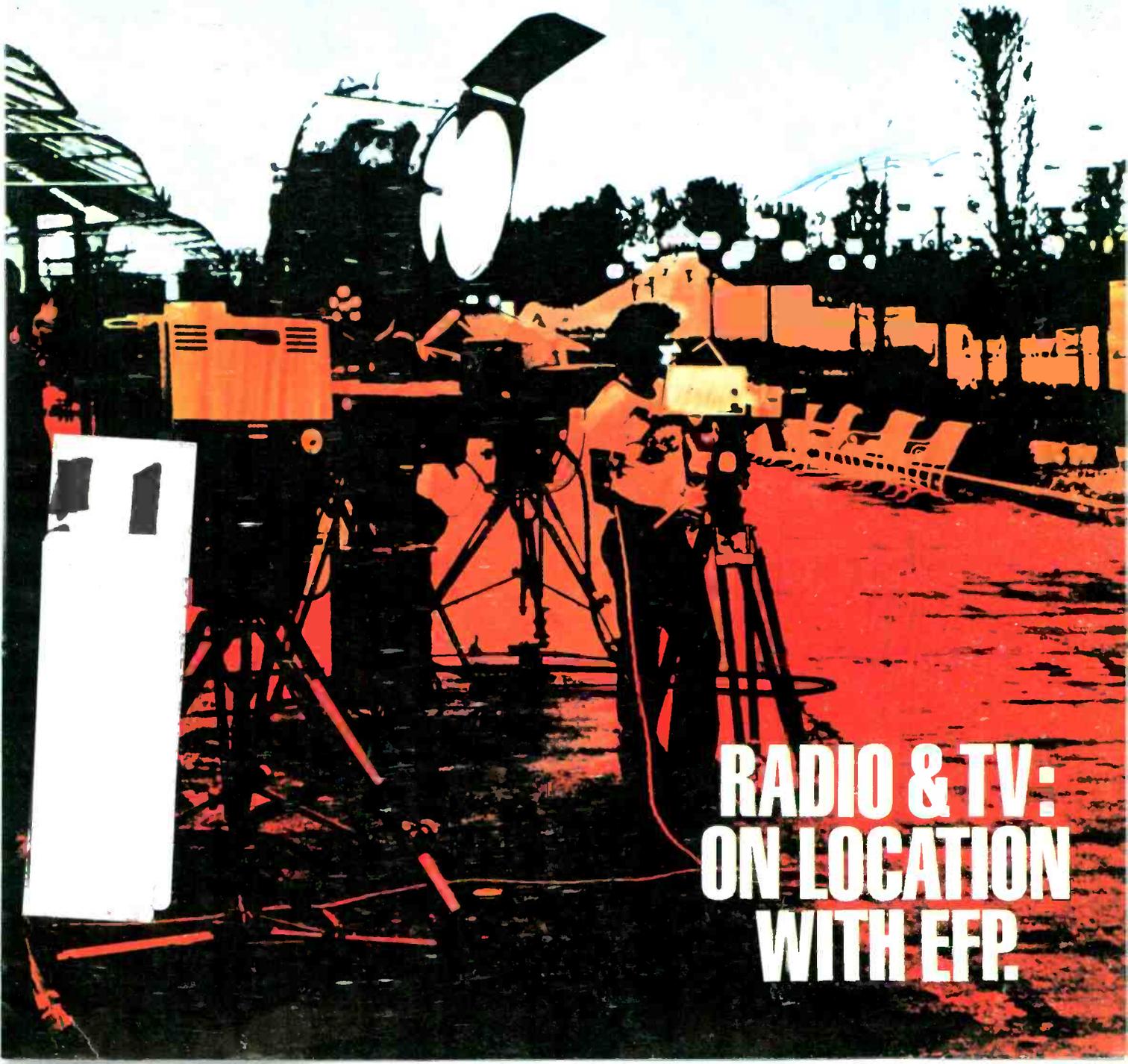


APRIL 1978

# BME

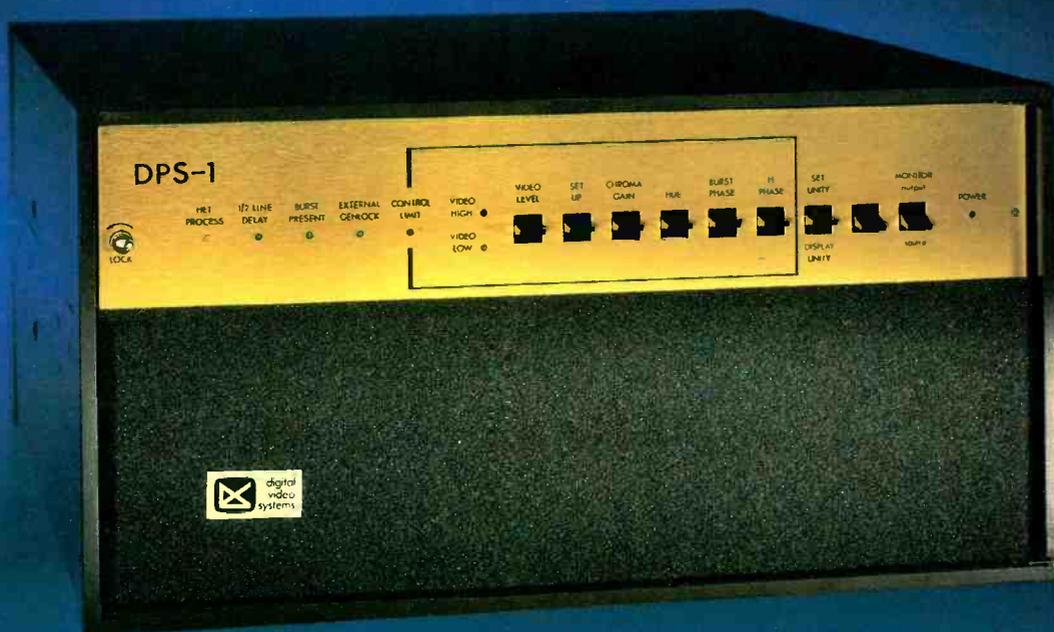
BROADCAST MANAGEMENT/ENGINEERING



**RADIO & TV:  
ON LOCATION  
WITH EFP.**

# First in a new advanced class of digital processors!

The DPS-1  
by Digital Video Systems.



The DPS-1 is the new third generation Time Base Corrector conceived to operate at standards significantly higher than those previously adopted by the television industry, and born through years of dedicated research by a team of experts.

This all-digital processing system, using computer circuitry operating at four times subcarrier, adapts its parameters automatically to incoming video feeds as input sources are changed.

Features include a super-wide 32 line window, digital test signal generator, microprocessor

control, digital burst processing, and a full range of circuit board options to satisfy all operating requirements, including Frame Store.

The DPS-1 offers substantially improved production capability to both broadcasters and industrial producers. Authorized dealer and customer service representatives, strategically located throughout the United States and Canada, will be happy to demonstrate the versatility of this new advanced system to you.

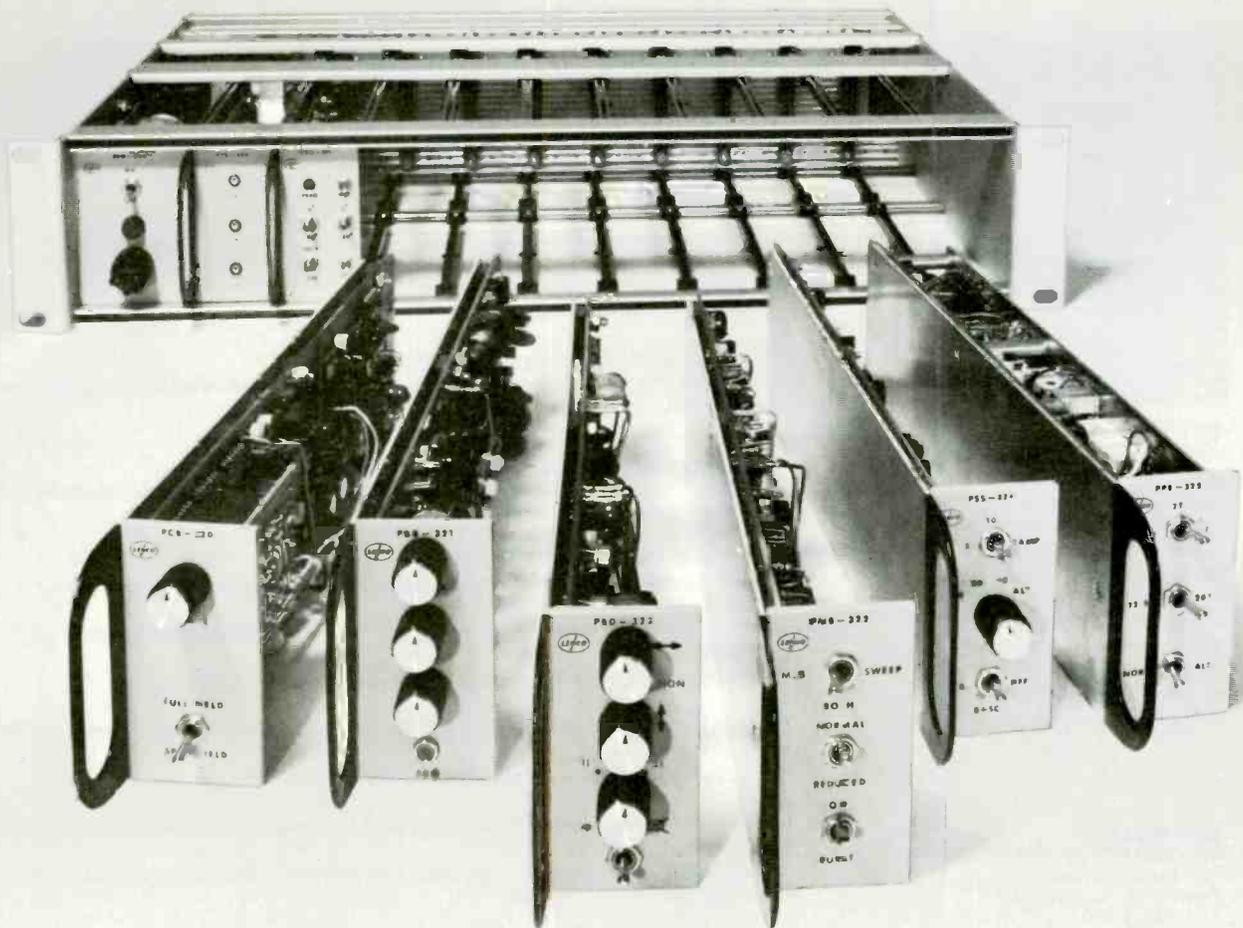
Ask us for full details.



DIGITAL VIDEO SYSTEMS, 519 McNicoll Avenue, Willowdale, Ontario, Canada M2H 2C9

Telephone: (416) 499-4826  
Circle 100 on Reader Service Card

# Introducing the you-name-it, you-got-it video test set.



Here, finally, is a totally integrated modular video test set designed specifically for professional use. Lenco's 300 System lets *you* specify video test signals to meet *your* system requirements, not the manufacturer's.

Use the Lenco PSG-310 Digital Color Sync Generator, or one of your own generators, with any one, a combination, or all of the test modules. Mix 'em or match 'em any way you want. There are 29 test signals available to answer *all* of your system test specifications.

And with the Lenco 300 System, you get a lot more for a lot less. For instance, all of our

advanced test signal modules have composite video delay, making Lenco the *only* manufacturer that can *individually time* the test signals to your system.

You won't have to wait to find out how much better the 300 System test set is, either. We'll deliver it to your studio within two weeks. And we're so sure of your acceptance of Lenco equipment that we offer a *two-year* warranty on all parts and labor—and that includes freight to and from our factory!

Call or write for a demonstration today. You'll find Lenco to be your first — and only — video test set alternative.

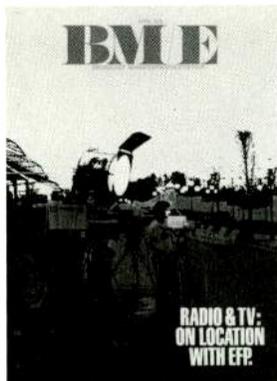


**LENCO, INC., ELECTRONICS DIVISION**

1 Elmwood Lane, Westport, CT 06880. (203) 226-4482 / 13670 Littlecrest Dr., Dallas, TX. 75234 (214) 241-0976 / P.O. Box 301, Atchison, KS. 66002, (913) 367-1146

# BM/E

BROADCAST MANAGEMENT/ENGINEERING



With high quality professional equipment now available, both radio and television broadcasters are finding location work more practical for them and more interesting for their audiences. The photograph on our cover is from the Hanna-Barbera production, "That Yellow Bus," shot on location in Cincinnati, Ohio, Kings Island Park.

**BROADBAND INFORMATION SERVICES, INC.**  
295 Madison Ave.  
New York, N.Y. 10017  
212-685-5320

Editor

**James A. Lippke**

Managing Editor

**David Hawthorne**

Senior Editor

**Robin Lanier**

Associate Editor

**James D. Uchniat**

Creative Director

**Gus Sauter**

Manager

Publication Services

**Djuna Zellmer**

Production Manager

**Daryl Winer**

Comptroller

**Joseph W. Kutner**

Reader Service

**Aetna Dowst**

FCC Counsel

**Pittman Lovett Ford  
and Hennessey**

Publisher

**Charles C. Lenz Jr.**

## APRIL 1978/VOLUME 14/NUMBER 4

### 6 Broadcast Industry News

*Alaskan Broadcasters Face Challenge; FCC Opens Inquiry On Fairness Doctrine and TV Time; NRBA Fights Proposed Labor Reform Act*

### 26 Radio Programming & Production for Profit

*Talk format seen as profit builder*

### 32 BM/E's Program Marketplace

*Profile of Concept Productions*

### 34 TV Programming & Production for Profit

*Panavideo Productions: Network quality broadcast journalism on a worldwide scale from free lance outfit*

### 41 Vehicles For Every Broadcast Need

*A "menagerie" of specialized mobile units designed to provide the broadcaster with everything he needs, anywhere he needs it*

### 55 The Care And Feeding of Location Audio

*A crash course in location audio techniques for recording and broadcasting*

### 64 Location Lighting: Consider Everything, Then Remember That No Two Locations Are The Same

*Four leading lighting directors discuss the problems of location lighting*

### 77 Remote Pickup Technology Gives Radio Stations High Quality Alternatives To Land Lines

*Big and small stations find their salvation with wireless RPUs*

### 84 Elaborate And Impressive System In Place To Broadcast 1978 World Cup Soccer Championship Games

*Argentina has put together an elaborate field network to broadcast the games to more than 800 million viewers*

### 96 Special Programming and Automation - Does It Pay?

*600 Stations evidence that listener support for special programming does produce results*

### 100 Speak Out: Don B. Curran Calls On FCC To Dictate Higher UHF Tuner Standards

### 103 Great Idea Contest Winners for 1977

### 104 FCC Rules And Regulations

*Commission says no to restrictions on AM and FM signal carriage on cable systems*

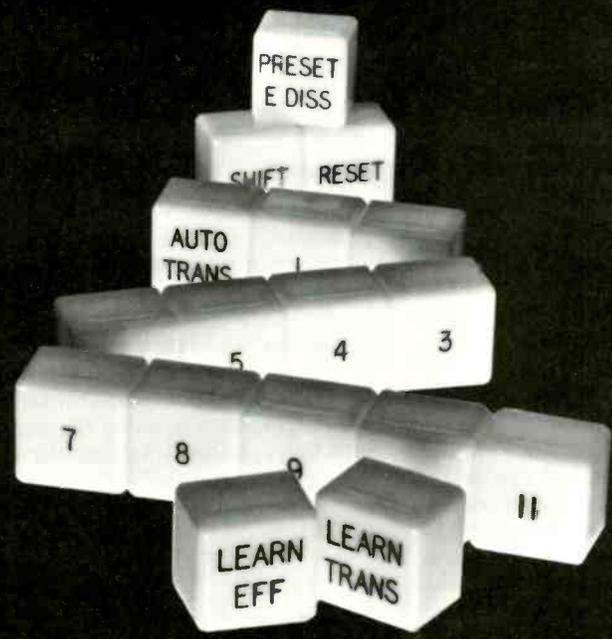
### 107 Broadcast Equipment

*BM/E's Survey of New Products*

**Coming next month: Continuing Coverage of AM Stereo: Why the FCC Needs Help**



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 295 Madison Ave., New York, N.Y. 10017. BM/E is circulated without charge to those responsible for station operation and for specifying and authorizing the purchase of equipment used in broadcast facilities. These facilities include AM, FM, and TV broadcast stations, CATV systems, ETV stations, networks and studios, audio and video recording studios, consultants, etc. Subscription prices to others: \$18.00 one year, \$28.00 two years, Foreign \$24.00 one year, \$38.00 two years. Foreign Air Mail additional \$30.00. Copyright © 1978 by Broadband Information Services, Inc. New York City. Controlled circulation postage paid at East Stroudsburg, PA.



# E-MEM\*



Learns complex switching functions. Stores them.  
Recalls them later, EXACTLY.  
At the touch of a button!  
It makes switching easier,  
good operators better.

E-MEM; creative assistance for video production.

**THE GRASS VALLEY GROUP, INC.**  
A Tektronix Company

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

1644 Tullie Cir, NE  
ATLANTA, GA 30329  
(404) 321-4318

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

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

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

(\* Effects Memory)

# BROADCAST INDUSTRY NEWS

## Alaskan Broadcasters Facing Challenge From Activist Groups

Alaskans for Better Media, Inc. (ABM), an activist coalition based in Anchorage, has challenged the FCC license of Midnight Sun Broadcasters, Inc. to operate seven radio and TV stations in Anchorage, Juneau, Fairbanks, and Ketchikan. ABM was also considering petitions to deny renewals of 11 more stations in the state if the organization could not reach agreement with station owners on alleged deficiencies in the stations' performances.

Among the group's charges are that the broadcasters charge different rates to political candidates, put in extra local commercials by clipping network programming, harass persons who seek to inspect public files, and tie in PSAs to advertising purchases.

Supporting the broadcasters' side is Senator Ted Stevens, who has said the ABM broadcasters' request "borders on extortion," and that the group used the "tactics of Naziism." Stevens indicated that his less than one-half of one percent ownership in an Alaskan TV station had nothing to do with his position.

Also defending the broadcasters is the important *Alaskan Times* newspaper. According to the *Alaska Advocate*, the *Times* has suggested the possibility of a nationwide conspiracy to take over the electronic media.

## FCC Opens Inquiry On Fairness Doctrine And Access To TV Time

In response to a mandate from the Washington, D.C. Appeals Court, the Federal Communications Commission has opened inquiry on the fairness doctrine and mandatory public access to TV time.

The Court returned these two issues for further consideration, in upholding the majority of the Commission's 1974 policy statement on the fairness doctrine. The inquiry will consider a proposal by Henry Geller that television stations be required each year to list 10 local and national issues of public importance which they covered during the previous year. The stations would also have to list their invitations to the public

to respond to those issues. The FCC will also consider the mandatory access proposal from the Committee for Open Media (COM) which calls for stations to allocate an hour weekly for "spot announcements and longer programming that would be available for presentations of messages by the public." This latter plan may be considered as a possible replacement for the FCC's current method of considering fairness complaints on a case-by-case basis.

## NRBA Fights Proposed Labor Reform Act

The National Radio Broadcasters Association is calling on its members to fight for changes in the Labor Reform Act, S. 2467 (formerly S. 1883) which is being considered in the U.S. Senate, and has already been passed in the House of Representatives. The Senate version, reported from the Subcommittee, recommends that the period for scheduling labor elections be extended to 30 days instead of the original 15 days, along with several other minor changes. For the most part, however, the Senate bill is not much better than the House's, says NRBA, in urging its members to contact their Senators to tell them that defeat of the bill "is absolutely necessary to protect all business from union domination."

## Christian Broadcasting Web Orders Earth Stations And Announces National News Net

The Christian Broadcasting Network, Inc. (CBN) has ordered 30 satellite earth stations for delivery in the next several months from Scientific Atlanta Corporation. Thirty more will follow. When the satellite earth stations are in place, CBN will begin a daily national and international 30-minute newscast, and later twice daily, six days a week, to independent TV stations across the U.S. and to network affiliates seeking alternate news sources.

CBN's new National News Division is to be headed by Bob G. Slosser, former assistant national editor of *The New York Times* and founding editor of *The National Courier*. Plans are for a

news network of some 200 correspondents in the U.S. and abroad and satellite feeds from VIZNEWS in London and JUJI Television in Tokyo.

Regional bureaus will be set up in major U.S. cities and in news centers abroad. The network's Washington correspondents will include Forrest Boyd, former White House correspondent with Mutual News, and Cal Thomas, formerly with NBC News.

According to Slosser, in addition to the two daily newscasts, CBN plans a weekly news magazine with a 60-minute format, and a separate religious news program. The news service may be provided free to affiliate stations, with revenues coming from national and regional advertising.

CBN will lease channel space from Continental Satellite Corporation, which is also leasing space to other program producers. From its international communications center in Virginia Beach, Virginia, CBN will be able to send to and receive from RCA's SATCOM and Western Union's Westar Satellites. It will also have switching facilities from either satellite, enabling it to store and retransmit programming across the country to meet time zone scheduling.

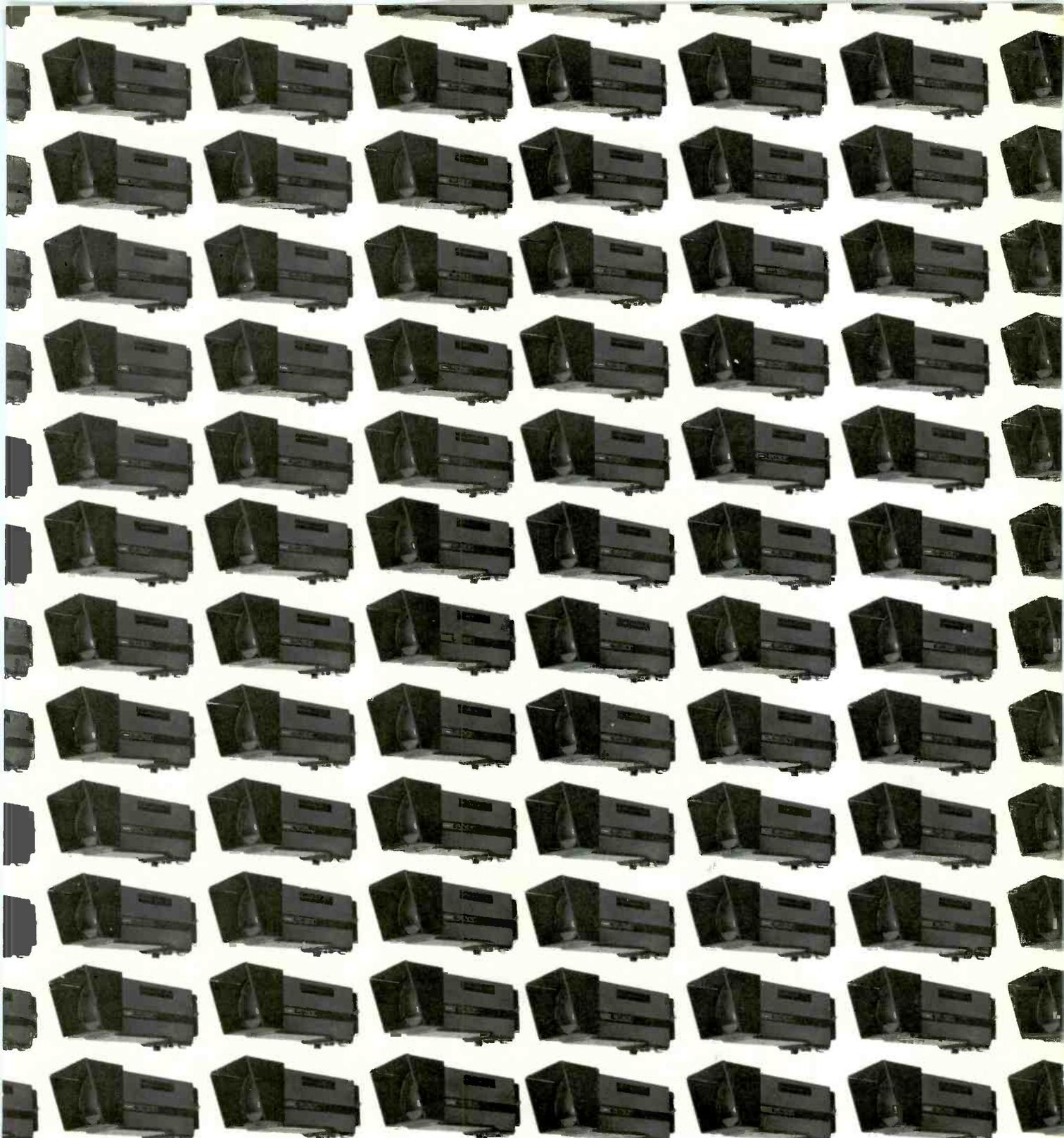
## NRBA Supports FCC's Proposal On Operator Licensing Procedures

The National Radio Broadcasters Association has filed comments with the FCC, supporting the Commission's proposal to eliminate the 3rd class operator license on the grounds that it is burdensome to broadcasters without easy access to an FCC examining point. The new rules would require technicians responsible for the installation, servicing, and maintenance of broadcast equipment to be certified by the FCC, though no test will be needed.

## Wasilewski Outlines Industry Status To FCBA Members

In an address before the Federal Communications Bar Association, NAB President Vincent T. Wasilewski presented a wide range of information, in-

continued on page 8



## OVER 100X IN LESS THAN A YEAR. ZOOM!

When our 18:1 was boldly introduced as "the ultimate studio lens," we were confident that its larger relative aperture, superior wide-angle coverage and shorter M.O.D. would raise a few eyebrows in the industry. Less than a year later, more than 100 network stations, independents, ETV installations and production houses proved we broke an industry precedent. With *understatement*. For more information, or to arrange a demonstration, please write or call:

**Canon**<sup>®</sup>

Canon U.S.A. Inc. Head Office, 10 Nevada Drive, Lake Success, N.Y. 11040 (516) 488-6700 • 140 Industrial Drive, Elmhurst, Ill. 60126 (312) 833-3070 • 123 Paularino Avenue East, Costa Mesa, Ca. 92626 (714) 979-6000  
Canon Optics & Business Machines, Canada, Ltd., 3245 American Drive, Mississauga, Ontario L4V 1B8, Can.  
Canon Amsterdam N.V., Industrial Products Division: De Boelelaan 8, Amsterdam, Netherlands

Circle 102 on Reader Service Card

## News

cluding pending or recently considered proposals, size and scope of the industry, and its profit structure.

One of the most important of the regulatory matters facing broadcasters is a proposal that would require broadcasters to pay additional fees to recording artists and record companies. The defeat of performers royalty is one of NAB's top priorities.

Regarding the industry's size, Wasilewski said "two-thirds of all

radio stations have less than 10 employees. And, although the broadcasting industry is massive in terms of outreach, in number of employees it hardly qualifies as 'big business.' He also pointed out FCC statistics for calendar year 1976 — 1,677 commercial radio stations operated at a loss; independent FM radio registered more stations with operational losses than gains; a third of UHF television stations reported losses as did nearly 10 percent of VHF stations.

Wasilewski also encouraged the communications lawyers to "get in-

involved" and urged "greater participation" by them in the law-making process.

### Computer Helps BMI To Determine Royalty Payments

Broadcast Music Inc. (BMI) now has the world's largest on-line music information system stored on an IBM computer. Information needed to determine payments from a representative sampling of some 500,000 hours of music used by radio and television stations is now instantly available at computer terminals located in New York City.

Edward Cramer, president of BMI, said that the computer is allowing the firm to offer new services, such as its new bonus payment schedule, and also to help BMI with other functions. These include faster distribution and more detailed payment records of all monies due BMI writers and publishers, more efficient collection of performance royalty payments from broadcasters and other organizations, tracking for the first time the performance of all motion picture and syndicated TV show themes used by broadcasters, and improved control over possible copyright infringement.

### KRON Resists Search Warrant From San Francisco D.A.'s Office

KRON-TV staff and security guards greeted officials of the San Francisco district attorney's office carrying search warrants and refused to turn over footage being sought. All four TV local commercial stations were visited with officials carrying search warrants more than a week after a fight when houseboaters were trying to block construction of a new bay marina. A number of persons were injured and several persons were arrested. KRON and KTVU refused to turn over any footage, and KPIX and KGO surrendered only that film of the incident which had already been aired.

KRON News Director Mitch Farris told the officials from the D.A.'s office that, as is standard station procedure, he would let them view the footage of the incident used on air, and sell them a copy upon receiving a legal subpoena. Farris and Station Manager Francis Martin were warned by the officials that they might be found in contempt of court for ignoring the search warrants. Later an agreement was reached; the search warrants were withdrawn and the D.A.'s office officials came to the station and viewed a dub of the KRON film.

# Are you as tough as this Ampro console?

Can you work 24 hours a day, 7 days a week, 365 days a year...year after year without a vacation?

Consider the physical abuse that this console is forced to take. Could you perform up to your capabilities if you had 17 pairs of hands working you over with no concern for your general welfare? Ampro Audio Consoles can do it.

They're built to sound better and last longer.

It's a rough world and Ampro Consoles are tough enough to take it. Ampro tough!

Quality, reliability and ruggedness. That's why hardworking Ampro is the choice of the broadcasting professionals.



**AMPRO BROADCASTING INC.**

850 PENNSYLVANIA BLVD., FEASTERVILLE, PA 19047 • (215) 322-5100  
Professional Equipment for Broadcasting Professionals

Circle 103 on Reader Service Card

continued on page 12

# SQUEEZOOM™

is...  
One Channel

## FRAME SYNCHRONIZER

Locks all remote signals to house sync. Network, ENG, Remote pick-ups, and satellite signals will mix with local signals with no disturbance.

Sampling video at 4 times subcarrier for superior technical standard and picture quality.

## TIME BASE CORRECTOR

Will "NTSC" COLOR and sync of low cost VTR's.

## FRAME FREEZER

Will act like having another camera in the studio for still shots. Will freeze any full frame picture. Will retain last frame of interrupted incoming signal automatically until picture is restored.

## VIDEO COMPRESSOR

No matter how a slide or scene comes in, you can compress and/or change its aspect ratio as you wish, down to one picture element, and position it anywhere on the screen.



## ELECTRONIC ZOOM

See or read information not possible without zoom.

In sports, determine if ball is good, simply freeze and enlarge. Call foul plays more accurately. Zoom capability on a remote or recorded scene. Zoom while chroma key tracking.

## VERY SPECIAL EFFECTS

With 2 channels or more, open new unlimited vistas of movie-type effects.

GENERATE your own effects with Vital's pre-programmed micro-processor.

Record 4 pictures on one recorder and play back any one full screen with no perceptible degradation.

Observe or monitor 4 TV channels on one receiver; listen to any one audio.

Conceived, designed, and manufactured in Florida by Vital Industries, Inc.-makers of the VIX-114 Series Switching Systems.

## Or up to 4 Channels in One



You will not be locked out with one video channel "Squeezoom." Add other channels as you wish. Too many exciting features and applications to describe. Call us toll free 1-800-874-4608.



HI TECHNOLOGY PRODUCT INNOVATORS

**VITAL INDUSTRIES, INC.**

MAIN OFFICE: 3700 N.E. 53rd Ave., Gainesville, Fla. 32601 U.S.A. • Tel.: Area 904-378-1581.

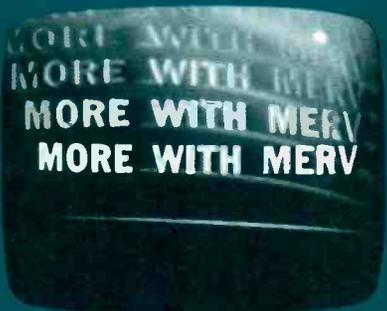
MORRELL BEAVERS Midwest  
2644 North Seventh St.  
Terre Haute, Indiana 47804  
Phone 812/466-3212

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

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

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

BARRY HOLLAND West Coast  
7960 West Beverly Blvd.  
Los Angeles, California 90048  
Phone 213/653-9438



# YOU CAN TAKE

You can take us to the Super Bowl, you can take us to a local sporting event. You can take us to the Merv Griffin Show, or you can take us on air in a commercial. We're at home with the independent broadcaster, and with all the major networks...we're even comfortable on a mobile van. We've been on Satellite/weather assignments, and we've recorded important news events.

We're the Arvin/Echo family of professional video products.

**High-Band Slo/Mo-1**...replaceable Discassette® makes maintenance easy and inexpensive. It takes only a couple of minutes to install...and only \$50. Each Discassette® provides 20 seconds of record time with variable speed playback, stop action and reverse.

**EFS-1 Frame-Stor™ Recorder**...stop-action, freeze-frame...all directly recorded on interchangeable Discassette® Records. Stores 200 frames on-line. It's RC-100 Remote Random Access Controller makes it an indispensably versatile machine.

**EFS-1 Frame-Stor™ Recorder**  
New & versatile production tool for instant stills and animation. So versatile you'll use it as a second source telecine or camera.






**ANGEL CORDERO, JR.**

CAREER WINS: 2,836  
 MOUNTS EARNINGS: \$24,922,714  
 WON KENTUCKY DERBY IN 1974  
 ARDARD CANNONADE



# US ANYWHERE

EFS-1 with Single or Dual Chyron Interface ... the one you've all been asking for!

We're all compact, lightweight, affordable, and rugged enough to go anywhere you want to go, anytime you're ready.

## ARVIN/ECHO™

ECHO SCIENCE CORPORATION an ARVIN SYSTEMS, INC. company  
 485 E. Middlefield Road, Mountain View, California 94043  
 Tel: (415) 961-7145 TWX: 910-379-6499  
 Circle 105 on Reader Service Card



**High-Band SLO/MO-1**  
 Introductory Price \$47,750  
 Professional SLO/MO at an affordable price. Built in TBC...8 bit 4X subcarrier with DOC...Digital comb filter and digital field store... Auto-Cue™ System.



## News

Reporting on the incident, the *RTNDA Communicator* explained the implications: "The issue revolves around the scope of two devices. For example, if your news organization believes certain documents or newsfilms should not be disclosed, it may move to quash the subpoena. But with a search warrant there is no legal option you may exercise to contest it. Under most state laws it is a violation of the law to resist a search warrant, although KRON-TV

did resist. Also, when a subpoena is served, you need only show what is specifically asked for in the subpoena. However, if a search warrant is used, the searching parties may look for the requested material themselves, and in the process they may come upon information you did not want them to have."

### Two-For-One TV System Demonstrated In Juneau

A new digital electronic system called STRAP which allows two color TV pic-

tures to be transmitted simultaneously by a single satellite transponder had its first public demonstration at a viewing in Juneau, Alaska's Hotel Baranof in March. Host for the presentation was Robert Wold Company, Inc. Alaska's TV officials are considering his proposal to arrange for interstate delivery of satellite TV beginning July 1, 1978.

The presentation included programs of all three commercial TV networks transmitted simultaneously from "the lower 48" to Juneau on Western Union's Westar II satellite. At Juneau, B-C Cable Inc. furnished the satellite receiving antenna and a cable run to Hotel Baranof.

STRAP equipment was provided by CBS, Inc. which developed the technique and has privately tested it. ABC and NBC television networks also cooperated in the demonstration.

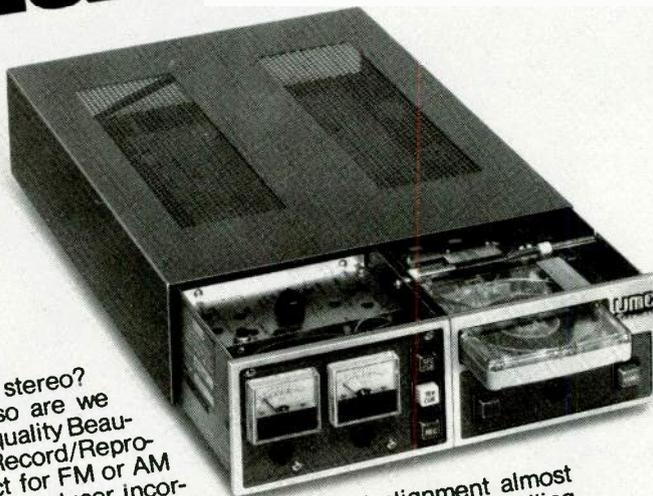
STRAP is an acronym for "simultaneous transmission and reception of alternating pictures." Wold's contract proposal to Alaska calls for use of the Westar satellite, use of the STRAP technique, sharing of uplink costs with users in Hawaii, and construction (by a separate company known as Satelink, Inc.) of earth receiving stations at four Alaska locations.

### Radio Code Dues Structure Consolidated

The Radio Board of Directors of the National Association of Broadcasters has voted to financially consolidate the Radio Code dues structure with that of the Association. Each member station may at its option become a Radio Code member at no additional cost; a non-NAB station may continue to subscribe to the Code. In the restructuring of dues to accommodate the plan, it was voted that there will be no adjustment for any individual station to exceed a 15 percent increase of current dues and fees. Until this action, stations have paid separate dues to subscribe to the Radio Code.

Other actions of the Board included: 1) reappointment of two members whose terms expire at the time of the NAB annual convention for another two-year term: Erica Farber, general manager, WXLO Radio, NY, NY, and Walter Rubens, president and general manager, KOBE Radio, Las Cruces, N. Mex. 2) Appointment of Bruce Goodman, general counsel, Mutual Broadcasting System, Washington, D.C. to replace Jack Stuppler, director, Program Practices, Radio, CBS, Inc., NY, NY. 3) Ratification of the appointment of Dick Painter, general manager, KYSM Radio, Mankato, Minn., as vice chairman of the Radio Board.

# Beaucart Stereo Machines.



Ready for AM stereo? It's here, and so are we with our super quality Beaucart® Stereo Record/Reproducer. Perfect for FM or AM stereo, each reproducer incorporates a unique head hold-down assembly which keeps heads in perfect alignment almost indefinitely, plus a series of patented cart locating and handling features for the utmost in stereo reproduction. And only Beaucart machines feature our patented Beau pancake motor and matched Beau audio heads.

If you need the ultimate in AM or FM broadcast stereo machines for A, B, and C-size carts, you owe it to yourself to look at Beaucart. Price specs, service, performance: No wonder they've become so popular! For the full story, write today for Bulletin 103 or call us at (203) 288-7731. We're the Broadcast Products Division, UMC Electronics Co., 460 Sackett Point Road, North Haven, Connecticut 06473.

# UMC®

# IF YOU'RE A PERFECTIONIST YOU'VE MET YOUR MATCH



WJZ-TV, Baltimore, Maryland

If you're really hard-nosed about audio quality, you'll see our perfectionism in our equipment. We're really demanding about our engineering, manufacturing and quality control standards. Correction. Make that read "downright finicky."

We're insistent about maintaining complete in-house design and manufacturing operations and about our painstaking quality control methods. These factors help maintain our position as the innovator, the one others look to for leadership. They assure you of the finest, the most reliable and advanced audio equipment.

You'll probably want to read every word of our excellent 5-year warranty, the most comprehensive in the industry. And while you're at it ask for our customer list. We're proud of it and we think you'd be proud to have your name on it some day.

For our complete catalog contact Audio Designs and Manufacturing, Inc., 16005 Sturgeon, Roseville, Michigan 48066. Phone (313) 778-8400. TLX-23-1114.

**AMPEX** Distributed outside U.S.A. by Ampex International Operations, Inc.

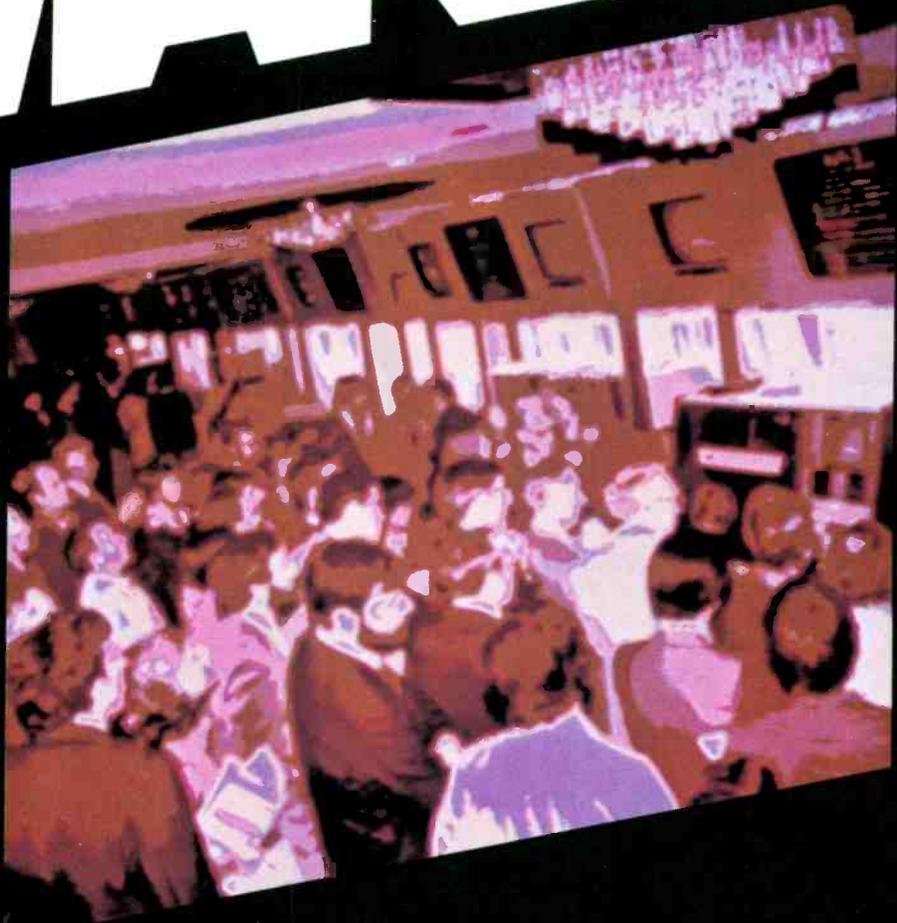
**CONSOLES &  
COMPONENTS**  
for audio control



**AUDIO  
DESIGNS**  
and Manufacturing, Inc.

The Audio Company

# NAB. AMPEX MAKES



# IT EXCITING.

Ampex makes the equipment for exciting broadcast productions, and it'll all be on display at this year's NAB convention in Las Vegas.

Excitement in Cameras: Star of this year's Ampex camera show is the BCC-10 color studio camera, with on-demand ACT and more automatics than ever to enhance the visual "punch" of your most imaginative productions.

Excitement in Helical: Ampex is showing a new Type C machine, the VPR-2, and a companion portable, the VPR-20. There's a new wide-window digital time base corrector, the TBC-2, to round out the helical excitement Ampex is creating.

Excitement in Quad: Super High Band Pilot is today's hottest quad development, and it's available in the "intelligent" AVR-3 and the "grow-on-the-job" AVR-2. These sophisticated

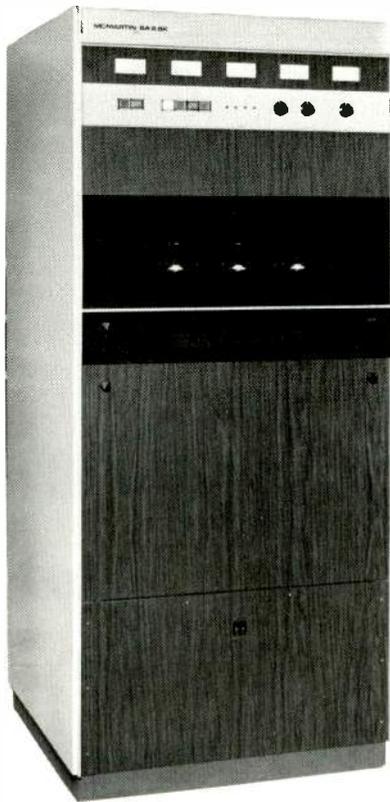
and versatile VTRs extend the worldwide leadership of Ampex in quad recording. Excitement in Editing: Now there are three electronic editing systems from Ampex to provide any desired degree of flexibility, making tape as creative as the mind that controls it.

Excitement in Digital Technology: If you're ready to go digital, Ampex has the first commercially available digital video production system, the ESS-2. You have to see it to believe what it brings to video.

Excitement all over the Booth: Ampex audio recorders, synchronizers and magnetic tape products will be at NAB too. It's going to be an outstanding NAB year, because... Ampex makes it exciting.

## AMPEX

Ampex Corporation



## Before you buy a TRANSMITTER, take a look at the RECORD.

In the past two years nearly 200 stations have switched to McMartin transmitters. That's an industry record.

Competitive radio demands the best sound quality and signal stability, but rising costs require minimum capital investment and low maintenance costs. McMartin AM and FM transmitters represent a "New Breed" of high performance equipment designed to help stations build profits and cut costs.

We're booth 302 at the NAB. Come and see us.

### MCMARTIN

4500 South 76th St • Omaha, Nebraska 68127 • (402) 331-2000 Telex 484485  
Circle 108 on Reader Service Card

## NEW FM AND TV FIELD STRENGTH METER FIM-71

- Accurate — Direct Reading — Volts or dB ■ 45 MHz to 225 MHz — Continuous Tuning ■ Peak or Averaging Detector (switch selectable) ■ Wide or Narrow IF Bandwidth (switch selectable) ■ 20 dB or 60 dB Meter Range (switch selectable) ■ AM or FM Demodulator (switch selectable) ■ Calibrated Dipole Antenna, Mounted on Case for Near-Ground Measurements or Removable for TASO Measurements ■ 140 dB Measurement Range (1  $\mu$ V to 10 V) ■ 4½-Inch, Mirrored Scale, Taut-Band Meter
- Front Panel Speaker
- Recorder Output
- Rugged, Portable Package ■ Calibrated Signal Generator, 45 MHz to 225 MHz
- Battery or External Power ■ Use as Signal Source/Selective Voltmeter for Insertion Loss Measurements of Filters, etc. ■ Measures FM Harmonics to -80 dB
- Price — \$2,500 complete with dipole antenna.



CONTACT US FOR DETAILS.

# POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.  
SILVER SPRING, MD. 20910  
(301) 589-2662

Circle 109 on Reader Service Card

## News

### Satellite System Shining: AP Radio Looking Into Sats; Mutual Files For Satellite Web

Mutual Broadcasting System and Western Union have filed applications with the FCC for permission to transmit Mutual radio network programs to Mutual affiliate stations via Westar I. The Associated Press announced that it will explore satellite delivery of its audio service, AP Radio.

When the Mutual/Westar system is approved, Mutual programs will be beamed directly to earth stations located at 500 of Mutual's 780 affiliates. The earth stations, developed and manufactured by California Microwave, Inc., will be installed and owned by the Mutual Broadcasting System and will be maintained by Western Union.

Roy Steinfort, AP vice president and director of the Broadcast Services division, said recent technological improvements in small-aperture earth stations make conversion to satellite delivery from land lines an attractive possibility.

Steinfort said "based on reactions to date, AP is prepared to contract for satellite space and up-link capability and the purchase of an earth station." Steinfort also said that AP would then file with the FCC a description of the system and ask approval to begin the transition to satellite delivery.

Steinfort pointed out that the 15 kHz response of the satellite system offers a quality "far above that of any current network programming available." APR carries 168 hours weekly of news plus special programs dealing with sports, business, agriculture, consumer news, and public affairs to more than 500 affiliated stations.

### Code Language On Obscenity And Profanity Affirmed By NAB TV Board

In its January meeting, the National Association of Broadcasters' Television Board of Directors affirmed the action taken at its September 1977 meeting regarding adoption of Television Code language on obscenity and profanity:

"Subscribers shall not broadcast any material which they determine to be obscene, profane or indecent.

"Above and beyond the requirements of law, broadcasters must consider the family atmosphere in which many of their programs are viewed.

"There shall be no graphic portrayal of sexual acts by sight or sound. The portrayal of implied sexual acts must be essential to the plot and presented in a

responsible and tasteful manner.

"Subscribers are obligated to bring positive responsibility and reasoned judgment to bear upon all those involved in the development, production, and selection of programs."

The Board urged the Television Code Board and the Code Authority to continue their meetings with network presidents, writers, and principal producers and public groups.

The Board also directed that additional broadcast town meetings should be held.

In other actions, the Board: 1) appointed Leavitt Pope, president, WPIX, Inc., NY, NY, to fill a vacant seat on the Television Code Board; 2) named Donn O'Brien vice president, Program Practices, CBS, Inc., NY, and Robert King, executive vice president-TV, Broadcasting Division, Capital Cities Communications, Inc., Philadelphia, Pa., to fill vacancies on the Code Board.

## HBO To Make Satellite Receive Equipment Available To Cable Industry

Home Box Office, pay cable network, in its ever-expanding operations, has signed an agreement to purchase earth stations and related ground equipment developed by two leading cable industry manufacturers, Scientific-Atlanta and Hughes Microwave Communications Products, for the reception of TV signals via satellite.

With these quantity purchases, HBO will be able to make earth stations available at reduced cost to cable systems wishing to receive HBO's pay entertainment programming service and other services delivered by satellite.

The equipment packages contain several options. Also, the manufacturers will provide the earth station foundation designs, and their engineers will supervise installation and proof-of-performance testing for each cable system.

## Rockwell Group Wins \$12.9 Million National Public Radio Contract

The Corporation for Public Broadcasting (CPB) has awarded a \$12.9 million contract to the Dallas-based Commercial Telecommunications Group (CTG) of Rockwell International to construct a satellite interconnect system for public radio stations. The Public Radio Interconnection system will consist of 192 receive earth stations, 15 of which will also have transmit capability. Also, a main origination capability will be constructed for National Public Radio (NPR) to enable it to originate, assem-

continued on page 19

# THINKING IKEGAMI? THINK CAMERA MART.

Because we're a full-service Ikegami Dealer.



At Camera Mart, we feature the entire line of Ikegami quality products. *And we service what we sell*—with our own in-house, factory-trained technicians and factory-approved facilities. The ENG package below is just one of the many we offer, so why not talk to us about your needs... or come in for a demonstration.

### CAMERA MART CUSTOM IKEGAMI PACKAGE

**The camera:** Ikegami's HL-77,\* completely self-contained. High-sensitivity color in a compact, lightweight three-Plumbicon\*\*\* package. All in a single low-profile 16mm-size

camera with eye-level CRT monitoring on take and playback, plus many more features you'll appreciate.

**The lens:** The Canon f/1.6 10-100mm zoom, for wider wide-angles and tighter tele's.

**The recorder:** Sony's easy-to-operate VO-3800—a 30-lb. package that gives you up to 20 minutes of NTSC color on a single U-Matic® cassette which can be edited on the 2850.

\*Also available with HL-35.  
\*\*Plumbicon is a trademark of N.V. Philips



### OPTIONAL ACCESSORY: "VIDEO CRASH CART"

Custom-designed to make production safer and smoother, with reduced set-up and strike time, easier transport and fatigue-free shooting. Sturdy, welded construction with 2-position handle lets you transport or operate in upright "handtruck" or horizontal "dolly" position. So it can go virtually anywhere your crew can go.

Holds camera backpack, recorder, AC adapter, cables—even extra cassettes.

### RENTAL-LEASE-PURCHASE:

Pick the terms that suit your budget (and tax situation) best

NAB

## CAMERA MART

THE CAMERA MART, INC.

456 W 55th Street, New York 10019 (212) 757-6977 Telex: 1-2078  
Sales • Service • Rental



SUSTAINING  
SMPTA  
MEMBER

Circle 110 on Reader Service Card

# The Added Dimension in TV Broadcasting

Broadcasting professionals know that the business or marketing value of their productions is ultimately dependent upon audience coverage. In this regard, industry leaders have been confronted with problems such as how to economically achieve total saturation of an existing broadcast target area, and how to extend the range of quality transmission without costly equipment purchase or modification.

Acrodyne has been working with professional commercial and educational broadcasters to do just that.

Since introducing its solid state TV Transmitter and Translator equipment in 1971, Acrodyne has broadened the dimension of TV Broadcasting throughout the world primarily by reaching areas that were previously unreachable due to terrain, low population or just sheer economics — opening up new, creative ways to bring high quality television to a universal market . . . you might call it professional problem-solving.

As a result, Acrodyne has encountered the numerous and diverse problems that tend to hinder or negate broadcasting efforts. It has worked with dedicated, imaginative industry

leaders who have recognized that Acrodyne's low and medium power transmitter and translator systems can help achieve their audience-expanding objectives.

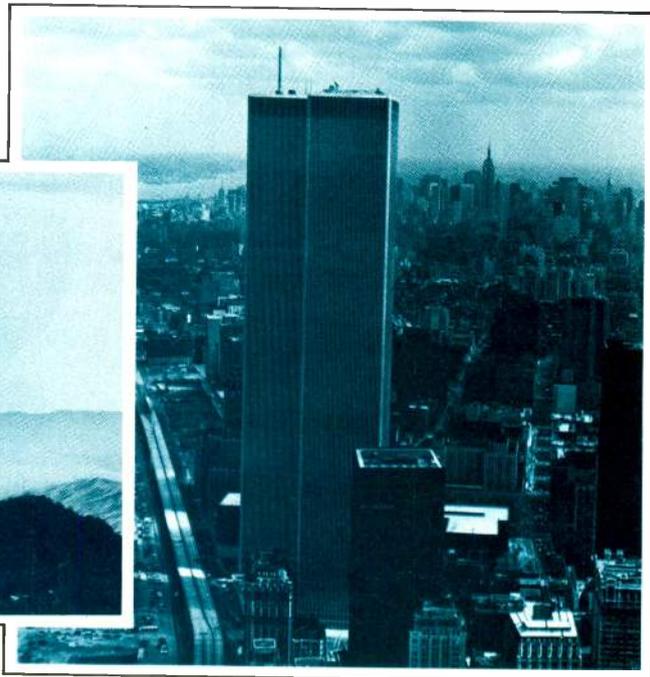
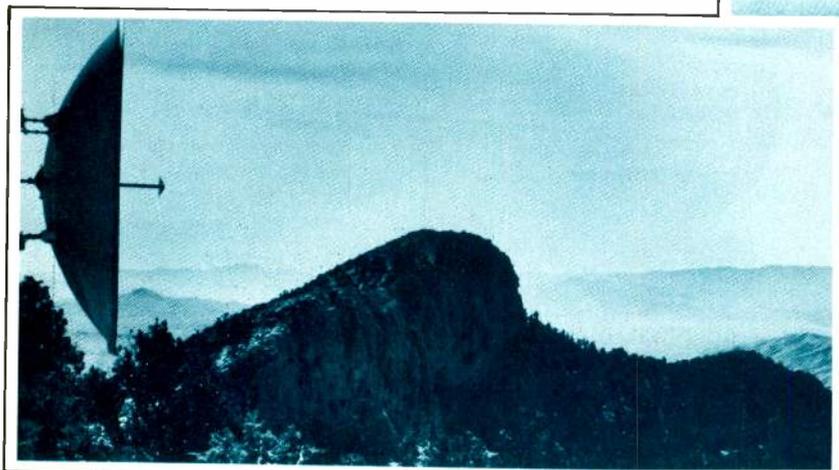
Acrodyne is aware of the need for a full range of professional equipment that is versatile enough to meet almost any situation — from beaming down on practically unreachable communities from inaccessible mountain tops; transmitting from mini-stations in the tundra; broadcasting from tethered balloons; coupling into CATV systems; to developing a new method for extending low cost pay TV reception in New York City.

Acrodyne brings the added dimension to TV broadcasting through experience, vision, and most of all, equipment and systems that will take punishment and stand the test of time.

***acrodyne***  
***industries, inc.***

**21 Commerce Drive, Montgomeryville, Pa. 18936**  
**(215) 368-2600 • TWX 510-661-7265**

Circle 111 on Reader Service Card



## News

ble, and distribute programs to its member public radio stations.

Collins Commercial Satellite Communications (CCSC), part of the CTG, will design, fabricate, and install the system. Under terms of the contract, Rockwell will also provide public radio with one year of operation and maintenance support after the last site has been accepted.

### RCA To Double Satellite Capacity For Cable TV

RCA American Communications, Inc. plans to shift of the cable TV industry's traffic to its RCA Satcom I (F-1) satellite and reserve it principally for cable TV program transmission. This shift provides the potential of doubling the numbers of channels which can be received by a single cable system earth station. Transfer of the cable TV traffic is planned for sometime in early May.

### Carter Proposes Plan For Greater Role Of Minorities In Broadcasting

The Carter Administration has announced a plan to increase minority ownership of broadcast stations and cable TV systems, and to direct more of the government's advertising budget to minority owned advertising firms and broadcast outlets.

Most of the program was included in a petition submitted to the Federal Communications Commission by the Commerce Dept. and the Office of Telecommunications Policy. The petition, which is dependent on FCC approval, provides for deferral of capital gains taxes to broadcasters who sell their stations to minority entrepreneurs (a policy that was proposed by the National Association of Broadcasters) and other economic incentives to white station owners to sell to minorities. As another part of the new general policy, it was announced that the Small Business Administration (SBA) will provide up to \$350,000 in direct loans and up to \$500,000 in guaranteed bank loans to groups or individuals desiring to buy broadcast or cable TV properties.

### NCTA Promotes N.J. As Setting For Cable Deregulation

In comments filed with the FCC, the National Cable Television Association supported the petition of the New Jersey Office of Cable Television for cable systems in that state to be relieved from federal government restrictions on the

television systems they can import. NCTA argued that New Jersey, with no commercial VHF television station operating within its boundaries to serve its over seven million residents, would be an ideal setting for monitoring the effects of cable TV importation of distant TV signals.

Since there is no local commercial broadcaster to be protected, there is no reason to continue the restriction, NCTA claimed. The economic base of cable systems serving the area would be significantly boosted through this waiver, and then the industry will "be

able to provide access to the public coverage of local events and outlets for local advertising," according to NCTA.

## News Briefs

Latest RADAR "Radio Usage Volume" reveals that **radio and TV continue to make ideal partners** in a daytime media mix for women. Of the total 79 million U.S. women 18 years and older, 46 million, or almost 58 percent

continued on page 20

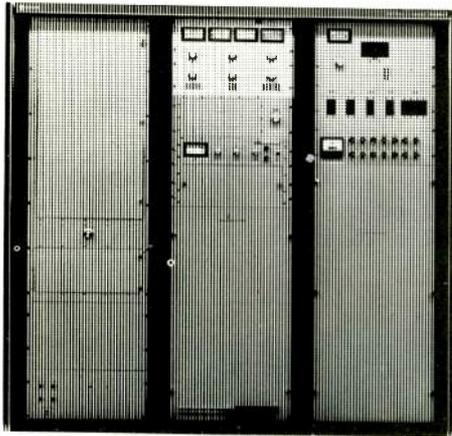


# MULTILIMITER MULTIMAX

## THE BUILDING BLOCKS OF GREAT BROADCAST SOUND

PACIFIC RECORDERS AND ENGINEERING CORPORATION  
11100 ROSELLE ST., SAN DIEGO, CALIFORNIA 92121  
TELEPHONE (714) 453-3255 TELEX 695008  
exclusive export agent: Sierra Audio Burbank, Calif.

Circle 112 on Reader Service Card



## What's so exciting about our 25-kW FM transmitter? The exciter.

*First*, it is the highest power single unit from a major transmitter manufacturer. And two can be diplexed for a whopping 50 kW. The advantage? Fewer antenna bays and a generally improved pattern for Class B or C operation.

*Second*, at the heart of all Rockwell-Collins Generation 4<sup>™</sup> transmitters is the exciter that has set the world standard for excellence. It's the field-proven Collins Phase 4<sup>™</sup> exciter. How good is it? So good that it was selected by the Swedish network after more than a year of intensive evaluation of the leading FM exciters in the world to upgrade *every* FM station in Sweden. So good it has been selected by over 300 stations in the U.S. and Canada.

- So good that it's the only exciter good enough for you. Interested? Contact your Rockwell-Collins man and choose your size from 1 to 50 kilowatts. Or call Collins Broadcast Marketing, Commercial Telecommunications Group, Rockwell International, Dallas, Texas 75207. Phone 214/690-5574 or 5424.



**Rockwell International**

...where science gets down to business

Circle 113 on Reader Service Card

## News Briefs

report no TV watching between the hours of 10 a.m. and 3 p.m. on the average weekday. Of these 48 million women, 22 million are in the radio audience for an average of over half that same midday period. And of those women who watch some daytime TV, half also report two hours of radio usage during the midday time span.

A new public radio station has gone on the air in the Sioux City, Iowa area. KWIT-FM is located on the campus of Western Iowa Tech Community College (WITCC) in Sioux City, and will serve the 400,000 people within 80 to 100 miles of the city in northwest Iowa and neighboring states. KWIT broadcasts classical music during the week and supplements it with folk, jazz, and opera on weekends. . . . The Board of Directors of the National Association of Broadcasters has voted to **allocate \$10,000 to the World Press Freedom Committee**, which is an organization of 30 affiliate media organizations worldwide which works to preserve press freedom internationally.

A new **Video Program-of-the-Week Plan for libraries, schools**, and other non-profit organizations is being offered by the PBS Public Television Library (PTL). The plan provides for participating organizations to use a different public TV program on ¾-inch "U" videocassette each week for a 12-week period at a cost much lower than the regular rental charge. Participants will choose the programs from a special group of over 350 individual public TV programs. "Subscription Cycles" have been established, and begin this year on April 1, July 1, October 1, and on January 1, 1979. Cost for a week's use of each videocassette is \$25 for 30 minutes or less, and \$35 for 31 to 60 minutes. This represents a saving of over 60 percent over the normal rental charges.

The National Aeronautics and Space Administration (NASA) has issued a **communications service award** to RCA American Communications, Inc. for wideband data satellite communications links to support NASA's decade-long Voyager mission into outer space. . . . **WRTN, a new regional radio station** has begun stereo broadcasting at 93.5, in New Rochelle, NY. WRTN, formerly WVOX-FM, is owned and operated by Hudson-Westchester Radio, Inc., which also operates Westchester community station WVOX on the AM band. The parent company has invested about \$175,000 in improvements for WRTN, thus increasing its signal by 65 percent.

The National Advertising Division (NAD) of the Council of Better Busi-

ness Bureaus resolved fifteen challenges to national advertising in January. Three challenges concerned advertising directed to children and were handled by the Children's Advertising Review Unit of NAD. Seven matters were resolved when advertising under investigation was either discontinued or when advertisers agreed to changes in copy requested by NAD. Eight investigations were concluded when NAD found that advertisers had substantiated their claims. . . .

**KCMO-TV 5**, in Fairway, Kansas has announced its move to a new address: 4500 Johnson Drive, Fairway, Kansas 66205. New phone number is 913/677-5555; TWX is 910/743-4180. . . . RCA American Communications, Inc. has **purchased an earth station near Atlanta for \$910,000** as part of a plan to offer expanded services from the Southeast later in the year. The company has been leasing this earth station to provide satellite services since October 1976. The station, which was owned by Satellite Equipment Leasing of Atlanta, is located less than 10 miles from the downtown area.

Arthur Godfrey, Jim and Marian Jordan (Fibber McGee and Molly), wireless inventor Guglielmo Marconi, and journalist and radio broadcaster, Walter Winchell, have been elected to the National Association of Broadcasters' **Radio Hall of Fame**. The four new members, elected by radio broadcasters from across the country, will be inducted into the Hall of Fame at the NAB's annual convention in Las Vegas, April 9-12. . . . The **Mutual Broadcasting System** will establish a southwest regional headquarters to be located in Dallas. This division will be the first action by Mutual to move some functions from its Washington base and establish network facilities in various areas of the U.S. Mutual has sales offices in several other cities, but this will be the first with broadcast capabilities. . . . Wometco Enterprises, Inc. has completed the **acquisition of WZZM-TV**, the ABC television network affiliate serving the Grand Rapids-Kalamazoo-Muskegon, Michigan area. The station was purchased from West Michigan Telecasters, Inc. for approximately \$12.5 million cash.

## Business Briefs

The telephone number for **Ramko Research, Inc.** is 916/631-3600 (correction from September 1977 *BM/E* source 77). . . . **KalaMusic**, a Kalamazoo based Beautiful Music Programming and Consultation firm, has

continued on page 23

# We interrupt this magazine to bring you all you need in broadcast equipment.

One call is all it takes to get anything and everything you need in broadcast equipment — from turntables to AM and FM transmitters.

Choose from Rockwell-Collins equipment plus that of close to a hundred different manufacturers. It's one-stop shopping with fourfold advantages:

**1. Quality products.** Our transmitters and consoles are the result of our technical excellence and single-minded dedication exclusively to the radio broadcaster for over 40 years. We've never once deviated from our goal: to make our name synonymous with quality, reliability and long life... for your benefit.

**2. Broad choice of products.** In addition to our own Generation 4<sup>™</sup> FM transmitters and our all-new Power Rock 5-kW AM transmitters (the cleanest,

brightest, loudest AM in town), we carry products from the largest team of respected specialty vendors available anywhere from a single source — from ADC to UREI, with nearly a hundred other such leaders in between. If we don't have what you want, chances are we can get it for you. Fast.

**3. Flexible financing arrangements.** If it's under \$1000, you can use your own or your company's Master Charge. For larger orders, take your choice of time-purchase (up to 5 years) or lease plans.

**4. Unbeatable customer support.** Your emergency is our emergency. We're ready to respond — without delay — 24 hours a day, 365 days a year.

See the cities listed below for the representative nearest you — and call him for one-stop shopping, Rockwell-Collins style. Ask him for a copy of our new brochure, or contact: Collins Broadcast Marketing, Commercial Telecommunications Group, Rockwell International, Dallas, Texas 75207.  
Phone: 214/690-5424.

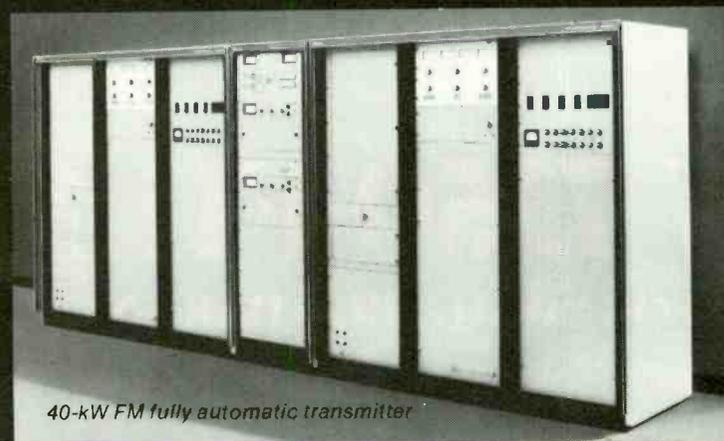


**Rockwell  
International**

...where science gets down to business

Circle 114 on Reader Service Card

Cairo 801525 • Frankfurt (Rodgau 6 Weiskirchen) (0) 6106-4093 • Hong Kong 5-274-321 • Johannesburg 211-521  
Kuala Lumpur 27283 • London 01-759 9911 • Mexico City (905) 533-1846 • Melbourne (Lilydale) (03) 726-0766 • Paris (Rungis Principal) 687-31-02  
Rio de Janeiro (021) 246-3276 • Riyadh 69060 or 68324 • Rome (0) 6-862-415 • Tehran 685-180 • Toronto (416) 757-1101



40-kW FM fully automatic transmitter



Generation 5 super power antenna

# The latest words in communications: Rockwell-Collins.



# EASTMAN 7250 FILM

**A NEW HIGH-SPEED FILM FOR "AVAILABLE DARKNESS"**

If you've ever had to pass up a story for lack of light, we'd like you to know about new Eastman Ektachrome video news film high speed 7250 (tungsten).

It is a companion film to our Ektachrome video news film 7240 and uses the same Process VNF-1 procedures. It is, however, far faster (EI 400), and it can be pushed two stops and still provide you with an image of excellent broadcast quality.

It is an ideal solution for news assignments when additional lighting would be inappropriate or prohibitively expensive.

For available light, available twilight, or "available darkness," Kodak has a film to help you get the news. For literature or a call from one of our Sales and Engineering Representatives please write: Eastman Kodak Company, Dept. 640, Rochester, N.Y. 14650.

**Film is good news.**

Circle 115 on Reader Service Card



## Business Briefs

announced an exclusive consulting agreement with four of the five E Z Communication stations. The stations involved are WJOL, Pittsburgh; WEZC, Charlotte; WEZS, Richmond; and WEZB, New Orleans.

**CCA Electronics Corporation**, Cherry Hill, N.J., has signed agreements with LGT, of Chatou, France under which CCA will distribute LGT translators in the United States, and LGT will supply advanced state of the art exciter-drivers to be incorporated into CCA high power VHF and UHF television transmitters. The IF-modulated, completely solid-state, high-technology CCA/LGT translator has built-in trouble-shooting aids which are self-diagnosing without using meters. It has settable AGC-controlled output level, is double modular, compact, self-contained, and rack-mounted.

**Orrox Corporation** has announced that its **CMX Systems** division closed out 1977 with the largest sales ever of TV editing equipment. They also entered the first quarter of 1978 with a backlog in excess of \$1.2 million — the largest backlog in CMX history . . . . **Home Box Office and RCA Ameri-**

**can Communications** have reached a preliminary agreement for "a major expansion of HBO's domestic satellite transmission commitment." The two firms are negotiating a 10-year agreement that would replace the nearly four years left in the original six-year contract. Under the new contract, HBO will lease three rather than two transponders.

**Communications Technology, Inc.**, of Huntsville, Ala., has been purchased by the **3M Company**, St. Paul, Minnesota. The name is changed to **Comtec Video Systems Mincom Division**, 3M Company. **Comtec Video Systems** will remain at its present address and operate with the same management personnel. All invoices should be addressed to **Comtec Video Systems, 3M Company, 3070 Leeman Ferry Road, Huntsville, Ala. 35801** . . . . **CONRAC Corporation** has relocated its corporate offices to: Three Landmark Square, Stamford, Connecticut 06901. Telephone: 203/348-2100. Telex: 96-5978.

**Micro Consultants, Inc.**, Palto Alto-based digital video firm, has made first deliveries of its new Quantel DFS 3100 digital framestore synchronizer and DFS 1500 digital fieldstore synchronizer. First recipients of the DFS 3100 were **WNAC-TV**, Boston, **KCST-TV**, San Diego, and the Ameri-

**can Broadcasting Corporation**, New York. The latter unit was also the first with the company's new Digital Framestore Control option which permits a variety of special effects, such as video compression and picture positioning. First to receive the DFS 1500 fieldstore synchronizer was **CFTO-TV**, owned and operated by the Canadian Television Network . . . . **CBS-TV** has placed orders for six additional DFS 3100 digital framestore synchronizers from **Micro Consultants** — representing a total of 11 units purchased by CBS.

**RCA** has introduced its first fiber optics data link designed for use in digital-data computer links, digital telephony, secure communications, process control and high-voltage optically isolated data systems. The new system consists of a transmitter containing an RCA gallium-aluminum-arsenide, light-emitting diode and a receiver equipped with an RCA silicon photodiode. The units are housed in compact modules which each measure approximately two inches square by one inch thick. According to Dr. Ralph E. Simon, division vice president, **RCA Electro-Optics and Devices**, the company expects that the fiber optics communications segment of the electronic industry may grow to sales of over \$500 million annually.

# Split Second Time Machine

The Telex/Magnecord 1400 recorder. Split second timing accuracy. A grid of 524 lines passing a quartz crystal control rate of one capstan revolution. This senses, and corrects the speed of the DC servo drive some 4000 times per second\*. Speed stability is so accurate the National Weather and the Environmental Services selected Telex/Magnecord 1400's over all others to record meteorological display data. Of course, broadcasters also favor the 1400 for the rugged stability of the die cast main-frame, DTL logic and exceptionally clean electronics. Compare our speed, specs, and price. We invite you to make a split second decision.

\*At 7½ ips, adjustable ± 1% to compensate for tape thicknesses and mechanical wear.

PRODUCTS OF SOUND RESEARCH  
**TELEX**<sup>®</sup>  
COMMUNICATIONS, INC.

9600 ALDRICH AVE. SO. • MINNEAPOLIS, MINN. 55420 U.S.A.  
Europe: 22 rue de la Legion-d'honneur, 93200 St. Denis, France  
Canada: Telak Electronics, Ltd., Scarborough, Ontario

Circle 116 on Reader Service Card



# The Sony BVH series. Consider the accomplishment.

Two years ago, 1" helical-scan recording was just a gleam on the broadcast horizon.

Now, there's the new SMPTE Type C Standard.

We're kind of proud of that. From the start, Sony Broadcast was a leader in the 1" revolution. We pioneered many of the technical innovations incorporated into the 1" helical-scan VTR. And it's good to be part of a movement so beneficial to the broadcast industry.

How does our new SMPTE Type C machine differ from the more than one hundred BVH-1000's already in use across the nation? Frankly, very little.

And we're proud to be able to offer you SMPTE-standard 1" machines that maintain all the unique advantages of the Sony Broadcast equipment already in the field.

**Consider the advantages.** Advantages like BIDIREX, which gives you full bi-directional search capability in both shuttle and jog modes. And that means 100% post-production creative freedom, with all the ease and flexibility of 35mm film techniques.

Advantages like the incredible economy of the 1" tape format. Far lower acquisition costs. Smaller size, so you save valuable studio space. Lower maintenance costs. Plus major savings in 1" videotape alone.

Advantages like three high fidelity audio tracks. Color framing, to maintain perfect timing continuity during editing and animation

sequences. And more.

**Consider the possibilities.** Think about the local programming capabilities that open up with the BVH-1000 and portable BVH-500. Capabilities quad can't match. With an economy that leaves film far behind.

Think about creating your own documentaries. Taping your own commercials. Think about taking 1" tape out into the field, then bringing it home and going directly on the air without the need for converting to another format.

Think about the kind of panoramic production once possible only on film. And think about what single-camera film editing techniques will mean to your creative effort.

**Consider the source.** There's one more thing you should think about as you consider the move to 1".

The source of your equipment.

And when you consider Sony Broadcast, you'll find benefits no other source can give you.

Like our years of experience in research, engineering, and production of advanced video systems.

And access to a complete family of professional video equipment from a single manufacturer. With the kind of reliability and performance only a single manufacturer system can guarantee.

The BVH Series, from Sony Broadcast.

All things considered, it's quite an accomplishment.

## Sony Broadcast

Sony Corporation of America, 9 West 57 Street, New York, New York 10019  
New York: (212) 371-5800 Chicago: (312) 792-3600 Los Angeles: (213) 537-4300 Canada: (416) 252-3581

Sony® is a registered trademark of Sony Corporation of America  
Circle 117 on Reader Service Card

# RADIO

PROGRAMMING & PRODUCTION FOR PROFIT

## Talk Format Seen As Profit Builder

THE TALK SHOW is nothing new, but in high-density markets such as metropolitan New York, where one crowded music format vies with another for that ever-precious listener, talk is the profit-maker today. In fact, some of the major stations rely heavily on talk for best possible listener appeal.

"We're 98 percent talk" is the way WMCA's Vice President/General Manager Dennis Israel summed it up. And interestingly, two talk headliners on the station came from arch rival WOR, which also finds the mostly-talk format a profit builder.

At WOR, the mostly-talk format is widely varied with a few long-haul talk shows interspersed with numerous different personalities, each with a one-hour show per day. On weekends, you can also hear specials such as the Saturday Metropolitan Opera broadcasts and New York Jets football games. But the rest of the time, it's talk — very profitable talk.

Interestingly, the one non-talk station *BM/E* contacted, Philadelphia's classical station WFLN, characterized its one hour a day of talk as prime time for advertisers, and the station charges premium rates for this period.

### WMCA, New York, NY

Using 5000 watts AM with a directional array sited in Kearney, NJ, slotted at 570 kHz, the station has a prime listening audience over an estimated 50 mile radius. Vice President/General Manager Dennis Israel summed up the station's philosophy for *BM/E*:

"We believe in using well-known personalities in our talk segments. The majority of our people are doing the same sort of thing they've been doing for a long time and are pretty recogniz-

able in the areas they're in.

"For example, Barry Gray, who's on from 10 p.m. to midnight has been doing his kind of talk show for 27 years. His is more interview than talk, and he will take some phone calls. He's very contemporary, and deals heavily with politics, the city, and show business.

"Long John Nebel is on overnight and has been doing his kind of show for 23 years. He's an extraordinary interviewer. Now, we've just added Barry Farber to our lineup.

"What we try to do here is to be extremely contemporary in order to reach a very general audience. Evening seems to be the best time slot; it's an alternative to television. In radio, the prime volume is drive time, and this is where the greatest demand for advertising time is on any station. But a talk station that's successfully run can sell a tremendous amount of time in the evening — which we do. Most music and other stations do not do as well in the evening hours as during drive time. Yet we do extremely well in the evening. For example, we get as much for a Barry Gray or Nebel spot as we do for morning drive.

"In the last ARB, we found that we garnered about half of the general audience for this type of programming. Our demographics tend to be very young, but there's no one category that we appeal to.

"Historically, talk format stations like us tend to do much better than other types of stations on a response-type of advertising. People are *listening* up front; this is not background music, and the listeners are involved. You can't make love to this radio station.

"Our non-talk programming is minuscule — not even two percent, and

this fraction is religious programming. I should amplify — we broadcast a lot of sports programs — baseball, hockey, and basketball — which make up about 24 to 25 percent of our broadcast day. And we consider this to be listener-involved talk programming. Our sports programs reach a very young audience, both male and female, and we deal with a lot of clients who would normally buy contemporary music stations."

### WOR, New York, NY

Broadcasting at 50,000 watts AM from a directional array in Lyndhurst, NJ at 710 kHz, the clear channel station has a huge listening audience and takes full advantage of nighttime skip for even greater reach.

According to Dan Griffen, WOR's director of operations, the all-talk-show day starts at 5 a.m. with John Gambling's five-hour marathon of news, traffic, and weather with about one record played per hour. This is followed by one-hour slots filled by Arlene Francis, Pat McCann, Jack O'Brian, the Fitzgeralds, and Sherrye Henry, which takes the programming day through 3 p.m. The different programs each have their own particular emphasis — critical reviews, discussion with phone-in, current issues, and just plain rap.

Each hour, the programming changes with a 10- to 15-minute news broadcast, and at 3:15, the rather unconventional Gene Klaven takes over for nearly four hours of drive-time news, weather, and traffic.

Evening programming starts with the one-hour *Radio Mystery Theater* produced by CBS — an immensely popular feature, according to Griffen. This is

continued on page 29

Broadcast Electronics moves to automation . . . . .

# CONTROL 16 moves out front



among microprocessor program automation and it should—it's the "INTELLIGENT ONE"

Only with Control 16 do you have all the benefits of the intelligent radio program automation system

LIKE . . .

## 5 INTELLIGENT AND INNOVATIVE CRT DISPLAYS—YES FIVE!

It is absolutely amazing the ease with which you have full system control.



Exclusive Assignment Table display for easy change of source assignment (Time Announce, Dead Roll, etc.) from the Keyboard instead of being hardwired directly.



Exclusive Diagnostic Logging display for instant review of last 10 logging lines. From anywhere in the station you can see if events as scheduled did actually play.



Exclusive Program display for monitoring on-air programming while at the same time (and on same display) you can make program changes.

## PLUS 2 MORE EXCLUSIVE REVIEW DISPLAYS

You can look ahead at any 96 Program Events at one time. Or look at any 72 Compare Time Entries at one time. Both available for making intelligent programming decisions.

## AND THESE "OUT FRONT" FEATURES

### Intelligent and Attractive Portable Keyboard

This low, clean keyboard design eliminates all those unnecessary keys that cause confusion. Control 16's **self teaching** keyboard makes automation operation a real snap.

### Intelligent and Versatile Memory System

Innovative memory concept with SEQUENTIAL, MAIN/SUB, and TIME INSERTION PROGRAMMING. Plus a unique 12/24 hour self correcting digital clock system. With a powerful 500 entry Compare Time memory with 17 programmable functions!

There is a lot more that Control 16 offers. To learn what modern automation equipment is capable of, send for our brochure on Control 16. Or call John Burtle at (217) 224-9600 and tell John you want to know more about "THE INTELLIGENT ONE."



## BROADCAST ELECTRONICS, INC.

PRODUCERS OF *Spotmaster* TAPE CARTRIDGE EQUIPMENT  
4100 NORTH 24th STREET, QUINCY, ILLINOIS 62301

Circle 118 on Reader Service Card



# 9 outstanding reasons why you should choose Otari

**1. MX-5050-2S Two-Channel Half-Track** Popular worldwide • 15 & 7½ or 7½ & 3¾ ips • Optional dc capstan servo • Also reproduces quarter-track • Other features listed below.

**2. MX-5050-FL One-Channel Full-Track** • 7½ & 3¾ ips • Also reproduces two-track.

**3. MX-5050-QXHD Four-Channel Quarter-Inch** 15 & 7½ ips • Variable speed ( $\pm 7\%$ ) dc capstan servo • Other features same as two-track.

**4. MX-5050-8D Eight-Channel Half-Inch** Full eight track performance and features • 15 & 7½ ips • Variable speed ( $\pm 7\%$ ) dc capstan servo.

**5. Mark II-2 Two-Channel Quarter-Inch** All MX-5050 features plus: • Separate transport and electronics • 15 & 7½ ips • Variable speed ( $\pm 7\%$ ) dc capstan servo.

**6. Mark II-4 Four-Channel Half-Inch** Same features as Mark II-2.

**7. MX-7308 Eight-Channel One-Inch** Compatible one-inch eight-track format • 30 & 15 ips • Reel tension servo • Long life heads • Floor console.

*Call or write for full specifications and pricing.*

## OTARI

**8. ARS-1000 Automated Radio Station Reproducer** Two speeds 7½ & 3¾ ips • Two channel stereo • Ruggedized for continuous operation.

**9. DP-4050 8:1 In-Cassette Duplicator** Easily operated • Open-reel master (7½ or 3¾) and six slaves • Six C30's in under two minutes.

### All Otari recorders feature:

- Professional quality and reliability
- Selective reproduce on all channels
- 600 ohm +4 dBm outputs
- XLR connectors • 19 dBm headroom
- Motion sensing • Edit and cue
- Built in test tones • Portable, rack, or console mounting

# IT'S A PLEASURE TO PROGRAM BASIC A

Just tell BASIC A what you want to do, in standard broadcast English... and it does it. No need for complex codes, no translation into computerese.

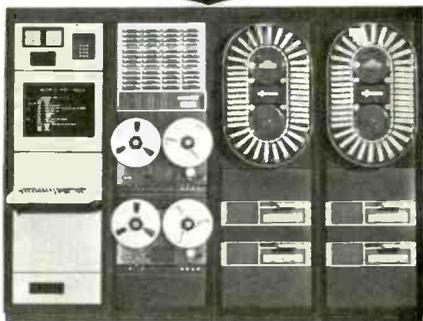
And, anytime you want to add, insert or delete program entries or alter your programming in any way, just ask BASIC A, in English, and the system will respond.

BASIC A performs all the functions all IGM systems ever did... and more. It stores 4000 events via RAM (Random Access Memory). It's expandable in 2000-event increments. And for right now, BASIC A operates with existing peripheral equipment. As your needs grow, BASIC A grows with you.

Best of all, BASIC A is less than the cost of other systems that give you less. Ask for the brochure.

## IGM

A Division of NTI  
4041 Home Road  
Bellingham, WA 98225  
206-733-4567



Circle 119 on Reader Service Card

## Radio Programming

followed by two hours of Bernard Meltzer's phone-in-for-advice program — another very popular time slot.

Carlton Fredericks holds forth about nutrition from 10 to 10:30, followed by a half-hour of Garner Ted Armstrong. Bob Grant takes over the graveyard slot from 11:30 p.m. to 5 a.m. with an open forum, often with guests and some phone-in.

"Meltzer's show has shot out of sight with its ratings," Griffen commented. "Meltzer holds a Ph.D., is a civil engineer, was chairman of Philadelphia's planning commission for several years, had been a professor of finance and real estate, and has done his own real estate developing — he knows where he's coming from. His program has been on for about three years, and we've just expanded it. He started out with a two-hour slot on Saturday night; then we put him on Saturday daytime, and he is now on weeknights.

"We also carry New York Jets professional football games, and 21 weeks of Metropolitan Opera performances on Saturday afternoons. Joe Franklin does the Saturday night show, a nostalgia program. And we have some weekend variations interspersed with some religious programs.

"Congressman Lester Wolfe does a 15-minute program on weekends with another congressman from the tri-state area so they can talk about legislation that will have a direct effect on the area. We have correspondents and special news programs to go along with our very large news department."

Sunday night is religious programming night until 12:30 a.m. when what Griffen described as a "potpourri" program comes on until 5 a.m. "This program deals with various topics from nutrition to some sticky legal problems. There are special interview programs, and other such shows during this slot."

Regarding specific show revenues, Griffen pointed out that as a show's ratings increase, the revenue from that show likewise increases. "The Meltzer show, for example, has been extremely successful," he said. "Gambling during the morning drive time is still a very highly-rated show, while Meltzer gets a thundering commercial response. Strong personalities build credibility and also sell the product.

"Ours is a foreground format; it's not the sort of radio you just leave on for background music. When you're into talk, it's not a wall-to-wall music area. Our people are very strong personalities and they're talking with other exciting people."

continued on page 32

## BROADCAST AUDIO DISTRIBUTION SYSTEMS

FROM



### DA504

■ Standard DA504 systems are supplied with up to six active, balanced AT310 distribution amplifiers, c/w self contained PS855 power supply.

- Each amplifier is supplied with 12 600 ohm output splits.
- Remote, D.C. or computer ramp gain control available.



### DA505

■ Standard DA505 systems are supplied with up to six AM487 self powered amplifiers.

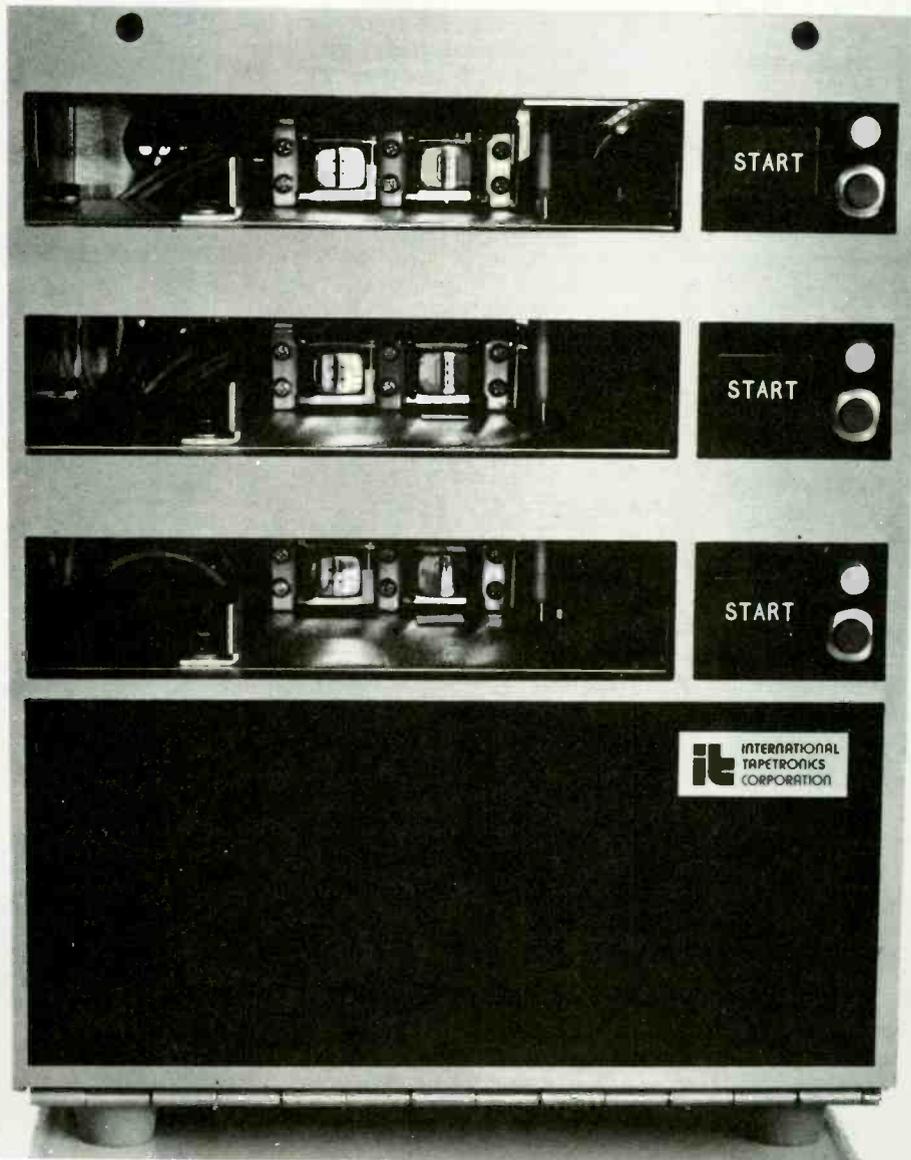
- Input and output transformer coupled with the output strappable for 4, 8, 16, 150 or 600 ohm impedance.
- Each amplifier capable of driving a maximum of 75 output splits, 600 ohm, or delivering 20W into 8-ohm load.
- Remote controlled mute circuit in each AM487.
- Front-mounted power heat sinks provide a cool interior operation.
- Larger audio distribution systems are also available.

## McCURDY RADIO INDUSTRIES

Chicago (312) 640-7077, TWX 910-222-0436  
New York (201) 327-0750, TWX 710-988-2254  
Toronto (416) 751-6262, Telex 06-963533

Circle 120 on Reader Service Card

# Evolutionary!



**The 3D Reproducer. An instant success.  
And it got better with time.  
Through engineering improvements like these:**

- New program recording and reproducing amplifiers provide less distortion, more headroom.
- +18 dBm audio output (optional).
- Improved 450 RPM capstan motor with less heat, less wow and flutter, higher reliability.
- New, long life Nortronics Duracore® heads. Ten times longer head life.
- Improved head mounting blocks provide better stability.
- Improved air-damped solenoid with Teflon® coated plunger for quieter operation.
- Self-aligning top capstan bearing.
- WRA Series Recording Amplifier (optional).
- New IC Voltage Regulators with thermal and short circuit protection provide improved regulation.
- Two year warranty on parts and factory labor.

#### **No Risk Trial Offer**

Try ITC tape cartridge equipment in your own station for 30 days. If it doesn't outperform the competition, return it. No cost. No obligation. To place a trial order call us toll-free. Ask about our attractive lease-purchase plan and trade-in allowances.

**CALL TOLL-FREE  
800-477-0414**

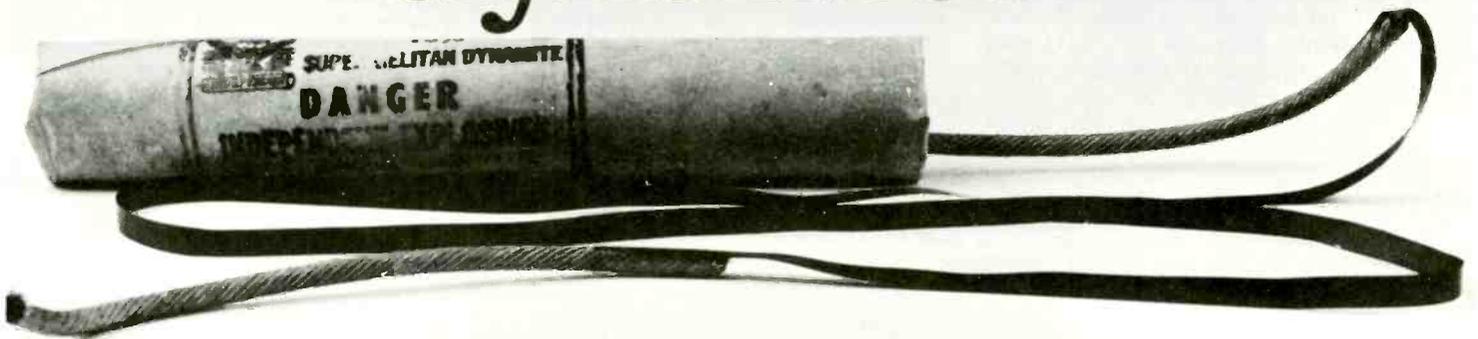
**In Alaska, Hawaii or  
Illinois call collect:  
(309)828-1381.**

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

**it** INTERNATIONAL TAPETRONICS CORPORATION  
Bloomington, Ill. 61701  
**Quality** Improves with Time

Circle 162 on Reader Service Card

# Talk shows can be dynamite!



(The risk is less  
with our 4 foot fuse.)

A four-function tape cartridge machine: normal cartridge recording and playback, plus network and continuous program delay. And that delay feature provides lots of insurance for little extra cost. Against libel suits, FCC actions, alienated audiences, estranged advertisers. Just insert an erased cartridge. A seven second tape (that's about four feet) for talk shows. Five minutes or longer to record a network program. Our three head, dual playback amplifier design

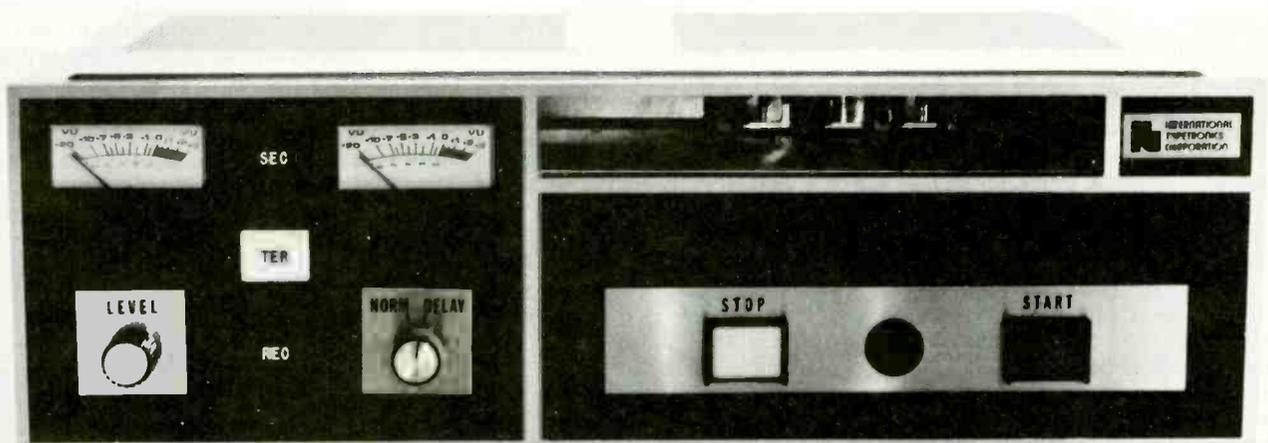
results in no audio compromises. Four functions for little more than the price of two.

#### No Risk Trial Offer

Try ITC tape cartridge equipment in your own station for 30 days. If it doesn't outperform the competition, return it. No cost. No obligation. To place a trial order call us toll-free. Ask about our attractive lease-purchase plan and trade-in allowances.

**CALL TOLL-FREE**  
**800-477-0414**

**In Alaska, Hawaii or  
Illinois call collect:**  
**(309)828-1381.**



INTERNATIONAL TAPETRONICS CORPORATION  
Bloomington, Ill. 61701

## Quality

"Insures" Performance

## Radio Programming

### WFLN, Philadelphia, PA

Broadcasting daytime AM at one kilowatt and a full FM schedule at 50 kilowatts, this station has an all-classical music format with one hour daily programmed for two half-hour talk shows. Program Director David Conant explained the need for this particular programming:

"We've had the one program, hosted by Ralph Collier, from 12:30 to 1 p.m.

for 10 or 15 years. It deals with the arts, artists, musicians, and so on. The other program is *Inside Delaware Valley* hosted by Frank Ford. This deals primarily with community issues and may from time to time deal with people in the arts." Conant said that this type of programming satisfies the station's public service requirements at a time of day that provides a good listening audience.

"More often than not, the second program focuses on interviews with community leaders, politicians, and local groups. It keeps our listener in-

formed about what is going on locally, what issues have to be dealt with, and so forth. It's up to each station as to how it's going to deal with public affairs. We don't consider this a departure from our format since we are a fine arts station. We do carry NBC news and NBC features. We feel that this is all part of our fine arts format."

Conant indicated that these two half-hour segments command a premium price from advertisers and that there is a heavy demand to buy time during this one hour per day of talk.

## BM/E's Program Marketplace

# Syndicators for Radio

### Concept Productions

P.O. Box 41406  
Sacramento, CA 95841  
Tel. 916-782-7754

GETTING THE BENEFITS of automation while simultaneously keeping the programming alive, fresh, and personal has concerned many radio managers. Concept Productions has made a success from satisfying exactly that need.

With three formats, Concept Productions supplies each one with a daily "voice track" of on-air personalities who introduce and discuss the music in a very relaxed, "one-to-one" manner. All the voice track announcers are experienced, highly successful on-air operators who have had, and currently hold, large audiences in West Coast radio. They not only give the music a daily fresh turn, but also supply custom IDs, PSAs, and promos for each station that further remove any sense of "automation" from the programming.

Concept Productions grew out of the success of Dick Wagner and some associates at KFYE, Fresno, Calif., starting in about 1971. As program director of KFYE, Dick managed to move the station from number 16 to number two with the kind of personalized program sectors that Concept Productions specializes in now. In 1973-74, Wagner and some associates decided to go on their own. Since then, the growth of the company has been moderate but steady, with Dick holding his original ideas and refining them with years of experience.

The firm now has approximately 20 clients, and Wagner is looking for more. Yet he does want to keep the operation comparatively small and

dynamic, with a rather small group who can move quickly and give full attention to the specific needs of each client.

This attention to clients includes specific market analysis and promotion aid, not only at the beginning of the service, but also whenever the station management feels the need for it. Even Wagner is "on call" 100 percent of the time. He believes that his accumulation of experience in getting stations to or near the top of their markets has great value for station managements everywhere. Nearly all of the Concept Production stations in rated markets are number one or number two.

There are three formats, or "concepts." Concept 1, "Contemporary MOR," vocal and instrumental MOR selections, aimed for the 25- to 40-year-old, is supplied in four "packages:"

- A tape of the 28 top current hits, which is updated weekly;
- A tape of 28 songs from one to six months old, updated weekly;
- Fourteen or more "library" reels of traditional MOR selections, with one or more new reels each month.

Each week, the client also gets the daily voice tracks for that week, and a complete plan for using the four elements of the music based on the analysis of that station's particular competitive situation and market need. This analysis is kept up to date through the constant consultation that Wagner and his associates provide.

The other two "concepts" work in a similar fashion. Concept 2 is what Wagner calls a "Soft Top 40," geared toward the 18- to 34-year-old. It, too, has two current tapes and two sets of "library" tapes of 14 reels each. The current tapes have the 21 top hits and 28 current songs; these are updated weekly. "Library A" emphasizes hits

of the past three to five years and "Library B" has hits of the past 10 years; both are updated monthly. There is also the weekly set of daily voice tracks and full instructions.

Concept 3 uses a parallel four-element arrangement of "Album 40" music. It is designed to attract 18- to 34-year-old listeners in market situations deemed proper for this music.

Dick Wagner says that the way the company's programming is organized allows him and his associates to apply quickly, with great flexibility, their particular skills in adjusting programming to meet changing market needs. He has some interesting comments on today's highly fluid trends in radio programming.

He says that concentration on very elaborate research often takes over at two or more stations in a market. One station, or its syndicator, brings in heavy research, and the other stations decide that they must have it too. But elaborate audience-survey studies tend to reduce the number of songs on the air as the client stations cut back to only the topmost songs. Soon, all the stations in one area are playing those songs, a situation which leads to audience boredom.

Wagner says that Concept Productions avoids this trap and keeps its programming fresh and interesting by maintaining a wide range of music and the "fresh voice" approach. Of course, he has to be up to the minute with the maze of trends in popular music. With that awareness, however, the effectiveness of popular music programming will depend more on skilled judgment by the programmer than on great research. Again, as often before in this series on syndicators, highly informed personal taste emerges as an essential element in devising radio programming that works. **BM/E**

- Experience **Super** Transparency  
**Super** Wide Window  
**Super** Portability

---

Microtime, Inc.  
1280 Blue Hills Avenue  
Bloomfield, Ct. 06002  
(203) 242-0761 TWX 710-425-2390

**MICRO****TIME**

# TELEVISION

PROGRAMMING & PRODUCTION FOR PROFIT

## Panavideo Productions: Network quality broadcast journalism on a worldwide scale from free lance outfit

NEARLY TWO YEARS AGO, after fourteen years as a news professional with ABC News and Mutual Broadcasting, Howard Goldsmith decided that the new technology and the explosion of television broadcasting in the world market created a set of circumstances which augured the establishment of a "broadcast news service that had television equipment, rather than an equipment service that did news."

Anyone who has witnessed the growing number of "video production companies" over the past few years can easily understand what Goldsmith is driving at. Many companies have been established in the recent past based on the fact that they had equipment and technical expertise. Frequently, these companies go after the full gamut of television production: industrials, commercials, training, education, etc. Some companies also take news assignments if they can get them, and others like Action Movie News, which we wrote about in this column for the January, 1978 issue of *BM/E*, make most of their revenue from news. Goldsmith's point is that Panavideo specializes in "legitimate news assignments." Panavideo does do commercials, industrials, and other types of production, but their greatest strength is their news savvy.

For instance, Panavideo recently

completed coverage of the OPEC (Oil and Petroleum Exporting Countries) Conference held in Caracas, Venezuela, on assignment from Visnews. Visnews Ltd. is, perhaps, the largest worldwide news-gathering organization in existence today. Based in London, Visnews is a non-profit consortium organized by some of the world's largest television networks such as the BBC, the Canadian Broadcasting Corporation, NBC, NHK (Japan), ZDF (Germany), and many other national systems around the world.

The meeting of the OPEC nations' oil ministers in Caracas provided Panavideo with an opportunity to really show off its capabilities. "Four months of solid planning went into the operation," said Peter Kimber, coordinator of the Locations Specials Unit of the Visnews News Division. The plan called for Kimber, Goldsmith, and the Panavideo crew to go to Caracas and provide two one-hour daily satellite news feeds of conference news to a number of client nations.

The conference news was beamed from Caracas to London, where it was converted to the appropriate standards for re-transmission to the client nations. The organizations receiving these reports included Abu Dhabi, Dubai Color TV, Bahrain TV, Libyan Arab Jamahirayah TV, Qatar TV, Iran TV,

the Japanese Network Satellite Pool, consisting of NHK, TBS, Fuji-TV, and NTV, as well as the BBC and ZDF (West German Television). Australia, New Zealand, and Hong Kong also received Visnews coverage. In the U.S., NBC and ITNA, as members of the Visnews consortium were entitled to use the coverage, and it is presumed that some of the Panavideo/Visnews efforts were probably used by these organizations.

### Covering the conference

The conference itself presented Panavideo with some fairly hairy challenges. For one thing, security for the conference was extremely tight. Platoons of Venezuelan Army troops surrounded the Melita Hotel where the conference was held to enforce elaborate security measures. The press was housed in the Macuto Sheraton Hotel, about a block and a half from the Melita. Separate sets of credentials were needed to gain access to either of the hotels, and a military escort of a captain or above had to accompany any news crew entering the Melita. No news crew could be admitted to the Melita without an appointment with one of the delegations, and a member of the delegation had to meet the crew at the entrance gate to the Melita before the crew would be allowed to proceed.

Given these restrictions, and numerous others, Goldsmith selected his equipment carefully. From Panavideo's inventory of three Hitachi SK-80s and an Ikegami HL-77, Goldsmith chose two of the SK-80s for their lightweight compactness and low light level operation. Panavideo also took two Sony VO-3800 portable videotape recorders, three Sony VO-2850s for editing and back up, and a Convergences ECS editing system with a Sony RM-400 for back up. Goldsmith also believes that cassette production can be of the highest quality, and with satellite transmission planned, signal processing was a major consideration. Goldsmith took along a Microtime 2020 with Image Ex for use in both the

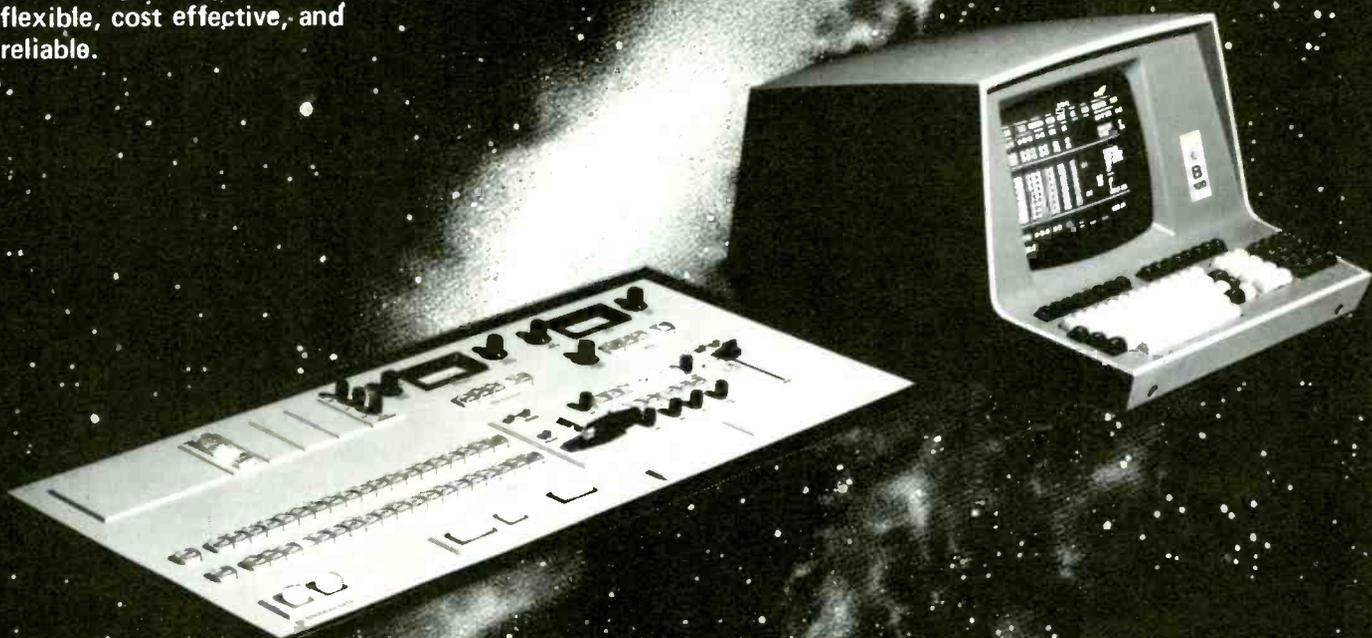
continued on page 36



*Panavideo president, Howard Goldsmith sits amidst Panavideo's equipment prior to departure from Caracas.*

**American Data**, innovator in fourth generation production switching, now introduces the first fully programmable computer controlled television switching system.

The **3100 Series Automatic Control Television Switcher (ACTS)** will meet any initial requirement and maintain the capability of improving or expanding the system as future demands are made. Modular expandability justifies its application in the smallest or largest broadcast facility. From basic manual operation to complete automatic control of event scheduling, the 3100 remains flexible, cost effective, and reliable.



**American Data**

A North American Philips Company  
Research Park • P.O. Box 5228  
Huntsville, Alabama 35805  
Telephone (205) 837-5180  
TWX 810 726-2125

ADC NORTHEAST  
P.O. Box 452  
New Hartford, CT 06057  
(203) 379-7840

ADC MID-ATLANTIC  
5504 Waterway  
Rockville, MD 20853  
(301) 460-1454

ADC SOUTHEAST  
2219 Oakawana Rd., N.E.  
Atlanta, GA 30345  
(404) 633-2100

ADC MIDWEST  
P.O. Box 27324  
Indianapolis, IN 46227  
(317) 784-3000

ADC WEST  
3760 Cahuenga Blvd.  
North Hollywood, CA 91604  
(213) 760-3221

## TV Programming

editing system and in the playback for satellite transmission. Electrical performance was another major consideration so Goldsmith took a Frezzolini crystal-controlled power inverter, and made certain that everything could work off converted DC if necessary. The power inverter, said Goldsmith, "provided rock stable 110 volt 60 cycle power off a 12 volt car battery." The Venezuelan current was 50 cycle so transformers were used for the most part. Added to this was an ample supply of batteries for cameras and recorders.

Perhaps the equipment that gave Panavideo the greatest advantage under the circumstances were the Motorola walkie-talkies they carried. Each of the two crews had a walkie-talkie for the unit chief and a third walkie-talkie was kept at the suite in the Macuto.

The Panavideo suite at the Macuto Sheraton was set up as a studio/base

station. In addition to the editing and other equipment set up there, they used one corner of the suite as a mini studio so that pool reporters could record their opening and closing segments which were to be edited together with the outgoing interview reports. "The idea," said Goldsmith, "was to get as many interviews with the various oil ministers as possible."

Peter Kimber, of Visnews, operated as the executive producer for the coverage. Kimber was invaluable to the operation since he had firm contacts with each of the oil ministers. He was frequently able to get interviews that no other broadcast journalist there was able to get. The idea was for Kimber to arrange for the interview. Then, Kimber or Goldsmith, with a camera crew, would walk the block and a half to the Melita. There the soldiers would check their credentials and then radio into the hotel to the delegation the crew was to see. A member of the delegation would come out and, along with an Army officer, escort the crew to its

interview. As many interviews as were possible at one time would be arranged to minimize the travel back and forth between the hotels. This was one area where the walkie-talkies were indispensable.

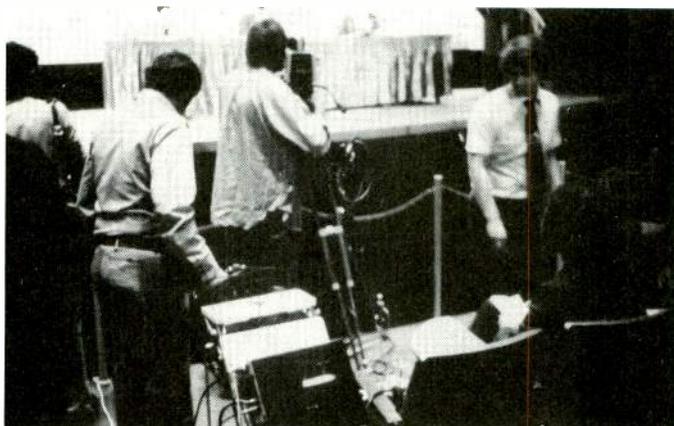
Once the interviews were completed, the tapes would be rushed back to the Panavideo suite. There, the pool reporters would make their selections and the piece would be edited. Since the pool consisted of many client nations, Panavideo had a library of leaders. If a segment was scheduled for German television, the appropriate German academy leader was rolled onto a cassette, followed by the German reporter's opening, then the interview, and then the closing. Abutted to this piece might be the NHK slate in Japanese, followed by that report. All the various reports were edited onto a single cassette.

At the appointed hour, the cassette was taken downstairs where Venezuelan television operated the satellite uplink. A Panavideo technical director would hook up the Microtime 2020 to the Venezuelan's Sony 2850, and when communications with London were established, the feed would begin. Voice communications between Caracas and London advised the receiving end when to change cassettes for the delivery of each client nation's segment. This entire process was performed twice daily and took about an hour each time.

The most hectic day of the five-day conference was the last. As the conference was breaking up, every oil minister was in a hurry to get on his way; yet a wrap-up of the conference was essential. Kimber and Goldsmith devised a plan of attack. Since Kimber was "virtually on a first name basis with the oil ministers," he preceded Goldsmith and the Panavideo crew. He would set up an oil minister for an interview, and then Goldsmith would slip in and do the interview. Meanwhile, Kimber would move on and set up the next interview and keep the minister busy until Goldsmith arrived.

After several interviews had been accomplished, the crew ran out of tape and their batteries were getting low. Goldsmith got on the walkie-talkie to the suite at the Macuto and ordered additional cassettes and batteries. A hotel bellhop was given the supplies and a walkie-talkie, with instructions to get to the Melita entrance and simply announce on his radio that he was there. The relay worked beautifully but still took about ten minutes to complete. Goldsmith and Kimber were able to keep the oil minister occupied by playing back a segment of his interview on the camera monitor and giving him a sort of crash course in use of the equipment.

continued on page 39



*Panavideo crew tapes opening press briefing given by OPEC press chief, Zahari.*



*Cameraman John Lindley and executive producer Peter Kimber, VISNEWS, stake out Melita Hotel for interviews with oil ministers.*



*Iranian Oil Minister is interviewed by Peter Kimber in lobby of the Melita Hotel.*

# The FV4-ESR Video Earth Station.

**Totally self-contained.  
A variety of outputs and options.  
Superb maintainability.**

*Farinon*

# Farinon

**Only Farinon has it all.**

**Turn the page and see -**

# The Farinon Video Earth Station.

The only complete video earth station has more options, too.

Now there's a *complete* video receive-only earth station that can give you the outputs you need, without the need for peripheral equipment and secondary suppliers. Farinon's FV4-ESR package gives you much more than just audio and video drops. You can feed a microwave radio link or a CATV system—or use it as a stand-alone source for audio and video signals. The system is fully compatible with NTSC, PAL, PAL-M, and SECAM standards.

**Baseband interface options:** separate audio and video outputs for use in CATV distribution systems or composite video with 4.5 MHz intercarrier for CARS-band microwave.

**IF interface options:** a 70 MHz output to drive a heterodyne back-haul radio system.

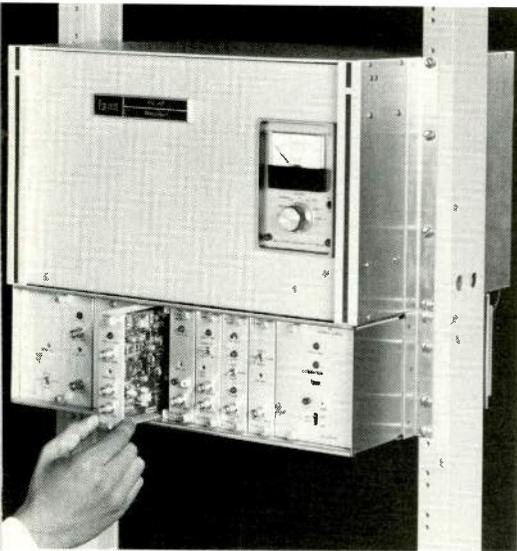
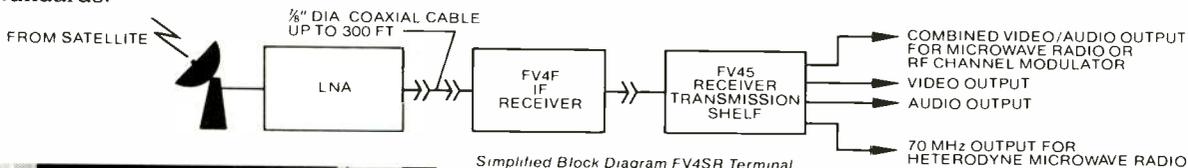
**And some versatile plug-in options:** AM and FM program transmission channels, orderwire channels, clammers, remote control and monitoring equipment, FM cueing, and 4.5/5.5 MHz aural carrier generators.

single extender board to care for all modules.

**And we give you an easy way out in case of power failures.** You can switch from 110 VAC to 24-48 VDC just by plugging in a new power supply. You don't have to buy an inverter. It's a simple, inexpensive step to take when you have to go into protected modes.

**But we're not just selling equipment.**

We're selling Farinon. Which is complete factory support—system



FV4SR Terminal. System shown includes FV4F Receiver and FV45 Baseband Shelf.

**We've made it easy to maintain.**

It's the right size and shape. We coordinated size, shape and mechanical design to put everything within easy reach. That's why the receiver is more spacious than other makes. It's also the reason you won't find any 4GHz push-on fittings. Not only that, but you need only remove a single panel—the front panel—and you can get at everything.

And *Pin-Out* on every module is identical, so that you need only a single extender board to care for all modules.

engineering, field service engineering, and repair service. Experienced telecommunications engineers. Twenty-four-hour customer service. A single responsible supplier for all parts of the system including antenna and low-noise amplifier. Factory-pretested equipment, quick and easy to set up.

So go to the most versatile, maintainable earth station you can buy. And to the company with the outstanding service, worldwide. Farinon.

Call us collect. Ask for the Video Sales Group. And watch us respond. We'll give you the engineering help you need.

Remember only Farinon has it all.

See us at the NCTA Show  
Booths 822 and 823.

# Farinon



Farinon Electric  
1691 Bayport,  
San Carlos, CA 94070.  
Phone (415) 592-4120.  
Telex: 34-8491.

**Only Farinon has it all.**

Circle 161 on Reader Service Card

## TV Programming

During this period, the pool reporters were using the mini-newsroom set in Panavideo's suite to record their wrap-up reports. Eventually, the pool reporter's segments were merged with the interviews done by Kimber and Goldsmith, and the final reports were transmitted.

Bringing off a major assignment like this requires what Goldsmith believes Panavideo has most of: broadcast journalism experience, good engineering, good organization, and good equipment. Goldsmith points out that "we don't treat any of our equipment as appliances." Every piece of equipment receives constant care and maintenance. "We shoot for quality that meets or exceeds FCC standards in all circumstances," says Goldsmith. Before any piece of equipment goes out, it is thoroughly checked for performance and it is checked again when it returns. "Cassette recording," says Goldsmith, "can give beautiful pictures if tension is always checked and if heads are maintained the moment they drop below certain standards." Many of Panavideo's assignments are overseas, and even though freight charges can be heavy, "we carry a few hundred pounds of back-up gear just to make certain."

In addition to many such overseas assignments, Panavideo does quite a bit of work here in the U.S. "We will accept any legitimate news assignment," said Goldsmith. This includes coverage of any event that a station cannot get one of its own crews to. Located in the Forest Hills section of Queens, a New York City borough, Panavideo has covered any number of assignments in and around the city for out-of-town stations. "We will sit down with a news executive and plan coverage, and we produce a complete news item." Panavideo will supply a professional broadcast journalist if so desired. "We have about five that we like to use," said Goldsmith. "These are broadcast journalists who make their livings in television news." In addition, there are a number of cinematographers on call who can bring to a single camera production the high quality images that can make a story work, according to Goldsmith. If the story requires a multiple camera operation, Panavideo has a specially-built "production pod." The pod contains broadcast standard equipment for up to three cameras and can be transported in a station wagon and set up almost anywhere. The pod has also been taken on commercial airlines for out-of-town assignments (most recently to Washing-



*Panavideo's specially designed "production pod," offers go-anywhere capability.*

ton, D.C. for coverage of an event at Kennedy Center).

The point Goldsmith likes to stress, however, is the importance of understanding what must go into a story from a journalistic standpoint. To illustrate this, even in a simple case, Goldsmith tells of a recent assignment Panavideo received from NHK, the Japanese network. Panavideo was told to record a "handshake" between the Japanese ambassador and the Ambassador to the United Nations of the Peoples Republic of China. This "handshake" description was about all the information Goldsmith received in the way of instructions, but he realized that this wasn't enough material to make a broadcast story.

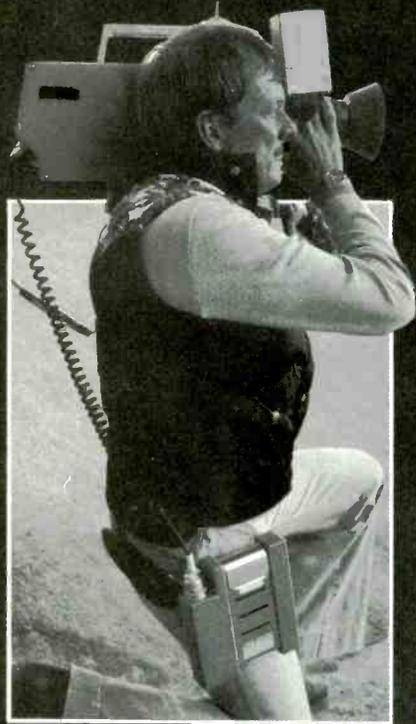
As it turned out, the Japanese ambassador had invited the Chinese ambassador to a dinner meeting. Goldsmith and his crew recorded not only the handshake, but the limousine arrival, the signing of the guest book by the Chinese ambassador, the table settings, and the ambassador's tour of the Japanese residence. The cassettes were turned over to a representative of NHK and Goldsmith never saw them again. The important thing was that there was enough information of a wide enough variety that a "story" could be done.

The next expansion for Panavideo will be the establishment of a Washington, D.C. newsbureau. Goldsmith feels

that his wide experience in network news has provided him with valuable contacts in the Washington community, and that many events in Washington are of such specific interest that network news organizations fail to provide sufficient coverage for those specific interests. Goldsmith sees an opportunity to provide coverage of local representatives for home districts and coverage of events that are of interest to foreign clients. Goldsmith will again provide broadcast journalists for clients requesting them and will be able to establish those reporters as the client's Washington stringer if necessary. But Goldsmith also realizes that some clients, particularly foreign clients, may want to assign their own reporter to do the story in the client nation's native tongue.

Moreover, Panavideo normally records using both audio channels of the cassette machine and frequently uses the reporter's audio on channel one with the interviewee's audio on channel two. If desired, a client station can replace the Panavideo reporter's audio with narration by local talent to provide station identity.

To make such an approach work, says Goldsmith, the client must trust in Panavideo's journalistic, as well as technical, integrity. Goldsmith believes that he can prove this "integrity" to any perspective client. **BM/E**



You're covering live news. Capturing a story as it unfolds. Ready for a shift in emphasis at a second's notice. In a situation like this, the last thing you can afford to be concerned with is power failure... because no news is bad news.

The revolutionary Christie Reflex 20 charger and battery give you the reliability you need, as well as provide full recharge of completely discharged battery packs in 12 to 20 minutes. Even faster recharge of partially discharged battery packs. And there's more.

90 to 97% net charging efficiency keeps the batteries cool during charge and extends battery cycle life up to 10 times that of conventional ni-cads. Patented "Negative Pulse" minimizes capacity fading (memory). Christie's unique "Trough Voltage Sensing" assures charge turn-off at precisely the right moment. To insure long life, the

Reflex 20 System battery-temperature-lockout automatically delays recharging of overheated batteries due to high current discharge. The system includes a state-of-charge indicator. The net result is the least expensive battery on a cost per cycle basis.

Contact Christie for complete information on the Reflex 20 line. For dependability in DC power supply, Christie is the source.

# CHRISTIE

ELECTRIC CORP

The Source. Since 1929.

3410 West 67th Street  
Los Angeles, California 90043  
(213) 750-1151

From outside California, call toll-free  
(800) 421-2058

TWX 910-321-3867



## When every second counts, count on Christie.

The charger/battery system that gives you full recharge in 12 to 20 minutes.

( Now Shipping From Stock )

Circle 123 on Reader Service Card

# Vehicles For Every Broadcast Need

There are probably as many different types of vehicles being pressed into broadcast service as there are types of assignments for broadcasters. The result is an interesting "menagerie" of specialized mobile units designed to provide the broadcaster with everything he needs, anywhere he needs it.

THE ONLY "ULTIMATE" BROADCAST vehicle would have to be designed by a Rube Goldberg. It would have to be part off-road vehicle, part land cruiser, small enough to get through tight places, large enough to carry umpteen cameras, smooth-riding enough to protect the equipment, rugged enough to take mountain paths, simple enough to work in easily, and complicated enough to do all the things a broadcaster has to do. Since this "ultimate" vehicle has not been built, we have, instead, a wide variety of vehicles incorporating varied capacities.

Not even a single station can select "the optimal vehicle" so the result has been opting for a number of vehicles. WCVB-TV, Boston, has a veritable menagerie of broadcast vehicles including the "Bumblebee," the "Zebra," and the "Hippo." As you might have guessed, the station has gone so far as to give each of these specialized "broadcast beasts" its own distinctive paint job to carry the theme even further.

All three of the WCVB-TV vehicles are products of Wolf Coach, Inc., Northboro, Mass. The "Bee" was the second van built by Wolf Coach, the first one going to WBZ-TV, Boston. In those days, the idea was to mount the equipment on roll out racks for easy maintenance and to facilitate removal of equipment for setup on location. Though a handy idea, experience showed that equipment was not often taken off the van for field production. The next generation of WCVB van was the "Zebra," which eliminated the roll off capability in favor of fixed equipment and more working space for operation from inside the van. This was accomplished by placing the equipment racks across the back of the van. This way, access to the rear of the equipment racks was achieved through the rear of the van. Access panels protect the rear of the racks and need only be removed for maintenance of the equipment. Hookup can be achieved through ports in the access panels.

Both the "Bee" and the "Zebra" are essentially ENG/EFP vans intended to get the necessities of production to a location. Both are equipped with microwave capability and are basically single-camera units. The "Hippo," which is yet to be constructed, will be a three-camera unit with complete production facilities. This larger unit will be built in a "bread truck"-type vehicle.

Stations, by and large, have chosen the van for obvious reasons. While relatively compact, the van will carry a lot of gear. If carefully planned, it can carry enough equipment for any type of assignment from breaking news to a three camera remote. Most stations, however, seem to have kept the vans on single-camera

continued on page 42



interior of WGBH's field production van by Wolf Coach. This configuration reflects the intention of WGBH to use the van for remote recording. Because the van is used for remote production and not news, more room is provided for personnel.



Another configuration for the interior reflects the intention to use the van as a production center. Wiremold is installed around the interior to provide a maximum number of power outlets since actual layout of equipment may change from day to day.



Another Wolf Coach approach is to install equipment racks at the rear of the van. Plug-in to the equipment is achieved through ports in the access panels. Maintenance is done by removing the access panels.

## Vehicles For Broadcast



Rockford Park Cablevision of Rockford, Ill. uses cherry picker baskets for camera position. Live feed is provided to headend over existing cable lines.

WGBH's production module, mounted on a 4-wheel drive chassis has a 24-inch fold out camera platform at the rear door. The storage space on the roof of the van has also been reinforced for use as a camera platform.



assignment with "live" ENG capability. Assignments requiring multiple cameras are usually relegated to larger vehicles ranging in size from the "bread truck" to a 40-foot trailer. KGO-TV, San Francisco, however, does have a six-camera unit, "Star Ship Seven," built onto the body of a one ton Ford E 350. This van was built by E-N-G Manufacturing of Concord, Calif., which seems to specialize in getting enormous production power into small packages. Jack Harris, president of E-N-G, is currently building the ENG Sedan, which was exhibited at the NAB Convention.

The Sedan is a Ford LTD and will carry a crew of four. Structurally, only the rear suspension has been



RCA constructed Range Rover van uses roof turret for camera mount.



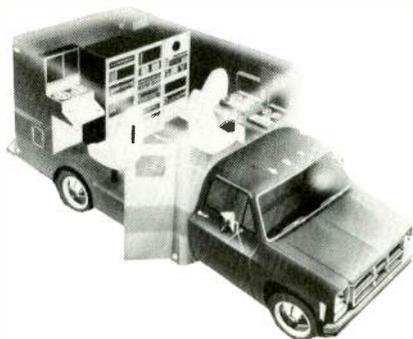
KCMO-TV's remote production unit, Mini Mote has both a camera platform on the roof of the truck and a cherry picker basket on an extension aerial ladder.

modified. The modification has been approved by California authorities and is simple so that it should not create maintenance worries. The reason behind the van is that, Harris feels, for urban environments, a sedan is much easier to handle than a van.

The rear seat of the sedan has been removed. In its place are equipment racks, power supplies, a small switcher (built by E-N-G), and an audio mixer. The operator sits in a swivel chair forward of this equipment rack, behind the passenger's side of the front seat. The chair swivels a full 180 degrees, from riding position to operating position.

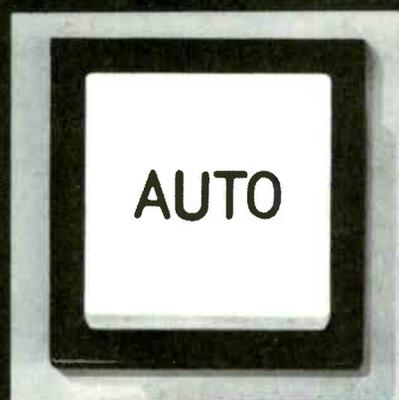
continued on page 47

The Video Box by Wolf Coach offers the broadcaster an opportunity to spread out the cost of the equipment module over several chassis. Internal configurations are numerous.

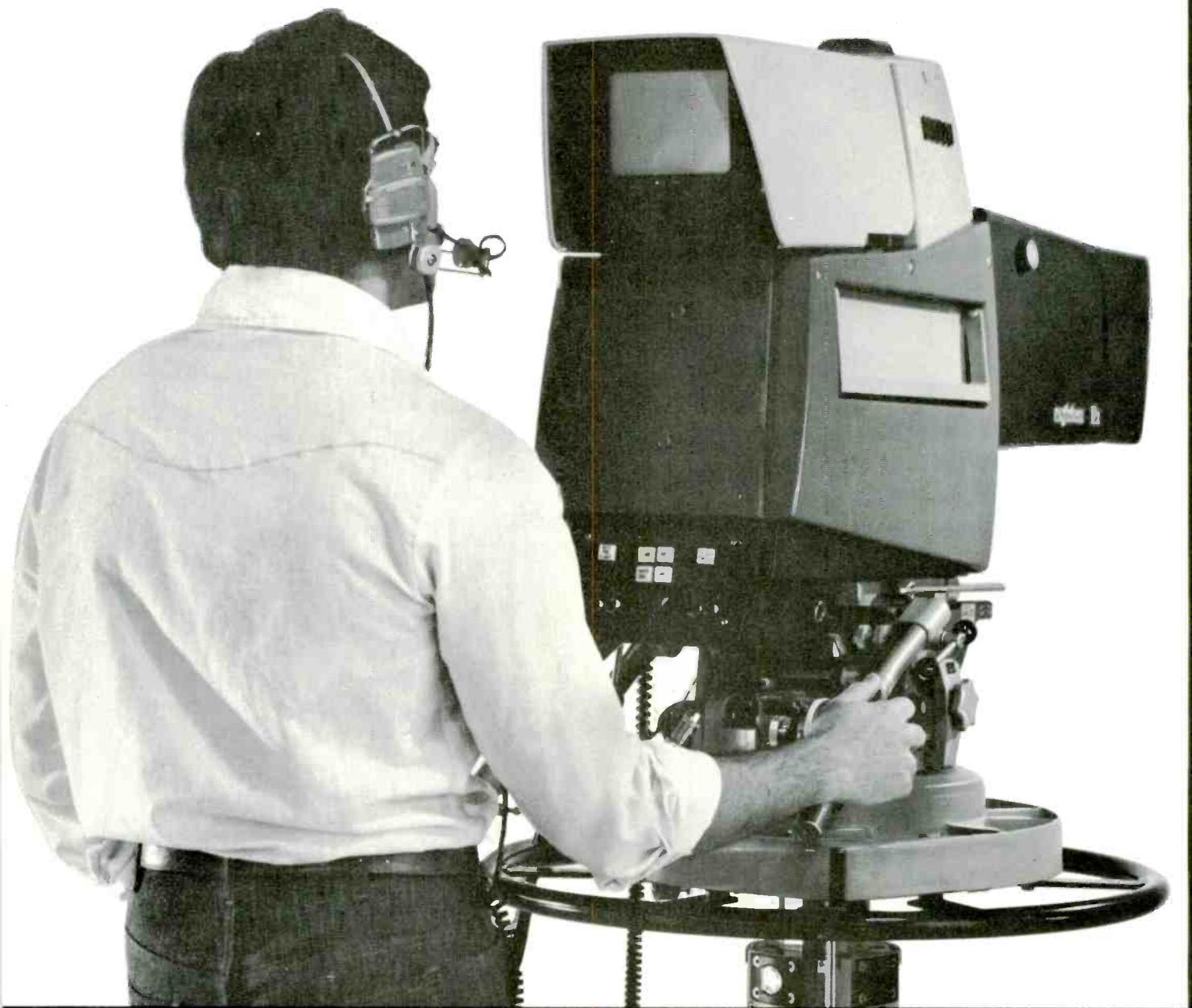


The WCVB-TV, "Bumblebee." A second ENG van, the "Zebra," has been added. Soon, the station will operate a third unit, the "Hippo," a 3-camera van.

**Touch a button...**



**and enter the whole new world  
of fully automatic television camera  
technology from RCA.**



*Setup control unit.*

*Automatic setup delivers consistent picture quality.*



# RCA introduces the "tomorrow" camera— the fully automatic TK-47, for today's ultimate in video freedom.

Here is a dramatic breakthrough from RCA: the completely new, fully automatic TK-47 studio camera.

The TK-47 offers completely automatic programmed microprocessor-controlled setup of all camera functions. And all at the touch of a single button.

State-of-the-art design technology is used throughout. Extensive use of LSI's, digital memory circuits and other sophisticated components provide new standards of stability, reliability and superior performance. Outstanding picture performance is yours with the touch of the "Auto" button. You get fast, accurate setup.

Your video operators can forget about tweaking and concentrate on artistic creativity and picture

composition. That's because numerous camera operating functions are automated, too—iris, white balance, black balance, pulse advance, cable equalization, plus many more.

The TK-47 is also operable in a semi-automated mode. It functions as an electronic instruction book to permit programmed step-by-step setup controlled by four knobs.

Either way—with the touch of a button or with semi-automated setup—the TK-47 gives you the ultimate video freedom in a studio camera.

See the TK-47 demonstrated at NAB, or contact your RCA Representative, or write us. RCA Broadcast Systems, Bldg. 2-2, Camden, NJ 08102.

## The new video freedom.

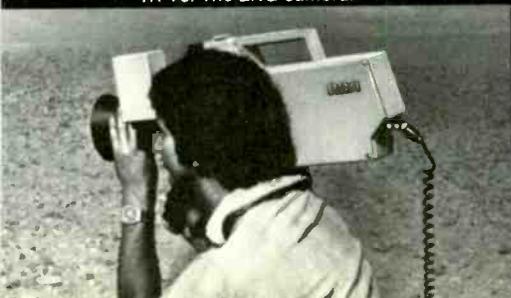
# RCA

*"The family of RCA video freedom cameras"*

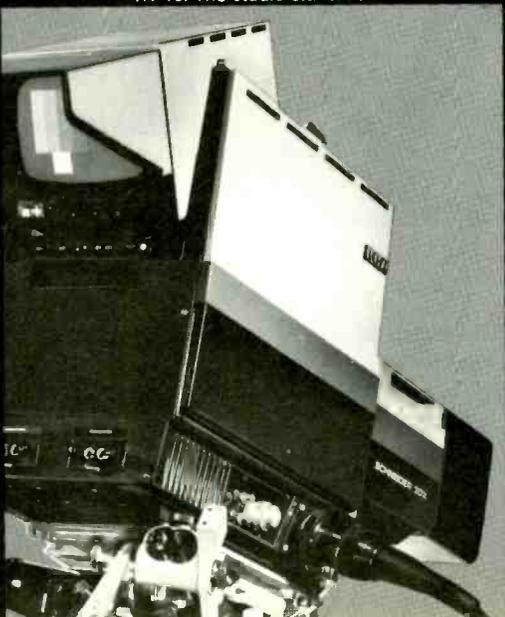
TK-760: The convertible camera.



TK-76: The ENG camera.



TK-46: The studio standard.



TKP-46: The system camera.



# Hitachi's Latest from NAB... Plus More!



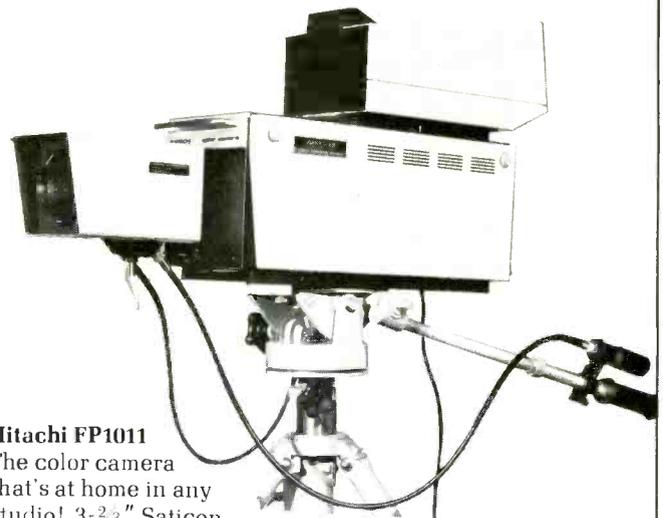
**Hitachi FP1020**  
Performance *PLUS* from a self-contained 3-Saticon ( $\frac{2}{3}$ " ) ENG/EFP color camera. Low power consumption, built-in vertical enhancer, plug-in PCB, auto white and black balance circuits, and much more.



**Hitachi FP 3060**  
For professional quality pictures from a modestly priced, one-piece ENG color camera! Features new tri-electrode Saticon<sup>®</sup> tube, low power consumption, aluminum die cast body, tiltable and adjustable viewfinder, and an optional single coaxial power supply system.



**Hitachi SK-90**  
Superb, broadcast quality ENG/EFP color camera (self-contained). Features 3- $\frac{2}{3}$ " Saticons with extra small prism optics, built-in ABO (Automatic Beam Optimizer) circuit, 2H Contour Corrector and Masking Amplifier, and low power consumption.



**Hitachi FP1011**  
The color camera that's at home in any studio! 3- $\frac{2}{3}$ " Saticon tubes, multifunction RC panel, optional kit for conversion self-contained use, tiltable and detachable 7" viewfinder.

- Plus:**
- Hitachi SK-96: our newest broadcast convertible.
  - Hitachi FP3040: the new economy convertible.
  - Hitachi FP3030-G: a self-contained Gen-lock economy portable.



Executive Office: 58-25 Brooklyn-Queens Expressway, Woodside, N.Y. 11377 (212) 898-1261 Offices in: Chicago (312) 344-4020; Los Angeles (213) 328-2110; Dallas (214) 233-7623; Atlanta (404) 451-9453; Denver (303) 344-3156; Seattle.

## Vehicles For Broadcast

Near the rear lefthand door are a 12-inch color monitor and an eight-inch black and white monitor. Forward of the monitors is the mast for the microwave antenna. This mast rises through the roof of the sedan. Fully retracted, the mast extends just eight inches above the roof, and fully extended (by the push of a button) it will rise to a height of 20 feet. Forward of the mast are power controls for the mast, microwave, an air compressor, circuit breakers, and VTR.

The microwave equipment is Microwave Associates. The transmitter and power supplies sit on a small cart rather than being permanently fixed to the floor. Harris says that many times, especially in San Francisco, it is easier to remove the microwave link from the vehicle and roll it up a hill or take it to the top of a building in order to get a "shot" at the tower. The microwave fits on a golf cart and has its own 12-foot mast with dual "Golden Rod" Nurad antennas.

In the trunk of the sedan is a 1500W generator, room for three light cases, tripod storage, camera storage, and a 500-foot reel of audio/video cable. Power outlets are installed in the rear fender. The overall height of the sedan is just 67 inches; and all of the equipment has added just about 400 pounds to the sedan's weight (not



*This motorcycle, exhibited at Montreux, as part of the TRT display, is equipped with a 13GHz CP transmitter as well as camera equipment.*

counting the weight of the microwave gear).

Wolf Coache's "Video Box" approach offers another alternative to the traditional van. According to Richard Wolf, who operates the company in partnership with his father, the "Video Box" approach is designed to let a broadcaster spread the cost of a van over several chassis rather than just one. All production equipment is

continued on page 50

## Tennis Anyone? — Or Golf, Football, Baseball — You Name It KBMA-TV Does It

The outside of station KBMA-TV's remote van proclaims in flowing script that it is "The Sport Station of Mid America." And the Kansas City UHF independent has the track record to prove it.

In 1977, the KBMA-TV production crews covered nearly every major city in producing more than 250 hours of sports programming alone for a wide variety of clients as well as a large number of remote commercials for local advertisers in Kansas City. The roster of sports production clients reads like the "Who's Who" of the major leagues in all sports with teams from the American League in baseball, the NHL, the NFL, and the NBA. The Big Eight football and basketball and World Team Tennis are also represented.

Robert Wormington, president and general manager of KBMA-TV, says, "The KBMA-TV remote unit has been one of our major revenue sources and is so much in demand that we have had to establish a priority for its use."

The demand has come from innumerable sources. All of the major networks have called on the KBMA-TV production unit for support production at one time or another. More than 41 individual stations from Chicago to Los Angeles utilize the KBMA-TV production unit. Independent producers have also found the Kansas City UHF's production unit to be valuable in their operations. In addition, the KBMA-TV remote team has been called on by the Hughes Sports Network, the Robert Wold Company, LaCiede Commercials, C.D. Chesley, TVS, the Schlitz Broadcast Division, and Sports Venture Productions.

KBMA-TV has one of the most completely equipped remote production units at any broadcast operation in the country, and the fact that it's one of the few in the country to boast a "Slo-Mo" Disc Recorder is a major reason for its great demand, particularly for sports coverage. The 32-foot long remote van is equipped with two Ampex Color Broadcast Cameras, a Grass Valley 1600 1A production switcher with 32 effects patterns with borders, a soft edge wipe, liner key chrome, and all necessary audio facilities and portable lights. Remote production costs are



*KBMA remote truck has logged over 20,000 miles in the production of more than 250 hours of programming.*



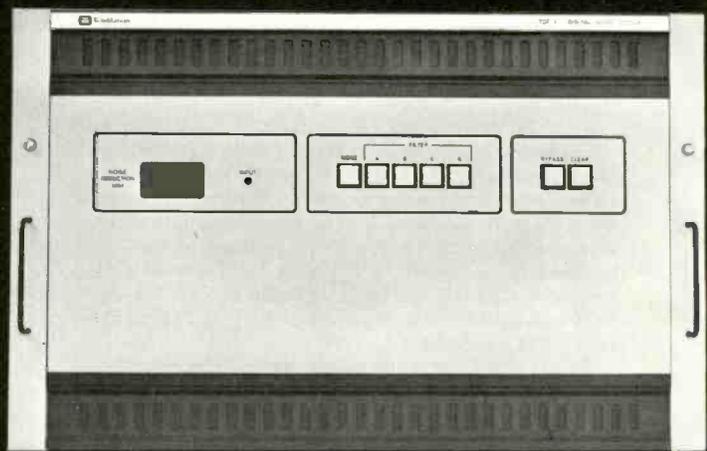
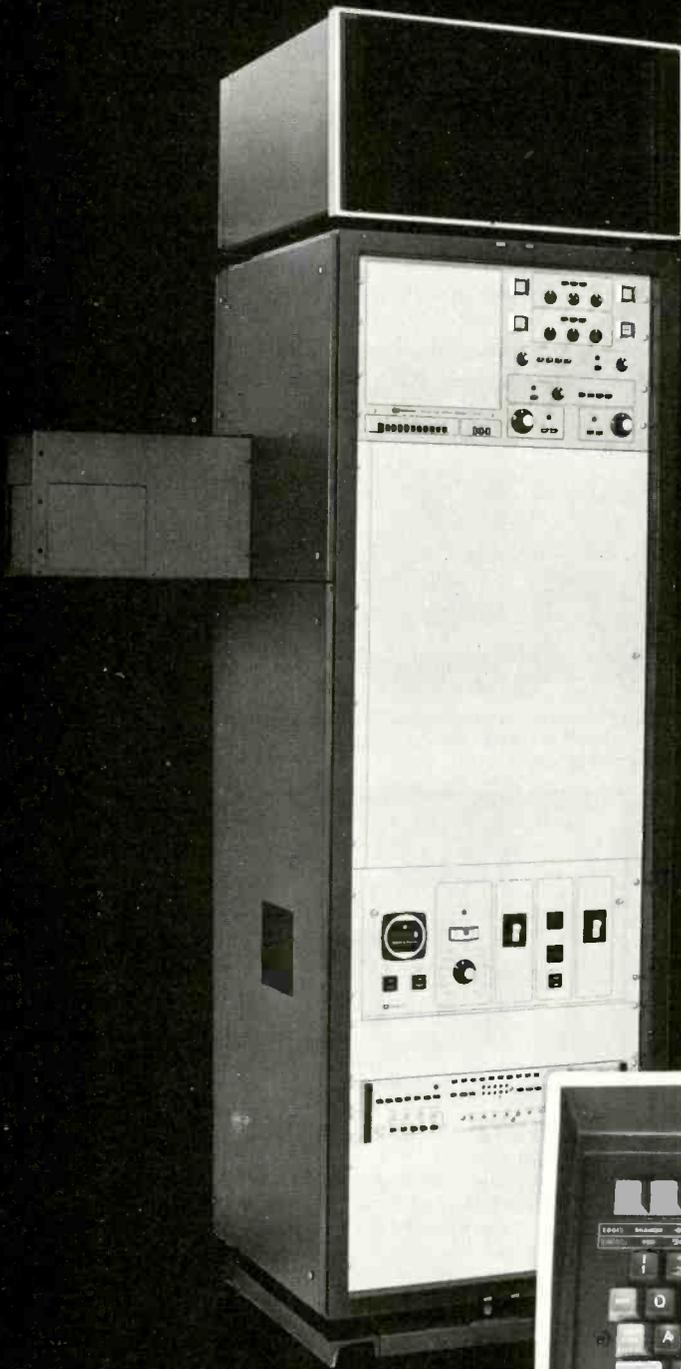
*Monitor bank inside truck. Equipment features one of the area's few "Slo-Mo" disc units.*

\$225 per hour with post-production editings \$75 per hour, and Slo-Mo use is \$60 per hour.

Lonnie Dale, production manager for the KBMA-TV remote station, considers his unit to be "another TV station." Says Lonnie, "We're really an extension of the Kansas City operation and we strive for the same quality of production on remote operations that our home station offers."

One thing that the KBMA-TV remote unit offers, according to Bob Wormington, is an opportunity to travel. "We're really like the service ads of the old days; instead of 'join the Navy and see the world,' it's join KBMA-TV and see the world." Last year, the KBMA-TV unit traveled over 20,000 miles as it covered over 100 major events. The crew figures that they spend about 80 percent of their production time on the road, and they're on the road constantly.

# New from TeleMation



### **Introducing a state-of-the-art digital noise filter that costs less.**

From input to output, the 8-bit TDF-1 represents an entirely new approach to digital noise reduction. At the input, we've included a full, broadcast-quality processing amplifier that completely regenerates incoming sync pulses. The TDF-1's charge-coupled device (CCD) memory offers the same high performance as RAM systems at a significantly lower cost. We've also increased the video sampling rate from three-times-subcarrier to four-times-subcarrier for greater bandwidth and resolution. And maintenance of the TDF-1 is made simple by a built-in diagnostic system.

### **A graphics system with off-line archival storage.**

Everyone who uses an electronic graphics system has their own artistic requirements. With the new Compositor I™ memory system, each of your clients (or departments) can use the fonts they like and logos they need to create up to 999 graphics on a low-cost, removable cartridge disk. At the end of their taping session, they simply take out the cartridge and put it on the shelf. The next user (such as your news department) can then load another cartridge containing different fonts, logos, and pages and be on line in seconds. And, with the new dual disk system, you can copy directly from one cartridge to another.

What else is new with Compositor I? Fonts! More than 40 fonts are now available, including weather symbols, graph characters, and foreign fonts. And Compositor I's are now in use in PAL countries.

### **A microprocessor-controlled distribution switcher.**

The new TVS/TAS-1000 Distribution Switcher microprocessor option can be programmed to perform salvo switches of multiple crosspoints simultaneously. Eight (or more) different salvos can be loaded into the system's memory and previewed by the operator before the live switch is executed, virtually eliminating the possibility of error. Other new control options include X-Y panels, where the source is selected with one button and the destination with another, and category-number selectors, where the input is selected by a name key (such as "VTR," "Camera," "Studio," etc.) and a number key.

### **A telecine camera that replaces GE units quickly and easily.**

A new optics kit allows the TCF-3000 Broadcast Color Film Camera to replace GE 240 and 240-format cameras without so much as moving a projector or changing a lens. The TCF-3000 also gives you true hands-off color balance and color correction, automatically correcting poor-quality film without disturbing balance or gamma tracking of good film. This long term operational stability is made possible by unique, temperature-compensated sampling and control techniques. The TCF-3000 has several other advantages over competitive units, such as lower noise, more detail in black, and superior color separation. And a fully-remotable six-vector color corrector is available as an option.

For more information about these TeleMation products, circle one of the numbers below or contact:  
TeleMation, Inc., P.O. Box 15068, Salt Lake City, Utah 84115. Phone: (801) 972-8000.



Circle 124 on Reader Service Card for TDF-1 literature  
Circle 125 on Reader Service Card for Compositor literature  
Circle 126 on Reader Service Card for TVS/TAS-1000 literature  
Circle 127 on Reader Service Card for TCF-3000 literature

## Vehicles For Broadcast

installed in a basic housing. The housing is insulated, reinforced, and all electrical wiring installed. Racks, cabinets, and work lights are installed in addition to alarm systems. It is all of this construction that is the most costly element of a van with the possible exception of the hardware that actually goes into it. Wolf points out, however, that hardware gets changed according to the state of the art, so that cannot necessarily be considered an integral part of the cost in a mobile unit.

Once all the "Video Box" is completed, it is mounted on just about any chassis the station chooses.

WGBH-TV, Boston, for instance, has theirs mounted on a four-wheel-drive vehicle. When the vehicle becomes worn-out, a new chassis can be purchased and the "Video Box" can simply be remounted on the new vehicle.

There are probably more than two hundred ENG/EFP vehicles in use at stations across the country. Added to this figure are EFP vehicles at colleges, production houses, cable-TV companies, and government agencies. We hope that the accompanying photographs will give you some idea of the hundreds of ways mobile units can be put to use. For a television station, a mobile unit can be a source of revenue (see KBMA-TV box) or, at the very least, a vital link in service to the community (see WJAR-TV box). **BM/E**

### ENG Shines In Rhode Island's Darkest Hours During the Blizzard of '78

The Great Blizzard of '78, which dumped up to 54 inches of snow on southeastern New England, began on the morning of February 6. Steve J. Caminis, WJAR-TV's news director, decided to send the station's microwave-equipped ENG van to the state capitol, site of the Civil Defense Headquarters for Rhode Island. Caminis figured that with meteorological reports indicating that "this would be a big one," he might get a piece for the evening news on the state's preparedness.

A reporter, photographer, and engineer were sent out in the van. A second engineer accompanied the crew to help set things up. All in all, the van was expected to return to the station later that night. It didn't, nor did the crew. Instead, the storm became massive and the WJAR team found themselves stranded at the capitol for the night and the next five days.

WJAR, an Outlet Broadcasting station, has the only "Live" ENG capability in the market. As the storm grew worse, thousands of citizens found themselves stranded on highways, in offices, at hotels, and train stations. Soon, it was clear that Rhode Island was on the verge of a state-of-emergency. With WJAR's Live "Newscam" unit at the state-house, the station soon became the only reliable television source of information on the worsening storm. WJAR, an NBC affiliate, provided NBC with a 24-hour lead on news of the Rhode Island situation. On Tuesday, February 7, the Newscam team provided a live cut in for the *Today Show*. With the only live feed from Civil Defense Headquarters, a coincidental Arbitron conducted on February 8 gave WJAR a record 47 rating and a 61 percent share of the audience for the 6 p.m. *Newswatch 10* report. The two other stations in the market followed with a 27 percent share and a three percent share. On Thursday, February 9, Rhode Island Governor J. Joseph Garrahy declared a state-of-emergency and activated the Emergency Broadcast System. Radio WEAN, Rhode Island's EBS station, immediately began feeding emergency information to the state's other radio stations. The other two television stations in Rhode Island asked for and received permission from WJAR to use portions of WJAR's Newscam coverage, off the air. Later, they also carried the Gov-

ernor's news conference via the WJAR off-air signal. Finally, WJAR helped ABC and CBS by providing feeds of their news film back to New York.

Meanwhile, back at the station, Caminis was directing a major effort to keep his audience informed. The station is located on the fifth floor of the Outlet Department Store in downtown Providence, which turned out to be a major advantage. Station personnel remained on duty from Monday through the next Sunday, and the store's furniture department became the main WJAR dormitory. Personnel slept on mattresses, beds, and couches in the furniture department with blankets from the bedding department. A restaurant on the first floor remained open to serve food. When supplies ran out, new supplies were obtained from local merchants.

WJAR made heavy use of helicopters during the storm to ferry essential personnel into the station and on assignments. Veteran cameraman George Clark provided WJAR viewers with the first aerial film coverage of the devastation. Snowmobiles were called into service on many jobs and also ferried a replacement photographer and a VTR to the Newscam crew at the statehouse.

When troops were called in to provide assistance, Caminis wanted to get footage of their arrival at the airport. When a crew attempted to reach the airport in a four-wheel-drive vehicle, they were forced to turn back because of blocked highways. The helicopter could not be used because of low visibility. Finally, a call was placed to Amtrak to see if one of their trains would make an emergency stop near the airport to let off a television crew. Permission was granted and the WJAR news team took a New York-bound Amtrak train and disembarked at Warwick, Rhode Island, about a half-mile from the airport. From there, reporter Bill Northrup and photographer Ed English made it to the airport on foot.

According to Assistant Chief Engineer Owen Kelleher, the equipment held up amazingly well under the conditions. The van, built by Wolf Coach and equipped with Microwave Associates' 2 GHz equipment with Nurad dual Golden Rod antennas, performed flawlessly. As soon as it became apparent that the van was at the statehouse for the duration, the van was switched over to AC from the capitol building. Eventually, the van became hopelessly locked in snow, but an on-board heater protected the equipment from the severe weather.

By Sunday, February 12, the emergency was under control. Roads were passable again and WJAR wanted to get its Newscam van back out. The only problem was that, by now, it was completely blocked in by a wall of snow on all sides. A crane was called in and the van was lifted over the snow and gently lowered onto the road.

Looking back, Caminis remarks that he was impressed by the number of people who depend on information such that WJAR provided. The HUT (Household Utilizing Television) level of the coincidental was 77 percent. "If you ever wanted a situation to prove the value of microwave capability," said Caminis, "this was it."



WJAR's Newscam unit parked by the capitol, where it remained for 6 days providing the only live link to the State's Civil Defense center for television.



For you,  
the new breed of  
video professional,  
the new breed of  
professional video from  
**JVC.**



# If you're a video professional today, you're a tougher customer than ever.

## So JVC's rugged professional line delivers the quality and features you demand at prices you want to pay.

We know you've got a lean new attitude about the video equipment you buy, no matter how long you've been in the business. Or whether you're in broadcasting...a sophisticated corporate A/V operation...a top production house...or building your first video capability.

And that attitude is, with all the people vying for your video dollar, you want more state-of-the-art technology in equipment

that costs you less to own and maintain.

JVC's attitude is basic too. We build in engineering innovations—we don't add them on later. And we do it first. Which means you enjoy better picture and sound quality, easier operation, and sophisticated features you may not even find in equipment selling for twice the price.

For instance:

### You wanted faster performance and greater accuracy in 3/4-Inch video editing.

And JVC's new CR-8500LU Recorder/Editor System offers bi-directional fast/slow search from approximately 10 times to 1/20 time, with editing accuracy to  $\pm 2$  frames.

It's a new generation of 3/4-Inch VCR editing—the fastest, surest way to get the frame-by-frame accuracy you need.

But JVC's CR-8500LU is still priced well below its closest performing competition.

With a single unit, you can edit with full functions and broadcast quality. Even if you don't happen to have special technical knowledge.

With a complete editing system of two CR-8500LU units and the new RM-85U Control Unit, you can perform the most advanced editing feats at approximately 10 times actual speed, then stop on a single frame.

Here's how the CR-8500LU gives you that kind of precision:

- **Frame to frame editing** is made possible by the capstan servo/built-in rotary erase head/blanking switcher frame servo design. A design that also ensures true assemble and insert editing with no distortion at the edit points. Plus horizontal sync phase compensation to minimize timing error at the editing points.
- **Variable speed auto-search** lets you perform both high speed and low speed search. You can search at approximately 10 times in fast forward or reverse to find edit points faster. Or slow speed search at 2 times, 1 time, 1/5 time and 1/20 time. Or use the special auto-speed shift feature to automatically slow you down from 2 times, real time, 1/5 time, 1/20 time.
- **Automatic pre-roll** enables you to pre-roll tape between edits, with an automatic on/off switch. Which can come in especially handy during successive assemble edits using camera signals.

- **Self-illuminated control buttons**, allowing easy identification of the operation mode.
- **Full logic control** for direct mode change without pressing the stop button.
- **Remote control** of all operations, with the optional remote control unit RM-85U.
- **Audio level control with meters**, preventing over-level recording without audible distortion, with attenuator. Also, manual audio level controls let you adjust the audio recording level by checking the level meters.
- **Auto/Manual selection for video recording level control**, adjustable by the automatic gain control circuit or manually by referring to an independent video level meter.
- **RF output** to connect an external drop-out compensator.
- **Patented color dubbing switch** for stable color multi-generation dupes.
- **S.C./sync input connector** allows connection of time base corrector and allows for two second pre-roll.
- **Chroma level** can be controlled man-

ually for convenient connection to an external system.

- **Built-in comb-filter** for playback (switchable on-off).
- **Servo-lock indicator** to check the tape transport condition.

- **Counter search mechanism**, permitting Auto-Search of a particular section of the tape.

- **Solid construction for easy maintenance**: both side panels, top and bottom panels are detachable for easy access to the inside.
- **Tracking control meter** for maximum

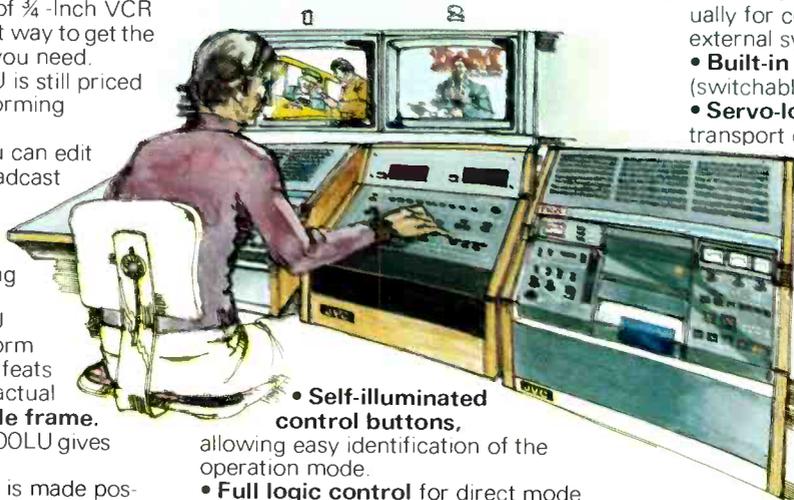
tracking adjustment.

- **Heavy fan motor** for better circulation.

All that with one editing unit. But when you combine two editing units with our new RM-85U automatic editing control unit, you'll enjoy all the benefits of a total-performance system.

Starting with the kind of control only JVC's RM-85U can give you:

- **Independent LED time counters** for player and recorder, read out edit points in minutes, seconds and frames.
- **Edit-in and edit-out automatic control**. Four built-in memories let you control edit-in and edit-out points of both the player and recorder. And once starting and ending points are determined, accurate editing is memory-controlled automatically.
- **Edit shift control** allows frame-to-frame edit point correction.



- **Lap time indicated** for each insert edit length by LED display.
- **Edit preview mode available**, for "rehearsals" of actual edits.
- **Edit-in point search mechanism.** After each edit, a Return button rewinds the tape automatically to the edit-in point, so it's easier to check edit conditions.
- **Auto-shift search mechanism** to step down the tape speed automatically, and ensure quick and accurate location of the editing point.
- **Tape safety guard circuit.** Because leaving the unit in the still-frame mode can eventually cause damage to tape or video heads, a tape safety guard circuit places the unit into the stop mode automatically.

if it is left in the still-frame mode for more than 10 minutes.

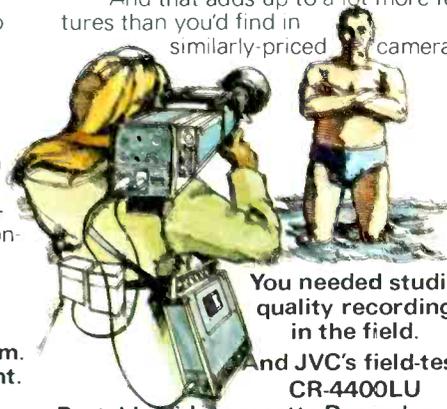
- **Selective editing modes**—assemble editing, insert editing for audio channel-1, audio channel-2 or video.
- **Versatile editing capability** offering techniques like "edit-in/out," pre-roll, and automatic pre-roll.

You'll find that nothing in its price class performs anywhere near the CR-8500LU/RM-85U videocassette editing system. And that you'd have to spend a lot more on the competitive unit that offers many of the same features.

That's what we mean by giving video people more of what they want, for less than they expect to pay.

- **Built-in horizontal and vertical contour correction circuits.**
- **Signal-to-noise ratio of 49dB,** F 4/3000 lux.
- **Resolution of 500 lines at center.**
- **Return video** in the viewfinder.
- **A built-in -G circuit** for registration.
- **Minimum illumination F 1.9/300 lux** (+6dB switch on).
- **A comfortable hand grip** to stop and start the recorder. With a switch to operate iris control and a switch for return video.
- **A built-in CCU.**

And that adds up to a lot more features than you'd find in similarly-priced cameras.



You needed studio quality recording in the field.

And JVC's field-tested CR-4400LU

**Portable Videocassette Recorder with automatic editing lets you bring your recording/editing capability wherever you need to shoot.**

If you spend time on location in either ENG or EFP applications, you need a portable video system that can shoot, edit, and give you something to show in no time flat. Without awkward equipment hassles.

JVC's CR-4400LU is the one to take along when you can't bring a studio.

Because it's the lightweight machine with heavyweight features:

**You demanded more versatility in a moderate-priced, broadcast-quality camera.**

**And JVC's value-packed CY-8800U goes with you from studio to location.**

Our CY-8800U offers a lot more than picture quality and stability that compares favorably with units costing twice as much. Thanks to JVC's technology, the CY-8800U camera, utilizing



three 2/3" magnetic focus, magnetic deflection Plumbicon\* or Saticon\*\* tubes offer total flexibility. And a rugged die cast chassis in front and back to hold up under the toughest conditions.

- **A built-in 1.5 Inch adjustable electronic viewfinder** for the convenience of the operator.
- **A built-in battery warning system.**
- **A built-in tally light.**
- **A built-in VSI**—video system indicator for precision F stop control.

- **A built-in color bar generator.**
- **A built-in +6dB, +12dB sensitivity switch** for low light level applications.
- **A built-in auto white balance.**
- **A built-in fast warm-up capability.**
- **A built-in electrical color temperature adjustment** for different applications (variable from 3000°K to 10,000°K).
- **A built-in filter system** (neutral density) for variable light levels.
- **A built-in level switch** (+50%, 0, -50%) provides 1/2 F-stop adjustment, letting you fine tune for added contrast.
- **A built-in time lapse meter** to show total hours of camera use.
- **A built-in intercom system** for studio applications.
- **An RGB output,** and NTSC encoding (Y, I, Q).

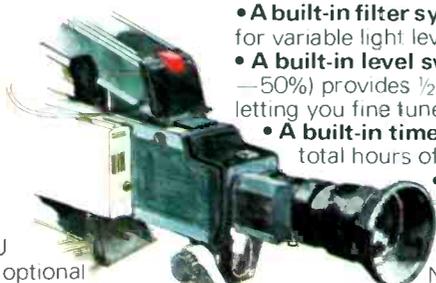
- **A built-in Gamma control** to fine tune gamma level.
- **An AC Adaptor**—standard.
- **Lightweight**—17.4 lbs.—portability.
- **Optional 12-to-1 zoom lens** with automatic iris and power zoom.



With the **Basic** configuration, it's a compact ENG/EFP camera that's completely self-contained—no CCU required. It's easy to operate, ready to plug into our CR-4400LU/CR-4400U portable recorder, with optional cables available up to 66 feet.

With the **Studio** configuration it's a hard-working studio camera. Just add the RS-8800U remote Synchronizing unit and the large screen, top mounted viewfinder.

And as for big-ticket features, we've built in what the others would let you add on later:



\*registered trademark of North American Philips Corporation.  
\*\*registered trademark of Hitachi Corp.

## **JVC's new breed of professional video. Backed by an old tradition of JVC quality and reliability.**

For the past fifty years, more and more professionals have turned to JVC for innovative equipment they can count on to perform.

Isn't it time you discovered why?

Call your JVC representative for a demonstration. Or write to your nearest JVC office:

58-75 Queens Midtown Expressway  
Maspeth, N.Y. 11378  
(212) 476-8010

3012 Malmo Dr.  
Arlington Heights, Ill. 60005  
(312) 593-8997

1011 W. Artesia Blvd.  
Compton, Ca. 90220  
(213) 537-8230

3400 South Loop East  
Houston, Texas 77021  
(713) 741-3741



TV reception simulated

## **JVC Professional Video. The tough new breed.**

**JVC**  
JVC INDUSTRIES COMPANY  
DIVISION OF US JVC CORP.

# The Care and Feeding Of Location Audio

---

Bob Liftin, one of the best audio men in the business, provides broadcasters with a crash course in location audio techniques for recording and broadcast.

---

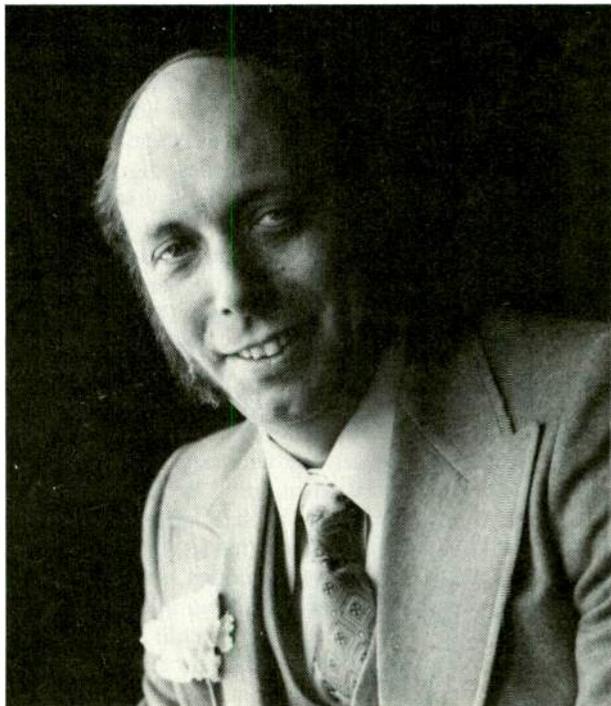
BOB LIFTIN ADMITS, "The first time I got heavily into television production, I would tend to forget the sound. As a human being you have to admit that there's a certain fascination that goes with the picture, but this fascination goes away after you do a certain amount of the stuff. Then you get down to the nitty gritty of getting the sound to be as good as the picture." This initial fascination with video images along with a set of standards that grew out of evolving technology, rather than a notion of "ideal standards" for high quality sound has created a climate over the years which forced audio to take a back seat to video.

In order to get high quality audio for either recording or broadcast, Liftin explains that you must first understand the context in which audio fits. Up until the arrival of the

15 kHz diplexed audio line this year, audio transmission for television was artificially restricted into a 5 kHz bandwidth if telco lines were needed somewhere along the way. Added to this were problems relating to preemphasis, equalization, and NAB standards that related more to the limitations of the technology that existed at the time the standards were established than they did to the optimization of audio quality. Once these various conditions are understood, it is then possible to start looking for ways to put out the best audio obtainable under the circumstances.

For instance, Liftin is a great believer in the Peak Program Meter (PPM). The biggest problem we have under the circumstances, says Liftin, is that the vu meter gives us "average level after the fact." The PPM, on the

continued on page 56



**Bob Liftin**, president of Regent Sound Studios, New York has been an audio engineer since 1954. Though he began in the record end of the business, he is now heavily involved in broadcast production and has been for many years. Liftin has done the audio on literally hundreds of remote broadcasts and on-location recordings including The Presidential Inaugural Celebration from Kennedy Center and numerous awards programs such as the Tony Awards. Recently, he has been engaged in recording musical specials for pay-TV enterprises.

## Location Audio

other hand, "tells us exactly what's going on." Liftin uses an analogy to explain the difference between PPMs and vu meters: If audio were viewed as water coming from a faucet and pouring into a basin, you can see that if the drain is too small, water will begin to back up at a rate relating to the difference between the size of the drain and the amount of water flowing in. Now, the vu meter will tell you the average amount of "water" that is in the basin at any given moment. However, said Liftin, knowing the average amount will not tell you anything about how much water is splashing over the side of the basin. In audio, it is this "splashing" that causes distortion. Yet the PPM will tell you when splashing occurs. This means that if you are monitoring audio level with a vu meter, the tendency is to set levels lower to avoid distortion. With a PPM, however, you can open up to a greater level with full confidence that you will know precisely when you are beginning to overshoot. Liftin uses both PPMs and vu meters, and recommends that any console should use both. If you are monitoring stereo output, Liftin recommends 1 vu and 1 PPM per output channel.

Liftin is adamant about the use of the PPM and maintains that without this type of measurement, a discussion of other good audio techniques for location work is virtually moot. He points out that, like other equipment, there are both good and bad PPMs on the market. Liftin recommends the Plasma-type PPM over others.

### Choosing a microphone and placing it

There are few hard and fast rules regarding the choice of microphones for particular jobs. For instance, there is no microphone for a boom that is best in all circumstances. "One thing that many people do not realize," said Liftin, "is that most microphones are basically the same with the exception of some condenser microphones." "It is the case," said Liftin, "that determines the microphone's acceptance pattern;" and moreover, the way the microphone is used will often effect its acceptance pattern. If you take a dynamic super-cardioid microphone which has the best front-to-back rejection, and place it in a confined area, or give it to a performer who cups his hand over it, that microphone then becomes non-directional; worse yet, it is not a good non-directional microphone. Examples of confined spaces might include putting a microphone in a musical instrument. If one intends to do that, then it is usually best to use an omnidirectional microphone. The omni is a good choice for such use because it has the flattest frequency response of any microphone.

"Looking at the pattern of microphones is something that many engineers do not do in any great depth," says Liftin. He suggests that you see the basic microphone's pattern in terms of a rubber ball. As a simple ball, you see the pattern of an omnidirectional microphone. If you squeeze the ball in the center you see the pattern of a figure eight-type microphone with two distinct lobes providing good separation. If you press your thumb into the center of the ball, then you can see the cardioid pattern. "Once you've got this idea clearly in your mind that a microphone is just a rubber ball and that the various pattern of microphones are just reshaping of this basic pattern, you can come to certain conclusions." "For example," said Liftin, "a microphone that has a long reach, like a shot-

gun, will pick up from in back of it as well as in front of it. Though its side rejection is good, it will have almost as much sensitivity in back as it has in front." The problem with some so-called shotgun microphones then, is that the frequency response at the rear of the microphone is worse than it is at the front. So not only are you picking up an unwanted signal, but you are also picking it up at unwanted frequencies. The cure-all for this problem has been to put high pass filters in the microphone to cut off the low frequencies which is what basically comes in from the rear of the mic.

What Liftin frequently does, in the right situations, is to choose a condenser microphone with a switchable pattern. Since, in the boom situation, he wants high side rejection characteristics, he will select the figure eight pattern on the mic. This gives him high side rejection; and since the frequency response in the figure eight is essentially flat from front to back, any unwanted sound that is picked up is of good quality.

Now, with the figure eight microphone in the boom situation, the front of the mic is pointed at the performer and the rear is aimed at the ceiling. Chances are that the only sound that the rear will pick up is ambient room sound. Since the sound pressure level at the front of the mic will be much greater, the quality of the audio will be excellent.

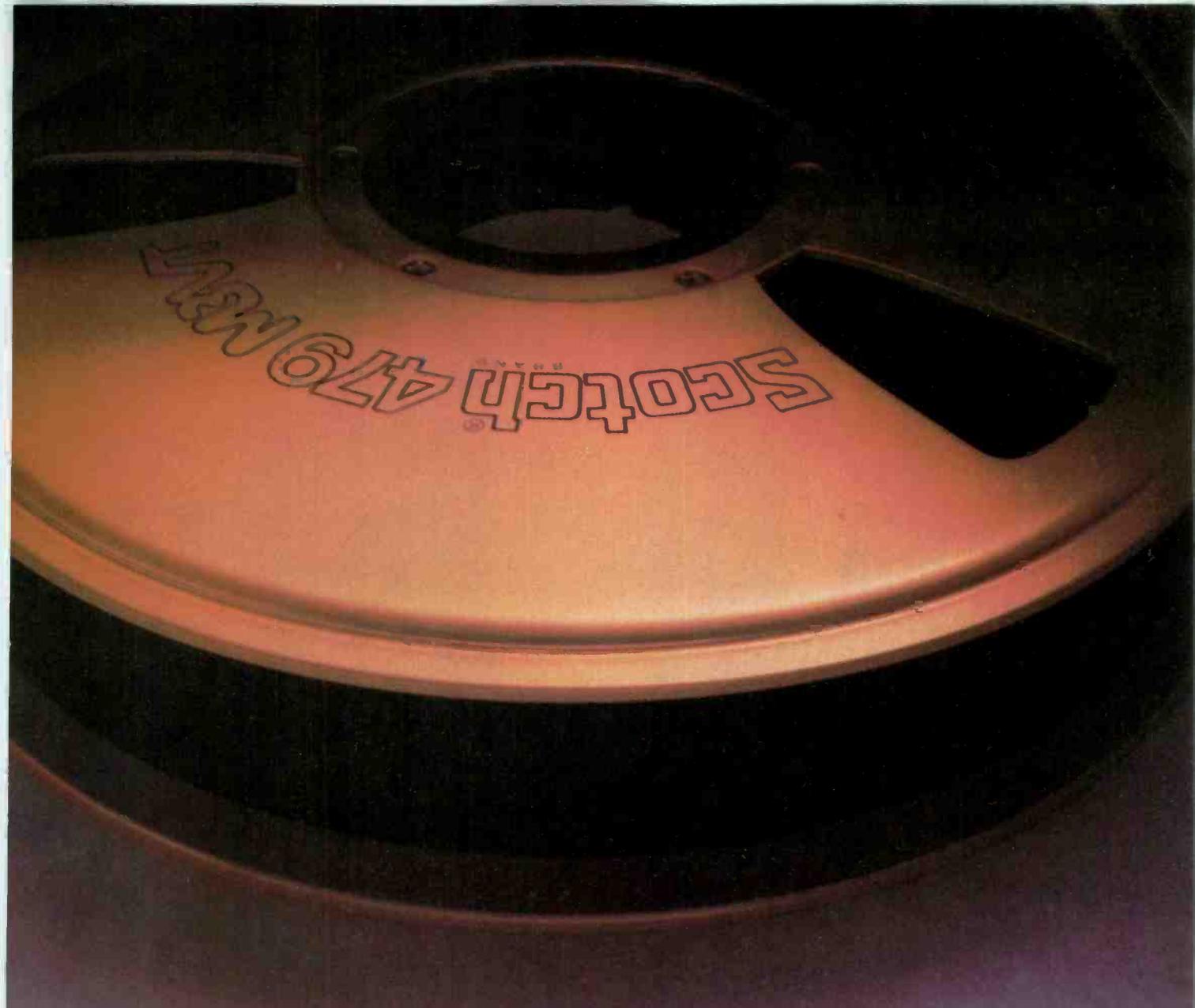
The choice of a figure eight microphone for use on a boom is good in a situation where the boom can be located relatively close to the performer and the room is relatively quiet. There are other situations where the shotgun would be preferred. On *Saturday Night Live*, to which Liftin is sound consultant, they use a shotgun on the boom. There, they are dealing with a live audience in bleachers located above the stage and less than optimum acoustical conditions.

On the other hand, the cardioid microphone can create certain problems when used on a boom because of its front-to-back rejection characteristics. If a performer were one foot away from the boom microphone, and was putting out a sound pressure level of 75 dB SPL, the reflected sound from a PA system at the back of the mic might be about 55 dB SPL. "Now, if you look at the front-to-back rejection in most cardioid microphones," says Liftin, "you will see that it is not greater than 20 dB at all frequencies." There are exceptions, of course, but one should look carefully at these figures to be sure that the mic will do the job you think it will.

Liftin points out that on some occasions he has achieved very good results with the Neumann KM84, which is a cardioid, and with the Sennheiser 415 shotgun. On *Saturday Night*, they use a DL42, but on an ABC Howard Cosell special, he used KM88s and KM86s. "There are no hard and fast rules," said Liftin. "Anyone who says there is a best boom microphone is wrong!"

On some location shows a boom microphone becomes altogether impractical. One very helpful approach that Liftin discovered when doing Broadway shows was the use of a "mouse." A "mouse" essentially is a small soft housing for a microphone that sits on the floor at the front of a stage. If the stage is wooden, the surface will act as a huge diaphragm, and a cardioid microphone placed in a "mouse" will get very acceptable audio. Liftin recommends the Electro Voice RE15 for this application primarily because of its ruggedness. Even if the situation can use

continued on page 59



Scotch 479 Master Broadcast

## SCOTCH IS FIRST IN BROADCAST. GIVE OR TAKE AN INCH.

Scotch® has been state of the art in broadcast videotape for more than twenty years. It's an industry-wide fact that nobody knows tape like 3M.

So when the industry looks at a new format, the industry looks to Scotch.



In broadcast quality one-inch, it's Scotch Master Broadcast 479. 479 has all of the qualities you've come to expect from a tape named Scotch.

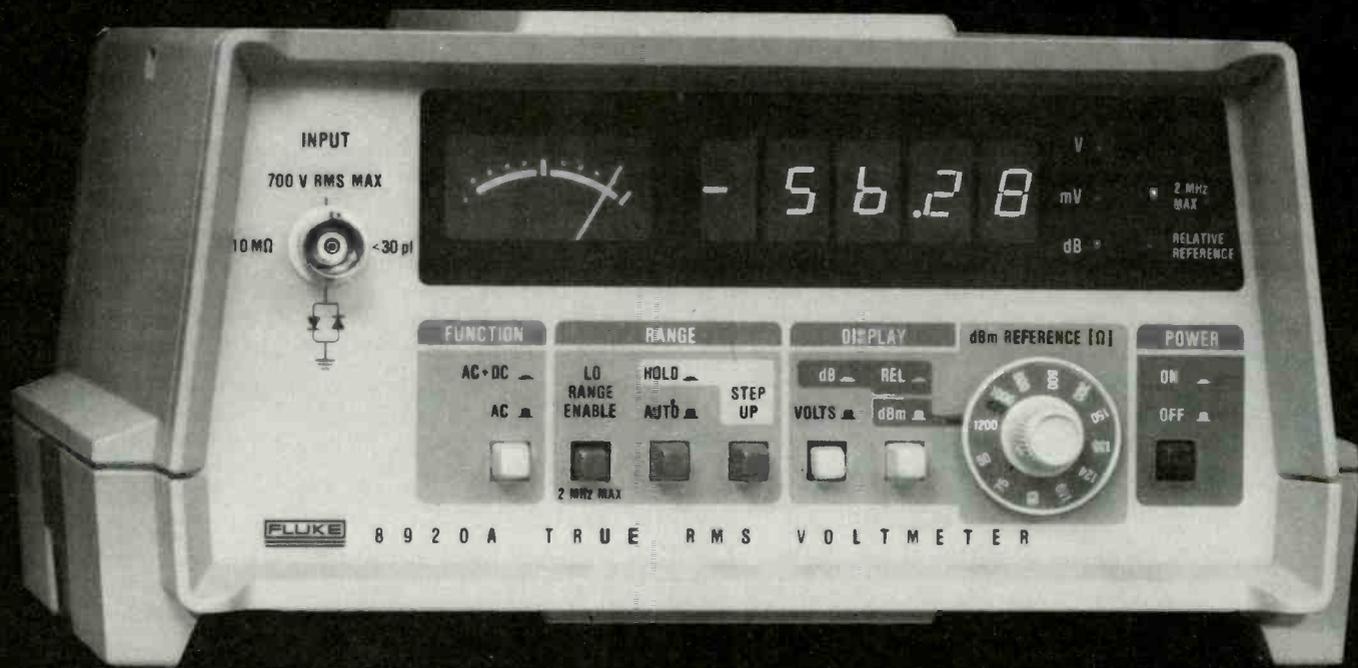
Like superior color noise and signal-to-noise. And nobody gives you better RF output.

### Scotch Master Broadcast 479.

When you come to that new format, you'll have an old friend.

® Scotch is a registered trademark of 3M Company, St. Paul, MN 55101 © 1977. 3M CO

# THE WIDEBAND RMS VOLTMETER ONLY FLUKE COULD CREATE.



You're probably accustomed to using analog meters for audio-to-rf measurements. Maybe you've given up hope of going digital at a reasonable price.

## Good news!

Fluke's new 8920A wideband true rms DMM is loaded with features—some you can't buy anywhere at any price, and it sells at an analog price: \$995\*!

For starters, 8920A bandwidth is 10 Hz to 20 MHz for sub-audio to video AC measurements. Mid-band accuracy is 0.5%, compliments of an exclusive Fluke designed (and built) micro-electronic rms chip. Accurately measuring noise and non-sinusoidal waveforms is easy since the chip responds only to the heating effect of the waveform. You can select the AC + DC function for non-symmetrical waveforms like pulses that have a DC component.

We gave the 8920A dynamic range from 180  $\mu$ V to 700 volts, to measure from low noise levels to the output of powerful amplifiers. And, fast auto-ranging relieves you of the knob twisting chores!

Put the 8920A into dBV mode and measure from -75db to +57db (132db range), with 0.01db resolution. If you want your dBV reference somewhere else beside 1V, Fluke's



8921A's Isolated Banana Jack Input.



"Dial-An-Ohm"

exclusive *relative reference* lets you store any voltage as the 0-db point. Imagine how simple your gain measurements can be!

To make the 8920A all things to all people, we've included a "dial-an-ohm" feature for dbm measurements. Instead of laboriously correcting each of your readings from a 600 ohm reference, simply dial 50, 75, 300, or one of nine *other* impedances up to 1200 ohms, and be right on every reading. There are several selections for broadcast, telephone, TV and RF applications.

An analog meter is standard, for convenient peaking/dipping/nulling, as is a linear analog output for continuous recording. Optional are logarithmic analog output and an isolated output to drive a counter. Soon, IEEE 488 interface will be available for systems use.

If you prefer an isolated banana jack input with full floating capability, specify the 8921A (also only \$995\*). \*U.S. Price

For more information, contact one of the more than 100 Fluke offices or representatives, worldwide. In the U.S., CALL (800) 426-0361, TOLL FREE. Residents of the U.S. and all countries outside of Europe, contact: John Fluke Mfg. Co., Inc., P.O. Box 43210, Mountlake Terrace, WA 98043, U.S.A. Telex: 32-0013.

In Europe, contact: Fluke (Nederland) B.V., P.O. Box 5053, Tilburg, The Netherlands. Telephone (013) 673973. Telex: 52237.

Circle 163 on Reader Service Card for literature  
Circle 164 on Reader Service Card for demonstration  
2504-8118

**FLUKE**

## Location Audio

other approaches for the primary pick up the "mouse" is a good idea for a backup.

When Liftin did the Inaugural Celebration, a musical number was to use two wireless microphones. When the number came up, one wireless failed and the other became noisy. Liftin went to his "mouse" and said that the sound quality was "excellent." "Another good thing about the "mouse," said Liftin, "is that in a wide shot, you can frequently get physically closer to a performer with a "mouse" than you can with a boom microphone."

Lavaliers on remotes can be extremely useful. "The ECM-50 (Sony) is probably one of the most versatile microphones I have ever had the occasion to use," said Liftin. For one thing, Liftin believes in hardwiring a performer with an ECM-50, even if he plans to use a wireless microphone. This he sees as necessary backup. Liftin credits Scotty Schacter, the audio man on *Saturday Night Live*, for encouraging him to use the ECM-50 for an internal piano pick up. "For one thing," says Liftin, "the microphone is so small that you frequently don't even see it in the picture." Liftin prefers to use two ECM-50s inside the piano. He places each one a few inches from either end of the keyboard.

For brass, Liftin prefers a dynamic microphone because "they can't overload it." With reeds, Liftin uses the RE-15 or a KM84, both cardioids. Microphones used for instrument pickup should generally have built-in pads, and Liftin prefers the "sound" he gets out of condensers. For a drum kit, Liftin will use a bass drum microphone in

the base drum, a condenser microphone on the snare and the high hat, and generally, a condenser microphone overhead. With rock groups, however, he will switch to a dynamic microphone for the overhead. For the performer, the one microphone that Liftin says generally gets the best results is a Shure SM-58. "Performers," said Liftin, "love the proximity effect of this microphone." That is, at close range, when a performer chokes up on the microphone, its bottom-end response is enhanced. Also, the SM-58 is virtually pop proof and suffers a minimum of hand-noise.

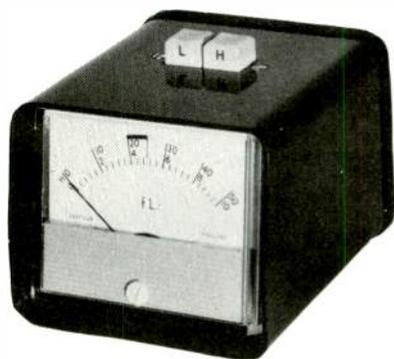
### AC hum, the biggest location headache

"The biggest problem on a remote," said Liftin, "is AC-induced hum." The sources of AC-induced hum are manifold. A noisy SCR dimmer can create static; broken shields on the audio cable can make the line susceptible to hum; and running audio cable parallel and in close proximity to power lines can cause hum. Liftin follows some basic rules. "First," he says, "you've got to become friends with the lighting director." You must work with the lighting director and be on good terms with him. You must ascertain from him where he has to run his lines and then figure out how you can stay away from them. Then, you have to make it clear to the lighting crew that if they make any change in the routing of their power lines, audio must be informed.

As always happens, you will find that somewhere, a microphone line will have to run parallel to a power line. If it can't be avoided, the best thing to do is to run the microphone line perpendicular to the power line. Accord-

continued on page 63

## Standardize your color monitors to a true D<sub>65</sub> at all luminance levels, with **GRAFIKON** instruments



TV Light Meter for rapid, precise check of luminance.



Optical Color Comparator for setting color temperature at all luminance levels, to D<sub>65</sub> or other standards.



Electronic Color Analyser for transferring color temperature readings from a master to other monitors. Digital pre-settable compensation for phosphor batches.



**POWER-OPTICS, INC.**

1055 WEST GERMANTOWN PIKE

FAIRVIEW VILLAGE

PENNSYLVANIA 19409

TELEPHONE 215-539-5300

TELEX 84-6314

Circle 128 on Reader Service Card



# "The real disaster is when your ENG camera doesn't work."

Talk with a broadcast TV news cameraman and that's what he'll tell you. And that's why more TV news teams use Ikegami ENG cameras than all others combined. When you get only one chance to cover a news event, a dependable Ikegami is the one ENG camera to use.

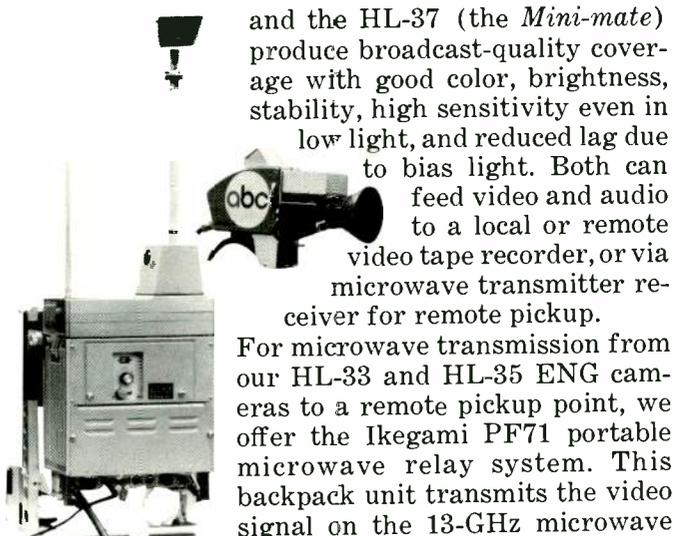
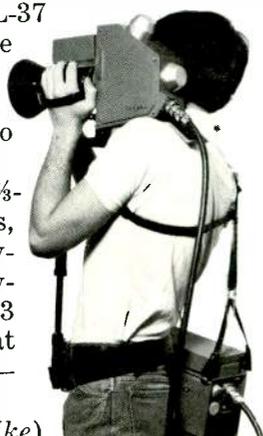
The reason: The prime features built into Ikegami

ENG cameras are dependability and colorimetry. Everything else is icing on the cake. And the Ikegami combination of dependability with ruggedness, light weight, image stability, and simplified controls, is why all three networks used the Ikegami HL-33 and HL-35 ENG cameras at the 1976 Democratic and Republican Conventions. And why they were used at the 1976 Summer Olympics.

Now we have two cameras that are even better: the Ikegami HL-77 and HL-37. In the HL-77 we've done away with the 26½-lb backpack and tucked its functions inside the camera body—and still reduced the HL-77's weight (less lens, but with viewfinder) to a pound less than the HL-35 head alone. The HL-77 weighs in at 13½ lb. In the HL-37 we've split the package so the head weight (without lens) is even less, and the shoulder-slinging process pack comes to 6½ lb.

Both cameras use three ¾-inch Plumbicon\* pickup tubes, and f/1.4 prism optics. The viewfinder is 1½ inches. And everything else that made the HL-33 and HL-35 the real winners at the conventions is still there—just smaller and lighter.

Both the new HL-77 (the *Ike*)



and the HL-37 (the *Mini-mate*) produce broadcast-quality coverage with good color, brightness, stability, high sensitivity even in low light, and reduced lag due to bias light. Both can feed video and audio to a local or remote video tape recorder, or via microwave transmitter receiver for remote pickup.

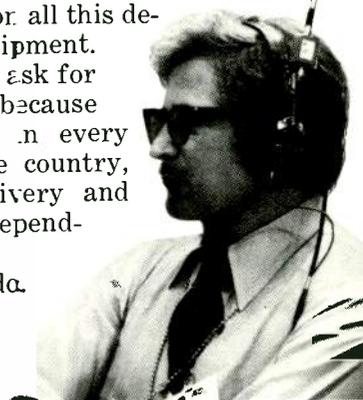
For microwave transmission from our HL-33 and HL-35 ENG cameras to a remote pickup point, we offer the Ikegami PF71 portable microwave relay system. This backpack unit transmits the video signal on the 13-GHz microwave band; audio and command signals on the 950-MHz uhf band. Maximum range is about 1800 feet with omni antenna, 3700 feet with 60-degree horn, two miles with a 20-degree horn.

For the sound portion of the program, the Ikegami PFM-091 wireless microphone system is used to transmit program audio and receive intercom audio. It includes a compact transmitter and receiver worn on the belt, a miniature condenser microphone, and a small headset/whip antenna.

We've got the specs or all this dependable portable equipment. Just write for them, or ask for a demonstration. And because we have distributors in every major area across the country, you can get fast delivery and service. If you want dependability, you get it from Ikegami. More people do.

## Ikegami

Ikegami Electronics (USA) Inc., 29-19 39th Ave., Long Island City, N.Y. 11101 • (212) 932-2577



# HOW TO CUT THE CLIMBING COSTS OF TRANSMITTER OPERATION

The entire line of CCA FM transmitters was designed to cut operating costs. Using proven, grounded-grid design. Neither Collins nor Harris have it. But every CCA FM transmitter does. Grounded-grid design. From 1kw to 80kw.

Conservative grounded-grid design cuts operating costs. Cuts the expense of replacing tubes with the short life cycle inherent in transmitter designs using high frequency tetrodes for FM. In a recent survey, the tube life at a typical station, WFPG-FM in Atlantic City, N.J. was 55,586 hours running continuously. Still, other transmitter manufacturers continue to use

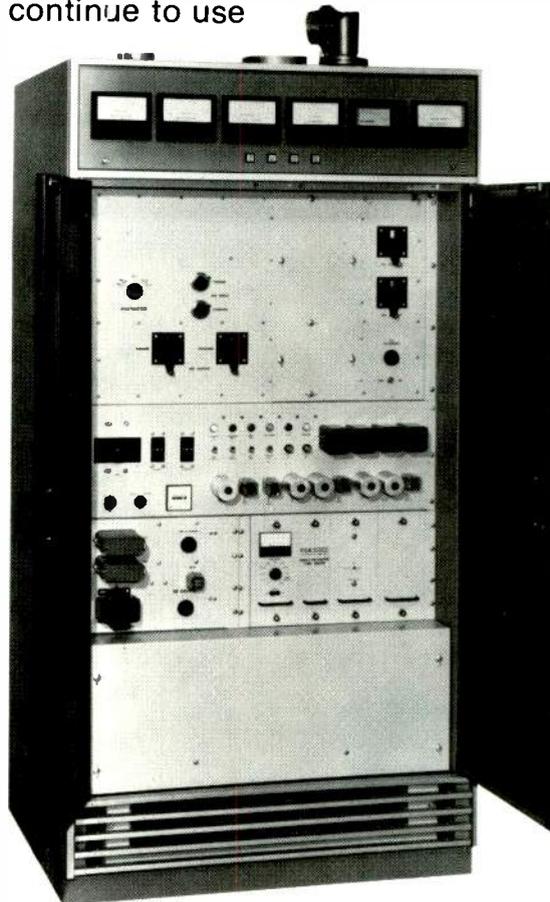
the tetrode approach requiring periodic neutralization. And—most important—the unnecessary expense and compromise of shorter tube life.

You'll hear a lot of talk about the cost of operation between different makes of transmitters. But one thing stands out:

*The transmitter with the longer tube life costs less to operate. The grounded-grid CCA FM transmitter.*

You won't empty your pocket buying or operating CCA equipment.

For further details, call our toll-free number, or write.



## *The New CCA*

CCA Electronics Corporation • Broadcast Plaza • Box 5500 • Cherry Hill, N.J. 08034

Call toll-free: 800-257-8171. In N.J. call collect: (609) 424-1500 • Telex: 845200

In Canada call toll-free: 800-261-4088, or (416) 438-6230

## Location Audio

ing to Liftin, this method will eliminate the hum 85 percent of the time. When one does have to cross a power line, the audio line should be elevated away from the power line as an added precaution.

"Fifty percent of the time," says Liftin, "the problem is broken shielding on the audio cable." In this case, the best solution is to avoid broken shielding in the first place. Lines should be checked before going on location. A simple way to do this is to physically examine the cable for damage. If you suspect that a cable's shielding is broken, hook up a microphone and a monitoring device and run the cable next to a power line. Listen for the hum. If one is detected, then get rid of the cable. It is also a good idea to run multiple audio cables in bundles. If during the setup a defective cable is found, it is much quicker and simpler to switch the cable being used than it is to run out and find another cable and start from scratch.

Liftin also recommends that cables not be run through doorways so that the door cannot be closed without damaging the cable.

Liftin also suggests that a number of isolation transformers and ground lifters should be kept on hand. The transformers are helpful if a cable shield is grounded or some other group loop problem occurs. Ground lifters, which are simply two XLR connectors with the number one pin connected on only one end, can be used to protect equipment and people should something be incorrectly wired. They are most frequently used when taping into a direct box from which you are picking up an electronic instrument. In theory, proper wiring should protect you from this situation, but on location you can't always trust that everything you are hooked into is properly wired. One should also keep on hand plenty of "sex reversal" plugs, "because no matter how well you plan you always run into the situation of having two male connectors or two female connectors facing each other."

Direct boxes are good because they should already include isolation transformers. But many bands do not have properly-wired equipment so that if the ground reversal switch is thrown in the wrong direction on an amplifier, you can get 110 volts between the amplifier and the microphone case. To test this, Liftin has placed a neon lamp between pin one of the XLR cable going back to the console, and the shield of the instrument directly being tapped. If the light goes on when the circuit is opened they then know to throw the ground reversal switch.

### The console

At the console, Liftin will sometimes use "phantom power supplies" for all his condenser microphones. The use of phantom power supplies eliminates the need for batteries in all condenser microphones. Essentially, balanced resistors are used to apply voltage directly to the microphone cable. Different makes of condensers, however, have different voltage requirements, and you must be certain that you are applying the correct amount of power. If phantom power supplies are not used, then the only alternative is to make sure that you have plenty of fresh batteries on hand. You should install fresh batteries before each shoot. Also, batteries should be checked under load conditions.

Proper use of the sub-masters on a console can be very

advantageous. Sub-masters should be delegated: one for announcers, one for the house band, one for the performers, and so on. This way all levels can be pre-set, and the appropriate group of microphones can be brought on by the simple opening of a single pot or attenuator. Liftin believes that Voltage Controlled Amplifiers are probably the best system of sub-mastering available today.

Liftin always uses a console with both a plasma type PPM and galvanometer type vu meter on each output channel. Again, Liftin feels that this approach allows him to send out a louder average level. "With diplexed audio" said Liftin, "PPMs are even more important." According to Liftin, the diplex audio system will overload at plus 18 dB, and with anything over that, "will go into complete crack up. Nevertheless, it is still a good engineering standard since it is at least 10 dB above operating level."

If Liftin is using a plus 8 dB line from the telephone company, he will calibrate his console at plus 4 vu. "I will send zero out," says Liftin, "at plus four and take that four extra dB as headroom." Liftin uses a UREI 1176 limiter across the output line on and 8-to-1 setting so that it starts to limit at plus four out. "The end result," says Liftin, "is that I get four dB of headroom for openers because my line is guaranteed to 8 dB, and since the phone company has 10 dB above that, we are talking about 14 dB of headroom." Liftin believes that this is a minimum standard to prevent distortion. He admits that some noise figures are given up, but the difference is negligible. If the program material is classical music, Liftin says you can run into some noise build up when certain passages run 10 dB below program level. Nevertheless, setting your console so that transmission gets zero when you are putting out plus four, and with a limiter set on 8-to-1 so that it starts limiting at 4 dB should assure you that transmission's limiter will not be hit too hard.

Liftin's favorite console is one that has at least 24 dB of headroom on the output and a signal-to-noise ratio that is at least 70 dB, "or equivalent to an input signal of minus 134 which would be the theoretical limit, though you wind up with something more like minus 127." This "favorite" console would also have enough EQ to make things "sound good to me." Liftin makes one serious warning about a console for location: "Number one, watch out for anything that has any kind of switch near the input of the microphone preamp. They've got to get dirty, and when they do, you end up getting noise." Rather than pads at the microphone input to the preamp, Liftin prefers to bring along plenty of pads for the microphones themselves, or he tries to get a console with fixed selectable pads.

"The same thing is true of other switches in the audio path of the console. Try to pick a console whose switches are least vulnerable to noise." "Generally," says Liftin, "I like a console that is as straight-forward as possible. The fewer the amplifiers between the microphone and the output the better."

Some final precautions that Liftin employs on a remote include: plenty of fuses of the appropriate type, taped to anything that uses a fuse; a portable tone generator that you can build yourself or purchase, to test lines and microphones; a set of earphones with small power amp and jacks so that the floorman can test lines and microphones without having to route the signal through the board; and as an ultimate backup for a broadcast, a couple of inexpensive mixers, like the Shure M-67s, so that if all else fails, you can still send out some kind of audio. **BM/E**

# Location Lighting: Consider Everything, Then Remember That No Two Locations Are the Same

Four leading lighting directors from the firm of Imero Fiorentino Associates recently sat down to tell *BM/E* about the methods of location lighting. It is not easy, it is rarely the same twice but it can make the difference between a successful show and a flop.

IN THE MONTHS AND YEARS AHEAD, as equipment gets smaller and quality improves, more and more stations will probably consider doing location work, both for live broadcast and recording. It is sometimes forgotten that studios were the location of choice mostly due to the limitations of technology. But more and more, the feel and look of the location is making the location-type program more popular as the equipment available is making location work more practical. But in the intervening years, as broadcasts were done under a very controlled studio set up, many of the skills of the lighting director were neglected. Technicians, engineers, and producers assumed that lighting from the studio grid could be set up for routine shows in a matter of a few hours or less. But now that we are moving back to the field, we need to learn from lighting directors what they have learned from lighting hundreds of locations and hundreds of different types of performances.

There have been two major tendencies in location lighting in the past. One has been to throw in as much light as possible (mostly soft light) which was caused by the high light requirements of the old Image Orthicon camera tube. The other was to keep lighting as flat as possible which was caused by the poor performance of early color camera pick-up tubes. Things have changed. The modern camera tube is much improved and still getting better. The electronics are more consistent so that matching is less of a problem, and in most cases, a good camera will get a good image in as little as 100 fc.

Now, with the advent of the one-inch VTR offering professional performance in a smaller package with better audio to boot, the temptation is to leave the studio for the earthier environs. In addition, we now have the telephone company's ability to supply 15 kHz lines (diplexed audio) and, therefore, a generally available superior audio system. So, field production, where it concerns musical performances, is now much more attractive than it was in the past.

Tony DiGirolamo, one of the IFA lighting directors, notes that the lighting director has to be concerned with the performer. "After all," said DiGirolamo, "it is his (or her) career. You can't expect the audience to know that a performer looked good or bad due to the lighting." Carl Vitelli, Jr., another lighting director of Imero Fiorentino Associates, points out, "The first thing is to get the performer to look good, then take into consideration the camera angles; then consider how you can use your lights

to meet those requirements."

## Good lighting begins with a good survey

The four lighting directors, Tony DiGirolamo, Billy Knight, Carl Vitelli, Jr., and Dick Weiss, agreed that a lighting survey should take place "at least" two weeks in advance of the scheduled shoot. They don't always get two weeks, but they should. There are hundreds of questions that must be answered, and the answers to those questions must be confirmed. "When a building superintendent tells you that you can drop a cable "out-the-window" to your generator truck, you better check it out," said Vitelli. "You can find," he continued, "that it is out-the-window, across a 100-ft. roof, down four stories, and halfway down the block. This does not add up to 'out-the-window.'"

"Go on a survey," said Vitelli. "See the premises." If the location is to be a theater or a nightclub, there is a good chance that much of the equipment can be used. That is, there may be many fixtures already in place. Lamps may have to be replaced with higher power lamps, but for the most part, the fixtures are usable. "Most places," said DiGirolamo, "will have incandescent lamps, so it's a good idea to have plenty of higher power incandescent lamps available." Many clubs, again depending on size, will have lamps varying from 250W to 500W. Whereas you may be able to use the 500W lamps, you may want to replace the lower power lamps with something higher. There is little need to worry about the color temperature of lights that are in place since most bulbs in existence are 3200K anyway. Moreover, the additional lighting introduced to the location for television is sure to overwhelm the existing lights so that even if they are burning at less than 3200K, they probably will not be a problem.

Of course, the primary concern is power. Power has a lot of considerations. First, one must consider the demand on the power. Lighting usually goes in first at a location, but the person doing the lighting has to be aware that soon engineering will need power, audio will need power, and certainly, the act will need power. At this point, consultation with the other production groups is essential. There are any number of options and alternative power sources. In most cases, a separate power generator truck is not a bad choice. Every care should be taken to isolate the lighting power service from the other services.

The lighting directors at IFA (Imero Fiorentino Assoc.)

continued on page 67

# For the truest picture of transmitter performance available.



## The Philips TV Demodulator.

- Direct channel selection for easy shift to other RF sources
- AFC corrects for transmitter offset
- Synchronous detector for very accurate demodulation
- Automatic gain control eliminates measuring errors caused by drift of output level
- Quadrature output for incidental phase modulation
- Tight amplitude and group display profiles for very precise analysis and adjustment of transmitters and modulators
- Built-in vision rest carrier meter and sound deviation meter

If you are determined to maintain maximum control of the quality of the signal you transmit, this laboratory-quality demodulator is

an essential piece of equipment. With the proper video and audio measuring set-up to monitor not only the quality of the transmitted signal, but even the modulation depth.

We also make modulators, VITS analyzers, video signal generators and pattern generators, all with Philips' traditional respect for quality, ease-of-operation, and reliability.

For more information on what Philips can do to help you maintain signal quality, call Stuart Rauch on our toll-free Hotline number: (800) 631-7172 (New Jersey residents call collect). Or contact Philips Test & Measuring Instruments, Inc.

In the U.S.:  
85 McKee Drive  
Mahwah, New Jersey 07430  
Tel. (201) 529-3800

In Canada:  
6 Leswyn Road  
Toronto, Canada M6A 1K2  
Tel. (416) 789-7188



PHILIPS Test & Measuring Instruments

**PHILIPS**

Circle 131 on Reader Service Card

# FOR TOUGH SHOTS...



MNC-61A Color TV Camera

# A TOUGH CAMERA.

From shoe-top to tree-top, this tough-built ENG camera was designed to go where the action is. A rotating eyepiece lets you frame what's happening from almost any angle. While you're shooting, an LED display in the viewfinder keeps you informed of critical camera functions, including tally and video levels, so you can compensate instantly.

White and black balance, bias light, flair and aperture compensation and shading correction are adjusted automatically, so that you can concentrate on capturing the action. You can also use the viewfinder for H and V centering adjustment of R and B channels. In addition, both camera and VTR output can be monitored in the viewfinder, to make sure you get the coverage you came for.

The MNC-61A's rugged, cast-aluminum exterior houses integrated LSI pre-amp,

processor, encoder, and sync generator. A weight of 16½ pounds and shoulder-pad pivot point let you track the action surely and smoothly. Parallel optical systems give accurate registration when you pan and tilt.

You can shoot under almost any conditions, thanks to complete weather and temperature seal protection. Control VTR start/stop from the comfortable handgrip. Run on DC power anywhere with battery belt, since LSI has cut power consumption to 29 watts, extending battery life and reducing internal heat. (Optional AC power convertor is also available.) Whether its sports or spots, rallies or riots, gather it with the camera designed to bring it home. The MNC-61A.

Contact: *NEC America, Inc., Broadcast Equipment Division, 130 Martin Lane, Elk Grove Village, Illinois 60007. Phone (312) 640-3792*

27804

# NEC

Nippon Electric Co., Ltd.

Circle 133 on Reader Service Card

# New! For heterodyne VTRs



## a broadcast quality, digital TBC

It's the CVS 516, first digital TBC made and priced to give users of non-segmented, heterodyne VTRs all the proven advantages of modern digital video processing.

The CVS 516 is ideal for ENG, teleproduction, studio VTR backup and much more because it comes with features that, before, you'd find only in TBCs costing up to twice as much.

For example, correction of chroma/luminance delay problems, a 3dB chroma noise reduction, velocity compensation and color dropout compensation are standard.

So is "Gyrocomp," an exclusive, use-proven CVS memory design that easily handles severe gyroscopic distortions—without breakup.

There's also a broadcast stable, gen-lock sync generator, automatic VTR advanced sync and a built-in completely adjustable processing amplifier.

If all that's not enough, add our optional, moderately priced Image Enhancer/Noise Reducer. This plug-in card

substantially reduces luminance and chroma noise and significantly improves subjective resolution. And, to tame even the wildest instability, you can add our optional 16 line window.

Simple operation is another plus for the CVS 516. Front panel controls give you total mastery of your video signal. Each control also has a preset unity position to give you a consistent starting point for all your tapes.

All this, and more, is contained in a package that weighs only 25 pounds, is only 3½ inches high and uses only 175 watts—major advantages with today's increasing emphasis on ENG and field production.

So, to give your heterodyne productions the quality they deserve, get the one digital TBC made and priced to do the job—the CVS 516. For full details and/or a demonstration, contact your authorized CVS Distributor or CVS. And ask for our new booklet about the basics of digital time base correction. It's free.

**CVS** Consolidated  
Video  
Systems, inc.

1255 E. Arques Avenue, Sunnyvale, California 94086 (408) 737-2100 Telex: 35-2028

Circle 134 on Reader Service Card

## Location Lighting

ing person must work very closely together to avoid last minute changes and surprises. A slight change in staging or camera positions can undue a great deal of the lighting plan.

Billy Knight, who has a long list of lighting credits to his name while with Fiorentino, and in earlier years when he was a lighting director for Intertel Television, and before that, NBC, points out that color changes also must be considered. "If a director," said Knight, "wants a blue wash at one point and then a red wash at another, and maybe some other color later, pretty soon you wind up being triple hung." That is, the pace of production is so fast that such color changes can only be accomplished by hanging separate sets of lights for each desired effect. There is no time to change filters in the middle of a show. Not only should lighting anticipate the expected but also the unexpected. Vitelli points out that he may occasionally disagree with a director about how a particular lighting setup is going to work. On occasion, he may set a light the way he thinks it should be in addition to another set the way the director wants it. Then, if the shot doesn't work out, he is already prepared to provide the director with the alternative.

It is becoming clear that some location setups can get very complex, and if done properly, they can get very expensive. There is only one way to save money on lighting and that is to save time and labor. A good lighting plan must include adequate pre-light time. Vitelli tells of a time when on a very complex shoot, the schedule called for "set and light between 8 and 10 a.m. on the shoot day." When asked how many men it would require, Vitelli informed the producer that it would take a hundred stage hands. After assuring the producer that he wasn't kidding, he explained that the same job could be done with just eight men if given a full eight-hour work day prior to the shoot. The schedule was quickly changed to accommodate the pre-light. There are two lessons in that anecdote. You must allow time to light or expect huge labor costs; but it also shows that a professional lighting director will rarely tell a producer that any circumstances are "impossible."

Asked about heat build-up from lighting, all the lighting directors agreed that there really isn't very much that can be done about it. They said that there are lights which are "cooler" than other lights but the difference is negligible. It was recommended that once the lights are turned on, they be left on. The air conditioning will do a better job if it has time to adjust to the load. Performers are used to hot lights and audiences will also adjust more easily if the lights are on when they arrive. More often, the major problem with heat build-up is with respect to the cameras. This may be another characteristic to look for in a location camera in addition to low-light sensitivity. Auxilliary air conditioning has often been suggested but it has rarely been practical.

On the actual day of the shoot different lighting directors have different preferences. But whether the lighting director chooses to work right in the room, like DiGirolamo, or in the truck, or at another place, all agree that good communications are essential. When you are working in a control room or nearby you can see what is on preview, and this will help anticipate light changes. If you're on the floor, as DiGirolamo sometimes prefers,



For HBO's "Frank Gorshin On Location," additional lighting was needed to show off the luxurious interior of the Hyatt House, (Hilton Head, S.C.) where show was produced.

you need at least a program monitor, a good intercom system, and a preview monitor would be helpful. The advantage of working in the room is that you can see what is going on in the performance, and you can see how each of your lights is working. Getting a sense of the act is very important to a good lighting director, and DiGirolamo believes that making the performer look good is the major job of lighting.

Though most shows have a basic pattern in terms of picture requirements, Dick Weiss believes that communication with the director is absolutely necessary if the lighting director is working with the director for the first time. "He should describe to you," said Weiss, "what he is going to do with every camera." Moreover, there may very well be other things the director has planned, and the lighting director had better know about them way in advance. Sometimes a director will want to do an interview with the performer in the dressing room and then follow the performer out to the stage. This means that dressing rooms and hallways have to be lit.

Most of the on-location programs shot for the pay-TV operations do use these additional segments to add depth to the programs. They will also sometimes require the outside of a club to be recorded or will schedule a pre-show interview for a hotel room or a familiar site associated with the city. These incidental cases must be accounted for up top. Not only might they require additional lights, but they might also require a separate lighting survey. Hotels tend to have pretty good electrical supplies, but a lot can depend on the age of the hotel. Vitelli says that he automatically assumes there are 20 amps at an outlet if the building is new and assumes only 10 amps if the building is old.

With more than 82 years of lighting experience between the four directors, and with hundreds of location programs to their credit, they are in possession of more knowledge about lighting than we can possibly convey here. In fact, we have attempted to draw a picture in fairly general terms regarding location lighting. The important thing coming out of the conversation with these lighting directors was a sense of their dedication to the field. It is clear that there are as many ways to approach lighting on location as there are locations; but lighting cannot be glossed over or relegated to a secondary or tertiary consideration. Lighting properly is complicated—it can be expensive—but good location lighting is essential.

**BM/E**

# *...and what have we done for you lately?*

*14 years ago we delivered the original  
30mm Plumbicon® camera tube  
that revolutionized TV broadcasting...*

*9 years ago we introduced the 1-inch  
Plumbicon tube that permitted  
the design of more compact  
broadcast cameras...*

*4 years ago — the 2/3-inch Plumbicon  
tube brought broadcast quality to  
portable cameras and gave us ENG...*

*Today, we bring you two of these  
popular pickup tubes with further  
improvements in performance.*

Ever since the original Plumbicon tube won the Emmy Award for having revolutionized color TV broadcasting, we've been keenly aware of the importance of the name Plumbicon to the TV industry which has come to depend on it as its assurance of consistent performance and quality. There's no disputing the fact that contemporary Plumbicon tubes outperform their original versions by a wide margin.

Two of the most recent improvements in the Plumbicon pickup tube line, (the 30mm XQ1410 and the 2/3-inch XQ1427) are described here. These tubes, like all Plumbicon TV camera tubes, offer unmatched resolution and sensitivity, superior color rendition... excellent highlight handling... low and steady dark current... high signal-to-noise ratio... minimal lag... stable operation over a wide temperature range... and long life.



**Type XQ1427:** Offers significantly higher resolution than earlier versions; modulation depth is 60% typical at 320 TV lines giving sharper, clearer pictures and allowing operation at lower light levels. New gun design and 1500-line mesh construction result in improved registration and geometry, reduction of flare by a factor of 3 and reduced beam landing error.



**Type XQ1410:** The XQ1410 gained immediate acceptance by the television industry as a significant advance over all previous 30mm tubes. This recognition is based on the XQ1410's dramatic reduction in lag (typically 37% below that of our XQ1020.) The XQ1410 ends color-fringing, greatly reduces picture-smear and gives better dynamic resolution — even under poor lighting conditions. With its internal bias lighting, all three channels can now be balanced for identical lag characteristics. New gun construction gives improved resolution, (60% typical modulation depth at 400 TV lines). New mesh construction results in better geometry and registration and significantly reduces microphony.

Make no mistake — these are vitally important improvements on vitally important camera pickup tubes... but these developments are only part of the answer to — "What have we done for you lately?"

*...and now the next generation  
of Plumbicon TV camera tubes:  
with them begins the age of Electronic Cinematography.*



"Cinematography" once meant the creation of motion pictures on film, and film alone. But no more.

The next generation of Amperex Plumbicon TV pickup tubes, in combination with recent advances in new camera design and videotaping systems, is destined one day to reduce to near-zero the use of film in broadcast cinematography and in motion picture production. Now, indeed, begins a new era... and a new art form: Electronic Cinematography. All-electronic production will offer a technically superior product, and will permit shorter lead times between production and broadcast... and it allows motion picture directors to combine the creative aspects of single-camera film production with the immediacy of live-on-tape TV techniques.

All this has been no accident, of course. We, for instance, have been working toward this moment for fourteen years, ever since the introduction of the original Plumbicon tube... right through the advent of ENG, first brought to reality by our 2/3-inch version of the Plumbicon tube.

This steady stream of advances in TV pickup tube technology now culminates in a new generation of Plumbicon tubes that offers major advances in resolution and lag performance... advances that were prerequisite to the dawn of the age of Electronic Cinematography.

**Type S45XQ:** Developed for use in new studio cameras that will accept 30mm tubes, has limiting resolution of 1600 TV lines, with modulation depth of 95% at 400 TV lines and 40% at 1000 TV lines. Nothing like it has ever been offered in a broadcast quality tube. The S45XQ provides for external bias lighting; but decay lag, even without bias light, is typically only 7% after 50 milliseconds.

**Type S73XQ:** Physically interchangeable with conventional 1-inch broadcast Plumbicon tubes, can be used in existing studio and field production cameras with only minor circuit modifications. Typical limiting resolution of the S73XQ is 1000 TV lines, with modulation depth of 65% at 400 TV lines. Overall signal-to-noise ratio can be maximized in the S73XQ by a low-capacitance target contact. A revolutionary gun design in the S73XQ reduces lag; decay lag is typically 2% at 50 msec. with bias lighting.

Both of these new-generation tubes inherit all the finer qualities of the original Plumbicon pickup tube: near-zero dark current... high sensitivity... resistance to burn-in, even in highlights... precise geometry and registration... and long life. You can expect from them what you have learned to expect from Amperex Plumbicon tubes; performance at the edge of tomorrow.

For more information, contact: Amperex Electronic Corporation, Slatersville Division, Slatersville, Rhode Island 02876. Telephone: 401-762-3800.

**Amperex**

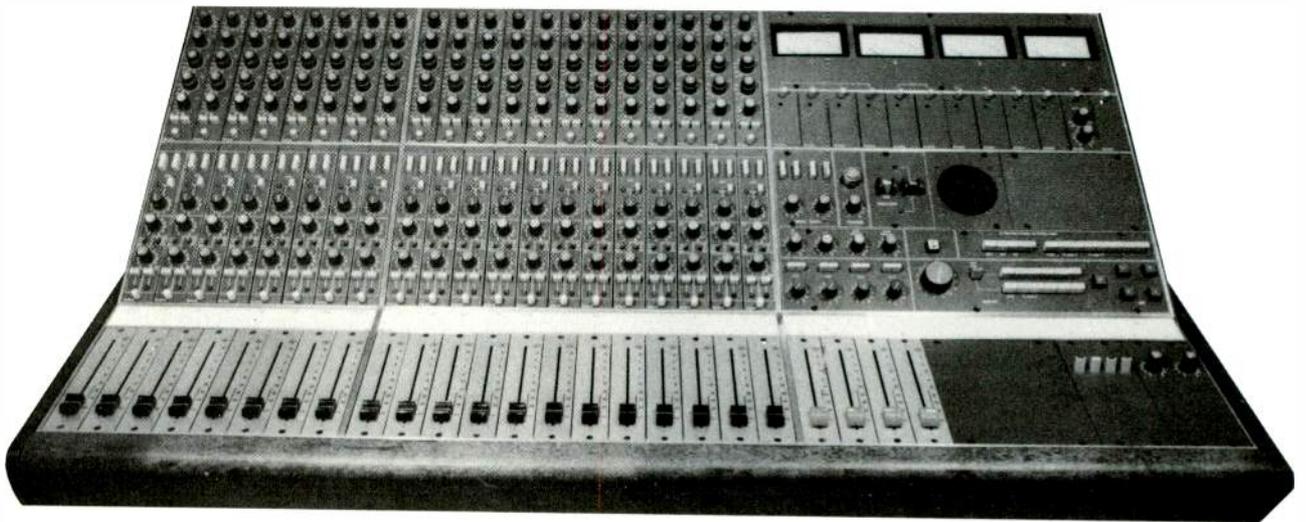
TOMORROW'S THINKING IN TODAY'S PRODUCTS

A NORTH AMERICAN PHILIPS COMPANY

Circle 135 on Reader Service Card

# The Best.

**New 5315/24 Console for Television  
Affordable 5402 Console for Radio  
Standard Consoles to 40 Channels  
Custom Designed Consoles  
NECAM Computer Audio Editing**



Our business is sound. Sound of the highest quality and reliability, for Television and Radio. Our standard and custom consoles need no color advertising or fancy words to convince you of our quality. Neve consoles are built to last. Frame construction is of heavy gauge aluminum and steel. Most electronics are housed in metal enclosed plug-in modules for maximum RF rejection and ease of maintenance. We give you the finest reputation, reliability and performance. Call our customers. They'll tell it to you straight. Neve is the best!

Take the 20 channel Model 5305 console pictured above. This is one of the most successful sound production consoles ever built by any console supplier. From Boston to Los Angeles, from Toronto to Austin, this range of consoles is widely used by network and independent broadcast facilities. And now we are introducing the 5315/24P, an expanded version with 24 input channels, 4 auxiliaries, 4 subs and stereo output. With these and other consoles, Neve offers you a real choice to suit your requirement. Standards, modified standards or custom consoles. Give us a call or drop us a line. You'll be working with the best!

Rupert Neve Incorporated, Berkshire Industrial Park, Bethel, Connecticut 06801 Tel: (203) 744-6230 Telex: 969638  
Rupert Neve Incorporated, Suite 609, 6255 Sunset Blvd., Hollywood, California, 90028 Tel: (213) 465-4822  
Rupert Neve of Canada, Ltd., 2717 Rena Road, Malton, Ontario L4T 3K1 Canada Tel: (416) 677-6611 Telex: 983502

 **Neve**

Circle 136 on Reader Service Card

# Remote Pickup Technology Gives Radio Stations High Quality Alternative To Land Lines

Both big and small stations are finding their salvation with wireless RPUs, and some of them are building entire new formats around this new capability.

BETWEEN AVAILABILITY SHORTAGES and restricted bandwidths — not to mention line noise and other problems outside the broadcasters' sphere of control — telco has managed to sour many users on land lines. The best operating mode these days seems to be wireless — usually a direct, low-powered link between the remote pickup site and the studio or transmitter.

With both high VHF and UHF frequencies available to broadcasters for this service, more and more stations are turning to reliable, easily transportable remote relay equipment that sets up on location in minutes. Some stations polled for this roundup use the relays in tandem, with a roving lightweight RF microphone at some field location transmitting back to the relay for retransmission to the studio. It all seems to come together very well, and the broadcasters surveyed for this article are enthusiastic about this mode of field work.

## **WBAP, Ft. Worth, Texas**

This clear-channel 50,000 watt AM station, along with sister FM outlet KSCS, is presided over by Chief Engineer Tom Green. Green has at his disposal no less than four dual-frequency RPT-25 RPUs by Marti, as well as a single hand-held transmitter and some older, tube-type equipment. The four switchable-frequency RPUs each have 25 watts output and operate in the UHF band. Green had this to say about his remotes:

"We use a motor home that we bought on special order with extra space inside. By eliminating the kitchen, we had room to install a five-input mono board, two turntables, an equipment rack with a reel-to-reel tape deck, a limiter, and the UHF remote transmitter.

"A big percentage of our programming is done by remote broadcast on location. We have a three-hour remote broadcast that we do with associated businesses. We're a C & W music station, we'll set up with a Western Food Store, new store openings, and get a lot of repeat business of the same kind that we've been doing for the last couple of years, so our advertisers must be very happy. It really brings in the business from the merchants, and it's expensive; our rates are not cheap. With our setup, the disc jockeys handle the whole thing.

"We have our own AC generator which we use when power fails or isn't available. We're coming up into a really heavy season now, spring and summer. We'll do two three-hour remotes on Saturday and probably one on Sunday, too. I have seen a total of four on a weekend, with a total of 12 hours of remote broadcast in a weekend slot. Most of the commercial businesses want coverage on weekends when people are available and can be pulled out to the shopping centers. We also do some remotes on

Friday nights. We do run into some problems with local blue laws that say a store can be open either on Saturday or Sunday. So we do the most remotes on a Saturday.

"We don't do any remote broadcasts on our FM station which is a mellower brand of C & W than our AM. It's more of an easy listening kind of western music."

## **WOSU, Ohio State University**

This university station is an NPR affiliate and works closely with its sister television outlet in stereo simulcasts. High quality audio is a must here, and relay transmission is via microwave. Chief Engineer Ron Stewart described the operation this way:

"We use a portable microwave unit from Microwave Associates and set it up on top of the building when we're doing a simulcast, from the main part of the campus and hop it over to the station — about a mile away. We also use two videotape machines which record stereo audio. Our simulcasts are mostly symphonic concerts. For radio-only concerts, we generally tape in our van which has mixing and recording facilities.

"We Dolbyize all our stereo programs that go out on our microwave link. We don't use diplexing for the audio; it goes out on two subcarriers that we have available for this. Our radio audience is super-critical about our audio quality. In fact, some of our TV viewers are also becoming just as critical of audio, and now we're thinking about Dolbyizing our TV audio.

"We stress high quality sound. In our symphonic pickups, for example, we will use more than 30 microphones. Our radio boys do the TV audio whenever possible, and our audience is very appreciative. The next thing we have to work on is improving the TV audio itself."

## **KIMP, Mount Pleasant, Texas**

A station heavily committed to remote pickups, the AM outlet broadcasts one kilowatt daytime, and the FM affiliate carries totally separate programming with its 100 kilowatt power. Station President David Ward detailed the remote operations for *BM/E*'s readers:

"All of our local sports are carried by radio relay as opposed to rented telephone lines. We have a Marti RPT-1 handheld and an RR-50/450 relay along with one of their older tube-type transmitters.

"We use high-band (161 MHz) for the ball games which we plug into the AC line, and set up an antenna at the stadium. We've successfully used this setup 10 to 15 miles away from the studio. The receive antenna is 243 feet up on our tower, so this works out pretty well.

continued on page 78

## Remote Radio

"We do all of our local sports and special events this way. We'll go down to the new car dealerships when they bring in the new models and do a five-minute interview with the sales manager or owner. He'll talk about his new models and invite everybody to have coffee with him.

"This method gives us immediacy that we can't get any other way. If something breaks, I can go right to it. We've just bought a UHF unit too, and if I want to go to cover a ground-breaking, I can go right out into the open lot where they're wielding the shovel and relay it back to our car which beams it back to the station on high-band. I still get the same 10-mile range from my car that I get from a fixed setup, but this procedure frees me to go on location without having to carry a lot of antennas and equipment.

"We did something a little unusual to cover the playoff football games here this year. A little town 17 miles away went into the state playoffs. We rigged up our high-band unit in the press box while I went down onto the field with our handheld UHF unit. I was broadcasting up to the booth and the booth was broadcasting back down to me. I carried a pocket scanning receiver tuned to the press-box unit. This gave us a full duplex operation. I did color from the field, while the man in the press box did play-by-play.

"We use remotes for both our AM and FM stations. We have two of the relay units and we can use both simultaneously to feed different remotes to the two stations.

"Mount Pleasant is a small town of about 15,000 people, and when an ambulance runs down the main street, people wonder if it's someone they know. So, we use our mobile units to cover the wrecks and fires. Our audience coverage is about 30 miles, with a total population of about 80,000 people. Although we reach a lot farther than that, we don't try to service that area."

### KMOX, St. Louis, Mo.

This old-line CBS O&O station has a 50 kilowatt clear channel and originates a great deal of material for network feed. Ed Karl, director of engineering, detailed the setup for *BM/E*:

"We currently use nine remote pickup units, all VHF. Everybody else in town went to UHF so we stayed with V. We're using five different frequencies, and most of them are switchable with at least two frequency capabilities, while some have four.

"We use equipment from McMartin and Motorola, and G.E. units in our two helicopters. Some of our news coverage is with Motorola two-way radios. But our regular remote broadcasts, such as press conferences, call for our McMartin gear.

"We just had a new football coach named, and we used the McMartin unit for the press conference. Baseball season starts soon; the Cardinals come home this month, and we'll use the McMartin handheld units for fan-in-the-stand coverage. We don't have to relay this material, but can go direct to the studio since the ball park's only two blocks away. We take along five-element Yagis for our greatest distance which is about 12 miles. We'll use the McMartin equipment for an actuality from the airport, but not for a program. We still use phone lines. But a lot of this is giving way to wireless remotes. This fall, we'll start to do the Blues hockey games by wireless. We plan to eliminate most of our land lines; in fact we're in the

process of phasing them out now.

"We also cover the football Cardinals and the Missouri University Tigers, but that's something we originate for the network, so it's done by phone lines. Besides, the stadium is 90 miles away, so land lines are a must.

"We find that the handheld equipment is simple and reliable, and the battery life is really good. We had a program where we operated with key down for three and a half hours, and you just can't do that with a handie-talkie. This was a fund-raising activity and it was done on the street corner so there wasn't a handy AC line to plug into.

"The receive antenna for our high-quality work is on top of our own building; the two-way radio antenna is on top of the Mercantile Center which is a little higher and is three blocks from the studio. We use land lines in between the two.

"A lot of our remotes go out over the network. We did a pickup over at the new convention center for the NAACP National Convention here. We fed the floor proceedings to the network and to the USIA through our studios.

"We do a great deal of sports around here plus a lot of news. This is a pretty neat town and we're the only talk station. Our morning drive consistently pulls very well."

### WRVA, Richmond, Va.

This AM outlet broadcasts with 50,000 watts at 1140 kHz, covering a large area of the state. Chief Engineer Ted Chezik told *BM/E* about the station's principal remote pickup activity:

"Our station's remote receiver is on top of a bank building about a mile away from the studio, and we have a land line hookup covering that distance. We operate the rotor on that pickup point by remote control from the studio, and with it we can easily pick up field broadcasts from 15 to 20 miles away. We're using a Moseley RPL-4 for the relay in the UHF band.

"We have one location with a permanent remote setup at the Jarrell Truck Plaza about 22 miles from our station. We use a separate antenna for that one since we remote from there six days a week from 11:30 p.m. until 5 a.m. This is our all-night talk show which is run by John Trimble and is tailored for the truckers. Because of its orientation, the truck plaza is the ideal place to originate the program.

"We do some other remotes in the area, mostly for clients — doing their commercials on location with post-production at the studio. Our FM programming is entirely different and we don't use any remote pickups for it. We also use Scala microwave equipment for our relay."

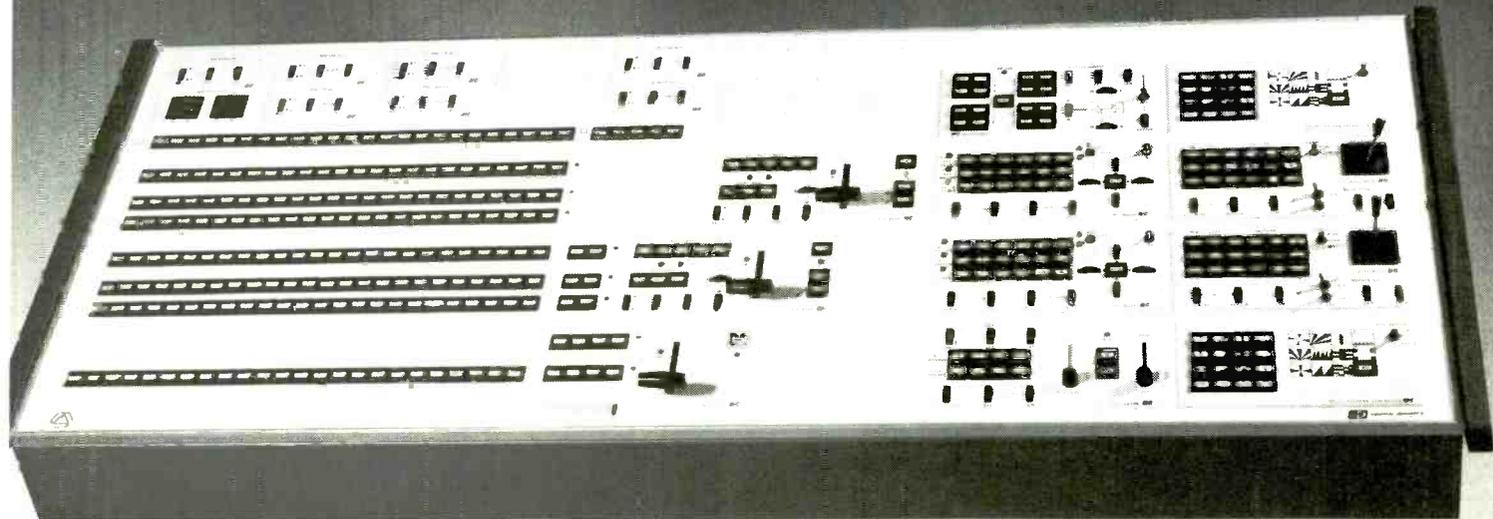
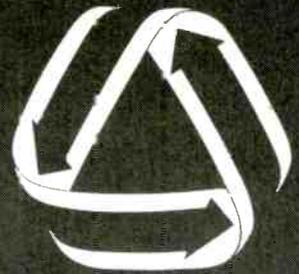
### KPBS, San Diego, Calif.

An affiliate of San Diego State University, this FM station has a 2,000 watt transmitter located "at a high altitude." The remote pickup van used by this station was on display at the recent National Public Radio meeting in San Francisco. Ken Kramer, the station's director of public affairs, described his station's RPU activity for *BM/E*:

"Basically, we use remote for news and public affairs programming — both live and recorded. The van is designed for music remotes as well, and it's designed a little bit differently than a van would be for a commercial station. We do our mixdown right on the spot. The van is a remote recording control room, and at the same time it can

continued on page 81

# The CD-480 "Smart Switcher" is here.



## Why settle for anything less!

If you're interested in an outstanding video production switcher, compare the following—against any other switcher.

**Operation:** Simple. At last the operator will have an efficient and easy-to-use control panel. Spend more time being creative with the many outstanding special effects available on the CD-480 and spend less time fighting a maze of buttons, knobs and switches.

**Features:** Everything you would expect to find on a first-rate production switcher. Most standard, with an assortment of options such as rotary wipes, quadplexer, and many more. Even the smallest CD-480 will surprise you.

**Technology:** The latest. Providing unprecedented and outstanding operation, while ensuring the highest reliability available.

**Your Requirements:** No problem, various models are available. The CD-480 is modular and can be configured to meet your individual needs.

**Expansion:** A snap. The modular construction allows features to be added at any time, usually on a plug-in basis. Even on the control panel.

**Price:** A real bargain. Likely no more than you would expect to pay for a run-of-the-mill outdated switcher.

**We Deliver:** Switchers are presently in use in many areas of the world including 8 of the top 12 U.S. markets.

**Why wait? Call us now.**

## CENTRAL DYNAMICS LTD



U.S.A.  
Chicago  
331 West Northwest Highway  
Palatine Ill 60067  
Tel. 312-991-4720  
TWX - 910 693 4805

New York City  
Tel. 201-767-1300  
TWX - 710 991 9753  
Atlanta  
Tel. 404-491-9037

Los Angeles  
Tel. 213-789-0574  
TWX - 910 495 1713  
Dallas  
Tel. 214

CAN

Circle 137 on Reader Service Card

Ask For The  
CD-480  
Demo Tape

# We give you more than a little extra.

In fact, we give you much more than some extra minutes of famous TDK tape in every cassette. (At 1 7/8 ips standard speed, our C30 is really 30 1/2"; our C45 is 46"; our C60 is 62" and so on). We also give you the same extraordinarily high quality construction standards and reliable performance that have made TDK recognized as a world leader in tape technology. For instance, all TDK A/V cassettes are precision molded, with a five-screw, high-impact shell, flanged guide rollers and all-felt pressure pad assembly, so they run smoothly, without jamming, snarling or spilling.

And you get the same kind of extra quality,

no matter what TDK tape you use. TDK SA, AD and D cassettes are ideal for dubs from master tapes; TDK "Y" series duplicator cassettes offer superb performance in an economical package (or, you can have the same quality tape in 1/8" pancake) and TDK Audua series open reels and pancakes provide the ultimate in 1/4" lab quality formulations. We also offer a complete selection of Endless, Dictation (leaderless), Data and Test Cassettes.

Check your A/V or professional products supplier. See how you can get the ultimate performance from all kinds of A/V gear and tape equipment with TDK—more than a little extra.



**TDK**  
AV CASSETTES

TDK Electronics Corp., 755 Eastgate Blvd., Garden City, NY 11530  
2906 W. Peterson Ave., Chicago, IL 60645; 2041 Rosecrans Ave., Suite 365, El Segundo, CA 90245.

## Remote Radio

get out there for a live remote pickup. While we're not set up for live stereo transmission, the unit is very versatile.

"Because the corridor between San Diego and Los Angeles is very crowded with VHF traffic we use UHF for our van/studio link. We're certainly considering the idea of adding a second UHF link so we will have live stereo pickup capability. I don't know just when we'll do this, since it's mostly a matter of financing.

"We use our van for our main channel programming plus our SCA channel. This is a special channel of programming for the blind and is totally separate. It's like having a second station, and we use the van for doing programming for our SCA service.

"Our van is also used for sports remotes and for wheelchair games, programs that are never heard on the main channel.

"There are really two setups for our truck. One is the typical news and public affairs center that we use with three mikes — two outside and one inside. The doors can be closed for that kind of arrangement so we have a mini studio in the van. And we have a multi-cable setup that we use for music recording.

"Philosophically, we like to think of the van as an extra studio/control room. Because we're so cramped for facilities, we'll often pull the truck up to the building and set up a studio in our program director's office, using the van as the control room. If you can get the van out into the community, it's really being put to its best possible application."

### KFAT, Gilroy, Calif.

This FM stereo station has its transmitter on a 4000-foot-high mountain with an ERP of 1.1 kilowatt. Live stereo remote pickups are its stock-in-trade with emphasis on its "progressive western" format. President Jeremy Lansman told *BM/E* about some of his pioneering work in remote pickups:

"When we ordered our equipment, we specified 100 kHz bandwidth, since this is permitted by the FCC. We were the first ones to have 100 kilohertz, and our two Marti units operate at Group S — one at 450.925 MHz and the other at 455.925.

"To get a good signal, I need 100 microvolts at the receiver; this means around 150 microvolts at the antenna. That's not just a little signal. We go out as far as 70 miles from our studio and we plan to do something this summer from the Sierra Nevadas, which, while it's line of sight, will put us well over 100 miles.

"We had been running with the Martis barefoot, which are 25 watts each. We bought a batch of Spectrum International amateur UHF antennas and trimmed them, which gave us 13.5 dB gain. This has been giving us really clean signals out to 15 miles line of sight and usable, but somewhat noisy signals as far as San Francisco (55 miles).

"Now we're doing long remotes from Palo Alto, for example — even behind some hills — about 30 miles away. We're doing remotes there every week, running 80 watts power output per transmitter, and the signal-to-noise ratio is better than the tape we make on location. It takes a lot of power to make it over that distance. Our receive antenna is really slapped together. Right now we're using a seven-foot parabolic antenna. It's essentially a UHF TV antenna that I modified, and slowly, I'm

getting it all together. Now, we're going to put up a 10-foot antenna, which will give us 22 dB gain at the receive end. Our sending antenna is a modified Yagi arrangement that falls apart easily, which is why we're using this type.

"We get the power boost we need with a pair of broadband linear amplifiers from KLM. These are prototypes of a newly type-accepted amplifier. KLM usually makes linears just for the amateur radio market. These things are supposed to put out 110 watts, but the first time we tried them, we overdrove them and had problems. There were literally parts falling out until we learned how to use these things. So now we run them at 80 watts per channel, and it works out really well. But anyone using them shouldn't make the mistake I did; they're not like tube amplifiers, and when you overdrive them, you get some melted finals.

"We have a weekly program from Palo Alto called *Fat Fry* which is essentially a return to early 1940s radio. We do a live music broadcast with MCs before a live audience. It's kind of a progressive Grand Ol' Opry. We made a decision about a half a year ago to do these remotes, since we felt our audience wanted to hear this music. We used to sell our remotes, but now we're after our own ratings. We want to keep our listeners happy.

"Our mixdown is done on location. We also do as many remotes of music programs as we can, possibly featuring somebody like Country Joe MacDonald. In fact, the first time we used the new linears was on one of his shows from San Francisco. We could not have done this without the 80 watts per channel. It's all legal and we have a license for it. Anyone can do this now just by getting type-approved power amps.

"A lot of the small-town broadcasters certainly don't need the kind of power we're working with for remotes. Usually, the stock remote transmitters will do the job. In addition, if you're an AM broadcaster, it's not really much of a trick; you don't need 60 dB S/N ratio then. An AMer will find it a whole lot easier than I have."

### KLEB, Golden Meadow, La.

This daytime AMer has a kilowatt broadcast transmitter, while FM affiliate KZZQ operates at 3 kW. KLEB's programming is country, while KZZQ is contemporary stereo. Station president Dick Egle told *BM/E* how he uses remote pickups:

"Our VHF unit works for us in remote locations such as the stadium and other fixed sites. We have a new handheld UHF unit which we can hand-carry out on the field with us. Our VHF receiver for the remote pickups is on our FM tower which is about seven miles from our AM studio. With this setup, we can go for various kinds of remotes — football and basketball games, tournaments, and so on.

"In the summertime, we have something really unusual on the Gulf Coast — fishing rodeos. We have eight or nine of them here during the summer. People come in and catch some of the biggest fish in the country, right in our back yard.

"We use the VHF unit with a telescoping antenna for these events, and it's a good 42 miles from Grand Isle, where the rodeos are held, to our studios. We also have a Yagi antenna which we use quite a bit when we're that far away. And then we use the small UHF unit in conjunction with the VHF transmitter. It acts as a kind of roving reporter source at these events."

BM/E

# Introducing two hours of Omnivision II™ VHS™

An important message from top management will soon be seen by all employees, whether they're in the home office, the branch offices or offices overseas. At the same time, a manufacturer decides his 450,000 volt generators, a bit too large to take along to sales demonstrations, are small enough to take along on tape. A large retailer trains the staff at four branch stores simultaneously. A real estate investor takes a tour of prospective California property from his office in New York. And a couple watch a new boat take the waves from a showroom miles away from water.

This is what industry can do through video communications. It's also why Panasonic brings you Omnivision II™ VHS™, the world's first two-hour 1/2" video cassette system with industrial strength.

## What is "industrial strength"?

The answer is simple: Durability, reliability, global adaptability and the kind of meaningful performance features and options industry requires. But industry also requires economy. That's why Omnivision II decks are available in two cost-efficient models. The NV-8300 player/recorder with VHF and UHF tuners.

And for situations that require only playback, there's the even more economical NV-8150 player. Both with a combination of features not found in any other 1/2" industrial system.

## Industrial strength performance.

For outstanding picture quality, both Omnivision II decks have direct-drive video head cylinders for low jitter and excellent stability. And for precise and steady tape speed, both use a capstan servo system. Combine this with patented HPF™ video heads and the results are what you'd expect from Panasonic: Horizontal resolution of 300 lines in black and white, 240 lines color and a superb S/N of 45 dB. There's also the kind of durability and strength you expect from Panasonic. That's why all the critical components and mechanical parts of both decks are mounted on an annealed aluminum die-cast chassis.

## Tape economy.

Omnivision II tape cassettes are less expensive, smaller, easier to store and more economical to mail than 3/4" tapes. They also give you twice the playing time on a video cassette half the size of a 3/4" cassette.



NV-8300 player/recorder.

# industrial strength video. from Panasonic.

So not only can you spend more time recording and playing, you'll also spend less money on tape. Omnivision II cassettes are also compatible with all other VHS systems.

## Duplication and global adaptability.

Recording one video tape with Omnivision II is simple enough. Making as many copies as you need is just about as easy, with independent duplication facilities in certain key areas in the U.S.

For multinational corporations, both Omnivision II decks will operate anywhere in the world where there's a power supply of 120 volts and AC frequency of either 60 or 50 Hz.

And for even greater international flexibility, no modification is required when Omnivision II decks are used in countries with other AC line voltages. Simply add an inexpensive step-down transformer. And wherever Omnivision II decks are used, fluctuations in AC line frequency won't affect them, because both use DC motors.

Both decks also have a VTR/TV antenna switch, automatic shutoff at the end of the tape, BNC and 8-pin output connectors and more. With the NV-8300

you also get a built-in digital clock/timer for recording when you're not there.

## Industrial strength options.

Omnivision II decks are available with the kind of options you require for your special communications needs. Like an RF modulator for playback on most TV receivers. A remote pause control. Black and white and color cameras. Monitors. And Panasonic 30, 60 and 120 minute VHS cassettes.

So no matter what your industrial communications needs are, take a look at Omnivision II VHS from Panasonic. The system with industrial strength.

For more information write: Panasonic Company, Video Systems Division, One Panasonic Way, Secaucus, N.J. 07094.

In Canada, contact Panasonic Video Systems Department, 40 Ronsen Drive, Rexdale, Ontario M9W 1B5.

CAUTION: Unauthorized recording of copyrighted television programs, films, video tapes and other materials may infringe the rights of copyright owners and be contrary to copyright laws.

**Panasonic** **VHS**<sup>™</sup>  
Omnivision II<sup>™</sup>



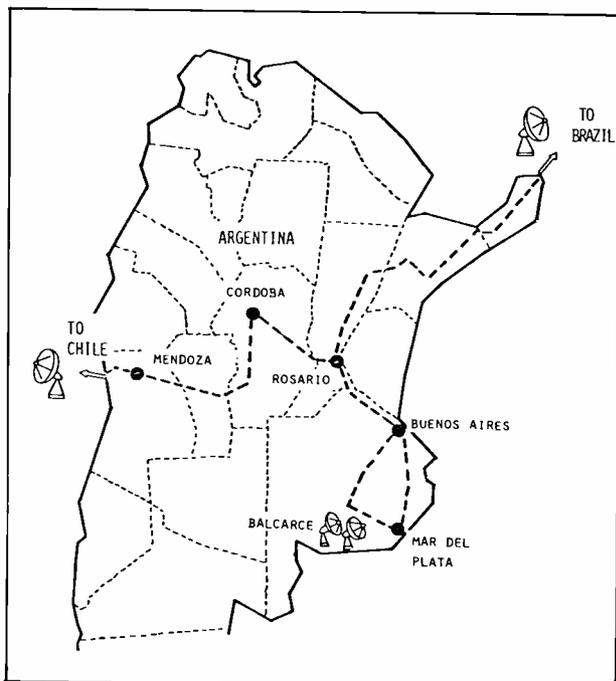
NV-8150 player.

# Elaborate and Impressive System In Place to Broadcast 1978 World Cup Soccer Championship Games

Second only to the Olympics in size, the XI Football Championship for the World Cup, to be held in Buenos Aires in June, presents an immense broadcast challenge. Argentina has responded by creating an advanced technology network which will beam games played from five different cities to a world audience of over 800 million viewers. Both PAL and NTSC satellite transmissions will go out.

ARGENTINA 78 TELEVISORA (A-78-TV) is a new entity constituted by Argentina in 1976 to be responsible for broadcasting the 11th Football Championship for the World Cup of 1978. If North American readers will translate football to mean soccer, they will understand what is at stake is the world soccer cup championship. For clarity, we will use "soccer" in this report, but for accuracy, however, let it be known that the group responsible for the games is the International Federation of Football Association (FIFA for short).

Since the matches will take place in six different stadiums — two in Buenos Aires and others in four other cities, Cordoba, Rosario, Mar del Plata, and Mendoza — it is no small task to arrange for transmission for both audio and visual information from each site to the home countries whose teams are represented.



World Cup soccer game will be played in five cities in Argentina.

Of all the facilities described in this special *BM/E* issue on radio and TV field applications, none equals the magnitude or scope of the arrangements made to broadcast the 1978 World Soccer Cup games. Thousands of miles of microwave routes have been constructed to link six stadiums located around the country to satellite transmit sites for worldwide coverage. Elaborate mobile vans have been ordered to help in the production of stadium events. Since some of the equipment installed for this event does become a permanent part of a new National Production Center, we are, perhaps, stretching a point to imply that what is described here is *all* field production. We're sure, however, that readers will find all aspects interesting.

Final plans permit commentators not only to talk directly to their own national network, but also to receive a return signal. As a result of expanded telecommunications installations, it is possible for Argentina to provide to commentators 560 channels of two-way audio transmission simultaneously.

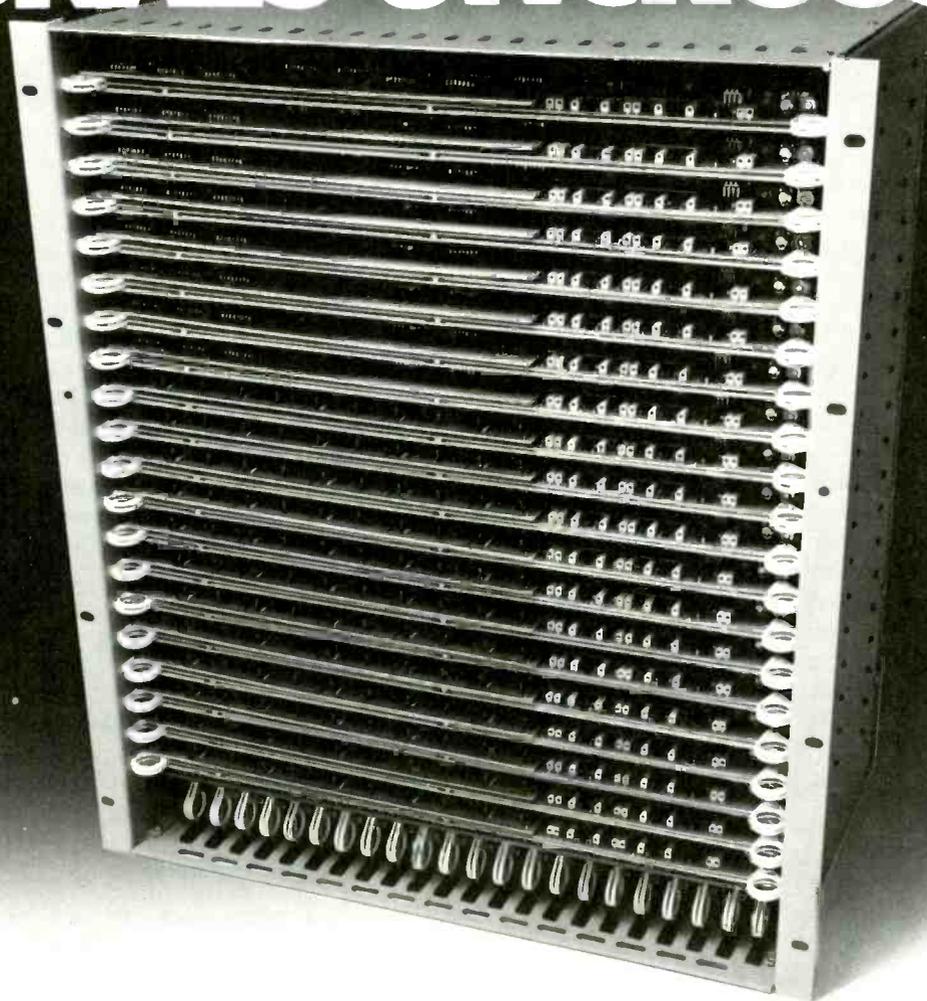
Because there was no existing infrastructure, A-78-TV was able to plan near ideal arrangements for the World Soccer Cup, and as a result has been able to use some advanced technology to a remarkable degree. Getting the best equipment on hand for the 1978 World Cup games has led to some major equipment contracts. Among them:

- Outside broadcast vans, cameras and switching consoles — \$10 million to Bosch Fernseh.
- Microwave equipment — \$1 million to Thomson-CSF.
- VTRs, telecines, and slow motion recorders — \$3.2 million to RCA Victor, Argentina.
- Audio units, lighting — \$800,000 to Dimerson and Platen.
- Monitors, test equipment — \$500,000 to Tektronix and Conrac.

The nerve center for the World Cup games is located in Buenos Aires; two major facilities there are the new 23,000 square meter Production Center and an enlarged

continued on page 86

# GET YOUR SIGNALS UNCROSSED.



No matter how complicated your studio operation is, we can unsnarl your signals and send them on their way, with one of our nine off-the-shelf Switcher series.

For example, many broadcasters use our lower cost 15X or RX Series Switchers to switch input signals to their VTR machines. By providing instant access to signals at the touch of a button, difficult editing jobs are accomplished on the spot and, during the Vertical Interval.

And to minimize system downtime we've designed our Series 20X and 40X Switchers for optimum reliability and capability. Most units have a microprocessor in every channel to eliminate total system failure if the logic system malfunctions. And you can replace a channel

module without shutting down the entire system.

For audio use, our solid-state Series AX Switchers make the old fashioned patch panel a thing of the past.

All 3M Routing Switchers can be built to nearly any input/output capability, with vertical interval switching and can be operated by many types of controls.

Studio operation is getting more complex every day. You can't fight it, so why not switch? Switch to 3M Routing Systems.

Circle the reader service card number at the back of the book for more information or call 205-883-7370 for system design assistance. 3M Video Systems. Watch us in action.

**3M**  
COMPANY

Circle 140 on Reader Service Card

## Soccer Championship

communications complex, Centro Internacional Buenos Aires (CIBA). Each of the six stadiums have been modified to accommodate both radio and television broadcasters and newspaper men. The overall plan calls for broadcasting two color transmissions simultaneously, one in PAL, the other in NTSC. A standards converter at the satellite transmit site permits either PAL or NTSC transmission. Unfortunately for Argentinians, they will have to watch in monochrome since a national standard for color has not yet been set. Television rights have been worked out with a consortium formed by the Organization of Iberoamerican Television (OTI), the European Broadcast Union (EBU), and the International Organization of Radio and Television (OIRT). In the U.S., the Spanish International Network will carry the games.

Both audio and color TV channels travel together via microwave or coaxial cable as shown in the network block diagram. The international terminal point is the two earth satellite stations at Balcarce. As a reliability measure, audio can be rerouted to Brazil and Chile earth stations.

All external communications for the World Cup have been under the direction of the ENTel (National Communications). In addition to setting up the transmission link for television transmission from the stadiums to the satellite stations at Balcarce, ENTel has supplied for broadcasters, and other press facilities such as telephone, telegraph, telex, and radio photo service.

Consoles for radio and television commentators are part of the communications network. One hundred and fifty such announce booths have been set up in the main stadium in Buenos Aires, River Plate. Another 50 have

been installed in the Velez Sarsfield stadium in Buenos Aires. At each of the stadiums in the country (secondary sites), 75 announce booths were set up. Twenty such booths are included in the new Production Center.

At CIBA, international circuits for all services have been expanded. Radio boards that control and distribute 24 radio and TV audio programs are part of the CIBA complex.

Some of the details of the audio distribution scheme were detailed by Oscar Juan Bonello, Sistemas Solidyne, at the 58th AES Convention in New York. All audio channels converge to CIBA. These may be regular radio and TV signals from national or foreign broadcasters, or they may be World Cup signals coming from the commentator's posts set up in the six stadiums.

Broadcast audio signals can be transmitted over a 4 kHz or 15 kHz bandwidth circuit. Signal routing is made through solid state matrices which can be punched from control consoles. The command circuits provide for operator communications both internally and internationally. It is possible, said Bonello, to equalize the transmitting and receiving circuits from the console. Signals headed to the satellite can be processed through a level processor of the expander-compressor-limiter type. This system has all of its constants automatically regulated by a memory and control circuit. Levels are analyzed and optimum parameters selected. Based on signal masking principles, 40 dB of control is provided without deteriorating quality. Signal to noise is 80 dB.

As mentioned, the audio matrices are solid state. They operate, according to Bonello, "on the principle of the coincidence of coordinates, thus the name MACCORD from the Spanish words, Matriz de Acceso por Coincidencia de Coordenadas — Access Matrix by Coincidence of Coordinates. Accordingly, to control a matrix of  $m$  inputs and  $n$  outputs ( $m \times n$  crossing points) on  $m+n$  control terminals will be needed."

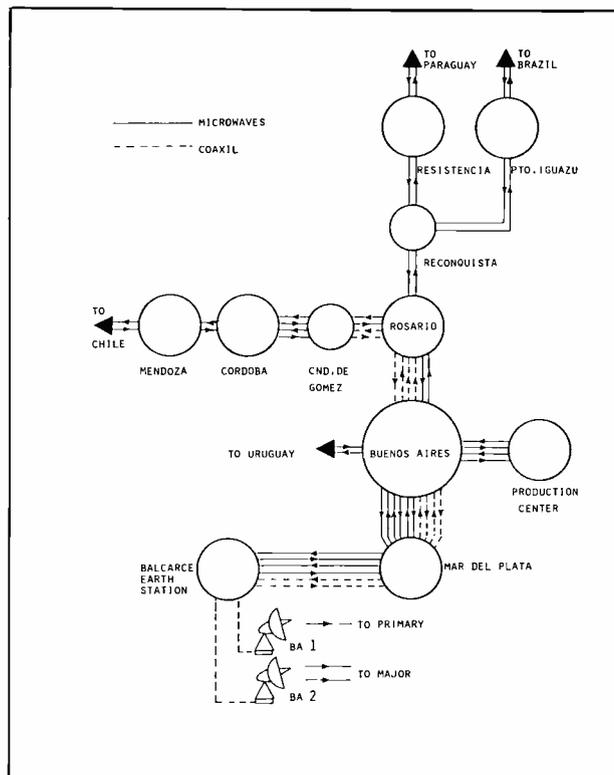


Diagram of World Cup broadcasting network (illustration courtesy of Audio Engineering Society).

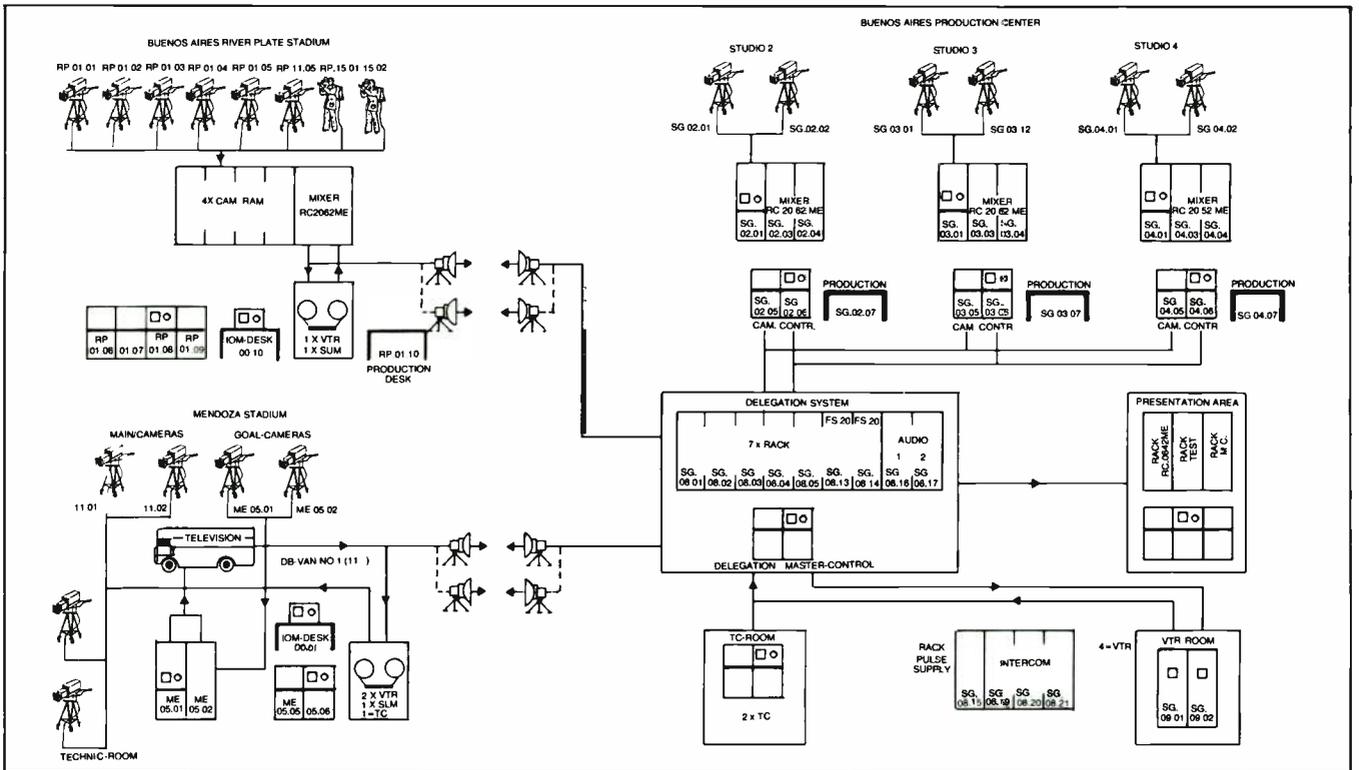
### Commentators' consoles

The originating point for audio in the World Cup network is the commentators' booths. Each booth accommodates two commentators complete with headphones and dynamic microphones. Commentators have a control panel that enables them to adjust return levels, listen through headphones to stadium loudspeakers, call a control console operator, and monitor their own voice.

A group of eight commentator booths are under the care of one technical operator who monitors transmissions through the control console. The operator applies the level processor which automatically maintains the right level. A 60 dB change in input will produce a variation of only 20 dB in the dynamic range of the output. Harmonic distortion is less than 0.3 percent.

The control console is equipped with a keyboard to control the signal and includes tape cassettes pre-recorded with the voice of the commentator. This facilitates pre-game set up and level adjustment. By switching in appropriate cassettes, the console operator can verify with the final destination point that the system is set and working properly without the commentator being present.

The ambient sound of the playing field is picked up by three microphones which are mixed with commentators' microphones. As a result of the level processor



Overall block diagram showing television equipment at the Buenos Aires Production Center, River Plate Stadium, Buenos Aires, and a typical secondary stadium.

action, the field sound modulates the channel 100 percent in the absence of the commentators' speech.

The consoles are automatically checked periodically. One unique test plots the dynamic behavior of the level processor using a tape recorded program.

### Installations at various stadiums

The basic equipment complement of the two stadiums in Buenos Aires includes four color cameras plus one b&w camera, one VTR, and one slow motion video disc machine, all connected to one video mixer. In addition there are two more color cameras behind the goals coming into the production switcher and fed to the video disc machine. River Plate stadium will also have two portable color cameras, bringing its total to eight. There is also a complete sound studio for the TV opera-

tion and two microwave links to ENTel. (The commentator booths are, of course, also part of the stadium facility.)

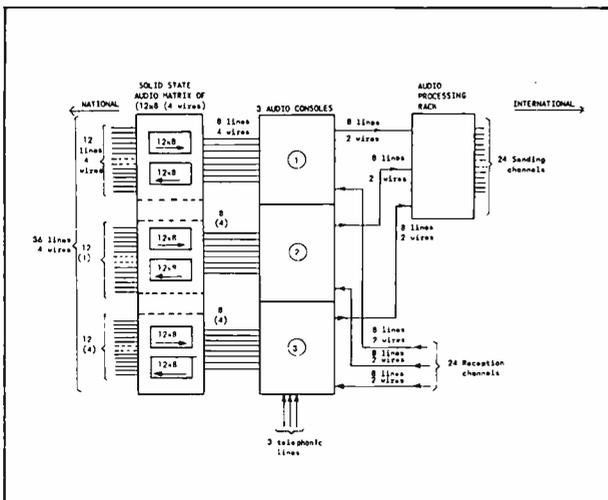
The stadiums at Rosario, Cordoba, Mendoza, and Mar Del Plata have somewhat less equipment and are backed up by the mobile van. Within the stadiums are a radio studio, two cameras, two VTRs, a slow motion recorder, and a telecine chain. Four more cameras come with the van. Within the mobile van is a complete setup: a video production room, an audio room, and an equipment room contain CCUs and a VTR. The mobile van becomes the centralized switching center. That is, the VTRs, slow motion recorder, and telecine chains that are within the stadium are controlled from the van.

### The A-78-TV Mobile Van

The four mobile vans purchased by A-78-TV will play a vital role in the coverage of the World Cup matches. The video control room has a 16 input switcher mixer with special effects and a character generator plus monitors. The sound room has a 20-input console, two audio recorders and two record players. The room is acoustically treated to cut noise levels. Great care was taken to avoid air conditioning noise. The truck itself is diesel powered and has a cruising range of 600 Km without refueling. It is able to travel all sorts of roads. The driver's seat is located within the main body, thus shortening the length one meter. The video control room is directly behind the driver's seat and is reached from the driver's door.

The sidewalls, floor, and roof plate are double-wall sandwich construction. That is, a filling between two fiber glass sheets insulates the body thermally and acoustically. This fiber glass construction saves weight

continued on page 90



Block diagram of audio system at telephone (CIBA) center.

# 1"-VTR-Report '78

The BCN-Format is the basis of the SMPTE-1"-Type B-Standard. Today more than 350 BCN systems are in operation throughout the world.



BCN scanner (life size), equally suitable for reels and cassettes

Bosch Fernseh decided in favour of the BCN short track segmented field technique from the alternative 1" solutions (segmented field with an 80 mm track and non-segmented field with a 450 mm track) for the following important reasons:

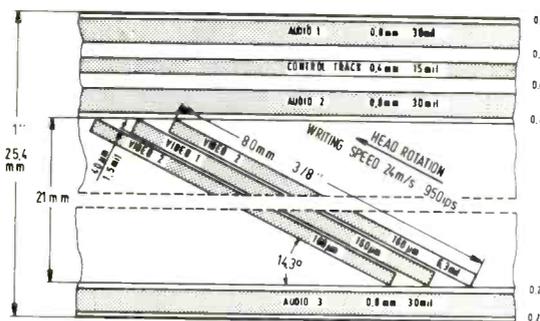
- Additional tracking correction system is not necessary.
- Omega wrap angle of 190° enables multigeneration copies with minimal chroma noise.
- Overlapping 2-head technique enables uninterrupted recording of the video signal encompassing also the entire vertical blanking period.
- No additional head required to record vertical blanking period.
- Superior luminance signal to noise ratio because time base correctors and their inherent analogue to digital, and digital to analogue conversions are not necessary.
- Video track tilt angle of 14,3° ensures insensitivity to longitudinal dropouts.
- The track and scanner arrangement is suitable for reel and cassette applications.

## The BCN-Format has three audio tracks

Apart from the video and control tracks there are three audio tracks of equal quality. It is therefore possible to record full stereo sound or multilingual commentary. Track 3 can also be used to record a time code, using either the built in time code generator or an external one.

## The BCN Editing Systems solve every problem

- Integrated insert/assemble operation
- Automatic electronic editing using the EES 9 with two BCN 40/50 machines
- An automatic editing system EPS 7000 for up to 5 BCN units
- A freely programmable, computer controlled editing system such as the ESC 40 K - offering an enormous range of applications.
- Editing point definition using the most modern digital techniques: Unlimited "still" picture reproduction without any danger of damaging the valuable master tape; jogging and slow motion are also possible as well as special digital production effects such as "Quad Split".



BCN format, basis of SMPTE-1"-Type B-Standard

### Identical tape transport for all TV Standards

The segmented field technique makes possible the adaption of the number of segments per field from 6 (625/50) to 5 (525/60). The conversion of any BCN machine to any standard NTSC, PAL, PAL-M or SECAM is therefore purely an electronic and not a mechanical matter. The tape transport and scanner remain completely unchanged.

### A guaranteed future for the BCN format with respect to digital recordings

The development of the BCN format was carried out bearing in mind the requirements of a future generation of video recording techniques. As soon as tape, head and component technology provide a cost effective solution for digital recording, BCN machines will find additional applications without any changes to the existing deck.

### Cassettes or reels for portable, mobile, or stationary operation

The BCN format concept covers all operational applications:

The BCN 5 cassette version is intended for the production of rapid, studio quality, 20 minute programme contributions and of course, for all ENG activities. The portable, battery operated BCN 20 having 60 minute reel time is ideally suitable for all mobile applications whereas the conventional BCN 40/50 machines combine mobile outside broadcast operation with stationary applications.

### BCN 40/50 for studio OB van applications

The BCN system is based upon a modular building brick concept. Modules with related functions are arranged in portable units.

The standard version of this universal equipment is the BCN 40/50, the typical VTR for studio stationary use.

The same version, however, is also, highly suited to mobile OB van applications.

For monitoring purpose a "monitoring bridge" consisting of a black and white or colour picture monitor, waveform monitor and vector scope can be added to the deck, electronics and processor units.

### Outside Broadcast productions with studio quality under all conditions: BCN 20

This portable or mains operated BCN version with 60 minute reel time is intended for high quality outside broadcast productions from a car, helicopter, ship, or motorcycle.

The additional electronic unit BCWQ 9 together with the standard processor unit enable high quality BCN 20 reproduction suitable for transmission.



The BCN has made this new compact OB van concept possible



BCN 50 as studio machine with "monitoring bridge" and integrated automatic editing EES9

### The first studio quality cassette: BCN 5

The BCN-cassette fulfills the demand for ENG in studio quality. Recording and reproduction are ensured under all conditions between  $-10^{\circ}\text{C}$  and  $+45^{\circ}\text{C}$ .

The 20 minute cassette enables rapid cassette change because it can be removed in any winding state and a reel subsequently removed and replayed directly on any BCN 20/40/50 without the need for adaptors.

A multi cassette automatic using the same 20 minute cassettes is in preparation and intended for automatic studio applications.



Reporter of the future with BCN-cassette

### Experience gained from practical use

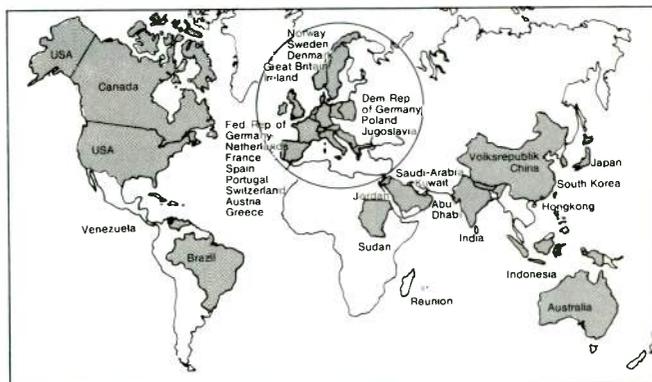


On the move recordings are now possible under the most extreme conditions

More than 70 TV authorities and production houses have decided in favour of the BCN system because of its outstanding economy and complete equipment range, covering both reels and cassettes. Stationary and portable BCN machines are now in operation all over the world.

### The BCN format is the basis of the SMPTE-1"-Type B Standard

All BCN machines delivered so far are in accordance with this standard and need no alterations. In addition, the BCN format is being processed at the IEC and published as DIN Draft 45 483. The EBU regards the BCN-standard as already defined by the SMPTE; the BCN is in use in 16 EBU countries.



More than 350 BCN-systems in operation in 33 countries

BCN. A format that has proved itself

# BOSCH

Robert Bosch GmbH, Geschäftsbereich Fernsehanlagen, Postfach 429, D-6100 Darmstadt, Fed. Rep. of Germany

Robert Bosch Corporation, Fernseh Group, 279 Midland Road, Saddle Brook, New Jersey 07662, USA., Phone (201) 797-7400

Circle 141 on Reader Service Card

# Your best buy in small screen monitors



## Everyone makes large monitors-but we're the leader in small screen units.

Setchell Carlson gives you a definite advantage in small screen video monitors with 9 different models to choose from, in 5", 6" and 10" screens. No one else offers such a wide selection.

Singles, duals and triples combine compact size with Setchell Carlson's well-known features. Like UNIT-IZED® 100% solid state circuitry, up front controls, regulated power supply, front panel screwdriver adjustments for vertical linearity, height and focus.

Feel more secure with Setchell Carlson.  
Made in America.

**SC ELECTRONICS, INC.**  
A SUBSIDIARY OF AUDIOTRONICS CORPORATION

530 5th AVE. N.W. NEW BRIGHTON, MN. 55112 (612) 633-3131

Circle 144 on Reader Service Card

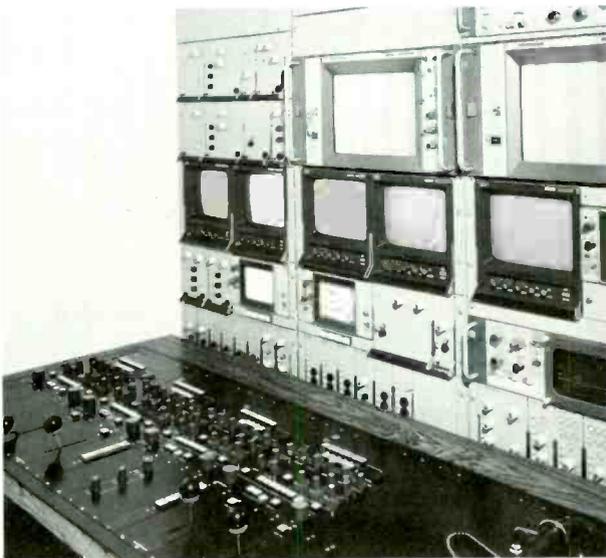
# Soccer Championship



View of audio console compartment in the A-78-TV mobile van. Tape recorder, not shown, is on left wall.



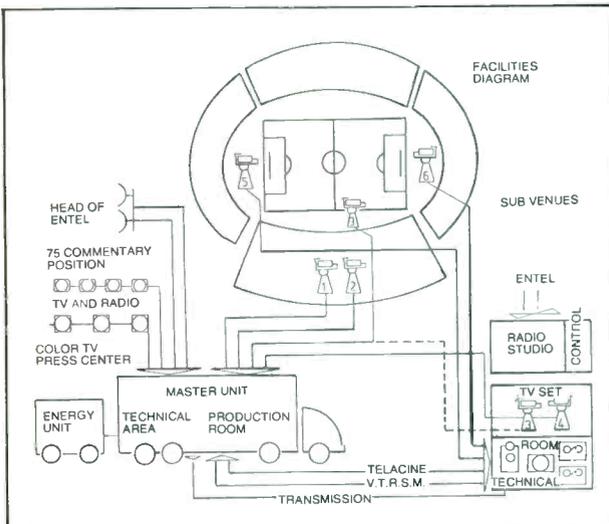
Production room inside van with Bosch switcher and character generator.



View of technical control room at rear of van.



Air conditioning equipment.



The van becomes the video control center at the outlying stadiums.

presentation mixer and production mixer, 2) telecine to the presentation mixer and production mixer, 3) frame synchronizer to both mixers, and 4) the presentation mixer and production mixer to the VTRs.

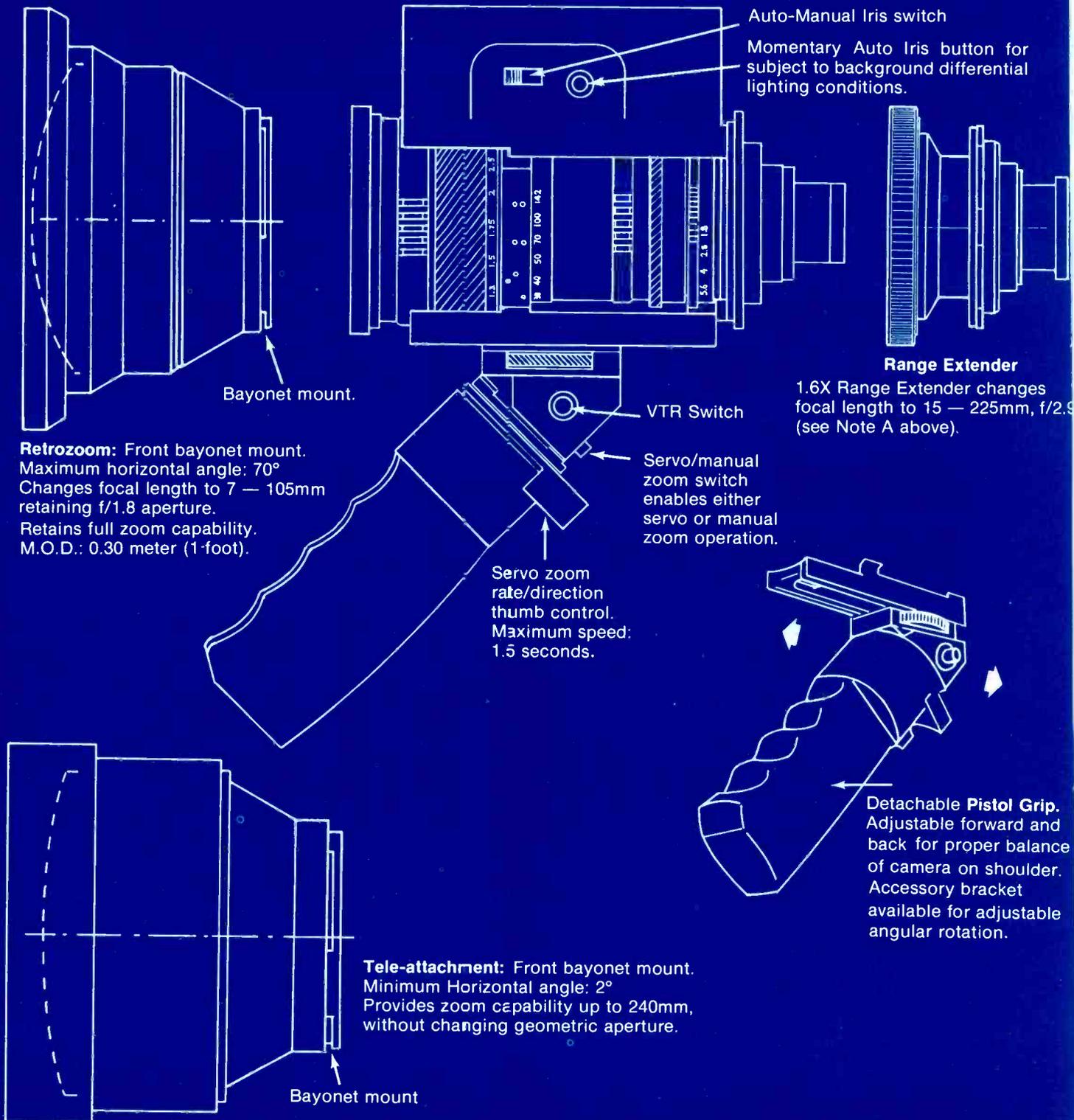
The presentation room is equipped with a central mixer which receives inputs from the studios, three telecines and three VTRs. The video switchers in the studios are Bosch Fernseh's model RC 2062 ME. The master control switcher is a Bosch RE 1641 ME. The delegation switcher is by Siemens and Bosch. Character generators are the Thomson-CSF Vidifont IVs.

Principal cameras are Bosch Fernseh KCK40As. VTRs are RCA TR600s (6 PAL, 2 NTSC). Two AE 600 editors are part of the complement. The slow motion recorder is the HS 1000C Ampex. A Recortec tape evaluator is on hand. Two RCA telecine chains are used.

Frame synchronizers are the Quantel DFS-3001. Lighting control is by Dimerson; light fixtures by Panoak. Microphones are Sennheiser and Neumann. As mentioned, monitors are by Conrac and Tektronix, and test equipment is mostly Tektronix. Radio equipment includes consoles by Dimerson, tape recorders by MCI, turntables by EMI, and microphones by Sennheiser.

A technical shakedown of all this equipment, fully crewed, began in March. By May 31, on the eve of the games, A-78-TV is confident that it will be ready to do the best job ever in broadcasting this event. **BM/E**

# How ingenieux's advanced 15x system provides extraordinary quality and performance



Bayonet mount.

**Retrozoom:** Front bayonet mount.  
Maximum horizontal angle: 70°  
Changes focal length to 7 — 105mm retaining f/1.8 aperture.  
Retains full zoom capability.  
M.O.D.: 0.30 meter (1-foot).

Auto-Manual Iris switch  
Momentary Auto Iris button for subject to background differential lighting conditions.

**Range Extender**

1.6X Range Extender changes focal length to 15 — 225mm, f/2.9 (see Note A above).

VTR Switch

Servo/manual zoom switch enables either servo or manual zoom operation.

Servo zoom rate/direction thumb control.  
Maximum speed: 1.5 seconds.

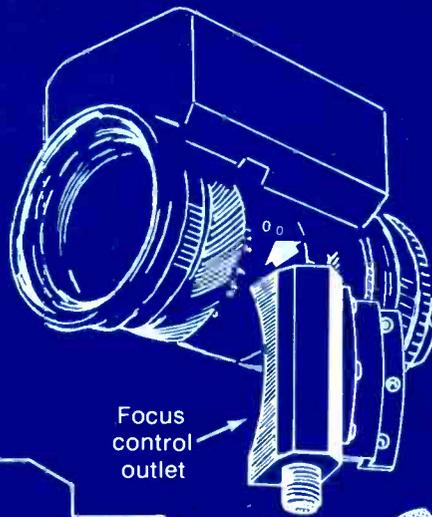
Bayonet mount

**Tele-attachment:** Front bayonet mount.  
Minimum Horizontal angle: 2°  
Provides zoom capability up to 240mm, without changing geometric aperture.

**Detachable Pistol Grip.**  
Adjustable forward and back for proper balance of camera on shoulder.  
Accessory bracket available for adjustable angular rotation.

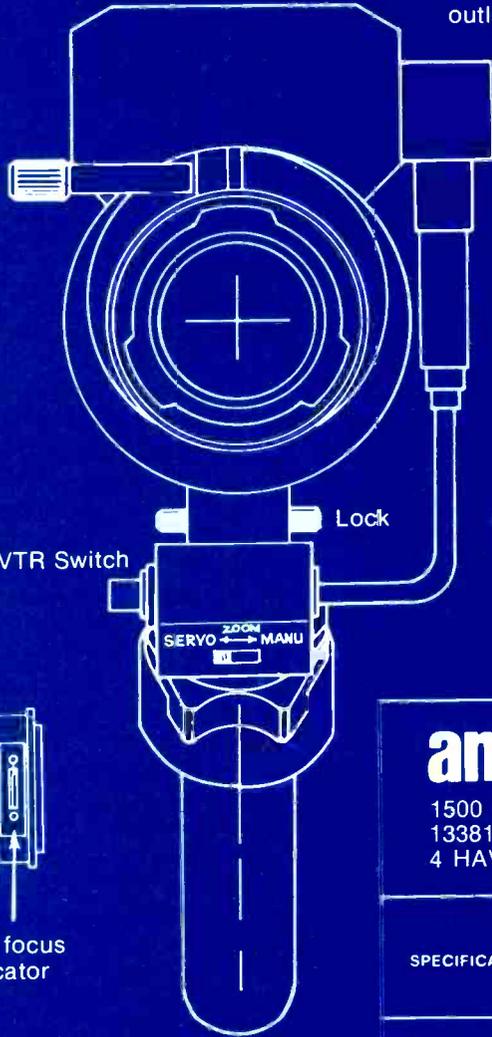
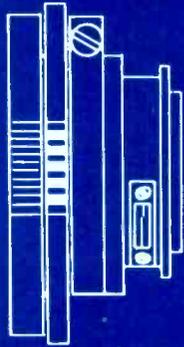
**Range Extender**

**Note A**  
 Second Range Extender (1.6X) may be mounted in tandem providing 2.56X factor, changing focal length to 25 — 365mm, f/4.6



**Accessory Focus Control** outlet available to accept flexible cable for manual focus hand control.

**Rear Mount**



Manual focus hand control for rear-camera operation.

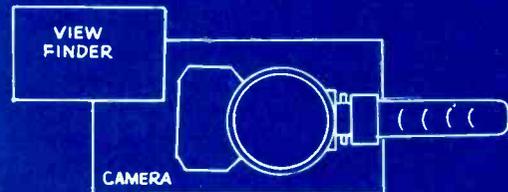


Accessory attachment utilizes servo zoom pistol grip on pan handle of tripod for studio mode operation.

**Rear Mount**



Adjustable back focus mount with indicator



The camera can be placed on its side without interference from the lens.

**angénieux** corporation of america

1500 OCEAN AVE., BOHEMIA, NEW YORK 11716 • (516) 567-1800  
 13381 BEACH AVE., VENICE, CALIFORNIA 90291 • (213) 821-5080  
 4 HAVEN HILL SQ., AGINCOURT, ONT. M1V1M4 • (416) 291-2363

SPECIFICATIONS	BASIC LENS	WITH RETROZOOM	WITH TELE-ATTACHMENT	WITH 1.6X RANGE EXTENDER	WITH TELE-ATTACHMENT AND TWO 1.6X RANGE EXTENDERS
Focal Length	9.5 - 142mm	7 - 105mm	60 - 240mm	15 - 225mm	154 - 615mm
Continuous Zoom Range	15X	15X	4X	15X	4X
Maximum Aperture	f/1.8 - f/2.6	f/1.8 - f/2.6	f/1.9 - f/2.6	f/2.9 - f/4.2	f/4.7 - f/6.7
Photometric factor	1.20	1.27	1.27	1.24	1.35
Minimum Object of View	0.60m 2 ft.	0.30m 1 ft.	1.50m 5 ft.	0.60m 2 ft.	1.50m 5 ft.
Horizontal Angle of View	54 - 4	70 - 5 1/4	9 - 2	34 1/2 - 2 1/2	3 1/2 - 1
Vertical Angle of View	41 - 3	53 1/2 - 3 3/4	6 1/2 - 1 3/4	26 - 2	2 1/2 - 3/4
Smallest Object Field	27 X 35mm 1.1 X 1.4"	20 X 26mm 0.8 X 1"	46 X 60mm 1.8 X 2.4"	17 X 22mm 0.7 X 0.9"	18 X 24mm 0.7 X 0.95"
Weight of Total Package: <small>lens, iris zoom, servoes, pistol grip, mount and attachments.</small>	2.5 kg 5.5 lbs.	3.8 kg 8.4 lbs.	4 kg 8.8 lbs.	2.7 kg 6.0 lbs.	4.6 kg 10.1 lbs.

**15 x 9.5 FOR 2/3" PRISM COLOR CAMERAS**

Circle 145 on Reader Service Card

# Special Programming And Automation — Does It Pay?

---

Not all special programming can be judged on the yardstick of dollar profits, but there is strong evidence that the loyalty of the listeners to special programming stations does produce results. Almost 600 such stations can't be wrong!

---

WJFD-FM, NEW BEDFORD, MASS., is a station which airs a specialized format slanted entirely to Portuguese-Americans. Even voice tracks, news, actualities, and commercials are in Portuguese because more than half of New Bedford's citizens are of Portuguese descent and have retained a dual language ability. Add parts of nearby Fall River, Providence, Bristol, and Pawtucket and you have more than 100,000 specialized listeners, a very respectable market, indeed. Alvaro Antonio, station manager and program director, has captured a large segment of this population block through imaginative programming. Lawyer-owner Ed Denis has installed an IGM RAM to control Instacarts, reel-to-reel units and other elements, providing effective total automation, so Antonio puts the seemingly-live program entirely on tape for cartridge and reel playback. Listeners are loyal and support the advertisers to the point that the station is making excellent profits.

International soccer, only of mild interest to many Americans, is absorbing to WJFD's listeners. On Sundays and Wednesdays the sportscast includes scores of soccer games from Spain, Portugal, England, France, and, of course, the local area.

The daily newscasts include items from Portugal and the Azores each day, as well as some news of the Spanish-American and Spanish sector gleaned from the UPI wire. News of interest to all Americans, as well as actualities, are translated into Portuguese and placed on carts. Super-specialized programming is aired in small doses, with an hour per week of broadcasting in Creole, a dialect of Cap Verdean origin, and one hour per week of Brazilian music.

The heavy concentration of Portuguese-Americans stems from the period between 1812 and 1860, when New Bedford was the chief whaling port of the Americas. Whaling men and fisherman flocked to Massachusetts from Portugal and the Azores. Most of them stayed and were joined by relatives over the next decades, and their descendants have remained fluent in Portuguese language and customs. Alvaro Antonio and his small staff are kept busy translating because the public affairs commitment

of one hour a week is made up of items from periodicals translated into Portuguese. Likewise, important news bulletins about civil affairs or governmental advisories are translated for public service announcements.

Wearing still another hat, "music director" Antonio prepared the music list personally, which presently consists of about 100 one-hour tapes of Portuguese, Spanish, and Italian music (a little French, too), chiefly instrumental, predominantly strings. In 1977, the station aired some Latin groups live; and when Portuguese dignitaries are visiting the United States, Antonio tries to stage live interviews.

Owner Denis feels "there is no doubt whatsoever that the efficient use of automation in such special programming makes it possible to be profitable."

All-classical music formats have become relatively scarce, but WGKA Atlanta runs a "Voice of the Arts" station where advertisers catering to upper middle class listeners are getting good returns. One of the mainstays of the station is Delta Airlines. By sponsoring each week the airing of a complete opera with program notes and comments regarding the performance, Delta promotes its flights with tangible results. Furniture or department stores with fine merchandise such as W & J Sloane and Davison's have measured direct response to commercials.

Manager Eathel Holley of WGKA uses his venerable IGM 500 to automate the station in the morning hours and runs live in the afternoon until sign-off (sunrise to sunset). Spots are contained on an Instacart, utilized all day. There is very little voice tracking in the morning — only what is absolutely necessary for announcements, news, IDs, and public service. The station breaks about four times an hour with a cluster of sports and IDs. To fit into the total format of the station, even the IGM time announcer has been tailored to include the words "Voice of the Arts." For the morning automated hours, Holley uses two classical music libraries — an older library by Altophonic that includes voice track announcements, and a recent library from Camex International, "Classical Experience," made up of unannounced tapes from KFAC Los Angeles' library.

The afternoon live program is quite varied. For the first hour there are interviews and news of all the arts intermingled with short selections on the turntable (Gates CB-1200). From 1 to 4 p.m. lengthy classical works are played, interrupted only by clusters of spots and IDs. Once more, between 4 p.m. and sunset, a disk jockey announces and plays shorter selections on the turntable.

"We enjoy 10 percent national advertising, which is really good for a classical station," comments Holley. "Most of the national commercials come from Concert Music Broadcast Sales."

On weekends the station features Arthur Fiedler and the Boston Pops, the New York Philharmonic, Atlanta Symphony, and the Delta opera on a regular basis. At various times during the year, broadcasts of the Chicago Lyric Opera and the New York City Opera are also carried. Even though the station is reaching for upper income listeners, in a recent promotion WGKA found that the audience is comprised of a cross-section of ages and income levels. The New York Metropolitan Opera visits Atlanta once annually and is sold out months in advance. WGKA broadcasts a Metropolitan Opera ticket exchange daily for one week prior to and during the company's engagement, providing a swap service for ticketholders who couldn't attend and would-be purchasers. Slated to run about fifteen minutes, the exchange often spilled over to thirty minutes a day or more, with the swappers ranging from 18-year-old students to dignified dowagers.

Automation is ideally suited for some special programming, like Michigan's Radio Talking Book operation, aired on a subchannel of WKAR-FM eight hours a day, six days a week. Such a service is not measurable in terms of dollars, but is of immense profit to more than 1000 blind and handicapped persons in the area. Supported by private contributions and local and state aid of various types, special crystal-tuned receivers are purchased and loaned to the handicapped by station WKAR-FM. Because of the "private broadcast" nature of the sub-channel service, newspapers, books, magazines, and other copyrighted material are read in their entirety without infringement on the copyright laws. (Changes in some state and federal laws may remove such restrictions soon making it possible for stations to broadcast talking book material on FM and be received by ordinary radio sets.) The transmitter and all of the automation equipment were funded by HEW.

Programming of the sub-channel broadcasts is managed by Michigan State University's Radio Broadcasting Department and facilitated by about 100 volunteers who read diverse material live on a daily basis. For example, a popular program on WKAR's Talking Books is an official from Social Security Administration to answer questions phoned in from listeners. Book tapes are placed on the IGM 730 automation system for playback.

Because of the large number of volunteers utilized, most of whom know nothing about broadcast procedures, the automation system assumes the role of "program director." At 6:50 a.m. a real-time card turns on the SCA carrier and the Instacart motors, doing a "master start." Until just before 7:00, fill music from Instacart is played, then another cartridge for an intro, and at 7:00 the reading by volunteers commences. An on-air light alerts the reader when to begin. The control system is programmed to override the reader under several circumstances; for example, at 9:00 a.m. whether the reader stops on time or not, the automation takes over and plays a 30-minute book

tape (continued daily), then goes to the intro for a 9:30 Bible program, etc. Taped, pre-recorded programming proceeds with liberal use of the random access feature of the Instacart cartridges until 10:00 a.m.; then volunteers resume reading live. Again, at 12:00 noon a time switch overrides the reader. The station does not have to give IDs but does so anyway. There are sub-routines for holidays, for "skip to" routines, and other variables, all programmed on real time. Elements other than the live volunteer time are prepared in seven-day program modules which are repeated. An unusual use of cartridge equipment is that the Instacart is operated at 3¼ IPS, providing 25 to 30 minutes of time per cartridge.

"The reason we use the automation as a relentless dictator is that, using so many volunteers in this program, we cannot require them to start and stop equipment and still maintain a degree of professionalism," observes John Hawkins, chief engineer of WKAR, which runs a fine arts format on its regular FM station.

KBYE/KFJL, Oklahoma City, recently had positive evidence of the effectiveness of its black-formatted station. Tom Lynch said, "We got started late on a promotion involving a local movie theater production and only aired spots three days ahead. Nevertheless, on the day the production was scheduled for 12:30, a long line had formed at 10:30, and we turned away a couple hundred people. This with publicity only on our station."

KBYE-AM broadcasts country gospel music, while KFJL-FM uses a Harris System 90 automation to manage a format leaning heavily toward progressive jazz (a departure from the usual rock or mellow rock). The station runs about 60 percent albums, 40 percent singles, and an occasional brief foray into oldies usually on Sundays. There's an all-jazz show hosted live from 6:00 to 9:00 p.m. each evening except Tuesday.

"Whenever we plug a particular selection, the local record shops sell out," said Tom Lynch, "as recently, Sound Warehouse, which has five stores, sold 500 to 1500 of a number in a single weekend — the number they normally sell in a week. The black community here feels that KFJL is *its* station, and is loyal to the advertisers."

The Program Director of KFJL feels that rock music is going to slide gradually into jazz, primarily because of disco use where jazz is more commercially advantageous. Herbie Hancock, Santana, and others have been some of the earlier exponents of rock-jazz, and the music is gaining broader acceptance. The staff of KFJL likes to believe that it was the first to recognize the trend that people's tastes are coming around to where the station has been all along.

Supported by individual contributions of small size, the World Radio Missionary Fellowship's station, HCJB in Quito, Ecuador, is not a commercial station, so it measures results on a different slide rule. However, an enterprise dependent on voluntary contributions also tries hard to get as much mileage as possible out of every expenditure. For the Fellowship this means automation, because broadcasts are beamed in several different languages simultaneously. Governing the setup is a Texas Instruments Model 960A computer interfaced by the Fellowship's own engineering staff. Announcements and special fill material, prepared in different languages, is placed on Instacart, specially modified so that each bank of 12 carts has a separate output. Thus, each bank contains material in a different language, and can be called upon by the computer for the proper program *running simultaneously*

## Special Programming

in four languages. Religious material is on reel-to-reel playbacks, often pre-programmed content like Billy Graham's *Hour of Decision* and the *Back to the Bible Broadcast* or programs prepared by HCJB's own staff. However, any time there is a vacuum of a few seconds or minutes in the programming, the computer analyzes the time remaining to the next scheduled event — then actuates a cartridge of fill material programmed with special messages of suitable length to form the necessary bridge — a verse from the Bible, announcements of special programs, and even time announcements.

Curiously, Ecuador is one of the best places worldwide from which to broadcast by shortwave. Eighty-five percent of the world's land masses can be reached from there. The missionary group uses three 100,000W RCA shortwave transmitters and three 50,000W staff-built transmitters for its long-distance broadcasting. For local Quito programs, a standard broadcast band 25,000W transmitter and a 20kW (ERP) RCA FM transmitter suffice. Another FM stereo station serves Guayaquil, a city of over one million people.

For shortwave broadcasts the amount of time on air is geared to the varying conditions for each targeted geographic location. For instance, the "window" to Western Europe or Russia or Japan may remain open for a few hours and then shift to another area as the earth rotates. The station subscribes to the National Bureau of Standards Computer Service to try to keep track of variables such as sunspots or other atmospheric conditions affecting reception.

Because Russia is eleven time zones wide, there are eleven separate one-half hour programs daily beamed to that nation, geared to the time zones. Not all of the station's format is religious, and it tends to vary both according to the country receiving it and the number of hours available for broadcasts in that language. Spanish language programs include only 15 to 20 percent religious subjects and cover local sports, music, news — a typical AM format. There are interviews and educational or instructional programs.

With the exceedingly complex mixture of programming prepared in fifteen languages, automation is essential. Without it, there is an immense possibility for error. The success of worldwide programming is verified by the baskets of mail received each day by the Fellowship.

As indicated, religious special programming overlaps and intermingles with general programming. In fact, station KICY, Nome, Alaska, is in the unusual position of subsidizing about one-half of its total cost of operation with its commercial load, even though its chief thrust is religious broadcasting. KICY recently installed a semi-automated FM stereo station with an IGM RAM, a huge vote of confidence in automation where repair services are thousands of miles away by aircraft. The reason for this move was to split the thrust of programming, with FM aimed at the Caucasian segment of Nome, featuring a "Bright and Beautiful" music format, and the AM catering to the needs of the Eskimo population scattered in villages along the coast of Western Alaska from Point Hope to the Aleutians — a distance of 1000 miles.

Both AM and FM stations are underwritten by the Evangelical Covenant Church of America and others. The

AM is listened to by most of the Eskimo villagers; after all, there are no daily newspapers, few books, and little contact with the outside world except by radio and airplane. Still, snowmobiles have provided fast transportation, and the Eskimo people come into Nome to shop. Thus, local merchants' advertising to this audience is unusually effective.

KICY-AM uses an all-country music format (one out of four selections are Easy Listening), either straight country or country religious. Presently, the operation is live with 45 RPM or LP records supplemented with tapes of local village musicians or church groups in both English and Eskimo. News gatherings is an original mix because a strong effort is made to gather "hard" news of local and regional nature. The station relies heavily on ARN-Alaska Radio Network news, which is a new network of eight Alaska stations, and gleans pertinent items from the AP wire (about 10 percent). CBS News is aired live every hour from 6:00 a.m. to 7:00 p.m., and at 10 and 11:00 p.m., simulcast with the FM at 7:00 a.m., 12 noon, 5:00 and 10:00 p.m. (The FM airings are followed by the latest ARN news.) To obtain local village news or "soft" news, KICY uses a sort of home-made "stringer" system. Because there is usually only one phone in an entire village, the newsmen simply calls a different village or two each day and asks the person answering "what's happening?"

While visiting the small villages, staff members record on cassettes Eskimo people singing religious music. These selections are included in the popular program, *Music of the Northland*, aired six days a week. Often such recorded music is played upon telephone request.

There's the *Ptarmigan Telegraph*, a message service broadcast at 11:45 and 5:45 daily. This consists of personal messages from one individual to another — matters like "Joe Wilson says to meet him at High Trail on Tuesday," or "urgent that Sam Jones return to village, wife is having a baby." A program called *Flight Log* provides the flight schedules of bush airplanes which vary daily. Also, the announcer will interrupt programs to inform a village that a plane, commercial or private, is going to a village at a particular time, so people can prepare to depart.

A continuing series of segments, *Village Views*, airs matters of concern to village leaders, especially material emanating from the regional or state agencies. Anyone visiting Nome might appear on *The Face of Our Town* if he has an interesting background.

News and sermonettes are broadcast regularly in three major Eskimo languages: Central Yupik, a southern language; Siberian Yupik, spoken by people who live on St. Lawrence Island and on the Russian Siberian coast; and Inupiat, a northern language. Another feature listened to by both Caucasian and Eskimo is *Word of the Day*, which translates an individual word into the three Eskimo languages and English to broaden all citizens' grasp of these languages.

Clearly, programming so special that it singles out a group of people bound together by a common bond, whatever it may be, has one advantage — absolute loyalty of its listeners. While standard broadcast stations must compete with many other similar stations, specially programmed broadcasts often have an audience all to themselves. Using automation to manage the special formats, and reduce errors and costs, such unique stations find that their "differentness" pays off. **BM/E**

# Far-out news team.

## Microwave 2GHz links extend your live ENG coverage up to 50%.

Now you can expect a good live feed even when you send your ENG crew out to the boonies. With the M/A 2GT microwave receiver and its low, 4.5 db noise figure, you can extend your live coverage by 30 to 50%. This greater coverage translates to higher ratings and increased ad revenues in outlying sections.

For fast setup and great results, the compatible 2CP (2-Watt) and 2EP (8-Watt) portable transmitters are rugged, weatherproof, easy to handle and are proven performers in everyday use.

And for extra long hops, the M/A solid-state PA-215M amplifier really gives your ENG signal a boost. The unit is light enough to be mast mounted, delivers full legal power directly to the antenna, and provides all-channel operation.

For greater live ENG coverage, flexibility and mobility, M/A equipment lets you cover prime areas and the boonies better than ever. It's a far-out news team that can make more money for you.

For complete engineering information, write or call the ENG pioneer, Microwave Associates, Communications Equipment Group, 63 Third Ave., Burlington, MA 01803, (617) 272-3100.

Circle 146 on Reader Service Card

Field Sales Offices: Atlanta, GA (404) 455-3815,  
Dallas, TX (214) 234-3522, Kansas City, MO (816) 891-8538,  
Sunnyvale, CA (408) 733-0222, Seattle, WA (206) 232-3550,  
Honolulu, HI (808) 537-3991, Edina, MN (612) 831-3920.



**Microwave  
Associates**

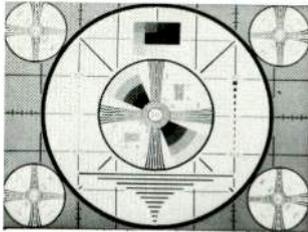
A M/A-COM COMPANY



### MODEL 525 SERIES DIGITAL MONOSCOPE SIGNAL GENERATOR

- Since the signal is generated electronically, there is no deflection distortion of the signal source itself, such as that of conventional monoscope cameras.
- The same picture quality as that of the camera is generated, DRC (Digital Rise time Controller) system.
- Single source generation system promises precise horizontal resolution.
- APC system in a constant size picture generates a perfect measurement signal.
- Built-in sync signal generator. External sync also possible.
- Grating and overscan signal can be turned ON/OFF.
- Extremely simple maintenance plug-in unit type.
- The final edition of the ultimate monoscope. Can be used with confidence for years to come.

#### ■ MODEL 525A12 picture

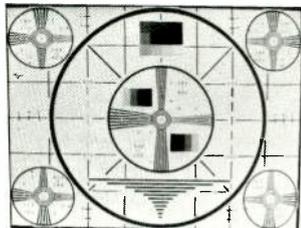


Delivered by Matsushita Electric Industry, used by RCA.

#### ● Features

- With acclaimed 10-step interleaved contrast
- Generates the same pattern and picture quality up to letters as a conventional monoscope.
- Production line oriented test pattern

#### ■ MODEL 525 A11 picture

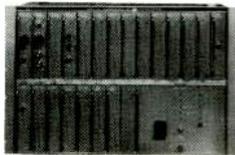


Delivered by television VTR Manufacturer, used by NASA (U.S. National Aeronautics and Space Administration).

#### ● Features

- With acclaimed 10-step interleaved contrast
- 525AH generates a horizontal resolution of up to 100 lines, and is ideal for research and development.

#### ■ Exterior view



- Video output level 1Vp-p (sync 0.3Vp-p, picture 0.7Vp-p 2 system)
- Video output impedance 75Ω
- Input/output connectors BNC
- Ambient temperature 0°C ~ +45°C
- Power requirement 100, 117, 200, 220, 240V ±10% 50/60HZ Approx 50VA (As specified by the customer)
- SIZE (Inch) 19" (W) × 12.2" (H) × 12.6" (D)
- Weight Approx 27kg

### NTI America, Inc.

1680 North Vine Street LOS ANGELES California 90028  
Phone 213 492 8945

Circle 147 on Reader Service Card

## SPEAK OUT:

# "If The FCC Dictated Higher UHF Tuner Standards, Manufacturers Could Respond Quickly and Economically," Says Don B. Curran



Don B. Curran, president of Field Communications, San Francisco, CA.

*With five independent UHF stations (WLVI-TV, Boston; WKBS-TV, Philadelphia; WFLD-TV, Chicago; WKBD-TV, Detroit, and KBHK-TV, San Francisco), Field Communications has embarked on an energetic program of improving UHF from the broadcaster's end. The technical facilities are being improved and the stations are providing better programming as well as a more aggressive programming strategy. Being independent and UHF has not always led to financial success, but Field has shown that it doesn't automatically lead to bankruptcy either. Field is reporting good profits for the past two years and intends to continue this trend. Before all this effort on the part of UHF broadcasters can pay off, there is one more very important link that needs improvement — the UHF tuner.*

A HIGHLY SIGNIFICANT broadcast-engineering event occurred in 1977: the Federal Communications Commission re-discovered UHF. Unlike other occasions when the FCC took precursory interest in UHF and then tossed up its hands in desperation because of the complexity of the subject (a wild mingling of engineering, allocation, and programming problems), in 1977 the Commission took one aspect of its bewilderment to an engineering research center for a solution.

It should come as no surprise to knowledgeable people that Texas Instruments was able to build a vastly improved UHF tuner-receiver in a short period of time. Although UHF broadcasters have been plagued by the tuner problem for decades, it is not viewed by manufacturers today as an engineering problem as much as it is an economic situation.

When the FCC first designed the U.S. television service, almost all

commercial stations were put in the lower, VHF spectrum. It was the quick and easy way to get the best reception to the home receiver under existing conditions. Those conditions were very poor. There were fewer stations, receiving antennae were inadequate, and there was no CATV. The built-in antenna was usually just a hunk of twin lead stapled to the back of the set. And there was no UHF provision at all.

Technology of TV receiver design has followed the crowd. The average receiver on the market today is designed to produce a fine VHF picture. Really very little attention has been paid to reception in the UHF spectrum. Viewers in large numbers have not demanded better reception and the FCC has been slow in meeting the challenge. Interestingly, some electronics manufacturers offer fine UHF tuners in their top-of-the-line models.

What are the problems? Tuner noise, image response, the IF beat, adjacent channel interference, cross modulation — all inherent weaknesses of "cheap and dirty" tuners. What is the solution? A large part of it is quality control and care in selection of components. It's that simple and inexpensive.

Manufacturers are subjective and self-serving in the quality of the product they are laying on the shelf for the average consumer. I must add, however, that in some cases manufacturers run ahead of the FCC in implementation of higher standards. Why should manufacturers spend \$40 (I really think the actual cost would be \$5) per set to provide average viewers with a capability they haven't asked for and probably wouldn't recognize?

What has Texas Instruments designed? I am told it is a tuner with excellent tuner noise characteristics, a reduction of at least 3 db. Although I do not yet know the specifics of this newly designed tuner, I am told by respected engineers that such improvements would cost manufacturers about 30¢ a set, which would result in a per-set increase of about \$1.20 to the consumer (considering the various steps in mark-up). A receiver could be built that

is vastly improved in every reception situation — it's merely a matter of supply and demand.

If the FCC dictated high standards today, the manufacturers working at top speed could supply dealers with marvelously improved receivers in one year. That's an unrealistic expectation, however. Precedence leads me to believe that *improved* receivers will be on the shelf in about five years.

Five years is too long. I want to issue a challenge to the FCC and manufacturers: give us greatly improved UHF tuners in two years and tuners comparable to VHF in five years. What will UHF broadcasters do in return? We will continue to improve our programming so that the viewing public may appreciate our alternative to network fare. I have challenged the FCC and manufacturers to meet our five-year deadline. Field communications is already two years into a five-year program and facilities improvement plan that has already resulted in a major increase in UHF viewing in San Francisco, Chicago, Detroit, Boston and Philadelphia.

Field (Kaiser) has always placed emphasis on hardware, programs and talent, not bricks and mortar. Hardware is the primary target of the present five-year plan. We're now installing some very basic equipment for today's operations . . . but we are projecting through the next three years and have set aside a very large budget to meet the deadline. This year, 1978, is the key year. Our purchases of tape and switching equipment were made in 1977 and are now being installed. Technology is changing so rapidly that a station that is behind today can, in a year or two, zoom way ahead. By the end of 1978, our five stations will be using state-of-the-art control room, tape and audio equipment, and cameras in a highly controlled operation in which routine switching will be very snappy and highly consistent.

During 1978, Field and the other independent UHF operations will be in a position to be more aggressive in program acquisition. At Field we have already completed research and some of the groundwork for installation of satellite receivers and other advanced equipment that will keep us flexible and competitive. Shortly after a major programmer announces his method of distribution, we will be ready: satellite-to-earth-station, film, quad or one-inch tape. Whatever the programming is, from whatever source, whatever time of the day or night, we will be able to compete for it and broadcast it profitably.

The technicalities of transmitting and receiving must be so finely developed that they can be taken for granted, so we can go on from that firm base to face the real frontier: programming. **BM/E**



# HEY! WHAT ABOUT AUDIO FOR VIDEO & LET'S NOT OVERLOOK RADIO

for Radio (TV too) . . .

★ **ARA-1** BATTERY OR A.C. POWERED REMOTE AMPLIFIER WITH COMPRESSOR FOR HANDS-OFF COMBO-MAN REMOTES.

★ **ARM31** 3-INPUT MIC. MIXER COMPANION TO ARA-1 WITH VU METER & COMPRESSOR DISABLE CONTROL. USE WITH ANY MIC-TO-LINE AMPLIFIER.

for Television . . .

★ **MS-105** 7 MICS., PHONO, 5 HI-LEVEL INPUTS, COMPRESSOR, E.Q. GROUP MASTERING, VOICE-OVER "DUCKING", AUDIO TONE, INTERCOM, CUEING, AUDITION, SLATING WITH TONE. IDEAL FOR SMALL STUDIO & REMOTES.

for Radio & Television . . .

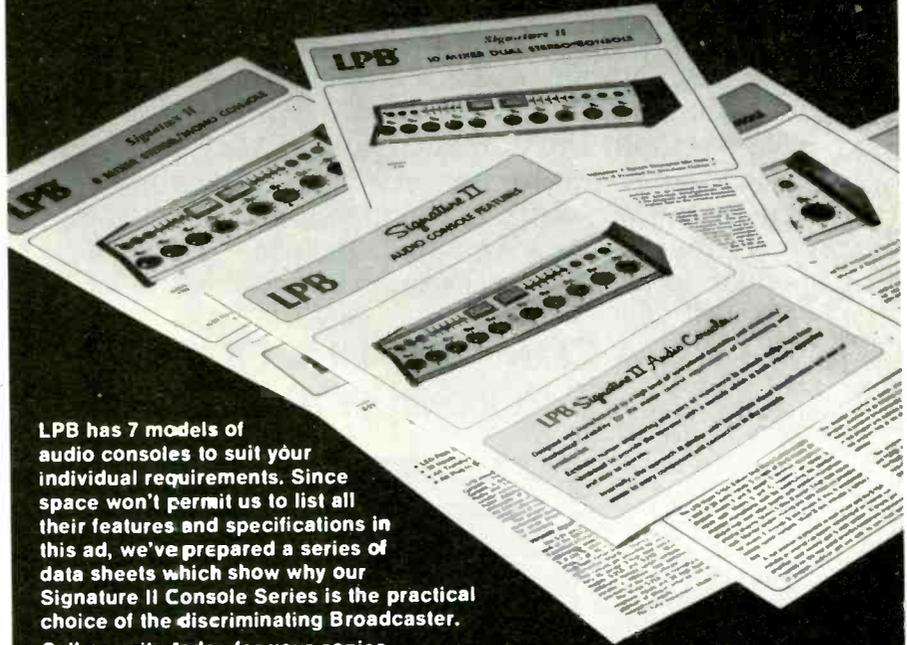
★ **APA52** DUAL-50 WATT AUDIO AMPLIFIER WITH INPUT TRANSFORMERS, SO COMPACT YOU CAN GANG 300 TOTAL AUDIO WATTS ON A 3 1/2-INCH RACKPANEL.

See all I have at booth 1133 NAB - Las Vegas & at The Los Angeles Video Show.

P.O. BOX 921 • BEVERLY HILLS, CA 90213  
213 / 276-2726

Circle 148 on Reader Service Card

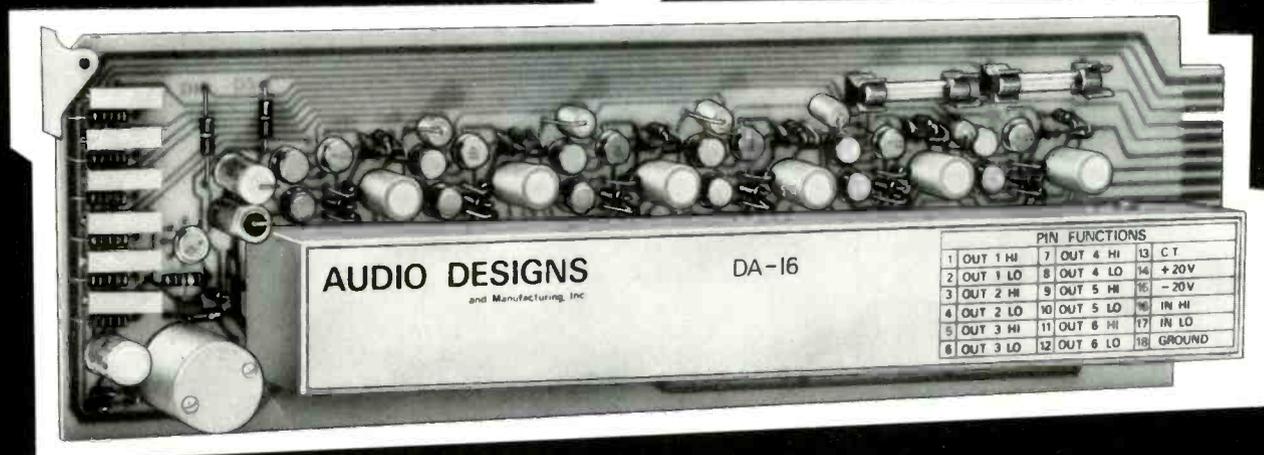
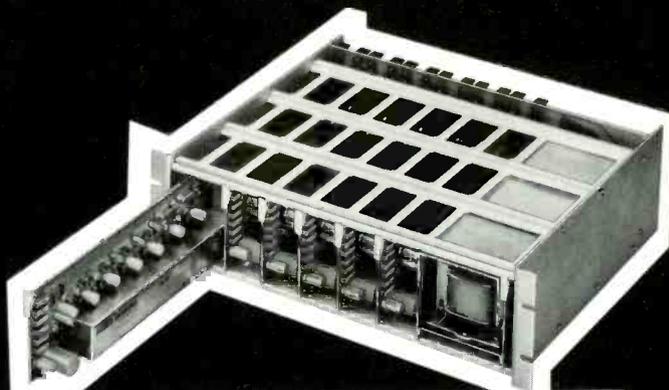
## 4, 5, 8, 10-Mono, Stereo!



LPB has 7 models of audio consoles to suit your individual requirements. Since space won't permit us to list all their features and specifications in this ad, we've prepared a series of data sheets which show why our Signature II Console Series is the practical choice of the discriminating Broadcaster. Call or write today for your copies.

**LPB®** LPB Inc.  
520 Lincoln Highway, Frazer, PA 19355 (215) 644-1123

Nothing else  
matches it for  
features and  
reliability



## ADM's UNIQUE DA16/CH20 AUDIO DISTRIBUTION SYSTEM

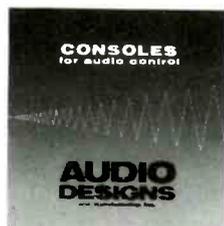
The ADM® DA16 incorporates an advanced-design approach, with superb specifications. It is the ultimate in audio distribution amplifiers. Each amplifier is a one in, six output plug-in card with +24DBM input and output capability.

The input is transformer coupled, and each of the six outputs is individually transformer isolated. Amplifiers have individual front panel gain adjustments.

Noise level is ultra low, and distortion is less than .1% at +24DBM.

Up to six DA16 amplifiers can be housed in the Audio Designs® CH20 rack frame, which includes a redundant power supply with automatic change-over. Built to exacting quality standards, DA16 amplifiers offer exceptionally high reliability. For complete information write or call for specification sheet.

A COMPLETE LINE OF HIGHEST QUALITY  
CONSOLES AND COMPONENTS



AUDIO DESIGNS AND MANUFACTURING, INC.  
16005 Sturgeon, Roseville, Michigan 48066  
Phone: (313) 778-8400, Cable: AUDEX TLX-23-1114

**AMPEX**

DISTRIBUTED OUTSIDE U.S.A.  
BY AMPEX INTERNATIONAL OPERATIONS, INC.

# Great Idea Contest Winners for 1977

All of the votes are in for the 1977 Great Idea Contest and we are pleased to announce the winners. The 3 top prize winners in the respective categories of AM, FM or TV for 1977 are:

**AM Radio** Michael D. Callaghan, Coordinator, Engineering KIIS AM/FM, Los Angeles, Calif. for his "Simple Circuit For 'Push To Start - Push To Stop' On Same Button" (April, page 66).

**FM Radio** Allen H. Burdick, Studio Technical Director, Christian Broadcasting Network, N.E. Radio Div., Ithaca, New York for his "Stereo Cart Alignment System" (Sept. page 176).

**TV** Jack Smith, Chief Engineer, KVVU-TV, Las Vegas, Nevada for his "Simple, Easy, Fast Way To Check For Bad Audio Cable" (Oct. page 98).

Each of these gentlemen will receive a Texas Instruments Scientific Calculator. In Addition, 10 runners up get pocket calculators for the next highest scoring ideas in the separate subcategories of audio, control and RF for AM & FM stations and audio, control and video for TV stations (there were no RF entries for TV stations). Parenthetically, we should add that Great Ideas published in December were not judged but will reappear in 1978 due to an error of the Reader Service card. Winners are:

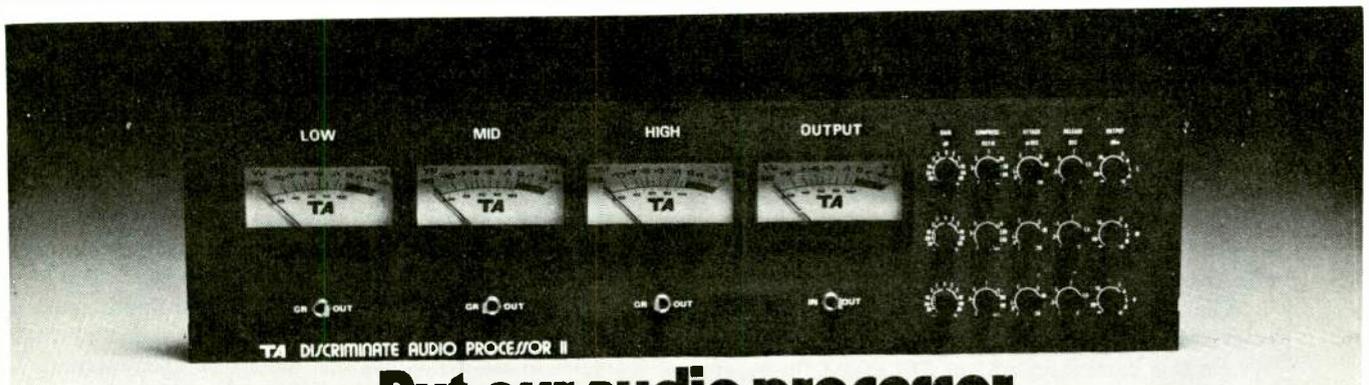
**For AM Audio** — Luther Grumbaugh, Chief Engineer, KGER, Long Beach, Calif. for his entry "Inexpensive Equalizer Unit Built In A Small Box" (July page 66); **For AM Control** — two runners up are James W. Nelson, Asst. Chief Engineer, WGST, Atlanta, Georgia for his entry "Network Alert Tone Detector" (April page 66) and Jon Bennett, Chief Engineer, KYND, Pasadena, Texas for his entry "Starting Multiple Scores At The

Same Instant" (Nov. page 79); **For AM RF** — Tom Busch, General Manager, KNOM, Nome, Alaska for his entry "Returning To The Air After Momentary Power Outages and Transfers" (Sept. page 178).

**For AM Audio** — David L. Williams, Chief Engineer KALF-FM Ukiah, Calif. for his entry, "Handling EBS When You're Automated" (July page 64); **for FM Control** — Rickey Benson, Chief Engineer, KHOM-FM, Houma, Louisiana for his entry "An LED, Cart, Status Circuit" (June page 83); **For FM RF** — Stephen R. Waldee, Broadcasting Consultant, Waldee Audio Productions, San Mateo, Calif., for his entry, "Uses Of An FM Tuner And Oscilloscope" (June page 84).

**For TV Audio** — Tom Schultz, Engineer, WGHP-TV, Kernersville, North Carolina, for his entry "Amplifier For Checking Audio Quality On Lines" (Aug. page 64); **For TV Control** — Lee. B. Ellis, Technical Director, KGLO-TV, Mason City, Iowa, for his entry "A System To Alert Studio Personnel To Intrusion On Transmitter Site" (July page 64); **For TV Video**, Gerald Mullin, Technician, WJBK-TV, Southfield, Mich. for his entry "Synchronizing the ENG Remote Without Studio Genlocking" (April page 69).

Each entry earns \$10, and readers determine by vote who wins 3 big year-end prizes — one each for AM, FM, and TV stations. Ten secondary prizes (audio, control, RF, and video for each class station). Simply jot down the problem and your solution (less than 500 words, please). Hand-prepared sketches are okay. Indicate whether the idea is in use at AM, FM, or TV stations. Send for full results, or consult *BM/E*, July 1977, page 67.



**Put our audio processor  
on your station for ten days.  
Then let your audience decide if you should keep it there.**

Quite simply, Track Audio makes the best audio processor available today.

That's quite a sweeping statement. But not when you consider that we back it up with the kind of independent research money can't buy — your listening audience. They'll tell you more about our sound than we can — after they've heard it on your station.

We'll send you our audio processor for a free ten day trial. If you like what you hear — from Track and from your listeners — you buy it. If not, we'll pay the freight both ways.

Once you're on Track, you're on the way to a whole new sound.

**Track Audio has another Sound idea.**  
33753 9th Ave. So. Federal Way, WA 98003 (206) 838-4460  
*Write or call us today.*

# INTERPRETING THE **FCC** RULES & REGULATIONS

## Commission Says No To Restrictions on AM and FM Signal Carriage on Cable Systems

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

RECENTLY, AM AND FM RADIO stations had their hopes dashed that the Commission would take preventative action to protect them from the growing incidence of local and distant radio signal carriage on cable television systems.<sup>1</sup> Specifically, the Commission declined to: 1) adopt rules to restrict cable television system carriage of AM and FM radio stations and 2) prohibit cable systems from providing cablecast radio programming unless local radio signals were also carried on the cable system.

### Background

In 1965, the Commission raised the issue of competitive injury to radio stations by carriage of distant and local radio signals on cable television systems. At the time, the Commission stated that there was "little evidence of abuse or adverse economic impact" on radio stations and effectively dropped the matter.

When it adopted the comprehensive 1972 cable television rules, the Commission required any cable system that carried an AM or FM signal, licensed to a community beyond 35 miles from the cable system community, to carry all local AM and FM stations, too. This move was meant to protect local radio stations from audience dilution. Oddly enough, the Commission adopted this requirement without any "hard" evidence of adverse economic impact on the local radio stations.

Subsequently, a western broadcasters association petitioned the Commission to institute a rulemaking to limit importation of distant radio signals. The association argued that there was no real difference between significant television audience fragmentation suffered through unrestricted importation of TV signals and audience fragmentation brought on by unrestricted importation of distant radio signals. The association argued that, without restrictions, importation of distant radio signals would erode the advertising revenue base and revenue potential of radio stations. The association argued that failure to impose restrictions would be felt

most strongly by small radio stations on the verge of economic viability. What seemed implicit in the association's arguments was the belief that *local* radio service would give way to radio service by "super" *regional* and *national* radio stations.

### Input from the broadcast and cable industry

The Commission received a multitude of comments. Many of the broadcast station comments paralleled those of the association that sought the rulemaking proceeding. On the other hand, cable television industry comments argued that restrictions on importation of distant radio signals would deprive cable television subscribers from listening diversity and the advantage of clear radio reception. The cable industry also pointed out that cable radio carriage has had no "significant impact" upon local radio service; any anticipation of future impact without "hard data" to back up the future impact argument would result in grossly unjust restrictions on cable systems to further the monopolistic position of broadcasters.

With respect to the rulemaking petition that cablecast radio programming be prohibited, broadcast spokesmen cited the unfair cost advantage that cable systems have over radio broadcasters. Cable systems are subject to virtually no Commission or local regulation of radio cablecasting. On the other hand, broadcasters are subject to extensive, ongoing regulation by the Commission. Cable systems, many with 35 channels, can initiate cablecast radio programming for little additional equipment costs. Broadcast stations must make capital investments of hundreds of thousands of dollars before they can begin operations.

The cable industry forces countered these arguments by stating that comprehensive regulation of the broadcast industry is the price that it must pay to utilize the scarce electromagnetic spectrum that is undisputably the property of the public and not the private broadcasters.

In discussing the rulemaking proposals, the Commission made clear from the outset that it would analyze all

<sup>1</sup>Report and Order in Docket No. 19418, 42 RR 2d 311 (1978).

arguments in terms of the *effect upon the public interest*. In deciding against imposing restrictions on cable carriage of radio signals, the Commission stated:

"The comments (of the broadcast and cable industry parties) contain speculation that cable systems will ultimately cause a net loss of radio service to the public and...suggest adverse solutions for averting this. Missing from the record to date, however, are facts indicating that present cable carriage of local or distant radio signals harms anyone—radio broadcasters, cable subscribers, or members of the general public—nor has our own inquiry into the relevant issues disclosed the existence of significant and pervasive problems in any respect. As a consequence we must find that we lack a sufficient basis upon which to adopt rules of general applicability in this matter."

This signals what some cable industry spokesmen call a change of position by the Commission. In the past, especially with respect to the 1972 cable rules, the Commission made assumptions concerning the future impact of cable television upon broadcasting, and fashioned restrictive rules against cable television to preserve and assure continued broadcast service to the public. Now, however, the Commission is on the record as stating that it will not impose restrictive rules upon cable systems absent a showing of "hard" data to back up its actions. The Commission is challenging the cable industry to develop new services and markets with a minimum of federal intervention. *This is a strong indication to broadcasters that they had better come armed with plenty of statistical and other evidence when the industry next approaches the Commission for competitive relief against the cable industry.*

As part of its analysis, the Commission reviewed more than 5,000 Cable Television Annual Reports.<sup>2</sup> The data that the Commission collected is interesting. Seventy-eight percent of the reporting cable companies carried all local FM signals or carried no signals at all. Therefore, the concerns expressed by broadcasters about the effects of existing cable carriage of distant radio signals are moot with regard to more than three-quarters of all operating cable companies.

The Commission also undertook an informal survey to determine the extent to which cable subscribers subscribed to cable radio service. The Commission concluded that, on the average, any particular local radio station would suffer no more than one-half of one percent of cable-caused loss of audience. Without more evidence of harm in particular radio markets, the Commission concluded that no restrictions on cable systems were warranted. Further, the Commission emphasized that "loss of audience is of no concern to the Commission unless it results in a loss of broadcast service to the public." The Commission does not regulate to protect the broadcasters interest, but rather the public interest.

The Commission summarized its conclusions by stating:

"... (W)e find in the comments received an abundance of concern and speculation over possibilities of harm to private interests or public service, but a paucity of data from which to generalize or to pinpoint those areas where our traditional belief in the value of unregulated individual enterprise must give way to the need for regulatory intervention."

In summarizing its refusal to prohibit radio cablecasting, the Commission found that it does not contravene the

continued on page 106

<sup>2</sup> FCC Form 325.

# PHILLYSTRAN®



## The Tough Guys

Far surpassing steel guys in strength and durability, PHILLYSTRAN is manufactured from impregnated KEVLAR\* and polyurethane. Completely non-metallic, PHILLYSTRAN eliminates electrical problems and the usual problems of RFI.

- **Non-interference**  
Outstanding dielectric properties
- **Minimum Stretch**  
New designs substantially reduce creep
- **Corrosion Proof**  
Non-metallic construction: polyurethane jacket
- **Non-Conducting**  
Outstanding insulation properties

PHILLYSTRAN . . . The Tough Guys in more ways than one.

®PHILLYSTRAN . . . proprietary resin impregnation process of Philadelphia Resins Corp.

\*duPont registered trademark

manufacturers of Chockfast®, Phillystran®, Phillybond®, Wearex™



## PHILLYSTRAN® ROPES AND CABLES

PHILADELPHIA RESINS CORPORATION  
20 Commerce Drive, Montgomeryville, Pa. 18936, U.S.A.  
215/855-8450 • Telex: 84-6342 • Cable: PHILRES MMLL

## FCC Rules and Regulations

purposes of the Communications Act and does not pose any realistic threat to the structure of over-the-air FM broadcasting. The Commission went further and declared that:

“By increasing the diversity of radio programming available to the listener as well as by providing radio programming where there might be none, radio cablecasting unquestionably furthers the aims of the Communications Act.”

### Petition for special relief

Despite declining to adopt rules restricting cable television carriage of radio signals, the Commission acknowledged that there is a possibility that radio stations could be significantly harmed. Therefore, the Commission declared that it will entertain petitions for special relief when a particular radio broadcaster finds itself adversely impacted by radio signal carriage by a local cable television system (e.g., located within the broadcaster's service area).

The Commission imposes a substantial burden of persuasion when it grants a petition for special relief. It expects that a petition by a broadcaster will “detail with specificity the carriage practice complained of and how it directly impacts the station's economic well-being.” In addition, the petition must comply with Section 76.7 of the Commission's rules relating to special relief and, in particular, must: 1) “state fully and precisely all pertinent

facts and considerations relied on to demonstrate the need for the relief requested and to support a determination that a grant of such relief would serve the public interest” and 2) support by affidavit of a person or persons having actual knowledge, all factual allegations contained in the petition.

### Conclusion

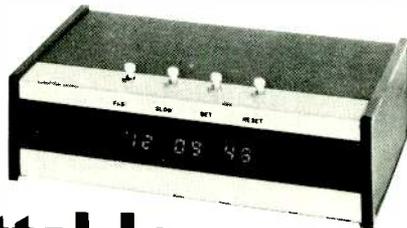
The Commission denied requests to restrict radio cablecasting or limit the importation of distant radio signals on cable systems. But, it did not close the door to future regulation if and when needed. And whenever future regulation is discussed, “grandfathering” immediately pops to mind. In this instance, if the Commission prohibited importation of distant radio signals on cable systems, it is likely that distant radio signals being carried at the time that the prohibitory rule is adopted would be “grandfathered” and granted the right of continued carriage in order to limit the disruption of listener patterns.

Broadcasters may want to study the possibility of increasing their station's audience by the “use” of cable systems. A broadcaster might achieve some increase in audience by working with cable systems located within the broadcast station's service area to implement all-band carriage of FM signals.<sup>3</sup> Some broadcasters may want to explore the possibilities of having his signal imported to a distant market since if done now, his signal would be “grandfathered” in the event that the Commission eventually restricts cable carriage of distant radio signals.

BM/E

<sup>3</sup> AM signals must be demodulated and carried on the FM band by a cable system.

## Perfect Timing



### Presettable tape timer

If you do OFF-AIR taping, or if you want to start your recorder when you'd rather be elsewhere, ES 1296 is for you! Presettable up to 96 hours in advance, starts any machine you want, turns it off after an hour, and for only \$150. For \$25 more, you get an option to turn off your equipment in 16, 33, 66 or 138 minutes, or 33, 66, 138 or 250 minutes.

And for another \$25, we'll give you Sequential Turn-On, for solenoid operated recorders.



Write, Wire or Call: (213) 674-3021  
505½ CENTINELA AVENUE • INGLEWOOD, CALIFORNIA 90302

## FREE FROM Tech Labs



### INDUSTRY'S MOST COMPLETE TECHNICAL INFORMATION ON

- ROTARY SWITCHES
- PROGRAMMING SWITCHES
- THUMBWHEEL SWITCHES
- ATTENUATORS

Call or Write For Free Catalog

### TECH LABORATORIES, INC

Bergen & Edsall Blvds., Palisades Park, N.J. 07650  
Tel. (201) 944-2221

Circle 153 on Reader Service Card

# BROADCAST EQUIPMENT

Among the interesting products described here are: an electronic still store system which also provides "slo-mo" operation; a series of solid-state television transmitters; a hand-held audio spectrum analysis system that measures many audio quantities with precision.

## Digital Still Recorder 250

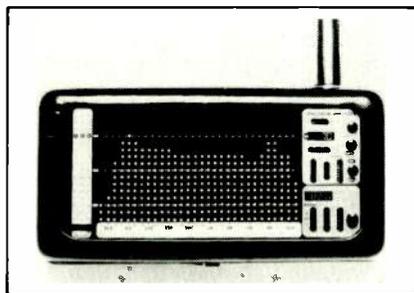
Digital video recording system stores up to thousands of stills, and also gives control in playback from still frame up to normal speed for "slow-motion" projection. Model ESS-2 replaces film slide systems, making every still stored in the system accessible in less than 70 milliseconds. Recording is in digital form on magnetic discs, with flying-head record and playback. Systems is available with one, two, or three drives. The single drive stores hundreds of stills and gives up to 27 seconds of real-time recording. The second drive raises this, and the third gives storage of 50,000 stills and 81 seconds of real-time playback. Programs can be assembled using the system's memory and fast access. Two-drive system, \$121,500. AMPEX CORP.

## Solid-State TV Transmitters 251

Television transmitters of 1 kW and 3 kW for the band 170 MHz to 230 MHz are all-solid-state. Systems require no high-tension voltage supplies for high safety in maintenance and operation. They need no pre-heating and use about 80% as much power as typical tube transmitters. Broadband impedance matching systems in every stage allows the transmitters to cover the entire band without tuning adjustments. NEC (NIPPON ELECTRIC CO.).

## Hand-Held Audio Analysis 252

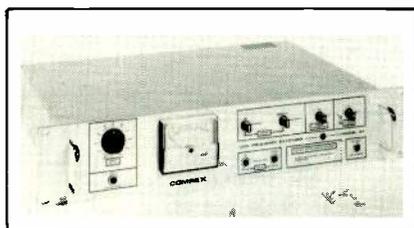
Audio analysis system in hand-held package shows full octave and 1/3 octave spectrum levels. Model IE-30A also includes a sound level meter calibrated in both dB SPL and dBmicroV. System quickly measures amplifier gain, weighted and unweighted SPL, peak accumulation, and impulse sig-



nals. With inexpensive optionals, it also measures distortion and reverb time. \$2,800. IVIE ELECTRONICS.

## Lo-Frequency Extender 253

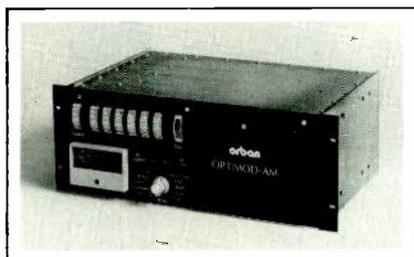
Encode-decode system for telco lines can be used on dial-up or dedicated lines. "LX Line Extender" lifts input by 250 Hz, returns output to level, mak-



ing effective low-frequency limit around 50 Hz and reducing clicks, pops, hum on telco lines, satellite circuits, and microwave links. COMREX CORPORATION.

## AM Audio Processor 254

AM audio processing system is aimed at best possible quality with present AM transmitters and typical receivers. Optimod-AM has a series of six basic blocks: input conditioning filter;



broadband compressor; program equalizer; six-band limiter; polarity follower; and a new "Smart Clipper" at output. All functions can be by-passed for proofs. \$3885. ORBAN ASSOCIATES.

continued on page 108



A group of the staff meet in the Broadcast Studio of the Station

## It was a College broadcast facility; Now it's a public radio station; KUSC, Los Angeles, still has a Stanton in every table...

It is interesting that the station which provides top quality classical music service to Los Angeles was an outgrowth of a College Radio Station.

It now has been incorporated into the public broadcasting system and serves all of Los Angeles, Ventura and Orange Counties, with a format of 85% classical music and 15% informational programming primarily from the National Public Radio Service. KUSC goes direct from disc to air and uses the Stanton 600E on its turntables.

Since the station has received substantial university support for upgrading their sound, which includes a new transmitting system ... new tower antenna ... new control board ... new turntables ... and new cartridges ... KUSC plans to install Stanton's Calibrated 681SE cartridges in all their turntables.

So, their sure-to-improve sound is certain to have a favorable impact on their growing audience.

Stanton's 681 Calibration Series cartridges offer improved tracking at all frequencies. They achieve perfectly flat frequency response to beyond 20 Kc.

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

Write today for further information to:  
Stanton Magnetics, Inc., Terminal Drive,  
Plainview, N.Y. 11803



STANTON

Circle 154 on Reader Service Card

# Meet AKG's "New Professionals"

AKG is a research, development and manufacturing organization specializing in electro-acoustic technology. Our designs have been awarded over 600 transducer related patents, and our products have earned the highest degree of user respect for quality and dependability.

The AKG line of various microphone models is considered to be the most sophisticated available for applications ranging through the spectrum of professional uses. From studio, to in-concert recording and reinforcement, to location film sound...our products can be called on to solve the most difficult situations you may encounter. AKG has developed a broad range of products to meet your varying creative requirements and, as new audio frontiers evolve, our engineers will lead the technological pioneering.

We set our goals rather high

and turn every stone to live up to, and improve upon, self-imposed challenges. We constantly strive to advance beyond state-of-the-art developments. Some of these advancements you see illustrated below. Loaded with practical, innovative features, AKG's "New Professional" microphones are intended to further build upon the remarkable results achievable with the other AKG "Professionals." Ask your dealer or write:



PHILIPS AUDIO VIDEO SYSTEMS CORP  
A NORTH AMERICAN PHILIPS COMPANY  
91 McKee Drive, Mahwah, N.J. 07430 - (201) 529-3800

The Mark of Professional Quality...  
in microphones, headphones,  
phonocartridges, reverb units.



## How About That!

**A Back Pack TV Camera  
Battery With  
250% More Power Output**

(At No Increase In Weight)

Specify

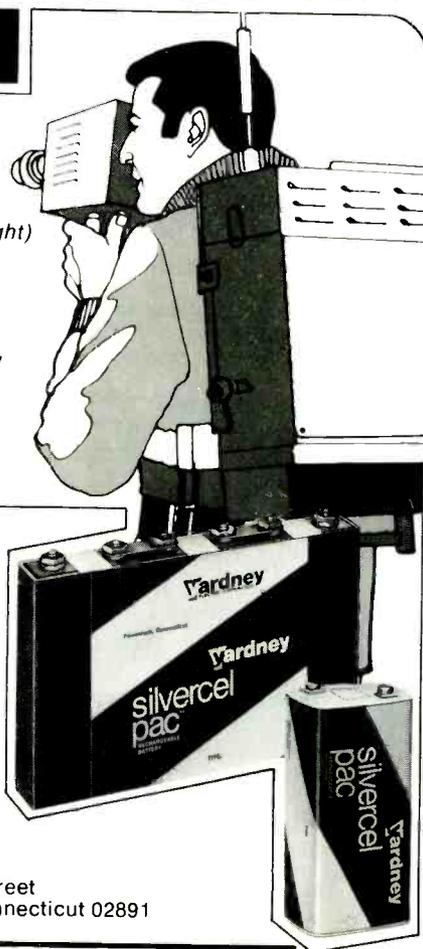
# silvercel

By Yardney

**Or, If Your Present Battery Is  
As Powerful As You Want It . . .  
How Would You Like To Have It  
At 1/3rd Its Present Weight?**

Silvercel rechargeable batteries pack the most useable power into the smallest and the lightest modular package. Used by all major manufacturers of TV Back Pack Cameras as original equipment, they offer the added advantage of a QUICK CHARGE without battery damage by the use of a quick pulse charge.

Silvercel (silver/zinc) rechargeable batteries — the recognized standard of excellence in power output for back pack TV cameras. Our technical assistance and catalog are yours for the asking.



**Yardney**  
ELECTRIC CORPORATION

82 Mechanic Street  
Pawcatuck, Connecticut 02891

Circle 155 on Reader Service Card

## Broadcast Equipment

For more information  
circle bold face numbers  
on reader service card.

### Routing Switchers

255

Switchers for video (5500, 5501) and audio (5502) use momentary illuminated pushbuttons located separately from the electronics. Other address means can be used, such as thumbwheel switches with read-outs or Touch Tone Control. Video inputs are in groups of four, hi impedance, bridging, with vertical interval switching. Audio switching is solid-state; crosstalk is rated at least -65dB, maximum output level +18dBm. 5500, A/V, \$4950.00; 5501, V. only \$4425.00; 5502, A. only, \$4425.00. DI-TECH, INC.

### Multi-Role Lens

256

Lens system has zoom modules (selectable front ends) for wide, narrow, or standard fields to meet individual needs and budgets. Varotal MRL has a compact objective, three interchangeable fronts for a focal length range of 56 to 1. No re-registration or camera adjustment is needed when exchanging modules. Portable version, for use with tripod-mounted portable TV cameras, has same optical specifications, with manual focus in addition to optional servo zoom. Relative apertures for all assemblies are 2 - 5.6. RANK PRECISION INDUSTRIES.

### Software For SMPTE Read

257

System utilizes 8080 based microcomputer with new program to read SMPTE code for editing, assembling, and many other functions. Program is written in "8080 Assembler," eliminating need for a high-level language. Read-out on CRT is in plain English, can handle up to eight sources simultaneously. J.S. WEINER, INC.

### Power Phase Converter

258

Phasemaster converts 220 volt or 440 volt single-phase service to 220 or 440 volt three-phase power. Phasemaster is the equivalent of utility supplied three-phase power providing three-phase power at affordable price to many combinations of motors varying in horsepower, speed, and duty cycle; operates individually or simultaneously.

## Broadcast Equipment

Fourteen models will handle motor sizes from ¼ to 150 horsepower and an indefinite number of electric motors in combination ranging up to 500 horsepower. KAY INDUSTRIES, INC.

### SMPTÉ Time Code Generator 259

Model TCG-80N Time Code Generator includes User Data features and may be used to record and display numerous types of identifying information on audio and videotape. User Data Memory may be loaded with information from the front panel thumbwheel preset, reset to zero, or loaded from an external source. Other features include Time and User Data displayed on seven segment LEDs with a contrast enhancing filter. Full frame, drop frame, and powerline modes are selectable from the front panel. Time code can be initiated from the front panel thumbwheel preset or an external source and the unit is not affected by momentary power dropouts. Depending on model and options selected, \$2150 to \$3710. SKOTEL CORP.

### Portable Receiving System 260

Vega Model 66 V.H.F. receiver is housed in a rugged metal case that is less than half the size of its predecessor, Model 57, which it replaces. The pocket size Model 66 is suitable for mounting to leading portable recorders, both audio and VTRs. Unit operates from either internal 9V batteries or an optional external DC voltage source. Optional power package uses "C" size batteries. Nearly all functions and connectors are front panel mounted. VEGA.

### Digital Message Timer 261

Timer is bright five digit LED display that reads out the cartridge elapsed playing time in minutes, seconds, and tenths. Integrated into front bezel of Ampro Cartridge Tape Recorders and Reproducers. Available as an option on new machines or in retrofit kit for earlier Ampro models. Playing time from spot start to finish is stored in the display for easy cartridge time labeling during cart production. AMPRO BROADCASTING INC.

**When accuracy Counts...Count on Belar for AM/FM/TV MONITORS**

**BELAR** CALL ARNO MEYER (215) 687-5550  
**ELECTRONICS LABORATORY, INC.**  
 LANCASTER AVENUE AT DORSÉT, DEVON, PA. 19333 • BOX 826 • (215) 687-5550

Circle 159 on Reader Service Card

## Don't Compromise...



when you purchase RF Components and Phasing Equipment.

For a Quotation on Custom-Designed Installations, call or write C.S.P.

- CONTACTORS
- FIXED COILS
- VARIABLE COILS
- RF COMPONENTS
- COMPLETE PHASING SYSTEMS

203 AIRPORT ROAD  
DOYLESTOWN, PA 18901

**C.S.P.**

INC.

(215) 345-7386

Circle 156 on Reader Service Card

## Video Engineer's Timing "Tool"



In every TV station, remote truck, or audio/visual department the video engineer has video timing problems. When he has a Matthey "UN360" in his tool bag he can deal with video timing up to and beyond 360° of phase at color sub-carrier.

It's fast to plug into cables. It's quick to switch to the required delay and a screw-driver vernier gives ± 4ns of fine trim.

The performance is suitable for full color timing and can be inserted directly into the video path without any extras. The equalizers are built inside the "UN360."

The "UN360" is in use by ABC, NBC and CBS and many TV engineers across the nation. Put one in YOUR tool bag — it's a real aid.

Television Equipment Associates, Inc.

**BILL PEGLER** Tel: 914-763-8893

Box 260, South Salem, N.Y. 10590

— Video Delays priced from \$75



Circle 157 on Reader Service Card

## Aural Studio-Transmitter and Remote Pickup Links



### SYSTEMS FOR

- 143-174 MHz
- 215-240 MHz
- 300-470 MHz
- 890-960 MHz
- Others on special order

- Solid State STL's for all applications — AM-FM-FM Stereo
- FM Stereo or QUAD on a single STL — a Moseley FIRST!

### Second Generation Solid-State Remote Pickup Links

Systems for 160 MHz and 450 MHz, sma l sized, self contained, plus R.F. power amplifier . . . from the pioneers in solid-state remote pickup equipment.

Please contact us for complete details.

**MOSELEY ASSOCIATES, INC.**

A FLOW GENERAL COMPANY  
 SANTA BARBARA RESEARCH PARK  
 111 CASTILIAN DR. • GOLETA, CA 93017  
 (805) 968-9621 • CABLE: MOSELEY  
 TELEX: 658-448

# add-on modules to these SCA convertible amplifiers



These unique amplifiers are designed to accept easy plug in modules in many combinations. Mike preamplifiers, telephone page preamplifier, chime, buzzer, siren, etc. . . . and there's a module available to convert the 10 watt or 25 watt amplifiers into tuner/amplifier.

Want to know more? Write or call today for more information.

 **Johnson Electronics Inc.**  
P.O. Box 7 — Casselberry, Florida 32707  
(305) 339-2111

Circle 160 on Reader Service Card

## DESIGN ENGINEERS BROADCAST EQUIPMENT

### TUNE YOUR CAREER TO AMERICAN DATA

We're a young, but fast growing manufacturer of television production and distribution switching systems and a unit of the North American Phillips Corporation, a giant and highly diversified company of international status. This association provides the strong financial, managerial, and technical resources it takes to undertake highly ambitious communications projects.

This growth position requires at least 2 years broadcast experience in television and distribution switching systems, digital audio, and/or video. While a degree is desirable it is not essential.

Relocation will be provided to our Huntsville location, a high technology area famous for its residential qualities and cultural diversity. Cost of living is modest and recreation facilities are exceptional.

Competitive salaries, full benefits, and opportunity for technical advancement are good reasons for finding out what we're doing and where we're going. While you're at the NAB Convention in Las Vegas, why not drop by our booth for a brief career discussion. If you cannot meet with us then, please send resume with salary history, in confidence, to: *Personnel Director*.

 **American Data Corporation**  
A North American Phillips Company  
401 Wynn Drive, P.O. Box 5228, Huntsville, Alabama 35805  
An Equal Opportunity Affirmative Action Employer M/F

## Advertiser's Index

Acrodyne Industries, Inc.	18
American Data Corp.	35
Amperex Electronics Corp.	74-75
Ampex Electronics Corp.	14-15
Ampro Broadcasting, Inc.	8
Angenieux Corp. of America	94-95
Arvin/Echo	10-11
Audio Designs & Mfg., Inc.	13, 102
Belar Electronics Labs	109
Robert Bosch Corp.	88-89
Broadcast Electronics, Inc.	27
Broadcast Products Div., UMC Electronics Co.	12
Canon USA, Inc.	7
Camera Mart	17
CCA Electronics Corp.	62
Central Dynamics, Ltd.	79
Christie Electric Corp.	40
Cinema Products Corp.	71
Consolidated Video Systems	72
CSP, Inc.	109
Digital Video Systems	Cover 2
Eastman Kodak Co.	22
ESE	106
Farinon Electric	37, 38
John Fluke Mfg. Co.	58
Grass Valley Group	5
Hitachi Ltd.	46
IGM, Div. NTI	29
Ikegami Electronics, Inc.	60-61
International Tapetronics Corp.	30-31
Johnson Electronics	110
JVC Industries Co.	51-54
Lenco, Inc.	3
LPB, Inc.	101
3M/Magnetic Tape Div.	57
3M/Mincom-Video Products	85
Martel Electronics Inc.	90
McCurdy Radio Industries, Inc.	29
McMartin Industries, Inc.	16
Micro Consultants, Inc.	66
Microtime	33
Microwave Associates, Inc.	99
Moseley Associates, Inc.	109
NEC Broadcast Equipment Div.	68-69
Rupert Neve	76
NTI America, Inc.	100
Otari Corp.	28
Pacific Recorders & Eng. Corp.	19
Panasonic Matsushita Elec. Corp.	82-83
Philadelphia Resins Corp.	105
Philips Audio Video Systems Corp.	108
Philips Test & Measuring Instruments	65
Potomac Instruments	16
Power-Optics, Inc.	59
RCA Broadcast Systems	43-45
Rockwell International, Collins Comm. Telecommunications Div.	20-21
SC Electronics	92
Sony Corp. of America	24-25
Stanton Magnetics, Inc.	107
TA Track Audio	103
TDK Electronics Corp.	80
Tech Labs, Inc.	106
Tektronix, Inc.	Cover 3
Telemation, Inc.	48-49
Television Equipment Assoc.	109
Telex Communications, Inc.	23, 91
Ultra Audio Plixtec	101
UMC Electronics Co., Broadcast Products Div.	12
Vital Industries	9
Ward-Beck Systems, Ltd.	Cover 4
Yardney Electric Corp.	108

## SALES OFFICES

**Broadband Information Services, Inc.**  
295 Madison Ave.  
New York, New York 10017

**EASTERN & MIDWESTERN STATES**  
295 Madison Avenue  
New York, New York 10017  
212-685-5320  
Kenneth F. Luker, Jr.

**WESTERN STATES**  
353 Sacramento Street  
Suite 600  
San Francisco, CA 94111  
415-421-7330  
William J. Healey  
1434 Westwood Blvd., Suite 9  
Los Angeles, California 90024  
213-475-8486  
Judy Milford



# Test and Save.

A simple philosophy? Yes. But, one that can save you and your clients many dollars.

Consider this:

You're recording an exciting, new spot for a new client. The musicians and vocalists are set. You're getting noise on the tape and you can't find it anywhere. Testing with a TM 500 audio test set before recording could have saved time and money.

Or, does this sound familiar?

You're midway through an important broadcast. You've sold every commercial minute allowable, when your audio fuzzes out. During a commercial minute a make good is in order. A quick check through your basic frequency/response levels with a TM 500 Oscillator/dB reading meter combination could have saved that minute.

Try this:

You're engineering a big theatre production. It's opening night with a full house attending. The curtain goes up while your audio stays down. Troubleshooting with a TM 500 test set before the show could have found the problem.

In this world of sound, time is money. TM 500 is a collection of modular test and measurement instruments from Tektronix that can save you plenty of both.

The heart of our TM 500 Audio Travel Lab is our 600  $\Omega$  low distortion audio oscillator, which generates square or low distortion sine waves from 5 Hz to 500 kHz (0.035% THD 20 Hz to 50 kHz).

For general troubleshooting combine this compact oscillator with a full function TM 500 Multimeter with ac, dc, current, temperature and resistance readings as well as dB capabilities. Add one of our TM 500 Counters (measuring capability to 1 GHz) with a TM 500 Oscilloscope (5 MHz, 15 MHz and 80 MHz varieties), you've got a complete, portable TM 500 audio test set.

Or if you're in need of a signal source, try our 40 MHz function generator capable of tone bursts, 20 Hz to 20 kHz lcg or linear sweep, and amplitude modulation.

TM 500 even has a tunable bandpass filter which selects narrow bands for selective frequency tests and a hi-gain differential amplifier with hi or lo filter capabilities.

These versatile plug-ins can be mixed, matched and packed in any one of 6 portable, benchtop, or rackmount TM 500 Mainframes to make a test set that suits your measurement needs.

**The Traveler Mainframe is on the move with you.**

When you're in and out of a lot of studios our TM 515 Traveler Mainframe is your number. The TM 515 carries up to five TM 500 plug-ins, looks like and acts like

carry-on-flight luggage. A rear interface circuit board in the TM 515 Traveler Mainframe lets you interconnect the plug-in instruments to make gain, loss or response measurements — at the touch of a pushbutton.



## TM 500 Designed for Configurability

Your nearby Tektronix Field Engineer would like to help you save time and money in audio measurements. Call today or write for a TM 500 Catalog: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97077, (503) 644-0161, Ext. 5283. In Europe: Tektronix Limited, P.O. Box 36, St. Peter Port, Guernsey, Channel Islands.

**Tektronix**  
COMMITTED TO EXCELLENCE

Circle 165 on Reader Service Card



## AM Stereo by Ward-Beck.

Something special has happened to radio. Now, for the first time, there are operator-oriented radio consoles designed in the Ward-Beck tradition.

We take pride in introducing the new WBS R1200 and R2000 Radio Programming and Production facilities, assiduously engineered for AM and FM, assembled AM stereo ready.

Our team of engineers devoted their full attention to the new generation features included in the 1200 and 2000 systems. The quality, the performance, the singular statement of stylish simplicity, are evidence of their complete success.



WBS 2000  
showing some options.



Tomorrow's Technology Today.

Ward Beck Systems Limited, 841 Progress Avenue, Scarborough, Ontario, Canada M1H 2X4.

Tel: (416) 438-6550.

Ward-Beck Systems Inc., 6900 East Camelback Road, Suite 1010, Scottsdale, Arizona 85251.