must, *inter alia*, provide designated access channels³ pursuant to Section
continued on page 26

¹ Section 76.201 of the Commission's Rules is repealed effective January 20, 1975. (Note that this Rule's effectiveness has been "stayed" by the Commission since May 27, 1971.)

² Section 76.253 is effective (1) on January 1, 1976, or (2) on the date that cablecast equipment is made available, if before then.

³ These include Public Access, Government and Education channels. The Public Access channel must be made available on a non-discriminatory, first-come basis and minimal equipment and facilities necessary for program production must be available for public use.

PEC-102

A Complete System Approach to Computer Controlled VTR Editing... by Central Dynamics

A frame-accurate editor for creative people, designed for your present and future requirements . . . with outstanding features including:

- Mimic CRT diagrams for Off-Line and On-Line edit modes graphically display current status of all operations including data entry, scene location, edit rehearsals, and automatic assembly.
- A control panel designed for the editor.
- Instant "call up" and control of all computer programs.
- Edits on any frame . . . with accurate color framing.
- Continuous SMPTE Time Code recovery and display for faster and more reliable editing.
- Audio edits can be offset from video and executed in the same pass.
- Edit-on-the-Fly.
- Performs open ended edits.
- System stores up to 600 edit scenes. Any edit scene can be called up, displayed, rehearsed, and changed at any time.
- Automatic control of audio/video switcher with full Mix/Effects capability.

- Interfaces to Quad, helical, multi-track audio machines and SLO MO's.
- Hardcopy output of edit decisions printed on demand.

The PEC-102 is an example of our "Total Design and Manufacturing Approach" to video tape editing systems . . . Hardware, Software and Service . . . all by Central Dynamics.

If you need more convincing, send for our PEC-102 and editing equipment brochures, or ask to see the PEC-102 in action. They are operating in most major cities across the country.



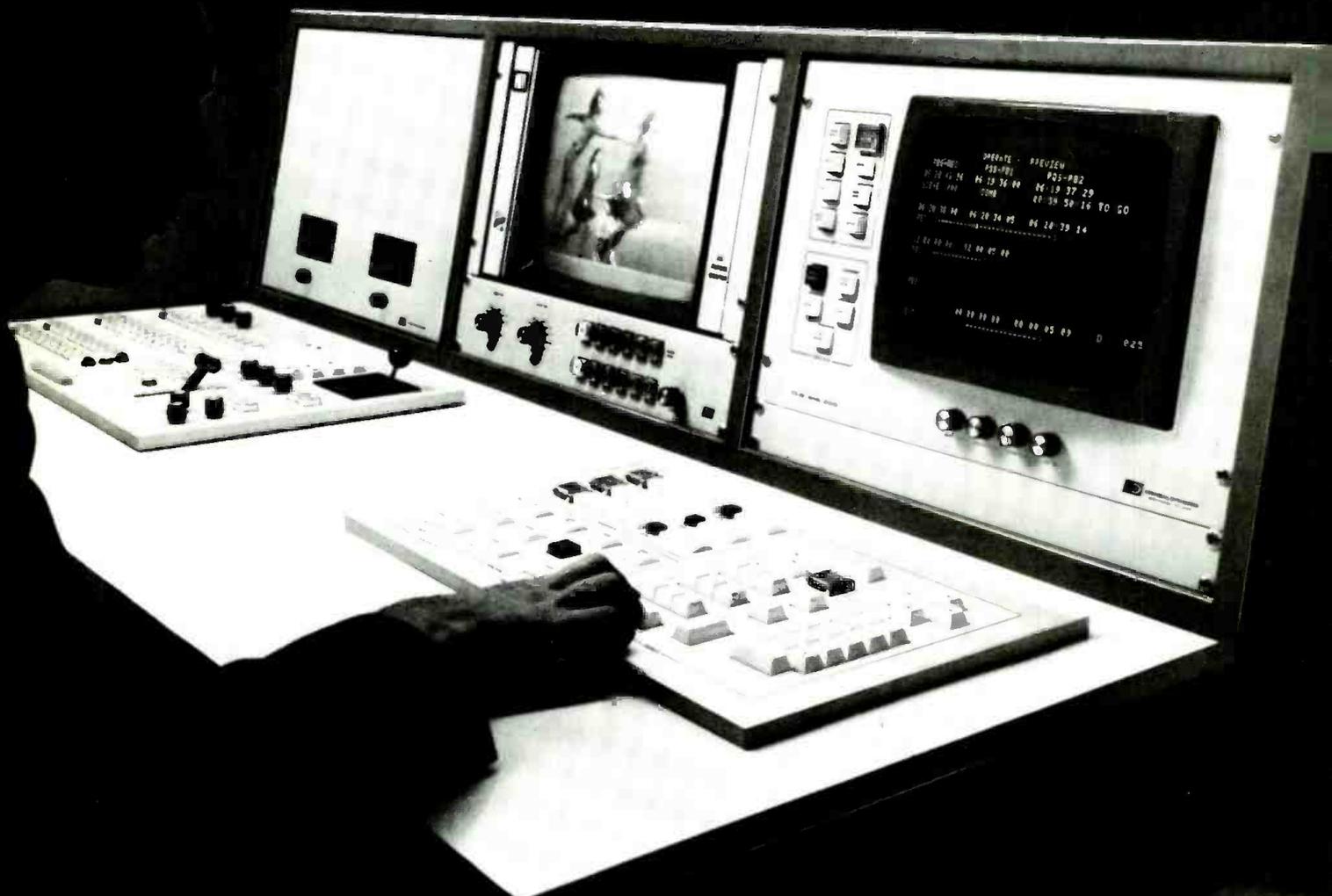
CENTRAL DYNAMICS LTD

Canada:

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

U.S.A.

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



Picture a new high performance,

One picture couldn't begin to tell the whole story of how our new TR-600 compares with other "new" VTR's.

Nor would a hundred.

But, we felt that a number of different views would give you a good idea of what we mean when we say totally new tape technology.



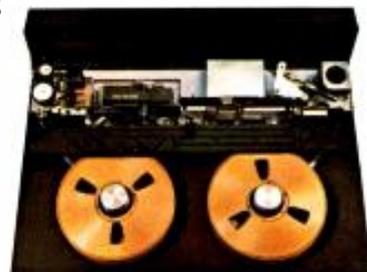
Like the drop-on reels for instance.



Then there's our unique straight line threading. It not only speeds loading, but once the tape reaches the take-up reel, the operator is also assured that threading has been accomplished properly.



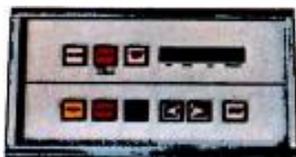
The TR-600 utilizes a standard headwheel (featuring long-life Alfecon II poletip material) that's compatible with all other RCA highband recorders. You'll find this really keeps down the expense of spares.



tape technology, medium price.

We've added an electronic LED readout tape timer. And LED diagnostic indicators.

At the first sign of certain malfunctions or nonstandard modes, a control panel light flashes a warning, while individual lights inside direct you to the module that's in question.



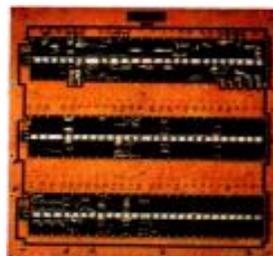
We've simplified the control panel for easy operation.



These module cards have the reliability advantages of computer assembly printed circuit wiring and automatic insertion of components.



Another TR-600 innovation is the copper backplane which assures precise resting of modules.



The backplane is wire wrapped under computer control replacing the past practice of using dense, bulky internal wiring harnesses.

Chimney cooling eliminates the need for blowers and a Venturi vacuum system replaces normally noisy vacuum pumps.



And for optimum playback performance our tape tension servo system features fast rewind and is gentle in handling of tape.

Unfortunately, there are so many things we can't show you. Like all the TR-600's automatics. Because they're all built in. Like the splicer, too. Or the fact that its new integrated design reduces the number of components by 40%.

Nor can we show you the time and money the TR-600 will save you.

But, if what we've shown you so far looks good, we'd be glad to send you a more complete picture of the TR-600.

Write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102. Get the picture, then compare.

RCA

76.251 of the Commission's Rules, and, therefore, need do nothing more because they already comply with the new cablecast equipment availability rule. Cable systems *not* required to provide a dedicated access channel pursuant to Section 76.251 need not do so now. Yet, such cable systems are expected to make a "reasonable effort" to provide public use of channel time whenever it is available.

"Natural Break" Advertising Rule Repealed

The "natural break" restrictions on origination cablecast advertising⁴ is repealed effective January 20, 1975. Henceforth, advertising can be inserted anywhere within an originated cablecast program, instead of only (1) at the beginning, (2) at the end of (3) at natural breaks. The Commission's purpose in eliminating the advertising restriction is to encourage the now voluntary origination programming by cable operators.

Access Equipment And Time Charges

Cable operators may make "reasonable" charges for the use of cablecasting *equipment* that is required to be made available for public access as long as such charges are "consistent with the goal of affording the public with a low cost means of television access." Yet, a cable franchise may still require that no charge be made for such equipment.

No charge may be made for *channel time* for non-commercial programs cablecast by local persons or entities that are not cable operators. Such "non-operator" programming should be identified as such during cablecasting.⁵

Rules Applicable To Operator And Non-Operator Cablecasters

Origination cablecasts under the full control of the operator must comply with Sections 76.205 *et seq.*⁶

Non-operator cablecasters need not comply with these origination cablecasting rules. Moreover, cable operators may exercise no control over program content of non-operator programs, are limited in cost assessments (discussed, *supra*), and must establish operating rules concerning the following:

- (1) first-come, nondiscriminatory availability of cablecast equipment;
- (2) prohibition of presentation of lottery information and obscene matter;
- (3) sponsorship identification;
- (4) specification of a rate schedule; and
- (5) public inspection of a complete record of names and addresses of all persons or groups requesting use of cablecasting equipment. Such record must be available for inspection for two years.

⁴ Section 76.217 of the Commission's Rules.

⁵ The Commission recommends identification of (1) a cablecast program as origination cablecasting or access cablecasting, and (2) the person or group presenting the program, until the pending cablecast identification rule making proceeding is completed.

⁶ These sections include rules relating to: origination cablecasts by candidates for public office; fairness doctrine; personal attacks; political editorials; obscenity; sponsorship identification; pay cable charges; minimum channel capacity; access channels.

Cable operators must file the required operating rules with the Commission within 90 days after the access equipment is first made available. Such rules must also be made available in the cable system's public inspection file.

2. Late-Night TV Program Carriage

The Commission recently enacted a rule⁷ permitting carriage of late-night programming from otherwise unauthorized stations. The rule is of immediate applicability to operating cable systems. To facilitate the planning of a more attractive and complete programming proposal, both operating and prospective CATV's should have a thorough understanding of the new rule.

Permissible Importations

Without FCC certification or notice to TV stations, CATV's may carry any and all television broadcast signals *from* (1) the sign-off of the *last* television signal that the cable system must carry *until* (2) the sign-on of the *first* television signal that the cable system must carry. The following hypothetical illustrates the new rule.

A cable system operating in Community X is required to carry 10 television signals by the Commission's Rules. The Rules do not permit carriage of any signals other than the 10 presently carried. Five of the stations sign-off at 12:00 a.m., three sign-off at 12:30 a.m., one signs-off at 1:00 a.m., and the final station signs-off at 1:30 a.m. The cable system may initiate carriage of any and all other television stations at 1:30 a.m. and not before. The system may continue to do so until the first mandated-signal returns to the air.

If a television station, the signal of which is the last required to be carried, signs-off *before* the hour or half hour, a cable system may initiate carriage of any and all other television signals at the preceding half hour or hour respectively.

The following illustration assumes the facts stated in the above hypothetical.

Of the stations required to be carried by the cable system in Community X, the one signing-off last does so, not at 1:30 a.m., but at 1:15 a.m. The cable system may initiate carriage of any and all other television stations at 1:00 a.m., one-quarter hour *before* the last "required-carriage" station signs-off. If the last "required-carriage" station signs-off at 1:50 a.m., the cable system may initiate carriage of any and all other television stations at 1:30 a.m., twenty minutes *before* sign-off of the final station.

continued on page 28

⁷ On October 18, 1974, the Commission enacted Sections 76.57(c), 76.59(d) (3) and 76.61(e) (3) of its Rules.

IKEGAMI TK-355

“...super-reliable
low-cost color camera”
says Midwest Teleproductions.



“At under 60 lbs., the TK-355 moves to new camera positions with a quarter the manpower and time of our previous studio-type color cameras. And it’s fantastically reliable. Our three Ikegami TK-355’s cover all events at the new sports and entertainment center in Northwest Ohio, The Coliseum. With these cameras, it’s been zero downtime all the way!

There are plenty of little ‘extras’ which make the TK-355 a pleasure to use, too. Like velvet-

smooth zooming with unique push-pull control ... and the built-in diascope registration chart for instant emergency set-up and alignment.

No other low-cost color camera we’ve tested is so portable, so reliable, so easy to use, and delivers such great pictures at moderate lighting levels. Ikegami has really put it all together in the TK-355!”

**Len Zaller, Operations Manager
Midwest Teleproductions, Inc.**

For further information and/or demonstration, call or write:

IKEGAMI ELECTRONICS INDUSTRIES INC. OF NEW YORK

35-27 31st Street, Long Island City, New York 11106/Telephone: (212) 932-2577

Circle 162 on Reader Service Card

Cable systems will be permitted to carry an imported program to its conclusion although a local station has signed-on (an exception to the general rule stated above). The Commission felt that a rule requiring termination of imported stations as soon as the first local station signs-on would be against the public interest. The Commission does require that carriage of any imported signals be consistent with the program exclusivity rules. In most cases, this means simultaneous exclusivity.⁸

Effects On Leapfrogging And Other Issues

The Commission's leapfrogging rule (limiting a cable system's choice of imported independent signals from the first 25 major TV markets) is not applicable to late-night cable system station carriage. Cable system operators may choose any signal in any priority regardless of distance from the cable system's community. *Nor will the Commission require prior certification of the distant signals chosen for carriage.*

No imported late-night programming will be grandfathered to a cable system by the Commission. Thus, local late-night broadcasting will be encouraged by giving local stations the power to terminate late-

⁸ But special note should be made by a cable system that imports a station after midnight. If a program will be broadcast during the same day by a Mountain Time Zone station that is entitled to same-day exclusivity protection, that program cannot be carried.

night signal importation by extension of their own programming day.

Finally, the Commission made clear that it was *not* ruling on several issues, including:

- (1) "videotaping programs for late-night replay";
- (2) imposition of "more stringent logging requirements" on cable systems; and
- (3) "requiring retransmission consent."

Consideration of these issues may be the subject of future Commission proceedings.

Conclusion

The mandatory local origination rule for cable systems with 3,500 or more subscribers is no longer applicable. However, such systems must provide public access to equipment for production and presentation of cablecast programs. The "natural break" advertising rule is repealed. Cable operators are subject to restrictions on (and in some cases, prohibition of) access equipment and access channel time charges. Operators must adopt operating rules and file same with the Commission 90 days after access equipment is made available.

The new late night programming rule may permit an expansion of program offerings for many cable systems. Late-night audiences, now small but growing in size, merit increasing attention by cable systems operators. Many CATV's are investigating the economic feasibility of importing stations with attractive programming, as permitted by this new rule. **BM/E**



Switch to Dynasciences Routing Switchers!

Dynasciences Routing Switchers now give you the opportunity to replace that messy patch panel. Signal routing is easier because of illuminated push-button selection.

Expansion? It's simple. Just add modules as you need them.

Reliability? The 8300/8500 Series gives you top performance. Crosstalk between channels: 50 dB down at 12 MHz; Frequency Response: ± 0.25 dB to 12 MHz; Differential Gain: Less than 0.3% at 3.58 MHz/channel.

These are only a few of the reasons to contact Dynasciences Video Products.



**8300/8500 SERIES
LOCALLY-CONTROLLED ROUTING SWITCHERS**

DYNASCIENCES
A SUBSIDIARY OF **Whittaker**

video products

TOWNSHIP LINE ROAD • BLUE BELL, PA. 19422
Telephone: (215) 643-0250 • Telex: 84-6358

Circle 122 on Reader Service Card

Here's the real lowdown.
Low noise at a new low price.



With the new Mark IV Image Enhancer in your system you'll have an unbeatable signal-to-noise ratio working for you. Better than 55 dB. That means quiet enhancement like you've never seen!

Best of all, better enhancement now costs you less. We've just reduced prices!

So whether you're buying a new live camera or telecine, or updating your present system, don't settle for less. It just doesn't pay to fool around with imitation units. Specify Image Enhancers from CBS Laboratories, the people who created image enhancement. Available for NTSC, PAL or SECAM installations.

For technical information on the Mark IV series, write for Marketing Bulletin 74-01, contact your local distributor, or call us. We'll give you the real lowdown.

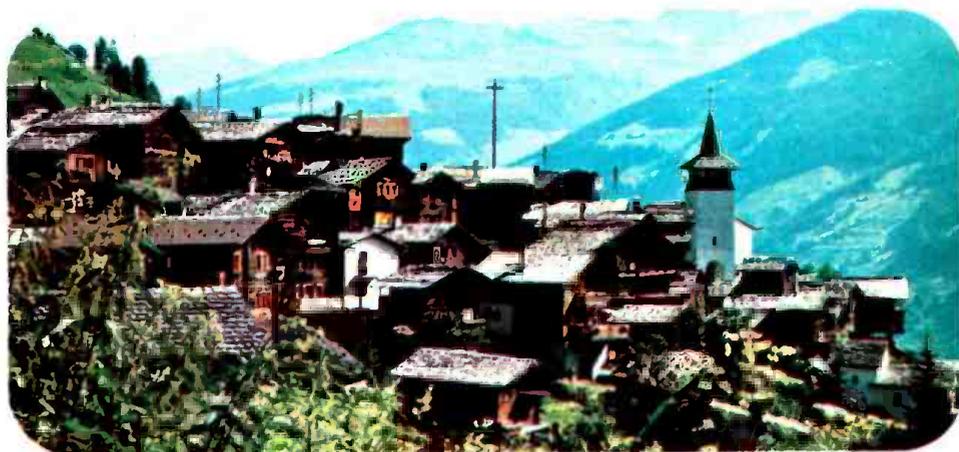
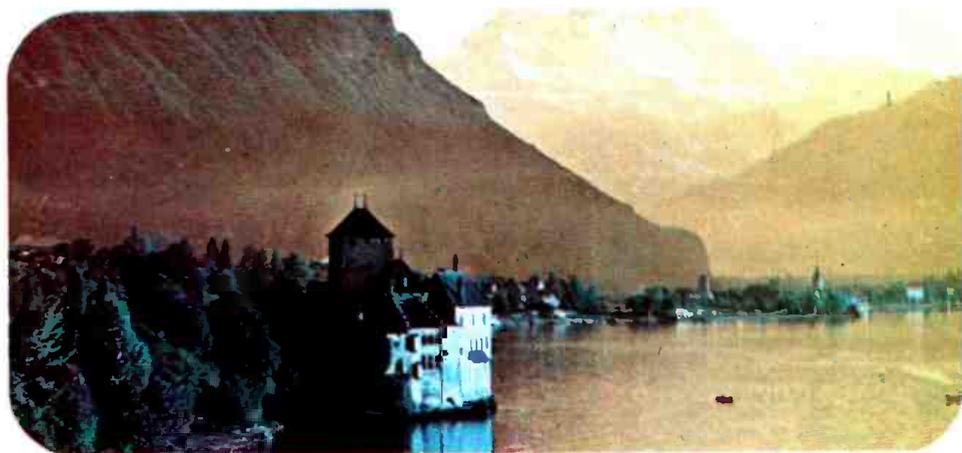
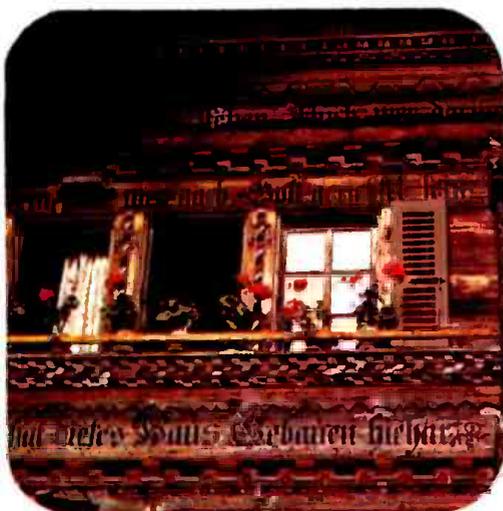
CBS LABORATORIES

A Division of CBS Inc.
227 High Ridge Road, Stamford, Connecticut 06905

Circle 123 on Reader Service Card

9TH International Television Symposium And Exhibition

Montreux, May 23-29, 1975



Dear Broadcaster:

You are cordially invited to join BM/E in a special trip designed to take you to Montreux to attend the Ninth International Television Symposium and Exhibition. This biennial Symposium has become the industry's most preeminent convention drawing leading authorities from every part of the world. Over 60 renowned international companies will be exhibiting the state of the art in equipment.

BM/E's International TV Tour has been prepared to offer the least expensive air and land rates available to encourage American broadcasters to attend this important event.

Two programs are available. The prices differ according to the quality of hotel chosen in Montreux. A post-symposium offer is included in order to qualify the use of a 14 day GIT air fare.

Itinerary

- May 22 Depart New York (JFK) for Geneva via Swissair Flight No. 111.
- May 23 Arrive Geneva and transfer by Motorcoach to Montreux hotels. Attend TV Symposium—Welcome cocktail party and International Review.
- May 24 through May 29 Hotel accommodations with breakfast daily and attendance of TV Symposium and Exhibition.
- May 30 Depart Montreux after breakfast for Geneva where you will start your second week of personal business or leisure.
- May 30 through June 5 One week including car (Volkswagon 1200 or Fiat 127) (Two per car) unlimited mileage. 7 nights in a typical Swiss guesthouse (location of guest-house will be assigned before departure).
- June 5 Return to Geneva airport by noon to relinquish your car and check in for return to New York on Swissair Flight No. 110.

Tour Prices

Package A	Deluxe Hotel	\$885.
Package B	First Class Hotel	\$785.

Single Supplement Surcharge on request

The above Tour Price Includes:

- Economy-class air ticket New York/Geneva/New York based on 14/21 day GIT fare.
- Transfers by private motorcoach from Geneva to Montreux upon arrival and Montreux to Geneva on May 30.
- Registration Fee for International Symposium and Exhibition.
- 7 nights hotel accommodations in Montreux double-occupancy in Deluxe or First Class hotel according to choice.
- 7 Continental breakfasts in your hotel in Montreux.
- 7 days car rental with unlimited mileage. (Volkswagon 1200 or Fiat 127) (Two per car).
- 7 nights in a typical Swiss guesthouse (location of guesthouse will be assigned before departure).

Optional Accommodatons to Above Offer

Second Week

1) Hotel accommodations at *Ambassador Hotels* throughout Switzerland.* The hotel will be allocated in the city of your choice or nearby, subject to availability—Cost \$15 per person per night including breakfast, taxes. (i.e. 6 nights \$90.)

2) *A.G.I.P. Motor Hotels in Italy** The AGIP Motor Hotels are located in most major Italian cities at a cost of \$9 per night—room only. Reservation guaranteed by 6:00 P.M. arrival.

* List of hotels available upon request.

For both options payment is requested in advance and vouchers are issued accordingly.

Please fill in the attached coupon and return as soon as possible. A deposit of \$100 per person made payable to BM/E must accompany your reservation request. In case of cancellation the deposit is refundable in full up to 30 days prior to departure.



BM/E International TV Tour

274 Madison Avenue
New York, New York 10016

Please enter _____ reservations for the trip. I have enclosed a \$100 deposit for each reservation requested.

Package A _____ Option I _____
Package B _____ Option II _____

Name (print) _____

Company or Station _____

Street Address _____

City _____ State _____ Zip _____

Phone No. _____

Wife's first name if she is traveling with you _____

The "Greatest Show" Set To Open In Las Vegas

NAB will do it again in April: put on an Annual Convention that outdoes all previous NAB Conventions. Early demand for exhibit space was running ahead of last year. The technical program, the special speakers, will all have genuine value and interest for broadcasters.

With the storied pleasures of Las Vegas within easy striking distance of the Convention setting, the National Association of Broadcasters will open its 53rd Annual Convention on Sunday, April 6th, in the Las Vegas Convention Center, with early indicators pointing to the largest product show in NAB history.

The Convention will offer those who come a familiar mix of technical papers and panels, distinguished luncheon and dinner speakers, and a whole-industry product exhibit.

Attendance may be down, but . . .

Las Vegas may not be the lure that the NAB hoped for. Preliminary figures from our annual "Panel of 100" survey shows that only 57% of those responding to BM/E's poll will be going. This is exactly the same number that said they would attend Houston, but less than the Chicago and Washington shows.

The "mix" of those attending is somewhat different than last year.

TV managers will show up in greater numbers; 82% compared to 69% last year. But TV engineers will decline—61% in 1975 compared to 70% last year. Radio managers may be there in fewer numbers than ever before—only 42% said they would be going. On the other hand, more radio engineers will be going—up 14%.

Those that will be attending have a keen product interest. Every TV manager, TV engineer, and radio engineer, planning to attend Las Vegas, has a specific product in mind to investigate. The only people without a specific product interest are radio managers.

In the TV area, the equipment of most interest will be time base correctors and hand-held cameras, i.e., gear for electronic news gathering. But switchers are still high on the list. There appears to be more interest in character generators than in previous years. Although the overall interest in TV transmitters has declined, those that intend to evaluate transmitters put them high on their priority list. This same group is interested in remote control.

Interest in studio cameras appears to be way off. There seems to be some stepped-up interest in film chains both in general and for those who put a priority on this product.

In the radio area, tape recorders have bumped consoles as the product of keenest interest. BM/E's article on tape recorders this issue is most timely. And automation is a priority item with many radio managers.

While Las Vegas attendees don't intend to commit themselves at the show, our Panel of 100 respondents reveal higher budgets for equipment than in 1974. We have always been reluctant to report budget figures since only a third indicate their plans. We can say, however, that there are a number of TV stations planning to spend over \$500,000 next year, and an impressive number of radio stations with budgets over \$30,000.

BM/E's March issue will have a complete rundown on products to be exhibited, based on advance reports from the companies that will be on the floor.

A few companies have made partial announcements about their exhibit plans. CBS Laboratories will emphasize their new automatic color corrector, and will show in addition their line of signal processing equipment. International Video Corporation will add to the equipment available for electronic news gathering with a portable, hand-held video camera that they say produces pic-

Overall Interest in TV Equipment

	Percent Interested 1975	Percent Interested 1974
Time Base Correctors	64%	N.A.
Production Switchers, large 30)	52	47
Production Switchers, small 22)	—	—
Character Generators	46	40
VTRs quad	44	47
TV Cameras, Portable	44	N.A.
Test Equipment	44	45
Audio Consoles	42	38
Video Cartridges/Cassettes	40	47
Picture Monitors	40	43
Film Chains	34	30
Video Tape Editors	32	41
VTRs Portable	32	N.A.
Routing Switchers	32	N.A.
Master Control Switchers	32	N.A.
Remote Control Equipment	28	24
Transmitters	24	34
TV Cameras top-of-line	22	36
TV Cameras med. price	16	40

Overall Interest in Radio Equipment

	Percent Interested 1975	Percent Interested 1974
Tape Recorders/Players	78	57
Consoles Mixers	53	65
Cartridge Players	49	62
Automation Equipment	46	42
Audio Processing Equipment	43	38
Test Equipment	39	N.A.
Remote Pickup & STL	32	32
Noise Reduction Systems	32	N.A.
AM Monitoring Equipment	28	38
AM Transmitters	25	32
Loggers	25	25
Turntables	25	37
FM Monitoring	19	40
FM Transmitters	18	33
FM Antennas	16	23

INTRODUCING THE INFORMATION SYSTEM

Information display system
reflex cameras keeps
you informed at all times about critical
operating conditions. It is
well organized, easy to interpret,
simple and dependable in performance.

This is how it works.

Advanced solid state circuitry permits the use of
dependable light emitting diodes (LEDs) as monitoring
devices, rather than the usual delicate metering needles
which are so susceptible to damage.

Above and below our unique CP-16R fiber optics viewing screen,
various LEDs light up or change in intensity as they monitor vital
camera functions. You get all the information you need, *only* when you
need it. Most of the time, no more than two LEDs will be on at any given mo-
ment. So you can concentrate on your prime objective: filming the scene!

The following indicators are standard equipment on all 1975 CP-16R
reflex camera models:

- B** — for "Battery." It lights up *only* when your battery is low.
- S** — for "Sync." It lights up *only* when your camera is running out-of-sync.
- F** — for "Footage." It lights up *only* when you're about to run out of film (whether
you're shooting with 200 ft. or 400 ft. film loads).
- VU** — for "VU Meter," of course. Here, the varying intensity of illumination indi-
cates modulation levels in the CP-16R/A camera with built-in Crystasound amplifier.

The exposure information (at the bottom of the display) is featured only in CP-16R
reflex cameras equipped with our *optional* semi-automatic or fully automatic exposure
control system. In which case, the illuminated **0** represents "Correct Exposure."
And the symbols to the right and to the left, progressing in ASA half-stop increments,
light up to indicate over- or underexposure.

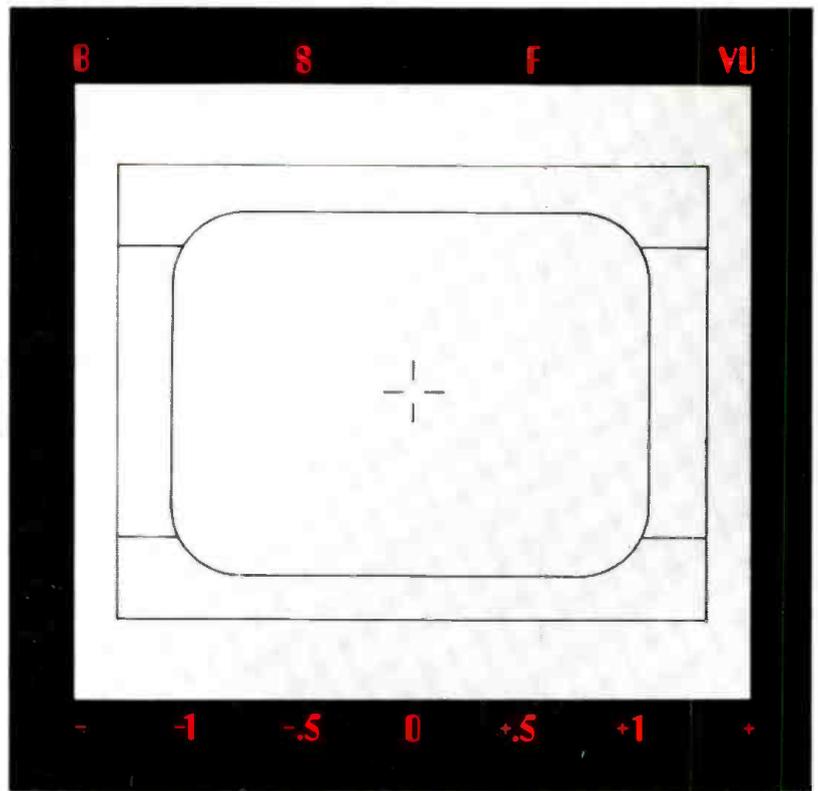
Our CP-16R *information display* truly informs, without distracting.
Without cluttering up the viewfinder. Sure, 1975 CP-16R camera models
cost more. But the *information display* alone is well worth the increase. And
it is but one of the many new innovative design features that make the CP-16R
reflex the most outstanding 16mm camera system ever!

For further
information,
please write to:

cinema E products
CORPORATION

Technology in the Service of Creativity

2037 Granville Avenue Los Angeles, California 90025
Telephone (213) 478-0711 ■ Telex 69-1339 ■ Cable Cinejevo



CP-16R/A reflex camera shown
with optional fully automatic exposure
control system.

Circle 124 on Reader Service Card

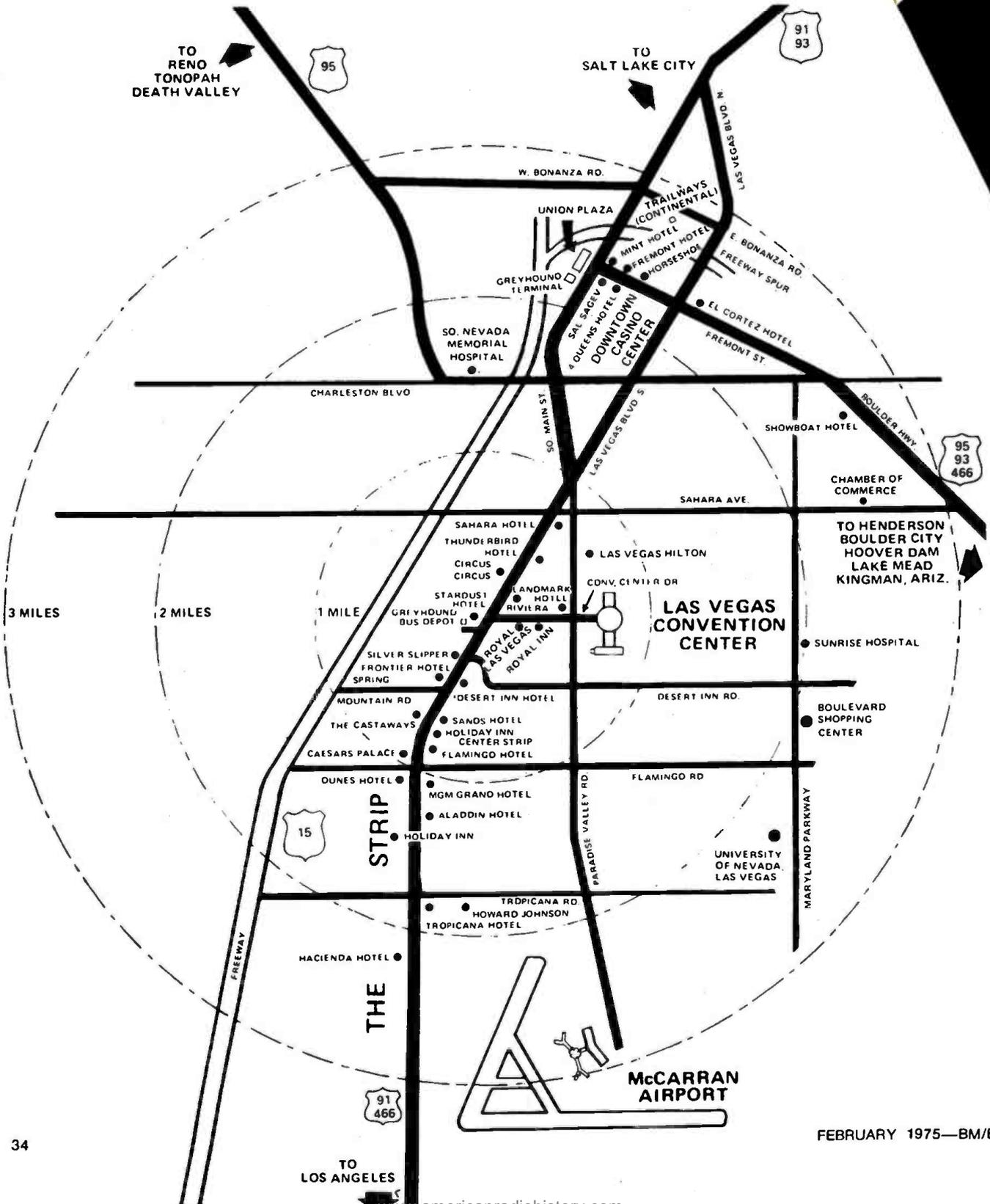
ture quality equal to that of the company's studio camera, Model 7000. Video Memory Corporation will introduce a nonsegmented helical VTR for 1" tape, the VR-1, which claims performance at a very high level, and sells for about \$9400.

RCA will push their new smaller quadruplex VTR, the Model 600, which was shown in prototype last year and will be ready for delivery at just about show time this year. However, there is no sign yet of an unexpected major entry in the top-quality

race that would match last year's last-minute unveiling by Ampex of the AVR-2. Ampex, RCA, and IVC will all have the machines that entered the great VTR race last year, the IVC's helical challenge to the reign of the quadruplex still in being.

Among the many technical sessions will be a series of papers on the all-solid-state AM transmitter, and another series on circular polarization of TV transmissions, both currently "hot" topics for broadcasters. And among the numerous distin-

guished high inter-
 sessions, one of very
 by Dr. Haer
 at the N
 charge of the
 will tell the ex
 nications with
 now some 900
 earth on the way
 the solar system.
 oneer take 60 min
 earth, for what is fa
 longest-distance radio
 completed.



Getting Acquainted With The Las Vegas Terrain

The toughest thing to lose in Las Vegas is your way. There are only two areas of major importance: The Strip or the downtown Casino Center. There's more action than you can handle at either one.

The Strip is in fact a roughly three-mile stretch of the Las Vegas Boulevard, bursting with hotels, casinos and other awesome attractions, bounded at one end by Tropicana Avenue and at the other by Sahara

Avenue. (The Convention Center is just a little off the Strip near the Sahara end—next to the Las Vegas Hilton.)

The Casino Center is a more compact area located on East Fremont Avenue at the northern end of Las Vegas Boulevard. Compressed into a three-square block area is more casino space than you can explore in a week, all wrapped up in a 43-mile long neon light network that boasts a \$65,000 a month electric bill.

Here's a list of the main hotels in both areas, including addresses and

telephone numbers, and an accompanying map to help you get your bearings in advance. In making your preliminary plans, be forewarned that, contrary to some prevailing myths, Las Vegas is not any less expensive than other comparable convention sites in terms of hotel accommodations, meals and nightlife. Those legendary complimentary suites and lavish meals are pretty much restricted to the regular "high rollers" who descend upon the town with considerably more frequency than does our less free-wheeling assemblage.

Single and double room rates range from \$22 to \$48 per person, with one and two-bedroom suites starting at around \$50 and soaring up, of course.

Lunch and dinner prices at the better hotels and restaurants are comparably scaled to the surroundings, with show-dinners hovering in the \$25 per person area, but normally well worth the investment, particularly to the Las Vegas first-timer.

And when you arrive, the first thing you'll need will be the soon-to-be-published, handy BM/E Las Vegas Survival Guide, a useful booklet chock full of useful information and tips on everything from restaurant ratings to advice for the novice gambler. If you're looking for an early start, a complete catalog of some 475 books on every conceivable aspect of gambling can be obtained free of charge by writing: Gambler's Book Club (GBC), Box 4115, Las Vegas, Nevada 98016. Their "How To/How Not To" booklets on the six principal games of chance (Baccarat, Blackjack, Craps, Keno, Slots and Roulette) could save you a lot of confusion (and grief) especially if your background is friendly penny-poker.

The Vegas Credit Credo:

If you are not an established casino regular, your credit rating is non-existent. More explicitly, don't bother to bring your personal checkbook to Las Vegas without an official Bank Letter of Credit, a document which at least affords you the privilege of having your credit line painstakingly checked. This rule of thumb applies not only in the casinos but in hotels, restaurants and shops as well. Major credit cards will get lodging and meals, but if it's chips you desire, be sure you can back every purchase with legal tender!

Ground Transportation in Las Vegas

1. **NAB Shuttle Buses:** There will be free shuttle buses running from all hotels to the Convention Center and back frequently during each day.

2. **Rates from airport:** coaches depart hourly for all hotels from McCarran Airport. Fare is 50¢. Taxi rates average \$2.50 to hotels on the Strip, up to \$3.50 for hotels in the Downtown Casino Center. Major hotels provide regular service to and from airport by private coach or limousine (standard phone call upon arrival procedure). Fourteen car rental agencies are located at McCarran Airport, including all the majors. Prevailing rates are low.

3. **Taxi Service:** taxis are as reasonably-priced as they are numerous. Meters start at 65¢/\$1.15 1st mile/60¢ each additional mile. In Strip area, and from Strip hotels to the Convention Center, fares will average \$1.00-1.50, and a bit more from the Casino Center.

4. **Public transit buses** are available up and down the Strip at 50¢ for adults, 15¢ for children.

Resort Hotels Along "The Strip"

Hotel	Address	Tel. No. (Area 702)
(Reservations thru NAB only)		
Caesars Palace	3570 Las Vegas Blvd. So.	734-7110
Castaways	3320 Las Vegas Blvd. So.	735-5252
Circus Circus	2880 Las Vegas Blvd. So.	734-0410
Desert Inn and Country Club	3145 Las Vegas Blvd. So.	735-1122
Dunes Hotel and Country Club	3650 Las Vegas Blvd. So.	734-4110
Flamingo	3555 Las Vegas Blvd. So.	735-8111
Frontier	3120 Las Vegas Blvd. So.	734-0110
Holiday Inn	3475 Las Vegas Blvd. So.	732-2333
Landmark	364 Convention Center Dr.	734-9110
Las Vegas Hilton	3000 Paradise Road	732-5111
MGM Grand	Flamingo Rd. at The Strip	739-4111
Riviera	2901 Las Vegas Blvd. So.	734-5110
Royal Inn	305 Convention Center Dr.	734-0711
Sahara	2535 Las Vegas Blvd. So.	735-2111
Sands	3355 Las Vegas Blvd. So.	735-9111
Stardust	3000 Las Vegas Blvd. So.	732-7111
Thunderbird	2755 Las Vegas Blvd. So.	735-4111
Tropicana	3801 Las Vegas Blvd. So.	736-4949
(Reservations directly with hotel)		
Aladdin	3667 Las Vegas Blvd. So.	736-0111
*El Cortez	600 E. Fremont	382-1500
*Four Queens	201 E. Fremont	385-4011
*Fremont	200 E. Fremont	385-4011
Hacienda	3950 Las Vegas Blvd. So.	736-2933
*Horseshoe	128 E. Fremont	382-1600
*The Mint	100 E. Fremont	385-7440
Showboat	2800 E. Fremont	385-9123
*Union Plaza	1 Main St.	386-2110

*Located off the North end of the Strip in the Downtown Casino Center

Fewer parts... fewer problems with **audiopak® A-2** broadcast cartridge

*Ribs are molded into the flange —
no pencil leads
to break and jam.*

*No top wire.
Reloading's easier.*



*Tape guide is
an integral part of
the cartridge base
— not glued in —
to insure accurate azimuth control.*

Try one free

In the broadcast cartridge world, the simpler the better. That's why the design of the audiopak A-2 eliminates parts that can give you trouble.

The lessons learned from our years of experience developing the world's leading 8-track cartridge have been applied to our audiopak A-2. The result is a more durable, more reliable broadcast cartridge. And because we manufacture the entire product — from tape to packaging — we can assure you of the highest possible quality control.

We're so sure we have the best product on the market, we want to prove it... at no cost to you. For

your free sample and more information on the audiopak A-2 broadcast cartridge, write on your company letterhead to: Capitol Magnetic Products, Division of Capitol Records, Inc., 1750 North Vine St., Los Angeles, Calif. 90028. Attention: Marketing Manager, Professional Products.



CAPITOL MAGNETIC PRODUCTS
A DIVISION OF CAPITOL RECORDS, INC.
LOS ANGELES, CALIFORNIA 90028



Circle 126 on Reader Service Card

We've all heard about "the problems with tape." "The problem with tape is... chroma noise... head wear... breakage... print-through... S/N... consistency... sensitivity... slitting... spooling... packaging..." It's been said so many times, it's easy to forget that the problem might not be "tape" ... just the tape that's been available.

After considerable research, development and testing, we've produced something we believe puts an end to many of "the problems with tape." A tape improved in everything from particle formulation to packaging (and just about everything in between). A tape that saves time and money from preproduction through syndication. In testing. Recording. Playback. Editing. Duplication. And re-use. Not to mention the initial cost of the tape itself.

We call the tape H701 High-Band Videotape, and full technical data is available for the asking.

Ask for it, and we'll show our appreciation by making it even easier to change your tape performance standards. With a special offer that will save you considerable money, while our tape saves you grief.

Fuji Videotape
 350 Fifth Avenue, New York 10001 (212) 736-3335

I'm interested. Tell me more about H701 High Band Videotape and your special offer.

How can I lose? Call me about an order.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE (_____) _____ EXTENSION _____

YOU'RE ABOUT TO CHANGE YOUR TAPE PERFORMANCE STANDARDS.



Circle 125 on Reader Service Card



Your budget problem tonight is the best reason to order ACR-25 tomorrow.

Late at night, these are some of the questions the dollar-conscious station manager asks himself.

Do I need a cassette VTR now? Why not wait until times are better?

If you want to save money now you need it now. The higher your spot volume, the faster a cassette VTR will pay for itself.

By adding automation capabilities you cut hours of man-effort and free your VTR staff for other assignments. And by adding production capabilities you bring in a new source of station revenue.

What are the choices?

There are two. One is only a spot player. The other is an automatic cassette VTR: our ACR-25.

How do they differ?

Basically, in terms of flexibility, speed, and overall capability.

For example, the ACR-25's exclusive choice of sequential or random access allows your operators to load and reload cassettes faster, program routinely or make last-minute changes without panic.

Will my spot programming needs change?

Count on it. It is a fact of life that the

number of impressions an advertiser can deliver on TV for his brand is dramatically declining, and his budget can't keep up. An independent study estimated that a \$5 million nighttime TV budget in 1965 bought him 38 impressions on all women, 18 years and over. In 1975: 22. In 1985: only 13.

Which means commercials will become shorter. Watch for twenties, fifteens, and soon the basic commercial length: 10 seconds.

Only ACR-25 can play 10 second spots back-to-back.

Is automation really necessary? Now?

Make no mistake; one day, very soon, you must automate your station to streamline the operation and cut costs. Tight money, today, is accelerating automation. Station managers in markets of all sizes are looking to automation today, not in the future, in order to save overhead dollars right now.

What is full automation like?

Your operator merely loads all your short segments—taped commercials, promos, off-the-air clips, news inserts, editorials, everything—at random into your computer-controlled, automated ACR-25 system.

The system writes its own Table of Contents, memorizes each segment, makes up a Playlist, programs it in the order you command, then executes with split-second, error-free timing.

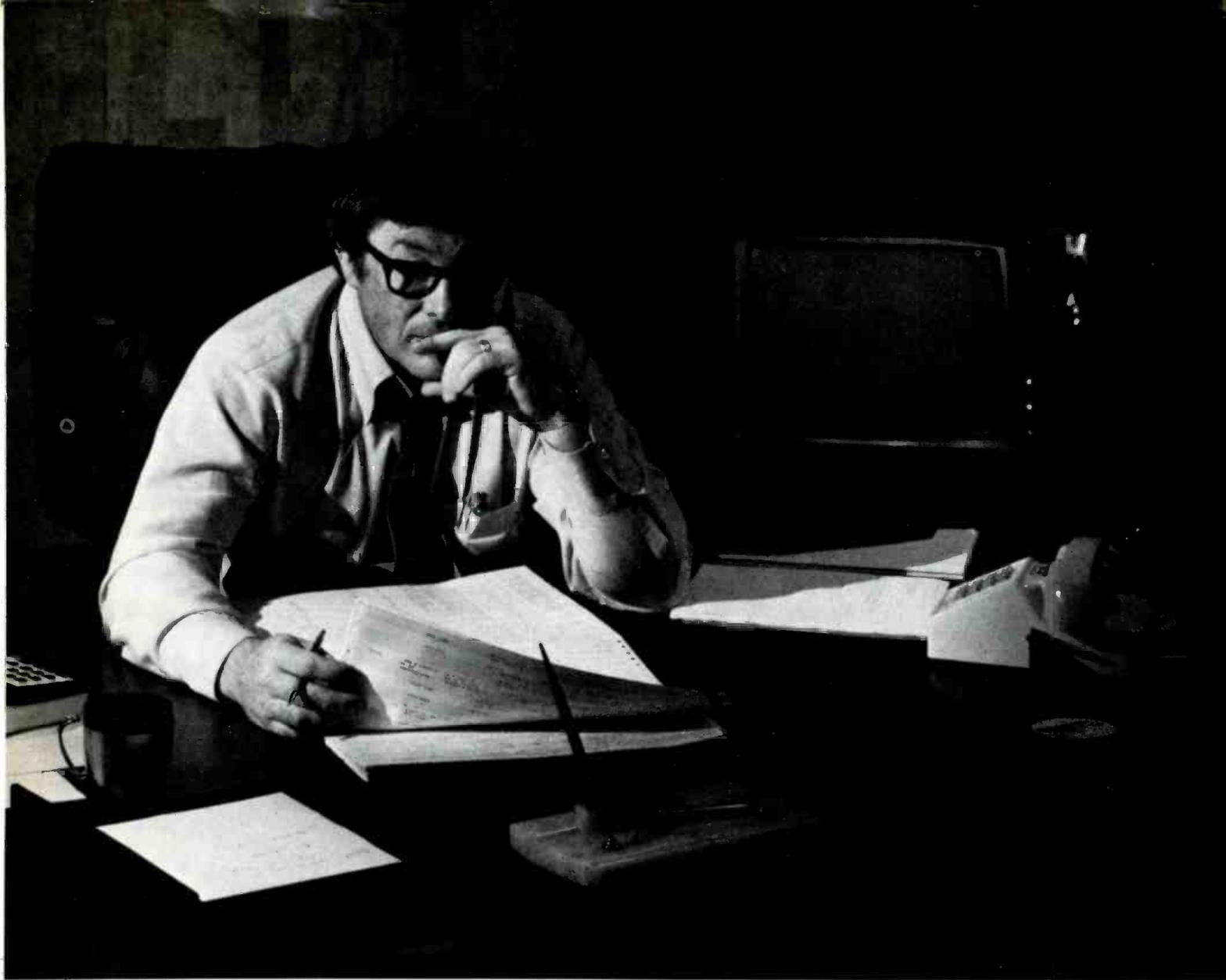
All your operator does is replace cassettes with new ones (reloading, again, at random), and he is free for other duties for up to a half day or more.

How can ACR-25 help me make money on production?

Whether you seek outside production volume or not, ACR-25 will free up reel-to-reel recorders and give you creative options you've never known before.

Use ACR-25 as the master when you make cassettes or reel-to-reel dubs. Record slides with audio. Promos. ID breaks. Dealer tags. Hitchhikers. Open and close billboards for live, on-camera shows. You can even produce prerecorded, pushbutton shows that mix live shots, film, and tape footage.

You'll find ACR-25 particularly useful for recording and editing news or sports segments off a network feed. It's a fact: in minutes you can edit what took you hours before.



What's my return on investment?

Money saved today and tomorrow. Plus a great deal more capability.

When the time comes for you to fully automate your station, you would have to get rid of anyone else's expensive equipment and buy the ACR-25 anyway, because it is the only cassette VTR with full computer control capability.

Until then, it will act as a time-saving, superior spot player, and a money-making, sophisticated production machine.

I'd rather save dollars than hours.

During tight budget days, it is understandably tempting to think this way. A station manager may think that because a spot player makes life easier for his tape room people he can do without it. **Wrong!** The ACR-25 makes their lives more efficient. And so the station becomes more efficient.

Wise station managers know that hours are dollars. They carefully add up the ACR-25's time-saving, cost-cutting benefits in terms of their own operation.

It is the most complete broadcast/production unit ever conceived. No matter how you use it, it saves money,

manpower, and mistakes, making it the only logical choice for every short-range budget problem.

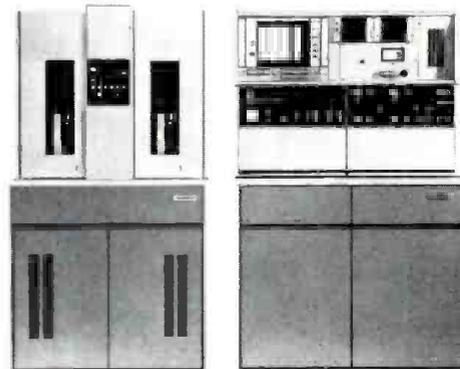
But we just don't have the dollars right now.

You may surprise yourself. Many stations have discovered we can tailor financing to their needs, long term or short.

Whatever is to your advantage—a lease, tax consideration, low monthly payment, low interest rate—chances are our finance program can help. Also, our trade-in values have never been higher.

So call us in. You might even be able to fund ACR-25 out of your operating budget.

Today's economy is not your enemy if it helps you discover ACR-25. It can help you open the door **today** to a future of increased efficiency and profit. For more details, contact your local Ampex Broadcast Video Sales Engineer, or write for full information.



AMPEX

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

Circle 127 on Reader Service Card

ACR-25

Reel To Reel Audio Machines: High Performance, The Easiest Operation In History

And that saves money. There are excellent specs not only at the top prices, but also in "semi-pro" machines that cost a half or a third as much. But your chances for day-in, day-out reliability under the heaviest use are still better in the top-price bracket.

We have a new crop of top-bracket audio tape machines, and they have gone a long way toward untieing the operator from the machine: new semi-automatic operation modes have brought the most efficient operation in history. They have also brought us great precision in speed control, and the concomitant feature, i.e., easy sync between audio machines and with video and film machines. And they carry forward the long-term trend to easy maintenance. Most are extremely easy to get into, and plug-in electronics is nearly universal.

We will describe how these advances and others are accomplished in more detail in the following. First here is a quick summary of the new units by brands.

One of the latest models to reach the market, the Ampex 440C, introduced in early 1974, has already established itself strongly: Ampex announced as this was written (late December) that one thousand of the new machines had been delivered. And as the description later along shows, it embodies a number of the important advances we are highlighting in this story.

But Ampex is obviously not alone in the top slot. Each of the following machines was recently preferred by several broadcasters in the survey BM/E made for this article: Scully 280B, MCI JH-110 (a

fast rising star), Electrosond 505, ITC 850, Studer A80, 3M 79 Series.

Ready in the wings is another import (by Gotham Audio of New York), the Telefunken M15, which has won rave reviews from recording studio engineers who have tried it. Some other machines in this bracket that put forward state-of-the-art claims are models of Xedit, Tape-Athon, Autotec, L. J. Scully and Telex.

The survey gave BM/E a revealing glimpse of the machines that are still out there carrying a full load in broadcast stations after three, five, even ten years on the job. As most engineers will anticipate, the Ampex 300 series were high on the list. Also prominent were the Scully 280's—the last of the "Bridgeport Scully's" marketed before this brand went West to Metrotech. The current Scully 280B has, of course, inherited some admired qualities from its predecessor—and added some of its own.

A sizeable number of broadcasters have bought what are sometimes called (or miscalled) "semi-pro" models, really meaning that they cost a lot less than the top-bracket machines. In this class are certain models of Revox, Teac, Otari, Crown, with Pioneer beginning to break into this market.

That is *competition*, and the broadcaster can gath-

Reel-to-reel audio machines have been a prominent feature at recent NAB exhibits, like this International Tapetronis machine introduced at the '74 show in Houston. BM/E's "Panel of 100" survey, reported in this issue, shows interest in audio machines will be higher than ever this year.





Four-channel version, also comes as do most other top-bracket



Scully/Metrotech 280B is particularly compact, has top plate that lifts for instant access to drive system.



3M Model M79 has "Isoloop" capstan drive, continuous speed control of DC servo motor.



MCI Model JH-110 has "joystick" for moving tape, down to fractions of an inch as wanted.



New import (by Gotham Audio) is Telefunken M15, usable on table or in console or rack.

er in the classic benefits: he is getting considerably more than he ever did before in a tape machine, at all price levels. Here are the principal technical advances that make a number of the new machines look good.

Recent technical advances

The dc capstan motor with servo control allows for very precise and flexible speed control, for example allowing for continuous speed shift over a wide range, or for very simple switching to the various standard speeds; it also makes sync with video machines, film cameras and projectors, and between audio machines, easy and precise. It helps in getting the flutter figures to new low levels (see the discussion on specs in the following).

Motion sensing, plus control logic, allows instant shift from any operation mode to any other, without going through "stop", and with no danger of tape

spills or breaks. This has been coming in for some time, is now very general.

Another refinement available here and there for a long while but now quite general on top-of-the-line machines is servo control of the tape tension, which increases precision by minimizing flutter, speed instability, and further reduces the chances of tape break-age.

Real-time tape position indication now often uses "counters" calibrated in minutes and seconds, electronically resettable to zero.

Automatic "return to zero" on rewind takes the tape back fast to zero on the time indicator without any attention from the operator, an important time saver in production work.

An extension of the last is the auto locator which takes the tape automatically in rewind or fast forward to any spot on the tape, using an address code for all



Teac Model A-7300 has DC-servo capstan motor, three-position switches for bias and equalization.



Otari has built-in test oscillator, calibrate settings on controls (as have a number of others), comes in two and four channels.

the editing points (this is an optional accessory for a number of machines).

Substantially improved editing provisions (in addition to fast location) also help to lighten the operation load and make results more precise. Among the outstanding devices of this kind is MCI's "Joystick"; it moves the tape in large or tiny steps as wanted (see below).

Generally supplied now is solid-state switching, which is smaller, more reliable, quieter, than relay systems (which are definitely obsolete at the top prices).

Also quite universal is low overall mechanical noise, making a number of the new machines excellent for work in the same room with the on-mike disc jockey or newsmen.

These more efficient operating modes are most helpful for production work, when program material is being mixed down or edited. A machine that will be used only for playback of already-edited material needs automation less, in the sense that there is less time-saving available; but the easier operation naturally adds to efficiency in any case.

It is worth noting here that production work is being done more and more on *multi-track machines*, from four-track up to 16, in broadcast stations. The flexibility, ease of changing parts of a program, that are inherent in multi-track recording, with subsequent mixdown, are saving money for many stations, especially those that produce commercials for outside clients. But the benefits apply to the station's programming too, even when it is all mixed down to mono.

New recorders are more accessible

On the easy maintenance score, high accessibility is now the rule: any machine that doesn't allow you to reach the whole electronic section by opening a single door, or by lifting the top plate like a lid, or by some other 10-second operation, is behind the times. Test points are often right on top; built-in calibration helps reduce maintenance time.

Plug-in electronics not only provides for instant "repair", but may also allow for quick changes in the system, as for example a change from NAB to CCIR equalization. Generally speaking, changes in equalization to match changes in speed are automatic when the speed is switched.

Let us be accused of losing our heads over the new accessibility, we must point out that perfection on this score has not arrived in every machine. There is still poor design here and there. One engineer interviewed by BM/E swore that it took him three hours to replace the indicator lights on his new machine. Another pointed out that a popular model came out originally with no labelling, or poor labelling, on a number of the crucial operating controls, throwing an unacceptable weight on the operator's memory.

The lesson of all this is that the broadcaster can demand easy operation and excellent accessibility. Keeping an audio tape machine in top shape ought to take today a small fraction of the time required as little as five to seven years ago.

Specifications are outstanding

This improved maintainability is all the more important, even necessary, since "top shape" is considerably higher than it used to be. We have had excellent specs on a few machines for a long time. What are the numbers to look for in the specs today? At 15 psi, we should expect real flat response (not just claims) to at least 16 kHz. On noise, the measurement standard has to be noted carefully. (See discussion on this in box). *Weighted* flutter ought to be below about 0.08%—figures from 0.04% to 0.06% are becoming fairly common setting a new, lower floor for flutter specs.

On distortion, we are usually measuring the *tape* and the *recording level*: all the machines in the high brackets add extremely little distortion on their own.

Specific specs, top bracket machines

Enough of generalizations; here is a model by



Electrosound 505, seen here at '74 NAB, has optional third reel to ease editing.



Pioneer RT-1050 has two switchable speeds, plug-in head assemblies for 2-track and 4-track use.



Ferrograph Studio 8 has modular electronics (very general), interchangeable head blocks.

model summary of the top bracket machines—\$2800 and up for a two track model—giving in each case just a few facts. Nearly all these machines have, in addition to what is listed here, many or most of the good features we have outlined in the foregoing, and all have excellent specs.

Important note; most of the listed machines are available in versions for $\frac{1}{2}$ ", 1", and in a few cases 2" tape for four or more tracks, in addition to the standard $\frac{1}{4}$ "; two-track versions. As noted already, the multi-track versions are becoming the norm when heavy production work has to be done. They can be money savers in any busy production shop.

Ampex 440C—DC capstan motor with servo control (or synchronous motor as an option); sapphire tape guides and scrape flutter idler for extremely low scrape flutter; calibrate positions on record and playback controls; tape guides instantly rotatable for $\frac{1}{4}$ " or $\frac{1}{2}$ " tape; head assembly mounts with a single screw; gold-plated contacts on plug-ins; claims ± 1 dB response to 25 kHz at 15 ips, possibly the highest "high" response of any audio machine.

Electrosound ES-505—Built-in test oscillator; third reel (driven) for taking up take during editing; edit button allows tape to move without going on to takeup reel.

ITC 850—Mechanical design for especially long life; automatic tape marker puts mark at edit points; convenient editing controls; gold-plated plug-in contacts; excellent accessibility.

MCI JH-110 Series—Strong on useful automaticity: "joystick" control for tiny increments of motion in either direction or large steps, at any speed wanted; speed control, using dc servo motor with phase locked control, allowing plus or minus 20% speed referenced against internal crystal oscillator, or 5-volt external signal for sync to audio or video machines; auto locator with address code system optional, providing velocity-proportioned approach to any spot on tape without overshoot; speed continuously variable 5 to 45 ips, or 2.5 to 22 ips.

Understanding S/N Figures: A Note On Reference Standards

The S/N figures given for most professional audio machines today are in an important sense measurements of the *tape* rather than of the *machine*. The "S" in the ratio is the peak signal at some arbitrarily chosen distortion level, traditionally 3%. In general, modern top-bracket machines are responsible for a very small fraction of that distortion: most of it is from the non-linearity of the tape itself. Thus the *tape* primarily establishes the "S" level in noise measurements. The recent "hotter" tapes that can take a bigger signal than older tapes before overloading have allowed tape recorder manufacturers, with total justification, to set their "S" levels higher than ever, which is a big reason for the best noise figures in history.

But there is no general agreement as to just where that level should be. Thus a full description of a noise measurement should include a statement of the peak level used, in nano-Webers per meter of track width (nWb/m), which further entails *specifying the width of the track*. We also need to know whether or not the noise was weighted according to the NAB standard.

An example of a fully-described noise measurement is given in a recent spec sheet for the Scully 280B. The tape used is stated: 3M 206 "or equivalent". The peak signal level is 500 nWb/m, the noise is weighted to the NAB standard. A table gives the results at various track widths, and we naturally get the best figure on a full track (72 dB at 15 ips), with half-track 3 dB lower.

A number of other makers say "3% distortion", according to long-established habit, for the peak level, but this must include a statement of what tape is used. There seems to be some agreement that with 3M 206 and other similar tapes the 3% point *is* in the neighborhood of 500 nWb/m (Revox uses 514 nWb/m), so to that extent we are on a common footing.

Scully/Metrotech 280B—Optical motion sensing for instant mode shifts; mother-daughter PC board electronics for simplified maintenance; selective synchronization for alignment of program material on separate tracks; motor board lifts for quick accessibility.

Studer A-80—Tape tension sensors control torque of takeup and supply reels; optical motion sensing for control logic system; electronic speed control of capstan motor, allowing use of either 50 Hz or 60 Hz supply; selective sync provision; minutes/seconds tape location indicator.

Telefunken Magnetophon M15—DC capstan drive, electronic control; tape tension servo control; ruby tape guides, plus idler between play and record heads, for low scrape flutter; swivel-out amplifier section; sophisticated logic, motion sensing; head assemblies replaceable without need for head realignment. In general, head realignment is not necessary—guaranteed permanently accurate.

RCA RT-21—Cue speed control; velocity-sensing brake system; optional fourth head for 4-track playback.

3M Series 79—DC servo-control capstan motor, allowing 7½, 15 and 30 ips speeds, plus continuous variation 5 to 45 ips; NAB and CCIR equalization can be set up for switchable selection; looped capstan drive for tape tension control; separate sync equalizers and amplifiers with same characteristics as main; auto locator using address code available as accessory; also sync unit, SMPTE edit code generator and reader.

Lower cost machines

In the \$1800-and-down “semi-pro” bracket we can find excellent specs, but naturally less automation and less refinement of drive and control. And we also have a spottier record on reliability in use. Some machines have done well in one station, very poorly at another. There *are* “scare” stories on top bracket-machines, but there are comparatively more of them about lower-cost machines—which is hardly a surprise.

Machines in this class that are now most widely used by broadcasters include the Revox A77 and some models of Teac. Both brands have supplied excellent technical performance at low cost, in the view of many broadcasters.

Revox's new A700 is clearly intended to supply some of the new operation modes and new “maintainability”, at a price—\$1800—still significantly lower than that of the top-bracket machines. It has motion sensing, tape tension servo control, dc capstan motor. The good track record of the less expensive A77 will influence broadcasters to consider it's big brother carefully. Similarly some Teac models have done well for a number of broadcasters. For example, at the National Black Network in New York, a Teac 4070 supplies “fill” music on an all-day basis for the subscribing stations.

Other makers with machines roughly of the same class are Otari, Crown, Pioneer. Any broadcaster who wants to keep his tape machine investment lower than \$1500-\$2000 ought to look the five brands over carefully.

But how does the broadcaster find out what a machine is likely to do when called on for 12 or 18 or 24 hours a day of playing, rewinding, stopping, starting, recording, etc.? The buyer's best recourse is the old standby; talk to as many users as possible. Get a list of users from the salesman, and nose out a few more if you can. You might uncover, as BM/E did, a prestigious machine that in a few early models accidentally erased tape when a minor failure occurred in playback mode. That is a really rare one, but a tendency to break down or lose specs in heavy use is fairly common.

Whatever you find out about a machine's durability, a supplier known for quick, effective service, with nearby supplies of spare parts, is worth a good 25% or more on the price. If you need several machines, having them all the same model has the obvious advantages in the spare parts department, and also in your technician's ability to get a quick fix on trouble.

Recent Advances In Videotape Recorders

Since the last NAB Exhibition in Houston, the most notable new VTRs are the Sony 2850 production cassette unit (with the companion battery-operated portable unit the 3800), a 2-in. helical format from Sony and a 1-in. helical unit from a brand new company, Video Memory Corp.

The NAB Convention in Houston last March was a good benchmark for marking progress in videotape recorder advancements. Preconvention publicity centered on the IVC-9000, a two-inch segmented helical format unit designed to outgun the quad format introduced seventeen years earlier. The format used one-half of the tape that quads do at 15 ips and head life was guaranteed for 1500 hrs. The IVC 9000 also offered two audio tracks and furthermore the cost was

about 2/3rds that of quad. But Ampex and RCA were not about to let the reign of quads end.

RCA showed a prototype TR-600 unit about half the size of existing quads and priced at \$79,500; good performance (with a lot of automatic features) at 7.5 ips was demonstrated. Further, RCA demonstrated that it could get two audio tracks from a TR-70C, for those impressed with that feature. A coup of sorts was pulled by Ampex. That pioneer company in magnetic

recording celebrated its thirtieth year in business by placing on the market what it called, "the world's first modular design studio quadruplex videotape recorder/reproducer." The AVR-2 was designed to operate at 7½ ips or 15 ips and to accommodate two audio tracks. Its price started at \$69,000. At the same time, Ampex distributed a white paper discussing the desirability of modifying the existing quadruplex standard to a) incorporate two audio channels and b) to introduce a pilot in the video to improve time base correction—a point RCA had been making. In one fell swoop Ampex deftly argued against RCA's position for a pilot (too big a change in format hurting compatibility) and against totally new standards (IVC) by saying two audio tracks and slower speed could be had with quad.

Since that time, it would appear that many of those who were saying they wanted the economy that IVC first delivered have decided to stay with quad format by purchasing AVR-2s. Ampex has said it has sold over 100 such units. The IVC 9000 has been shipped to broadcasters and production houses but not in such large numbers. The European market, a prime target for IVC's effort (jointly with Rand and Thompson-CSF), has been moving slower than expected. The Europeans, therefore, have not reshaped the market or the effort of manufacturers to the extent they might have.

RCA is moving ahead with the TR-600 and will begin deliveries to customers the beginning of April. The Canadian Broadcasting Corp. has leased two of these compact units (700 lbs) along with TK-28 film telecines, to aid in the television coverage of the 1976 Montreal summer Olympics. This unit follows the standard quad format.

In the meantime some big advances have been made at the so called low-end of the spectrum in helical VTRs. Most noticeably, the video cassette has moved in the burgeoning field of electronic news gathering. Sony, with its 3800 battery-operated portable cassette recorder and 2850 Master recorder with editing capacity is now a standard at several stations that have gone the all-electronic route of news gathering (see BM/E, January issue). The capabilities of the 2850 are covered in a separate article in this issue.

Nor has the reel-to-reel sector been quiet. Again Sony has produced a helical unit that has performance rivaling that of the best professional recorders. This unit is not well known in broadcasting circles since Sony feels it can make faster marketing headway in the industrial/educational training sector. A description of this unit follows.

Another quite reliable helical unit is the VR-1 developed by a new company, Video Memory Corp. The company calls the VR-1 "a new generation VTR." That is a bold claim but the VR-1 does offer remarkable features for its low base price of \$9400. It offers a single capstan drive with vacuum chambers for precise tension control, omega wrap format interchangeability, and high band color for reduced moire. This piece of equipment became possible as a result of the wide window that today's time base correctors can accept. Some of the features of this machine are described below.

The field of video tape recorders is indeed active and one can expect to see a lot more in the area of



RCA's miniaturized quadruplex video tape recorder, the TPR-10, is shown in an outside broadcast van of Videomobile Systems, a Hollywood teleproduction company.

portable units—either for news gathering or use in small vans. In the latter category falls the TPR-10 quadruplex recorder from RCA. This unit also made its debut at Houston but was somewhat eclipsed by its bigger brothers. It is now in use in a number of locations. Video-mobile Systems, a Hollywood teleproduction company was one of the first customers.

A portable quad saves the trouble of converting from one format to another. It may mean simpler editing if a user is already equipped with a certain editing system. The one-time advantage of sticking with a single format because of a loss in quality resulting from third or fourth generation tapes is less of a concern today. Many machines are so good now that fourth and fifth generation tapes are hardly distinguishable from the master.

The VR-1: A New Generation of A Video Tape REcorder*

One-inch helical-scan video tape recorders were introduced in the early 1960's. Performance of these recorders was marginal due to low signal-to-noise ratio and large time-base error when compared to broadcast standards. However, they were compact and considerably cheaper. In the 1970's significant breakthroughs were made in the development of head transducers and recording tape. High energy tape and hard-pressed ferrite heads, when incorporated on video recorders, increased the signal-to-noise ratio approximately by six dB. Also, the large window of the digital time-base corrector allowed for complete elimination of the large time-base error problems of the helical scan recorders. However, to date, the inroads of one-inch machines into the broadcast market has not been extensive. Apparently limitations of some formats, tape interchange problems, inferior tape handling, or just the general lack of a standard one-inch format impede the progress of one-inch tape re-

* Material on the VR-1 was prepared by J. M. C. Tucker and D. T. L. Chang of Video Memory Corp. Mr. Tucker is an engineer, Mr. Chang, also an engineer, is president of the company.

coders in the professional television marketplace. The VR-1, developed and manufactured by Video Memory Corporation, is a new generation video tape recorder which has been designed to overcome these drawbacks and fill this market need.

Several unusual features

The VR-1 recorder uses a non-segmented, helical "omega" format with 1000 inches per second (ips) writing speed and a 9.6 ips tape speed. The high band color signal system (7-10 MHz carrier) with its reduced moire and high signal-to-noise ratio expands post-production capabilities to more than five generations. The non-segmented format eliminates the possibility of banding or first line error in the playback picture. Recording and playback for two audio tracks and a control track are provided. Each track is independent from the other with no tracks overlapping, thereby providing for a full range of editing. This format allows for interchange of tapes recorded on other "omega" format recorders.

The transport design of the VR-1 recorder eliminates belts, clutches, pinch rollers, mechanical tape counter, mechanical brakes and retrievable guides. It utilizes a single-capstan drive system with vacuum columns to provide gentle tape handling and precise tension control. On helical scan recorders, generally, heretofore available, the friction generated by the tape guides to guide the tape along the helical angle creates a tension problem. This problem is non-existent in the VR-1 recorder. The vacuum column tape tension system used in the VR-1 recorder overcomes the tension problems while providing the user with a number of other advantages not found in other one-inch recorders.

Specifications of the VR-1 recorder include:

Video Bandwidth: ± 0.5 dB, 30 to 4.2 MHz; -3dB at 5 MHz

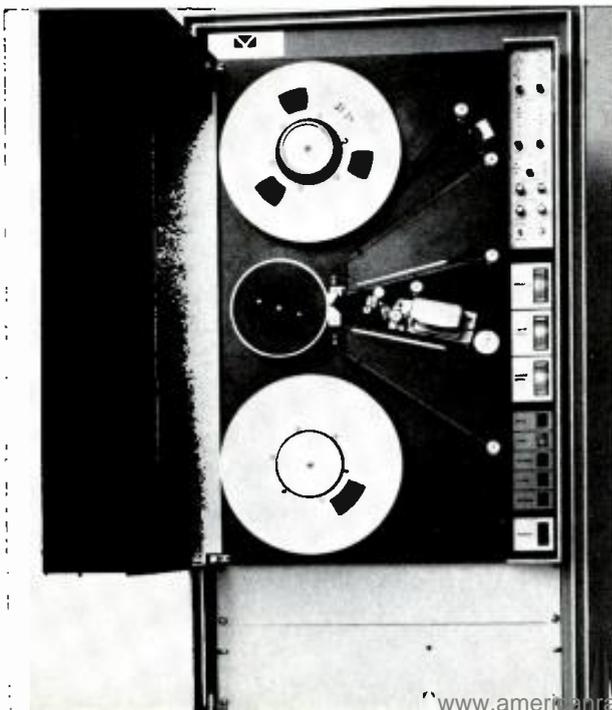
Signal-to-Noise (unweighted): 46 dB p/p Video to RMS Noise

Differential Gain: 4% max blanking to white

Differential phase: 4° max at 3.58 MHz off tape

Chrominance to Luminance Delay: 15 nsec max

Video Memory's VR-1 with electronics.



K factor Transient Response: 2T pulse 2%

Moire: -36 dB Color Bar 75% amplitude, 3.58 MHz subcarrier

Audio Frequency response: \pm dB, 50 Hz to 15,000 Hz

Signal-to-Noise Ratio: Down 53 dB at peak operating level (50 dB if dual audio is used.)

Shuttle speed is 2 minutes for a 1 hour tape; lock up time is 1 second nominal.

Ready advantages of the VR-1 recorder include:

- Precise tape tension in record mode—Ideally, tape tension of video recorders must be held constant during record. In the VR-1 transport, the reel servo, controlled by the positional sensor in the vacuum column, insures that the record tape tension is held to within 10% of the set value.

- Precise tape tension in playback mode—In the automatic tape tension mode, the VR-1 recorder will automatically compensate the field-to-field phase error caused by temperature, humidity, mechanical tolerance, aging, and the variation of record tape tension. This eliminates hooking in the picture. In the manual mode, once the tape tension error has been nulled on the tape tension meter, no further adjustment is required.

- Precise tape tension control in the edit mode—Tape tension memory is available, which allows operator to insert or assemble material at the same tape tension as previously recorded to avoid tension transients in the tape.

- Precise tape tension control in the shuttle mode—The tape tension provided by the vacuum column is independent of the tape speed. The VR-1 recorder is the only known available one-inch video tape recorder that can pack tape on a reel uniformly at the tape manufacturers recommended tape tension.

- Gentle tape handling—The vacuum column is the buffer between the capstan and reel. It eliminates the tension impact during start and stop transients to avoid tape damage and allow fast capstan lock-up. The tape storage in the column permits higher acceleration during tape shuttle modes and completely isolates reel disturbances in the head area.

- Immunity to rough environments—The vacuum column does not consist of any mechanical linkages. It is not effected by gravity force, vibration or acceleration.

- Simultaneous record and playback—Record and playback of the picture may be accomplished simultaneously. Thus, playback of the recorded information may be monitored simultaneously with recording so as not to interrupt recording operations.

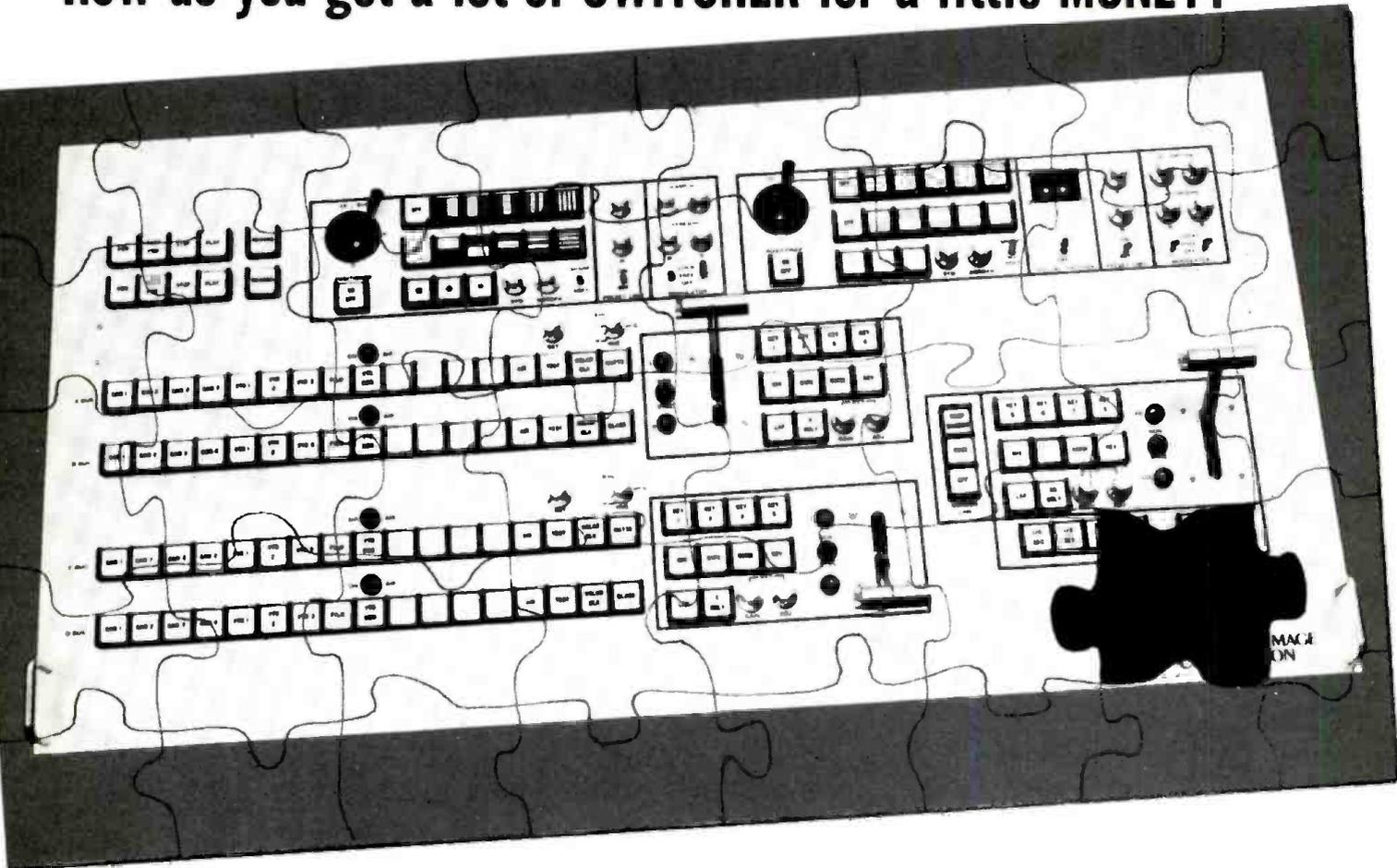
The capstan controls the tape motion. In other words, it drives the tape by friction at both 9.6 ips and 300 ips. The capstan contacts the back side of tape only thereby minimizing capstan surface contamination and tape damage. Slippage is eliminated by using a special coating on the capstan surface. The entire deck design of the VR-1 recorder reflects the concern for tape care. Vacuum columns control tape tension precisely. The capstan drives the tape gently. All secondary guides rotate to minimize edge damage. Even the primary guides located adjacent to the scanner comprise sapphire rods to minimize tape wear.

Dropouts—dark streaks in the picture—is another

continued on page 48

Puzzle:

How do you get a lot of SWITCHER for a little MONEY?



Answer: The Computer Image "Pre-wired" Modular Video Controller System.

Represented nationally by:

Broadcast Communications Devices
5526 East La Palma Avenue
Anaheim, California 92807
(714) 528-9505

Broadcast Communications Devices
8565 Hahn Road
Ben Lomond, California 95005
(408) 336-5437

Didier / Denver
P.O. Box 1599
Evergreen, Colorado 80439
(303) 674-6000

H. M. Dyer Electronics
31185 Ten Mile Road
Farmington Hills, Michigan 48024
(313) 478-2157

Landy Associates
12 Buxton Road
Cherry Hill, New Jersey 08003
(609) 424-9660

Radford Associates
3203 Lanier Drive
Atlanta, Georgia 30319
(404) 237-6097



See US at NAB!
Booth No. 1106
South Exhibit Hall

Now there is a way to plan for the ultimate in switching potential with the least initial outlay.

If you can afford the industry's finest broadcast quality switcher with all the latest state of the art techniques and capabilities... fine! Computer Image will deliver a Model 7243 with 7 buses, 24 inputs, four mix/effects amplifiers, preview and program buses with computer compatible control, and save you money!

If however, your budget is tight, then you may choose a Computer Image Model for as low as \$10,000—have it pre-wired for options you know you'll need and have a broadcast quality switcher today that will not soon be obsolete.

Computer Image Video Controllers are designed with circuit-element building blocks... to give you every advantage of add-on capabilities, and reliability of functions. Your basic purchase can be pre-wired for the options found in the most complete switching system.

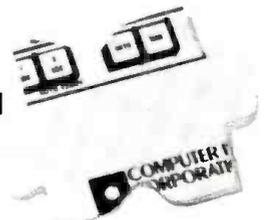
If your future requirements can be estimated at the time of ordering a basic unit, all the add-on options can be pre-wired for only 10% of each option. And, any options ordered within six months of initial delivery will be credited that 10% pre-wire charge! The installation of any option, because it's pre-wired and completely modular, is almost as simple as plugging in the morning coffee pot!

COMPARE THE VIDEO CONTROLLER WITH ANY OTHER SWITCHER... AT ANY PRICE! Ask about price, performance, versatility, reliability, guarantee and delivery... and ask about some very happy Video Controller users!

For further information call or write:
Vice President, Marketing, Video Controller Division



COMPUTER IMAGE CORPORATION
2475 West 2nd Avenue, Denver, Colorado 80223
(303) 934-5801



Computer Image, 1972 emmy winner for outstanding achievement in engineering development for its unique electronic animation systems for television.

Circle 128 on Reader Service Card

problem plaguing video tape users. They are the result of tiny specs of oxide or other debris on the tape surface causing a momentary loss of head-to-tape contact. If the loose oxide or debris sticks on to the video head, the result is a head clog. The VR-1 recorder incorporates a tape cleaner which constantly vacuums the tape surface to remove such debris.

As a result, the tape and head life are significantly extended. Most important, the possibility of head clog is minimized to improve the reliability of the recording. The VR-1 recorder is the only known tape recorder on the market with this feature.

An electronic counter, as included on the VR-1 transport, overcomes many of the problems of the older type mechanical counters. It is known that friction introduced into the tape path acts as a tension disturbance. For this reason, mechanical counters are inherently fighting themselves. Good coupling to the counter sufficient to insure an accurate count adds friction to the tape path. Conversely, light friction causes slippage in the counter. The VR-1's electronic counter overcomes these difficulties. Also, monitoring is readily achieved since minutes, seconds and frames are displayed on a large easy to read LED display.

In large installations it is often desirable to operate several VTR's from one central location. The VR-1 transport uses TTL electronic logic control and no mechanical switches or levelers, etc. Remote-control capability is easily accomplished. The VR-1 transport offers remote control of primary functions, remote editing, and remote tape timer. Direct-current motors are used. Thus, the problem associated with non-synchronous line voltages on vans, boats and airplanes is alleviated.

The VR-1 design emphasizes ease of maintenance. The plug-in modular design and ready access to all portions of the VR-1 greatly reduces service time and effort.

Packaged to fit individual needs

The VR-1 recorder is packaged such that the user can tailor the machine to fill the needs of any application without carrying the burden of unwanted features. A complete line of options is offered. For example, the basic cost of the VR-1 is \$9400. With options for van applications, it comes to \$11,050; with options for mastering, \$13,550, not including a time base corrector.

Operating costs for video heads per hour of operation is estimated to be \$0.45. Cost of one-hour tape is only \$50. Thus the VR-1 is a new generation of one-inch recorder that meets all of today's requirements from both an economy and performance standpoint. It is easy to service, easy to operate and economical to run. We feel the one-inch format can at last come into its own. BM/E

The Sony MV-10000 Helical Scan VTR

The Sony MV-10000, a relatively unknown professional 2-in helical scan tape recorder, delivers the high frequency response necessary for direct high band NTSC recording at 7½ ips (writing speed is 900 ips). Its servo-controlled, dual capstan transport minimizes jitter.

Picture performance is claimed to be as good as any recorder regardless of price. Further, the recorder is

designed to edit tapes.

This recorder certainly could fill many a broadcaster's requirement. Broadcasters interested, however, will have to seek Sony out. The company's marketing plan calls for concentrating on the industrial-educational sector—presumably Sony feels there are enough contenders for the broadcast market. Nonetheless the features and specs of the MV-10000 will be of interest to broadcasters and belong in this survey.

The MV-10000's full-field-scanning video head configuration virtually eliminates switching transients, color banding and other problems often associated with multi-head systems. The best possible tape-to-head contact (minimizing dropouts) and simplified tape interchangeability is thus assured.

It has two audio channels for stereo or bi-lingual production. Both are high-fidelity, with 30 to 20,000Hz ± 2dB response. The cue channel goes from 10Hz to 15kHz ± 3dB.

Some of the features are:

- Reference sync servo system—permits minimal time-base error, assuring minimum jitter and drift.
- Capstan servo-controls capstan located on take-up side of head drum.
- Tension servo-controls capstan on the supply side of head drum.
- High band FM recording—assures high quality recording and playback, with excellent signal to noise ratio.
- Built in rotary erase heads—permits erasure on field-by-field basis, thus insuring clean inserts.
- Drop-out compensator—replace dropouts with properly matched video information.
- Velocity compensator—permits greater interchangeability of color tapes.

The helical-scan MV-10000 was designed for precise frame-by-frame editing in add-or-insert modes. Because each of the unit's heads (video, sync and rotary erase) cover one complete field with every scan, additions and inserts are clean, with no visible junctions and overlaps or loss of information. Dual audio tracks allow individual insertion of dialogue and music-effects channels. Functionally grouped editing controls near the main operating controls (but carefully distinguished from them by size, shape and color, as well as by panel markings) are simple buttons.

Because of the MV-10000's compactness (only 21" wide), several machines can be grouped within one operator's easy reach, reducing the need for remote controls. With the addition of a monitor, tapes can be edited without tying up the main console.

Complete servo mode selection ensures precise picture quality in all edit modes. These facilities include a horizontal and vertical lock servo, a head-drum servo that can be switched to compensate for electronic delays in edit mode or for poor sync on damaged tapes, and easy, metered control of output and reference signals.

Sony says the MV-10000's performance, specifications, capabilities, and features are comparable to those of multi-head recorders costing two and three times as much. Precise correction is provided by a

continued on page 65

Introducing GEMINI



To let you wind up a day's work 100% ahead

It's the only cartridge winder of its kind around. An 8-track, dual-station unit that runs at 240 ips. You wind one tape while splicing another. That's how you double your count. And really up your profit.

It takes all types of cartridges. Supply reels up to 14". There's an automatic 45° tape cut. Plus new digital footage counter for winding precise lengths. Everytime. Operation is two-button simple. And it's built to take a beating.

Day after day. Year after year.

Our engineers call it the ES 100-8II. We call it Gemini. You'll call it fantastic.

Of course it's from Electro Sound. Because who else knows recording and duplicating better?

To get all the specs, write 725 Kifer Road, Sunnyvale, CA 94086.

Or phone (408) 245-6600.

ELECTRO SOUND®

Circle 129 on Reader Service Card

Mastering U-matic VTR Adds Edit Capability to Cassette Convenience

By Bob Paulson

The new Sony U-matic VO-2850, a teleproduction editor, the battery-pack portable VTR VO-3800 and new tape, accelerate acceptance of the U-matic format as a news gathering device. Editing features satisfy all teleproduction needs.

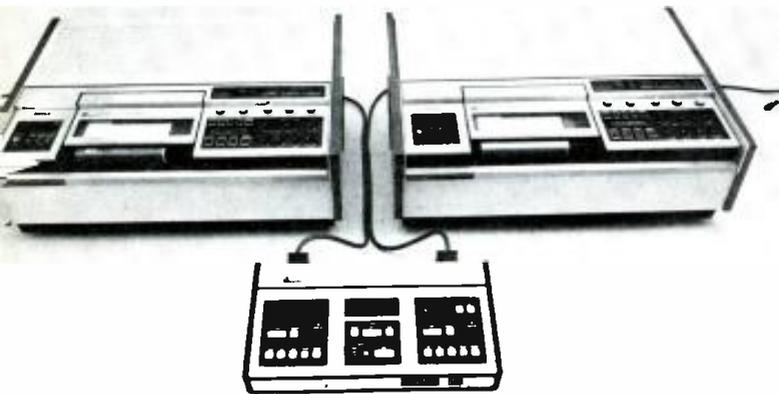


Fig. 1. The new Sony U-matic system for editing includes two VO-2850 Mastering VTRs (one for playback, one for record), and the RM-400 Automatic Editing Control Unit.

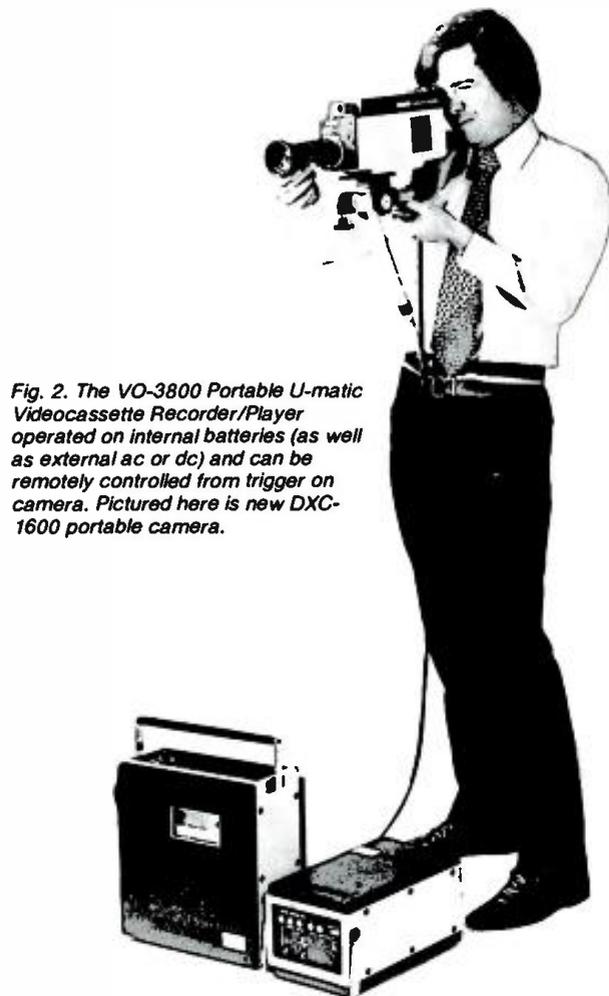


Fig. 2. The VO-3800 Portable U-matic Videocassette Recorder/Player operated on internal batteries (as well as external ac or dc) and can be remotely controlled from trigger on camera. Pictured here is new DXC-1600 portable camera.

A complete, yet simple, U-matic cassette VTR teleproduction editing system (Fig. 1) is now a reality. In conjunction with a battery-operated U-matic cassette recorder and a time base corrector, a cassette system is being used as an electronic journalism system. The components include the new VO-2850 Mastering U-matic VTR with complete audio-and-video assemble-and-insert edit flexibility, the RM-410 Remote Control for operating one VO-2850 from a camera position or switcher, and the RM-400 Automatic Editing Control Unit for precise control of tape-to-tape assemble and insert editing between two VO-2850's. Slow-motion and freeze-frame tape motion modes in the VO-2850 are possible with this new editor.

Rounding the system out for news gathering or field production operations is the VO-3800 Portable U-matic VTR (Fig. 2), which operates from internal batteries, external dc or ac. Its special 20-minute video cassette plays on all other U-matic models. The unit includes a stable sync generator for accurate control of tape and head servos, and can be operated remotely from a trigger on the compatible Sony DXC-1600 portable camera. A dropout compensator and NTSC color recovery system produce high-quality playback and a freeze-frame capability permits frame by frame examination of detail.

The freeze-frame review and analysis capability is the result of the introduction of the new KCA series tape. A durable binder system permits still frame reproduction of one track for up to 15 minutes. KCA and existing KC tapes are freely interchangeable among all earlier and the new U-matic models. However, the VO-2850 has an additional smart sensing circuit which prevents slow-motion or freeze-frame operation unless a KCA cassette is in place. This was accomplished by adding a sensor hole to the underside of all KCA cassettes.

These new VTR products make possible portable recording, remote control, and mastering and editing all in the U-matic format.

New U-matic cassette VTR production techniques are the consequence

What the VO-2850 offers first and foremost over

Mr. Paulson is a consultant from Westborough, Mass. The Sony Corp. is one of his clients.

earlier models is clean editing. No longer are we forced to be satisfied only with the programming we can transfer on one uninterrupted simultaneous audio and video pass to a U-matic recorder. This cancels a formerly undeniable advantage of the standard 1-inch formats, and to a lesser degree the 1/2" EIAJ format, and 8mm and 16mm film.

Three familiar production editing techniques can now be employed while you master on 3/4-inch cassettes: single camera editing; stop-and-go sequence editing and assemble and insert (Fig. 3).

In single camera setups, for instance (Fig. 3a), the "stop and go" technique so popular in film production can be handled by a single camera operator. Doubling as producer, director, floor manager, and soundmixer from the camera position, a reporter, for example, also becomes the video tape editor by manipulating the control buttons on the RM-410 Remote Control for the VO-2850 (Fig. 4).

Operations possible with this unit include tape preview in normal playback or freeze frame, rehearsing the talent for timing, and making either insert or assemble edits with one eye on the camera monitor and one eye on the pushbuttons. When the function switch on the VTR has been set to the insert mode, the new material laid down on the tape beginning at the edit point may be either video, audio channel 1, audio channel 2, or any combination. Besides conventional "stop and go" assemble editing, other first-generation mastering possibilities now include: adding voice-over commentary on channel 2; pacing to a cue track; synchronizing action and sound to a music track; inserting new video/audio to correct errors; inserting new video/audio to add impact; adding music and effects tracks; adding a foreign language track.

In studio production mastering with the VO-2850 (Fig. 3b), all the same assemble and insert editing applications are available. You can rehearse and record

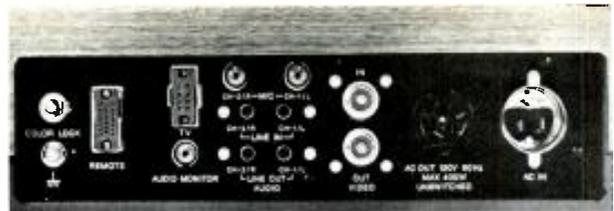


Fig. 4. Back of VO-2850 showing remote control receptacle.

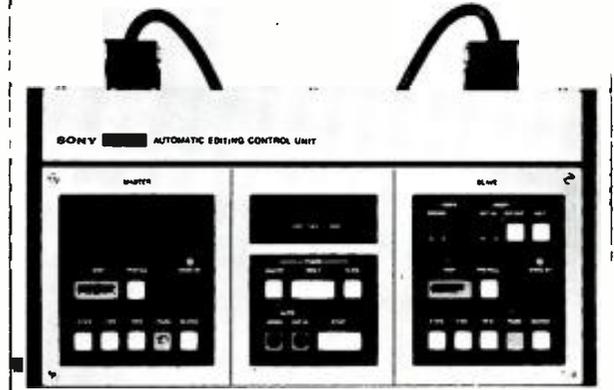


Fig. 5. Close-up of editing control unit. Master controls on left, slave on right, with editing controls in center.

stop and go sequences using multiple cameras and special effects. The VTR operation can be remote controlled by the director or a control room technician.

The VO-2850 really takes the pressure off the talent and production crew. You can cover a fluff or equipment trouble by an appropriate video/audio insert later. Or you can stop and rewind to an earlier audio pause point, and start up again with a new camera angle. Multiple set productions can be mastered in an unhurried manner, with time out between sequences for unsnarling the camera cables, re-setting the lights, checking the graphics and props, and rehearsing the talent.

Finally, you can now even shoot a complex production out of sequence on multiple cassettes, and edit the tapes into proper sequence later (Fig. 3c). Tight control of the editing process and precise, clean editing results are made even easier by adding the RM-400 Automatic Editing Control Unit (Fig. 5). It includes two remote control panels, one for the master playback VO-2850, the other for the slave VO-2850 recorder. Between them is a third panel for automatic control of the actual editing operation, after timing options have been previewed and rehearsed. This panel includes a function for automatically rewinding and cueing each VTR at a point 5 seconds ahead of the selected edit points.

The subjective results of editing on the VO-2850 have to be seen to be believed. The switch from playback to record mode is made during the vertical blanking interval, so there are no visible switching transients. Rotary erase heads erase each video track before new material is recorded. Audio switching transients are suppressed by muting circuitry. The transition is commanded by circuitry which counts control track pulses during the five-second roll period of both VTRs. The tolerance takes into account all worst-case, opposite-direction variations of the two

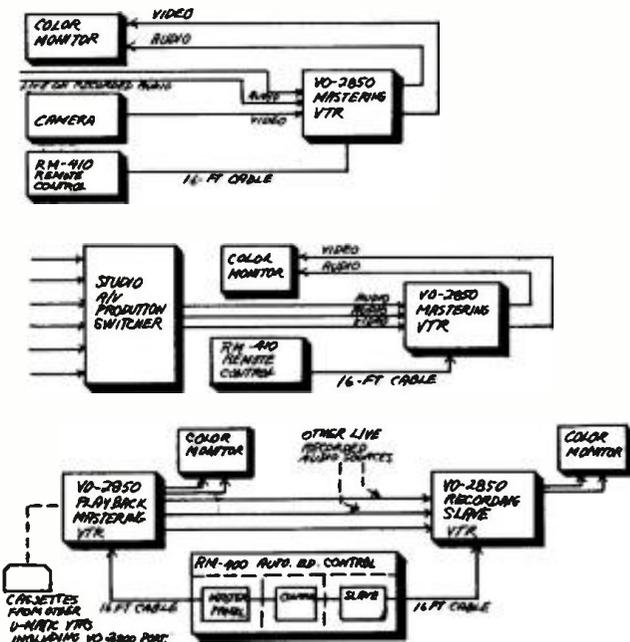


Fig. 3. Editing arrangements for stop and go with single camera (top), rehearse and record (middle), and out-of-sequence recording and editing (bottom).

VTRs during the rewind, cue, and pre-roll operating modes. Typically the edit point precision will be better than the conservative specs suggest.

"Assemble" versus "Insert" Editing

"Assemble" editing is a refinement on the recording technique of the basic U-matic VTR. When you push the record button, a full-width erase head begins to clean the tape of all previously recorded video, audio, and control track signals (Fig. 6), and the video and audio heads switch from playback to record operation.

There are two differences, however. First, in the VO-2850, as in any other capstan-servo'd (V-locked) VTR, in playback the off-tape signal is vertically phased to the incoming video. Once lockup is achieved, and edit can be made at any time without causing a picture roll or breakup.

Second, flying erase heads leading the video heads turn on in the same vertical interval when the video heads switch from playback to record mode. In this way, the picture even in the first frame of the new material is free of noise or residual images from previous recording. Also, two audio channel erase heads turn on to produce a clean, pop-free transition from old to new audio.

A properly recorded "control track" along one edge is the key to editing. This track is a train of precisely shaped and placed magnetization pulses, analogous to the single sprocket holes in 8mm film. If the holes are ragged, or the spacing changes at a splice point, you've got picture troubles.

The difficulty with "assemble" editing is that it's much easier to draw the track patterns precisely in Fig. 6 than it is to realize these patterns on the recorded tape. There's elasticity in the recording tape, wow and flutter and servo oscillation in the capstan drive system, machine to machine differences in the precise location of the control track heads. Therefore, after an "assemble" edit transition the pulses from the new "electronic sprocket hole" maker will be laterally displaced from where the original pulses would have been, had that recording continued. Further, the pulse spacing may be at least temporarily different because of tape tension differences.

On playback this discontinuity and timing change may or may not be objectionable, or even noticeable, depending on your equipment and your application. You won't see anything on a modern fast time constant monitor or home receiver. But if you're trying to dub the resulting edited tape onto a broadcast VTR, you'll have to call for a wide range TBC. (The sync time base stability and/or color subcarrier frequencies on either side of the edit do not meet the FCC specifications for broadcasting.)

"Assemble" editing is simple; you don't have to pre-condition the tape in any way. With "insert," of course, the selected new video or audio material does disturb the remaining original material. "Insert" editing has long been a standard operating mode in quad VTRs. Now it's available in the U-matic cassette VTR, and why its possible is easy to understand.

First let's dispel a misconception about "insert" editing. You don't have to have video material (or audio) on both sides of the length of tape where you

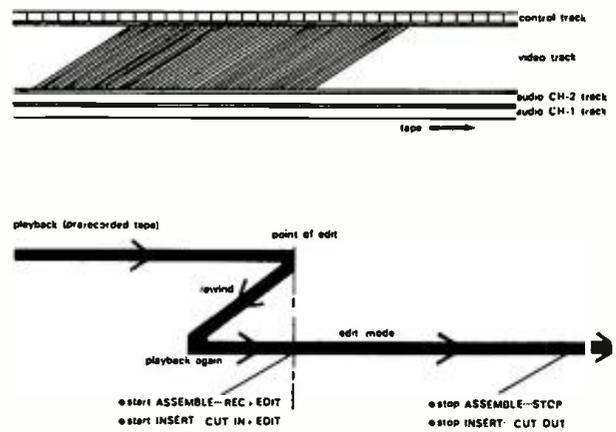


Fig. 6. Videotape format shows control track to aid "assemble" or "insert" edit modes.

plan to put the insertion. But you do have to have a pre-recorded control track along the tape for more than the length of the insert. In the "insert" mode, the new video or audio material is laid down synced in against original control track. That's why you can't erase it.

Once your tape is sprocket-holed from end to end, you can start and stop any place you choose. You can lay down a cue track, and audio track, or video only. Or any combination of the three, depending on how you set the insert mode switches. And change the combinations as you proceed along in the editing session.

Preparing a tape for use in "insert" editing is just like running a roll of film or tape through a sprocket hole puncher from beginning to end. With a cassette tape, you simply run it through any cassette recorder which is connected to a high quality color signal source with clean sync. It's better if you can use a "black burst" source. The video on the tape is then always at black level, and your fadeup and timing coordination is a little easier.

What about broadcasting a VO-2850 tape?

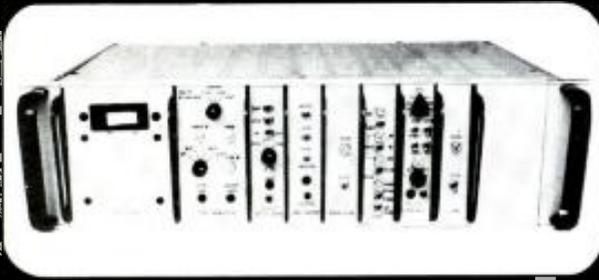
The visible picture quality of a cassette player stands up well in comparison with a quad tape picture quality, viewed on a home receiver. On modern receivers with fast-acting horizontal hold control circuits, there won't be any visible difference in picture stability, either. But without further signal processing time base instability, discontinuities, and sync frequencies make the signal unacceptable for broadcasting.

On a quad VTR playback the signal's time base instabilities are reduced to substantially less than ten nanoseconds total as a result of integral TBC in the quad. This residual jitter represents about $\frac{3}{1000}$ of an inch of picture detail movement on a 19" screen, and a change in the color subcarrier signal phase which just begins to be visible as hue shift. Also, the corrected signal is put through a proc amp to insert clean sync and subcarrier references from a stable sync generator.

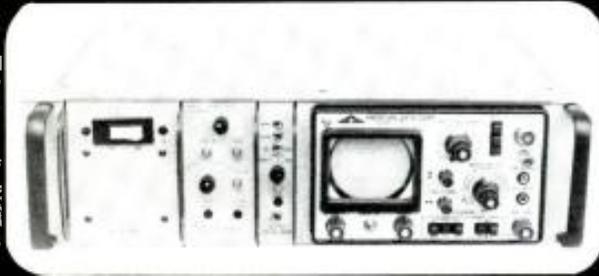
By contrast, the skew tension error in an interchanged cassette tape playback may be 10 to 15 microseconds, or better than 4.5 inches on 19" screen. Unless the signal has been put through a proc amp,

continued on page 77

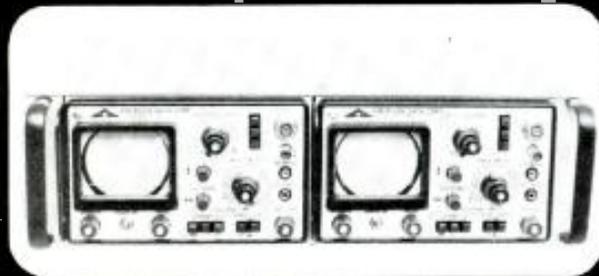
THE ADC 1100



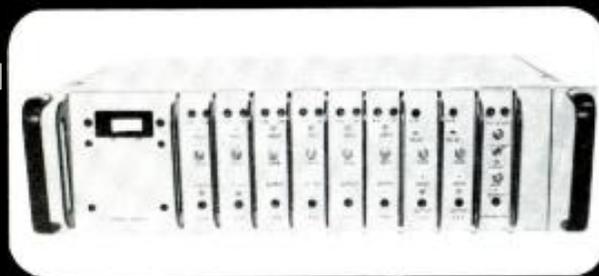
MASTER VIT TEST SETS



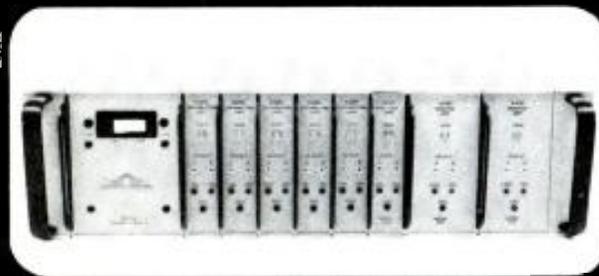
COMBINATION TEST SETS



WAVEFORM MONITORS



DISTRIBUTION AMPLIFIERS



AUDIO AMPLIFIERS

A state of the art system of test equipment, master sync generators and distribution amplifiers designed to let the user build a system to fit current needs and expand on the same system as requirements grow. The 1100V frame is common to all video, pulse, test and sync modules and the 1100A is common for all audio modules.

1100 series modules currently available:

- | | |
|---------|---|
| 1100V/A | Video/Audio Frame |
| 1101V/A | Video/Audio Power Supply |
| 1102 | Digital Sync Generator |
| 1103 | Color Standard |
| 1104 | Color Sync Lock |
| 1105 | Black Burst/Bar-Dot Generator |
| 1106 | Automatic Sync Changeover |
| 1107 | Module Extender |
| 1108 | Staircase Generator (linearity) |
| 1109 | Multiburst Generator |
| 1110 | Sine ² Pulse and Bar Generator |
| 1111 | Encoded Color Bar Generator |
| 1112 | Video Distribution Amplifier |
| 1113 | Differential Input VDA |
| 1114 | Pulse Distribution Amplifier |
| 1115 | Pulse Delay Amplifier |
| 1116 | VITS Composite Test Signal Generator |
| 1117 | VITS Delete/Insert |
| 1119 | Audio Distribution Amplifier |
| 1120 | Audio Preamplifier |
| 1121 | Audio Monitor Amplifier |
| 1122 | Subcarrier Distribution Amplifier |
| 1124 | Waveform Monitor |
| 1129 | VIR Signal Generator |

AMERICAN DATA CORPORATION



AN AIRPAX COMPANY

315 WYNN DRIVE, N.W. P. O. BOX 5228 HUNTSVILLE, ALABAMA 35805 TEL. 205-837-5180

ADC SOUTHEAST
205-837-5180

ADC SOUTHWEST
713-941-7272

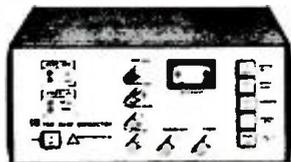
ADC MID ATLANTIC
301-460-1454

ADC NORTHEAST
617-237-2600

ADC WEST
213-387-7756

Circle 121 on Reader Service Card

Honestly now, which TBC is



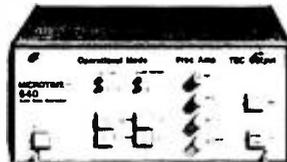
ANALOG.

Only MICROTIME can give you an unbiased answer. Because we are the only people who make both analog and digital time base corrector systems. Sometimes one system is best, sometimes the other. With MICROTIME, you always get the system best for you:

The new MICROTIME 640 TBC is now in production. This state-of-the-art TBC overcomes all the VTR and signal format restrictions of earlier digital units. With its wide window, it easily handles wild and wiggly signals from low-cost VTRs with large tension errors. It offers an outstanding signal-to-noise ratio and optimized differential phase and differential gain.

The 640 also offers direct/heterodyne processing, a built-in Proc Amp, and is the only digital with Signal Status Indicators.

Our MICROTIME 610 HETEROCOLOR analog TBC is an outstandingly versatile and cost-effective performer where VTR signals are more stable. As the most advanced analog TBC in the industry, it replaces all the separate stand-alone units that preceded it and handles the output of any VTR from quarter-inch to quad, NTSC direct or heterodyne color, EIA broadcast



DIGITAL.

or industrial sync.

Experience. We introduced the first stand-alone TBC three years ago and have been known for reliability ever since. You'll find our equipment designed with such unique features as front-panel Proc Amp controls to control and optimize the signal quality. Rear-lighted operating mode selectors. Input Signal Status indicators. And hot new features like DCS (Derived Coherent Subcarrier) mode, to let you dub up from a battery-pack to quad. A combination of features available in MICROTIME TBCs and nowhere else.

Our approach. We never try to sell you any TBC until we understand your system's requirements. Then, if a TBC will help, we'll recommend the MICROTIME model that's your best price/performance buy—we're not locked into pushing one system or the other at you. We meet your needs—not vice versa.

Send for our free new illustrated applications brochure that discusses time base error correction in non-technical language. Or call us for the name of the nearest distributor and a no-obligations demo at your facility.

Ask us. We're the only people who offer both.



Television Microtime Inc.

1280 Blue Hills Ave., Bloomfield, Conn. 06002
Call us for immediate attention to your needs. (203) 242-4242

Circle 164 on Reader Service Card

best for you?



Tulsa Cable: The Making Of A Super System

A great many eyes are on Tulsa, where cable TV sales—50% penetration—are exceeding most predictions for major markets (Tulsa is 57th). The magic came from offering 24 channels. Only six are regular TV

Can a cable system make good in a community that already has excellent broadcast TV reception? The answer is YES—if the system goes all out. Tulsa Cable Television originates twenty-four plus separate channels—half of them 24 hours a day. Subsidiary of United Cable Television Corp., Tulsa Cable, with a sophisticated computer controlled automatic multiple channel origination system and a lot of know-how—plus new, well-equipped studios and a very creative, dedicated staff—has a lot of people sitting up and taking notice. If what's happening in Tulsa can work elsewhere, cable TV is viable in the major market. What's more, with three educational channels plus another devoted entirely to covering city government activities, cable TV is beginning to live up to its promise.

Tulsa Cable began operations on January 18, 1974, and by November 1st boasted a subscriber count of 21,000, with drops being added at the rate of nearly 3,000 per month.

Tulsa's total market is somewhere around 140,000 potential cable customers, according to William D. (Bill) Swanson, President and General Manager of Tulsa Cable. Penetration in cabled areas is now at 50%—compared with Tulsa Cable's projected level of between 37-42%. Subscribers like what they get. Tulsa Cable reports that disconnects over the past ten months have averaged less than 10% of total subscribers, putting overall retention figures at better than 90%.

Tulsa Cable is building plant at about 50 miles per month which is currently peak capacity for the system. "We'd have been a lot further ahead," says Swanson, "but a tornado knocked out several miles of plant in March—one of the worst tornadoes in Tulsa's history." Tornado or no, Tulsa Cable is moving ahead—fast.

Three years in the planning, this new Oklahoma cable system obviously started off the right way. Marketing programs included a massive publicity effort by parent organization, United Cable Television (formerly LVO Cable, Inc.). The direct sales program is centered around a 24-page, full color brochure entitled, "The Magic of Cable Television is about to Dawn on Tulsa." This brochure tastefully presents the extensive services and programming plans proposed to the community by Tulsa Cable Television.

A potential subscriber learns that he can expect 25

Most of the material for this article was gathered and written by Vicki Sagers, TeleMation, Inc.

channels of individualized programming—some of them on-the-cable 24 hours a day; improved reception; and even FM radio, if desired. At a modest \$5.95 per month, plus a \$15.00 channel converter deposit, it seems like a bargain—and it is. Here's what Tulsa Cable is offering:

Three Network Affiliates—KTEW (NBC), Tulsa; KTUL-TV (ABC), Tulsa; and KOTV (CBS), Tulsa

Two Independent Broadcast Imports—KXTX-TV, Dallas; and KTVT, Fort Worth

One Local Educational Broadcast Station—KOED-TV, Tulsa

Two Educational Channels—Tulsa Schools and Tulsa Colleges. Programs produced in studios at the Tulsa Educational Service Center are viewed directly on channel 22. Tulsa Cable is the only cable system currently employing a direct, two-way system between the cable and local school systems' educational studios. On Channel 34, in the future, viewers may elect to watch productions from both Oral Roberts University and Tulsa University.

Religious Channel (automated plus live or tape). A "bulletin board" type channel which provides display of announcements and messages pertaining to community religious events. Information is supplied by the Tulsa Media Ministry. Religious programs produced by various denominations are also presented daily.

Childrens' Channel—Programming from schools and universities; all productions are especially geared for childrens' viewing.

Community Affairs Channel—Available for residents who desire to "air" opinions on civic or social matters. This channel also provides a "bulletin board" (automated) display format for messages advising the community of civic events and public service type announcements.

City Government Channel—Agencies of the Tulsa City government are equipped with complete television production studios and provide program material related to local governmental matters. A microwave link between the city & county's studios and Tulsa Cable is used for live telecasts of public meetings. (See separate box)

Three News Channels (automated). Instantaneous news directly off the AP broadcast wire. Channel 3: News Headlines (24-hour service); Channel 15: News Details (24-hour service); Channel 27: Oklahoma News (24-hour service)

Three Sports Channels (automated). Channel 4: Sports Headlines (wire service sorted; 24-hour ser-

vice); Channel 16: Sports Details (stories taken from the AP wire; 24-hour service); Channel 28: Sports Scores (bulletin board type display containing national, regional and local sports scores; 24-hour service). Channel 28 also displays sports programming. Remotes are handled by the system's fully equipped mobile unit and are either taped for later display or shown live via microwave. All News and Sports channels, except for "Sports Scores" are automatically edited for respective topical information by the Programmatic 3000 computer.

Weather Channel (automated). Provides current time/calendar weather data, continuously up-dated automatically from TeleMation weather instruments atop the Tulsa Cable studios. Display also includes weather forecasts and reports off the national weather bureau wire service. (24-hour service).

Movie Channel (automated). 24 hours of continuous movie viewing, uninterrupted by commercials. Tulsa offers subscribers a choice of fourteen different movies per week, rotated so that a viewer could conceivably watch a "new" movie, at the same specific time, every night of the year. All movies are displayed on videocassette from Tulsa Cable's T-MATIC™ Automated Videocassette Programming system. Transfers

from 16mm to cassette are made in-house. Movies are vintage 1968 or earlier but that hasn't affected the popularity of the channel.

Two Business News Channels (automated). Business stories and financial reports from the AP wire; and NYSE/AMEX stock quotations.

TV Program Guide Channel (automated). A four-hour "Look Ahead," presenting the schedule for all programs on the cable, continuously up-dated by the computer so that program information is current at any given time for the up-coming four-hour period. (24-hour service).

That's 24 channels on the cable now, with one additional planned—a convention/tourist channel offering viewers information on recreational activities, chamber-of-commerce supplied data, and tourist guide type displays. A channel has been set aside for public access but so far there is no demand.

Keeping 24 channels on the system is no easy task. It requires careful planning, sophisticated equipment, and creative personnel. To Production Manager, Hurst Swiggers, "It's a challenge that really keeps up moving."

Tulsa Cable's staff is responsible for providing about 25 hours of local origination programming a



Leon Rollerson gets ready for a taping session. Tulsa Cable uses IVC color cameras and 1 in. VTRs.



Don Jones operates TeleMation production switcher during one of the system's regular programs.



24-hour continuous movie displays and other videocassette programs can be handled automatically. Each player can be automatically started and stopped from the computer.

Anne Higginbotham, Tulsa U "intern-operator" enters daily TV Program Guide up-dates into computer memory. Using a tele-typewriter, she will have a "hard copy" reference of the entries.

week with some regular programs live or taped from their fully-equipped color studios or mobile unit. Close to 50% of these productions involve sports—Tulsa Cable has produced over fifty sports remotes since January.

One-half of the multi-channel operation is generated by a TeleMation Programatic 3000 computer controlled automatic origination package. According to Swiggert the system is extremely easy to operate. Employing four full-time "operators," most of whom are "interns" from Tulsa University's educational media center, Swiggert claims new recruits can learn to operate the computerized system within a one-week training period. A typical operator's day may be split up among various duties, including data entry for those automated channels requiring daily up-dates such as the TV Program Guide, Sports Scores, or special announcements for any of the system's "bulletin board" type channels. The operator is also responsible for checking audio levels on all channels carrying background music; making sure videocassette programs are on-line as scheduled; regularly spot-checking all channels for performance status; and helping as needed in studio production.

Why did Tulsa Cable choose the computerized au-

tomatic channel approach to offer their subscribers the widest variety of programming available on cable anywhere in the country? Management says it's an excellent solution to multiple channel local origination—at a reasonable cost.

United Cable Television is currently beginning construction on two new systems which will be formatted similarly to the Tulsa operation. Their Albuquerque (New Mexico) and Hartford area (Connecticut) systems will both include TeleMation Programatic 3000 multi-channel computer packages and will offer subscribers the same kind of individualized, viewer-interest automatic services, along with regular programming.

"We feel our automated channels are certainly an important part of the overall cable service package," says Greg Liptak, UCT's Vice President in charge of Marketing, "but aggressive, well-planned marketing and operations expertise are as important as the services you have to offer."

Marketing before and after

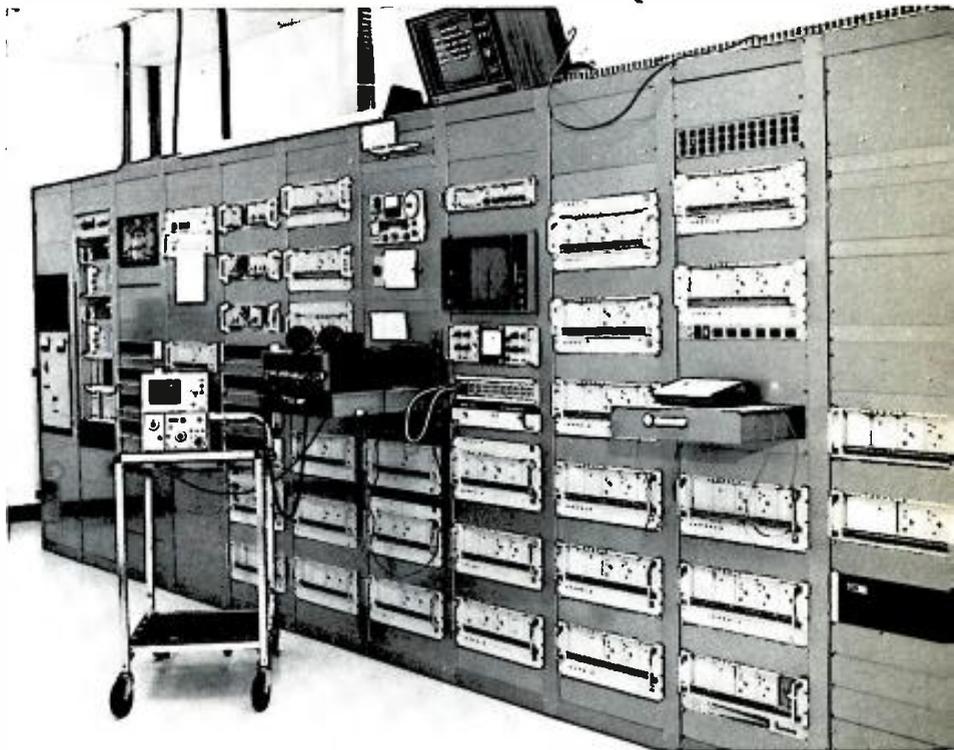
Subscriber handling from point of initial contact through installation is a well planned, smoothly-executed on page 60



President Bill Swanson feels CATV systems need finely integrated packages of program and marketing services.

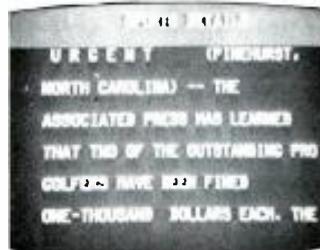


Production Manager, Hurst Swiggert, says movies, weather and sports scores are the most "popular" of the automated services.



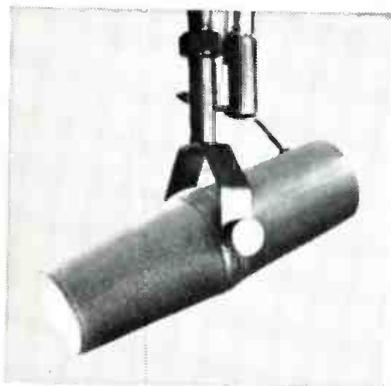
Tulsa Cable's all-Jerrold headend distributes the system's 24 channels to over 21,000 cable subscribers.

Typical automated displays generated by the character generator and controlled by mini-computer.





What you see is what you get.



The extraordinary Shure SM7 professional microphone features something you've never seen before: a *built-in Visual Indication Response Tailoring System* that offers you four different frequency response curves—and shows you the curve you've selected with a graphic readout (see above) at the back of the microphone! Choose: 1. flat response; 2. bass roll-off; 3. presence boost; 4. combination of roll-off and presence. And there's more: the SM7 delivers exceptional noise isolation with a revolutionary pneumatic suspension mount . . . an ultra-wide, ultra-smooth frequency response . . . an integral "pop" and wind filter . . . and a cardioid pickup pattern that looks "text-book perfect." The Shure SM7 Studio Microphone was extensively field-tested in recording studios and broadcasting stations! Write:

Shure Brothers Inc.
222 Hartrey Ave., Evanston, Ill. 60204
In Canada: A. C. Simmonds & Sons, Ltd.



Circle 130 on Reader Service Card

cutted professional marketing process. As cable construction reaches a new district, all potential subscribers (previously identified and classified by the Marketing Department) are personally contacted. If a sale is made, no later than 20 days after installation, a Tulsa Cable PR girl—attractive, uniformed and specially trained, calls upon the subscriber to see “how things are going.” She checks the service, can make minor converter and/or color set adjustments, and notes feedback from the customer regarding his satisfaction (or dis-satisfaction) with the cable service. If she finds problems on the cable, they are corrected within 24 hours (a service offered seven days a week, at no charge to the customer). If all aspects of the ser-

vice are satisfactory, she reports this condition too. “A lot of trouble is taken to insure the subscriber’s complete satisfaction with the cable,” says Swanson. “For instance, if problems are encountered with a subscriber’s color TV set, we don’t just tell him that it’s his set and not the cable—we show him. And we encourage all of our subscribers to report problems promptly; then we make every effort to remedy the trouble that same day. We feel that good customer service and PR really pay off and are important to the system’s overall success.”

Jerrold set-top converters are used to pull in the 24 channels. All signals are processed through Jerrold headend equipment. BM/E

31—The City Government Channel

Tulsa is one of the few communities that has devoted real resources—equipment and people—to the operation of a government channel. In Tulsa this means both the city and the county. A complete production studio is located on the premises of the Tulsa City-County library. Cost of the studio at the library and equipment came to over \$110,000. Staff consists of two full-time persons and two part-time persons. Annual operating budget this first year was \$56,880 not counting some services supplied at no charge by the library. Director of the program is Tom Ledbetter.

What happens on a city-government channel? First major agency to use cable TV was the Health Department, which prepares one program a week. Thrust of this programming is primarily educational. Shortly after the cable system commenced operation, Channel 31 began covering meetings of the City Commissioners which are held twice a week. This is a major activity since the average meeting runs about two hours. Occasionally a meeting lasts five hours. The longest ran 5½ hours when a battle over a zoning matter came up. These programs are produced live but also taped for repeat two or three times a week. There is no editing performed. Live feed goes from city hall to the headend via a microwave channel. Tapes for later play are delivered by hand to the headend.

Another extensive user of the city channel is the Parks and Recreation Department. The Zoo is a popular shooting location, followed by flower gardens. Some of the Parks and Recreation programs deal with, and promote, arts and crafts.

There are about 50 agencies that could be the source of programming. Ledbetter reports that about half of this number have been contacted so far.

After nearly a year of such programming, what is the outlook? Ledbetter remains optimistic and he is pleased with the support he is getting from the city fathers. It’s a time consuming job to explain the potential of cable TV programming to agencies who have traditionally not been media oriented, but the staff has run into no major roadblocks.

More equipment and staff would be a help. Trouble with equipment is the biggest frustration. When CM/E called, one camera was down and this curbed operations. A time base corrector is a must. Right now channel 31 plays some tapes in the early morning when a TBC can be borrowed from Tulsa Cable. A more sensitive camera would be good for cable-casting the city council meetings since the commissioners do not want lights facing them. Ledbetter may switch to black and white coverage so that a



View of studio at the library.

sharper picture can be transmitted. Extra equipment to leave at City Hall would be desirable because of the wear and tear in moving everything in and out twice a week.

Right now Channel 31 programming is on the cable about 12 hours a day—from noon to 5 p.m. and then again the next morning from 3 a.m. to 9 a.m. No, Tulsa does not have a large graveyard shift population—it’s just that those wee morning hours are attractive because of the availability of a TBC. When the channel gets its own TBC it will do some programming during prime time evening hours.

Another major piece of equipment will be used early this spring that will increase programming hours. The library is getting a Systa-Matic “electronic juke box” which will play video cassettes automatically. Hopefully this unit will operate unattended on week-ends. The same system can scan a series of card visuals and Ledbetter hopes to put employment openings on the channel when the cable would otherwise be dark. Channel 31 also has on order one of Eastman Kodak’s Supermatic film video players.

For next year, Ledbetter will try to increase his staff by one more full-time person. He needs a full-time technical engineer because keeping equipment running is a big job. This will free another person for more production.

Is anybody watching? No attempt has been made to measure or gauge viewership. The city council likes the idea of its sessions being televised. If the microwave is out, people do call in complaining. There’s evidence that at least a few people are watching and that’s sufficient for the moment. Ledbetter would like to see an evaluation made but since the cost for that would be a major budget item such research will have to wait.

Now There's An Easier Way To Get The Perfect Tape. Scully's 280-B.

Why make the job of recording tougher than it has to be? Operating a recorder/reproducer is so easy with solid state control switching, plus straight line threading for fast editing. A motion sensing system like OPTAC™ which helps prevent tape spill or damage. And you don't even have to use the stop button when changing transport modes.

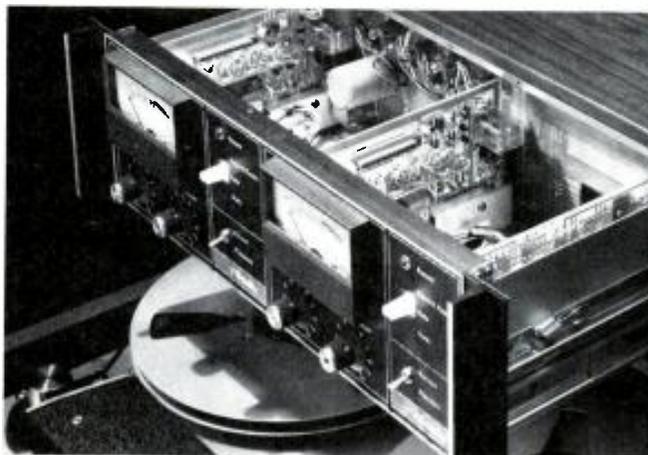
That's the kind of easy operation you get in Scully/Metrotech's 280-B.

And why be an acrobat when it comes to adjusting and maintaining equipment? All that bending and reaching can be eliminated with a pull-out control drawer that houses the mother-daughter boards to give full access to all set-up and equalizer adjustments. Would you believe no extender boards needed?

You enjoy this convenience in the 280-B, too.

But to really take it easy on the job, you need assurance that sound is being recorded to perfection. So we made sure that the efficient, clean-looking electronics of the 280-B deliver the goods — and then some.

An outstanding S/N ratio assures cleaner sound in progressive generations.



Up to 72dB on full track .25" tape at mastering speed. And 68dB on two-track .25" and four-track .50".

Flat frequency response usually exceeds published specifications: ± 2 dB, 30Hz to 18 kHz. You'll find reliable selective sync switching in the

280-B, with sync response equal to normal play response. But you won't find noisy push-buttons in the audio circuits. For easy insert, our function switch provides the ability to punch "in and out" of the record mode on any channel without disturbing tape motion.

The payoff is a superior end product — the perfect tape. And for long-playing tapes, the 280-B is now available in a 14" configuration. Clearly, this recorder/reproducer provides your transmitter with a perfect recording. When recording masters, the result is just as outstanding.

So get the facts. Then get the best — at a reasonable price. Contact your Scully/Metrotech field office in Los Angeles (213) 387-4252, Nashville (615) 244-1546, New York (212) 354-0623 or Chicago (312) 583-7878 for details on the 280-B

series with up to 4 channels, or write: Scully-Metrotech, 475 Ellis Street, Mountain View, California 94040. Telephone (415) 968-8389. TLX 345524.

▶ Scully/Metrotech Division of Dictaphone

Designers and manufacturers of a full line of tape recorders, reproducers for broadcast and master recordings, super slow speed voice logging recorders with time generators and readers.

Circle 131 on Reader Service Card

Scully/Metrotech and Optac are registered trademarks of Dictaphone Corporation, Inc., New York, U.S.A.

Innovative Delivery Techniques Described at NAEB Convention



The ATS-6 2500MHz educational satellite now serving the Rocky Mountain area, Appalachia and Alaska received a great deal of pre-convention publicity (see BM/E November) and indeed delegates were able to witness actual satellite transmissions. The notion of a permanent U.S. educational satellite (the ATS-6 will move to India next year) intrigued educational broadcasters as a bountiful delivery system but it was not the only technological innovation to promise effective use of the electro-magnetic spectrum.

There was a resurgence of interest expressed this year in SCA, as an adjunct to FM broadcasting and several technical and general sessions were devoted to that theme. In the exhibit area a novel way of transmitting coded information along with a TV picture was depicted by Atlantic Research Corp. Called Data-Dot, the system permitted data services to be present as a "dot" on standard TV screens; an optical transducer in the form of a suction cup which could be affixed to the CRT tube face, picks up data for decoding.

All kinds of data could be transmitted this way—including titles for the deaf—but more on this later. Still another method as a means of getting more information out of available spectrum was shown at Las Vegas. Making a debut was an audio-visual distribution system called VIDAC (Video Audio Compression). Its a compressed time variable rate scheme by Westinghouse. By sacrificing some of the unnecessary motion contained in most TV, VIDAC makes it possible to deliver hundreds of programs on a single TV channel. Westinghouse engineers and educators from the State of Georgia, where the new development

has been field tested, described the system and suggested some of the uses to which VIDAC could be put.

The system is built around the conventional NTSC system of transmitting 30 frames of picture information per second. But in using only as many visual frames as are necessary to present still pictures to illustrate a lecture and by allocating other frames to carry compressed audio, the result is a time compressed version of the lecture that can be transmitted in a small fraction of the time required to view the program. Up to 16 seconds of audio per TV frame is employed.

During viewing the single picture-frame transmitted is made to reappear on the screen a sufficient number of times for the eye to pick it up. (Process is similar to movies, frames are repeated.) A disc memory incorporated in the terminal at the receiving end captures the picture material and compressed audio for playback.

In essence then, VIDAC transmits a program consisting of a varying combination of pictorial and audio information over the air (or via cable) 30 frames a second. Thus a four-second 120-frame transmission could consist of 15 minutes of audio accompanied by 60 frames of pictures. (Fifteen separate 15-minute presentations can be transmitted in a one minute station break.)

In practice, the audio and visual information is multiplexed and compressed in a processor and stored on regular videotape until air time. At the receiving end, the signal is captured and recorded, this time, on a magnetic disc. The disc has separate heads to pick up picture info and audio. Signals are sent encoded and the heads function in a coordinated way to present the visual and audio information properly synchronized.

In the time compressed form prior to transmission, sixty inches of videotape is sufficient to store a 15-minute illustrated lecture. A one hour reel of tape stores one thousand 15-minute programs.

A wide variety of operating systems are possible with VIDAC

creating a new type of audio-visual network. A few of the possibilities: An educational television station or network could serve as an audio-visual distribution system using a single resource library. Any urban or rural school, hospital or public institution within the reception area could select programming from that library and have it delivered to them using only a few seconds of transmission time. A centralized audio-visual library at the head end of a cable television system could serve individual schools, hospitals or other public institutions with individualized instructional needs yet only use a single channel of television to do so. A university campus instructional library could provide classroom or student learning carrel access to audio-visual material when assigned as an integral part of college courses.

While the receiving terminal can store only two programs on a disc, additional programs could be recorded on video cassettes for local distribution.

The Georgia ETV network has found the costs of producing VIDAC program considerably less than standard TV. Visuals are inserted electronically using slides, pictures or drawings, film strips, etc. Teachers can produce their own lectures.

Of extreme interest to schools is the fact that one A-V library can serve an entire system with VIDAC. Projecting this concept on a national scale, one can envision a national library serving schools everywhere. The Public Broadcasting System network, for example, could transmit thousands of programs every night after sign off. Those seeking a particular program could simply set their recorder to capture only those programs carrying the desired identification number. Although the receiver terminal now costs in the vicinity of \$20,000, this could be reduced in quantity. Westinghouse experts feel VIDAC could be a less expensive way than mail or air express for delivering films. Getting a hard copy to a user destination and back

continued on page 64

NEED PROGRAM SUB-CARRIERS?

THE NEW FARINON FV41
An FM Transmission Channel System For Microwave Radio Or Video Cable

COMPACT, 1 3/4" SHELF

... illustrated above is equipped with transmitter, receiver and diplexer units for one-way, drop-and-insert transmission. Shelf also may be arranged for one-way transmitting or receiving of two channels. Two shelves provide duplex transmission.

APPLICATION FLEXIBILITY

... use the FV41 for: program audio, express order-wire, voice-frequency multiplex or other auxiliary channels above video. With its optional 100kHz bandwidth, the FV41 can also be used for wideband data.

FULL SPECTRUM COORDINATION

... with video signals and radio pilots is provided by the FV41's four standard sub-carrier frequencies. The diplexer is transparent to video components below 5 MHz and provides at least 45dB attenuation at sub-carrier frequencies.

THE FV41 MEETS REQUIREMENTS

... of FCC, CCIR, EIA, networks and Bell System. Also Ask About: AM Channels • clamper amplifiers • distribution amplifiers • order-wire • 70 MHz modulators and demodulators • and other transmission accessories ... all from:

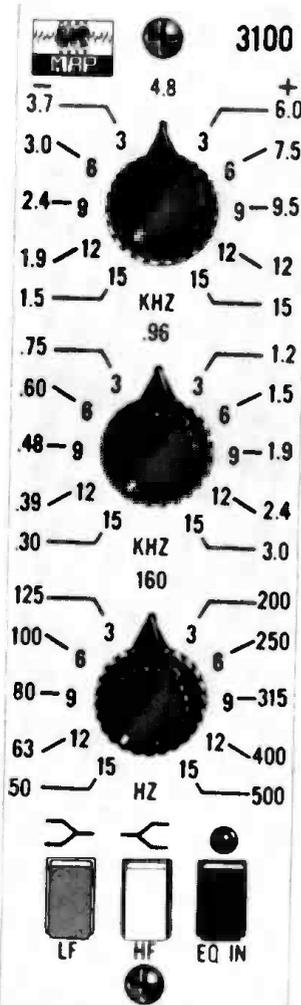
Farinon Electric
1691 Bayport Avenue
San Carlos, CA 94070
(415) 593-8491



Circle 132 on Reader Service Card

MODULAR AUDIO PRODUCTS

Graphic/Shelf Equalizer with REPEATABLE EQUALIZATION



Model 3100 ■ Actual Size

- Three independent overlapping frequency ranges; 50Hz to 500Hz, 300Hz to 3KHz and 1.5KHz to 15KHz, with 11 detented center frequencies per range.

- Selectable Bell shaped or Shelf response curves on high and low frequency ranges.

- -15dB to +15dB cut and boost, 11 detented positions.

- Silent equalization in-out switch with LED indicator.

- High output capability, up to +27dBm into 600Ω, TYP THD .05%.

- Low noise, -90dBm unweighted, 20Hz to 20KHz.

- Frequency

- Level

- Curve Shape

Modular Audio Products is an engineering oriented company providing a complete line of console and studio components. In addition to supplying the finest quality products, we also provide the technical and application backup to go with them.



Call or write us today for information on this and other state-of-the-art units.

MAP MODULAR AUDIO PRODUCTS, Inc.

A UNIT OF MODULAR DEVICES, INC.

1385 Lakeland Ave. • Airport International Plaza
Bohemia, New York 11716 • 516-567-9620

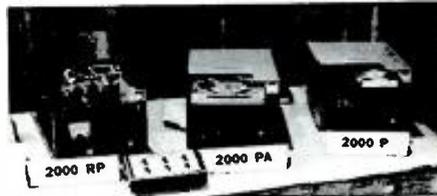
Circle 133 on Reader Service Card



Edutron introduced \$2900 TBC.



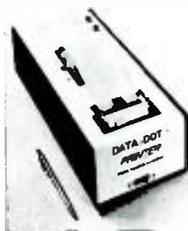
Digital Video Labs had \$15,000 TBC.



Broadcast Electronic's new economy line of cart machines.



Panasonic cameras, left; Data Dot printer, below.



Other NAEB Highlights

Financing

- Public broadcasters are closer than ever to obtaining long-range federal financing that is insulated from political pressure. However, the funding bill—which is now before Congress—still has “a long way to go” before it becomes law. For every \$2.50 that public broadcasting obtains from nonfederal sources, the Corporation for Public Broadcasting would receive one dollar of federal support, up to a specified ceiling. Additionally, appropriations from Congress would be for a period of five years.

Ford Foundation

- The Ford Foundation, which has contributed \$273 million to the development and growth on the non-commercial broadcasting industry since 1951, received a Distinguished Service Award from the National Association of Educational Broadcasters.

Buckminster Fuller

- Scientist-philosopher-architect R. Buckminster Fuller addressing the NAEB said “This is an extraordinary new moment, for we now have enough knowledge so that by 1985 we can take care of all humanity.” Fuller said a special mission of public broadcasters is to “see how soon we can get all men to think in large patterns, and not to be overcome with local obstacles.” Fuller believes that mankind can get “more out of less,” through science and that the limits-of-growth prophets are wrong.

Satellite Technology Demonstration

- Gordon Law, project director, said “When future satellites are launched—as they will be—and these satellites are made available to educational broadcasting, a spirit of cooperation among potential users must manifest itself.” He stressed the importance of working together to maximize the effectiveness of new satellite technology.
- Phillip A. Rubin, director of Engineering and Research, CPS, predicted that PBS would be the first broadcast entity to be served by satellite. In other engineering sessions PBS reported progress in improving audio services. AT&T longlines is committed to an improvement.

now costs \$3 to \$6.

While VIDAC is compatible with NTSC transmission systems, the actual information occupying each time frame is processed in a special way. The DATA-DOT system from Atlantic Research, on the other hand, adds data to an otherwise normal TV transmission.

To the eye the dot appears as a rapidly and randomly blinking light source. It is this blinking (modulation) of the light level which carries the information. All that is needed at the receiving end is a means of precisely detecting the light pulses and converting the digital data back to their original form.

The dot is created by a unique special-effects signal generator located at the television station. Known as the Data Insertion Unit (DIU) and keyboard. The Model 666 DIU is capable of inserting a single channel of data.

The video signal from a television camera is routed through the DIU.

A black or blinking border also is created within the DIU. Controls surround the dot and permit placement of the dot at any location on the television screen.

Incoming information is picked off the screen by a photo transmitter in the Data Detector. The detector is held on the glass by the small suction cup attached to the detector case. An opening in the center of the suction cup permits light from the dot to strike the sensor. The Data Detector feeds a Responder and mini printer on other display devices.

A device is designed to permit and encourage a student to respond to questions posed by the instructor in the television studio and to know instantly whether his answer is correct or incorrect.

The student responds by pressing one of the twelve symbols on the Responder keyboard. As he does so, one of the two light-emitting diodes (LED) above the keyboard will begin to flash. These LED are la-

beled YES and NO, corresponding to whether his answer is correct or incorrect. If the answer is incorrect, the student can select a new answer until he determines the correct one.

A mini-Printer has been designed especially for use with the Data-Dot system. It is, however, compatible with many other digital data systems. The Model 111 mini-Printer format provides 18 alphanumeric characters per line. Examples of outputs are news bulletins, answers to quiz questions, and weather summaries. Many other types of messages can be adapted to the mini format.

The use of such TV reception techniques permit hundreds of “non visible” data channels to be placed anywhere on the periphery of the screen. Through special receiving techniques, these data channels are available to a wide variety of users—educators, government, industry, commerce—without disturbing normal public viewing.

Cable TV

• James R. Ludwig of Flathead Valley Community College, Kalispell, Montana showed how Cable TV could be used for educational and community service programming. Ludwig outlined and showed examples of the college's "Total Community Education" program.

Women

• A national task force has been established by CPB to investigate the role and image of women in public broadcasting. Currently only 27.1% of total full-time employees in 1972—the last year for which figures are available—were female; and, of these, 79.02% held clerical, secretarial, manual and custodial jobs.

Minorities

• An advisory panel to the NAEB recommended an evaluation of program co-ops and questioned whether they were limiting freedom of expression. In many cases minority expression was voted out, Dr. David Berkman said.

Research

• Dr. Stephen L. Yelon, Michigan State Univ., outlined criteria for "grabbing" kids' attention: functionally relevant activity on the screen pertaining to the segment on the screen; strong rhythm or rhyme; on stage correction of performers making mistakes; children on the screen; and a comprehensive spoken script to accompany the visual product. Long message monologs and performers competing with visual words or phrases on the screen, do not maintain children's attention.

Telecommunications

• The "symbolic interchanges" offered by telecommunications can and must replace a greater percentage of the physical encounters now serviced by physical travel. This was the consensus of one group meeting at the NAEB. Dr. Gerbard J. Hanneman, Annenberg School of Communications, projected that in the future when telecommunications takes a greater share of the message moving market there will be dramatic shifts in population with the advent of decentralized, desirable located, shopping-center type offices. Business travel may not be replaced as much as expected, though, others hypothesized based on surveys of business travelers.

Atlanta Research Corp. speculates that the mini printer, while not cheap (it's still over \$1000 in small quantities) might actually pay for itself. Advertisers, for example could offer Data-Dot customer discount coupons over the air. Since the cost of the distribution is cheap, both the advertisers and the customer wins.

Other Exhibits

The exhibitors at NAEB were down in number but a few brand new items were revealed. Two were the new time base correctors—a top of the line unit with a wide correction window from Digital Video Labs of Toronto and a bottom of the line unit from Edutron, Gainesville,

Fla. The later is a shift register type which costs less than \$3000. Also in the TBC category, Ampex announced that its unit could now work with heterodyne VTRs.

Among other "firsts" was the showing of a new line of low cost audio tape cartridge players by Broadcast Electronics; a new color film camera chain with more automatic features (the 1550) from Cohu; a new tower flashing light system from Flash Technology Corp., Nashua, N.H.; a new modified Panasonic (or Concord) video cassette unit from National Video Corp, of Glendale Calif., that could slow scan in both forward and reverse directions to make editing easier; a new camera from Philips and a new cross pulse generator and other video accessories from Video Aids of Colorado.

Many of the exhibits were devoted to program services and several showed mobile production facilities—Thomas Washburn, Santa Cruz, and Mobile Systems Inc., Minneapolis. Conspicuous by their absence were large exhibitors of previous years, principally TeleMation, Sony and IVC. Their demise at NAEB along with that of other exhibitors meant NAEB, which nearly rivaled NAB in size a few years ago, is now not even a complete closed-circuit TV show. New first-time exhibitors to NAEB, however, did make the show interesting.

In addition to those already mentioned, were Industrial Science Inc. with a line of production switchers and accessories and Television Research International with its "easy-as-film" editing system, the EA-5 (see separate article on CITY in the January issue on news gathering.)

VIDEOTAPE RECORDERS

cont from pg 48

built-in, double-heterodyne color-phase stabilizer including velocity compensator.

The MV-10000's full-field recording system eliminates the need for automatic, individual-head color saturation compensators.

Because of the low, 900 ips, writing speed, the time between head changes is exceptionally long—more than 500 hours (the tape floats on a thin layer of air to reduce friction). Because of the MV-10000's one-video-head-plus-one-sync-head-per-field scanning system a new head can be installed in about five minutes, with all alignments completed in 30 minutes.

With only half (or less) as many heads to change, parts costs are reduced as well.

A few key specs are as follows:

Video bandwidth: 30Hz to 4.0MHz \pm 1dB; less than 3dB at 4.2MHz.

Signal-to-noise ratio: Better than 52dB weighted (46dB unweighted) p-p Video signal to RMS noise.

Time base error: Jitter: less than 0.5 microsec. peak to peak; Drift: less than \pm 0.5 microsec.

Color moire: Better than 36dB down measured with color bars of 75% saturation.

Recording time: 93 minutes (10 1/2 inch reel).

Audio bandwidth: 30Hz to 20kHz (CH-1 and CH-2) \pm 2dB.

Audio signal-to-noise ratio: Better than 50dB (CH-1 and CH-2).

BROADCAST EQUIPMENT

Video test transparencies are produced on a clear acrylic plastic base, with a direct reading emulsion. The line of geometric test patterns fits into an 8" X 10" light box, and eliminates glass distortion. The patterns available are: Resolution, Linearity, Registration, Multi-Burst, Chess Board, Window, Line Focus and Depth of Modulation. TELECOMMUNICATIONS INDUSTRIES LIMITED. 300

Intensified silicon-vidicon (ISV) television camera tube, designated S7000, is for low-light-level TV systems. Sensitivity is 300 μ A/fc, and resolution is rated at 30% modulation depth at 400 TV lines per picture height. Usable output signals are produced at light levels as low as 5×10^{-5} fc. AMPEREX 301

Quadruplex video cassette is used with the Ampex ACR-25 broadcast recorder-player. The cassettes are available in one- and three-minute versions. Dust covers are optional. 3M COMPANY 302

Color Encoder/Auto Balance/Image Enhancer, Model 9900, combines these three instruments into one. The instruments are also available separately. VIR insertion capability is provided. Detail on/off, detail gain, burst remote control are standard features. The encoded signal meets all NTSC, EIA, and FCC specifications. COHU 303

Zoom lens has range of 10-150 mm, is for the 16mm cine film camera. The lens can focus down to 32" from the image plane while still retaining zoom capability. A field size of 1" X 1 3/8" can be focused upon while leaving a working distance of 24" between the front lens and the object for lighting and camera manipulation. \$2850. ANGENIEUX CORP. 304

Crimp tool is designed to crimp the rings on RG-59/U and RG-6/U cable. The tool measures 2 1/2" X 8 1/2" and fits in the CATV installer's tool

belt. The die used for crimping RG-59/U is 0.262" and 0.324" for RG-6/U cable, on a flat-to-flat measurement. \$27.50. UTILITY TOOL CORP. 305

CATV test system features a sweep receiver with an output bandwidth up to 25 times greater than conventional detectors operating at the



same RF level. The system consists of a simultaneous sweep generator, and sweep recovery receiver(s) located at remote amplifiers or in mobile vans. The receiver has a detector rated at 260 kHz and the 1-440 MHz sweep generator is flat to within ± 0.25 dB. \$1048 for the receiver and \$675 for the generator (in unit quantities). PECA. 306

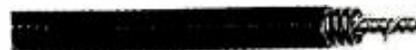
Relative power monitor, type 5478, is a passive sampling unit. It provides two voltage outputs representing forward and reflected power in 50-ohm transmission lines. The type 5478 operates in the 80-500 MHz range; the 5478A covers 500-900 MHz. MOSELEY ASSOCIATES 307

Shielded cable clip protects conductors in a cable from a current surge of 1000 amps for up to 20 seconds. The Bullet Bond Clip 1000 features a wrap-around tail on the clip's shim plate to make contact between the cable shield and bond bar or other grounding conductor. An insulating shield has also been added to protect underlying conductors from high current surges. COMMUNICATIONS TECHNOLOGY CORP. 308

Continuous-belt magnetic tape eraser removes recorded audio digital or

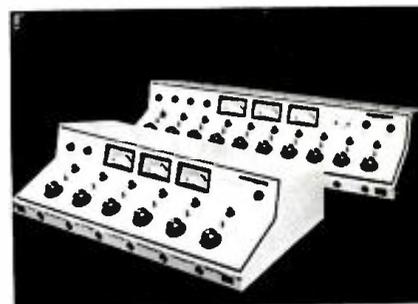
video material from any 7" reel, cartridge or cassette in a single pass. About 4 seconds is required for the tapes to travel the length of the belt. GARNER INDUSTRIES. 309

Air dielectric coaxial cable is available in 3" size, and features a corrugated tubular copper center conductor, polyethylene dielectric, corru-



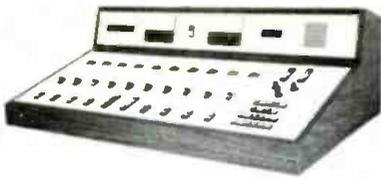
gated outer conductor and a black polyethylene jacket. Impedance of the cable is 50 ohms. Attenuation at 100 MHz is 13 dB/100 ft.; average power capability at 100 MHz is 35.9 kW. CABLEWAVE SYSTEMS, INC. 310

Six-channel and 10-channel audio consoles feature integrated circuit phono preamps, shielded plug-in modules, 15-watt rms monitor output, remote control functions, and bottom or rear cable entranceways. Consoles in this series are wired for



both monaural and stereo by adding the needed plug-in and/or transformers. Both versions come with stereo input attenuators that control the left and right channels simultaneously. COLLINS. 311

Audio console features ten channel, dual monaural operation. Two microphone channels, two turntable channels, automatic cartridge switching on two channels are features. A digital realtime clock and elapsed timer with automatic reset and start are included. Price of the



MA-31 is \$6995. DYMA ENGINEERING. 312

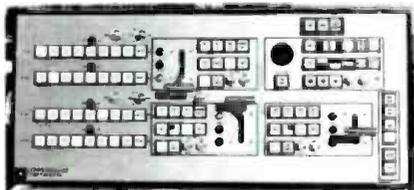
Video character generator and multiple message store offers eight sizes of both upright and italicized characters, two-page memory, computer data interface. The model VCG1 character generator black-outlines the 52 characters provided: 26 letters, 10 numerals, 16 symbols. Words may be displayed in up to 5 colors, and are stored in a floppy disc at TTL levels. ASTON. 315

Special effects generator features more than 4000 patterns available from the controls, plus spotlight, fan or rotary wipes, control via computer, memory or from control panel. The type 7100 is expandable to generate extra patterns such as stars, binoculars, keyhole, hearts, origami wipes, etc. Available options include Positioner, Pattern Modulation, Color Matte, and Black or Colored Edging. EMI. 316

Self-contained TV cable tester performs continuity test of up to 99 conductors in one second. Model AS-99-DO checks for shorts, opens and miswires in cable assemblies up to 10,000 feet long. ADDISON. 317

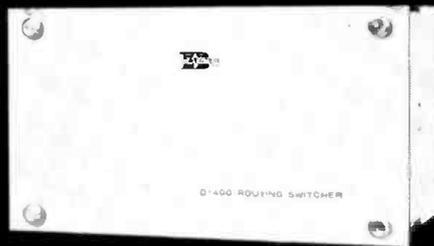
Retrofit ferrite heads for video recorders are warranted for a year or 1000 hours of use. The heads are designed to fit Ampex VR660B and VR660C helical scan recorders. \$220 and \$275, respectively. SPIN PHYSICS. 318

Video controller (switcher) features eight to 24 inputs, linear keying with adjustable gain and clip level, soft or border edge wipes, additive(lap) and non-additive mixing, non-sync inhibit, split faders, and computer compatible control inputs. Options for



the model 4081 controller include 105 effects and positioner, audio follow video, linear chroma key, output proc amp, etc. COMPUTER IMAGE. 319

Cine film magazine holds up to 400 feet of 16mm stock using the Mitch- continued on page 68



- Random or Multi-Reference Vertical Interval Switching
- Differential, Hum Bucking Inputs
- High Audio Level Capability, + 24dBm/600 ohms
- Readily Expanded without Field Modifications
- Cable Equalizing
- Clamped Inputs
- Source (camera) and Feedback Crosspoint Tallies

Other advanced Datatek products:

- Transmitter Phase Equalizers and Waveform Correctors
- Envelope Delay Measuring Sets
- Video Waveform Equalizers
- Video & Pulse D.A.s
- Audio Distribution Amplifiers

Datatek D-400 video-audio routing switcher

high performance standards at an economic price



1200 W. Chestnut St.
Union, N.J. 07083
(201) 964-3656

Circle 134 on Reader Service Card

RADIOWAVES

An FM Transmitter is no better than its exciter.



And it's easy to get excited over our exciter. A lot of broadcasters do!

Why? For one thing, it's all solid state for super reliability and performance.

For another, it uses Direct FM to give you wide frequency response, low distortion and low noise.

All RCA FM Transmitters use the BTE-15A Exciter and are available with transmitter power outputs of from 10 watts to 40 kW.

See your RCA representative. And see what all the excitement is about. RCA Broadcast Systems, Camden, N.J. 08102.

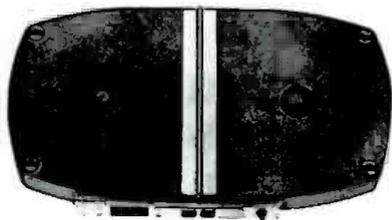


AM & FM Transmitters and Monitors • Antennas • Microphones • Consoles
Tape and Transcription Equipment • Automation Systems • Amplifiers and Speakers

Circle 135 on Reader Service Card

PRODUCTS

ell-type system. The PLC-4 is made from Lexan®, eliminating the prob-



lem of magnesium-particle contamination of the film bath. Hinged doors have a triple step light trap to guard against light leaks. \$160. CINEMA PRODUCTS. 320

Sweep/signal generator covers the frequency range of 0.5 to 300 MHz. Flatness is ± 0.25 dB. Output amplitude is +60 dBmV maximum with a total attenuation range of 90 dB. Model 1001A costs \$1,100; model 1002 (1.0 to 500 MHz) costs \$1,150. WAVETEK. 321

Cable TV trunk station is part of a line of less expensive CCTV system components. Device shown is two-way convertible, has a bandpass of 50 to 220 MHz and has capacity of 23 channels. Trunk stations in the series are spaced at 34 dB. C-COR. 322

Tape cartridge player uses integrated circuits, plug-in record module which is field-installable, and features a noise spec rated at 55 dB below +8 dBm. Options include telco answering devices, plug-in speaker module. Playback Series 2000 costs \$465; Record/playback versions cost \$675. SPOTMASTER. 323

Audio flutter meter, model 8160, complies with the IEEE and DIN measurement standards. It is designed for field servicing, and can measure up to 3% peak flutter. 3M CO. 324

Cable jacket resists rodent attack of insulation on wires and cables. Jacketing, made of plastic, is treated to repel rodents. Installation consists of placing the insulation over the cable to be protected, the zipping shut. ZIPPERTUBING CO. 325

High frequency pre-amplifiers are translator frequency versions of standard line of UHF solid-state RF pre-amps. These amps are optimized for translator channels 70-83. Three models are available: the Able-U2, the American 300, and the American 75. BLONDER-TONGUE LABORATORIES. 326

Automatic video cassette programmer adapts most videocassette players for continued unattended io-

If you're thinking about electronic titling systems...
...and you want the best there is...
then you want

CHIRON II

ELECTRONIC GRAPHICS SYSTEM



Only Chiron has All these features:

- Highest resolution of any character generator available.
- User can create own type styles and logos quickly and easily!
- Up to 6 fonts selectable and intermixable on keyboard on a letter-by-letter basis.
- Very convenient keyboard.
- Individual characters or complete lines can be shifted horizontally and vertically.
- Automatic line and/or full page centering.
- Letter-by-letter color.
- Letter-by-letter flash.
- Four roll and crawl speeds.

Unsurpassed for price/performance and reliability.

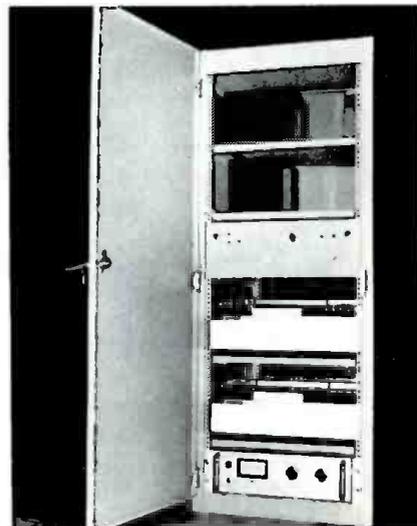
For complete information send for brochure.

CHIRON telesystems

A Division of The Computer Exchange Inc.

11 Grace Avenue, Great Neck, New York 11021 • 516 829-5666
235 Montgomery St., San Francisco, Calif. 94104 • 415 788-0600

Circle 136 on Reader Service Card



eration. System starts and stops itself automatically. Sliding drawer containing unit is housed in a cabinet with players, VHF modulator and storage space for several videocassettes. VCAP. 327

greater interest in what is being televised and to make their views known to station management.

The program was developed in response to recently adopted FCC rules designed to foster "continuous dialogue between licensees and members of the public concerning what both consider to be the major problems and needs of the community . . . so that any dissatisfaction with a licensee's conception of community problems and needs or his efforts to meet them would be immediately communicated to the licensee, resulting in local resolution of such dissatisfaction as it arises, and eliminating the need for the filing of a petition to deny license renewal."

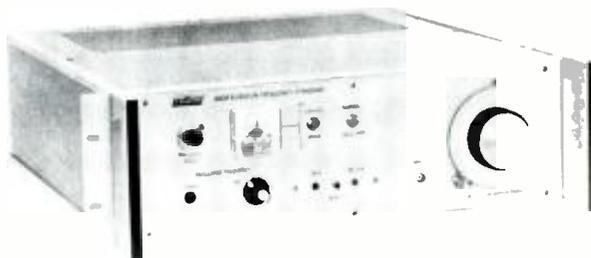
BRIEFS

GTE International announced receipt of contracts totaling \$2.6 million to provide microwave communications equipment for the expansion of Spain's national television network . . . **Eastman Kodak Company** has broken ground for new facilities at its Whittier marketing and distribution center, headquarters for the company's Pacific Southern region . . . **Super8 Sound, Inc.**, has moved to new and larger offices at 95 Harvey Street, Cambridge, Mass. . . . **WLCY-TV**, of Tampa/St. Petersburg, Florida, has introduced a special weather warning bulletin production designed especially to serve the deaf. A series of generic video taped announcements, thirty seconds in length, have been produced utilizing a split screen. One half of the picture graphically shows the printed weather advisory in Spanish. A woman is seen on the other half giving the announcement in sign language. Simultaneously, the bulletin message is read in English by an announcer.

RCA has available a line of video switchers with from four to 20 inputs and up to eight output busses, priced from \$6050 to \$33000 . . . **WFIR Radio**, Roanoke, Va., returned as an affiliate of the CBS Radio Network. The station broadcasts contemporary adult MOR music with emphasis on local news and play-by-play local sports . . . **William O'Shaughnessy** of New Rochelle has signed an agreement to acquire the outstanding shares of Hudson-Westchester Radio, Inc and 100% of the company's suburban radio stations **WVOX**

continued on page 70

BIG TIME NETWORK TV STAR.



Tracor Model 600A Rubidium Frequency Standard. Used by NBC, ABC and CBS television networks. Price: \$7,950.

Only rubidium standard found in TV application. Compact, rugged, designed for color subcarrier generation. Utilizes stable quartz crystal oscillator whose frequency is controlled by the atomic resonance in the ground state of rubidium 87. Features continuous rotation phase shifter and built-in Time Scale Selector. Long-term stability is 3×10^{-11} . Write or call for full technical and application information.

Tracor

Industrial Instruments

6500 Tracor Lane • Austin, Texas 78721 • AC 512/926-2800

Circle 137 on Reader Service Card

RADIOWAVES

Our FM Antennas
travel in the best circles.



True circular polarization is a reason and because all our FM Antennas have excellent pattern circularities starting from as low as ± 1 dB.

You control signal distribution by choosing from a wide range of antennas. We offer models from low-power educational units to custom-designed multi-station FM panel antennas, all with low VSWR.

And because we've got the accessory equipment you need, you don't have to go shopping all over the lot. Your RCA representative has the facts. RCA Broadcast Systems, Camden, N.J. 08102.

RCA

AM & FM Transmitters and Monitors • Antennas • Microphones • Consoles
Tape and Transcription Equipment • Automation Systems • Amplifiers and Speakers

Circle 138 on Reader Service Card

NEWS

and WVOX-FM . . . Burndy Corporation's "Tape Cable" product line was purchased by the **Brand-Rex Company**, Willimantic, Conn. . . . **Goldmark Communications Corp.** has announced the development of a new system to electronically transfer feature motion picture films to magnetic video tape cassettes to meet broadcasting standards for European television . . . **Pearl Brewing Company** of San An-

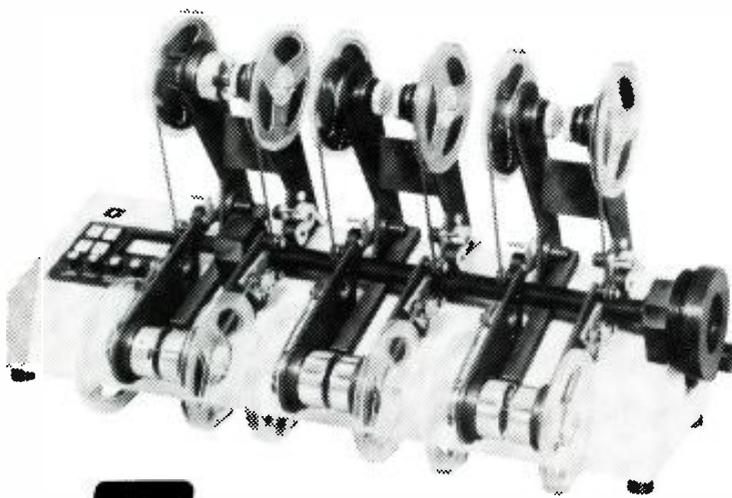
tonio has been involved in a special promotion with several radio stations throughout Texas. Pearl initiated a statewide all-aluminum beverage can collection network in February, 1973. The network, composed of Pearl distributors, began operating in late April of that year. To date, more than 65 million beverage cans have been collected by Pearl for recycling. Pearl has advertised the program on radio, in newspapers, and on outdoor boards. Television was also used to help initiate the campaign for a cleaner environment.

General Telephone of the Northwest, a subsidiary of General Telephone & Electronics Corp, constructed a microwave tower on Mission Ridge, a 6,700-foot peak in the Cascade Mountains. The tower is unique in that it pleases skiers, environmentalists, foresters, and telephone-company management . . . **3M Company**, St. Paul, Minn., has expanded its line of video accessory products by acquiring **Datavision, Inc.**, Gaithersburg, Md., manufacturer of character generators for broadcast, cable and industrial television . . . **The Jefferson-Pilot Broadcasting Company** has purchased radio station KFML-FM in Denver, Colorado. The station began operations in 1953 and is assigned 98.5 MHz.

Dynair Electronics, Inc. of San Diego, Calif., has been awarded a \$345,000 contract from Jet Propulsion Laboratory, Pasadena, Calif. for expansion of an existing video switching system . . . **Byrron Motion Pictures**, a video tape and film laboratory, has installed a CBS laser beam color tape-to-film transfer recorder. The recorder, through three laser beams, transfers video tape of any standard format to film for 16mm, super 8 or 35mm release . . . Radio station KLMS has been sold to **Telegraph-Herald, Inc.**, of Dubuque, Iowa. **Harley Lampman** has been assigned as general manager of KLMS. He was formerly sales manager for radio station KDTH, a Telegraph-Herald property in Dubuque . . . **Ampex Corp.** has announced a contract for approximately \$400,000 to deliver five AVR-2 modular studio quadruplex recorder/reproducers with New York educational station WNET-TV in Buffalo.

After you use the 1056, we'll know one thing about your dub quality: it just got better.

Professional studios that make lots of dubs for radio, welcome the speed and quality they get using the Garner 1056. It offers a whole new set of advantages for producers of reel-to-reel duplicates for radio, AV, or educational needs. Some of those are: • Single capstan drives the master and all five copies. • Solid-state electronics and special heads provide outstanding frequency response. • Two-speed drive allows either 30 or 60 i.p.s. duplicating. • Extra-fast rewind of master tape speeds production. • Unique forward tilt of transport mechanism aids threading. • Conveniently located controls feature push button operation.



GARNER INDUSTRIES

4200 NORTH 48TH STREET
LINCOLN, NEBRASKA 68504

Circle 139 on Reader Service Card

PEOPLE

Eric Small, Broadcast Audio Consultant, has moved to San Francisco from New York. He represents Nippon Columbia in the National Quadraphonic Radio Committee tests being conducted in the Bay Area, there . . . **Robert D. Eisenhardt, Jr.** is corporate vice president of General Instrument Corp. and president of Jerrold Electronics . . . **Joseph A. Flaherty**, General Manager of Engineering and Development, CBS Television Network, has been awarded the David Sarnoff Gold Medal of the Society of Motion Picture and Television Engineers for 1974.

Ted Ashley, Chairman and Chief Executive Officer of Warner Communications, Inc. has recinded those

positions . . . **Raymond E. Carpenter** has been named director of sales and marketing of the Electronic and Industrial Cable Division, Brand-Rex Co. . . . **Wilbur Schramm, Douglass Cater, Marya Mannes, James Lehrer** are among the eleven men and women who have been selected to serve as the Editorial Advisory Board for the "Public Telecommunications Review," published six times a year by the NAEB.

Si Willing, General Manager of KPAL, Pineville, La., has been with the station since it went on the air, this past June. . . . **Willard J. (Bill) Wilmot** has been appointed Sales Manager of community antenna television products for Belden Corporation's Electronic Division. . . . **Walter B. Rice** has been promoted to Sales Manager, Radio Broadcast Equipment, Gates Broadcast Equipment Div., Harris Corp.

Mr. James E. Wickersham has been appointed to the board of directors of Coastcom . . . **Alan B. Bennett** and **Herb Victor**, General Managers for Kaiser Broadcasting television stations in Cleveland and San Francisco, have been elected vice presidents of Kaiser Broadcasting Company. . . . **David A. Shefler**, general manager, Comm-Plex Electronics Ltd., announced the appointment of **Ian MacFarquhar**, P. Eng. as Field Engineer for Comm-Plex in Ontario. . . . **Peter Waldeck** has been appointed Vice President and new member of the Board of Directors of CPD International, Inc., the export marketing subsidiary of Cinema Products Corp. . . . **John Silva**, of KTLA, Los Angeles, has been chosen by the NAB to receive the association's annual Engineering Achievement Award for 1974.

PROGRAMMING

"Medix," a television series about medicine and health, has been syndicated and will be broadcast nationally each week beginning January 1975. The series of half-hour public service programs, produced by Dave Bell Associates, Inc. in association with the Los Angeles County Medical Association, will be sponsored by the Burroughs Wellcome Co. The documentary programs, filmed with real life situations involving actual physicians, patients and scientists, is hosted by CBS newsman, Mario Machado. It covers a diversity of current health topics including alcoholism, dieting, noise pollution, venereal disease, heart attacks, sports injuries and what to expect in an

emergency room, as well as the latest developments in medical science. Syndication of the series is being handled by **Syndicast Services, Inc.** of New York.

Archibald MacLeish, three-time Pulitzer Prize winner, has written a new radio drama, "The Great American Fourth of July Parade," for Earplay 75, the radio drama production unit of the national public radio stations. It is jointly sponsored by

the University of Wisconsin-Extension, the **Corporation for Public Broadcasting**, and the National Endowment for the Arts. Beginning in January, the 26 one-hour programs have been broadcast by public radio stations throughout the country. Earplay 75, an art form utilizing radio drama, is a series of sound essays, verse drama, features, and other more conventional forms of radio theater.

You want to know something about tape cartridge equipment . . . such as our 3D Series multi-reproducer and the WRA Series recording amplifier. Sure . . . you want to talk to an engineer who knows his equipment. But you also want to talk to someone who understands **your** problems as a broadcaster. We combine both. Our men are former broadcasters and engineers. You'll get straight answers as to which of our equipment will solve your problems best. We think you'll be pleasantly surprised at how much we can help. That's why we have a standing offer to any broadcaster with a question to call us collect. And after you buy, we're always as close as your phone. So, let's talk it over — broadcaster to broadcaster . . . today.

CALL 309-828-1381 COLLECT

ITC INTERNATIONAL TAPETRONICS CORPORATION
2425 South Main Street • Bloomington, Illinois 61701

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

Circle 140 on Reader Service Card

NEW SERIES 2000 CARTRIDGE MACHINES



Spotmaster's new Series 2000 Cartridge Machines are the most significant step forward in our 15 year history. Complete new design features simplicity and ease of operation, with plug in modules for recording and audition. Superb electrical and mechanical specs at a new low price.

Spotmaster
18 MONTH
WARRANTY

BROADCAST ELECTRONICS
8810 Brookville Road
Silver Spring, Maryland 20910
Phone: 301-588-4983

Circle 154 on Reader Service Card

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

A home study digital instrument course is being offered by Philips Test & Measuring Instruments, 400 Crossways Park Drive, Woodbury, N.Y. 11797. Each part of the course is divided into five sections, each offering an understanding of digital circuits and the mathematical theory behind them. Each of the soft-cover books is available for \$3.50 from the Publications Department, at the above address.

Eight-page, short-form catalog contains basic specifications and prices for switches and keyboards. Cherry Electrical Products Corp. 259

Technical data sheets and a four-page brochure describe two videotape contact printers designed for use in education, government and industrial training. The brochure also

describes the STAM (Sequential Thermal Anhyseretic Magnetization) system operation, which makes possible signal transfer and copying without mirror-image master dupes. 3M Company. 256

Catalog sheet lists a pair of acoustic delay lines which provide short delays (1.5 to 10 μ sec) at 60 MHz. Specifications include delay, delay tolerance, center frequency, bandwidth, insertion loss, spurious signals input and output impedance of the lines. Walther M. A. Andersen & Associates. 264

A 528-page handbook incorporating application information on silicon controlled rectifiers is available for \$3. A 20-page preface reviews the current state of the art in electric power conversion using SCRs. Copies of the handbook can be ordered from International Rectifier Corp., 233 Kansas St., El Segundo, Calif. 90245.

Booklet, intended to familiarize students with the most widely used types of modulation, is entitled "An Introduction to Time and Frequency Domain Modulation and Waveform Analysis with Lab Experiments." It is available at no charge in small quantities. Tektronix. 257

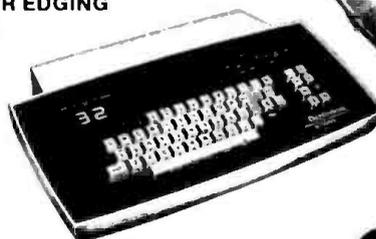
show me a need for graphic arts characters at economic prices...and I'll show you DATAVISION D-3000.

Here is a Video Character Generator that costs thousands of dollars less. Yet, has graphic arts characters with 1120-element resolution equal to the most expensive equipment. Available with two keyboard selectable type fonts. Use the D-3000 alone (internal memory); with low-speed audio tape interface; or with our Model D-4000 "floppy disc" high speed, random access storage system.

- OTHER FEATURES** ● COMPACT, SELF-CONTAINED, PORTABLE
● 2 CHARACTER SIZES ● 2 INDEPENDENT OUTPUT CHANNELS
● 3 SPEED ROLL AND CRAWL ● CHARACTER EDGING
● WORD FLASH ● AUTOMATIC CENTERING

Write or call: Datavision Video Products,
15932 Shady Grove Road, Gaithersburg,
MD 20760. Telephone: (301) 948-0460.

DATAVISION VIDEO PRODUCTS
Mincom Division **3M**
COMPANY



Call or write today.
Just say "Show Me"
and we'll give you a
free on-site
demonstration.

You'll Love It, Too!

Circle 141 on Reader Service Card

We guarantee
the unique
individually tested

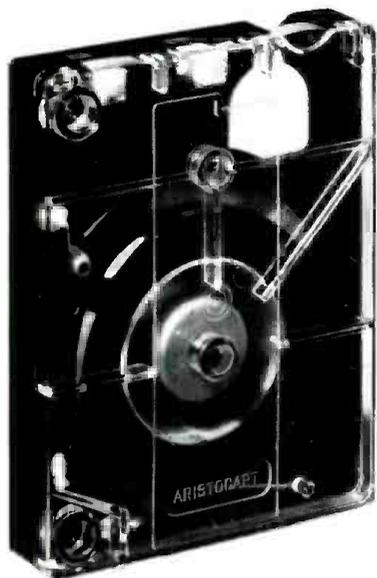
ARISTOCART

will deliver
a consistently higher
standard of voice and
music reproduction
than you'll get from
any other cartridge on
the market.

SPECIFICALLY:

Aristocart's exclusive internal guidance system delivers reel-to-reel fidelity — 20Hz to 15kHz — for the life of the tape. Phase stability is better than 90° to 12.5kHz with any properly aligned machine. Wow and flutter have been minimized.

Every Aristocrat cartridge is factory tested before shipment for phase and frequency response. We replace at our expense any cartridge which fails to perform within areas indicated.



believe your own ears

Switch to

ARISTOCART

A DIVISION OF WESTERN BROADCASTING LTD.
505 Burrard Street, Vancouver, Canada V7X 1M6
Tel.: (604) 687-2844

Distributors: U.S.A. — McCurdy Radio Industries Inc., Buffalo N.Y. — IGM, Bellingham, Wash. CANADA — McCurdy Radio Industries Ltd., Toronto, Ont. — L. A. Varah Ltd., Vancouver, B.C. GREAT BRITAIN — Selkirk Communications Limited, London, Eng. AUSTRALIA — Syntec Electronic Distributors, Pty., Castle Cove, N.S.W.

Circle 163 on Reader Service Card

**NEW SOUND
IN A BOX!**

**Pacific Recorders does it
again!**



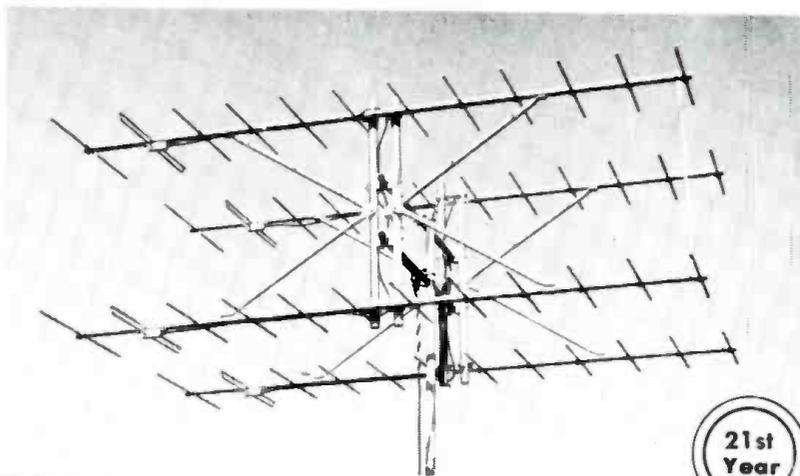
**This time it's a limiter for all time—an all new
FM-AM-TV-PRODUCTION LIMITER to keep you up
and on top! Hear it at the NAB show!**



PACIFIC RECORDERS AND ENGINEERING CORPORATION
11760 SORRENTO VALLEY ROAD, SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255 TELEX 695008

Circle 142 on Reader Service Card

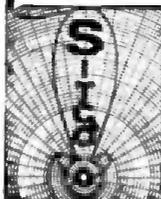
The **Sitco** quad array is still
the hottest and sharpest CATV
array on the market today.



Write For Latest Literature

SITCO *Antennas*

10330 N. E. MARX ST. • P. O. BOX 20456
PORTLAND, OREGON 97220 Telephone 503-253-2000



Circle 143 on Reader Service Card

The TWO-in-ONE Machine



Our one unit CLE-500 Sound Britener does everything — and more — than the old two unit compression/limiting systems. Operation is fully automatic, with only 3 controls for initial set-up. It's ideal to increase "talk power" with absolute over modulation protection.

Call or write for specifications and our 30 day free trial.

Spotmaster

ALSO
CARTRIDGE
MACHINES AND
AUDIO CONSOLES



BROADCAST ELECTRONICS
8810 Brookville Road
Silver Spring, Maryland 20910
Phone: 301-588-4983

Circle 144 on Reader Service Card



10 WATT FM

B-910 series

a brilliant addition to the "full choice line";

B-910 exciter and B-910T transmitter — accessories include

the plug-in

B-110 stereo generator and B-113 SCA generator

unique phase-lock • direct FM modulation

precision frequency control •

full metering •

FCC type accepted •

exciter

McMartin

McMartin Industries Inc.
4500 South Seventy-sixth Street
Omaha, Nebraska 68127
(402) 331-2000

Circle 145 on Reader Service Card

LETTERS/FEEDBACK

Loud Stations Not Clear

Dear Editor:

I read with great interest Mr. Bryan's article: "Getting Better AM Sound: It's a Mike-Thru-Antenna Job." The industry needs more articles like it and more people like Mr. Bryan.

For the past two years my sole activity has been consulting work in the area of broadcast audio. As a result I have critically examined the technical facilities of probably two dozen or more AM stations. It seems to be the rule rather than the exception to find a radio station equipped with an assortment of equalizers, limiters and reverb, trying to sound "loud" and supermodulated when the transmitter can modulate no more than 75% without breaking up. In line with this, I suggest that a copy of Mr. Bryan's "conclusions" regarding the relationship between the Chief Engineer and Program Director be framed and hung in the office of the Chief Engineer, Program Director and General Manager.

My experience indicates that the most common problem sources are somewhat different from those mentioned in Mr. Bryan's article. In the spirit of technical discussion I would like to mention them.

Except in cases of very complex direction arrays, I have not found antenna system bandwidth to be a serious problem. That is not to say that I do not recognize that it can be a problem, just that it does not seem common. Those DA's that do exhibit difficulties because of excessive Q, usually have other symptoms like component heating and instability. I do strongly agree that an RF consultant should sweep the common point of all stations (non-DA's too) and look at the results in terms of the audio. By far, though, I find transmitters rather than antenna systems to be the problem. All too often a transmitter becomes acutely non-linear as it approaches cutoff (100% negative modulation) and when it recovers from cutoff. Just because the peak lamp flashes at 95% negative and 120% positive doesn't mean that there is anything but garbage (IM products) out there.

The subject of clippers, limiters and transmitters could be the entire paper itself. The relationships are complex, but I cannot agree with Mr. Bryan's position that hard clip-

pers necessarily spell "big trouble." Given the nature of the peak flasher in modulation monitors and the rather absolute nature of 100% negative modulation, hard clipping is necessary if good control is to be maintained over peaks. There are a number of recording type limiters that are excellent, but not quite fast enough attack for broadcasting, there are also a few broadcast limiters that are not quite fast enough for broadcasting. All other things being equal, a good external clipper operated on a *low duty cycle* will sound excellent.

The problem comes in not from the clipping, but from what some transmitters (especially the high level plate modulated variety) do to the audio signal.^{1,2} The phase shift (time delay) Mr. Bryan discusses in relation to equalizers is very much present in plate modulation transformers.

I wish I had as much faith in the manufacturers' of broadcast limiters as Mr. Bryan does. I have been appalled by the design errors stemming from a lack of understanding the nature of AM modulation that several major suppliers have evidenced. A number of current transmitters, as exemplified by the Gates PDM³ and Continental designs can only be taken full advantage of by employing a limiter that clips.

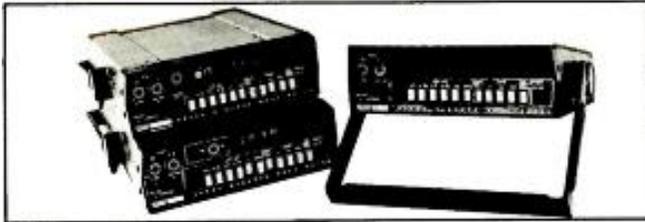
On the subject of equalizers before the limiter, I should point out that the statistical distribution of both peaks and RMS energy for music⁴ and speech is far from linear across the audio spectrum. In addition, the transducer system in the receiver is the least flat element in the system. It is my opinion that so long as one avoids the frequency bands containing the bulk of the energy, the equalization must be a matter of taste. In many cases the loss of modulation will be greatly offset by the increase in apparent loudness.

I sincerely hope my comments are not interpreted as detracting from the praise due Mr. Bryan for writing his article. It was my purpose to stimulate further discussion of the points raised in his article.

Eric Small,
271 Columbus Ave.,
San Francisco, Calif. 94133

1. Davis, Michael D. "Transmitter Lim-

continued on page 76



No other DMM offers you all of these outstanding specs in one box

- Best accuracy statement of any 3½ digit DMM: 0.1% accuracy ± 1 digit; one year accuracy time span; 25° C ± 10° C accuracy temperature span.
- Normal mode rejection: 60 dB at 50 and 60 Hz.
- Common mode rejection: 120 dB with 1 KΩ unbalance.
- Overload protection specified for all ranges.
- 26 ranges of volts, amps and ohms.
- More option power than any other DMM. Includes low ohms option with 1 milliohm resolution. 20 amp ac/dc current capability. BCD output. Built-in rechargeable battery pack.
- More accessories than any other DMM: Includes 600 amp AC clamp-on current probe. 40 KV high voltage probe. 100 and 500 MHz rf probes.
- Auto zero (no zeroing necessary).

Add to this the incomparable Fluke reputation. No wonder this is the best selling DMM in the world. Still only \$299 (domestic only). For data out today, dial our toll-free hotline, 800-426-0361.



John Fluke Mfg. Co., Inc.
P. O. Box 7428
Seattle, WA 98133

Circle 146 on Reader Service Card

Beau... the best replacement motor for Ampex and Scully units.



More and more broadcasters are coming to UMC for Ampex and Scully replacement motors because they realize that the famed Beau inside-out design provides maximum performance as well as rugged construction and compact size. Beau motors are fully factory repairable, too. All standard tape speeds are available. Those are just a few of the reasons why all of the finest new broadcast cartridge machines incorporate the Beau hysteresis synchronous drive as original equipment.

Here's how to order Beau replacement drive motors, direct from the factory. 1) Specify tape speed. 2) Choose from the table below:

Type and Models	Beau Prices
Ampex — Model 440	\$180.00
Ampex — Models 350, 351, 354	\$195.00
Scully — Models 270, 275, 280, 282	\$180.00

Six page catalog available on request.

UMC® BEAU MOTOR DIVISION
UMC ELECTRONICS CO.
460 Sackett Point Rd. North Haven, CT 06473

Circle 147 on Reader Service Card

WORLD'S BEST STEREO GENERATOR WILKINSON ELECTRONICS SG1E

POSITIVE PROOF

- * 60 db separation 50 Hz-7500 Hz
- * 55 db separation 7500 Hz-10000 Hz
- * 50 db separation 10 KHz 15 KHz
- * FM Noise — 75 db Cross Talk — 60 db



**COMES COMPLETE WITH POWER SUPPLY
REQUIRES ONLY 3½" RACK SPACE
ONLY ONE FRONT PANEL ADJUSTMENT
REMOTE STEREO ON/OFF FUNCTION**

WORLD'S BEST FM EXCITER WILKINSON ELECTRONICS FME10

POSITIVE PROOF

- * Frequency response ±¼ DB 15 HZ-350 KHz.
- * FM Noise Level — 70 DB below 100% Mod.
- * Distortion — 0.3%
- * Modulation — Direct FM
- * Power Output — Adjustable to 18 watts
- * Stability 1 part in 100000
- * Requires no oven and is not susceptible to rumble and microphonics



**FCC TYPE ACCEPTED
POWER SUPPLY INCLUDED
REQUIRES 7" VERT. SPACE
IMMEDIATELY USABLE IN ANY TRANSMITTER
SHIELDED BY BOTH STEEL & ALUMINUM
COMPLETELY METERED
ADJUSTMENT FREE**

NO ONE CAN MATCH THIS COMBINATION

**WILKINSON
ELECTRONICS, INC.**

1937 W. Mac Dade Blvd.
Woodlyn, Pa. 19094
Telephone (215) 874-5236/874-5237

Circle 148 on Reader Service Card

LETTERS

itations in Achieving High Amplitude Modulation Percentages." Audio Eng. Society Preprint 994, presented at 49th Convention, N.Y., N.Y., September, 1974.

2. Endres, George C. "The Evaluation and Correction of AM Transmitter Deficiencies," Technical Papers, NAB Engineering Convention, 1973.

3. Cox, Brian C. "Enhancing AM Signal Coverage Through Improved Modulation Techniques." Proceedings, 28th Annual Broadcasting Engineering Conference, NAB.

4. McKnight, John G. "The Distribution of Peak Energy in Recorded Music, and Its Relation to Magnetic Recording Systems." JAES, 7:2, 1959, p. 65.

Dear Editor:

Mr. Bryans' article on loudness and brightness (Getting Better AM Sound, Oct.), certainly was right on target. But there may be many readers who missed the main point—that there are more problems with transmitters and RF systems than with audio systems that precede those transmitters and RF systems.

It is too bad there are Johnny-

come-latelys in this business calling themselves audio specialists preying on non-technical persons such as program directors and general managers. They stage nice demonstrations and offer pat answers and solutions to very serious problems. The sad part is that most general managers would rather spend \$600 to \$1200 on one or two pieces of processing equipment than anywhere from \$20,000 to \$60,000 on phasor-antenna tuning units and ground systems. Sure, there have been some beautiful advancements in phono carts, tape heads, phono preamps, tape preamps, mike preamps, program amps, equalizers, AGC amps, and limiters. I have a couple of pieces of processing equipment I prefer myself, and if you take care in connecting them they work well.

However, it must be said that about 80% of the bad sounding stations can be traced to poor transmitter operation and inefficient antenna systems. Fortunately there is hope for any transmitter built in the last 15 years—it probably just lacks maintenance. My statements probably bring frowns to audio processing companys, and transmitting equip-

ment companys. However, consulting engineering firms will smile because the Johnny-come-latelys cannot design a simple tee matching network or re-tune or re-design the output matching section of a transmitter on the constructive side.

A good place for a bad sounding station to start after they have installed all the goodies, is to get a competent consultant to check the RF systems—then give the station engineer some money to fix up that transmitter.

John H. Rees

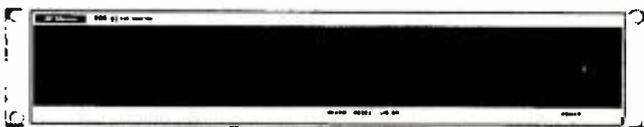
Director of Engineering
WBBF Inc., Rochester, NY

Editors Note: BM/E received a great deal of favorable comment on Mr. Bryan's article. It is interesting to note that both Mr. Small and Mr. Rees feel transmitters are a weak link. From presentations and discussions at the fall NAB Engineering sessions, it is clear that the new breed of pulse duration modulator transmitters offer good performance, high efficiency and easy tuning. Some of Mr. Bryan's comments on difficulties regarding super modulating and tuning would not apply to these newer transmitters.

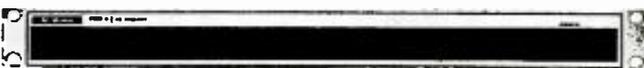
the new TWO-TONE EBS monitor

the EBS-2—available when you need it, meets the new FCC requirements, effective January 15, 1976, can be used with the FMR-1 or the AMR-1, AM or FM fixed frequency receivers see it at NAB booth 301

delivery late 1975.



EBS-2



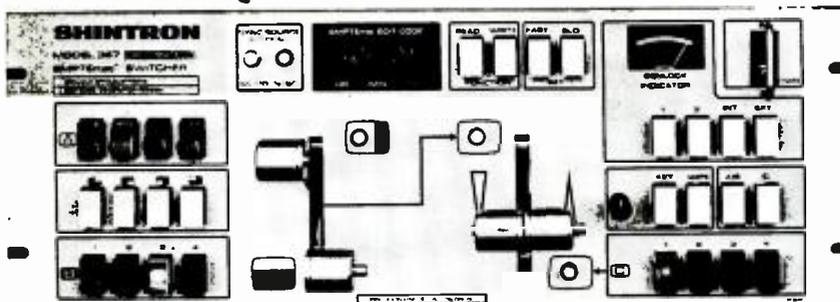
AMR-1 or FMR-1 (unit shown)

McMartin

McMartin Industries Inc., 4500 South Seventy-sixth Street
Omaha, Nebraska 68127 Phone (402) 331-2000

Circle 149 on Reader Service Card

Finally... MODEL 367 a "Video Tape Generation" Switcher



• Color Genlock • SMPTE Code Generator-Reader • Color Switcher
SHINTRON ... the precision people
Cambridge, MA 02142 (617) 491-8700

Circle 150 on Reader Service Card

"Hot" Test Equipment

If you're offered a good deal on a H-P spectrum analyzer, a dual-beam oscilloscope and other test equipment, check the serial numbers. H-P equipment main frame (Serial #1232A03922), RF Section (Serial #1205A02493), IF Section (Serial #1234A02834) and a Philips scope PM 3232 Serial #DQ4922, were stolen from Cable TV of Chester County, Coatsville, Pa., in November. If you have a lead, call Louis Seltzer (215) 384-2100.

Wanted: Ideas for Saving Energy

TV and large AM stations are big consumers of energy. Some enterprising stations use heat generated by the transmitter to warm the plant. Studios are cutting down on lighting levels. But more needs to be done. To spur innovation and action, BM/E would like to sponsor a Save-A-Watt (or KW) contest. No prizes, but recognition for conservation. But we need rules, judges, etc. Give us the benefit of your thoughts now. Call or write.

the sync and subcarrier signals will have substantial wave shape distortions associated with any video record/playback process.

Further, the frequencies of these signals will not be coherent, or phased, as they were prior to recording. This is because the color information is specially recorded. The color recovery "heterodyning" process embodies a technique which stabilizes the color reproduction as close to the original color frequency. However, the time base stability of the reproduced picture detail i.e.—the sync frequencies, will be independently varying over a time span of up to 2 H lines in the picture (120 microseconds). The vertical field rate will be locked to reference vertical with this same tolerance.

Actually one could broadcast a playback from a VO-2850 without processing. Its shortcomings compared to a corrected quad playback might not even be detectable, except on a broadcast station's cross-pulse picture monitor, wave form monitor, and vector scope. But it would have to be a non-synchronous playback and it could not be fed through the station's production switcher.

With either an analog/heterodyne TBC (fractional H correction), or a digital/heterodyne TBC (full H-plus correction range), you can integrate a playback from one U-matic cassette VTR into a studio switcher as a synchronous picture source (Fig. 7a). The studio must be gen-locked to the TBC if it is of the "analog" type—such as the HETROCOLOR 300 Series unit from Television Microtime Inc., for instance. If the TBC is "digital"—heterodyne color units offered by Consolidated Video Systems, Inc., TMI and Ampex—the TBC gen-locks to the studio. If you are working from an un-servo'd playback from the VO-3800 VTR, you can also make phased-color dubs of the heterodyne signal playback to a quad through the CVS and TMI units.

Looking at an edited master tape, without test

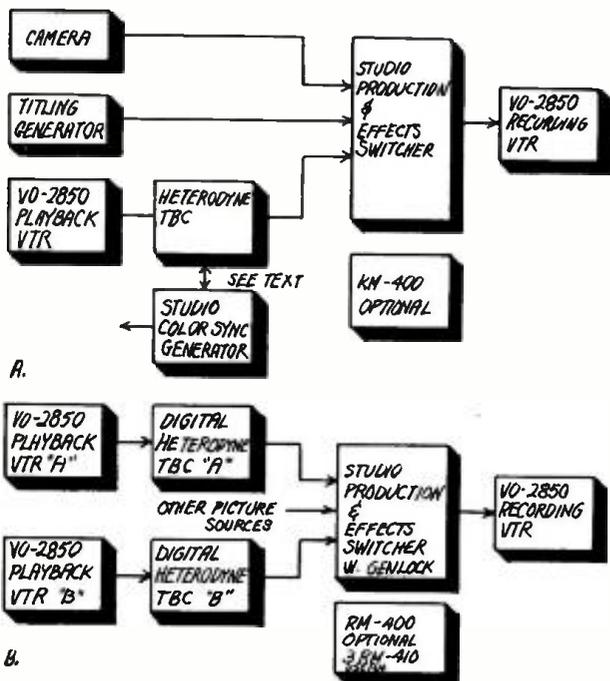


Fig. 7. Editing arrangements possible by adding a time base corrector to the VO-2850 VTR.



Ralph Hucaby, vice president and director of engineering for Nashville's WLAC-TV station, shown at the editing console used in the station's new electronic news gathering system. The console incorporates two Sony 2850 recorders, two monitors and the Datatron Vidicue 5050 Electronic Editor. See article in BM/E, January for more details.

equipment, you'll be hard pressed which kind of time base correction was used. However you may see picture jitter or vector wobble in the analog-processed picture, or quantizing noise in the digital processed picture.

When the system is gen-locked, and using two "digital"/heterodyne TBCs connected to the outputs of two VO-2850s (Fig. 7b), you can achieve "A/B roll" dissolves and special effects mixes between the two VTRs and other studio picture sources (live cameras, film chain, titling generator). With this capability, (at the relative modest cost of \$25,000), you can now duplicate almost every teleproduction trick possible with broadcast VTRs. The one exception is the broadcast editing system's ability to edit to an exact frame. Nonetheless, the Sony RM-400 Editor provides sufficient accuracy for almost all applications.

You have freeze frame capability otherwise available only with broadcast "slo-mo" video disc systems. The tape is almost an order of magnitude less expensive than quad tape. And the replacement head cost versus useful life, compared to quad head refurbishing cost, is negligible. Finally, system operation does not require a team of technicians to back of the production staff during editing sessions.

There are numerous other operator-oriented features incorporated in the master VTR. Only one will be mentioned here and that is the humidity sensing override feature.

A humidity sensor and switch connected to front panel "AUTO-OFF" lamp prevents the VTR from threading the tape if moisture has condensed on the head drum, when the moisture has cleared, the machine switches to the operation mode again.

If there's any one bugaboo more important to guard against than any other, for the proper operation of a helical VTR, it's moisture. Humidity changes tape length. This dimensional change frequently is seen as a skew tension error that can't be corrected. The humidity sensor feature firmly prevents you from ruining a tape because you didn't store the VTR properly between uses.

BM/E



Capitol Records

- Calibrates
 - Evaluates
 - Approves
 - Tests
 - Repairs
 - Quality-Controls
- and Reviews with
the Stanton 681
Cartridge Series



STANTON

Write today for further information to
Stanton Magnetics, Inc.,
Terminal Drive, Plainview, N. Y. 11803.
Circle 157 on Reader Service Card

Unfinished Cable TV Business on 1975 Agenda

A year ago January, CM/E devoted some ten pages to "Challenge the Cable TV Industry Must Meet in 1974." Unfortunately, practically every problem facing the industry in 1974 still exists. The only hopeful sign is some evidence of tractability on the part of the FCC — at least in some areas such as non-duplication protection, relaxing testing standards, etc. Of course, in many respects the FCC continues its stance of protecting the broadcaster from competition. In December, former Chairman Dean Burch in a speech at the Western Cable Convention sardonically said, in reference to the then forthcoming anti-siphoning rules on pay TV "in all candor, about the best I can say for these new rules is that they'll give a tremendous boost to the President's proposal for a National Commission on Regulatory Reform. If this really is all that two years of regulatory process can produce, then the case for reform is indeed compelling."

Non-duplication did not get resolved in 1974. Just how far the FCC will go in relaxing non-duplication requirements in 1975 is not known (as this is being written—early January—the FCC is scheduled to consider specific changes). Under consideration is changing current rules to limit non duplication to a 35 mile radius, limiting non duplication protection to significantly-viewed signals only and exempting altogether cable system with fewer than 1000 subscribers. In the Rocky mountain time zone, only simultaneous non duplication protection would be required.

The industry is asking for more. It would like to see a complete moratorium at least in several test areas. The Arizona Cable Television Assn. would exempt altogether systems with fewer than 3000 subscribers as opposed to 1000 and signals already carried by local translators. It favors only simultaneous non-duplication protection in the Rocky mountain time zone.

The industry rose to the non-duplication challenge vigorously in 1974 and it has carried the effort in 1975. It should get some relief for its

efforts and justifiable cause.

Another issue that should have been resolved in 1974 but was not was to determine fair pole rental rates. The FCC repeatedly backed away from having to get into yet another form of regulation and hoped the cable industry could negotiate its differences satisfactorily with telcos and utilities. In this case, because the pole owners appear intractable, the cable industry is anxious to have the FCC enter in. The challenge of some equitable solution remains on the agenda for next year.

Not satisfactorily resolved is two-tier versus three-tier regulation. Although the FCC has had a giant report from the Federal/State-local advisory committee (FSLAC) since September 1973, it elected not to choose between the positions of the majority members and the minority members regarding legal authority. (The Commission did issue a clarification of rules last April which focused on franchising and access rules thus responding to part one of the FSLAC report.) As part of a new inquiry on duplicative regulation (Docket 20272) the FCC will try to decide if it should act on duplicative regulation schemes or specific issues of overlap. One key question to which answers are sought is "Should rules be adopted requiring nonduplicative regulation of cable television, and if so, what should those rules be?"

Although Chairman Wiley is anxious that the Commission take a position, and in fact, opposed the additional inquiry and its attendant delay, it doesn't appear that the Commission can make a final decision in time to announce it at the national NCTA Convention in April. Thus the current ambiguities will prevail which means three tiers of regulation will not be prevented from developing. (Of course they may continue to grow despite any FCC attempt to assert jurisdiction.)

New Push in 1975

A major drive of industry is to get the FCC requirements that go into effect in 1977 rescinded or stayed. Rules of major concern are those

that call for one non-broadcast channel for every broadcast signal carried (this means installing wideband amplifiers plus converters even if only one or two extra channels are necessary), requirement for two-way signals (putting in two-way filters will be a gigantic expense) and public access provisions for minor political subdivisions.

The FCC Cable Bureau and James Hudgens, Chief, Reregulation Task Force of the FCC, at least appear willing to accommodate the industry and some new relief is expected to be forthcoming. Should this relief be announced by NCTA convention time, it would give the industry one occasion to breathe a bit easier. Reregulation as it might affect technical standards is expected to get sound guidance from CTAC reports generated during 1974 and submitted to the FCC in early 1975.

Despite present intentions, however, there is a reasonable fear** that the FCC is incapable of sufficiently reregulating itself—at least to the extent that it might mean deregulation—and that the cable industry will have to take its case to Congress.

In a major address to the Western

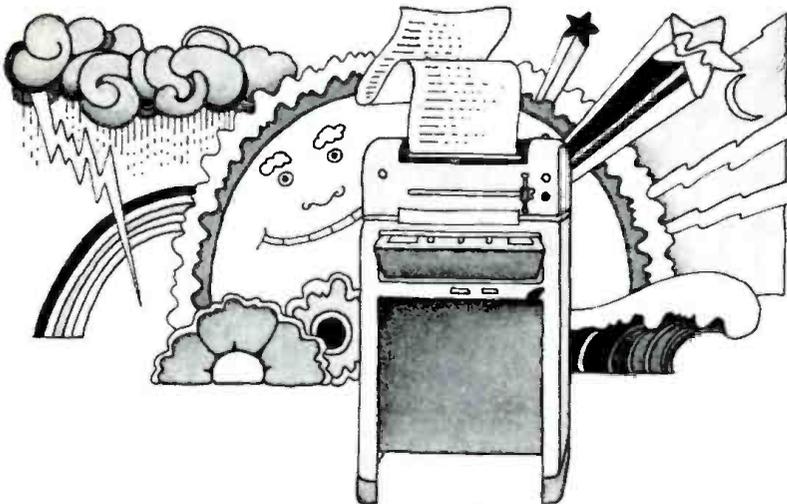
Cable Convention, John Eger, acting director of OTP plumped for OTP's proposed cable legislation as the best hope for the industry. Eger said the inescapable conclusion of (former FCC chairman) Burch's lifted freeze, i.e. the "ancillary approach" is that cable is not recognized as a communications medium in its own right but is merely a supplement to broadcast service.

Indeed, NCTA is convening sessions in March in Washington is so that cable operators might help explain their industry to Congressmen. Regretably such meetings cannot be devoted simply to FCC jurisdiction and new legislation on cable regulation. The perennial issue of copyright will come up again in 1975 and this is sine qua non of issues.

Last June the NCTA hailed the Senate Judiciary Committee vote on copyright Bill S. 1361, which deleted the CATV sports blackout provision and halved the fee schedule to 1/2% to 2 1/2%, as a great victory. By November the industry was again torn asunder over the issue of copyright—although the NCTA Board of Directors by a 17 to 5 vote coalesced around a modified copyright stand.

continued on page 80

And now the weather...



Get your weather forecasts via a teleprinter from RCA. Teleprinter, including maintenance, on a lease basis — just \$63 per month. Also available on outright purchase.

The teleprinter prints out the weather forecast automatically, and we make sure it keeps running reliably. Maintenance is prescheduled and automatic. Installation and service are fast, because RCA data communications specialists are based in over 140 cities, and our warehouse network is nationwide.

The weather changes, but RCA reliability stays constant.

Call us at (609) 779-5087.

RCA Service Company, A Division of RCA
Technical Services, Bldg. 204-2, Camden, N.J. 08101

RCA

WE GIVE YOU MORE OF WHAT YOU'RE LOOKING FOR.

Circle 151 on Reader Service Card

FEBRUARY 1975—BM/E



the first
reel to reel
with the rugged
reliability of
itc

The makers of premium quality tape cartridge equipment in the reel-to-reel market? It had to happen! The result is what you, Mr. Broadcaster, have been looking for. All the features you demand plus a few innovative optionals of our own. And all with the rugged reliability inherent in the International Tapetronics' name. Check out these plusses in your own studios. We offer a 30 day guarantee of satisfaction plus a one year warranty. Just call collect and say you want to try the "850" series. We'll do the rest.

Phone 309-828-1381



**INTERNATIONAL
TAPETRONICS CORPORATION**

2425 South Main Street Bloomington, Illinois 61701

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

Circle 152 on Reader Service Card

with or without
FREQUENCY MEASUREMENT



**TBM 3700 for
FREQUENCY/MODULATION
MONITORING**



**TBM 3500B for
MODULATION MONITORING
ONLY**

either can accommodate
TBM 2200A for STEREO
TBM 2000B for SCA

either capable of
OFF-AIR remote operation with
TBM 2500C with TBM 3700
LL 35B with TBM 3500B
(plug-in card)

the "FULL CHOICE" line

McMartin.

McMartin Industries Inc. • 4500 South 76th Street
Omaha, Nebraska 68127 • Phone (402) 331-2000
Circle 155 on Reader Service Card

FM monitors

UNFINISHED CABLE

Perils of the copyright bill as passed by the Senate (S. 1361) and originally hailed a victory by NCTA, were first voiced to the industry at Lexington Kentucky, last October by Sol Schildhouse, former FCC Cable Bureau Chief, and the Community Antenna Television Assn. (CATA). CATA, as an organization of small and independent cable operators, identified its interests as completely different from those of large operators, particularly MSOs. In November the "traps" of the bill and NCTA's position were explored fully at the Denver Cable Club. The item became a priority matter on agenda for NCTA Bd. of Directors meeting in Wash. D.C., Nov. 21-22. Members and non-members alike participated and outcome was modified stand* that NCTA would take later this spring before House committee.

On the issue of copyright fees, Alfred Stern said at the Western Cable convention that the NCTA reaffirmed that a percentage of gross is to be preferred to a payment for distant signals only. In another presentation, Chas. Walsh of NCTA said in comparing copyright-for-distant-signals-only vs. copyright-for-all-signals, its the older systems which have traditionally carried distant sig-

* At Anaheim, however, CATA, under leadership of Kyle Moore, pres., and Bob Cooper, Exec. Dir., claimed copyright should not be paid at all—and if it is, systems with fewer than 3500 subscribers should be exempt. S. 1361 is further considered wholly unsatisfactory to CATA (and Schildhouse) in that it leaves door open for escalation of fee. Schildhouse would have Congress and only Congress fix fees and he suggested 3/40th of 1% a fairer starting point than 1/2% now in S. 1361. Another Schildhouse inequity; if copyright is paid, it should be only for distant signals. As to the moral commitment of cable TV to support copyright as per consensus agreement engineered by OTP in 1971, Schildhouse says broadcasters first violated spirit of the agreement with their wholesale resistance to certification of compliances. CATA and Schildhouse also object to the S. 1361 provisions that permit a broadcaster to sue cable operators for breach of copyright payment or distant signal violations. Position of both is that cable portions of copyright bill should be pulled out of S. 1361 for further study.

Al Stern, Chairman of NCTA's negotiating team on copyright reported NCTA's new stand following Nov. Bd. of Directors meeting. He reminded group that NCTA originally gave up exempting smaller systems (below 3500) from liability as a trade-off for the lower fee of 1/2 to 2 1/2% (half of the original proposal) applicable to all. NCTA's new position will try to win exemption from systems smaller than 1500.

nals that would be hit hardest by a change.

Stern said the Board's biggest apprehension was over the establishment of the tribunal that could raise (or lower) fees. Although agreement to the idea of a tribunal was essential to get copyright holders off of their original 16% demands, Stern said economic conditions of today argue for a fixed small fee for years to come and that will be NCTA's new position.

Both Stern and Walsh argued that the political reality today is that Congress expects cable TV to pay copyright and the industry would have no friends if now changed its position.

CATA argues that new Congressmen would be joining the House Committee in 1975 (12 new members) and that attitudes could be turned around. Thus a big challenge in 1975 is for the industry to come together as an industry. If it cannot, NCTA will have to disassociate it-

continued on page 82

**CARTRIDGE
TAPE
EQUIPMENT**

- Compact Modules
- Multiple Units
- Single Units
- Record/Playback
- Playback Only
- Monaural
- Stereo

INFORMATION
ON REQUEST

GARRON ELECTRONICS INC.™

RAPID-Q

1216 KIFER ROAD SUNNYVALE CALIF. 94086 (408) 738-8737

THE BLOCKS TO BUILD ON! RAPID-Q!

Circle 156 on Reader Service Card

**DIGITAL TAPE
TIMER \$595.**

- Fits ALL 2" machines
- Optional remote display
- Power supply included
- Field proven for more than 2 years
- The ORIGINAL exact-replacement timer; installs with one nut
- THE SAME LOW PRICE

OTHER VAMCO PRODUCTS

- Chroma key input switchers \$595
- Composite chroma key kit \$395
- Digital program Clock/Timers \$195
- Routing Switchers
- 1 in 12 out Video DA
- 1 in 20 out Audio DA
- Color Monitors/Receivers

**VAMCO
ENGINEERING**

Box 7512
Tulsa, Oklahoma 74105
(918) 252-4142, 747-0421

Leadership through creativity in design

Circle 153 on Reader Service Card

BM/E CLASSIFIED MARKETPLACE

CLASSIFIED ADVERTISING RATES

DISPLAY CLASSIFIED ADVERTISING: \$32.50 per inch 1x; \$30.00 per inch 6x; \$27.50 per inch 12x. ALL OTHER CLASSIFIED ADVERTISING 35¢ per word; minimum \$3.50. BLIND BOX NUMBER: \$1.00 extra charge. Replies sent to address below will be forwarded to you. PAYABLE IN ADVANCE; send check with order. CLOSING DATE: 5th of 2nd month preceding issue date.

BM/E, Monterey and Pinola Avenues, Blue Ridge Summit, Pa. 17214 Phone 717/794/2191

EMPLOYMENT OPPORTUNITIES

Need Operations and maintenance engineer with broad background to maintain sophisticated new color TV/audio fax for large Chicago corporation. First phone preferred. Equipment includes: TR-4's, IVC 960's, LDH-20's, CI switcher. Contact:

Jim Franck
CNA Insurance
CNA Plaza
Chicago, Ill. 60685
Phone: (312) 822-7772
An Equal Opportunity Employer

FIELD SERVICE ENGINEER

Extensive Travel. All Benefits. Experience in Color video and switching systems preferred. Contact: Mr. Buzan, Vital Industries, Inc., 3700 N.E. 53rd Avenue, Gainesville, FLA. 32601 Phone: (904) 378-1581.

TV Technician wanted with some experience on 1200B VTR, audio console and projection or transmitter operation. First phone license required. Salary range \$7,700 to \$10,000 depending upon experience. Contact Walter Harrison at WXXI TV/FM, 410 Alexander Street, Rochester, N.Y. 14607.

New Commercial broadcast facility in Virginia seeking studio maintenance man. TK-630, TK-28, TR-22. First ticket may be waived. Contact: Jack King, C.E., WRLU TV, P.O. Box 27, Roanoke, Virginia 24001. Phone: (703) 345-8191, Ext. 31.

POSITION WANTED

Are things really changing? I am an experienced black newscaster-announcer-D.J. with some college. Third phone; will relocate. Tape and resume available. Box 1174-L, c/o BM/E, Blue Ridge Summit, PA. 17214.

EQUIPMENT FOR SALE

Two—IVC 150 Plumbicon Color Cameras with:

Extended red, Lenco CEC 810 Broadcast Encoders; One RTH Servo Iris 10:1 Zoom Lens; One 6:1 Nikor Zoom Lens; Two Gibraltar Quick-Set Heads and Dollies; 50-Ft. Cables, and Remote Camera Control Units. \$25,000.00

One—MOD RSS Teleprompter Unit with Two Displays; Control Unit, Cables; and IBM Typewriter. \$3,500.00

CONTACT: John M. Allison; Taft Broadcasting Corporation; Houston, Texas 77027. Phone: (713) 622-1010.

Broadcast mixer for remote out of studio programming. Can be used as inexpensive second console for college and small radio stations. D.J.'s can now originate programming at home. Simultaneous mixing of two stereo phonographs, a tape machine and a microphone. Precue for all inputs with built-in monitor headphone amplifier. Send for literature. \$325. Professional discount, use letterhead. G.L.I. Box 2076, DEPT BM/E, Brooklyn, N.Y. 11201. Phone: (212) 875-6992.

CCA FM-10 exciter, stereo generator, 2 bay antenna. 5 years old. Dale Rosenon, WEOS-FM, Geneva, N.Y. 14456.

EQUIPMENT FOR SALE (Cont'd)

FOR SALE: One complete "500" series IGM Automation Unit including two Sculley 14 inch reel playbacks—time announcer—One ATC Criterion playback—encoder, decoder, and logger—three carousels—DA MOS memory unit for random select operation of carousels plus extra control for other sources—IGM control for six sources—sono mag record playback unit used with encoder—two remote control units, one factory built, one station built for control from two control rooms. All instruction manuals and recommended spare parts included. Unit has been in service since July 1, 1969 except MOS memory unit which is less than one year old. Asking \$15,000. For any further information contact Dave McGowan, KWPC-KFMH, Muscatine, Iowa 52761. Phone: (319) 263-2442.

GATES EASTERN SERVICE CENTER

East coast headquarters for broadcast and recording equipment. Gates Broadcast Equipment Division, Harris Corporation, 130 E. 34 St., N.Y., N.Y. 10016 (212) 889-0790.

STODDART NM-30A radio interference-field intensity meter, 20-400 MHz. Like New condition—1966 Manufacture. Complete with AC PS, Dipole antennas, cables, tripod, and inst. book. Calibrated prior to shipment. \$1,595. Surcom Associates. (213) 382-6985.

Solid-state audio modules-console kits, power amplifier kits, power supplies, Octal plug-ins—mic, eq. line, disc, tape play, tape record, amplifiers, Audio & tape bias oscillators. Over 50 audio products. Send for free catalog and applications. Opamp Labs, Inc., 1033 N. Sycamore Ave. Los Angeles, Calif. 90036. (213) 934-3566.

For Sale: Approximately 2,000' 51.5 ohm 3/4" flanged Steatite used transmission line. Line in excellent condition—removed due to complete transmitter plant replacement. Contact Jack Jopling, Chief Engineer, WJBF-TV, Augusta, Georgia. Telephone 404-722-6664

AC power line lightning arrestors. 120 VAC 25.00 per leg. 220 VAC 27.00 per leg. Single phase to three phase converters, any size transmitter. G. DuVall Co., 6838 N. Ottawa, Chicago, Ill. 60631.

MICA AND VACUUM transmitting capacitors. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 1147 Venice Blvd., Los Angeles, Cal. 90015. (213) 382-6985.

MAGNECORD-VIKING-TELEX PARTS: Largest stock in the country. Factory prices. Try us for hard to find items. Dept. M, DUNN INDUSTRIES, 12157 Valliant Dr., San Antonio, TX 78216. (512) 349-2953.

Spotmaster model 500AR-114C mono. record/play rack mount cartmachines. \$269.00 ea. Weigand Audio, R.D.3, Middleburg, PA. 17842. Phone: (717) 837-1444.

RCA 250K AM transmitter. 1230 KHz and 1240KHz crystals. 17 spare tubes. KHAS RADIO, Hastings, Neb. 68901.

MISCELLANEOUS WANTED

Wanted for personal library—MBS or CIE frequency allocation atlas. Box #10, Wallace, CAL. 95254.

EQUIPMENT WANTED

WE NEED USED 250, 500, 1KW, 5KW AM Transmitters. 250. 1000 Watt FM transmitters. No junk. Guarantee Radio Supply Corp., 1314 Iturbide St., Laredo, TX. 78040.

Need 36 or 42 inch 500 ft. FM tower. KNXR, Rochester, Minn. (507) 288-7700.

PROGRAM SERVICES

"FREE" CATALOG . . . Everything for the Deejay! Custom I.D.'s, Promos, Airchecks, Wildtracks, Books, FCC Tests, Comedy, and more! Write: Command, Box 26348-A, San Francisco 94126.

Deejays! New Comedy! 11,000 classified one-line gags, \$10. Catalog FREE! Edmund Orrin, 2786-M West Roberts, Fresno, CA. 93705.

INSTRUCTIONS

First phone through tape recorded lessons at home plus one week personal instruction in Washington, D.C., Atlanta, Boston, Detroit, New Orleans, Minneapolis, Seattle, Denver, Portland, Los Angeles. Proven results. Our 17th year teaching FCC license courses. Bob Johnson Broadcast License Training, 10600 Duncan, Manhattan Beach, Calif. 90296, 213-379-1161.

Broadcast Technicians: Learn advanced electronics and earn college degree by correspondence. Free brochure. Grantham, 2006 Stoner Ave., Los Angeles, CA. 90025.

PROFESSIONAL CARDS

McCLANATHAN & ASSOCIATES Consulting Engineers

APPLICATIONS & FIELD ENGINEERING
TURKEY INSTALLATIONS — RADIO & TV
Domestic and Foreign
P. O. Box 750
PORTLAND, OREGON 97207
Phone: 503/246-8080

COHEN & DIPPELL, P.C.

CONSULTING ENGINEERS
527 Munsey Bldg.
(202) 783-0111
Washington, D. C. 20004
Member AFCEE

RALPH E. EVANS ASSOCIATES Consulting Telecommunications Engineers

AM-FM-TV-CATV-ITFS
3500 North Sherman Boulevard
MILWAUKEE, WISCONSIN 53216
Phone: (414) 442-4210
Member AFCEE

USE BM/E's CLASSIFIED

MARKETPLACE TO

REACH OVER 28,000

BROADCASTERS!

ADVERTISERS' INDEX

AKAI America, Ltd.	11
American Data Corp.	53
Ampex Corp.	38,39
Ampro	16
Aristocart	73
Barblzon Electric	82
Belar Electronics Laboratory, Inc. ...	8
Broadcast Electronics, Inc. ...	72,74,82
Cablewave Systems, Inc.	Cover II
CBS Laboratories, A Div. of CBS Broadcast Systems, Inc.	29
Canon, U. S. A. Inc.	16
Capitol Magnetic Products	36
Central Dynamics, Ltd.	23
Charles Machine Works, Inc.	13
Chiron Telesystems, Inc.	68
Cinema Products Corp.	18,33
Cohu Electronics, Inc.	19
Computer Image Corp.	47
Datatek, Corp.	67
Datavision, Inc.	72
Dynair Electronics, Inc.	3
Dynasciences Video Products	28
Eimac-Varian	17
Electro Sound	49
Farlon Electric	63
Fidelpac Div. of Telepro Industries, Inc.	14
Fluke Mfg. Co. Inc., John	75
Fuji Videotape	37
Garner Electronics	70
Garron Electronics	80
Gates Broadcast Equip. Div. Harris Corp.	9
Grass Valley Group, The	5
International Tapetronics Corp. ...	71,79
Ikegami Electronic Industries, Inc.	27
McCurdy Radio Industries, Inc.	Cover IV
McMartin Radio Industries, Inc.	74,76,80
Microwave Associates, Inc. ...	Cover III
Modular Audio Products	63
Monroe Electronics, Inc.	12
Pacific Recorders & Engrg. Corp. ...	73
Potomac Instruments	10
RCA Broadcast Systems ..	24,25,67,69
RCA Global Communications, Inc. ...	15
RCA Service Co.	79
Rank Precision Industries, Inc.	14
Rapid Q	80
Scully, Metrotech Div. of Dictaphone	61
Shintron Co., Inc.	76
Sitco Antennas	73
Shure Bros., Inc.	59
Sony Corp.	7
Stanton Magnetics	78
Swiss Air TV Tour	30,31
Television Equipment Associates, Inc.	10
Television Microtime, Inc.	54,55
Thomson-CSF,	20,21
Tracor, Inc.	69
UMC Electronics Co.	75
Vamco Engineering	80
Wilkinson Electronics, Inc.	75

SALES OFFICES

Broadband Information Services, Inc.
274 Madison Ave. New York, N.Y. 10016

WESTERN STATES
1111 Hearst Building
San Francisco, California 94130
415-362-8547
William J. Healey
16400 Ventura Blvd.
Encino, California 91416
213-981-0611
Art Mandell

UNFINISHED CABLE

self from those non-industry segments which in reality are more service groups than anything else.

Pay cable and other challenges

Among the other challenges in 1974 were increasing penetration, selling city fathers on new economic realities (both as they affect franchise obligations for ancillary services and increases in subscriber rates for existing systems), and selling Wall St. that cable TV is a viable industry. Positive results have been scored on all of these fronts except the Wall St. line. New for 1975 is the FCC proposed ban of distant live sports if the cable system is in the Grade B contour of the event.

Getting pay cable rolling was a challenge in 1974 that carries over into 1975. Good sales were reported at the Western Cable Convention by four cable operators, a channel leasing company (Optical Systems), and a film buyer for a half-dozen cable companies (Robert Weisberg). Home Box Office reported they now have 40,000 subscribers and expect 50,000 before the years end. Gordon Stulberg, president of Twentieth Century Fox, said sales for pay cable were in the "modest five figures" in 1972 and twenty times higher in 1974. By 1976 he said income from pay cable would be seven digits. Producers are now thinking about releasing film to pay cable earlier to optimize the income between theatrical release and pay cable—prior to this time pay cable was too insignificant to consider timing so carefully.

Ralph Baruch, President of Viacom Int'l., predicted more interconnection of small systems to make quality pay cable distribution more feasible. At the convention, Optical Systems reported that it is establishing two networks in California—a northern tier and a southern tier.

The tremendous future need for broadband circuits to handle local data and voice communications still looms as a challenge to cable TV operators. Action in this direction has been nearly totally absent, as operators grappled with other issues but Reuters and Manhattan Cable TV announced the beginnings of such a service. Its a challenge that remains for 1975.

Spotmaster®



FULL FEATURE 4-CHANNEL CONSOLE

- Only full feature 4-channel console on the market
- 8 inputs selectable for cart machine (high) or mike (low) levels
- Long life sealed mixer pots
- Internal cue, phone and monitor amps
- Plug-in muting relay
- Rack mount version available

FULL LINE INCLUDING 12
OTHER MODELS AVAILABLE
CALL OR WRITE



BROADCAST ELECTRONICS
8810 Brookville Road
Silver Spring, Maryland 20910
Phone: 301-588-4983

Circle 158 on Reader Service Card



Over 5,000 Rosco color sheets and rolls of reflective, diffusing, color-correcting media always in stock—plus all the newest, like new super-thin 2-mil for TV and ¼-inch 4' x 8' panels for display. Everything for the professional—ready for immediate off-the-shelf delivery!

In NY, come use our unique new color media Test Lounge. Discover, innovate, experiment, consult, relax—on us!

Nationwide service for over 25 years.
Same-day shipment anywhere in US.

Rush delivery in Manhattan.

(212) JUDSON 6-1620

BARBIZON ELECTRIC

426 W. 55, NYC 10019

Circle 159 on Reader Service Card



Not just equipment, but live journalism.

We supply you with portable TV pick-up links, mobile van links and back pack camera links in all FCC allocated microwave frequency bands.

So you get fast site-to-studio transmission that's just right for on-air production processing or video tape storage.

And all our equipment is backed by 20 years of experience making components and subassemblies that are part of over 3,000 systems in 50 countries.

At Microwave, we're working to help you bring the world closer together.

Microwave Associates, Burlington, Mass. 01803. (617) 272-3000.
Dunstable Woodside Estate, Dunstable, Beds., United Kingdom.
Dunstable 601441.



Circle 160 on Reader Service Card

STEREO PACKAGE SHOWN: KMOX-FM — ST. LOUIS, MISSOURI



the ultimate in **Turn-Key** construction

The McCurdy approach to engineering and construction of a packaged system allows the user to easily locate his new equipment without the added burden of wiring to auxiliary equipment.

All aspects of the broadcast function, from news booth to music production center, can be assembled into a unique and functional package.

Each system is fully pretested as a total functional unit and will meet or exceed all broadcast specifications.

FEATURES OF THE SYSTEM SHOWN ABOVE

- All inputs and outputs to the system are normalled through jacks and wired to blue ribbon connectors, (for convenience of service and transportation).
- Audio and D.C. interface to an automation system.
- Remote control of reel, turntable and cartridge machines.
- Program routing switcher to delegate audio to telco lines.
- Switchable A.G.C. control on all microphone mixers.
- Equalization can be delegated to any mixer or program channel
- Included in the package are tone and digital information generators which are used in the production of tape and cartridges for playback in automation systems.

McCURDY RADIO INDUSTRIES INCORPORATED

1051 CLINTON STREET, BUFFALO, N.Y. 14206 (716) 854-6700

108 CARNFORTH RD., TORONTO, ONT. M4A 2L4 (416) 751-6262

Circle 161 on Reader Service Card

