

SEPTEMBER 1983

\$3.00

# BMUE

BROADCAST MANAGEMENT ENGINEERING

## ENA:

A NEW ERA  
IN NEWS  
ACQUISITION

Also in this issue

Viewfinders  
for ENG

Selecting an  
AM antenna

RTNDA Preview

FM SCA

NETWORK FEED  
FIELD REPORT  
WIRE SERVICE  
CALL-IN  
SATELLITE SYNCHRONIZATION  
WEATHER SERVICE

Time In: Time Out: Rec:

Time In	Time Out	Rec

Teletype

TV PROGRAMMING & PRODUCTION:  
THE  
**DIANA ROSS**  
CONCERT

# ADM takes AM/FM versatility to new levels

We are proud to announce a major new development in our ST Series II AM/FM stereo consoles. These popular, highly versatile consoles are now available in four basic main frame sizes with 10, 16, 20 or 24 inputs. Each can be initially equipped with your choice of a variety of input, output and signal processing modules. Each has built-in capacity for future expandability.

For superior, unflinching *stereo-tracking*, ADM® has developed a unique *stereo VCA*. It

is included on all ST Series II input modules. These new ST II's have the same long list of "plus value" features, as do all ADM consoles. And they're backed by our same exclusive 5-year warranty. There is no better assurance of performance and reliability in audio equipment.

Let's talk AM/FM technology soon. Contact ADM Technology, Inc. - The Audio Company - 1626 E. Big Beaver Road, Troy, MI 48084, Phone (313) 524-2100. TLX 23-1114.



# ADM

The  
Audio  
Company

WEST CENTRAL SALES  
(817) 467-2990

ST SALES  
31

MAIN OFFICE AND  
EAST COAST SALES  
(313) 524-2100

# THE BROADEST LINE OF TELEPRODUCTION GRAPHIC TITLERS IN THE WORLD

QUANTAFONT 93



QUANTAFONT SELECT 7



MICROGEN



**Choose Your Solution from the Shapes  
and Strengths of Quanta Technology.**

**QUANTA**<sup>TM</sup>

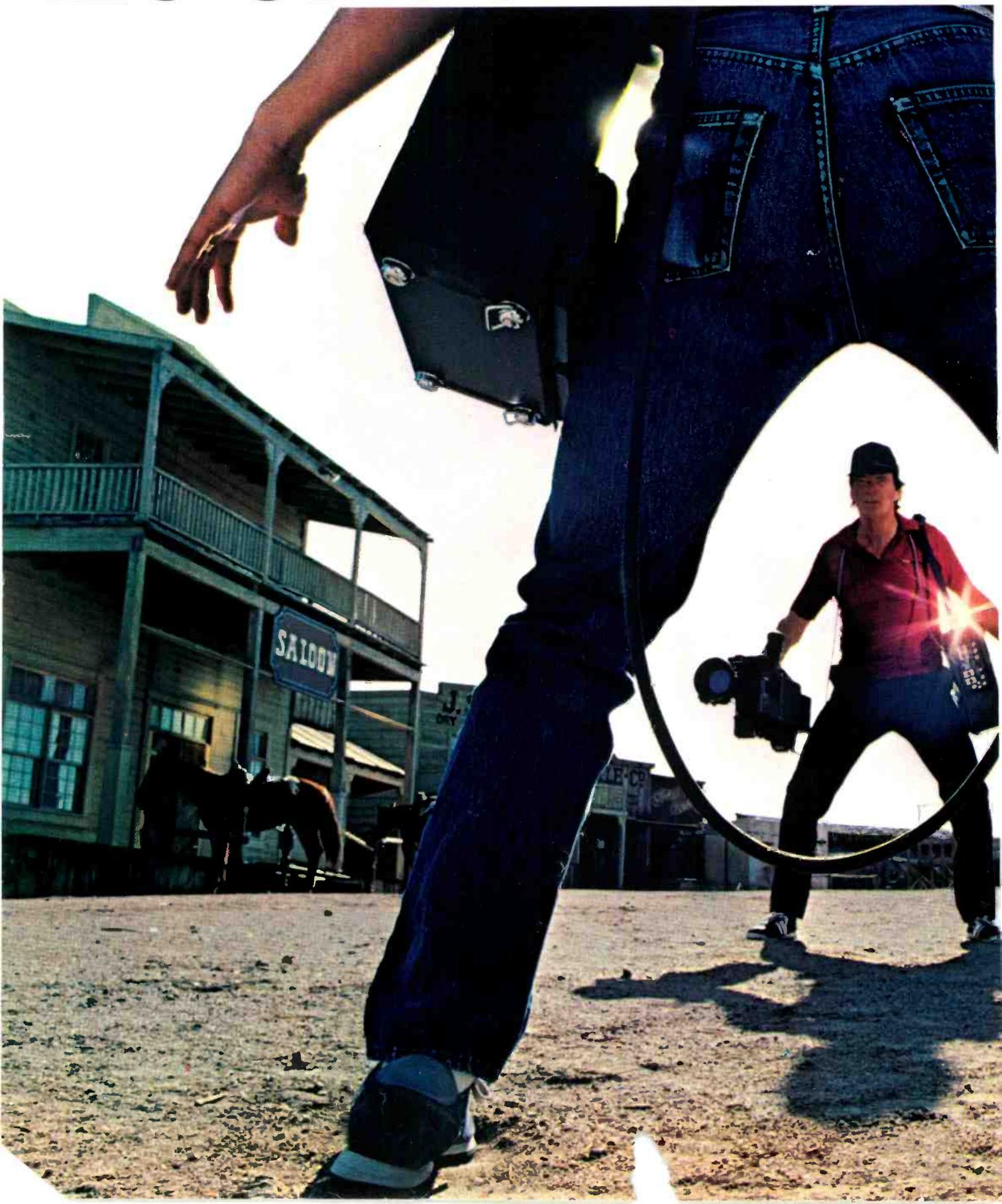
2440 So. Progress Drive, Salt Lake City, Utah 84119  
(801) 972-3992 TWX 913-925-5684

Sales Offices: California San Jose (408) 985-8888  
Connecticut Danbury (203) 797-1179  
Georgia Atlanta (404) 493-3913  
Ohio Cleveland (216) 692-3410  
Oklahoma Tulsa (918) 627-4151  
The Netherlands, Aalsmeer  
(31) 2977-23473  
TLX 18241-QJANT-NL

Registered trademark of Quanta Corporation

Circle 100 on Reader Service Card

# 25 SHOOT-OUTS.



# NO LOSSES.



Every television station that has pitted the new Sony BVP-3 camera against the competition has arrived at a singular result.

In bright light and low light. In the field and lab. With vectorscopes, wave form monitors, noise meters and the ultimate arbitrator—the naked eye—Sony outshot them all.

The overwhelming factor: the BVP-3 contains the most revolutionary breakthrough in pickup tube technology in the history of broadcast. The exclusive, Sony developed  $\frac{2}{3}$ " mixed field Saticon™ tubes.

Sony, unlike many of its competitors, didn't stick with the heavy, bulky  $\frac{2}{3}$ " tube assemblies commonly used. Nor did they switch to inferior  $\frac{1}{2}$ " tubes. Instead, they stayed with the  $\frac{2}{3}$ " format, but radically reduced the size and weight and reinvented the electron optical system. Resulting in not just the best resolution, registration and signal-to-noise ratio, but the best balanced camera in the industry.

And it plugs into any recording format, including our superior  $\frac{1}{2}$ " Betacam™ system.

## ARRANGE YOUR OWN SHOOT-OUT.

If you'd care to see how well this self-contained ENG camera shoots, a camera that has all the features you've been asking for, and at \$20,000\* easily packs the most bang for the buck, just name the time and place and we'll be there.

In N.Y./N.J. call (201) 368-5085; in the Northeast/Mid-Atlantic (201) 368-5112; in the Midwest (312) 773-6045; in the Southeast (404) 451-7671; in the Southwest (214) 659-3600; in the West (213) 841-8711.

Sony is a registered trademark and Betacam is a trademark of the Sony Corp. © 1983 Sony Corp. of America, 9 W. 57th St., New York, NY 10019.

**SONY**  
Broadcast



\*U.S. list price.

# CHYRON AT CAMERA MART:

## WHERE YOU'LL FIND THE BEST NAMES IN VIDEO.

CHYRON VP-1



ACTUAL VP-1 GENERATED GRAPHICS  
PHOTOGRAPHED FROM A MONITOR

### Chyron VP-1 Character Generator: Astounding Capability at an Affordable Price.

The Chyron VP-1 is a broadcast quality generator that gives you superb image resolution: crisp, clear characters and an extraordinary range of special effects usually found in units costing far more.

Use the VP-1 with any micro-computer to achieve exciting, creative visuals and titles for all your video graphics: news, weather, election results, advertising, training, sales presen-

tations and educational aids.

You get two fonts supplied, expandable to six; eight colors from a palette of 64, for characters background and edging, plus extensive common capability, including font selection, color selection, placement, spacing, italics and many, many more!

In New York see the Chyron VP-1 *only* at *Camera Mart!*

## The Camera Mart, Inc.

456 West 55th Street, New York 10019 • (212) 757-6977/Telex: 1-2078  
Video Department: 800 Tenth Avenue  
Sales • Service • Rental

Circle 101 on Reader Service Card

# BM/E

BROADCAST MANAGEMENT/ENGINEERING

Publisher  
**Charles C. Lenz, Jr.**  
Editor Emeritus  
**James A. Lippke**

Editorial Director  
**Gerald M. Walker**

Editor  
**Robert Rivlin**  
Senior Editor  
**Robin Lanier**  
Senior Associate Editor  
**Eva J. Blinder**  
Associate Editor  
**Tim E. Wetmore**  
Copy/Research Editor  
**Allene J. Roberts**  
Assistant to the Editor  
**Douglas Damoth**  
Editorial Assistant  
**Toria Smith**

FCC Counsel  
**Farmer, McGuinn, Flood, Bechtel & Ward**  
Broadcast Financial Consultant  
**Mark E. Battersby**  
Special Projects Editor  
**C. Robert Paulson**

Associate Publisher  
**Neal Wilder**  
Production Director  
**Janet E. Smith**  
Art/Design  
**Mark Rogan**  
**Edwin Torres**  
Advertising Coordinator  
**Dana L. Kurtz**  
Marketing Assistant  
**Elaine Ailmonti**  
Reader Service  
**Sharon Porges**

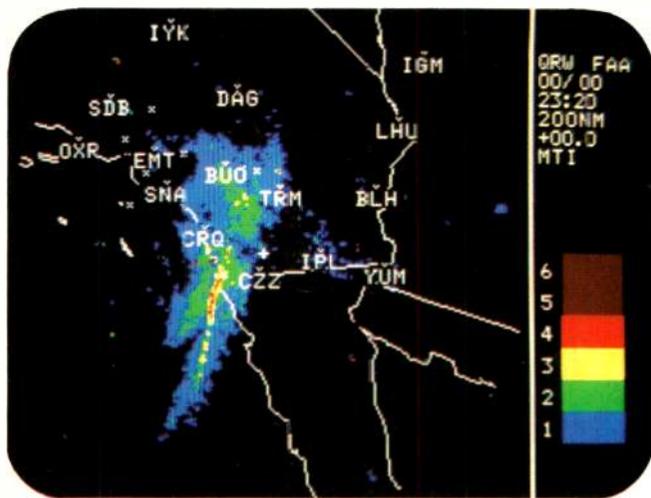
Controller  
**Michael J. Lanni**

**BROADBAND INFORMATION SERVICES, INC.**  
295 Madison Ave., New York, N.Y. 10017  
212-685-5320, Telex: 64-4001  
Publishers of:  
**BM/E—Broadcast Management/Engineering**  
**BM/E's World Broadcast News**



BM/E BROADCAST MANAGEMENT ENGINEERING (ISSN 0005-3201) 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, NY 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 in the U.S. and Canada. These facilities include AM, FM and TV broadcast stations, CATV systems, ETV stations, networks and studios, audio and video recording studios, telecine facilities, consultants, etc. Subscription prices to others \$24.00 one year, \$36.00 two years. Foreign \$36.00 one year, \$60.00 two years. Air Mail rates on request. Copyright 1983 by Broadband Information Services, Inc., New York City. Second class postage paid N.Y., N.Y. and additional mailing offices.

# Make your weather forecast good for nothing.



Our Live Color Radar System accesses free government transmitters nationwide, with a simple phone modem.

## NEW ALDEN LIVE WEATHER RADAR WITH FREE ACCESS

Live color radar adds drama to any weather report. Now you can have live color radar (with coast-to-coast coverage) without paying access fees, monthly charges or high equipment costs . . .

Because Alden Electronics is introducing a unique weather radar system. It can access the government's new network of live radar transmitters (RRWDS) using just a simple phone modem.

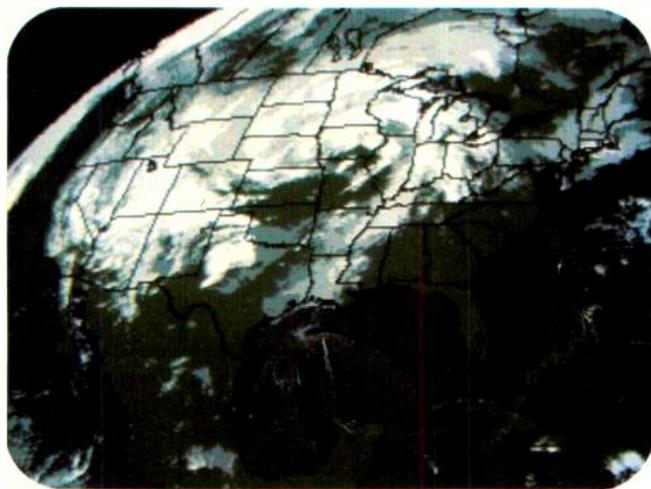
Your meteorologist can zoom in on local precipitation. And take his forecasts—and your audience—into hurricanes, tornados or blizzards nearby or anywhere in the country. Good for forecasting, great for exciting weathercasts.

But the best news is the price—the basic hardware is a fraction of the cost of comparably equipped private radar service products. And the RRWDS data is free.

The Alden Color Radar System is available as a stand-alone addition to whatever you may already be using for color weather display. Or it can be added to Alden's Satellite/Weather Graphics System, compatible with private weather data bases. Show surface weather, temperature contours, hourly national weather radar and satellite photos. Zoom in for local conditions, or loop satellite photos to illustrate frontal movement.

The price? We invite you to compare ours with other systems. And you can lease directly from Alden, with no third-party expense.

Who is Alden? We're the most respected name in weather forecasting equipment. Just ask your meteorologist.



Our Satellite/Weather Graphics System is compatible with private data bases, and can be combined with our Live Color Radar System.

Call or write us for a demonstration. Alden Electronics, 117 Washington Street, Westborough, MA 01581. (617) 366-8851.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

## ALDEN ELECTRONICS

See us at RTNDA for a live demonstration.

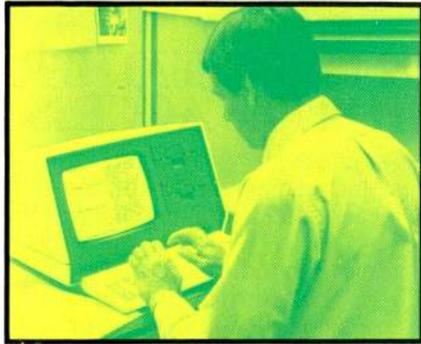
# BM/E

BROADCAST MANAGEMENT/ENGINEERING

SEPTEMBER 1983 VOLUME 19/NUMBER 9

## FEATURES

### SPECIAL REPORT: ENG



#### **ENA: New Era in Electronic News Acquisition**

47

How does a radio or TV station battle the ever-increasing number of news sources? Computerized Electronic News Acquisition is the answer.

#### **VIEWFINDERS FOR ENG**

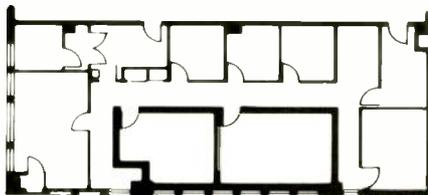
59

With the wealth of information available in today's ENG camera viewfinders, the operator need never look away from the scene. But is there too much information?

#### **RTNDA URGES NEWS DIRECTORS: "BRING YOUR ENGINEERS"**

71

More time for exhibit-visiting has been planned for this year's show in Las Vegas, so engineers are especially welcome.



#### **FACILITIES DESIGN AND ENGINEERING, PART 10: Selecting and Installing an FM Antenna**

75

AM stations planning a new or upgraded facility would be wise to pay careful attention to John Battison's analysis about how to select and install both antennas and towers.

## DEPARTMENTS

**Editorial** 10  
News and Profits

**Letters to the Editor** 12

**Broadcast Industry News** 16  
McKinney Lands Top Spot at Mass Media Bureau; U.S. Takes Reservation on Two DBS Agreements; Sophisticated Edit Center Opens in Southwest.

**Radio Programming and Production** 31  
Radio Engineers Champion the DAD

**Television Programming and Production** 39  
Careful Camera Placement Gets Angle on Rain-Delayed Diana Ross Concert

**News Feature** 85  
FM SCA: An Engineering Perspective

**News Feature** 95  
Montreux Symposium Reveals Europeans Hungry for Technology

**Great Idea Contest** 102  
Problem 22: Commercial Production Automation  
Problem 23: Moisture Detection

**Advertisers Index** 104

**FCC Rules and Regulations** 107  
Class Operation Restructuring Under Deregulation

**Broadcast Equipment** 110

**Business Briefs** 114

COMING IN  
**OCTOBER**  
DIGITAL AUDIO  
LOCAL COMMERCIAL  
PRODUCTION  
SMPTE PREVIEW

# INTRODUCING THE NEW PRIMUS<sup>TM</sup> AUDIO COMPONENTS



**CERTIFIED  
PERFORMANCE**

## Powerful performance in the palm of your hand.

PRIMUS (Prēe-mūs): an array of compact, performance-engineered audio electronics from Ramko Research.

The new PRIMUS components are unlike any professional audio equipment you've ever used. Never before has so much advanced performance been put into such compact and rugged packages. Rarely have you had available so many features and options to help get the job done. Never have you had a three-year warranty that's backed up by factory certified proof-of-performance.

PRIMUS is a comprehensive range of components that give you the flexibility to configure an audio system limited only by your imagination. Whether you choose from tabletop or rack mounting versions, there's hardly an audio job that can't be improved upon.

Here's a partial list of models currently available:

- Lab standard mono or stereo turntable preamplifiers.
- Dual and quad input, gain selectable microphone/line amplifier mixers.
- Audio distribution amps from three (3) stereo/six (6) mono up to eight (8) stereo/sixteen (16) mono outputs. All models feature individual recessed front panel adjustments or optional high resolution, conductive plastic potentiometers.
- Mic/Line equalizer amplifiers with balanced I/O and up to +15 db of reciprocal equalization.
- Expandable audio console mixers with cueing, selectable EQ, metering phones and monitor.
- Voicegard™ combination limiter/compressor, noise gate with variable threshold and slope ratio; gain reduction metering.
- Signal processing VCA's with six (6) independently controlled channels. DC remote control with balanced outputs.
- R/P and playback, stereo and mono NAB cart machines.

Whichever combination of precision PRIMUS audio components you choose, you're guaranteed outstanding specifications. For example, our stereo turntable preamplifier measures:

Signal-to-noise Ratio: -93 dB (A weighted)  
Total Harmonic Distortion: Below .0018%  
Frequency Response: 10 Hz to 20 kHz, ±.25 dB  
Stereo Separation: -70 dB @ 1 kHz  
Output Level: +25 dBm (10 Hz - 20 kHz)

The simplified and modular packaging of PRIMUS allows us to concentrate the quality where it belongs: in state-of-the-art circuitry. High slew-rate integrated circuits and extensive ground planes insure the highest RFI protection.

All IC's plug into gold plated sockets. All models feature quick disconnect I/O connectors and require only 1 3/4 inch standard rack height.

We've taken another important step, too.

When you invest in PRIMUS, you receive a *Certified Performance Gold Card* that instantly puts you in touch with our Technical Assistance Department on a toll-free line. Just call in your registered serial number and you're in touch with the advice you need.

To put PRIMUS audio components to task on a free two-week trial, call toll free (800) 821-2545 or contact your nearest Ramko Research sales representative or distributor. Put the powerful performance of PRIMUS in the palm of your hand.



PRIMUS audio components are an array of compact, performance-engineered rack mounting or tabletop packages.



**PRIMUS** is a division of Ramko Research, Inc. 11355-A Folsom Blvd., Rancho Cordova California 95670

(916) 635-3670

Circle 103 on Reader Service Card

© 1983 Ramko Research

# KING OF THE

## IKEGAMI'S NEW HL-79E THE HEIR TO THE THRONE

Ikegami's latest technological triumph, the HL-79E, heralds a new generation of hand-held broadcast camera excellence.

Engineered to surpass the most rigorous standards of performance and introducing features that are masterpieces of innovative thinking, the HL-79E's picture quality even exceeds that of other manufacturers' top-of-the-line studio cameras.

In the fiercely competitive video market where others hope to be as good as the HL-79D, Ikegami is the unquestioned leader. And the HL-79E will soon ascend to a loftier throne as King of the Jungle. Only by seeing this remarkable camera in action can it be fully appreciated.

How great a camera is it? To begin with, it is smaller and lighter than the world's standard for comparison, the Ikegami HL-79D Series. And it has features as yet unknown to even sophisticated camera users: Dynamic Detail Correction, Chroma Aperture Correction, Highlight Aperture Correction and Auto Contrast Compression. Plus the HL-79E offers improvements in contrast range, S/N ratio, registration, accuracy, resolution viewfinder performance and more.

Optional accessories include the ADC-79E Auto Set-Up Digital Control, the RDC-79E Remote Digital Control and the VF 45-3 Large Viewfinder. The HL-79E is compatible for use with existing HL-79A and HL-79D lenses, power supplies, VTR cables, and other accessories. Plus, it can

be adapted to the MA-79 Multicore Base Station and TA-79/79C Triax Base Station.

The HL-79E is part of the great and proud family of Ikegami cameras and monitors serving many satisfied users worldwide. For a complete demonstration of Ikegami Cameras and Monitors, contact your local dealer or call Ikegami Electronics.



ADC-79E Auto Set-Up Digital Control

# Ikegami HL-79E

Ikegami Electronics (USA) Inc. 37 Brook Avenue Maywood, NJ 07607

■ Northeast (201) 368-9171 ■ Midwest (219) 271-8240 ■ West Coast (214) 534-0050  
■ Southwest (713) 445-0100 ■ Southeast (813) 884-2046

# THE JUNGLE



Circle 104 on Reader Service Card

## News and Profits

A GLOWING REPORT in the RTNDA *Communicator* (June 1983) prepared by Vernon Stone confirms what most have suspected: that news is making money for radio and TV stations in every market size. Among the TV stations surveyed, 83 percent said news was paying its own way (79 percent in ADIs 1-25, 88 percent in ADIs 26-50, and over 80 percent in every other market). Among radio stations, 66 percent said news was profitable (the highest percentages being in large, medium, and small markets, with major markets trailing somewhat behind).

Equally significant compared with this finding is that news ad revenues are up over the previous year's figures. Among TV stations, 78 percent were up (seven percent were down and 15 percent were unchanged); among radio stations, 49 percent were up (15 percent were down and 26 percent were unchanged).

Reports from other sources also help confirm that news is a money-maker. Some stations report that more than 50 percent of their income comes from news operations, and that the figure is growing steadily. This, of course, is to be expected. After all, it is news which gives a station the local market identity and sense of community involvement which most experts suggest is the best means for stations to survive the onslaught of satellite-delivered programming from national sources. Evidently the survival plan is working.

But the RTNDA study also reveals another, less pride-inspiring fact about news: in some cases, expenditures for news are down. This does not appear to be the case in television, where average news expenditures are up at 77 percent of stations (as high as 85 percent of stations in ADIs 26-50). But in the radio arena, even though news profits are up at almost two-thirds of the stations, expenditures for news are up at only 43 percent. The worst case is small market radio, where news revenues are up at 51 percent of the stations but news expenditures are up at only 35 percent.

It is, of course, only natural that there should be some profit-taking, especially among smaller operations. But it is equally clear that if news is to remain a source of profits, then management must keep investing money in it, both in terms of personnel and state-of-the-art hardware. Selling news short now will surely mean disaster in the future if the station skimps on promoting its local identity.

This is borne out by still another finding in the RTNDA study: there is a direct relationship between the staff size and how profitable the news operation is. In every case, there were more stations with news staffs of three or more making money off news than stations with one or two news staffers. For example, ad revenues were up at 76 percent of stations with three or more news staff, 66 percent at those with two staff members, and only 51 percent at those with one staff member.

In general, the RTNDA study makes it clear that there is much to be proud about when it comes to television and radio news. But it also suggests that management take a long, hard look at the return-for-effort profile of the news department and consider strongly a renewed investment in the future of the news operation.

TV-4 'SOLUTION'  
\$29,900

# It's a small price to pay for the 'SOLUTION'

Selecting a new audio console can be a problem if you are a busy executive engineer with broad responsibilities.

Your audio needs, however, are probably *not unique*.

We have identified several common needs in broadcast audio and have configured specific consoles to meet those needs.

One of the most common is 16 inputs with two program feeds (stereo or mono) and four auxiliary outputs. We have integrated a generous patchbay, space for two stereo-line input modules, and called the answer the 'Solution'. All interconnections are by way of XLR or easy to use DIN standard 30-pin connectors.

We also have many solutions to other needs, all at prices that will not compromise your budget or your requirement.

Now you get price,  
the solution,  
and, you get a Harrison.



 **Harrison**

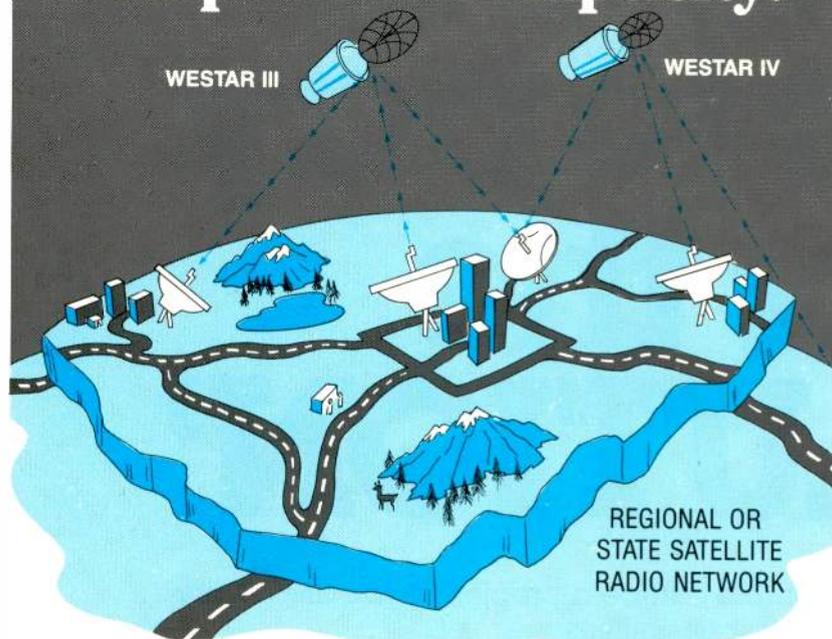
HARRISON SYSTEMS, INC. • P.O. Box 22964, Nashville, Tennessee 37202 • (615) 834-1184 • Telex 555133

**SERIES 4 FEATURES:** All transformerless design • Thick-film resistor networks • 5532/5534/LF353 amplifiers • Minimum audio-path design • State-variable equalizer • +4 dB (or +8 dB) balanced outputs • Automated fader • Extensive patching • DIN (Tuchel) interconnects • DIN Eurocard internal connectors • Center-detent panpots • Center-detent  $\pm$  EQ controls • All sends switchable main/monitor • All EQ sections switchable main/monitor • 4 mono sends, plus 1 stereo send • Automatic PFL • Optional non-interrupting stereo solo • New high RF-immunity transformerless mic preamplifiers • Dual switchable mic inputs to each module • 24 tracks, plus direct outs (MR) • 8 stereo groups, plus 4 stereo programs, plus 4 mono programs (TV) • Extensive internal and external communications • Multitrack interface from stereo groups (TV) • All-aluminum (lightweight) housing • Internal or external patching • Various meter options • P&G faders.

\*Prices shown are for direct factory sales in USA, FOB Factory, installation not included. Commissioning into a prepared facility is included. Prices outside of the USA are higher due to freight, duty, dealer service support, etc. Normal payment terms are 30% with order, 70% prior to shipment. Price, specifications, terms, and availability are subject to change and are determined only at the time of sale.

Circle 105 on Reader Service Card

# Comtech's satellite feed uses less than 1% of a transponder's capacity.



Our sophisticated satellite radio network system can reduce your monthly operating costs substantially compared to land lines. We design and deliver complete networks that provide the highest level of performance and reliability at a very attractive cost of ownership.

**Less than 1% of a transponder's** bandwidth and EIRP is required to achieve the same performance provided by other systems requiring considerably more capacity.

**Network expandability** is achieved via Comtech's unique mechanical package which allows a combination of SCPC, MCPC, digital data or composite video/audio demodulators. Dual and triple feeds are available for simultaneous reception from satellites spaced up to 8°, such as Westar III and Westar IV.

**High quality audio** is the result of Comtech's advanced audio processing system.

Up-link Terminal includes audio processor, SCPC modulator, up-converter, high power amplifier, antenna feed system, 5 meter antenna with mount, and receive-only components for system monitoring.

Receive-Only Terminals include SCPC demodulator, audio processor, 7-slot housing, down converter, low noise amplifier, antenna feed, and 3.8 meter antenna with mount.

**For your complete regional or state radio network, designed, built and delivered by Comtech, call or write:**



**COMTECH Data Corporation**

A SUBSIDIARY OF COMTECH TELECOMMUNICATIONS CORP.

350 North Hayden Road • Scottsdale, AZ 85257

(602) 949-1155, TWX 910-950-0085

Circle 106 on Reader Service Card

## LETTERS

### FM SCA QUESTIONS

#### To the Editor:

I have just seen the article in your June issue on FM SCA use. ["Deregulation of SCAs," FCC Rules and Regulations.] May I point out a small but egregious error. After posing the question of whether or not the use of one or both of the SCAs will adversely affect the signal coverage on the main channel, the writer states: "There are, unfortunately, no answers to this question."

I would like to point out that there is, indeed, an answer to that question, and it has nothing to do with theoretical mathematics or nervous engineers. An SCA properly installed and maintained has no discernible effect on main channel operation. The usual 10 percent injection amounts to slightly less than 1 dB of modulation, which is below the threshold of hearing. The suggestion that 1 dB of modulation will "seriously affect" the station's coverage is ludicrous. The fact is, it would be next to impossible to even find a listener in a fringe area who would find a signal-to-noise ratio acceptable at, say, 24 dB but not at 23 dB. But even if you could find such a listener, signal strength fluctuations of seven to 10 dB are the rule rather than the exception in fringe areas, because of factors such as weather, day-to-night propagation characteristics, sun spots, terrain, and so on, all quite independent of whether or not the SCA is in use. In short, if listeners can receive a useable signal without the SCA, adding the SCA will make no discernible difference to them at all.

To put the whole question in proper perspective for the programmers, they run a greater risk of losing a listener by playing a bad record than by turning on and using the SCA.

**Joe Meier**  
VP of Network and Operations  
Radio Data Systems, Inc.  
(Bonneville International Corp.)  
Centerville, UT

For more discussion of the FM SCA issues, see "FM SCA" elsewhere in this issue.—ED.

# THE ULTIMATE VTR. FAST, YET GENTLE. SOPHISTICATED, YET SIMPLE.



## THE REMARKABLE VPR-3.

Meet the classic one-inch Type "C" VTR. Light years ahead in technology. With everything you want in one machine. We call it the VPR-3.

VPR-3 has it all. Just look into its exclusive features. Gentle air-guided and vacuum-controlled tape handling. Tape acceleration to 500 inches per second shuttle in one second with one-hour reels. "Fail-safe" dynamic braking. Fast synchronous lockup. The ability to run with three-hour to "spot" reels



without adjustment. Superior built-in audio features. Simpler operation using a fluorescent display screen and soft-key-driven menus. And extensive diagnostics.

Get all details from your nearest Ampex sales office, or call us today.

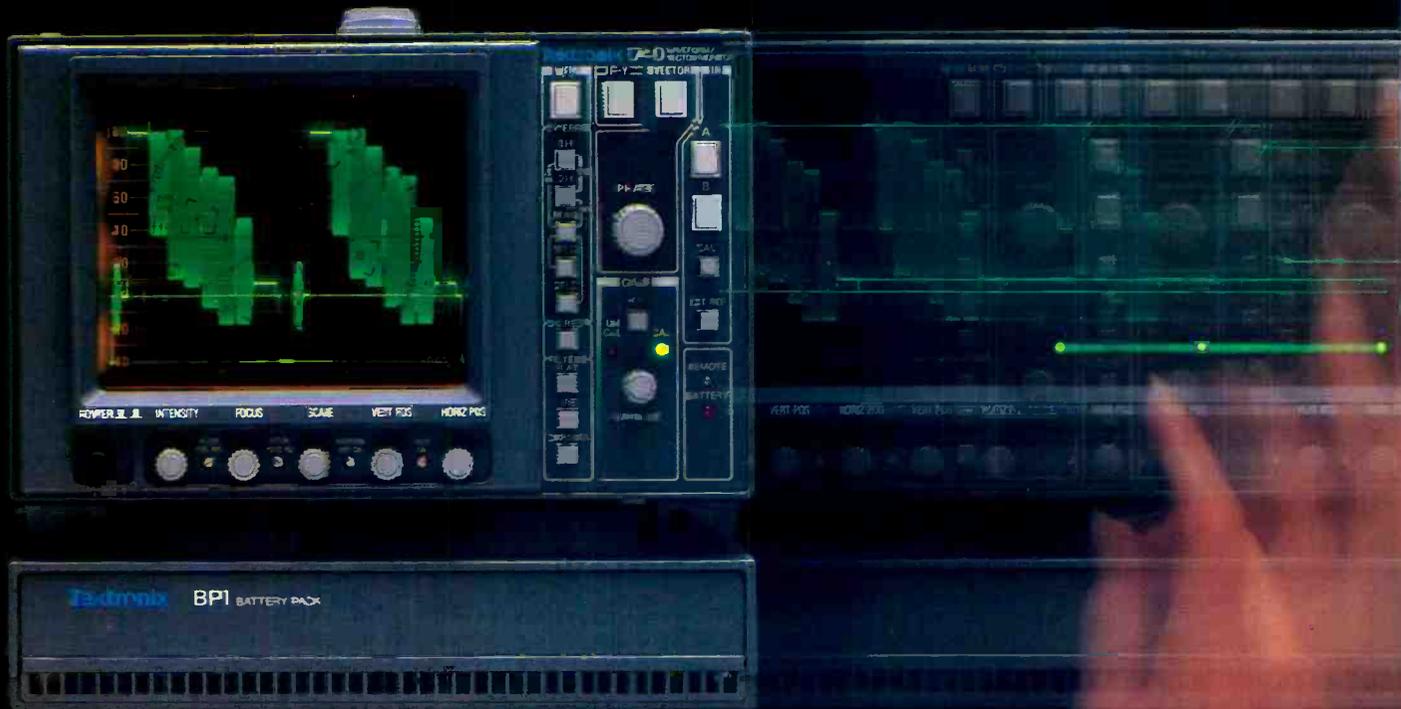
### AMPEX

Ampex Corporation - One of The Signal Companies  
Atlanta 404/451-7112 • Chicago 312/593-6000  
Dallas 214/960-1162 • Los Angeles  
213/240-5000 • New York/New Jersey  
201/825-9600 • San Francisco 408/255-4800  
Washington, D.C. 301/530-8800

Circle 107 on Reader Service Card

**TWO MONITORS IN ONE  
PORTABLE PACKAGE...**

**THAT'S A NICE SWITCH.**



The model above is pictured with the optional battery pack.

Tektronix introduces a new product to help improve your signal quality: The 1740 series portable waveform/vector monitor.

We know that in-studio or out on remote, space is critical. And the smaller the equipment is, the better. So we've combined our waveform and vector monitoring functions, and integrated them into one compact, go-anywhere package.

#### **HALF THE RACK SPACE.**

At 8½ inches wide and 18 inches long, the 1740 series uses only half the normal rack width. That means you gain more usable space and more flexibility than ever.

To change from waveform mode to vectorscope mode and back, just press a button. Couldn't be simpler.

There's a brighter CRT display on the 1740 series, too. Viewing is easy even in high ambient light.

And, because it operates on either AC or DC, the 1740 can go wherever you go.



**TWO-IN-ONE ECONOMY.**

Using one monitor where two were needed before lowers your equipment costs. And because the 1740 series is completely portable, it makes a sensible purchase for either studio or field use.

And there's more. The 1740 series operates on only 50 watts of power. And that means less heat build-up (which is important in crowded equipment racks).

And in addition, there's a single line display preset for monitoring VIRS.

**SEE FOR YOURSELF.**

Now that you've heard about our new two-in-one tool, you should see one. Call or write us for a demonstration. We have field offices in most cities. Or you can call Toll Free 800-547-1412 (in Oregon 800-452-1873), or contact your authorized Tektronix professional video dealer.

And remember, you can depend on Tektronix for video monitoring equipment that works and for technical support and service worldwide.

**WORKING HARD FOR YOUR SIGNAL QUALITY.**

**Tektronix, Inc.**  
P.O. Box 1700  
Beaverton, OR 97075

**Tektronix**  
COMMITTED TO EXCELLENCE



## McKinney Lands Top Spot at Mass Media Bureau

Career FCC staffer James C. McKinney has been appointed chief of the FCC's Mass Media Bureau, succeeding Larry Harris, who left late in July to accept the president's post at Metro-media Communications.

McKinney, who has been with the Commission 20 years, was chief of the Private Radio Bureau prior to his reassignment. He hopes to transfer his success in Private Radio—where he cleared serious backlog problems and application processing delays despite a 15 percent staff reduction—to Mass Media.

In a recent interview, McKinney said that his first priorities in the new post would be to familiarize himself with the policy issues that affect the Mass Media Bureau and to meet the staff. "Then I'll be getting actively involved in the low-power television process," McKinney continued. The huge backlog of LPTV applications poses an obstacle to the FCC's deregulatory policies, McKin-



ney feels. He is confident he will be able to speed up the LPTV process, but predicts the improvement will be less dramatic than in Private Radio because of the more complex legal and regulatory issues involved.

An engineer with a broadcasting background, McKinney takes a cau-

tious view of technical deregulation. "I think the Commission hasn't made any fatal errors yet," he said, "but I think the Commission has to be very careful." Such changes as the recent deletion of logging requirements "won't do any harm," according to McKinney, "but some of the other things—I won't enumerate which ones—do have some chance of severe interference, and the public doesn't like that. . . . I'm going to be worried about it, and when I'm worried, I'm going to tell the Commission."

## U.S. Takes Reservation on Two DBS Agreements

In the aftermath of the recent Region 2 Administrative Radio Conference, which allocated orbital positions for direct-broadcast satellites, the United States delegation was mostly pleased with the outcome. But in at least two areas, U.S. dissatisfaction was serious enough to cause this country to take a reservation—a formal statement that it would not be bound by the international agreement.

The first and most important issue was power flux density, a measurement of the strength of the satellite's signal on the earth. The U.S. had pushed for a pfd of  $-105$  dBw/m<sup>2</sup>, 60 percent higher than the  $-107$  dBw/m<sup>2</sup> standard the conference adopted. The higher power level would have permitted the use of smaller—and cheaper—receiving dishes, a big selling point here, where DBS will be primarily directed at individual households. For countries planning to serve communities rather than homes, however, the savings in building lower-powered satellites more than offset the cost of the larger dishes. In addition, some countries were concerned about signals crossing their borders, which the higher power level could have encouraged.

Even with the reservation, the U.S. will still have to negotiate with Canada and Mexico to avoid interference problems if it uses the higher power figure.

As for the orbital slots themselves, the allocations the U.S. received were amply sufficient to accommodate the current DBS licensees. The plan falls short of expectations, however, in that any satellite in the farthest east position, at 65° W, will lose power during as much as an hour 22 evenings of the year as the earth's shadow falls on its solar panels. The two most western positions—166° W and 176° W—are capable of serving only the Pacific time

## Sophisticated Edit Center Opens in Southwest

Video and film producers in the Dallas area have increased opportunities for state-of-the-art post-production with the opening of the new Dallas Post-Production Center, a recent addition to the \$25 million Dallas Communications Complex at Las Colinas. According to the center's owners, the 13,000-square-foot installation is the largest post-production facility in the southwest.

The new editing facility, designed to complement the production capabilities of the larger complex, cost \$2.5 million to construct. The equipment, which is valued at over \$2 million, includes the brand-new CMX 3400 X editor, introduced at the April 1983 NAB convention. Complementing the computer editor are a Grass Valley Group 300 switcher, a \$100,000 Dubner graphics system, Ampex two-channel ADO, and Ampex VPR-2B VTRs. The

facility offers videotape editing and dubbing in one-inch, two-inch, and ¾-inch formats and expects to serve ad agencies, network and independent producers, and corporate clients.

Principals in the post-production center are Dallas-based video producers Lee Martin and Nick Riccelli, with investors Carl Summers and Wells Morse. Former ABC television engineer Dave Gass is director of engineering; Randy Seiler is assistant director of engineering. Dale Thorne is chief editor and Carey Elizabeth Morse is creative director.

Nick Riccelli (left) and Lee Martin lounge in an edit suite of the new Dallas Post-Production Center as chief editor Dale Thorne operates the console.



# How the Midwest advantage adds up for you.



## Technical Expertise

One of the nation's largest suppliers to the communications industry, Midwest offers more than a comprehensive inventory of the finest quality equipment and supplies from the industry's leading manufacturers. We also offer all the technical advice and assistance you need - from initial

planning and design, through engineering and installation. With years of technical education and experience, the staff engineers on the Midwest Team can augment your staff during critical installation periods so you don't have to hire extra, temporary personnel.

## Plus, Control Systems

Whatever the control application, from CATV Commercial Insertion to Broadcast Station Master Control, the Midwest Team can provide the solution, from design through implementation.



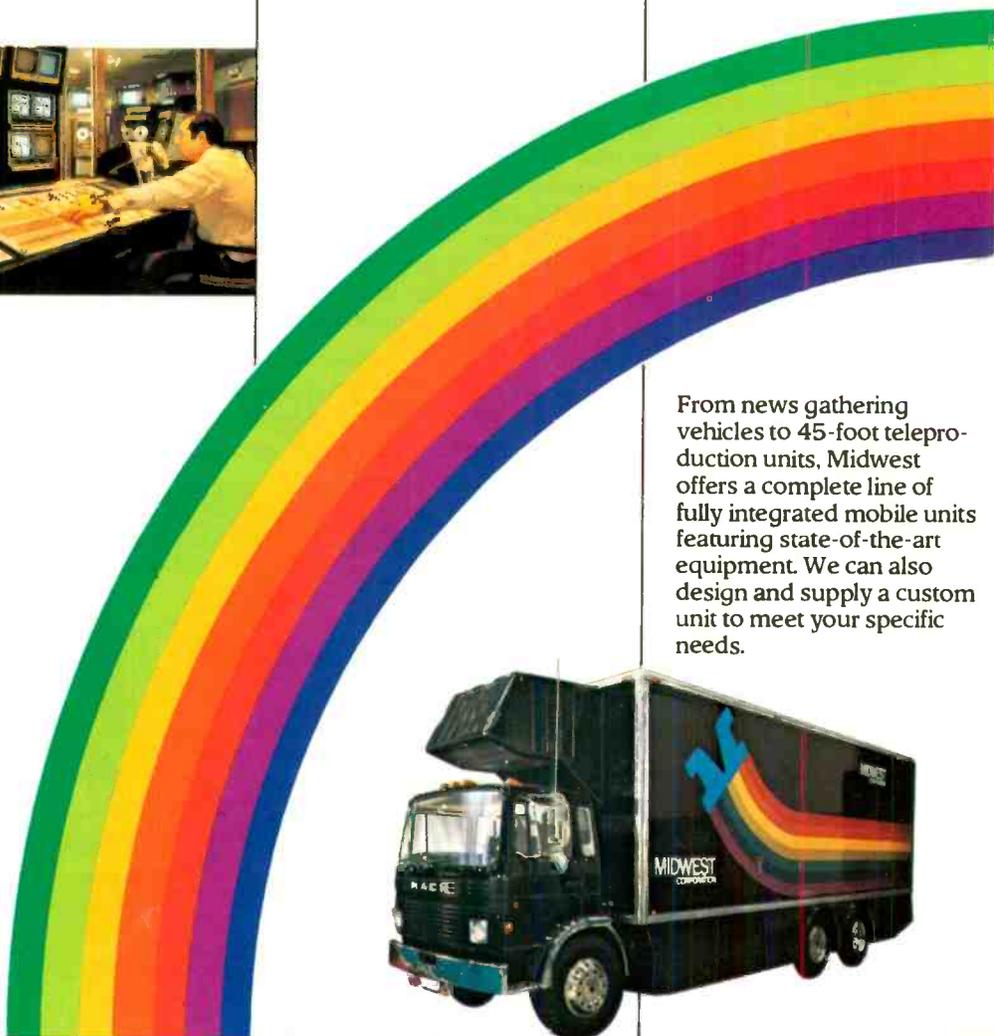
## Plus, Teleproduction Systems

We can provide complete "turnkey" teleproduction systems, procuring all the necessary components, designing and installing the system, and maintaining all service and warranty responsibilities once the system is in place.



## Plus, Transmission Systems

We have the experience and capability to design, supply, install, and maintain transmission systems of any level of complexity, including Television Broadcast, LPTV, CATV, MATV, Microwave, Satellite, Fiber Optics, and more!



From news gathering vehicles to 45-foot teleproduction units, Midwest offers a complete line of fully integrated mobile units featuring state-of-the-art equipment. We can also design and supply a custom unit to meet your specific needs.



## It all adds up to Midwest!

Call us toll free and find out where our capabilities can meet your needs.  
800-543-1584



One Sperti Drive  
Edgewood, KY. 41017

Cincinnati, OH  
606-331-8990  
Columbus, OH  
614-476-2800  
Dayton, OH  
513-298-0421  
Cleveland, OH  
216-447-9745  
Pittsburgh, PA  
412-781-7707

Detroit, MI  
313-689-9730  
Indianapolis, IN  
317-251-5750  
Louisville, KY  
502-491-2888  
Lexington, KY  
606-277-4994  
Bristol, TN  
615-968-2289

Nashville, TN  
615-331-5791  
Charleston, WV  
304-722-2921  
Virginia Beach, VA  
804-464-6256  
Washington, DC  
301-577-4903  
Charlotte, NC  
704-399-6336

Atlanta, GA  
404-875-3753  
Miami, FL  
305-592-5355  
Tampa, FL  
813-885-9308

zone; planners had originally wanted them to serve the Mountain zone as well.

## DBS Standards Plan Announced

The FCC has suggested to the General Services Administration (GSA) the establishment of an Industry Advisory Committee on Technical Standards for the Direct Broadcast Satellite service. The committee, according to the Commission proposal, would advise the FCC on the pros and cons of standardizing technical requirements for DBS transmission and reception, and would develop proposed standards if such standards were deemed desirable.

When the Commission initially authorized DBS service last year, it did so on an interim basis and refrained from setting technical standards, pleading a lack of information. In its proposal, however, it noted that "it would not be inconsistent with this position" to invite members of the industry to advise it on the issue of technical standards, and said the advisory committee could provide a forum for participants to express their views for or against any proposed standards.

In another satellite move, the FCC acted to lengthen the maximum license term for common carrier and fixed satellite licenses from five to 10 years. The change had been proposed in a rulemaking last April and was authorized by amendments to the Communications Act last year. It became effective on publication and included an extension of all current full-term licenses in the affected services to 10 years.

## Networks Can't Deliver Audience, Turner Claims

A recent examination of viewer demographics by the Turner Broadcasting System, at a self-sponsored cable advertising seminar, produced claims by Turner and his executives that broadcast television was guilty of over-delivery or under-delivery of audiences, but could not deliver an audience that was appropriate for an advertiser.

The cable advertising seminar, held in July in New York, purported to examine results of demographic studies done by TBS and NTI. The product of the studies, the NAD (National Audience Demographic), was used as the

basis for claims made by cable television of a favorable advertising impact. If the claims made by Turner's panel are correct, interested representatives of the advertising industry who were gathered at the meeting witnessed an increase in cable penetration into viewers' homes, signalling a better delivery for advertisers' dollars.

The hosts introduced all of the TBS shows scheduled for next season, outlined program content for the coming season, and explained exactly what they meant by the Turner network. TBS offers 10 percent sports, 25 percent original production, and 50 percent films each week over the Turner network, which consists of CNN, CNN Headline News, CNN broadcast TV, CNN Radio, WTBS, and TNT (Turner Network Television). Even Japan will be getting a taste of Turner later this year when CNN is broadcast on that country's English-language channel.

All of this information was geared toward shedding a good light on cable TV in general, with TBS as the flagship of the medium. According to Robert Wussler, executive VP of TBS, all of Turner's efforts (including this seminar) combined with the rest of the cable industry's work illustrated a concerted

## the first portable Digital Waveform Monitor...



**the new DELPHI-I**

with IRE-calibrated LCD allows precision analysis of sync and burst amplitudes, peak luminance, set-up, and VITS measurements. Compact size (2¾" H x 5½" W x 5¼" D), Light weight (19 oz.). Shoulder Strap, Belt Clip, and rechargeable internal DC power source make the DELPHI-I ideal for your on-location applications.

Only from Videotek.

**PROGRESS·BY·DESIGN**

125 North York Street, Pottstown, PA 19464, (215) 327-2292, TWX: 710-653-0125  
9625 North 21st Drive, Phoenix, AZ 85021, (602) 997-7523, TWX: 910-951-0621



**VIDEOTEK** INC

Circle 110 on Reader Service Card

Harris All-Solid-State SX Transmitters

# Bring Back Your AM Listeners!

Contrary to what you may have heard, your "average" listener has a better-than-average knack for finding stations with a quality, transparent sound—even on a crowded dial. The lower your sound quality, the higher your audience tune-out.

Bring back those listeners with a Harris SX Series all-solid-state AM transmitter. Harris' exclusive Polyphase PDM modulation system provides a *discernible difference in sound...* a crisp transparency that virtually eliminates listener fatigue and compares with the best FM has to offer. The specs will show you why. On the SX-5, for example, Intermodulation Distortion (IMD) is less than 1%!

SX Series transmitters (available in 1, 2.5 and 5 kW) also offer diagnostic capability through a microprocessor-based, pushbutton information center. You get instant readings on vital parameters.

Solid-state design means you'll save up to 46% more power than with other transmitters currently in use. That's a plus you'll see immediately in lower power bills.

And Harris has designed the SX Series transmitters for optimum AM Stereo performance. Strict AM Stereo compatibility was a major design goal right from the start—not an add-on or an after-thought.

Make the investment in quality sound that can build and hold your listening audience. For more information on Harris SX Series AM transmitters, contact Harris Corporation, Broadcast Group, P.O. Box 4290, Quincy, Illinois 62305-4290. 217-222-8200.



## NEWS

effort to draw more advertising. The success of such an effort was illustrated with two statistics: CNN's jump from 17 advertisers three years ago to 230 currently on the books and Turner's prediction that, at the end of the current decade, broadcast will only be providing to the advertiser 50 percent of viewer homes. Such figures and claims disputed the recent CBS 1990 television viewing projection, which predicted that the three major networks alone would garner 86 percent of the viewing homes.

### FCC Dumps More Rules in Deregulatory Efforts

The FCC performed some additional regulatory housecleaning in its recent elimination of several longstanding policies and rules. Among the rules the commissioners deemed unnecessary were requirements that licensees maintain operating and maintenance logs of routine equipment observations.

In deleting these rules, the FCC reminded broadcasters that they remain responsible for operating their stations to standard, and warned that it would consider reinstating log-keeping if it found its technical rules abused. AM

stations with directional antennas but without FCC-approved antenna sampling systems will be required to continue both periodic observations and logging of antenna system operation. All broadcasters will have to continue logging results of tests of the Emergency Broadcast System; logging requirements for experimental stations also remain in force.

Antenna tower lighting log requirements were eliminated, although observation and inspection requirements stand. The FCC also reserved the option of requiring licensees to maintain logs in the event of interference or deficient operations.

In two other actions the same day, the Commission eliminated its type-approval requirement for aural modulation monitors and deleted its policies on licensee misuse of ratings data and use of inaccurate or exaggerated coverage maps. It based the latter action on its finding that nonregulatory methods exist for dealing with ratings and coverage map abuses, and that those transgressions are primarily of a commercial nature. It said that complaints about ratings abuses should be filed with the FTC. Licensees filing misleading coverage maps with the Commission could

be subject to criminal penalties for U.S. Code violations, the FCC said, and could place their licenses at risk.

### SMPTE Group Agrees on Analog Component Video

Looking ahead toward the digital television studio, SMPTE's Working Group on Component Analog Video Standards has come up with a recommendation that may help ease the transition. The group recently reached consensus on a standardized signal for studio interconnection of television equipment in analog component form.

The new SMPTE standard calls for time multiplexing of the luminance and color difference signals, with the luminance signal time-compressed in a 2:1 ratio and the R-Y and B-Y signals time-compressed in a 4:1 ratio. In addition, the luminance and chrominance components will be normalized to equal amplitude ranges.

The standard allows baseband bandwidths of 5.5 MHz for luminance and 2.75 MHz each for R-Y and B-Y, significantly higher than the 4.2 MHz luminance bandwidth and 1 MHz chrominance bandwidth of NTSC. According to SMPTE's Barry C. Detwil-

# Anton/Bauer 30/13. The *Only* Universal Battery Belt.

## Exclusive Features:

- Selectable output voltage...30 volts at 4 AH or 13.5 volts at 8 AH, switchable.
- 115/230 volt internal charger, switchable...charges at the overnight rate.
- Rugged construction...leather belt, Lexan® battery cell modules, adjustable military quick release buckle.
- Ergonomic design...supple leather with anatomical contours is the most comfortable belt both around waist or over shoulder.
- Premium fast charge NiCad cells...includes unique Anton/Bauer charge sensing system that monitors every cell.
- 100% computer tested...a printout of test results is delivered with each battery belt.

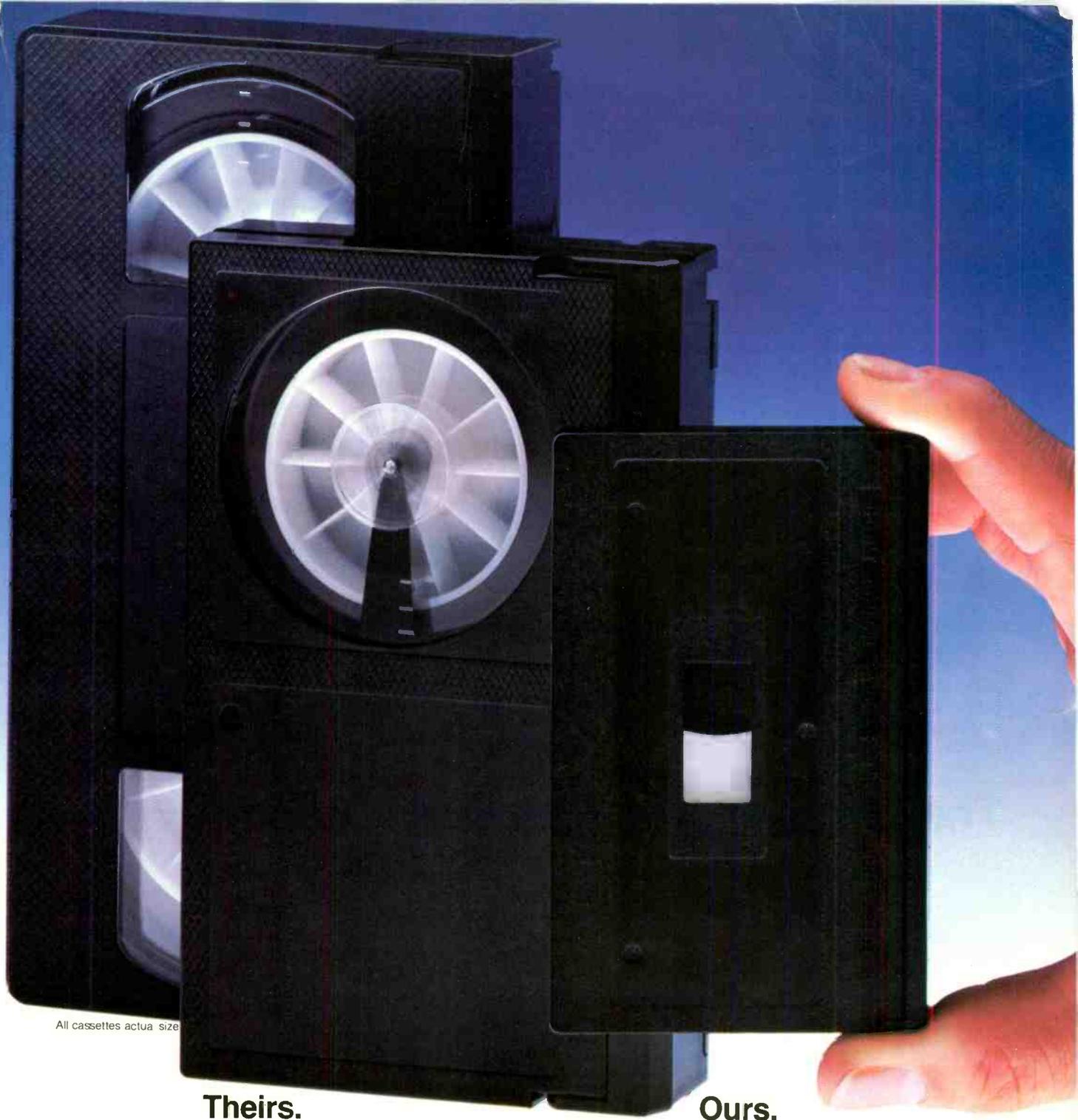


# anton bauer

*The quality standard  
of the video industry.*



The Anton/Bauer Lifesaver Fast Charger, LSFC, safely charges the 30/13 in one hour.



All cassettes actual size

**Theirs.**

**Ours.**

In the current debate concerning 1/2-inch and 1/4-inch recorder-camera videotape formats, we ask you to consider these simple facts:

There are two 1/2-inch incompatible formats, VHS and Beta. And the broadcast quality 1/4-inch Quartercam™ from Bosch.

Quartercam 20-minute cassettes occupy one-fifth the volume of VHS and one-third the volume of Beta 20-minute cassettes.

You can fit a Quartercam cassette in your shirt pocket. You can't with

VHS or Beta. You can save a lot of archive space and shipping costs.

The logical ENG/EFM successor to 3/4-inch is 1/4-inch—not 1/2-inch. If you're going 1/2-inch you're only going half-way.

Call your local Bosch-Fernseh office, or Fernseh Inc., P.O. Box 31816, Salt Lake City, UT 84131, (801) 972-8000.



**BOSCH**

Circle 113 on Reader Service Card

## NEWS

er, the additional bandwidth leaves room for improvements in television standards. "It's also good engineering practice to allow television facilities to have greater detail ability in all stages of production," Detwiler added. "That way, the only limitation occurs at the transmitter."

Detwiler also noted that the SMPTE groups working on digital standards will use the same system for maximum compatibility between analog and digital equipment in the transition studio.

### NPR Loan Plan Approved Despite Last-Minute Hitch

A massive loan designed to save the life of National Public Radio was approved late in July after difficult negotiations that pitted the network against its benefactor, the Corporation for Public Broadcasting. One of the main sticking points was CPB's insistence that the network turn over the title to its transmitting equipment to a group of selected public radio stations. NPR rejected this proposal, but the parties finally agreed to a compromise whereby the equipment would be placed under the oversight of three independent trustees. The agreement broke the

deadlock, which almost forced NPR to miss its payroll.

At press time, the trustees were reported to be former U.S. Attorney General Elliott L. Richardson; Henry Geller of Duke University, a former Carter Administration telecommunications adviser; and Virginia Duncan of the Bechtel Group, formerly of the CPB board of trustees.

In addition to oversight of the transmitting equipment, the loan agreement calls for the CPB to maintain strict tabs on NPR's finances until the loan has been cleared. CPB will supervise NPR's financial officers and have full access to its financial records; it has the right to approve any budget changes. The loan will be granted as an \$8.5 million line of credit; CPB is also forgiving a previous \$600,000 loan to NPR, thus covering the entire \$9.1 million deficit.

The loan is being guaranteed by 170 NPR member stations, who have agreed to contribute money from their federal grants if NPR cannot meet its payments. The loan is scheduled to be repaid over the next three years through budget cutbacks and fundraising; next year's budget has been set at \$17.65 million, down \$8.35 million from the previous year. The new budget is

designed to allow NPR to continue its acclaimed public affairs programs, *Morning Edition* and *All Things Considered*.

Those two programs became fundraising vehicles last month when they hosted "NPR's Drive to Survive," special live editions of the show that urged listeners to contribute to NPR's barren coffers.

### CBS Programs Go East in Ad-Supported Deal

Chinese television viewers will watch American programs and be pitched by American advertisers as the result of a unique agreement between CBS and China Central Television (CCTV).

Under the terms of the recent agreement, CBS will supply 64 hours of programs to CCTV, which was to select the shows this summer. CCTV is expected to lean heavily toward sports, documentaries, and cultural shows, with some of the last category perhaps coming from the archives of CBS Cable, the ill-fated arts service. The programs will be dubbed into Mandarin Chinese and will air Friday evenings after the CCTV newscast and alternate Sundays after the Chinese network's

## The Standard-Setting Telephone Interface (Modestly Improved)

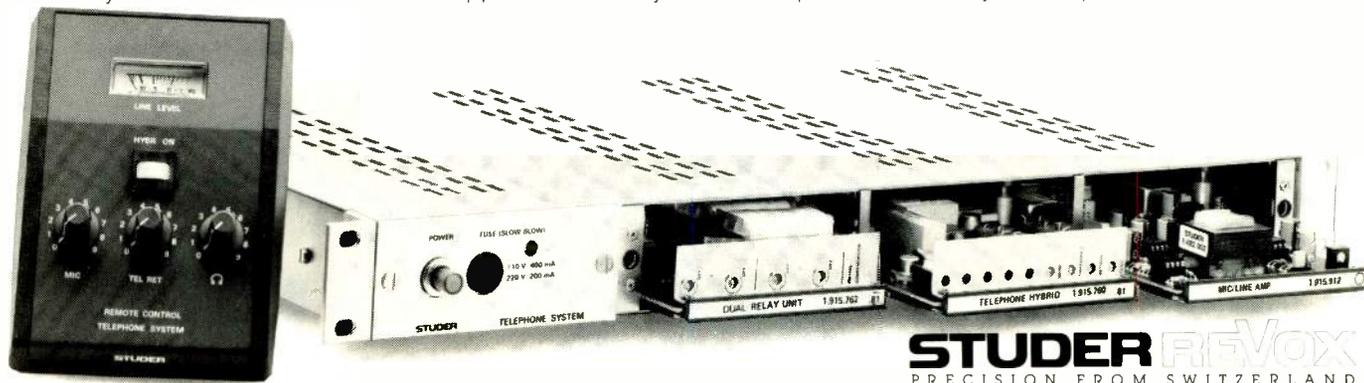
It's no secret. Studer has become the acknowledged leader in high quality telephone interfacing equipment. The Studer Telephone Hybrid – already selected by hundreds of U.S. broadcasters, including all three major networks – has been praised for its straightforward design, long-term reliability, and consistently outstanding performance.

At the heart of the Studer Telephone Hybrid is an auto-balancing hybrid circuit which automatically matches phone line impedance while isolating send and receive signals for maximum sidetone attenuation. A built-in limiter prevents sudden overloads, and bandpass filters shape the voice signals for optimum clarity and system protection. The new updated Studer Hybrid includes additional noise suppression circuitry

to eliminate unwanted noise and crosstalk while still preserving true 2-way hybrid operation.

Now the Studer Telephone Hybrid is also available as part of a complete Telephone System. Designed to operate independent of the studio console, the self-contained Telephone System includes a microphone input plus a palm-sized remote module (on a 30' cable) with VU meter for line level, headphone output, and level controls for microphone, headphone, and telephone receive.

The time-tested Studer interfaces. Improved for even better performance. Expanded for more flexible operation. And built to set the quality standard for years to come. Call your Studer representative today for complete details.

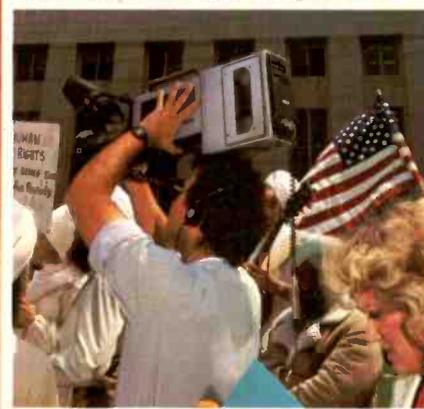
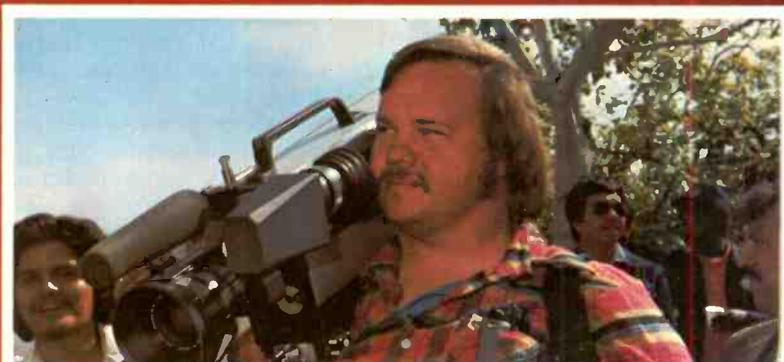


**STUDER REVOX**  
PRECISION FROM SWITZERLAND

1425 Elm Hill Pike, Nashville, TN 37210 (615) 254-5651 • Los Angeles (213) 780-4234 • New York (212) 255-4462 • Dallas (214) 760-8647

Circle 114 on Reader Service Card

# And the Winner is . . . RCA HAWKEYE



RCA has been awarded another EMMY for technological achievement—this one for the development of HAWKEYE, the system that first put the camera and the recorder together.

RCA pioneered this half-inch system; introduced the first commercial products; had the first "in use" systems in broadcast and teleproduction facilities.

The EMMY award for this outstanding development is most appreciated . . . and we thank The National Academy of Television Arts and Sciences, the broadcasters and teleproducers who encouraged us in the early developmental stages, and, most of all, our many HAWKEYE customers.

RCA, Building 2-2, Camden, NJ 08102

**HAWKEYE . . . The Half-Inch System  
That Makes The Difference!**

**RCA**

# NEWS

telecast English lessons.

CBS will sell five minutes of advertising per hour to advertisers trying to establish themselves with the Chinese public. Revenues from the advertising will be shared with CCTV. CBS reportedly plans to limit the number of advertisers to fewer than a dozen, each promoting a distinct product type.

The accord between CBS and CCTV will not stop with programming—the organizations plan to cooperate in “current and new broadcast technologies,” according to spokespersons, and may engage in some joint productions.

## Broadcast Systems Attract Crowds at Siggraph '83

Siggraph '83, the annual exhibit and conference of the Association for Computing Machinery (ACM) Special Interest Group on Computer Graphics, drew over 200,000 to Detroit in late July. Though many were in attendance to learn more about computer graphics applications in such areas as atomic research, jet fighter simulation, architecture, computer-aided automobile design, and so forth, interest in broadcast-related products and themes

has never been stronger.

On the exhibit floor, for instance, the biggest crowds were not at the booths of CAD/CAM manufacturers or even IBM, but rather at demonstrations of the MCI/Quantel Paint Box, the Via Video System One, the Dubner CBG, the Computer Graphics Labs IMAGES art system, and a computer-aided cartooning program in which the artist sketches frame-by-frame interpolated in-betweens. All, of course, were originally derived from computer graphics programs written for other industries; but it is television that is now using the hardware to create the dazzling array of effects and graphics that computer-aided designers in other areas can only dream about.

Another group of broadcast equipment manufacturers also eyeing the computer graphics market are display device suppliers—companies with high-resolution monitors, such as Ikegami, Tektronix, and Barco. Dynair showed its RGB switching equipment.

Still more evidence of interest in broadcast-related systems was demonstrated at two evening film/tape shows, where computer-graphics-generated products were shown to a large audience at Detroit's Cobo Hall. Again, the

images produced for entertainment media were the ones drawing the most attention—demonstration reels from TV commercial production companies such as Digital Effects in New York City and Robert Abel & Associates in Hollywood. A standing ovation greeted the screening of an extended segment of *The Works*, a computer-graphics-generated feature-length film being created by Lance Williams and others at the New York Institute of Technology. Wild applause also greeted a public service announcement produced at KRON, San Francisco, on its Aurora art/paint system showing a schoolhouse under attack as if in a video war game.

About the only area in which other applications of computer graphics still lead the broadcast industry is three-dimensional modeling, even though both MCI/Quantel (Mirage) and Bosch (FGS-4000) have 3D systems that produce many of the CAD/CAM-like effects. The problem with television systems, of course, is that they must work in real time, whereas other computer graphics applications have no such restraint. But several products on view at Siggraph indicate that real-time 3D modeling and manipulation may be just around the corner.

## Affordable Random Access Video Cart Systems

Cost effective, modular, and expandable



**Component Switching and Processing**

Modified 3/4" U-Matic Players with

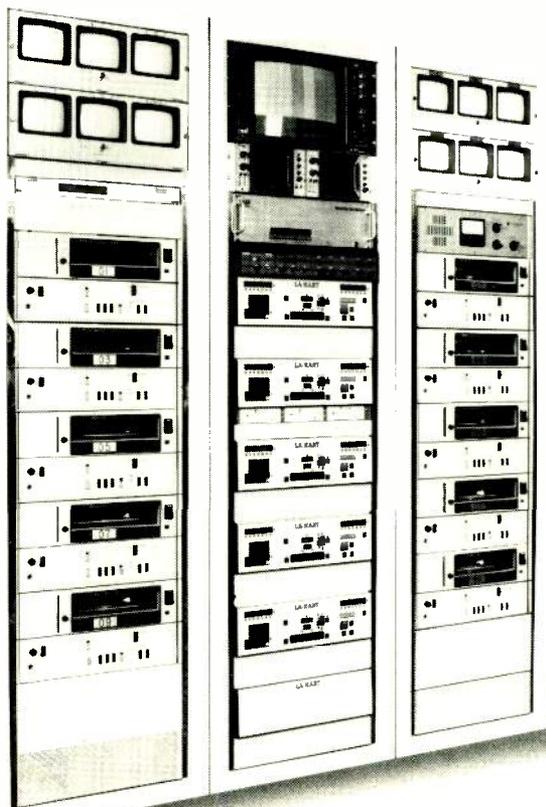
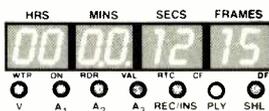
Y-C/DOC outputs or 1/2" Type M with YIQ outputs are switched through our vertical interval Matrix Switcher into a component TBC.

**Automatic Directory Reading**

Cassettes are loaded randomly into any empty deck. They rewind automatically to the head and the directory, containing a 4-digit reel ID number with precise start and finish times of each segment according to their location with reference to SMPTE time code read into memory. The status indicating ID found and VTR location is displayed on the terminal.

**Send for Brochure**

Lake Systems Corporation,  
55 Chapel Street, Newton,  
MA 02160 617/244-6881



**Any Tape Format**

Choose from 1" Type C, 3/4" U-Matic, 1/2" Type M, or any combination.

**1000 EVENTS**

Or more with 68K Multi-Event Programmer and Disc Drive.

The computer identifies, searches out, and activates tape segments to be cued and aired in the order scheduled.

Lease Plans Available

**LA-KART**  
LAKE SYSTEMS CORPORATION

Prices Start at \$89,900

See us at Booth 325 SMPTE-Los Angeles



**3M  
IS HELPING  
A LOT OF  
COMPANIES  
FILL A  
ONE-INCH  
GAP.**



For many broadcasters and production companies, wanting a one-inch VTR system is one thing. But finding the money to buy one is quite another. That's where 3M can help. We've put together a financing package that makes our TT-8000 VTR very affordable. And the special combination of enhanced editing features, automatic track following and controlled tape interchange program make the TT-8000 an even more attractive package. For a free brochure, call us toll-free at 1-800-328-1684 (1-800-792-1072 in Minnesota), and find out how we've brought professional quality one-inch VTR within reach.

Professional Audio/Video Equipment/3M.

3M hears you . . .

## NEWS BRIEFS

Cincinnati television viewers can receive teletext in their homes with Taft Broadcasting's introduction of its "Electra" service. Zenith Radio Corp. has cooperated by making teletext decoders available to consumers; Taft and Zenith are proponents of the British-developed World System Teletext standard. . . . Torbet Radio's second-quarter national spot profile shows 25-54 continuing its lead as the most requested age cell. Second was 18-49, with 25-49 third. . . . Film ranks second only to two-inch tape for TV station PSAs, according to a recent National Dairy Council survey of more than 1100 broadcast TV stations. For commercials, however, film is third, trailing 3/4-inch tape.

The FCC has proposed deleting provisions that limit certain full-time AM stations to the same daytime power as proposed for nighttime operations. . . . In the aftermath of a Broadcast Bureau decision that the CBS TV network had not violated the fairness doctrine in a 1981 Mike Wallace Profile on Jean Seberg, the Commission has announced a new policy requiring "follow-up" fairness complaints to be filed within a reasonable time (usually 30 days) after FCC denial of the original

complaint. Shortly after announcing the policy, the Commission affirmed the Broadcast Bureau action, which threw out a complaint by conservative group Accuracy in Media. . . . Outlet Co. has completed its acquisition of WHFS-FM, Bethesda, MD, which will switch to a news-talk format. Outlet's board of directors recently unanimously approved the company's merger agreement with Rockefeller Center, Inc. . . . Signal Media Corp. of Dallas has agreed to purchase KAAZ-AM and KLPO-FM, Little Rock, from Multimedia Radio for \$4.25 million.

Terminating its FM quadraphonic sound proceeding, the FCC stated that its deregulation of SCAs allows FM broadcasters to go ahead with quad sound if they wish. NAB president Edward O. Fritts responded by expressing his hope that broadcasters would use subcarriers for quad, although he noted that NAB would have preferred the FCC to set a single standard. . . . NAB's annual financial survey of TV stations found the typical station earned pretax profits of \$1,253,100 in 1982. The 17.7 percent increase in profits was matched by a 9.7 percent jump in gross time sales and climbs of 12.6 percent and 8.8 percent,

respectively, for national/regional spots and local advertising.

A bill designed to ease minority purchase of telecommunications properties has received NAB endorsement. Sponsored by Rep. Mickey Leland (D-TX), the legislation would authorize the FCC to allow tax certificates for sale of nonbroadcast properties to minority buyers. . . . NAB has asked the FCC to reconsider three points of its teletext decision. The association wants the FCC to require cable operators to carry broadcast teletext signals, to ease the burden of common carrier regulation for teletext services, and to expand its "unnecessarily restrictive definition" of the service.

Mutual Broadcasting System president and CEO Martin Rubenstein has called for a "concerted industry-wide effort" to convince Congress to repeal the fairness doctrine. . . . RTNDA had declared itself "flatly opposed" to the quantification inquiry now under way in the House of Representatives. Group president Dean Mell continued, "The amount of news and public affairs programming on radio and television should be determined by the demand for such programming, not by government edict."

NEW

## Your best value in wireless.



Cetec Vega's R-31 PRO is your best value in a wireless-microphone receiver. When you compare the price, compare the performance too. And the size. And the features:

- **"Infinite gain" receiver technology.** Improved performance in the critical threshold region, superior accommodation of multipath conditions, better signal-to-noise ratio, and constant receiver audio level output.
- **High signal-to-noise ratio and wide dynamic range.** 97 dB (103 dB A-weighted) with DYNEX® II; 77 dB (83 dB A-weighted) non-DYNEX.†

- **DYNEX® II, a new standard in audio processing.** Can be switched in and out, to accommodate transmitters with or without DYNEX® II.
- **Power-source flexibility.** Dual 115/230 Vac, 50-60 Hz operation, and external +12 to +24 Vdc for vehicular and portable use.
- **Attractive, compact case.** Only 7.15 inches wide, 1.72 inches high, and 8.25 inches deep.
- **True helical-resonator front-end filter.** Plus all of the other standard features expected in Cetec Vega's professional

wireless equipment, famous for quality and reliability.

Write or call for further information on the R-31 PRO wireless-microphone receiver, and for the location of your nearest dealer: Cetec Vega, P.O. Box 5348, El Monte, CA 91734. (213) 442-0782. TWX: 910-587-3539.

 **Cetec Vega**  
... the professional's wireless.

Circle 118 on Reader Service Card

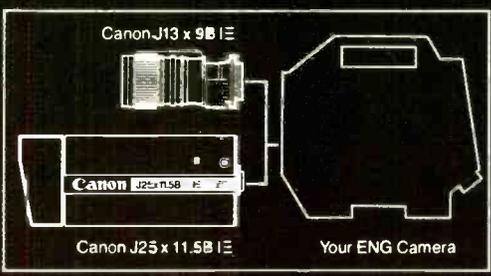
# Two Assignments

## Canon J13 x 9B IE plus Canon J25 x 11.5B IE and your camera

Two assignments, one location. For example, get great action shots of a football game and also get player interviews at half-time. You can do it with one cameraman and one camera—like the one shown here—with Canon's amazing E.F.P. lenses. Here's how:

Mount our J25 x 11.5B IE on a tripod at your principal location. It's 2/3" system was designed specifically to work with ENG cameras, yet this lens provides a 25-to-1 zoom ratio, power zoom and focus, automatic iris and the image quality you'd expect from a Canon broadcast lens. Another choice is the Canon J20 x 8.5B IE, with a 20-to-1 zoom ratio. (Both these lenses have built-in extenders, too!) With your ENG camera attached, you've got full capability.

Detach your camera from the fixed lens, mount the famous

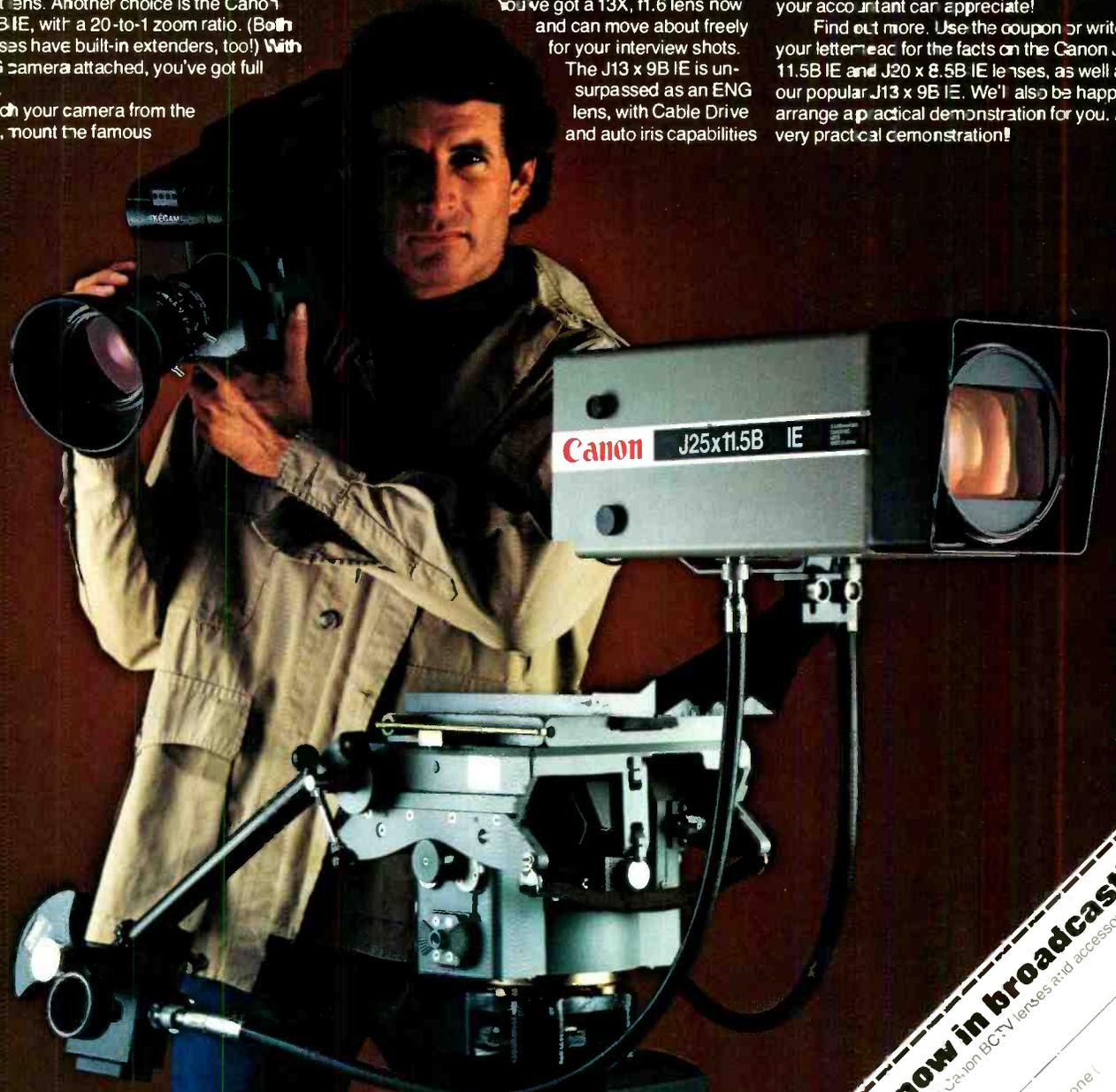


Canon J13 x 9B IE and head for the locker room! You've got a 13X, f1.6 lens now and can move about freely for your interview shots. The J13 x 9B IE is unsurpassed as an ENG lens, with Cable Drive and auto iris capabilities

plus built-in extenders and auxiliary wide-angle and telephoto accessories available as well.

Electronic Field Production is a reality. A practical reality, because you don't have to send two crews or even two cameras to a single location if all you really need is one ENG camera and two Canon lenses. And, costs notwithstanding, sometimes you just don't have enough cameras to go around. Selecting the right combination of Canon lenses could actually double the utility of the ENG cameras you already own. And that's something even your accountant can appreciate!

Find out more. Use the coupon or write on your letterhead for the facts on the Canon J25 x 11.5B IE and J20 x 8.5B IE lenses, as well as our popular J13 x 9B IE. We'll also be happy to arrange a practical demonstration for you. A very practical demonstration!



# Canon®

Optics Division

Canon U.S.A., Inc. Head Office: One Canon Plaza, Lake Success, N.Y. 11042 (516) 464-7700  
 140 Industrial Drive, Elmhurst, Ill. 60126 (312) 833-3070 • 13 Paulina Avenue East, Costa Mesa, Ca. 92626 (714) 979-8000  
 Canon Canada, Inc. 3245 American Drive, Mississauga, Ontario L4V1B8, Canada  
 Canon Amsterdam N.V., Industriële Productie Divisie De Boelelaan 6 Amsterdam, Netherlands

© 1981 Canon U.S.A., Inc.

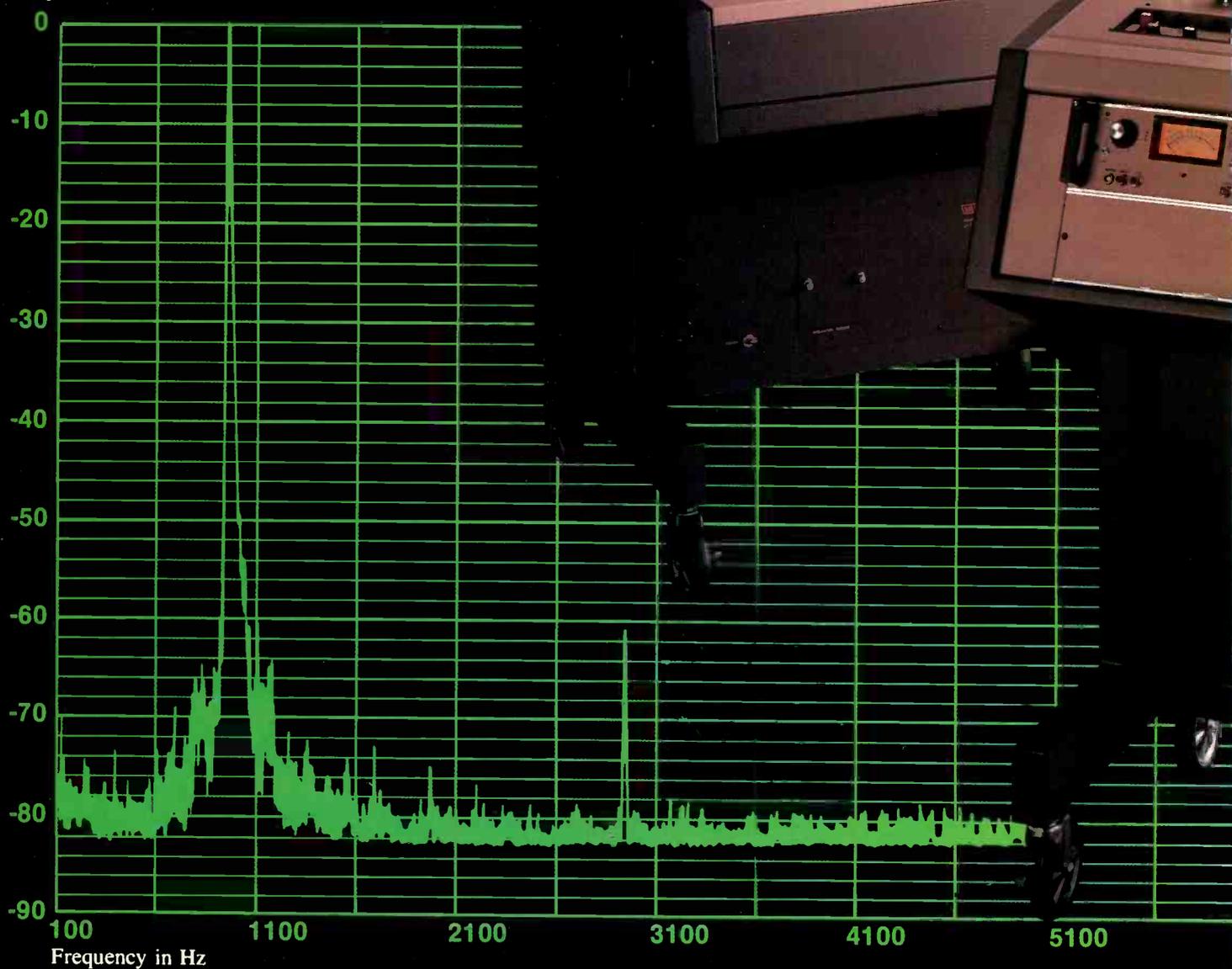
Circle 119 on Reader Service Card

**The name to know in broadcasting.**  
 Please send me information on Canon BC-TV lenses and accessories

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Company/Organization \_\_\_\_\_  
 Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone (\_\_\_\_) \_\_\_\_\_

JH-110B-2-HP

Amplitude in dBm



DISTORTION/PURITY OF SIGNAL

# DOES MCI REALLY OUTPERFORM THE REST?



In a world filled with claims and counter claims for high performance audio products, sometimes it's hard to separate opinion from fact. That's why MCI has provided complete graphic proof of all important tape recorder/reproducer performance characteristics. Now available in a handy Engineering Notebook, these curves and their accompanying methodology form the standard by which all other tape recorders must be judged.

If performance matters in your broadcast or teleproduction application, don't be fooled by "simple specmanship." And if you want to decide for yourself how the JH-110 Series measures up to comparable units, just ask Sony Broadcast to arrange for a demonstration.

Does MCI really outperform the rest? We'll let you decide. For your free copy of the Engineering Notebook and more information about our demonstrator program, call Tony Dean, Eastern Regional Sales Manager, Audio Products, (305) 771-3997, or Holmes Ives, Western Regional Sales Manager, Audio Products, (213) 841-8711.

**SONY**<sup>®</sup>  
Broadcast

JH-110B-2-VP

© 1983 Sony Corp. of America. Sony is a registered trademark of the Sony Corp.

Circle 123 on Reader Service Card

# The Leader Sync/Test Generators.

Every important feature for under \$2,000.



## Precise NTSC sync/test pattern generators.

Leader's LCG-400 series sync/test generators provide accurate reference signals for any off-the-air broadcast or non-broadcast operation. Available in either multiburst or sweep marker configurations, the LCG-400 provides EIA and full-field color bars as well as staircase, raster (in eight colors), window, convergence and cross-hatch test signals... plus gen-lock capabilities and a host of auxiliary outputs. As a matter of fact, Leader's sync/test generators do virtually everything the \$4,000 generators do... except cost as much.

## A network-proven 50 MHz oscilloscope.

The Leader LBO-517 oscilloscope makes accurate and detailed measurements. It offers sensitivities of 1 mV to 10 MHz and 5 mV to 50 MHz. Two main and two auxiliary channels can be displayed on main and delayed time bases (8 traces) simultaneously while intensifying



LBO-517 50 MHz Oscilloscope.

the delayed portion. Composite triggering provides *stable* viewing of two asynchronous inputs. Positive, stable triggering on composite video signals, at either H or V rates, is automatic. Leader's new dome-mesh 20 kV CRT assures bright, clearly defined displays, even at the highest or lowest sweep rates. Very competitively priced.

## The Leader Vectorscope is unique.

Only the Leader Vectorscope offers CRT-generated phase/amplitude targets that are as bright and clear as the vectors themselves. Now you can easily verify NTSC Vectors in darkened control rooms. And, electronically generating the targets eliminates non-linearity errors caused by CRT aging. You can mount it in your existing console, view it from any angle



VLS-5850 NTSC Vectorscope.

or distance, and be confident that what you see is what you've got.

## Two-year warranty. Evaluation units.

A history of high reliability permits Leader to provide a generous two-year warranty (even on the CRT)... backed by factory service depots on the East and West Coasts.

Evaluation units are available to all qualified customers.

Call toll-free (800) 645-5104 to request: an evaluation unit, our latest catalog, the name of your nearest "Select" distributor and additional information.

For video engineers who know the difference.

**LEADER**  
Instruments Corporation

380 Cser Avenue  
Hauppauge, N.Y. 11788 (516) 231-6900  
Regional Offices:  
Chicago, Los Angeles, Dallas.

# RADIO programming & production

## Radio Engineers Champion The DAD

TECHNOLOGICAL PROGRESS is often curtailed by financial constraints. But fortunately, there are always some who are willing to take the risks and possibly to turn a profit in promoting the technological cause. WNCN, a GAF-owned classical FM station in New York City, has been using the new DAD compact audio disc as a new programming tool for several months now and has proved that being a standard-bearer can pay dividends.

"We have always striven to be at the forefront of the new technologies," says WNCN chief engineer Richard Koziol. "We have been well known for our signal quality, innovations in live production, and the use of new equipment."

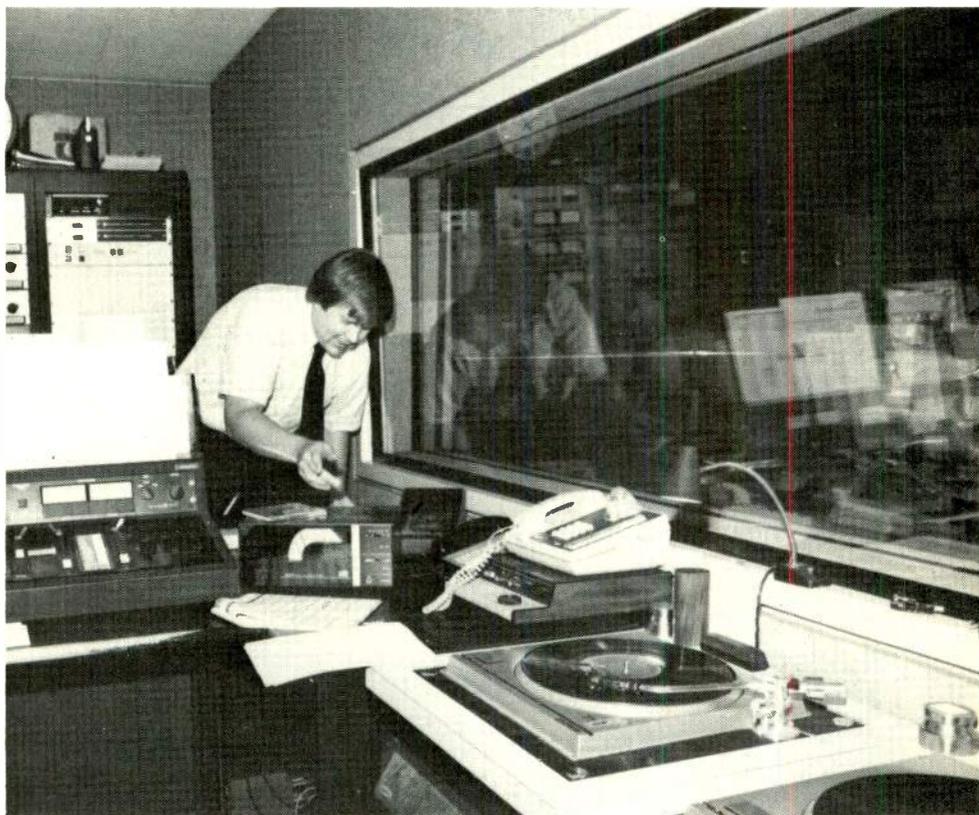
In keeping on the cutting edge of that tradition, Koziol and program director Mario Mazza feel the use of the digital audio disc helps distinguish the station from its competition on the air, helps with audience recognition, and also enhances the relationship with advertisers.

### On-air improvement

The reason for using any new tool is to improve the final product, the on-air programming. The people at WNCN adhere strictly to that philosophy. Koziol carefully evaluates all of the new equipment, decides on its engineering merits or lack thereof, and discusses with Mazza the impact such new technology will have on the programming side.

So it was, back in February 1983, that WNCN made the move to programming with the digital disc players. Station management committed itself to the long-term digital programming project with the only restriction being the availability of software.

The first step came when Koziol received a demonstrator unit from Denon, along with five discs encoded with classical music. At the time, all the discs were from Japan with Japanese orchestras. (Since then, many new titles by European and American com-



WNCN chief engineer Richard Koziol demonstrates the compatibility of the CD player with the on-air studio.

posers and performers have been produced.)

The digital broadcasts were kicked off with a one-hour call-in show featuring Larry Klein, a music reviewer for *Stereo Review* magazine. The station was overwhelmed by callers, both during the one-hour show and for a week afterward, many offering to loan their personal compact discs to the station. In one case, a listener offered, and the station accepted, temporary use of a listener's player obtained overseas. The overall response was unanimous: The audience was excited by the new quality of sound it was hearing.

### Hardware developments

Although the story ends with software—the sound of the music over the

airwaves—it begins with hardware. Notwithstanding the great variety of hardware that is beginning to flood the market, what almost all of the players have in common are those advantages offered by digital technology: pre-programmability of cuts in any order desired, infinite repeatability, frame-accurate access to musical passages, and digitally accurate cueing. What they also almost all have in common is that they are consumer machines.

After returning the borrowed unit to the generous listener, WNCN acquired a Philips consumer machine under the Magnavox label (Magnavox markets all the company's consumer players in the U.S.).

Sony, too, is playing an active role in promoting its digital player to the radio

# RADIO PROGRAMMING

industry, and donated its units to radio stations in exchange for on-air mention of the digital disc player. Sony now has over 20 radio stations (nationwide) programming on its machines. Magnavox has about 15 to 20 stations, and Denon has even more.

WNCN, however, has been programming steadily with Magnavox and Denon players. In response to the station's needs, and with feedback from Koziol and engineers at RKO, Denon has been developing a professional ver-

sion of the digital system for marketing in North America. The DN-3000F has heavier construction, exact cueing, remote control, programmability of following cuts while current cut is being played, reduced access time, and other features.

Sony's machine also has remote control and the company is in the process of marketing a sturdier, more sophisticated machine for the broadcast industry. Philips, meanwhile, recently unveiled at a show in Europe its new



Denon has developed its new professional CD player for broadcast use.

professional CD player system. The system contains two disc players hooked to a remote control console. The new system offers numerous features, the most important of which may be fast and accurate access to program information such as: track number, absolute time code (indication of the elapsed time since the pause prior to the first piece of music on the disc), relative time code (exact amount of time from the beginning of the track being played), absolute time to go (amount of program time left on the disc), and relative time to go (amount of program time left on the track being played). There is also a dial for fast/slow frame search. Philips has indicated the machine may be available in the U.S. some time late in 1983.

Other companies are scrambling to come up with professional systems, hoping to offer the broadcaster the combination of quality, durability, and reasonable cost. Both Denon and Sony have had professional disc players in operation in Japan for some time, and Technics announced the release of its consumer machine at the summer CES. For now, many of the consumer systems are doing quite well, but that is only half the battle.

## Software is key

Equally important to these hardware developments, however, are the software developments that allow a station to acquire music in digital form. At

## *more* Here's What Customers Say About Broadcast Electronics' FX-30 Exciter.

- "State of the Art." ..... WMC, Memphis, TN
- "Dramatic Difference in Sound." ..... WCKW, Garyville, LA
- "Interfaces So Well." ..... KEZK, St. Louis, MO
- "Best Performer on the Market." ..... KSTP, St. Paul, MN
- "More Dynamic Response." ..... WGAY, Silver Spring, MD
- "Exceeded Specs." ..... KISW, Seattle, WA
- "Quietest Exciter on the Market." ..... KBZT, San Diego, CA
- "Great Company-Great Product." ..... WBCY, Charlotte, NC
- "Dramatic Improvement in Sound." .. WSSH, Lowell, MA
- "Fantastic! Beautiful Exciter." ..... WEZB, New Orleans, LA
- "Works Great." ..... WSTO, Owensboro, KY
- "Terrific! Industry Standard." ..... WPRO, Providence, RI



The Standard of the Industry.  
More than 400 in use.

For more information on the FX-30 Exciter and BE's exciting new FM transmitters, call or write Joe Engle at:

**BE BROADCAST ELECTRONICS INC.**

4100 N. 24th ST., P.O. BOX 3606, QUINCY, IL 62305-3606, (217)224-9600, TELEX: 25-0142

Circle 122 on Reader Service Card



## It was driving Arthur out of his tree.

Fidelipac builds the broadcast industry's most rugged, most reliable audio cartridge, by far.

Now, you know, we load those cartridges with tape from manufacturers whose tape meets our specifications. And we're very picky about those specs.

Every time we discover a hub with uneven oxide coating; poor surface bonding; ragged edges or spotty lubrication, Arthur Constantine,

our VP Sales, goes out of his tree. He'll ship miles of the stuff back to where it came from, before he'll send twenty five feet of it out to you.

That's the way he is. That's the way we all are.

And that's why seven out of ten radio stations around the world use Fidelipac Tape Cartridges.

There's simply no way we'll compromise the quality of our product.



**FIDELIPAC®**  
BROADCAST TAPE PRODUCTS

Fidelipac Corporation □ P.O. Box 808 □ Moorestown, NJ 08057 □ U.S.A. □ 609-235-3900 TELEX 710 897-0254 □ Toll Free 800—HOT TAPE

Circle 123 on Reader Service Card

# RADIO PROGRAMMING

WNCN, the biggest problem with the early forays into digital programming was the lack of available software. Even though the station borrowed from its loyal listeners in addition to receiving releases from Denon, there was a lack of enough quality programming.

The station also received software from Philips/Magnavox, but not in sufficient quantity. Part of the problem was that WNCN was unable to satisfy a widely diverse programming philosophy with what was available. WNCN

has now built its CD library to over 40 titles and is aggressively looking for more. Increasing numbers of titles are now coming onto the market from previously mentioned manufacturers as well as some others.

In fact, many of the companies are offering the permanent loan of the players to stations as a means of promoting their software selection, both current and soon-to-be-released titles.

A related development reflecting the

scramble for software is the formation of the new Compact Disc Group, an association of digital hardware and software manufacturers. The group's purpose is to promote awareness of the discs and the players, to inform the public about upcoming developments, and to catalog the number of titles available (which by August will be over 250).

In spite of such industry-wide efforts, there is presently a shortage of software. This impacts most severely on the classical stations, but is also felt at stations programming other formats as well. Because of a lack of digital masters, or even analog-to-digital conversions in rock music, AOR stations are programming very little CD music. WNEW-FM in New York, for example, has access to only three titles: Billy Joel and Santana (both digital masters), and a Bruce Springsteen which was an analog-to-digital transfer. Another problem inherent in AOR is that the extent of limiting practiced by stations using that format tends to have a negative influence on the quality of the digital signal.

That leaves the greatest impetus in broadcasting's digital uprising to classical stations such as WNCN. Programming at that station is done months in advance so that the station's monthly program guide, *Keynote*, will have accurate listings. Currently, the structure is to play CDs on a Wednesday evening set and to fill in throughout the week whenever the opportunity presents itself.

As for expanding the amount of digital programming time, Mazza says that "the more discs we get that will fit into our overall programming themes and philosophies, the more CD programming time we will have."

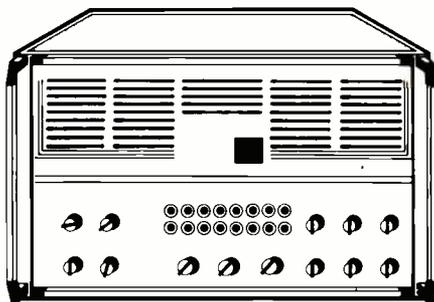
One obstacle which may prevent WNCN from going totally digital is the large number of program hours devoted to live broadcasting. Currently, according to Koziol, the station has decided not to go with digital in the live segments because it would require a substantial investment in recording equipment and training costs, would require additional personnel, and would necessitate the purchase of brand-new editing equipment. For this type of production, then, analog programming is more economically feasible.

Despite this, the number of hours the CDs are on the air steadily increases as the program director looks to substitute similar digital material for existing analog records. And in spite of an anemic software supply and the supposed extra expense of digital technology, stations such as WNCN have stepped forward in an effort to prove the viability of regular digital programming. **BM/E**

**THE MERLIN ME-288 DIGITAL IMAGE PROCESSOR IS A NTSC/PAL STANDARDS CONVERTER + TBC + DIGITAL NOISE REDUCER + COLOR CORRECTOR + FRAME SYNCHRONIZER + FIELD & FRAME STORE + HORIZONTAL & VERTICAL IMAGE ENHANCER. . . ALL IN ONE INTEGRATED, LOW-COST UNIT!**

## **Merlin ME-288 Standards Converter**

Unique in the field of digital video processing, the ME-288 combines the major image processing and signal correction features plus NTSC to PAL/PAL to NTSC Standards Conversion . . . all for what you would expect to pay for a good TBC/frame synchronizer alone.



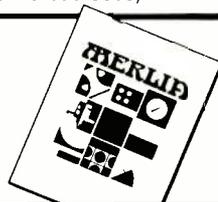
Send for full specifications, today!

# **MERLIN**

1880 Embarcadero, Palo Alto, CA 94303

Call Toll Free — 800-227-1980 (California — Call Collect 415-856-0900)

Merlin Engineering has a full range of products and assemblies for bringing your broadcast VTR up to date, as well as complete engineering facilities for custom applications. Write for your copy of the Merlin catalog.



Circle 124 on Reader Service Card



## If your equipment could speak, it would say just one thing.



In your business, looks and reliability are everything. TDK gives you both. With a complete line of video cassettes and floppy disks that are truly reliable performers.

TDK's latest Super Avilyn  $\frac{3}{4}$ " U-Matics provide optimum chrominance and luminance signals, plus crisp, clear performance. They give you first generation-like quality every time you record. And they come in all standard lengths—both packaged and duplicator.

When it comes to VHS format, TDK's PT cassettes are exceptional. They make accurate masters and dupes. And they're available in all standard lengths.

TDK's Extra High Grade VHS and Beta cassettes are even more advanced. They incorporate some of the most notable features ever found on video tape for broadcast use. As a result, you'll get the finest picture imaginable on  $\frac{1}{2}$ -inch tape, with sound to match.

If you're involved in sophisticated post-production work, TDK's complete line of 8" and 5 $\frac{1}{4}$ " floppy disks will generate more excitement when it comes to computer graphics and special effects.

In addition, TDK also makes a high-quality line of audio tapes. They deliver incredible sound reproduction for

all your applications—especially mastering and dubbing.

Once you try TDK, you'll know why we're the eyes and ears of the pro-industrial market. So if you're ready to fill in the missing qualities of your present tapes or disks, just fill in the coupon below.

Please send me information on the following TDK products:

- |   |                                       |
|---|---------------------------------------|
| <input type="checkbox"/> $\frac{3}{4}$ " U-Matics                       | <input type="checkbox"/> Floppy Disks |
| <input type="checkbox"/> $\frac{1}{2}$ " PT Video Cassettes             | <input type="checkbox"/> Audio Tapes  |
| <input type="checkbox"/> Extra High Grade Video Cassettes               |                                       |
| <input type="checkbox"/> Please have a sales representative contact me. |                                       |

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone ( ) \_\_\_\_\_

**TDK Electronics Corp., Pro-Industrial Marketing Dept.  
12 Harbor Park Drive, Port Washington, N.Y. 11050**

K13

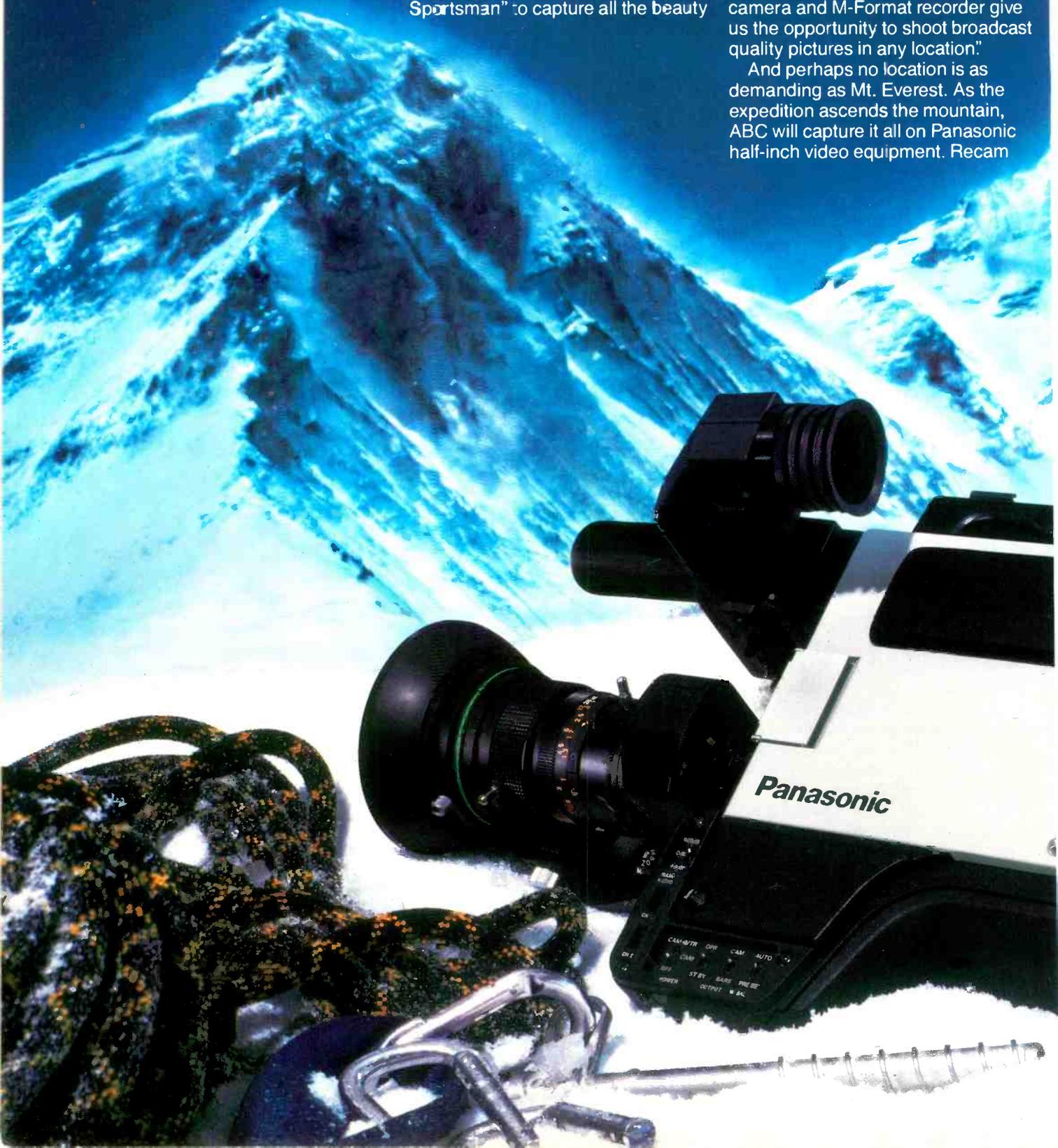
# Why ABC Sports selected Panasonic

ABC Sports demands uncompromising picture quality. Mt. Everest demands absolute portability. Panasonic Recam delivers both.

That's why Recam was the natural choice for ABC's "American Sportsman" to capture all the beauty

and danger of the U.S. expedition scaling Mt. Everest this Spring. John Wilcox, executive producer of "American Sportsman", said it best: "Recam's picture quality is as good as one inch... the 3-tube Plumbicon® camera and M-Format recorder give us the opportunity to shoot broadcast quality pictures in any location."

And perhaps no location is as demanding as Mt. Everest. As the expedition ascends the mountain, ABC will capture it all on Panasonic half-inch video equipment. Recam



# Recam to climb Mt. Everest.

recorder/cameras will transmit pictures via microwave to a base station specially outfitted with two Panasonic AU-300 source decks, an AU-A70 editing controller, an AS-6100 switcher and another AU-300 for mastering. These high-quality Recam pictures will then be

beamed via satellite to the U.S.

But this is just the beginning. Recam's picture quality and portability will be used by ABC Sports for future remote locations whenever the going gets rough.

Look into Recam for yourself and see why it's becoming the choice of demanding professionals whatever their EFP needs.

**Panasonic**  
AUDIO-VIDEO SYSTEMS DIVISION



# Series 800

*just imagine... SFX video power plus...*

- + Dual Chroma Keyers + Dual Luminance Keyers
- + Dual Matte Key Generators + Dual Key Borders
- + Super wide, SuperSoft borders
- + CAP, Computer Assisted Production
- + FlexiKey... Central Dynamics' new, powerful Digital Video Effects at a fraction of the cost... manipulates titles, logos and images with spin, flip, rotation, zoom, compression or any combination of these effects.

All this power is surprisingly affordable... the Series 80's modular, proven design assures fast

delivery and there is a model to meet any post-production and live programming requirement.

**480.** *Compact versatility...* 4 buses with the SFX Power+ system.

**680.** *Exceptional big studio performance...* 6 buses with the SFX Power+ system and the new Series 80 Program Processor.

**1080.** *The ultimate switcher* for the most sophisticated productions... 10 buses with 2 SFX Power+ systems and the new Series 80 Program Processor.

Call or write for complete details.



**CENTRAL DYNAMICS**

Central Dynamics, 401 Wynn Drive, Huntsville, AL 35805 (205) 837-5180  
New York: (914) 592-5440, Chicago: (312) 991-4720, Los Angeles: (213) 766-8185  
Montreal: 147 Hymus Blvd., H9R 1G1 (514) 697-0810, Toronto (416) 446-1543  
Circle 127 on Reader Service Card

# TELEVISION

## programming & production

### Careful Camera Placement Gets Angle on Rain-Delayed Diana Ross Concert

OF ALL THE FACTORS that go into making a successful live concert production, one of the most critical is the selection and placement of cameras and lenses. One person who's given great thought to the problem is Keith Winikoff, director of video operations at Greene, Crowe and Co., the Burbank mobile teleproduction facility.

"Just watching the stage for two hours can be boring," Winikoff complains. It is unlikely that viewers of the recent Diana Ross concert, which Paramount produced live for Showtime from New York City's Central Park, had much to beef about in that respect. (The weather, on the other hand, was a legitimate cause for complaint. Rain forced the show to be cancelled midway through the original July 21 gig and rescheduled for the following evening.) According to Winikoff, the production was carefully preplanned to make the most of the dynamic relationship between the star and her audience.

Winikoff worked closely with director Steve Binder to develop the camera positions for the production, which was broadcast live over Showtime and recorded for later worldwide distribution by Paramount.

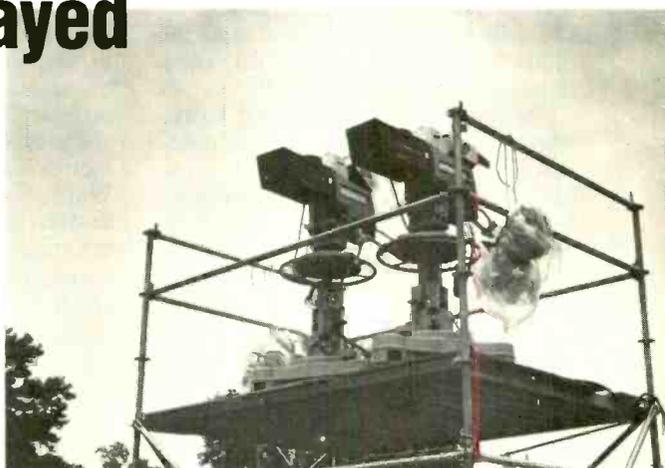
#### Getting the big picture

"Steve's concern was to keep the large scope of the concert part of the event," explains Winikoff. The Great Lawn in Central Park measures roughly 1000 feet by 400 feet, and the crowd was expected to number approximately 500,000. To give viewers the full scope, Binder originally hoped to put a camera in a helicopter or blimp, but city regulations and scheduling problems grounded that idea. The next best thing, then, was to get on top of one of the skyscrapers that look north toward the park. A particular advantage of this angle is that the stage was to be set up at the southern end of the lawn, facing

north; with the right lens, therefore, the camera could look over the singer's left shoulder into the crowd.

Similar concerns informed the placement of all the cameras for the concert. The four hard cameras, all RCA TK-47s, were to be set up on pedestals for the stage shots. Cameras 1 and 2, both on a center platform located about 40 feet from the stage, were designed to give head-on views of the performer. Camera 1, the "head-to-toe" shot, had a Fujinon 14:1 lens for the primary coverage of the entertainer; Camera 2, with a 30:1 Fujinon lens, was slated for tight face shots. Winikoff praises the 30:1 lens for its excellent ramping characteristics, although in this case the concert

At the lawn's northern end, an HL-79 on a Chapman Titan crane gave crowd views.



Camera 1 (left), with 14:1 Fujinon lens, shares platform in front of stage with Camera 2, with 30:1 lens. Both are RCA TK-47s.

took place during daylight (6:00 to 8:00 p.m. Eastern time), making aperture less critical.

Camera 3 was positioned at stage right, just in front of the stage, on a Vinten pedestal for eye-level shots. The last hard camera, Camera 4, was on the opposite end of the stage on a small Chapman Electra crane designed to move across the front of the stage and

Last-minute changes put both Camera 3 (shown here) and Camera 4 on Chapman Electra cranes.



# TELEVISION PROGRAMMING

give crowd shots. Both Cameras 3 and 4 had 14:1 Fujinon lenses.

## Hand-held flexibility

The first of the hand-held cameras, Camera 5, was an Ikegami HL-79 with Fujinon's 17:1 lens. The camera operator had the option of using a tripod or going hand-held, to follow Ross if she moved down toward the audience. Winikoff and Binder chose the 17:1 lens for this camera because of its 9 to 153 mm focal range, allowing close shots of the crowd as well as fairly wide shots.

For less conventional crowd shots, Winikoff and Binder planned to position Camera 6, another HL-79, on a Louma crane (made in France and handled in the U.S. by Panavision), a remote-control crane with a 26-foot arm. With the remote pan and tilt, Winikoff says, "we could drop the camera into the crowd for many interesting moods—such as 360-degree pans directly over people." To increase the versatility of this camera, the crane was installed on a 300-foot track, allowing many different audience shots.

"We used Fujinon's new 7x7 lens for the Louma crane," Winikoff adds, "because its 7 to 50 mm range gave an

extreme wide angle, almost fisheye, but it goes tight enough to focus in on something. The minimum focusing distance is just a few inches and infinity is past 12 feet, so focusing isn't critical."

For Camera 7, Winikoff and Binder opted for "the largest crane we could find"—in this case, a converted hook-and-ladder truck operated by Camera Towers of New Jersey. The truck, with its elevation of nearly 100 feet, was to be situated approximately 800 feet from the stage on the right side.

"We chose a Fujinon 17:1 lens for this camera, rather than a larger one, because such a high camera platform sways a little, and you can't hold an effective closeup with a huge lens," Winikoff explains. "Also, we wanted to show the scope of the event, not just the stage."

Also mounted on a crane was Camera 8, on a Chapman Titan with a 36-foot extension arm. Winikoff used this camera, with its 17:1 lens, for a fast arc shot about 10 feet above the crowd—a shot he had used before and considers very effective.

Some disagreement arose as to the deployment of Camera 9. "The director wanted a roaming RF camera in the crowd," Winikoff explains, "but the

New York police department said 'You're nuts!'" The police department's objections apparently stemmed from its fears—not without foundation—of restricted mobility and unpredictable audience members. Finally okayed, the plan called for the RF camera to use M/A-COM's MA 13 portable 13 GHz transmitter, with a receiver positioned behind the stage and RF communication to the camera operator.

The final camera position, described earlier, provided a bird's-eye view from the top of the Gulf & Western building. This camera had a 30:1 Fujinon lens and also transmitted over an RF link. The signals from both Cameras 9 and 10 were routed through Digital Video Systems frame synchronizers rented for the occasion.

Selection of the cameras themselves was a major consideration. Four new Ikegami HK-322s, on order at the time of the concert, had not yet arrived, so the Greene, Crowe truck's four RCA TK-47s were slated for Central Park. The remaining six cameras were Ikegami HL-79As.

## Small tube advantages

In making the switch from the TK-47 to the HK-322, Winikoff is also switch-

# AVCOM® NEW Product Update

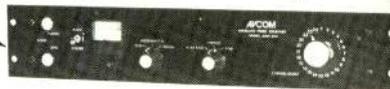
COM-20T



AVCOM's COM-20T High Stability Satellite Video Receiver is the answer to your need for a highly stable and reliable receiver for cable, private cable, radio stations, TV stations, BIZNET, News, Weather & Music Services, and other dedicated applications. The COM-20T can be factory or field adjusted to a particular transponder and will remain on frequency without attention. The COM-20T is normally supplied with a remote downconverter and tunable audio. Optional configurations include fixed-tuned audio, internal downconverter, and downconverter switching for multi-channel capability. Styling matches AVCOM's popular series of rack mount receivers.

NEW from AVCOM

COM-60 Series



COM-66T

COM-65T



for Cost-Effective

Multi-Channel Installations

- \* Commercial Quality
- \* High Stability
- \* Compatible with SA's 6650 system
- \* Double Conversion
- \* Rack Mount, standard
- \* Flexible Downconverter (Use any degree and brand LNA)

Write or Call

AVCOM's Toll-free OrderLine 800-446-2500 (Orders Only)  
AVCOM • 500 Research Road • Richmond, VA 23236 • 804-794-2500

## TELEVISION PROGRAMMING

ing pickup tube sizes—from 30 mm to 25 mm. The change, he says, was deliberate.

“We’ve found in the past that the larger format has had problems with microphonics”—distortions in the video caused by sound waves hitting the pickup tubes—“in very loud sound environments,” Winikoff explains. As a concert and show engineer, Winikoff is especially sensitive to such difficulties. The distortion caused by microphonics gives a “waterfall” effect on the screen.

Another problem with the larger tubes, especially with the lead-oxide Plumbicons, is lens flare, discoloration in the low-light areas or the light level changes. The larger optical surface of 30 mm tubes exaggerates both these problems, according to Winikoff. Another drawback of the 30 mm format is highlight decay lag, the stiction problem with afterimages of bright light sources.

“We felt our next camera would be a 25 mm variety,” Winikoff relates. The advantages of 30 mm tubes in ease of registration have been largely matched by recent advances in 25 mm camera technology, with features such as spatial error correction that allow very

**Enormous Camera Towers crane raised an HL-79 with a Fujinon 17:1 lens high above the audience.**



tight registration even with the smaller tubes. In addition, the 32x32 zone pattern offered by Ikegami and other camera manufacturers lets the operator register the camera to a finite point for great accuracy. This accuracy and the better performance in terms of micro-

phonics and lens flare make the 25 mm tubes very attractive.

If smaller tubes have so many advantages, why not use all 2/3-inch cameras? “The small cameras don’t have enough mass to work well on a large pedestal,” Winikoff explains. The extra weight of

## THE MOST FAMOUS PICTURE IN HISTORY WAS SHOT WITH AN ANGENIEUX TV LENS

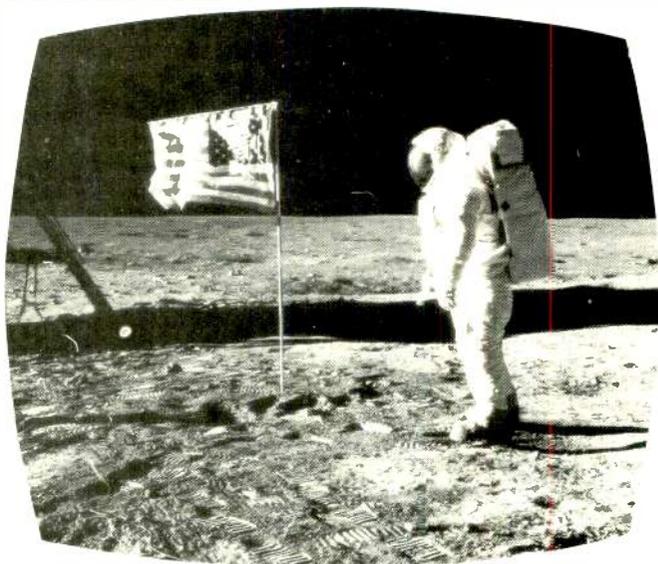
On July 20, 1969 over 600 million people watched as man first set foot on the moon. The lens which brought the excitement back to earth was an ANGENIEUX.

More recently, the most watched TV spectacular ever, “The Winds of War,” was shot with an Angenieux lens.

Now you may ask, what makes Angenieux so special. Perhaps it’s our reliability. We’re dependable enough to have been selected by NASA for all its space to earth transmissions. We even give NASA a 50 mission guarantee on every Angenieux lens. Or maybe it’s our innovation. After all, we pioneered the retro-focus lens and the world’s first 10 to 1 zoom lens.

Or maybe it’s our wide selection of lenses that broadcasters and production houses count on for top performance.

Before you buy your next broadcast lens, look at Angenieux. We’ll make you famous, too.



## angenieux

FOR MORE INFORMATION ON OUR WIDE RANGE OF PRODUCTS CONTACT THE FOLLOWING ANGENIEUX BROADCAST SALES OFFICES

**North/South Americas** 12901 SW 74th St.  
Miami, Florida 33183  
Tel (305) 386-1740  
Telex 80-8045 Intelac-Mia

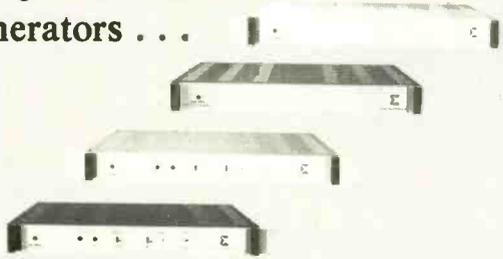
**Canada** 190 Don Park Road.  
Markham, Ontario L3R-2V8  
Tel (416) 495-5454

**Remainder of World** Opticam S.A. Case Postale 91  
1211 Geneva 17, Switzerland  
Tel (22) 362266  
Telex 27670-Opti-CH

Circle 129 on Reader Service Card

# Specify SIGMA

Sync Generators . . .



There is now one for any application!

All Offer These Features:

- Stability  $\pm 2$  cycles per year
- RS-170A Standard, SC/H Locked
- Color Field I.D. Pulse
- Blackburst

Options Include:

- SMPTE Color Bars
- Audio Test Tone
- Genlock

Call a Sigma Dealer near you.



**SIGMA ELECTRONICS INC.**

1830 STATE STREET, EAST PETERSBURG, PA 17520  
(717) 569-2681

Circle 130 on Reader Service Card

## TV PROGRAMMING

a larger camera gives more stability and control for smoother dollying. Also, many of the lenses available for  $\frac{2}{3}$ -inch cameras, while of excellent optical quality, are basically designed for ENG-type work and may have somewhat less smooth and less sophisticated servos than the larger-format lenses, designed for the studio.

### Roomy control room

The Greene, Crowe truck, designed for show and concert work, was built by the company's principal partners—Winikoff, Gene Crowe, and Ed Greene—in a 45-foot Gerstenslager box with a 26-foot expandable side that increases its width by another four feet. "One of the main advantages of the truck," Winikoff says, "is the control room, which is over twelve and a half feet wide because of the expanding side. Most trucks put the production switcher crosswise in the control room, which is eight feet wide at the most and very cramped for four people."

In the Greene, Crowe truck, on the other hand, the Grass Valley 1600-7K switcher runs lengthwise in the truck, giving plenty of room for the director, technical director, assistant director and production assistant. Along with the switcher is a customized Teleamation 30x20 routing system, with a software interface to a programmable 40-button control panel.

Another feature of the truck that came in handy for the Diana Ross concert was the on-board MCI/Quantel DPE-5000SP, which Winikoff used for transitional effects and to integrate montage footage, shot before the show, into the telecast.

As one would expect for a concert production involving a 20-piece orchestra, extensive audio work was to be part of the show. The idea was to have the orchestra in a pit in front of the stage, where one of the cranes could drop down for closeups of the performers or even their sheet music. For audio, Winikoff used two Otari MTR-24 24-track recorders and Greene, Crowe's custom Auditorionics board, which has 48 inputs and 24 outputs. Winikoff notes that the truck itself is capable of handling up to 160 inputs. One of the 24-tracks is permanently mounted, although the truck is wired for two; the usual audio complement is the 24-track plus two Otari four-track ATRs.

With Keith Winikoff and Greene, Crowe, there's nothing accidental about selection and placement of cameras and lenses. If careful preplanning is any indication of final success, the July 21 show covered Diana Ross—and the star's audience—from all the right angles.

BM/E

**REVOLUTIONARY  
NEW  
ISOMAX™  
MICROPHONE**

**IMPROVES:**

- ↑ "on mike" sound
- ↑ available gain without feedback
- ↑ Isolation for conferences & interviews
- ↑ matte black finish looks great on camera

**REDUCES:**

- ↓ room rumble & echo
- ↓ clothing noise
- ↓ camera noise
- ↓ paper shuffle noise

**ISOMAX PRO**  
for balanced line, battery or phantom operation.

**ISOMAX W**  
for use with all wireless body pack transmitters.

**CAJ COUNTRYMAN ASSOCIATES INC.**  
417 STANFORD AVE.-REDWOOD CITY, CA. 94063-PHONE 415-364-9988

Circle 131 on Reader Service Card

# WE BET YOU \$100

WE BET YOU \$100 that the Y-688<sup>32</sup> Total Error Corrector™ will deliver better pictures from your 3/4" VTR than any other TBC, frame synchronizer or multi-processor, regardless of cost.

Call or write us and we'll arrange a split-screen comparison in your facility, against the unit you're considering. If the Y-688<sup>32</sup> TEC pictures are not of noticeably higher quality we'll send you or your favorite charity \$100.

FORTEL quality. Quality that lets us give the industry's only one-year warranty on parts and labor.

Quality . . . Made in the USA

# Y-688<sup>32</sup> Total Error Corrector

Offer ends November 30, 1983 and is subject to certain test criteria.  
TMY-68832 Total Error Corrector is a trademark of Fortel Incorporated.



Fortel Incorporated  
6649 Peachtree Industrial Boulevard  
Norcross, Georgia 30092  
Telephone 404-447-4422  
Telex 804822

Circle 158 on Reader Service Card

**FORTEL**

**In the past ten years,  
computers have gotten smarter,  
cameras have gotten simpler,  
ovens have gotten quicker,  
beer has gotten lighter,  
bodies have gotten leaner,  
athletes have gotten richer,  
hi-fi has gotten higher,  
radio has gotten stronger,  
studios have gotten smaller,  
towers have gotten taller,  
movies have gotten longer,  
cars have gotten shorter,  
film has gotten faster,  
outerspace has gotten closer  
and blue jeans have gotten classier.**

# Now it's our turn.

In the past 10 years, the Premium Line from ITC has seen refinements, but no major changes. Frankly, it hasn't needed any. The Premium Line has been a dependable workhorse that's found its way into more studios than its next two competitors combined.

But we couldn't leave well enough alone. So this year, the Premium Line gives way to the Delta Series, a new generation of cartridge machines that offers you more than ten years worth of improvements.

It's mechanically better. The cart guides are improved. There's a crystal-referenced servo capstan motor with a vapor-honed non-magnetic shaft. Modular construction makes alignment and service convenient. High-speed recue is standard. And the Delta III gives you three

independently removable decks.

It's electronically better. There are new, high performance components, including NE5500 Series amplifiers. There's an exclusive ITC/3M playback head for smooth frequency response and improved signal-to-noise. We've added a toroidal power transformer with fully regulated and protected power supplies. And a digital cue tone detector controlled by a powerful microprocessor.

And it's physically better because it's smaller. The whole unit is only one-third rack width (5 $\frac{5}{8}$ "'). The enclosure is made of  $\frac{1}{4}$ -inch milled or cast aluminum, for stability. And the panel inserts are made of Lexan<sup>®</sup>.

Of course, we left in all the good things that made the

Premium Line so popular. The  $\frac{1}{2}$ -inch tool plate aluminum deck. Durable, high quality switches. And a solenoid-actuated, chain-and-sprocket pressure roller assembly. All backed by our famous two-year warranty on parts and factory labor, plus a 30-day guarantee of satisfaction. If, for any reason, you're not completely satisfied, you can return the unit within 30 days of purchase and we'll refund your money in full.

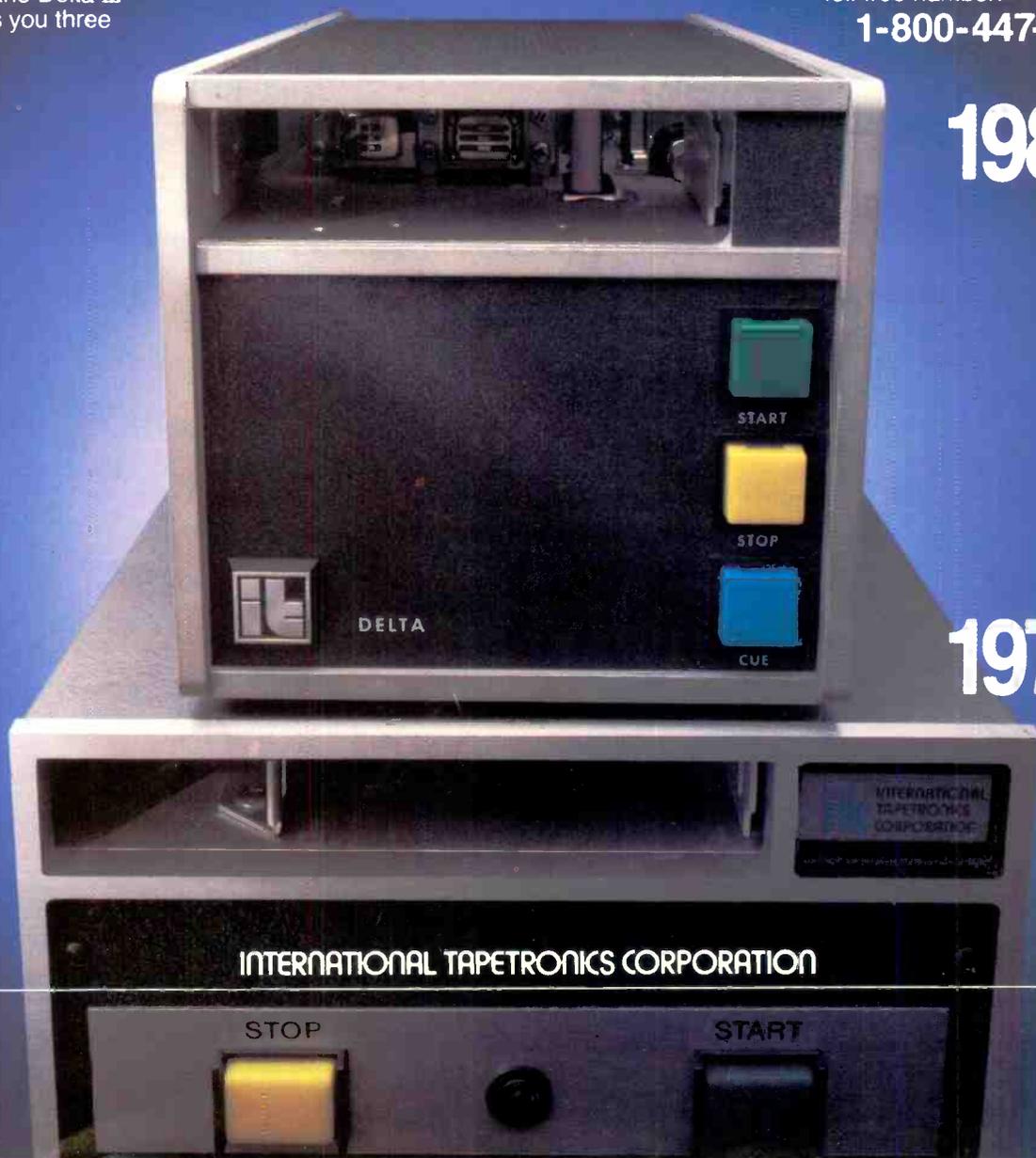
The good things are still there. But what you'll notice are the improvements. We think they were worth the wait.

For more information, or to place an order, call us collect from Alaska, Hawaii or Illinois, at 1-309-828-1381. From the rest of the U.S., call the following. Toll-free number:

**1-800-447-0414.**

**1983**

**1973**



**INTERNATIONAL TAPETRONICS CORPORATION**

3M hears you...

**3M**



*Can we do this?*

**DATA NEWS**<sup>TM</sup>

# The complete Electronic newsroom.

**IF YOU CAN LIVE WITHOUT IT AFTER 30 DAYS, RETURN IT.**

*Check this out!*

DataNews can turn an ordinary newsroom into an electronic news system. More efficient, more organized, more able to produce a superior newscast, for less money.

DataNews is easy to install, easy to operate, and easy to expand.

- DataNews does it all.
- Electronic Prompting.
- Exclusive Closed Captioning.
- Producers Rundown and timing.

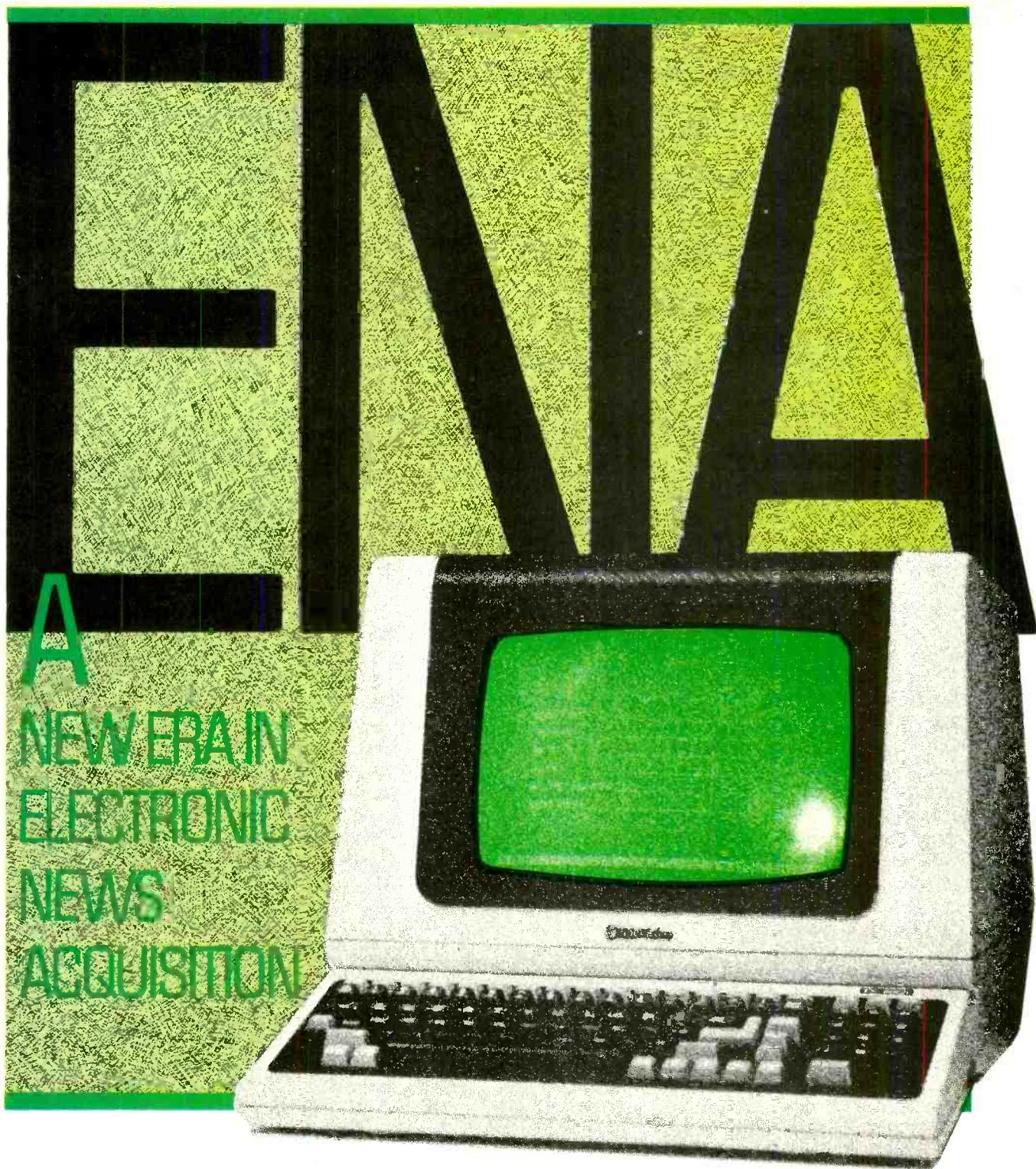
- Hard copy Script and Producer's Rundown.
- Basic system begins at \$14,995.
- Newsroom word processing.
- Disc storage with each terminal.
- Easily expandable to include:
  - Cataloging
  - Archiving
  - Story Search
  - Assignment Sheet

See a Beston representative for our full product line, including character generators, light controls, and prompting systems.



Olathe, KS • 913/764-1900

*Wonder what else they're up to!*



# A NEW ERA IN ELECTRONIC NEWS ACQUISITION

**T** By Tim Wetmore, Associate Editor  
echnology has changed the way news is gathered. Today's radio and TV stations have entered a new era in which news is electronically acquired from a huge variety of sources, then electronically blended into the newscast.

FACED WITH AN ALMOST BEWILDERING number of sources of news in today's competitive newsroom environment—feeds from the network, syndicated news services, the station's own reporters, viewer/listener call-ins, wire services, etc., etc.—and the need to record, route, and process them all, news directors and engineers are increasingly turning to newsroom computers as the only way to manage. And with the computerized newsroom has come a brand-new era in broadcast journalism—ENA, or electronic news acquisition. ENG concepts, as sophisticated as they have become, simply cannot keep pace with all the news sources.

Computers are changing the way news is being assembled, written, and broadcast, permitting news staffs to



handle information in ways never before possible. This is not a bold prediction of things to come; this is a simple fact of the electronic information age, at the forefront of which is the broadcast industry. The important questions in this issue are no longer whether computer-controlled news will take over or how it will happen. The relevant queries are now: When will computer-controlled news take over broadcasting? How and why has it already happened?

The prudent analysis wisely sidesteps the prediction required to answer the first question of when. But as to how and why computer systems are moving into newsrooms across the country, there is much hard evidence to examine.

Exhibit A: The well-known and much-documented case of KCBS in San Francisco. In 1977, Larry Cooper, the news director at KCBS, was inundated with the volume of news and the speed with which it was coming in. "We decided that something had to be done," says Cooper, "something that would help acquire and process the information faster than we could do it by conventional methods." The first move was to become a UPI bureau, because UPI had an open port in its computer at the New York headquarters. In addition, KCBS was linked by satellite and phone lines. KCBS paid for the six terminals and the circuit, and rented the ports from UPI.

When the next step—expansion beyond simple computerized wire service monitoring—was contemplated, the station ran into an obstacle. At the time, there were no broadcast-oriented computerized news systems available, at least none with a track record. The people at KCBS decided to put an advertisement in a computer magazine, but all the responses were from companies who had designed and installed computers for various newspaper bureaus. Cooper found that the newspaper systems didn't have the speed required, nor did they have the ability to coordinate, rapidly, an entire news broadcast. Still, the decision was made to go with a newspaper system designed by Integrated Technology. After modification of both hardware and software, with a great deal of input from station personnel, the system was up and running by December 1980.

At first there was a problem with the station's new ENA system, something the news staff could not get used to even after several training periods: quiet. The newly installed system was too quiet, and it unnerved a veteran staff used to the noise and chaos of bells and wire printers. KCBS finally discovered a solution at Radio Shack—a little \$2.50 noisemaker that would go "beep" every time the computer received information over the wire!

#### **Parallel development verifies trend**

Exhibit B: The less well-known but no less important case of CNN. At the same time KCBS was experimenting with UPI computers and looking for news systems to modify for broadcasting, Basys was busy adapting its successful print news computers for applications in the broadcast industry. The adaptations resulted in the Mini Fury and the larger and more complex News Fury. By June 1980, the company's first ENA system was installed at CNN.

At CNN, like most other news productions, when an urgent news item came over one of the wires, an assistant

heard the bell, went over to the machine, and took the copy to an editor who would confirm whether or not it was urgent. Only then, if it didn't need to be rewritten, was it taken to one of the news personalities to be read on the air. With the Basys system installed, urgent messages flash on a monitor which can be placed anywhere in the newsroom for easy availability, and can be immediately read or rewritten, saving much time and effort.

Further, with the phenomenal volume of information flowing through CNN's 24-hour-a-day newscast, its people now have a system that allows them to store and retrieve information more efficiently than they had in the precomputer past.

#### **Small-market applications**

CNN and KCBS were the pioneering cases in the fledgling electronic news acquisition industry. Since then, Colorgraphics/IT, Basys, Quanta, BEI (which is making a bid to acquire the Newscan/Weathergraphics system from McInnis-Skinner), and Telesource, among others, have installed systems at a number of radio and television stations. The electronic handling of information is becoming a necessity to keep up with the constant flow of news material and turn it around fast enough to get it on the air—even outside the four or five top markets.

WKYT, Channel 27 in Lexington, KY, for example, recently installed in its newsroom a complete Newstar computer news package from Colorgraphics. (Earlier this year, Colorgraphics bought Integrated Technology, which had developed Newstar, perhaps foreseeing the arrival of the all-electronic newsroom in which not only wire feeds and word processing, but also weather, sports, and on-air graphics, may one day be integrated.) WKYT bought the system as Lexington went from 132 to 78 in market size and the station's small news staff grew to 35.

This move to computers conforms to the general consensus among ENA experts that, if your news staff has grown to more than 25, you may need a computerized newsgathering system. Smaller than this, the investment may not realize a return. It must be recognized, though, that this hasn't been a deterrent to many small market stations. In fact, one of the principal advantages of ENA is that it can be implemented in stages, starting small and growing larger when the situation demands it.

This was the case with WTLV, an ABC affiliate in Jacksonville, FL. News director Tom Sanders purchased the QuantaNews system from Quanta as a way of growing into an ever-expanding system. The QuantaNews is a versatile system, meeting a station's needs for anything from a simple start-up, user-defined archive system, to a full-blown multiterminal computer handling wire services, data sources, remote bureaus, and electronic mail.

"We changed to computers because we saw newspapers operating more efficiently with them, and felt that we should make the move now so as not to fall behind in a very demanding and competitive business," asserts Sanders. The station started out with two terminals because they required only a small investment and still gave the station a base on which to grow. With the two terminals, both at the assignment desk where the most paperwork is done, WTLV could train its personnel at the proper pace and still have the advantages the computer offered.



## You're looking at a man who could use some good news. The new AP Network News.

As Program Director, your job is to get and keep listeners. To do that you need good strategy, determination and the best tools to work with.

At AP Network News, we want to help. That's why we're generating an additional 24 dynamic, drive-time news updates each day. All free of commercial clearances.

A two-minute NewsWatch highlights breaking news at the bottom of the hour. Our 60 second NewsMinute features the top stories at two minutes before the hour.

We've added these reports to our schedule of hourly newscasts, already available in 2½ and five minute versions.

Our new reports are short, and they're jammed with reliable information. You'd expect that from AP.

What's more, they add unmatched flexibility to your overall programming.

And AP Network News actually helps you keep listeners tuned to your station while keeping them tuned-in to the world.

There's more. AP Network

News has expanded its feature programming, from consumer affairs to computer news. It's information programming you and your audience will enjoy.

Best of all, our increased service comes without an increase in cost.

So, if you can use some good news in your ratings battle, call Glenn Serafin at (212) 621-1511 for more information and our latest demo tape. He'll explain how AP means good news for your listeners—and good news for you at ratings time.



# Associated Press Broadcast Services. Without a doubt.



Later, Sanders expanded to six terminals, providing the staff with the capabilities of archiving, future file storage, and a place to schedule lineups and rundowns in addition to text editing. This involved training producers to do lineups on the computer—according to the majority of broadcasters the most efficient way to handle the rapid-fire demands on news programming. As the rundowns are being entered, the computer can time-out the stories, telling the producer how long they will take on the air, one of the most important considerations for news directors, writers, and producers.

Archive facilities are another approach to starter systems for ENA. KRIS, the NBC affiliate in Corpus Christi, TX, started its archiving with a Jefferson Data NewsInventory software system based on the IBM PC/XT with Winchester hard disk. News director Doug Caldwell says the purchase was a way of beginning the station's effort toward acquiring an all-electronic newsroom, and that the next step will involve text editing, wire service monitoring, and program handling. In Caldwell's words, "Electronic newsrooms are the wave of the future—orderly, clean, and efficient. They are also more accurate and make people look smarter. Even better, they will pay for themselves over the long term."

#### **Financial considerations**

Whether the decision is made to start with a small archive unit or to go to the sophisticated newsroom system that handles all information processing, an important consideration for those pondering the relative merits of an ENA system is its economic value. When a station pays for equipment, its return on the investment is realized by money savings and more efficient use of staff time. As it happens, those radio and television stations which have converted their news operation completely to computers have found the greatest return in money and efficiency.

A case in point is WOR Radio, a large operation in New York City which converted its conventional newsroom to an ENA system in March 1983. The \$160,000 Basys system now installed consists of seven terminals in the newsroom and two in the on-air studio used by anchor John Gambling, a top-rated news personality, and by the show's producer. There are two CPUs, each with 20 Mbytes of memory.

The station feels that the way the computer has helped with its morning news, and the way in which it fits into future plans for all programming needs, has made it well worth the money. Gambling keeps one terminal with him in the studio and the producer has the second. The script can appear on the screen right in front of Gambling, obviating the need for paper. Any weather messages, updates, traffic, or high-priority material is flashed on the screen as it comes in, allowing the anchor to have it on the air the very second the information is available. If it's not of immediate importance, the producer can decide and route messages to other writers or reporters via the electronic mail system, telling them to rewrite the story, do further research, or to file in the archives or subject file.

Having a story first is very important in news, but may not, in the end, save or make the station money. WOR's plan, though, was to put the continuity involving all live commercials on the screen, and later to expand the conti-



**The electronic newsroom from Basys coordinates all news efforts at KRON-TV, San Francisco.**

nunity and traffic systems, thereby coordinating the whole operation. This, in management's estimate, could save the station money and could only be accomplished with the ENA system. The station management has found that the system has cut down tremendously on make-goods and has caused fewer mistakes by having less old or superfluous copy sitting around. When stations like WOR do a lot of live copy, the ability to edit wires from any terminal as the information comes in, and to be able to cut down on paper costs, is a savings worth the investment.

Another Basys system was installed at KRON-TV, the NBC affiliate in San Francisco. The station originally went on-line in May 1982, expanded in December of the same year, and continued the expansion to the present system in June of this year—62 terminals operating off 660 Mybytes of memory and 38 Mybytes of disk storage. The return has been a tremendous amount of savings in staff time and paper cost.

Under its current incarnation, the ENA system at KRON also saves money on rentals for wire printers, and makes the whole information processing task quicker and more accurate, with absolutely nothing on the air coming from paper or originating on a typewriter. With its huge staff of about 180 people, KRON uses the computer for rapid and clear communication between terminals and even its bureaus in Sacramento, San Jose, and Oakland. The station's entire library is computerized, presently using an IBM machine, but soon to be converted to the Basys system, allowing anyone at any terminal immediate access to relevant information.

As Dick Van Wie, news director at KRON states, "It's more cost-effective because in the long run it's no more expensive than the equipment for the standard newsroom—while being more efficient. In our old system, it was almost impossible to keep all the various information from all the sources straight, and to organize and retain it for immediate reference. That's the kind of thing a computer does best."

#### **Total electronic news**

One of the biggest forces in the present tendency toward the all-electronic television, radio and combined TV/radio station is Colorgraphics/Integrated Technology. The company sold 15 systems on the floor at NAB and currently has double TV/radio systems installed at KIRO-Seattle, WGN-Chicago, and is installing the Newstar sys-



# Until now, no component video system on Earth has been complete.

*Editing suite courtesy  
of WNEV-TV, Boston, MA*

## **Shintron 390. The world's first and only component video switcher and editor-interface.**

Now your M-format, BetaCam, or Quarter-Cam tapes can receive the full range of editing, effects, and other post-production techniques used on standard NTSC materials. Never possible before, because there was no such thing as the Shintron 390.

The Shintron 390 is the first switcher that can handle the three separate video component channels simultaneously; for M-format (Y, I, and Q),

BetaCam (Y, R-Y, and B-Y), and for general purpose (R,G,B). It can be driven by time code, and its special Convergence port along with a standard RS-422 port permit direct interface with most professional editors. And, its two independent microprocessors make it smart enough to perform a wide variety of intelligent, programmable functions.

The Shintron 390 is the missing link. Without it, no component video system is complete. Call now for more information.



*Shintron 390 lets you mix, wipe, key, edit, and post-produce component video tapes with the same flexibility of NTSC systems.*

## **SHINTRON**

SHINTRON Company, Inc.: 144 Rogers Street, Cambridge, MA 02142/Tel: (617) 491-8700/Telex: 921497  
Shintron Europe: 198 Avenue Brugmann, 1180 Brussels, Belgium/Tel: 02-347-2629/Telex: 61202

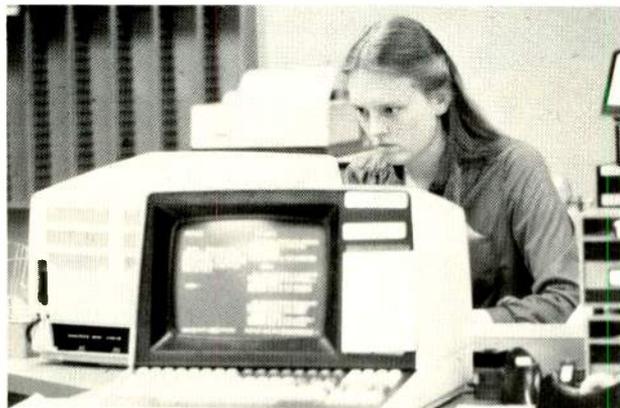
Circle 136 on Reader Service Card



tem at CBS Radio Network headquarters in New York, with the TV side taking a very serious look. These news organizations shared the vision with Colorgraphics that the broadcast news industry was heading for the total electronic newsroom eventually, and all indications urged them to begin the process now.

One of the conditions that pushed KIRO into the purchase of an ENA system was a paper crisis. As Vic Bremer, news and program manager at KIRO, relates, the newsroom environment had become stressful. There was the sound of ripping paper from the wires, reams of paper abounded in the noisy room, and dust and equipment breakdowns contributing to a generally tense atmosphere. "This was antithetical to the immediacy and the accuracy on which we placed such great importance in our broadcasts," Bremer maintains.

In June 1982, the station's 13-terminal system was installed and worked so well that immediate plans were made to get remote terminals for outlying bureaus. (There are two permanent bureaus in downtown Seattle and two less formal setups in the outer counties that the station serves.) With this connection for stories to be filed instantaneously from the perimeter of the metro area, a more complete and accurate newscast is possible. News from the downtown courthouse bureau and the distant county bureaus comes in faster, allowing "hot" stories to go immediately on the air, or giving the staff longer rewrite time between newscasts. This capability also permits remote terminals access to computerized archives, libraries, and



News editor Lynn Olson of KIRO, Seattle edits wire story picked up by Integrated Technology ENA system.

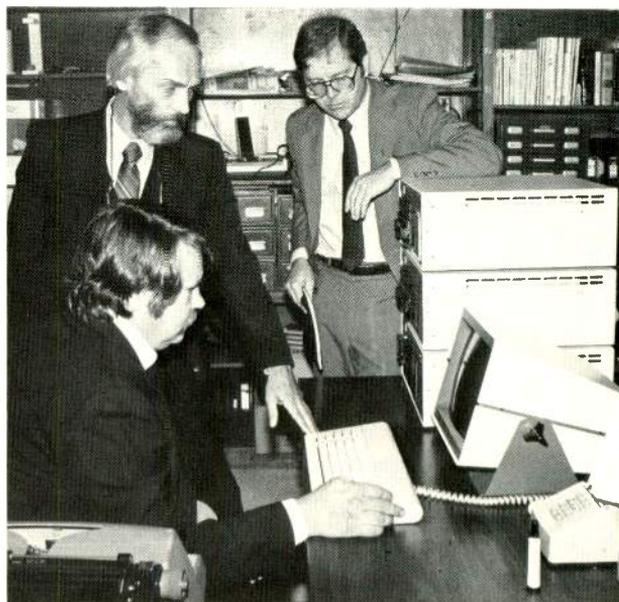
other research tools for more thorough reporting. Another benefit is that it gives the studio news staff more time to turn the regular stories around if they need rewriting, in order to fit them into any overriding theme that has developed during the day. To this end, Colorgraphics/IT will be offering a couple of portable models, allowing field reporters phone-in capability and access to computer files.

The interface with the radio side of the operation is important as the station progresses towards its electronic goal. Eventually, after the system is complete, television and radio operations will be able to trade information back and forth between the computers. This information can be modified or restricted by categories such as subject of news story, by title, date, on-air time, or many other important newscast parameters.

In the case of KIRO, the TV assignment desk computer

will have access to the radio computer's work file (the planned schedule of topics to air on the next broadcast). This capability permits a producer to run a parallel story, to sidestep a story rather than repeat it, or to scan any story in the file and decide whether it has merit for his particular medium. Any number of other possibilities are available, depending on the nature of the two broadcast media and the personnel involved. Such an interface between television and radio can increase a reporter's potential for the amount of news gathered and the outlets for such news. An interchange of this kind opens an important new facet of the business to staff members on both sides.

A station which plans to take advantage of these techniques is WGN, the Chicago superstation. Management will, according to news director Paul Davis, exchange information between radio and television. The station will



KAIT-TV news director Cal Wasson, at keyboard, works with QuantaNews; adjacent to CRT are dual redundant hard disk drives.

go one step further and exchange reporting through computer. WGN also purchased the Colorgraphics/IT Newstar system. Davis, in fact, purchased two separate but identical systems for radio and television. He felt the architecture of IT's internal system was well suited for interfacing the nine printers and the 39 terminals in each system. The station also possesses two remote terminals. "The overall exchange both in the studio and with the remotes offers an improvement in wordsmithing, and thus in the quality of our scripts," claims Davis. He also recognizes improvements in coordination of all writers' and reporters' efforts, and a newly found ease of scheduling. Davis hasn't forgotten the financial considerations either. "We were drowning in a sea of paper. This rescued us. We expect it to save us \$80,000 a year in paper alone."

#### Electronic prompting

One of the attractive features of the ENA system that helps save time and money is the electronic teleprompter. This device is useful for television and, strangely enough, for radio stations. The application in television is fairly direct, as any broadcast-ready script can be sent straight

# Our monitors are worth looking into

## Ikegami 8-Series Standard and High Resolution Color Monitors

Once you look into an Ikegami monitor, chances are you may never look into buying a monitor from anyone else. And it's no wonder, since every Ikegami monitor is designed by the same demanding engineers who have succeeded in making Ikegami cameras synonymous with performance and reliability.

Look around. If you think you're seeing more Ikegami monitors at NAB, network and independent stations, professional studios, remote vans and corporate facilities in general, it's because you are.

Fact is, when you look into the Ikegami 8-Series standard and high resolution color monitors, you'll see more than 13V and 19V monitors (23V standard resolution monitor available). You'll see a host of standard features, from American Standard Matched Phosphors (not available on 23V) to a Shadow Mask Dot Matrix CRT to an Active Convergence Circuit to Delta Gun tubes and more. And you'll see a product name that says exceptional quality—every time.

That's something worth looking into.



TM14-8R



TM14-2RHA



TM20-8R



TM20-8RH

# Ikegami

## Delta Gun Standard and High Resolution Monitors

*Ikegami is the supplier of Color Monitors to ABC for its coverage of the 1984 Winter and Summer Games.*

Ikegami Electronics (USA) Inc., 37 Brook Avenue, Maywood, NJ 07607: (201) 368-9171 • Northeast: (201) 368-9171  
West Coast: (213) 534-0050 • Southwest: (713) 445-0100 • Southeast: (813) 884-2046 • Canada: (201) 358-9179

Circle 140 on Reader Service Card

# COMPLETE CAPABILITY

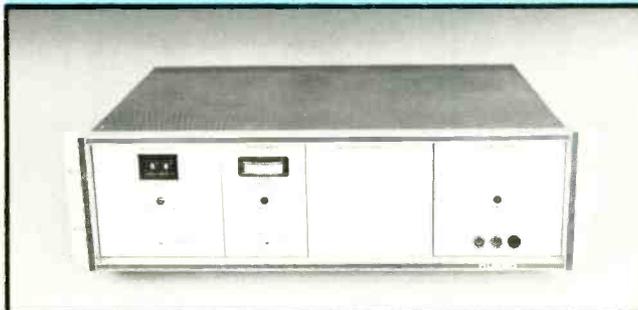


## Nurad Receive System

More than 120 broadcasters rely on the Nurad SUPERQUAD for their live ENG needs.

Available in single and dual band models, the SUPERQUAD II receive system includes bypassable preamplifiers, remotely switchable polarization, remote azimuth control and cosecant-squared elevation beam shaping. The offset feed produces extremely low sidelobes; and the axial ratio for circular polarization is unsurpassed.

To complement the SUPERQUAD, Nurad offers a complete line of frequency agile central receivers in both single and dual bands, ICR transmitters and receivers, and remote control systems.



**NURAD**  
MICROWAVE SYSTEMS

2165 DRUID PARK DR.  
BALTIMORE, MD 21211  
TELEPHONE (301) 462-1700  
TWX (710) 235-1071



from a terminal to the teleprompter. In radio, where a station may not want to invest in a completely separate terminal for the on-air news anchor, but still wants to increase its efficiency and eliminate its paper problems, an electronic teleprompter can come in handy. The type size and speed of operation can be varied according to the station's style of production and the anchor's preferences.

A company which started its foray into computerized news handling with an electronic teleprompter is Beston Electronics. The BEI unit was called DataPrompter, and the first one was sold to KDUB, an ABC affiliate in Dubuque, IA two years ago. Using a Texas Instruments 9900 as its hardware base, the DataPrompter can prompt the on-air news, restack shows for scheduling, and is capable of word processing for news writers. Its limitations came with its inability to sort wire stories, and it did not have archiving or electronic mail. Still, for a small market station, that at the time had no teleprompter at all, and wanted to begin its investment in an ENA system, it was a good start. The news staff consisted of eight people when the system was purchased in 1981.

Chuck Cyberski, the news director at KDUB, has found that the word processing feature has increased the quality of the broadcast product and that the electronic teleprompter is easier for the on-air personalities, and he is poised to go ahead into a more complete system that will include scheduling and wire service monitoring. An added feature is that there is a feed for closed captioning of the news broadcast made possible with the addition of a

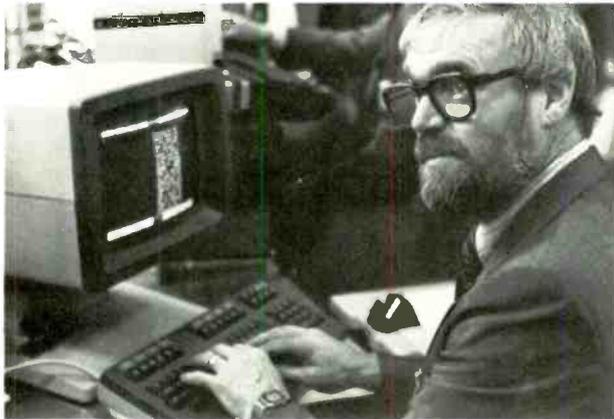


**Wendall Anschutz of KCTV prepares script using split-screen capability of BEI DataNews system.**

small box for encoding and decoding. Cyberski is convinced that the station will go to the total ENA system, that it is just a matter of timing.

After DataPrompter's success with several stations, Beston introduced at this year's NAB the DataNews system. This computer is an enhanced version of the DataPrompter, using a Motorola 68000 microprocessor and five-inch floppy disks for storage. There is much more memory with the new system, allowing a greater degree of uses through customized software. Meanwhile the company is in the process of acquiring McInnis-Skinner, manufacturers of the popular NewsScan and Weathergraphics systems.

A different twist on the computerized newsroom system, one that includes capability for an electronic teleprompter, has been developed by Telesource. Using its own hardware, based on a Motorola 68000 processor, it is a networking system with each intelligent terminal dedicated to a specific processing purpose. The news staff will have terminals that pertain to their task, all linked through a central file server which also controls the teleprompting. If a person needs a function other than the ones normally performed, they move about to a different terminal. Capabilities of the system include word processing, wire monitoring, directory and indexing, with



Tam Fry, BBC journalist, using his ENS software at *Breakfast TV* newsroom.

news, sports, weather graphics, and still store facilities resulting from the system networking. The company's newly developed system is expandable beyond 200 terminals, with prices and configurations all depending on custom installation. Telesource plans to show the system at this year's RTNDA.

Another established company known for its teleprompting equipment is Autocue. The company's Model 2000 is a new digital prompting and script display system that has a hard copy printer, variable prompting format, and a remote-control unit that can control character size, roll speed, closed captioning, and story reset. The unit can be purchased as a standalone unit, but is also being marketed in the U.S. along with an electronic newsroom system developed by the BBC in Britain.

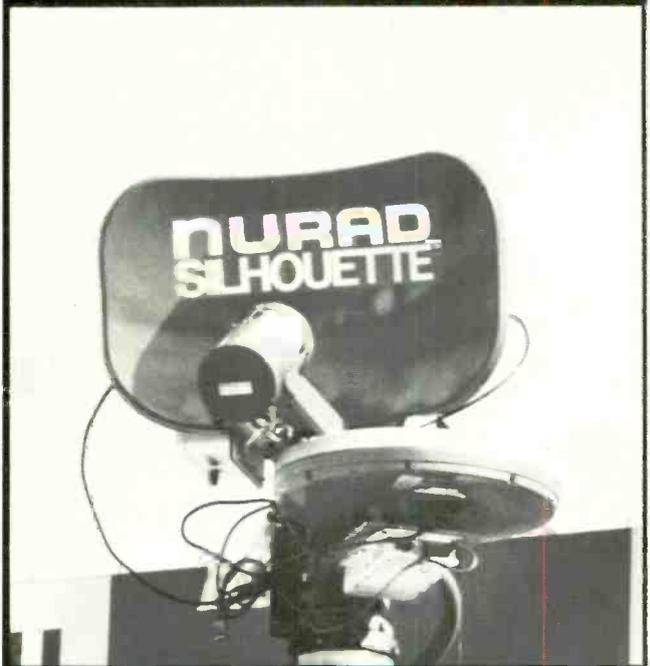
When the BBC went on the air in January 1983, with its news television program *Breakfast Time*, it was with the ENS system in full operation. Designed by Tam Fry, a journalist for the BBC show, programmed by System Solve, a software company, and operating on Hewlett Packard hardware, the system processes a 100-sequence program and holds 500 pages of script if necessary.

Along with the standard word processing and wire monitoring, the system has a diary that holds up to 365 days of entries with cross references. Storyboarding and technical sequences can also be stored in the computer, permitting a director to overview which cameras, VTRs, and other production equipment will be operating and the sequence in which they will operate. There is also a videotape log facility. The standard prompt unit is the Autocue 2000. With the system in operation since the beginning of the year and having experienced no down time under a 24-hour broadcast schedule, the designers felt they should display the system elsewhere. It was shown at the Montreux TV Symposium in Europe. The consortium of designers and programmers has also demonstrated it in the U.S., and the NBC TV network is actively interested.

Bringing the news delivery chain full circle, from the electronic teleprompter through text editing and archiving, back to computerized acquisition of information, the reality of electronic newsgathering is brought to bear on the broadcasting industry. The capabilities of computers are clearly impacting heavily on the way news is acquired, distributed and, finally, broadcast to the public. **BM/E**

Circle 139 on Reader Service Card ▶

# Nurad offers complete systems for dual-band video transmission



## Nurad Transmit System

The SILHOUETTE transmit antenna and the Nurad frequency-agile portable transmitter are ideal partners for live remote telecasts. Both single and dual band SILHOUETTES are offset fed parabolic antennas featuring low sidelobes, high efficiency, and excellent VSWR and axial ratio characteristics.

The portable transmitter is available in 2, 2.5, 7, and 13\* GHz bands and dual band combinations\* of these. All units contain many advanced features, which make them leaders in the state-of-the-art.

\*FCC Type Acceptance pending



**NURAD**  
MICROWAVE SYSTEMS



**THIS IS WHERE  
STICTION  
PROBLEMS  
BEGIN.**

It takes a very tough tape to withstand edit after edit through today's VTR equipment and still deliver a crisp, clean playback image.

And tough is exactly what new Scotch® 480 one-inch video tape is.

A special coating formulation on Scotch 480

means you no longer have to worry about problems like stiction.

In fact, during computer editing, 3M lab tests have shown 480 is capable of delivering over 1,000 edits from the same preroll point, with no significant reduction in playback quality.



Scotch<sup>®</sup>

480

NEW  
SCOTCH<sup>®</sup> 480  
IS WHERE  
THEY END.

And in today's tough video production environment, that kind of durability can mean a lot.

Scotch 480 is further proof of why 3M is the leader in professional use video tape. And why we sell more one-inch tape for professional use than all other

manufacturers put together.

For a free brochure on new Scotch 480 call 1-800-328-1684 (1-800-792-1072 in Minnesota). And find out more about the tape that's as tough as today's editing equipment.

Magnetic Audio/Video Products Division/3M.



**NEW  
SCOTCH 480  
1" VIDEO TAPE.  
LASER TESTED FOR  
CONSISTENCY.**

3M hears you...

**3M**

**“My goal is to find a camera that’s broadcast quality, tough in the field and easy on the budget.”**



## **HITACHI HEARD YOU.**

The new Hitachi FP-15 is a rugged, low-cost camera that's outstanding in the field. Whether you're shooting news or a documentary.

It's packed with features normally found on a \$40,000 camera. Yet it sells for under \$6,500.

The FP-15's 3-tube prism optics with advanced  $\frac{3}{8}$ " Saticon tubes shoot bright, sharp, broadcast quality pictures in just about any light or location. And the camera's aluminum die-cast housing and shock-mount RGB assembly assure high performance and maximum durability under the toughest field conditions.

The FP-15 weighs only 11.2 pounds (excluding lens). It has built-in

corner registration, 550 lines of horizontal resolution and a signal to noise ratio of 54dB.

Other features include: auto white, auto black, auto iris, ABO, a +6 and +12 dB gain switch, and built-in genlock. A full line of accessories is also available, including a 4.5" viewfinder and remote operation unit for studio use.

The Hitachi FP-15 ENG/EFP camera. It's a winner. Put it on *your* news or production team.

For more information, write or call Hitachi Denshi America, Ltd., Broadcast and Professional Video Divisions, 175 Crossways Park West, Woodbury, NY 11797. (516) 921-7200. Offices also in Atlanta, Chicago, Cincinnati, Dallas, Denver, Los Angeles, Seattle, and Washington, D.C.





# VIEW-FINDERS FOR ENG

ENG camera viewfinders give operators an eyeful of vital information. But is it too much?

By Eva J. Blinder  
Senior Associate Editor

**A**T AN ENG SHOOT, the news event doesn't stop for the camera operator to check just one more parameter. Therefore, some form of instantaneous assurance that the camera is indeed working properly is almost as important to the ENG crew as rapid setup. And for the camera operator, the most important link with the camera is through the viewfinder. It has reached the point, in fact, when the operator's eye need never leave the viewfinder from the moment the news team arrives at the scene until the last bit of tape has been shot.

Viewfinder indicators—from simple tally lights and LEDs to full character generator displays—offer a wide variety of different information to camera operators. The need for such information was recognized by ENG camera manufacturers very early, and such breakthrough cameras as the RCA TK-76 and the Ikegami HL-35, in including such indicators, were following an already established tradition. Thomson-CSF, in a 1976 description of its Microcam 1, listed LED viewfinder indicators for low battery voltage, tally, incorrect color filter wheel setting, and VTR servo lock. The increasing sophistication of ENG cameras, spurred by the availability of microprocessors, has led to a corresponding growth in the number and kinds of viewfinder indicators offered by

camera makers. In addition, the arrival of the single-piece recorder/camera combination has caused some rethinking of viewfinder functions.

The particular parameters a camera manufacturer will choose to highlight in the viewfinder, and the way they will be indicated, reflect a combination of current technology and design philosophy. The questions a camera designer must ask include: What information is most important to the camera operator? How much information can fit into the housing of a 1.5-inch viewfinder? What is the best way to display it?

#### Viewfinder indicator choices

A *BM/E* survey of manufacturers indicates that almost all include some warning of low battery voltage in their ENG camera viewfinders; record tally lights are almost as common. Beyond that, manufacturers diverge widely on what indicators they present. The more common include completion of white balance, high gain mode, and video level. More esoteric warnings include indication of excessive humidity in the VTR head cylinder, included in the Panasonic ReCam.

One of the most unusual viewfinder displays is provided by Harris for its TC-90. The Smart Package option, introduced last April at NAB, consists of two cards that plug into the camera to provide a variety of functions, including SMPTE and VITC timecode generation and au-



**ONE OF THE FEW EFFECTS YOU CAN'T DO  
ON THE EXPANDED E-FLEX SYSTEM.**

**YET.**

We're working on it, though. In the meantime, almost anything else you can think of is possible. Because we've just expanded the E-FLEX DVE® system with a new Perspective/Rotation accessory. So now, you can rotate images through all three axes. Add depth through perspective. Combine those effects with basic E-FLEX effects all on NEC's bubble memory cartridges.

We can't resist noting that our new capabilities make E-FLEX the virtual equivalent of systems costing far more. But more importantly, they make E-FLEX an instrument of almost limitless possibilities. One that takes only a few hours to master—and perhaps a lifetime to fully explore.

What's more, the E-FLEX system is modular. So you can buy it all at once, or start small and add later. And as we develop more capabilities, you'll be able to plug them right in. To find out what E-FLEX can do now, call NEC at 1-800-323-6656. By the time you call, we may have perfected the effect in the picture.

**NEC**

**IMAGINE WHAT WE'LL DO NEXT**

NEC America, Inc., Broadcast Equipment Division  
130 Martin Lane, Elk Grove Village, IL 60007. In Illinois: 312-640-3792



automatic registration on scene content, without the need for diasscopes or test charts. The new functions appear as a character-generator display that reads out time code and alphanumeric status messages as well as warnings in the viewfinder CRT raster itself. For example, if the camera operator chooses to use the automatic registration func-



**A character generator in the viewfinder of Harris's TC-90 ENG camera displays time code and auto setup status superimposed on the picture.**

tion, the character generator will flash the words AUTO OK for 30 seconds. If, however, the scene contains insufficient detail for automatic registration to proceed, the viewfinder will alternately flash the words WARNING and DETAIL, and the camera will revert to the previous registration setting.

The Smart Package's automatic white balance and black balance functions are also indicated in the viewfinder by a white cursor line that appears on the screen when either white or black balance has been selected; the line disappears when the camera is ready. The character generator even warns when the mercury battery that powers the time code generator is about to run down.

Fred Haines, manager of training and technical publications for Harris, says that laying the time code down during shooting saves the time it would take to do it either before or after the shoot. Then, when the ENG crew returns to the edit suite, they can edit instantly without delay, using the camera viewfinder as a time code display device if they wish. He notes that setting the time code generator for time of day gives the operator a record of the exact time events occur, which may come in handy for important news.

The option package took Harris about three years to develop, according to Haines. It was made possible by the introduction of CMOS chips, which draw very little power—allowing the mercury battery for the time code clock to run for six months of continuous operation. The time code feature, while unique among current ENG cameras, did not originate with Harris; the CEI-310 ENG camera, no longer on the market, also displayed time code in its viewfinder as an option.

"The reception has been quite enthusiastic, both here and in Europe," Haines says, although he admits that the idea was a "brainstorm" and not developed in response to user requests. "It's hard to say if this kind of thing will be-

come a trend," he muses, "but I think it's very possible."

Other manufacturers have mixed feelings about character generator displays in viewfinders, although many agree they may be the wave of the future. Lawrence See, Sony product manager for cameras and monitors, points out that several manufacturers, including Sony, have used graphic or character displays (the company's DXCM-3 indicated completion of white balance, for example, with a large WB OK across the middle of the screen).

See predicts that character or graphic displays will become "quite common" in the near future, but he worries about camera operators being overwhelmed with too much information. "I'd like to see it in its own area above the picture," he suggests, noting that a scene with large bright areas can easily wash out character displays, making them illegible.

"A camera operator doesn't have time to read too many displays, and he needs the information quickly," See continues. Too many indicators, whether in the screen or around the periphery, are distracting and take too long to read. "For example," See explains, "the camera operator doesn't need to know what the gamma is—but he could use a warning if someone turned the gamma off."

Representatives of several other manufacturers echoed See's concerns. For example, Jim Bonan, ENG/EFP camera product management at RCA, says, "Time code is a good example of something the camera operator doesn't want to know about. It gets in his way." In other areas, like battery warnings, Bonan concedes that character generator displays could be "a great idea. They could eliminate some of the cryptic flashing lights."

Philips product manager Nick La Bate agrees that character generator displays will be the new trend and says Philips is thinking along those lines. Their primary usefulness, however, will be "for people just getting into camera operation," La Bate feels. "The experienced operator is used to other techniques." Even experienced operators will get used to the new displays in time, La Bate predicts.

"A viewfinder in a camera is sort of like the dashboard of a car," says Dave Walton, product manager at JVC. "You can put a lot of information in there. Some people like all of it, but you can have so much that while you're looking at it, you run into a tree. We found that many people would rather not have it." JVC's KY-2000 Series cameras, Walton recalls, had a waveform monitor in the viewfinder that showed the illuminance level of each line of video. "It was very useful," Walton comments, "but most camera operators complained that it was in the way and they didn't need it." The zebra-type video level indication JVC (and other companies) uses in its newer cameras is "less useful but less obtrusive," according to Walton.

As for the time code idea, Walton dismisses it as unnecessary. "The most useful information would be playback off the tape, if you could get a high-resolution color CRT small enough to be a viewfinder," Walton suggests. He doesn't see this happening in the near future, however.

"I've always been a firm believer in keeping things simple," says Frank Coleman of Hitachi. "On larger, computerized cameras we'll probably see character-generator-based readouts of zoom and iris, but in a 1.5-inch viewfinder the characters are too small."



Coleman suggests as a possibility marrying in a small LCD character display below the raster for alphanumeric displays—something he feels Hitachi may do in the future—but he says there's really little need for change. "Time is money," he admonishes. "A camera operator can't waste time looking at indicators and controls." As for Walton's dream of a color viewfinder, Coleman predicts that the extra weight of a color viewfinder would make the idea impractical. In addition, the inherent chroma crawl problem of NTSC could create difficulty on such a small CRT, he feels.

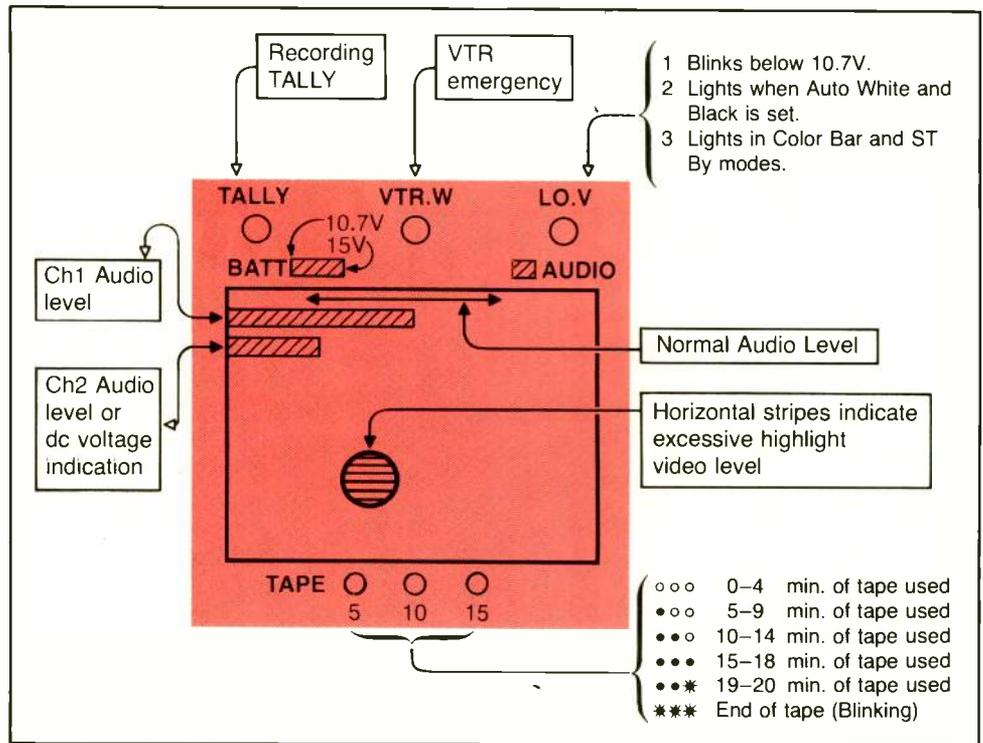
The ultimate answer, of course, may be the solution arrived at by the aircraft industry—a system of voice-synthesized warnings that would speak to the camera operator through a separate earpiece or interrupt the program audio monitor with phrases such as "low light level . . . switch in 6 dB gain" or the like. This type of oral presentation has been found to be the most effective way of alerting pilots to potential problems, and it keeps the viewfinder image free of visual clutter.

#### Recorder/cameras: A closer link

The close marriage of camera and recorder in the new one-piece units has opened the possibility of supplying additional information to the camera viewfinder. RCA's Bonan explains that the M-format VTR interface is a 62-pin connector that allows plenty of information to pass between the camera and recorder sections of the Hawk-eye. He adds, "With a one-piece, you know a lot more about the tape recorder than you knew before. You can share more information with a direct connection than with a cable."

Perhaps the most important piece of additional information—one found in the viewfinders of all the one-piece cameras *BM/E* surveyed—is minutes of tape remaining (in some cases, tape time elapsed).

In the Sony Betacam, for example, on-board computers in the recorder section calculate the amount of tape time remaining and feed the information to the viewfinder, which has indicators just above the top left corner of the CRT that read "10M" and "5M." Both light up when there is more than 15 minutes of tape remaining; the 10M sign lights when between 15 and 10 minutes remain; and the 5M sign lights when less than 10 minutes remain and starts blinking when less than five minutes of tape are left. The indication is the same in the Thomson-CSF Betacam



This schematic of the Ampex FPC-10 viewfinder illustrates the variety indicators offered. Note that some have dual meanings.

cameras, MC-611 and MC-613; in both cases, the tape time remaining indicators function only when the camera and recorder sections are linked with the 50-pin connector.

M-format recorder/cameras such as the RCA Hawk-eye, Panasonic ReCam, and Ampex ARC system use a slightly different arrangement that indicates how many minutes of tape have been used. A good example is the FPC-10, introduced by Ampex at the last NAB show as the camera section of ARC. Three LEDs are arranged horizontally under the viewfinder CRT. Once five minutes have elapsed, the left LED lights; the center LED lights when 10 minutes have passed; and all three are lit after 15 minutes. At 19 minutes the right-hand LED starts to blink, and all three blink when the tape reaches its end.

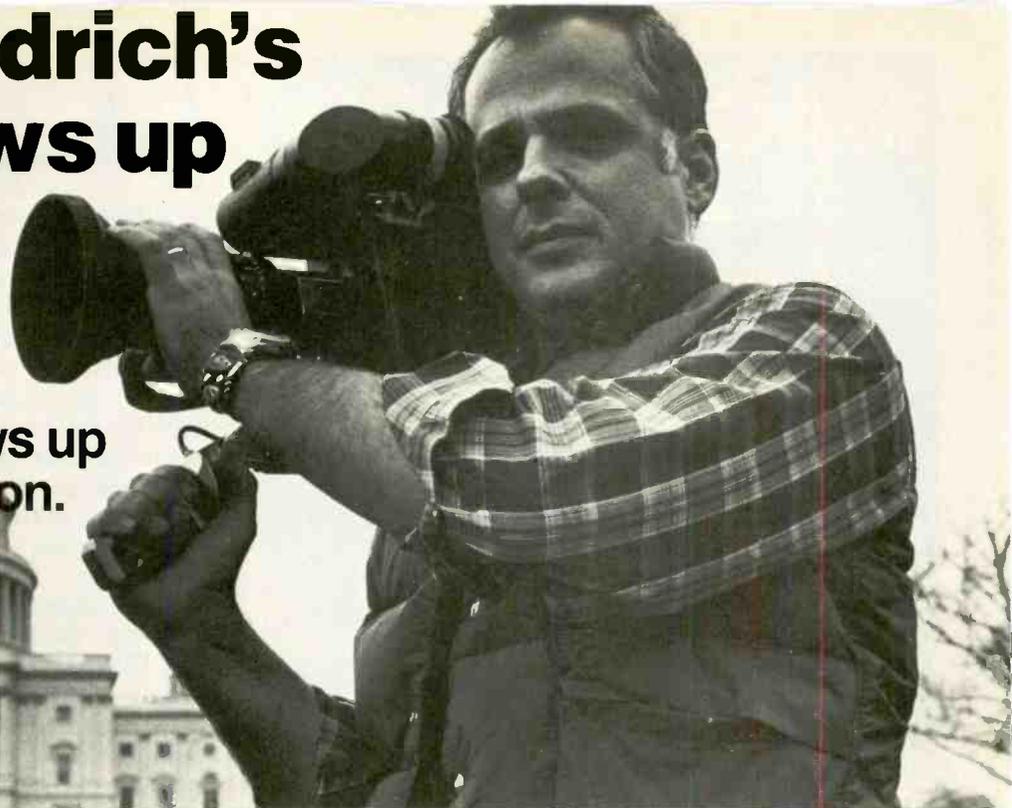
The Bosch Quartercam quarter-inch recorder/camera has yet another kind of tape length indicator, this one a graphic display. A white bar at the top of the viewfinder raster slowly diminishes in length as the tape is used, giving the camera operator a pictorial representation of the amount of tape remaining. (The bar doubles as an iris alignment aid.) The system also has an LED tape length indicator, as well as another LED that doubles as a VTR warning and EOT marker.

Several manufacturers of conventional ENG/EFP cameras also include some sort of VTR warning signals, although few are as specific as the time-elapsed lights of the one-piece units. JVC, for example, has a tape-end warning and tape servo alarm in the viewfinder for its KY-950U and KY-900U broadcast cameras; VTR warnings and/or EOT alarms are also offered by Harris (TC-90) and Panasonic (WV-888 and WV-777), among others.

An important indicator offered by many manufacturers is video level, frequently shown by a striped "zebra" pat-

# George Fridrich's name shows up on a lot of awards.

Only one name shows up on his lenses—Fujinon.



Network news cameraman George Fridrich covers the nation's Capital. Assignments also take him across the country. But wherever he goes, his work speaks with authority. The most prestigious awards confirm it.

The White House News Photographers Association named him "newsfilm photographer of the year" for 1982. (They did the same for 1981 and 1979.) And he received first place awards for spot and feature news in 1982 from the National Press Photographers Association.

Obviously, George Fridrich has his choice of lenses. For years, his choice has been Fujinon, exclusively. Here, in his words, are his reasons:

"Fujinon lenses deliver great performance and reliability. I use two of them, I abuse them and they hold up. They get knocked around and still perform often under the worst conditions. The fact is, you just can't go wrong with any Fujinon lens. On top of that, Fujinon's support and service are fantastic."

George's basic lens is a Fujinon 14X zoom with built-in 2X extender. When he can't get in close, the lens will and because its maximum F1.7 aperture stays flatter, farther, George can still get the brighter, higher contrast picture quality he demands. His second lens is Fujinon's exclusive 3.5x6.5 wide angle zoom. With an MOD under one foot, no assignment is ever missed because of tight quarters.

Incidentally, although George didn't receive the White House News Photographers' award for 1980, Pete Hakel (WJLA, Washington) did. He won with Fujinon, too. It's not a coincidence. According to Pete, "90% of the ENG work in D.C. is Fujinon."

**Before you make any ENG/EPF lens decision, see how much more you get with Fujinon.**

Fujinon provides it all—performance, quality, reliability and service. And to make it even better, Fujinon is also the value leader. For all the facts and figures to prove it, talk to your Fujinon representative or contact:

## Introducing FUJINON'S third generation ENG lens...

### THE NEW "WEATHERIZED" A14x9ERM

- Fast, light and compact—F1.7 speed, weighs only 1.48kg
- Wider angle, smoother zooms—9mm coverage, more precise servo control
- Built-in 2X extender
- Macro and adjustable back focus
- Servo zoom, auto iris standard
- Wide and tele converters optional
- Full range of studio conversion accessories including Fujinon's microprocessor shot box



**The tradition of innovation continues.**

Fujinon Inc.  
672 White Plains Road  
Scarsdale, New York 10583  
(914) 472-9800  
Telex: 131642

Fujinon Inc.  
2101 Midway, Suite 350  
Carrollton, Texas 75006  
(214) 385-8902

West Coast Division  
Fuji Optical Systems, Inc.  
118 Savarona Way  
Carson, California 90746  
(213) 532-2861 Telex: 194978



FUJINON

# MAGNECORD MC-II

Compare Quality at this Price



*Incomparable  
from \$1100.00\**

- Meets or exceeds NAB standards, with IEC equalization on request.
- DC servo, flutter-filter drive runs true regardless of line voltage fluctuation.
- Cool operation; no ventilation required.
- Full remote capability.
- Long life heads and phase locked tape guides.
- Mono or stereo play models field convertible to record.
- Automation cue tones (stop, secondary, tertiary) with LED's and external switching contacts.
- Cue track access for FSK logging.
- Universal mic/line input.
- Immune to RFI and EMI.
- Rugged design in the Magnecord tradition —made in USA.

\*Suggested Pro Net Price

Quality Products for the Audio Professional

**TELEX MAGNECORD**

TELEX COMMUNICATIONS, INC.

100 Alameda Street, New York, NY 10013, U.S.A.  
Europe: Le Bourget, France 75015; London, England; Paris, France 92100; Lyon, France 69003

Circle 143 on Reader Service Card



tern covering the area of the picture that has reached full level. An alternative method is the peak level indicator, which turns black any picture area that exceeds the set video level. The latter approach is taken chiefly by RCA and Panasonic. RCA's TK-710 has what Bonan calls an inversion indicator, in which areas of the picture that are over level turn black. An additional feature of the TK-710 (shared by the Hawkeye) is the ability of the viewfinder to lock at luminance output or to switch red, green, blue, or minus green into the viewfinder for a registration check.

According to Tony Fujii, product engineer at Panasonic, the company's WV-888 camera originally had a "wink effect," in which the signal area over 100 IRE blinked. The production models of the camera, however, incorporate an inversion level indicator similar to the RCA TK-710.

Zebra-pattern indicators seem more common and are found, with individual variations, in such cameras as Ikegami's HL-83, HL-79E, and ITC-730; Sony's BVP-3 Betacam; JVC's KY-950U, KY-900U, and KY-310; Ampex's FPC-10 (which uses horizontal stripes rather than diagonal stripes or a herringbone pattern); and Sharp's XC-800 and XC-900D. The Bosch KCF 1 camera has a dual level warning, showing a coarse zebra pattern over areas above 100 percent level and a fine pattern in the areas below 70 percent level.

In addition to video level, several cameras have some indication of audio level. For example, the viewfinder of the Ampex FPC-10 has two horizontal stripes at the upper left of the raster to indicate audio level for each of two channels. (The lower stripe doubles as a dc voltage indication.) RCA's Hawkeye has twin LEDs that light when the two audio channels have come up to full level; Panasonic's ReCam and Bosch's Quartercam also have audio level indicators in the viewfinder.

Completion of the white balance (and sometimes black balance) function is indicated in several manufacturers' viewfinders, usually by means of a simple tally light. An exception is the RCA Hawkeye, which displays a square white cursor over the sample area while auto white or black balance is being performed. When the function is successfully completed, the cursor disappears. A similar indicator in the Philips LDK 44 viewfinder has a black cursor. Black balance in the LDK 44 is indicated by a straight line across the picture, and an addition indicator, consisting of vertical and horizontal lines that bisect each other, shows completion of auto registration and auto white balance functions. Bosch's KCF 1 shows a "window" over the sample area for white balance.

Another viewfinder feature that differs considerably among manufacturers is the ability to view the output of the recorder's confidence heads (contingent, of course, on using an appropriately equipped VTR). JVC's new CR-4700U 3/4-inch portable recorder, for example, is thus equipped, and Walton says the confidence circuit on the viewfinder is "probably the most useful feature. It tells you whether or not you've got a picture." According to Walton, Panasonic has used the camera's return video circuit, usually used for program or VCR output, to view video confidence.

With RCA's Hawkeye and TK-710, VTR playback can

# The new Philips LDK 6

**The first "total"  
automatic camera.**

Only the LDK 6 provides 100% automatic control for all primary and secondary setup adjustments... plus it has multiple diagnostic systems and many other automatic and operating features.

The LDK 6's advanced design provides unprecedented reliability and flexibility. It launches a new era for broadcast and production.

If you are interested in the most advanced studio/field camera available today, and the best investment for the '80s... put yourself behind the LDK 6.

Call or write for details.  
Philips Television Systems, Inc.  
900 Corporate Drive  
Mahwah, New Jersey 07430  
201-529-1550

Circle 144 on Reader Service Card

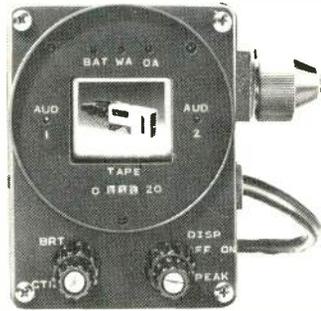


# PHILIPS



be seen in the viewfinder, as long as the camera is connected to a recorder that plays back. This is not, however, a video confidence feature, which many manufacturers see as unnecessary. "Video confidence is only useful with a color monitor," according to Hitachi's Coleman.

The LDK 44 offers some unusual test aids through its viewfinder. When the camera is in the standby mode, a sawtooth pattern can be generated for camera troubleshooting. The camera also generates color bars.



LEDs surrounding the viewfinder CRT of the RCA Hawkeye give information on battery status, white balance, audio level, and tape time remaining.

### Striking a balance

It is apparent, therefore, that camera manufacturers are limited only by their imaginations in the kinds of information they can feed into a viewfinder. Even so, most choose to keep their offerings fairly simple and straightforward, reasoning that the camera operator is most concerned with the picture. An interesting distinction is made by Panasonic's Fujii: "The kind of information you need on a camera viewfinder depends on the kind of camera operator. An amateur needs a lot, but professionals know how the camera works, and sometimes they don't like so much

information. They want the actual picture instead."

"A cameraman's basic function is to frame and focus the picture," states Bonan. "He only needs to know if something will not allow him to keep recording."

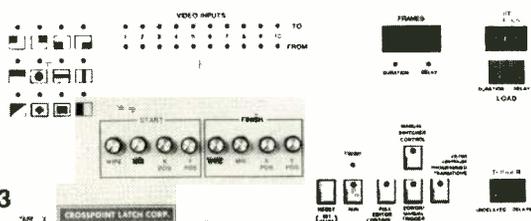
Still, many manufacturers see the number of viewfinder indicators increasing in the future as microcircuits make additional data available and competition for the flashiest viewfinder increases. Bonan likens the trend to what has happened to 35 mm still cameras in the past few years, with exposures, f-stops, shutter speeds and other information suddenly appearing in viewfinders. But while they recognize the trend, not all are convinced.

"Again, I would question what a camera operator needs to see other than correct levels, proper color balance, and some warning that he or she is about to run out of juice," says Walton. "As long as camera operators have two hands, switch positions will provide the final check. After all, you don't have an indicator to tell you that the indicator's not working."

On the other hand, it is possible that some manufacturer may one day incorporate the electronics necessary to present, at the operator's discretion, a waveform monitor/vectorscope display of the camera or VTR output right in the viewfinder. For the operator who is also an engineer, such convenience would mean the virtual elimination of supplementary scopes. Not all operators would welcome such an addition, and not all would be able to use it. But it comes down to a matter of taste—the reason why some buy automobiles with fancy dials and displays while others are content with speed and fuel indicators. **BM/E**

## A POWERFUL COMBINATION FOR YOUR POST-PRODUCTION FACILITY

### EDITOR SWITCHER INTERFACE CONTROLLED



6403

The 6403 allows the editor to talk to, and control your CROSSPOINT LATCH 6112, 6124, 6139 switchers.

With any editor, it can accept the 'cut-in' command pulse from the editor, and perform frame accurate mixes and wipes, and keys. It can even perform wipes which start or stop part way on the screen. It also performs delayed transitions.

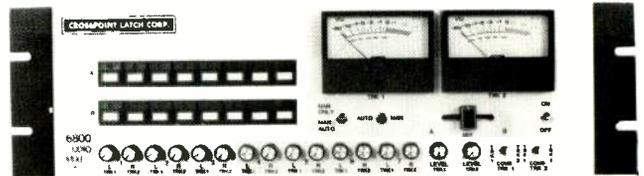
With sophisticated editors, it permits the switcher to be controlled entirely from the editor keyboard, accepting and executing commands such as, duration times, pattern types etc.

6403  
\$2750

Editor Module \$995  
(specify editor)

95 Progress St., Union, N.J. 07083  
(201) 688-1510 Telex 181160

### EDITOR AUDIO MIXER CONTROLLED



The 6800 is an audio mixer which can be controlled directly from an editor, to perform dissolves or cuts. It has a built in tone generator. Input 7 can be internally jumpered to perform a voice over function. The 6800 accepts commands such as duration times, and input selection from the editor keyboard. It also has a front panel manual override. The 6803 is an audio-follow mixer for the 6139, 6112 and 6124 switchers.

On both mixers the inputs are dual channel (stereo) and can be reversed or combined at the outputs.

6800 \$3500

6803 \$2500 (audio-follow only)

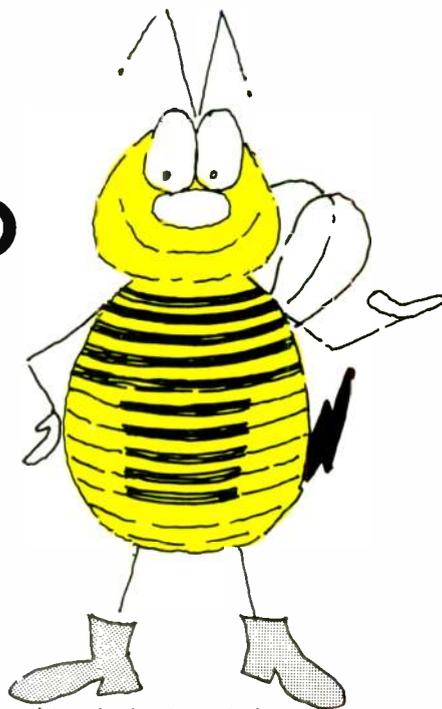
6112 \$7950

6124 \$13,700

6139 \$14,500

**CROSSPOINT LATCH CORP.**

# MEET THE **BUZ** Series 2000



Talk about blood, sweat and tears. Boy.

We had an idea two years ago to create a computerized newsroom system. And we had the talent. Hurry-up newspeople who wanted miracles — a system that did everything fast and easy. Imaginative engineers who wanted miracles — elegant, efficient design. Sharp programmers who wanted miracles — time and logical approaches.

Sometimes we didn't understand each other. Sometimes we had to shake hands in order to proceed. Sometimes we worked 16 and 20 hours a day. Sometimes we gave up our weekends. Even Friday nights.

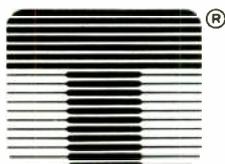
But, you know what we got? Miracles. We got the **BUZ SERIES 2000**.

It's great. We're using local area networking (LAN) so our system is quick. Its' data-transmission speeds zoom up to one million bits per second. The system can be easily and economically expanded so it's priced and sized for all markets.

It now has assignments, show formatting, scripting and editing, and wire capture. On their way are indexing, research morgue, and interfaces to teleprompters, still storers and titlers. These applications are so easy to use, we'd bet there's not a reporter on your staff who couldn't write and edit an entire story after their first 10 minutes at our terminals.

That's another thing — our terminals. They have their own Motorola 68000 processors. They're so "smart," they rarely have to call on any other devices to do their work. That's one of the reasons why our system is so fast. Resource isn't taken up with minor tasks —just the big ones like file serving.

Bragging? You bet.



Come see us at RTNDA in September at Las Vegas. Or visit us in Phoenix. We'll show you our miracle. We can hardly wait.

If you've already decided on a computerized newsroom system, we think you might be a little sorry.

If you haven't, boy, are you ever going to be glad.

Telesource Communication Services, Inc.

Phoenix, Arizona

(602 ) 265-1232



**We couldn't improve the  
conditions you work under.  
So we improved  
the tape you work with.  
Introducing...**

**maxell**<sup>®</sup>  
PROFESSIONAL  
INDUSTRIAL PII

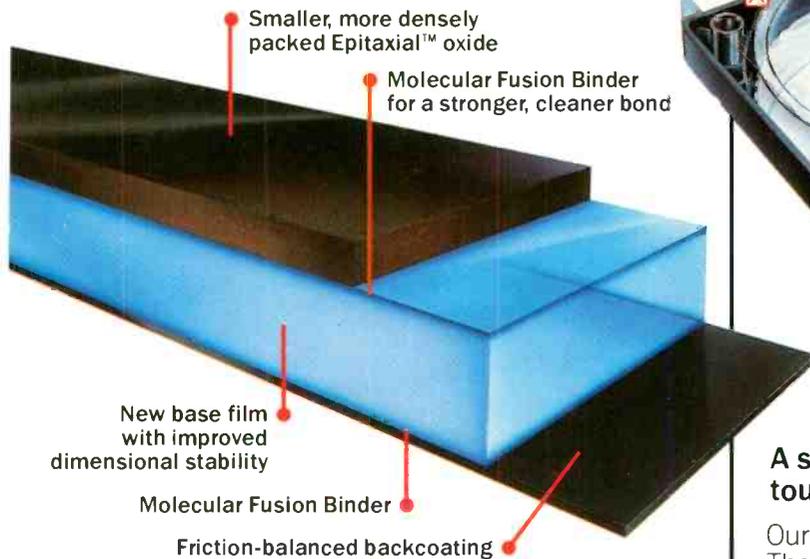
**HGX  
PRO**  
For ENG  
Recording

*Epitaxial*<sup>™</sup>  
Videocassette **VHS**

**T120**

# Introducing the world's first HGX Pro 1/2" Videocassette.

Introducing tape performance impervious to the whims of weather and the rigors of editing. Maxell has harnessed new tape technology and with it, given ENG dramatic improvements you can see, hear and retain. In the field or under freeze frame.



## The Epitaxial™ contribution: higher video, brighter chroma.

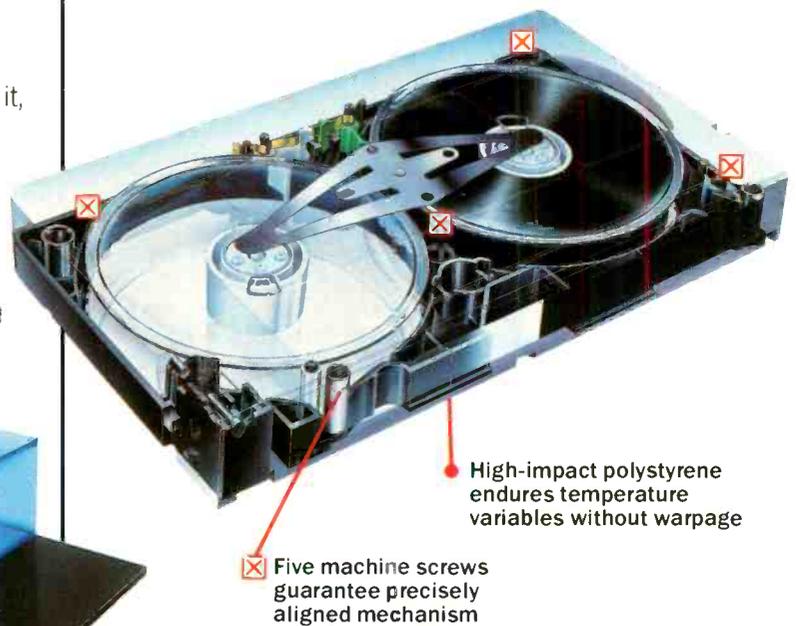
Unique, uniform cobalt ferrite oxide particles, now even smaller (a mere 3 microns long), yield unprecedented packing density. Expect enhanced signal-to-noise ratios in audio and video. Better definition. Brighter chroma. And no significant signal loss despite endless editing replays.

## Molecular Fusion Binder: longer life bonding for truer-to-life performance.

Gone are conventional adhesives that time and temperature tempt to the surface. In their place, self-curing resins fuse oxides to the base film. It's a bond immune to time and mechanical stress. Anticipate far fewer dropouts, less clogging and extended tape and head life.

## New base, binder, backcoating. Better support for the signal.

No static. No noise. No dust. The molecular-fused backcoating provides a perfect balance between inside and outside surfaces. For controlled friction. Less mechanical and magnetic noise. And optimum running smoothness, even in high heat.



## A shell made to the industry's toughest standards.

Ours. The transport is smooth, quiet and jam-proof. The housing immune to temperature extremes. The construction leaves nothing to chance.

From open reel tapes to a complete line of KCS/KCA U-Matics, audio and VHS/Beta cassettes, we're getting quality down to a science. And in your hands, our science turns to art.

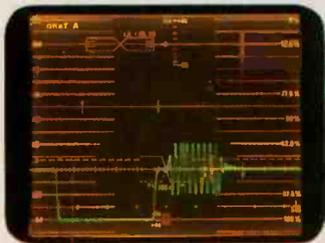
## HGX Pro 1/2" Videocassettes are available in Beta and VHS formats.



# maxell®

Maxell Corporation of America  
60 Oxford Drive, Moonachie, N.J. 07074 201-440-8020

# JVC engineers another breakthrough in video cameras.



JVC, a world leader in miniaturization of electronic components, brings you a new option at the highest level of production quality cameras.

**ProCam™ Video Cameras!**

They're available in two models: ProCam 950 with LOC diode gun Plumbicon\* tubes, and ProCam 900 with LOC diode gun Saticon\*\* tubes.

Never before has so much been put into cameras this size. One look at the double-sided circuit boards will give you an idea of how packed with features they are. And you'll see the great results every time you use them.

You'll see great picture quality: Better than 600 Lines Resolution... Signal-to-Noise Ratio of 58dB.

You'll see great performance features: Auto-Shift Registration... Automatic White and

Black Balance... Corner Registration Correction... Matrix Masking... Auto Centering... Flare Compensation... Focus Wobbling... Auto Black Level Stabilization... Zebra Stripe Video Level Indicators in Viewfinder... 2H Vertical Contour Correction... Split Field Color Bar Generation... f/1.4 Prism Optics With Built-In Quartz Filter... Stable RS-170A Sync Output with Color Frame.

You'll see great convenience features: Light Weight... A Pickup Tube Protection Circuit... Compact, Solid Aluminum-Diecast Body... Memory Back-Up... Preheating Circuit... Video Recorder Power Save Circuit... LED Viewfinder Indicators... Digital H/V Variable Blanking. You'll see traditional JVC value... traditional JVC



reliability... traditional JVC flexibility. And you'll see them in distinctly untraditional cameras... but cameras whose advanced circuitry is in the unique JVC tradition.

## ProCam™

For more information, call toll-free

**1-800-JVC-5825**

Or write JVC COMPANY OF AMERICA  
Professional Video Division, Dept. BME 9/83  
41 Slater Drive, Elmwood Park, NJ 07407  
JVC CANADA, Scarborough, ONT.

**Someday  
others will build  
3-tube color  
cameras like JVC.  
Not yet!**



© 1983 JVC COMPANY OF AMERICA

ProCam is a trademark of US JVC CORP.

\*Plumbicon is a registered trademark of North American Philips Corp.

\*\*Saticon is a registered trademark of Hitachi Denshi, Ltd.

# JVC®

JVC COMPANY OF AMERICA  
Professional Video Division

Circle 148 on Reader Service Card



News directors set to monitor increasing importance of news at annual meeting in Las Vegas.



When the thirty-eighth annual RTNDA conference convenes in Las Vegas later this month (September 22-24), more than 80 exhibitors will be on

hand to show the news community how the technology for gathering and presenting the news has become an inseparable part of news itself. And, with more time deliberately set aside for conventioners to tour the exhibits, RTNDA president-elect and program chairman Ed Godfrey of WAVE-TV, Louisville, is urging RTNDA members "to bring their chief engineers along this year."

Highlights of the exhibit (a complete listing of exhibitors and booth numbers follows) include a fully operational radio studio designed by Pacific Recorders & Engineering, from which broadcasts will originate during the convention. (The studio will be installed as

part of the new broadcast center at KSL, Salt Lake City, after the convention.)

Convention panel discussions will concentrate on topics of major concern to news directors: the TV assignment desk; campaign and election coverage; business and economic reporting; and the GM/ND relationship (see *BM/E*, November 1982; p.77, "Make the News Director a GM?", based on RTNDA research). Another panel will focus on the popular subject of newsroom computers.

RTNDA attendees can also look forward to an impressive lineup of guest speakers. Bill Moyers (CBS), Paul Harvey, and Diane Sawyer (CBS) will deliver luncheon addresses. Sig Mickelson will receive a distinguished service award. David Brinkley (ABC) will deliver the keynote speech. And John Chancellor (NBC) will close the proceedings by his acceptance speech at the Paul White Award banquet.

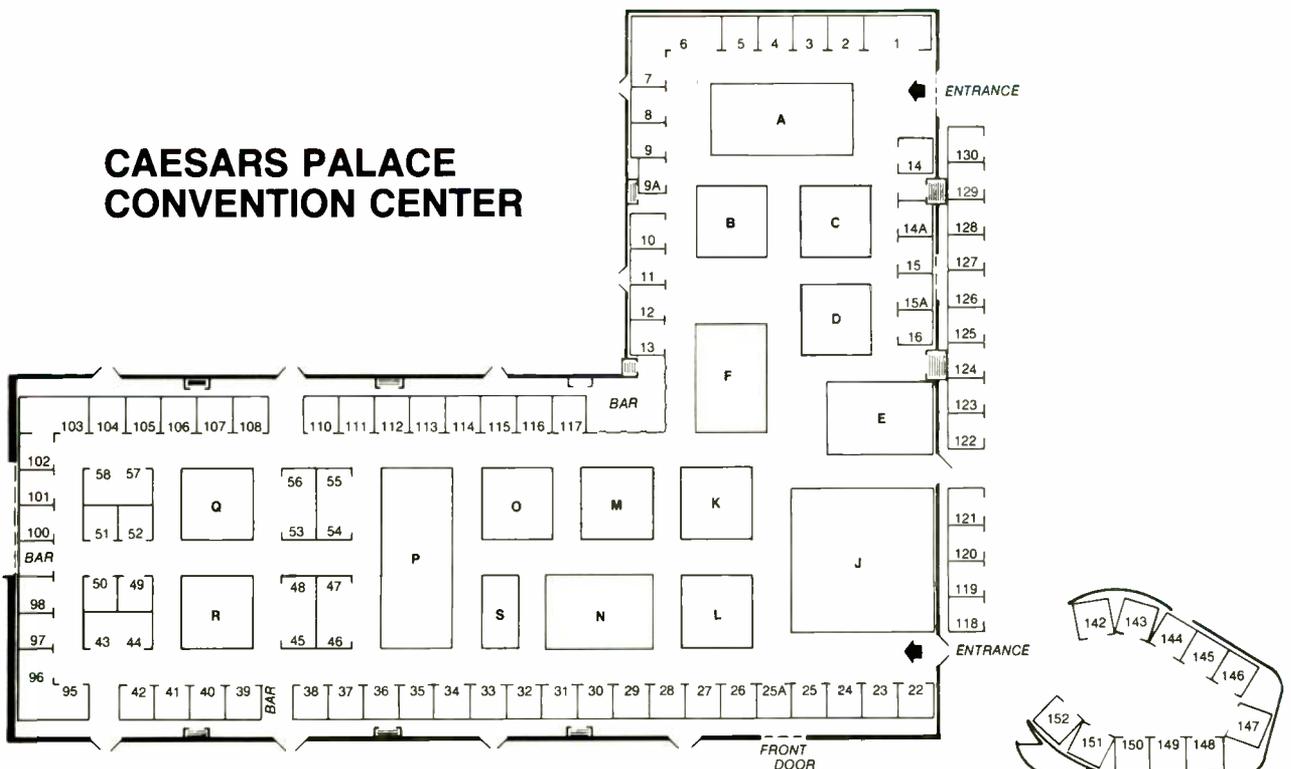
A full report on the convention will appear in the November issue.



## CONFERENCE EXHIBITORS

EXHIBITOR	BOOTH NO.	PRODUCT OR SERVICE	EXHIBITOR	BOOTH NO.	PRODUCT OR SERVICE	EXHIBITOR	BOOTH NO.	PRODUCT OR SERVICE
Accu-Weather	50	Weather systems	Fujinon	114	Lenses	Graphic Express	14	Sets, graphics
ADDA	B	Still stores	G&G Design	6, 7	Sets, graphics	Ivanhoe	51	Programming
Alcare	24	Features	Communications			Jacobs & Gerber	49	Programming
Alden	45, 48	Weather recorders	JVC	C	Production equip.	Jefferson Data	Q	Newsroom computers
Angenieux	25	Lenses	Kavouras	95, 96	Weather systems			Weather systems
Asaca	30	Newsgathering systems	King Features	32	Features			Features
Associated Press	22, 23	Programming	King World	K	Programming			Programming
Basys	107, 108	Newsroom computers	Lang Video	100	ENG switchers			ENG switchers
BEI/McInnis-Skinner	P	Newsroom computers	Marti	117	Transmission, RPU			Newsroom computers
Bill Black	46, 47	Mobile vans	McInnis-Skinner/BEI	P	Newsroom computers			Newsroom computers
Bonneville	122, 123	Satellite services	Mead Data	110-112	Newsroom computers			Newsroom computers
Bosch	54, 55	Production equip.	Media Computing	98	Newsroom computers			Newsroom computers
Bdcst. Microwave (BMS)	118-121	Microwave	Midwest Corp.	53, 56	Mobile vans			Mobile vans
Bdcst. News Service	9A,10	Programming	Mighty Minute Program	4	Programming			Programming
CBN/Newscom	40	Programming	Newslink	97	Programming			Programming
Colorgraphics	M	Weather systems	NY Comm.	57, 58	Programming			Programming
Comrex	28	Audio production	N*I*W*S	A	Programming			Programming
CQI/Sportsticker	16	Programming	Pacific Recorders	Radio Newsroom	Production equip.			Production equip.
Crosspoint Latch	124, 125	Production switchers	PEP	26, 27	Power supplies			Power supplies
Creative Works	52	Production	Quanta Corp.	1-3	Newsroom computers			Newsroom computers
Docuvid	41	Production services	Q-TV	116	Teleprompters			Teleprompters
E-N-G Corp.	E	Mobile vans	RCA	N	Production equip.			Production equip.
Environmental Satellite	113	Transmission	Reunion Tower	142, 143	Transmission			Transmission
Fortel	43, 44	Image processing	Rip 'N Read	127	Programming			Programming
			Rohr's TV	29	Production services			Production services

## CAESARS PALACE CONVENTION CENTER





<b>Scribe Recorders</b>	<b>128, 129</b>	<b>Newsgathering equip.</b>	<b>Thomson-CSF</b>	<b>8, 9</b>	<b>Cameras</b>
<b>Sony</b>	<b>J</b>	<b>Production equip.</b>	<b>Turner Bdcst.</b>	<b>F</b>	<b>Programming</b>
<b>Station Program Resources</b>	<b>36</b>	<b>Programming</b>	<b>Sports Network</b>	<b>106</b>	<b>Programming</b>
<b>Telescript</b>	<b>25A</b>	<b>Teleprompters</b>	<b>UPI</b>	<b>L</b>	<b>Programming</b>
<b>Telesource</b>	<b>R</b>	<b>Newsroom computers</b>	<b>Ultimatte</b>	<b>101</b>	<b>Special effects</b>
<b>TV Engineering Corp.</b>	<b>151, 152</b>	<b>Mobile vans</b>	<b>Westinghouse-Group W</b>	<b>D</b>	<b>Programming</b>
<b>Terminal Systems</b>	<b>12</b>	<b>Production equip.</b>	<b>Winsted</b>	<b>126</b>	<b>Racks, cabinets</b>
			<b>Wold</b>	<b>102, 103</b>	<b>Satellite services</b>
			<b>WSI</b>	<b>34, 35</b>	<b>Weather systems</b>
			<b>(partial list as of 7/15/83)</b>		

## PROGRAM HIGHLIGHTS

### Wednesday, September 21

8:00 a.m. Golf & tennis tournaments

6:30 p.m. Welcoming reception

### Thursday, September 22

8:00 a.m. Business breakfast

8:45 a.m. Business meeting: reports, resolutions, nominations

9:30 a.m. RTNDA DSA acceptance: Sig Mickelson

Keynote Address: David Brinkley, ABC News

10:00 a.m. Visit exhibits

11:30 a.m. Reception

Noon Luncheon: RTNDA Canada Report; Foundation Report; address by Bill Moyers, CBS

2:00 p.m. Visit exhibits

3:30 p.m. Radio Workshop: The PR Experts  
Lou Adler, WOR radio, New York City

Herb Schmertz, Mobile Oil  
Michael Klepper, Michael Klepper Assoc.

George Glazer, Hill & Knowlton

TV Workshop: TV Assignment Desk  
Zeke Segal, CBS News, Atlanta  
Chris Schmidt, WREG-TV, Memphis

Jon Mangum, WKRG-TV, Mobile  
Jim Rutledge, CNN, Washington, DC

6:30 p.m. Basic Computers for Newsroom Administration  
Skip Haley, WSFA-TV, Montgomery, AL

### Friday, September 23

9:00 a.m. Joint Workshops: Radio/TV Writing  
Rob Sunde, ABC Info. Network  
Charles Osgood, CBS News  
Av Westin, ABC News

Joint Workshops: Trouble in the Newsroom—Booze and Pills  
Tom Becherer, WLKY-TV, Louisville

Jim Wollert, Memphis State U.  
Lou Sanman, ABC TV  
Ellen Baker, VA Center

11:00 a.m. Visit exhibits

Noon Luncheon: RTNDA Intl. Radio

2:00 p.m. Awards; address by Paul Harvey

Business Meeting: elections, resolutions

3:30 p.m. Radio Workshop: Business and Economic Reporting

Mel Kampmann, Foundation for American Comm.

TV Workshop: Campaign and Election Coverage

Mike Michaelson, C-SPAN

Mike Miller, Republican Natl. Committee

Bob Neuman, Democratic Natl. Committee

Robert Snow, U.S. Secret Service  
Bruce Hough, Bonneville Satellite Corp.

### Saturday, September 24

8:00 a.m. Radio member meeting

9:00 a.m. Radio Workshop: The GM/ND Relationship

Gregg Peterson, WBBM, Chicago  
John Price, WWVA, Wheeling, WV  
Robert Biernacki, GM, WOR-AM, New York

Dale Miller, GM, WAJR, Morgantown, WV

TV Workshop: The GM/ND Relationship

Ron Miller, WWBT-TV, Richmond, VA

Jeff Davidson, President/CEO, Gannett Bdcst.

Richard Manship, GM, WBRZ, Baton Rouge, LA

A. Rabun Matthews, WSB-TV, Atlanta

Bob Sherwood, KFTY, Santa Rosa, CA

11:00 a.m. Visit exhibits

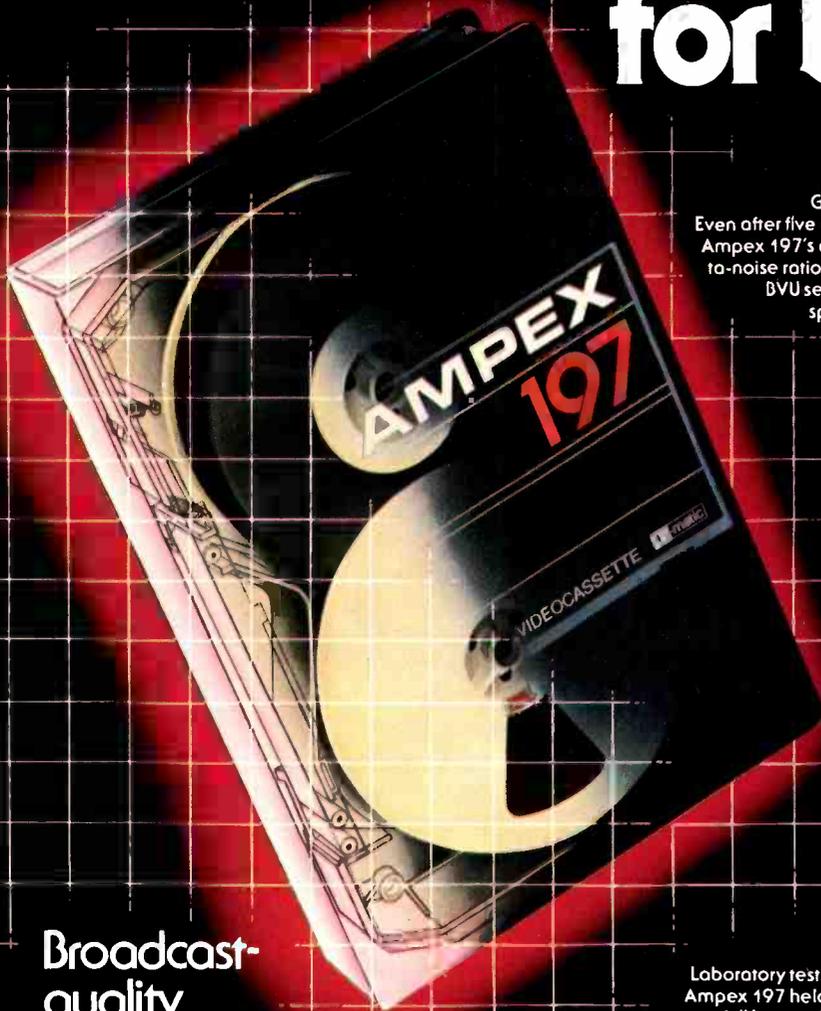
Noon Luncheon: RTNDA Intl. TV Awards; address by Diane Sawyer, CBS News

2:00 p.m. Joint Workshop: Management Motivation

Leo McManus, LF McManus Co.

6:30 p.m. Paul White Award Reception and Banquet; address by John Chancellor, NBC News

# Ampex 197: designed especially for broadcast.

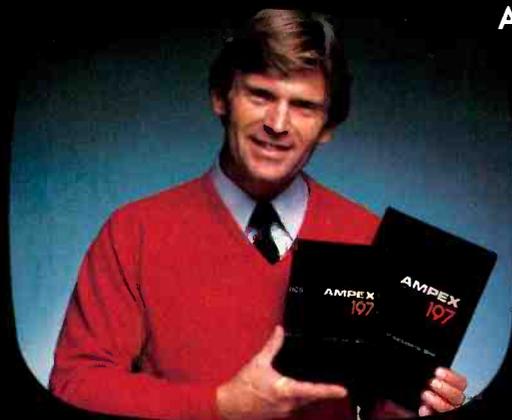


**Broadcast-quality color and sharpness.**

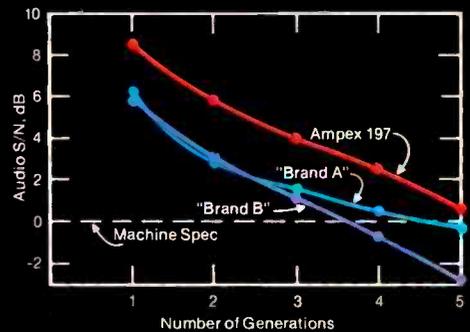
The Ampex 197 3/4" videocassette was developed with nothing less than perfection as the goal.

With superb chrominance and luminance performance it is ideal for ENG, EFP and on-line editing.

Ampex 197 has been especially formulated to optimize the performance of Sony BVU recorders.



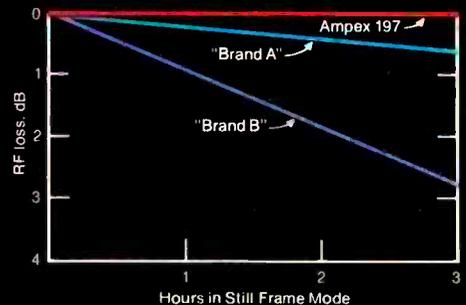
**AUDIO MULTIPLE GENERATIONS**  
Even after five generations, Ampex 197's audio signal-to-noise ratio exceeds the BVU series machine specifications.



**Broadcast-quality sound.**

Ampex 197 offers superior signal-to-noise and low distortion characteristics. This means crisper, cleaner audio performance under heavy editing conditions and multiple generation dubbing. Plus excellent stereo fidelity when used for music recording.

**STILL FRAME DURABILITY**  
Laboratory tests proved that Ampex 197 held up for three full hours with no RF loss.



**Broadcast-quality reliability.**

In blind field testing, Ampex 197 got the highest marks from broadcast professionals for picture quality, stability, and durability.

Find out more about why Ampex 197 is quality worth broadcasting. Call your Ampex Regional Office or write to: Ampex Corporation, 401 Broadway, Redwood City, CA 94063 (415) 367-3809

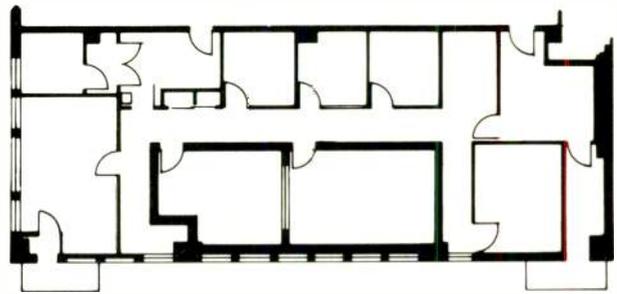
**AMPEX**

Ampex Corporation • One of The Signal Companies

**Quality worth broadcasting.**

Circle 149 on Reader Service Card

# PART 10



# SELECTING AND INSTALLING AN AM ANTENNA

BY JOHN H. BATTISON

THE ANTENNA, THE LAST LINK in the chain between the studio and the electromagnetic carrier in space, is the link most often grossly neglected. Antennas for FM and TV, ordinarily out of reach on tall towers, are comparatively easy for the engineer to ignore as long as they work even moderately well. But even easier to forget, AM antennas, usually standing right on the ground, too often are poorly designed and operated. The engineer's quick reaction to his AM antenna is likely to be, "that rusty old tower in the field."

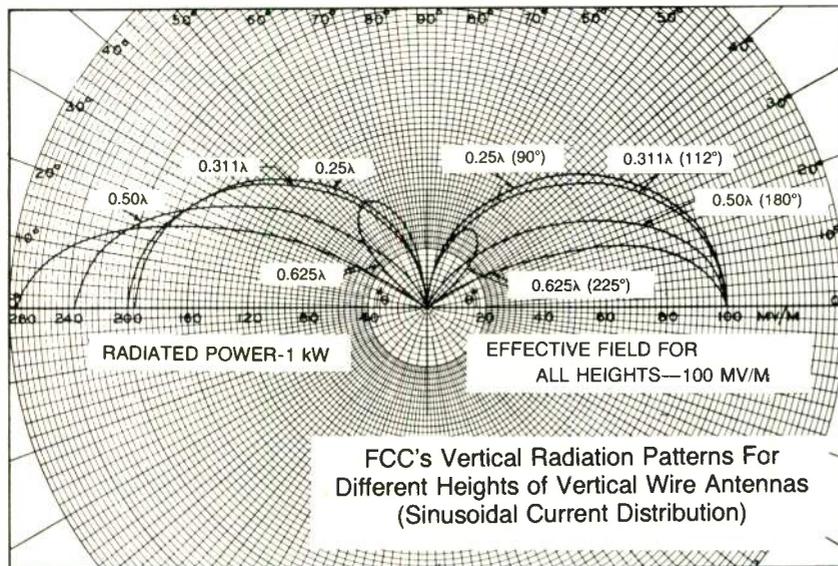
Instead, he should be thinking carefully and intelligently not only about the "rusty old tower" but also about the ground system at its base, the transmission line, and the tuning and coupling devices. It is essential to design and

out of service many years ago. The vertical radiator has a lot of advantages for AM broadcasting:

- It is nondirectional in the horizontal plane.
- Construction is simple and the cost is low.
- Efficiency can be high.
- It has ready control of base operating impedance.
- Vertical polarization gives excellent results since most receiving antennas, including auto antennas, are vertical.

The radiation efficiency of a vertical antenna depends mainly on the following factors:

- Electrical "height" as related to RF wavelength.
- Base operating impedance.
- The Q.
- Transmission line losses.
- Ground-plane conductivity.
- Environment (trees, towers, hills).



The effects of electrical height on efficiency are shown for several antennas in Figure 1, which is drawn from the Federal Communications Commission's Rules, and shows horizontal fields, radiated power, and vertical patterns. It is interesting to note that the 112-degree radiator (0.311 wavelength) is extremely rare in an actual antenna. At the time the rules were drawn up, the 112-degree radiator was simply the average height of all the AM antennas in use in broadcasting in the U.S.

Up to a point, the taller the antenna, the higher the efficiency, as the chart indicates. But efficiency falls off again at heights above about 225 degrees. The full-wave antenna, 360 degrees, is most inefficient. However, if it is economically desirable to use a very tall television or FM antenna as an AM radiator, the low efficiency can be overcome by breaking the antenna in two with insulators at the center, and feeding the two halves separately.

maintain every part of the antenna system properly to avoid having a signal poor in quality and a stumbling block to the station's efforts to cover the market.

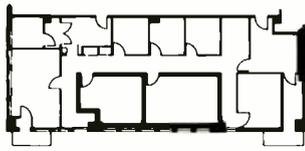
## BASIC DESIGN

All AM broadcast antennas today are vertical radiators—the last flat-top, at WOR in New Jersey, went

**John H. Battison, PE**, is director of engineering for WOSU-AM-FM-TV, Columbus, OH.

## THE QUARTER-WAVE ANTENNA

The most popular AM antenna for medium-wave broadcasting is the quarter-wave. One reason is that the



## FACILITIES DESIGN AND ENGINEERING

antenna lends itself readily to the necessary calculations for the antenna system. And it is efficient and not too costly over most of the AM band.

The quarter-wave can be driven in two different ways. One is the commonly used series feed, with the RF power fed in at the base of the antenna. The antenna must be insulated from ground at the base, as must the guy wires. The base operating impedance of this antenna is about 36 ohms, but the actual figure varies somewhat with cross-sectional dimensions as well as electrical length. Thus it is virtually unheard of to find two quarter-wave antennas with *exactly* the same base operating resistance.

The second way to drive a quarter-wave antenna is with shunt feed. Power is fed to the antenna through a line connected to a point where the antenna impedance approximately matches the transmission line impedance. The shunt feed is convenient when the original installation was for an FM or TV antenna, with a grounded tower. The tower can take up AM duty with a simple shunt feed, and no substantial alterations.

### THE FOLDED UNIPOLE

When physical height cannot reach the full dimension for a quarter-wave radiator, the folded unipole, developed by consulting engineer John Mullaney in the 1960s, is often a good solution. This shunt-fed design will give a short antenna additional electrical "length" where a full-length

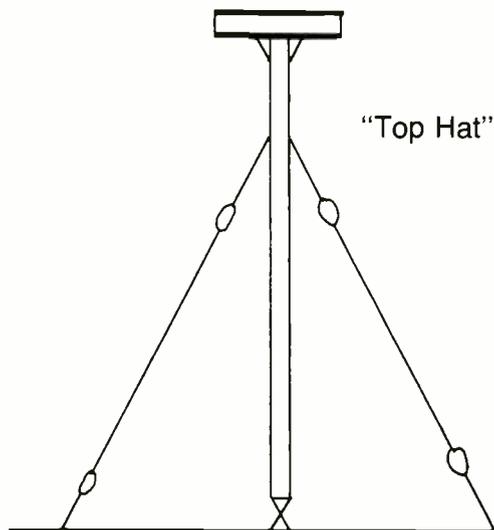


Figure 2. Top loaded tower using "Top Hat" to increase base operating resistance.

structure cannot be used such as near an airport where the FAA restricts the height of vertical structures. A 65-degree folded unipole can come close to the efficiency of a full 90-degree quarter-wave radiator and has a greater bandwidth.

One form of the folded unipole uses six wires suspended from arms at the top of the tower and insulated from it. These extend to just above ground at the base of the tower.

The addition of a "top hat" of conducting material is often used for increasing the electrical length of a vertical radiator (see Figure 2). The top hat, attached near the top

of the tower, can take several forms—such as a circular frame of conducting material on top of the tower which raises the operating resistance about 10 percent.

Even more effective is the use of the antenna tower guy wires for the top loading (see Figure 3). Twenty feet or more of each of the top three guy wires are electrically connected to the top of the tower (insulators are removed). The connections must be made carefully for very low resistance, to avoid arcing and  $I^2R$  losses. A skirt cable joins the lower ends of the three guy wires where they fasten to insulators in the lower portions.

### FACTORS IN CONSTRUCTION

A well-made antenna tower should last for years. But long life depends on expert design and construction. To obtain proper construction, the broadcaster should go to an established antenna maker with a record of success.

Basic in proper construction is the use of steel heavy enough to do the job. The taller the tower, the heavier the steel must be (a gauge that is right for a 100-foot tower is likely to be dangerously weak at 200 or 300 feet).

The greatest enemy of antenna health is rust, and the entire tower must be galvanized to prevent its formation. The best galvanizing is that done after a tower section is completely assembled so that the coating of zinc can cover all joints and cracks, as well as the steel members. If the tower section parts are galvanized before they are assembled, it is possible that the zinc may be stripped off in the assembly process, leaving openings for moisture and rust. The FCC requirement that the tower be painted in aviation red and white means that the galvanized surface must be roughened with a weak acid solution so that the paint will stick.

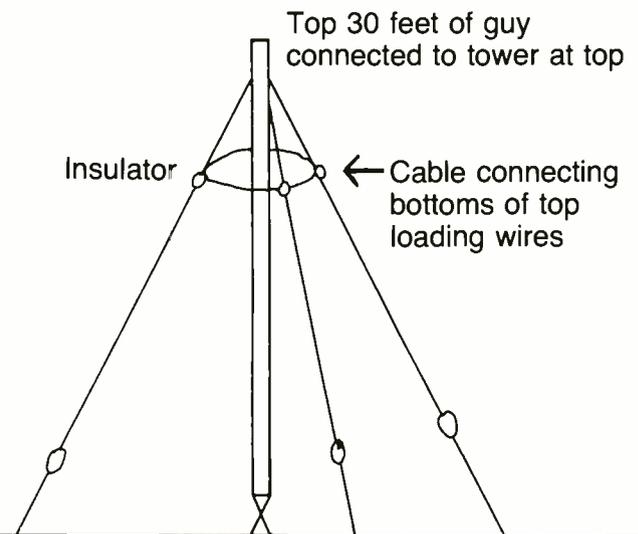


Figure 3. Top loading by means of top 30 feet of guys.

When you put up your tower, it is not enough to bolt the sections together. Across each joint you must weld or clamp a jumper cable to make sure of a low-resistance path from section to section. Many cases of poor radiation efficiency have been caused by power losses at high resistance tower joints. All bolted joints must be inspected for tightness after the tower is erected.

### SELF-SUPPORTING OR GUYED?

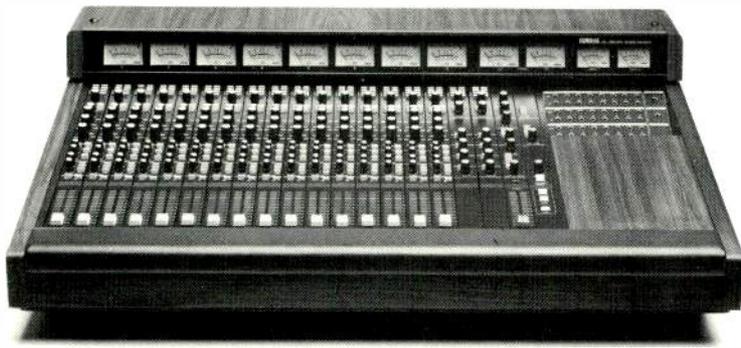
The choice between a self-supporting antenna and one held up by guy wires is usually determined by economics



And now  
a  
message  
on  
Yamaha's new  
RM1608  
recording  
mixer.

FUNCTION

- MULTI
- 2TRK
- MXD



# RM1608

## SPECIFICATIONS

### TOTAL HARMONIC DISTORTION (T.H.D.)

Less than 0.1% at +4dB \*output, 20Hz to 20kHz (all Faders and controls at nominal)

### HUM & NOISE (20Hz to 20kHz) $R_s = 150$ ohms (INPUT GAIN "-60")

- 128dB Equivalent Input Noise (E.I.N.)
- 95dB residual output noise: all Faders down.
- 80dB (84dB S/N) PGM Master volume control at maximum and all CH PGM assign switches off.
- 64dB (68dB S/N) PGM Master volume control at maximum and one CH Fader at nominal level.
- 73dB (77dB S/N) STEREO Master Fader at maximum and all CH STEREO level controls at minimum level.
- 64dB (68dB S/N) STEREO Master Fader at maximum and one CH STEREO level control at nominal level.
- 80dB (70dB S/N) ECHO SEND volume at maximum and all CH ECHO volumes at minimum level.
- 75dB (65dB S/N) ECHO SEND volume at maximum and one CH ECHO volume at nominal level.

### CROSSTALK

- 70db at 1kHz: adjacent Input.
- 70db at 1kHz: Input to Output.

### MAXIMUM VOLTAGE GAIN (INPUT GAIN "-60")

PGM	74dB: MIC IN to PGM OUT.	ECHO	70dB: MIC IN to ECHO SEND.	
	24dB: TAPE IN to PGM OUT.		C/R	74dB: MIC IN to C/R OUT.
	34dB: ECHO RETURN to PGM OUT.			24dB: 2 TRK IN to C/R OUT.
	14dB: PGM SUB IN to PGM OUT.		STUDIO	74dB: MIC IN to STUDIO OUT.
STEREO	74dB: MIC IN to STEREO OUT.		24dB: 2 TRK IN to STUDIO OUT.	
	24dB: TAPE IN to STEREO OUT.			
	34dB: ECHO RETURN to STEREO OUT.			

### CHANNEL EQUALIZATION

± 15 dB maximum

HIGH: from 2k to 20kHz PEAKING. MID: from 0.35k to 5kHz PEAKING. LOW: from 50 to 700 Hz PEAKING.

HIGH PASS FILTER - 12dB/octave cut off below 80Hz.

OSCILLATOR Switchable sine wave 100Hz, 1kHz, 10Hz

PHANTOM POWER 48V DC is applied to XLR type connector's 2 pin and 3 pin for powering condenser microphone.

DIMENSION (W x H x D) 37-1/2" x 11" x 30-1/4" (953 mm x 279.6 mm x 769 mm)

Hum and Noise are measured with a -6dB/octave filter at 12.47kHz; equivalent to a 20 kHz filter with infinite dB/octave attenuation.

\*0dB is referenced to 0.775V RMS.

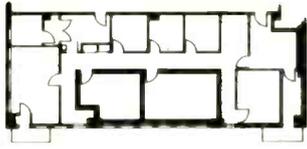
• Sensitivity is the lowest level that will produce an output of -10dB (245mV), or the nominal output level when the unit is set to maximum gain.

• All specifications subject to change without notice.

The specs speak for themselves. But they can't tell you how natural, logical and easy the RM1608 is to work. All the controls and switches are logically arranged to help you get the job done quickly and accurately.

And in the tradition of Yamaha's sound reinforcement mixers, the RM1608 sets new standards of reliability as well as ease of operation. For complete information, write: Yamaha International Corporation, P.O. Box 6600, Buena Park, CA 90622. In Canada, Yamaha Canada Music Ltd., 135 Milner Ave., Scarborough, Ont. M1S 3R1.





## FACILITIES DESIGN AND ENGINEERING

and the space available for the tower. Self-supporting, as might be expected, is more expensive, but necessary if the space is not large enough for a guy wire system.

The self-supporting tower, usually with four legs tapered outward, supplies a space under the tower for the tuning unit. The RF drive can be connected to the tower with four lengths of copper tubing, one to each leg.

The base insulators used to support series-fed towers are very important in the tower operation. Of course the insulator must be strong enough to carry the antenna weight, plus that of the guy wires and anything else hung on the tower. This is usually the responsibility of the tow-

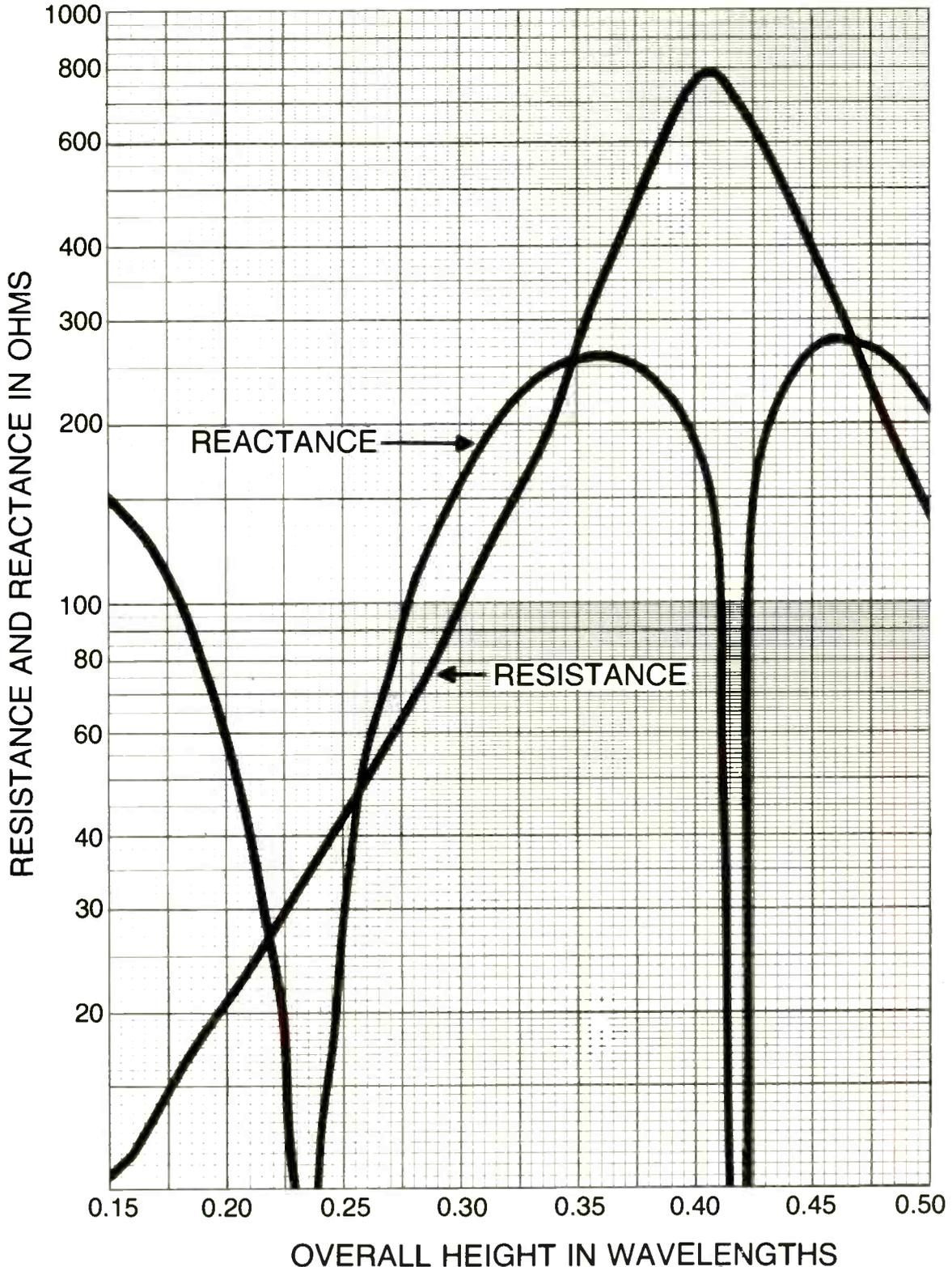
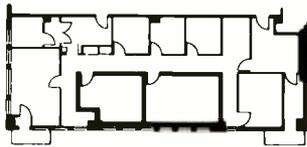


Figure 4. Graph of resistance and reactance of antennas of various lengths. This is adequate for most cases. If a more precise value is required, it can be calculated using the characteristic impedance.



# FACILITIES DESIGN AND ENGINEERING

er supplier—another reason for using a supplier with solid experience!

However, it is a good idea to interest yourself in the physical characteristics of a proposed base insulator. Be sure it has a weep hole, or holes, so that moisture can drain out promptly. An accumulation of moisture in insulator cavities is likely to crack the insulator in freezing weather, or the moisture may produce a short circuit to ground in wet weather, causing variability in the radiation characteristics of the antenna.

It is possible to jack up the antenna and put in a new insulator if the tower is installed with the necessary hardware for this purpose. (See Figure 4.)

## FEEDER SYSTEMS

Getting the RF power from transmitter to antenna with a nonradiating line is, of course, an integral part of the antenna system. The open-wire line, the favorite in the early days of radio, has high efficiency. The characteristic impedance is:

$$Z_c = 276 \log \frac{2s}{d}$$

Where:  $s$  = spacing between conductors  
 $d$  = diameter of conductors.

However, the disadvantages of the open-wire line are obvious: it is vulnerable to the weather (ice is a particular danger), and vandalism. It also has a tendency to excessive radiation. And so a natural development of the open-wire line was a form of coaxial cable, with six to twelve wires evenly spaced around a center conductor. This kind

of transmission line is still used in some parts of the world for very high-power medium-wave transmitters.

It is single coaxial cable, however, which solved the problems of the open-wire line and is now virtually universal in AM antenna systems: no vandalism if the line is buried and no damage by the weather. There are several types. Rigid coax, or "plumbing," popular in the '40s, is efficient, has a very long life when properly installed, and is relatively trouble-free. The great drawback is that the 20-foot length makes it difficult to install. The insulating spacers are fragile and easily damaged. The "bullets" that connect the inner conductors from one section to the next sometimes develop poor contacts, which may cause arcing, burning and damage to the line, in addition to power loss. Expansion and contraction because of thermal changes also make special suspension devices necessary on most tower installations.

Flexible, continuous coax is free of these installation problems, since it comes in any length. Coax can be supported on trestles above the ground, but if there is exposure to vandalism, it is safer buried below the frost line. A buried coax must have a plastic outer jacket to eliminate moisture problems.

Although it is satisfactory, in most cases, to use flexible coax without pressurization, the careful engineer will put air or gas, under pressure, in his lines by means of a dry-air pump that takes air, dehydrates it, and pressurizes the line with three to five pounds.

Nitrogen under the same pressure can be used, supplied by high-pressure cylinders with reduction valves. Nitrogen is preferred over air for high-power transmitters. In rigid coax, dry air or nitrogen pressurization should always be used.

## TOWER LIGHTS

Most broadcast towers require lighting and two kinds are used. Night-only lights are the familiar red side-

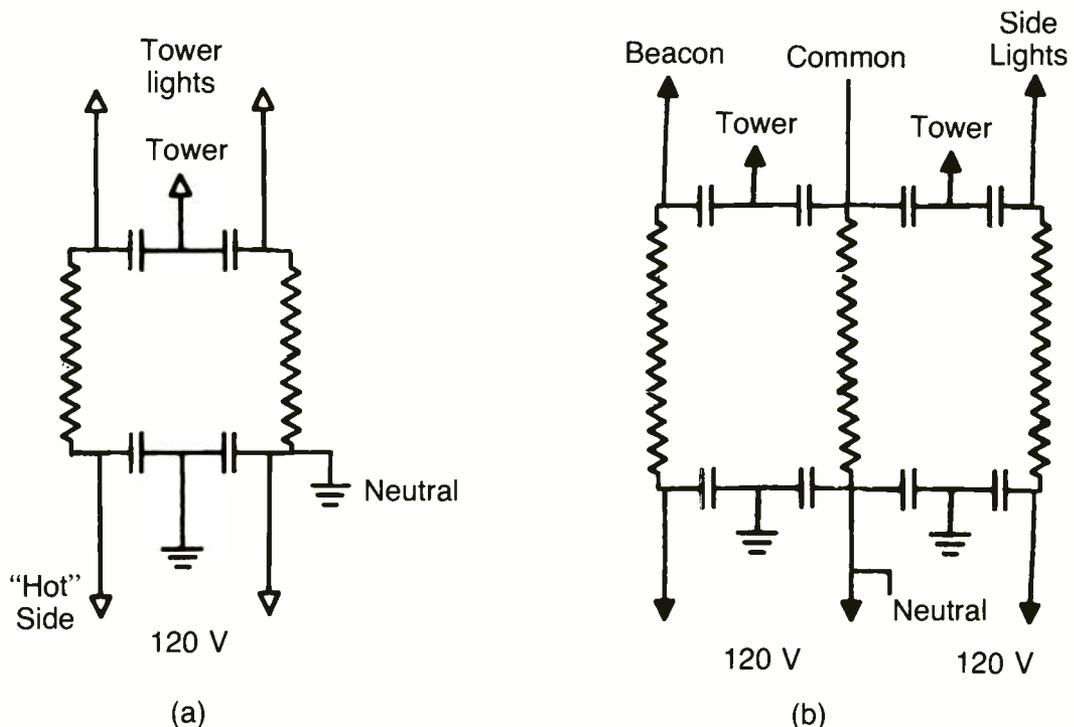


Figure 5. (a) Single supply, two RF chokes.  
 (b) Dual supply, three RF chokes.

(Note: ac power wires are usually pulled through the copper tube used to connect ATU to tower.)

# Introducing the New Electro-Voice RE30 omni and RE34 cardioid ENG/EFP microphones

**“Sophisticated microphones that simplify field production.”**

Action doesn't wait. The constant deadlines faced by news gathering and field production crews demand equipment compatibility, fast set-ups, simple operation and absolute reliability.

#### Electro-Voice knows.

We've designed and built the broadcast microphones that have set performance and reliability standards, and we stand behind EV Professional Microphones with a warranty and service policy that's second to none.

#### And EV listens.

Properly designed broadcast products are the result of pooled efforts. That's why EV devoted years to research, by working with network and local broadcasters to engineer all of the desired features into a pair of rather revolutionary new microphones for ENG and EFP.

EV confirmed that field microphones should incorporate low handling noise, resistance to humidity and moisture problems, extreme durability, and the same reliability and level of performance that the industry has become accustomed to expect from EV microphones like the phenomenal 635A and RE20.

#### Introducing the RE30 and RE34.

Because remotes present a variety of acoustic environments, EV engineered the RE30 with an omnidirectional pickup pattern, and the RE34 with a cardioid pattern. Except for their polar patterns, each model has the same features.

Both the RE30 and RE34 have switchable outputs—either line level or microphone level. No longer will field crews



be stuck without the right signal level. A flick of the recessed switch adjusts the output level, producing instant compatibility without the need for extra equipment or cables. The low distortion line-level amplifier allows direct interface with line-level inputs such as those common on microwave and fiber optic transmitters.

Additionally, the RE30 and RE34 will drive and hold telephone lines\*.

\*F.C.C. approved interconnect may be required.

Each microphone includes a low-distortion limiter which functions at either output level.

The RE30 and RE34 can be powered by either phantom power or a standard, available anywhere, 9-volt “transistor radio” battery. With both power sources present, the battery becomes a redundancy powering system that instantly and silently takes over if ever required.

An LED, mounted so as to be easily visible to the talent only, serves several important functions...it shows the presence of phantom power, monitors battery condition, and offers the world's first hand-held “tally light” to signal on-air personalities from off-camera.

#### Get the whole story.

No advertisement can hope to explain all of the features of these incredible new microphones. Complete engineering data sheets describing the many features and benefits of the RE30 and RE34 are available free upon request.

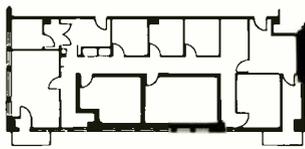
Many Electro-Voice Professional Microphone Dealers can arrange a hands-on trial at no cost to you. For more information please write to: Greg Silsby, Market Development Manager/Professional Markets, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.



a gulton company

**EV** Electro-Voice®  
SOUND IN ACTION™

Circle 152 on Reader Service Card



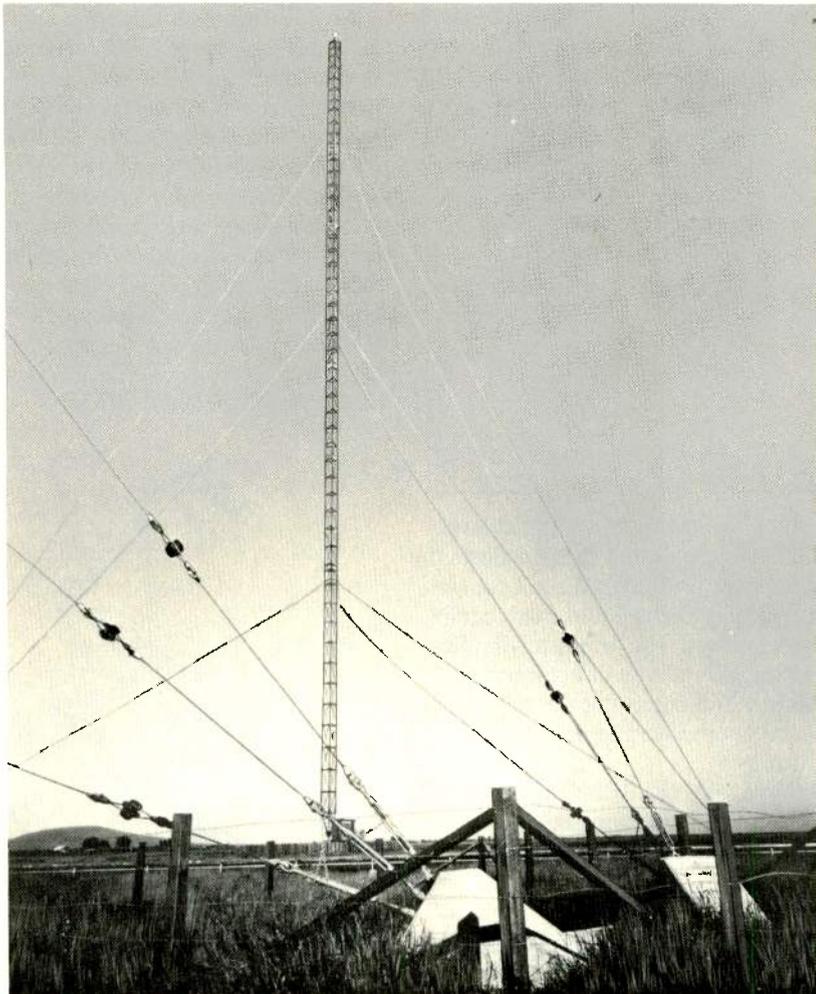
## FACILITIES DESIGN AND ENGINEERING

markers on the tower and flashing red beacon on top. Strobe lighting, on the other hand, is required by the FAA and FCC on tall towers and at locations near airports. Strobe lights are available that automatically shift from highest intensity in daylight to lower intensity at dusk, and to lowest at night. This helps reduce complaints from homeowners in the surrounding area.

On a grounded tower, there is no problem in supplying ac power to operate the lights. On a tower insulated from ground, however, some method must be found to get the power across the base insulator without shorting it to ground.

The best device for this is the Austin transformer, formed of two coils, rather like doughnuts, intersecting, but not touching, each other. The primary is attached to the tower footing and the secondary to the tower itself.

Another way to power is with lighting chokes. Figure 5 shows lighting choke circuits properly for one or two ac feeds to the tower. Lighting chokes work well as long as they are properly maintained. But if they are damaged and the inductance is reduced, antenna efficiency and radiation can be impaired. It is also important to use high-quality bypass capacitors to keep residual RF from getting into the power lines.



An AM antenna tower from RCA.

If you use lighting chokes, it is a good idea to measure the base operating impedance with, and without, the chokes connected. Any effects they have on the antenna characteristics will show up clearly. This information is also useful for reference if you have any problems with antenna performance.

## GROUND SYSTEMS

The power fed to the antenna system is dissipated in two major loads. One is the radiation resistance of the antenna itself, which determines the power actually radiated, the other is the resistance of the ground system. Clearly the ratio of antenna resistance to ground-system resistance determines the efficiency. With a total system resistance of 25 ohms, of which 20 is radiation resistance and 5 ohms is ground resistance, the efficiency will be poor—about 80 percent.

The ground system resistance is important because the currents induced in the earth by a vertical radiator return to the antenna along converging paths through the ground. Since the earth is an imperfect conductor, there will be  $I^2R$  losses in the ground, and these losses will be substantial unless steps are taken to reduce them.

A system of copper wire radials will drastically reduce the ground losses. Common practice is to make the radials about as long as the tower is high. In fact, there is very little to gain from making them longer—the area close to the antenna base is the most important. In general, the shorter the antenna, the higher the ground losses.

The usual radial system consists of 120 buried radials, spaced three degrees apart, equal in length to the height of the tower.

The ground system resistance can often be made even lower with shorter, 50-foot radials between the main radials. This interleaved system is often used where the ground conductivity is especially poor and the return current is expected to be high.

Another way to get low resistance in the ground path close to the tower is by burying a mat of expanded copper at the tower base. The mat can be from 24 to 48 feet square. A mat is especially useful if there is not room for the full length of the radials. If the radials on one side must be a little shorter than those on the other, a very small decrease in radiation on the short side might be detected by measurement. But it is most unlikely that listeners in that direction would be aware of any loss of signal strength.

The ATU must be installed close to the base of the tower and grounded with a four-inch copper strap brazed directly to the ground system. The trenches carrying the transmission line, ac power, intercom lines, and any sampling lines should be dug and all installed *before* the ground system is put in place. It is better to use conduit pipe for these cables; then if a cable has to be replaced, you are not required to dig up the whole system.

BM/E

# The telecine without tubes.

## Digital CCD technology means better pictures.

Advanced technology in the new Bosch FDL 60 "U.S. Series" with PanScan and black stretch gives you tremendous advantages over conventional film scanners.

And the most important of these is superb picture quality with high resolution, excellent signal-to-noise ratio, and brilliant color rendition with negative or positive film.

### CCDs make the difference

The use of solid-state CCDs—charge-coupled devices—completely

eliminates electro-optical problems inherent to pickup or scanning tubes.

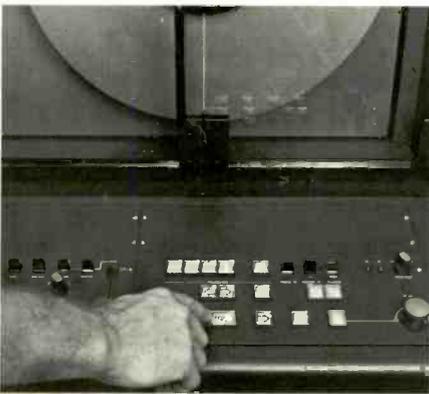
You don't have to worry about burn-in, afterglow, or field lag because there's no photoconductive or phosphor layer to cause these effects.

You can forget about shrinkage, flicker, vertical deflection, horizontal misregistration, and positioning errors of all kinds.

And never again will you be subjected to the expensive ordeal of tube changes.

### New operational modes

Thanks to the FDL 60's capstan drive and digital signal processing, you can operate slow motion, fast motion, forward, reverse, and freeze frame—all in full broadcast quality. You can start and stop instantly, and with frame accuracy. You can search for scenes or frames either with variable programmable search or frame jogging, both with full format color pictures.



*Convenient film deck controls include speed, mode, direction, format, framing, and focus. Adjacent decks control audio, video, and color correction.*

### Low operating costs

The solid-state devices used in the FDL 60, including the CCD sensors, need no maintenance. They have all the reliability and long operating life typical of semiconductors. So besides giving you a better picture, the FDL 60 saves you money on maintenance.

### Operational flexibility

The FDL 60 gives you operational flexibility you'd expect only in a modern videotape recorder. You control it like a VTR, too. The servo deck with continuous capstan drive and microcomputer control ensures gentle film handling. And it's totally insensitive to perforation damage.

A keyboard that lets you enter time code cue points and a changeover switch give you disturbance-free transitions between two machines in parallel operation.

You can even integrate the FDL 60 into your VTR editing and film-to-tape transfer systems.

A quick-switch optical block lets you run either 35mm or 16mm film in combination with all the usual types of sound track.

Find out for yourself how high technology can mean better pictures. Call your local Fernseh office. Or get in touch with Fernseh Inc., P.O. Box 31816, Salt Lake City, Utah 84131, (801) 972-8000.

## BOSCH



1982 Emmy Award  
Winner For  
CCD Technology

Circle 161 on Reader Service Card

© 1982 Fernseh Inc. All rights reserved.

# Is SCA paging a possibility?

**SCA** paging is not only a possibility, it is a reality. Radio station KFRX in Lincoln, Nebraska began SCA paging in July, 1983.

The success of this first commercial effort has proven both the feasibility of SCA paging and the reliability of Reach SCA pagers and related equipment.

This success is further reflected in the fact that over 60 other radio stations are currently working with Reach to introduce SCA paging in markets across the country.

As with any new technology, there will naturally be questions. We encourage you to contact a Reach representative for answers.



Reach Inc.  
301 South 68th Street  
Lincoln, NE 68510  
402/483-7518

## FM SCA: An Engineering Perspective

By Robin Lanier, Senior Editor

THE USE OF SUBCARRIERS IN FM under an SCA, spurned by many broadcasters in the past as likely to be harmful to a station's main signal, is getting new acceptance as an operation that can greatly expand profit power for FM broadcasters.

This transformation has come from recent engineering studies showing that not only one, but several subcarriers can be used without difficulties. Impetus was also gained from a deregulation ruling by the Federal Communications Commission, issued in April, incorporating some of the engineering findings and removing nearly all restrictions on the kinds of business operation allowed under an SCA.

In effect, the FCC's changes in the applications rules amount to a wide-open use entitlement for the broadcaster. (For more information see this month's FCC Rules and Regulations.) The new business landscape for an SCA would be much less attractive, however, without the technical changes. Under the earlier rules, the subcarriers were limited to the stereo second channel and one more, at 67 kHz. Sideband frequencies could not be above 75 kHz, and the total modulation of the FM carrier could not exceed 100 percent. This last restriction meant that if one subcarrier was injected at 10 percent, the main channel modulation was limited to 90 percent; or, if two subcarriers were at 10 percent each, the main channel had to be backed off to 80 percent.

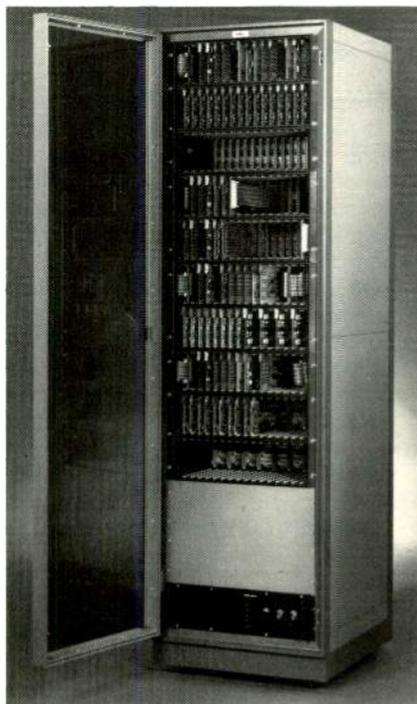
The latter requirement, of course, severely encumbered the broadcaster's economics, since he was reluctant to reduce his main channel coverage, even moderately.

National Public Radio, looking for ways to improve the profit-making potential of member stations, started investigations several years ago to determine if expansion of FM subcarrier use would be possible. The FCC had previously ruled that commercial use of additional subcarriers by public stations would be allowed if public service use of already existing SCA subcarriers

would not be affected.

An NPR engineering team under John Kean carried out tests at station WETA-FM in Washington, DC, in 1981, with a temporary authorization from the FCC. A subcarrier, in addition to the standard one at 67 kHz, was tried at various frequencies up to 95 kHz, with sideband frequencies to 99 kHz allowed. In addition, the team assessed the effects of modulation totals above 100 percent as the subcarriers were added.

The main findings were that a subcarrier at 92 kHz produces lower interference levels in the main channel than the one at 67 kHz. Further findings showed that adding the 92 kHz subcarrier without additional "back-off" in main-channel modulation, so that the total modulation reached 110 percent from time to time, produced no increase in the sideband spectrum at normal signal levels, and no combined sideband energy that exceeded the limits set up in the FCC rules.



The BBL System III radio paging terminal.

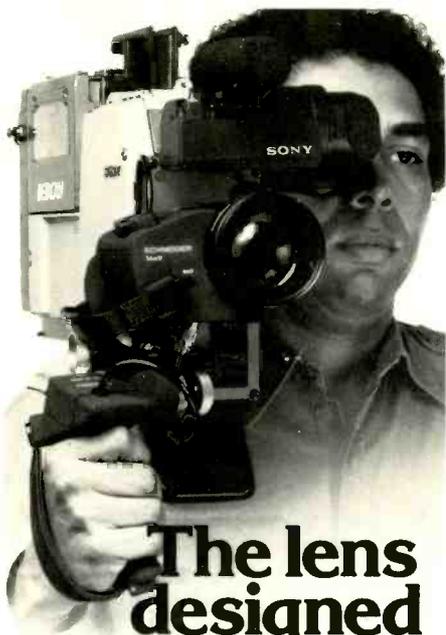
A study by Westinghouse Broadcasting and Cable, under the direction of Harrison Klein, director of radio engineering, confirmed the finding on total modulation. The report notes that the "back-off" requirement is the single most important factor preventing wide use of SCA subcarriers. As a result of extensive laboratory tests, the Westinghouse report concludes that: When the first subcarrier of 10 percent injection is added, the back-off should be one-half the total injection, or 5 percent for a 10 percent injection. When additional subcarriers are added, *no additional main channel back-off is needed*. Thus, with two SCA subcarriers, each of 10 percent, the total modulation should be allowed to reach 115 percent.

The tests, made at the plant of Broadcast Electronics in November 1982, showed that when a 92 kHz subcarrier is added to a composite already including a main, stereo, and 67 kHz modulation, there is almost no change in spectrum shape. The report notes that this apparent "something-for-nothing" result rests on the fact that the increase in modulation energy with the 92 kHz subcarrier is very small and makes up an insignificant part of the total. John Kean, discussing the quite similar results in the NPR tests, judged that another important factor is the very high probability that peaks of the different subcarrier signals will not all occur at the same time.

Meanwhile, the FCC issued in August 1982 a Notice of Proposed Rule-Making with technical changes fairly close to the NPR findings. Among the propositions was the opening of the FM baseband to additional subcarriers up to 95 kHz, allowance of sideband energy to 99 kHz, and allowance of total modulation to 110 percent. The April ruling approved all except the 110 percent modulation allowance.

### RF protection

The main question that remains at issue here is the RF protection ratio, which establishes the effective integrity of the



## The lens designed with the cameraman in mind.

The Schneider 14X ENG/EFP lens is economical, lightweight, and has all the features it should have. It brings out the best in the best cameras available today.

This lens is packed with conveniences that help the cameraman get the most out of every situation. It has a pistol-grip with built-in iris control that has all controls available within a thumb's touch. It has a generously sized rocker control that makes it easier to control the zoom. And because the iris and zoom electronics are in a weather-resistant housing, there are no shorts from moisture in the field.

The lens can power zoom from 9mm to 126mm. Or with the 2X built-in extender from 18 to 252mm. With the low distortion 6.3mm, to 9mm aspheric lens attachment, it can power zoom on the super wide angle shots. Schneider broadcast lenses are available throughout the United States and Canada from:

Tele-Cine Corp.  
400 Crossways Park Drive  
Woodbury, NY 11797  
(516) 496-8500

### Schneider

#### 14X ENG/EFP

Tele-Cine Corp. is a subsidiary of Schneider Corporation of America

Circle 155 on Reader Service Card

signal from one station in the face of interference from another. John Kean says that he is currently seeking support from industry groups for a series of RF protection ratio tests which should bring the results the FCC is looking for. NPR has all the needed equipment in place and ready to go.

If these tests are made with wide industry backing, and the results are conclusive for the increase in modulation limits, the general opinion is that the FCC will approve the change. With a June 7 date for final comment, the approval could come in early fall.

On the business side, the FCC's decision represented a total acceptance of the "new" SCA. In the notice of proposed rule-making, the FCC had emphasized the serious under-utilization of the spectrum arising from the small proportion of FM broadcasters using subcarriers. The proposal showed estimates of use and nonuse indicating that the industry was losing more than 100,000 hours of subcarrier use a day.

With the April 7 decision, the kinds of information that the broadcaster can handle under an SCA are almost without restriction. The FCC expressed the hope that there would be a substantial industry swing to the service. There is only one general restriction that the broadcaster should be aware of: The broadcaster must avoid performing like a "common carrier," unless the broadcaster wants to be a common carrier.

This would bring the broadcaster under a whole new set of FCC rules, more restrictive than the ones he now must follow, and would also put him under the regulation of the utility commission in his state.

Among the new SCA businesses, paging seems the one most likely to involve the broadcaster in common carrier activity. There are many radio common carriers in operation in the paging business. The FCC is preparing detailed regulations to clarify the rules on common carrier status, with regulations scheduled to be ready some time in May. A spokesman at the FCC gave *BM/E* a preliminary resume: If a broadcaster leases an SCA channel to a common carrier supplying paging, that does not make the broadcaster a common carrier. However, if the broadcaster operates the paging business himself, and has electronic connection to the telephone system for the use of customers, he is likely to be ruled a common carrier.

Of those organizations already in the SCA industry, a survey showed eager acceptance of the new opportunities. Firms that lease the subcarriers from the broadcaster and then contract to deliver information will be most affected. Radio Data, a subsidiary of Bonneville that handles very large quantities of data through about 40 FM stations around the country, is getting ready to promote some of the new services to

*continued on page 88*

## SCA: A Management Perspective

By Scott Goldman

One popular theory on how subcarrier channels will be put to use suggests radio paging services. Paging is a technology which has come a long way in recent years, and the potential market for pagers has increased almost exponentially since economies of scale brought the cost of paging down to the consumer level. In fact, at least two major radio common carriers (RCCs) have been responsible for marketing these services to the consumer as well as bringing the cost of these services down to a level affordable to the consumer. Metromedia, which owns a number of RCCs around the U.S., has recently begun marketing a pager in the New York market aimed exclusively at the consumer. Approaching the consumer market from a different angle, Communications Industries (CI) and its subsidiary, Gencom, have completed an agreement with the Tandy Corporation and its subsidiary, Radio Shack. Radio Shack outlets will sell pagers manufactured for them by Tandy and put them on Gencom's paging frequencies around the country. Mobile Communications Corporation of America (MCCA) has made a similar deal with National Public Radio.

Most of the capital-intensive equipment (transmitters, phone equipment, and

*continued on page 88*

**Scott Goldman** is sales and marketing manager of the Communications Marketing Research Groups of Compucon, Inc., a Dallas-based consulting firm specializing in communications systems design and market research.

# The new Saticon II camera tube. Clearly superior to lead oxide.

Compare the unretouched photos below and see for yourself how the new RCA Saticon\* II camera tube reduces specular high-light memory, without red trail.

You no longer have to choose between lead oxide's good handling of highlights and Saticon's well known superiority in other critical performance factors. Now it's a whole new ball game.

Computer-aided deposition and advanced material purification technologies have given Saticon II a considerably improved photoconductor. Your benefits: less highlight trail, reduced highlight memory (as much as 75% less than that experienced with earlier Saticon tubes), improved resistance to image burn.

What's more, you still get all of the recognized advantages of Saticon: high resolution,

distortion-free colors, very low lag, and extremely long tube life. And Saticon II is backed by a warranty that's second to none. RCA offers full replacement for any failure in normal use for six months, compared with only two months for Plumbicon™.

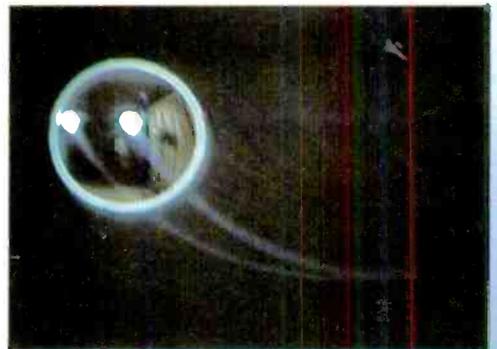
Your choice is now clear. For more information on the complete Saticon line, contact your RCA distributor or write to RCA Camera Tube Marketing, New Holland Avenue, Lancaster, PA 17603. Or call (800) 233-0155. In Penna., phone collect to (717) 397-7661. Overseas, contact RCA Brussels, Belgium. Sao Paulo, Brazil. Sunbury-on-Thames, Middlesex, England. Paris, France. Munich, W. Germany. Hong Kong. Mexico 16 DF, Mexico.

\*Used by permission of trade mark owner.



**Good. Plumbicon XQ1427.**

*Photograph of direct reflection of flood lamps, produced by camera with CTS circuitry. Note highlight memory with red trail.*



**Better. Saticon II BC4390.**

*Same subject and conditions as in photograph at left. Note reduced highlight memory without red trail.*



# RCA

*continued from page 88*

old and new customers. Joseph Meier, vice president of Radio Data, claims there has been a marked change in broadcaster attitudes toward operations of his kind. Earlier, it was difficult to convince most FMers that an SCA contract was a good deal. Today some stations are coming in, without prompting, to try to sell the channel.

Radio Data, in collaboration with the ABC engineering department in New York, has also been involved in technical tests similar to those already described. The Radio Data-ABC tests back up the general results of those by NPR and Westinghouse, and, according to Joe Meier, they suggest that even 120 percent modulation might be acceptable in some circumstances. Radio Data is also prepared for expansion through the use of satellite circuits for city-to-city hauls, with specially designed satellite antennas and receivers.

## New horizons

As the horizons for new services open, the demand for more equipment will increase. This implies new kinds of hardware to accommodate the service, and both Johnson Electronics and McMartin have indicated that new equipment would be forthcoming to take advantage of the new rules.

McMartin showed prototype models at NAB of a new "Super S" SCA system capable of injecting three or four subcarriers at selected frequencies. The bandwidth is also selectable, and the user can have several narrowband channels or fewer broadband channels.

Another new piece of SCA hardware also shown at NAB is a combined generator and audio processor called "Sidekick" by its developer, Modulation Sciences of Brooklyn, NY. It has three elements needed in an SCA operation: a subcarrier generator, an audio processor, and a transmitter tuning aid—all designed to work together. The maker claims great reduction in crosstalk as compared with earlier systems, better signal quality, and simplified operation. The generator is crystal controlled for frequency stability of  $\pm 0.01$  percent from 0 to 50 degrees C. The audio processor is designed for 150 microsecond pre-emphasis, with 75 microsecond and 0 pre-emphasis available. The audio lowpass filter is overshoot corrected. The tuning aid includes a random noise generator and AM noise meter, so that the IPA and PA can be tweaked for minimum incidental AM noise, an important consideration for low crosstalk.

New techniques in delivery will also proliferate. For example, an outfit

*continued from page 86*

so on) needed to establish a paging service is already in place in a typical FM station. You would need to add little to the hardware typically on your premises in order to lease this subcarrier to a local RCC for their use as a paging channel. Should you decide to proceed with this plan to file for authority to use your subcarrier for paging services, however, the RCCs in your area are likely to file petitions opposing your application as an attempt to either preclude or delay the entry of an FM station into a field that they consider their proprietary territory. It is true that the FM broadcaster could conceivably offer this portion of the spectrum on a lease basis to the RCCs in the area, but it is also true that the FM broadcaster could offer paging service in competition with the local RCCs. The potentiality of competing directly with the RCC will vary depending on the market area, the level of congestion currently experienced by RCCs on their allocated paging channels, and the relationship you have established with these entrepreneurs in your area.

On the other hand, the amount of spectrum available to the RCC has recently gone from famine to feast with the opening of the 900 MHz band for additional paging services. Consequently, the RCC may think at first that your spectrum availability is not so appealing. Yet the equipment needed both to transmit and to receive paging signals in this 900 MHz band is not fully developed, so what may occur is a reluctant acceptance by the RCC of a lease arrangement for your subcarrier.

The marketing researcher's activities can be crucial in determining whether you should offer these paging services, or other services such as portable teletext or various digital data delivery services. Perhaps a combination of all three is the most prudent approach, yet there is truly no way to make this determination without an intensive investigation of the marketplace. A good marketing research analyst will be able to develop a profile of the potential users of these different services and then determine the potential relative demand by applying that user profile to the specific demographics of your market.

In determining the potential relative demand for the different types of services you might provide, you should also structure a survey to be conducted either via telephone or through the mail. The potential users of FM SCA channels will be a specific sector of the population, i.e., the business sector. The business sector that you lease your subcarrier to may then sell services to the consumer, but sales to the business sector should be what you as the broadcaster should concentrate on. Survey methods, therefore, have to be tuned to the business community and not to the consumer. Many researchers favor surveys of businesses conducted by telephone because they entail an inherent flexibility and the capability of reaching large numbers of respondents in a relatively brief period of time. This large number of respondents to your survey will offer statistical and practical advantages when attempting to determine the demand for your new services; they allow more accurate conclusions to be reached regarding potential demand, and they allow more comprehensive coverage of all the market segments to which you will be attempting to sell your services.

Another potential means of generating revenues from your unused subcarrier channel would be by providing control services access to public utilities. Essentially, this means that a small FM receiver could be installed on any utility-driven device (e.g., street lights, water heaters, outdoor advertising) so that power to nonessential utilities could be reduced on a discriminating basis in the event of a power shortage. During a power shortage, a coded signal could be broadcast to the entire coverage area activating only those devices with the appropriate decoder at the receiving end.

In dealing with the local utilities, however, the standard radio coverage contours required by the FCC will not be sufficient to determine the extent of the subcarrier's signal propagation characteristics. When providing services beyond standard broadcasting, real-world propagation characteristics become more critical. The best available method to accurately determine the actual coverage contour of your subcarrier signal is through a detailed propagation analysis. This analysis employs a database of elevation contours from the United States Geological Survey (USGS) 7.5 minute maps translated into a computer-readable format and sophisticated software to account for various antenna patterns, radiated power levels, differing height of antennas above ground, and so forth.

By having the computer simulate the effect of the actual terrain variations upon the signal being transmitted and by then inputting into this computer mod-

*continued on page 90*

# BBL's PROFITABLE NEW PROGRAM IN FM BROADCASTING...

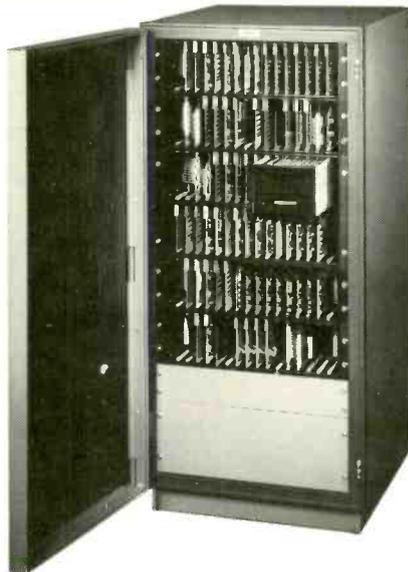
# PAGING.

**A profitable paging business can be yours now that the FCC has given the go ahead for FM sub-carrier authorizations.**

And nobody can better introduce you to paging technology than BBL, the undisputed leader in the field.

Our System VI-X paging terminal is especially suited to the FM broadcaster interested in diversification—and greater profitability. It's compact in design and surprisingly low in cost, yet includes all the advanced features which have made BBL paging terminals the recognized standards of excellence in the paging industry.

Most important, System VI-X is highly versatile. Unlike other paging terminals, which are restricted to a limited number of pager types, System VI-X is engineered to interface with *all* commonly used makes, enabling you to service all potential customers. System VI-X can even interface with BBL's voice messaging center, the Voice Retrieval System, as a combined paging/message center. What's more, its fully automated design keeps maintenance costs to a minimum



At an introductory price of \$18,600.

and significantly reduces labor costs, resulting in higher profits for you.

There's simply no more efficient terminal for the price than System VI-X. Check the software-intensive design, flexibility and proven reliability. We trust you'll agree... BBL's the best way for today's FM broadcaster to get with the paging program.



**BBL Industries, Inc.**

A Subsidiary of Communications Industries, Inc.

**GET WITH PAGING!** CALL (404) 449-7740.  
TELEX 804471. OR WRITE BBL FOR ADDITIONAL INFORMATION.  
Send to: BBL Industries, Inc., 2935 Northeast Parkway, Atlanta, Georgia 30360

Name \_\_\_\_\_ Title \_\_\_\_\_

Name of Company \_\_\_\_\_

Type of Company \_\_\_\_\_

Address \_\_\_\_\_ Phone \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

continued from page 88

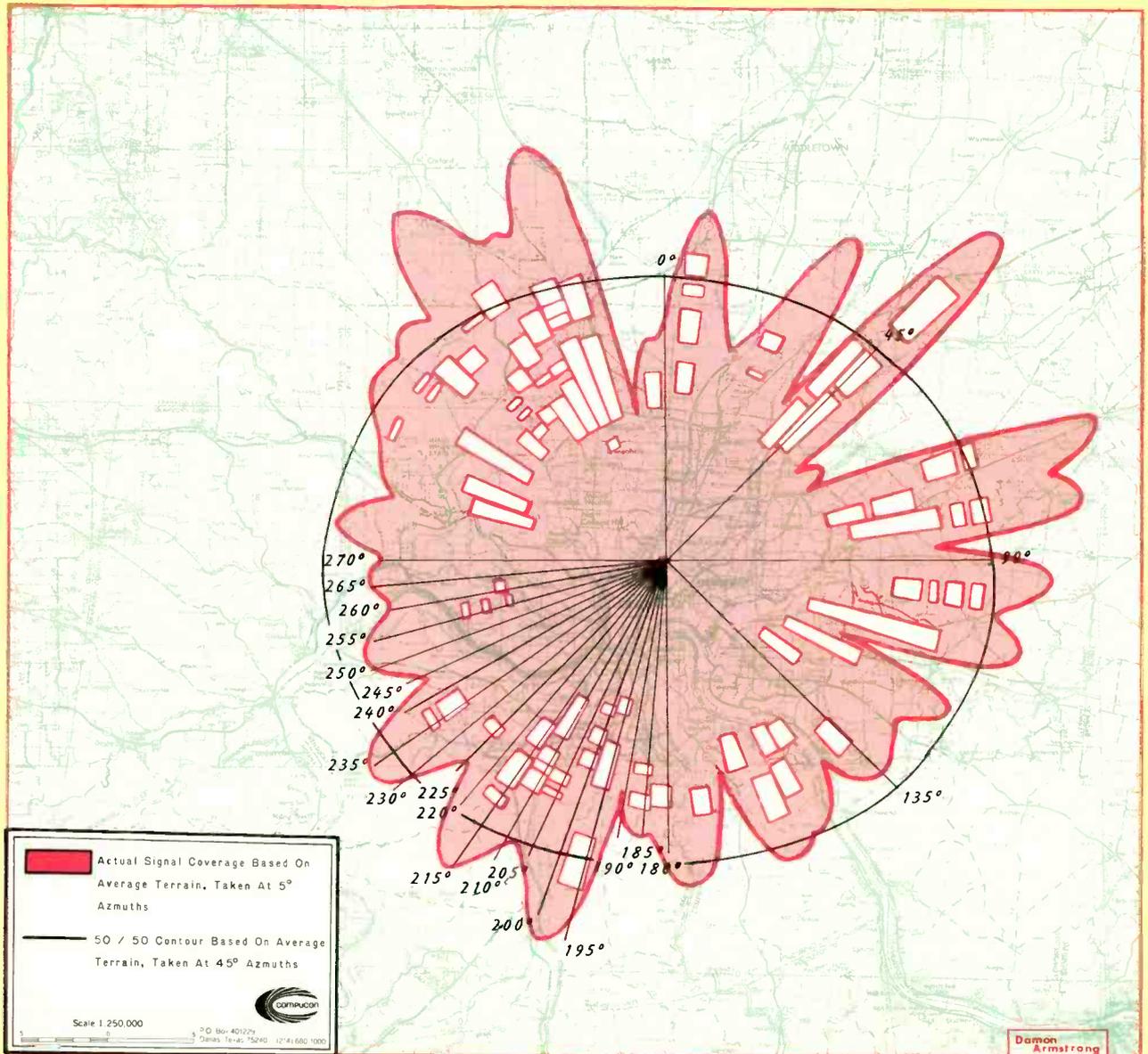
el the receive sensitivity of the device you are transmitting to, it is possible accurately to predict where the signal level of the subcarrier will be sufficient to activate the device to which you are signalling. The differences between the contour predicted by the standard method (known as an F(50,50) contour) and the actual predicted coverage of your signal can be dramatic. The F(50,50) contour averages the terrain variations of the topography of the broadcast area and produces a predicted signal coverage area based on these calculations of average terrain, taken at 45-degree azimuths. Conversely, detailed propagation analyses consider the actual terrain variations in predicting the coverage in each five-degree azimuth, representing a veritable quantum leap in prediction capabilities.

The software needed to make such radio coverage predic-

tions has gone through an evolutionary process. It is now possible to ascertain the dramatic difference between the real world and averaged terrain contours through the use of computers instead of the tedious and infinitely more costly methods of hand-profiling or actually measuring the signal level out in the field. For additional insight and impact, the contour of your predicted signal coverage limits can be merged with the demographics of the area to provide your prospective SCA users with the number of households, businesses, or other appropriate data that are encompassed by your actual coverage area. This data will greatly assist prospective users of your subcarrier in their determination as to whether or not your subcarrier signal reaches the geographic areas that they wish to cover. They will be able to physically see it for themselves instead of relying on an educated guess.

**Computer-plotted contour uses digitized information about natural terrain such as mountains and valleys to predict coverage area of the SCA signal. The contour is formed by**

**calculating data along 72 separate radials (every five degrees) from the transmitter. Nulls are also predicted, shown as "holes" in the shaded area.**



# A completely automated audio analyzer package and advanced portable scopes to simplify your job.

Now, Four new products from Tektronix deliver more capability and performance than ever before.

## SG 5010 Programmable 160 kHz Oscillator/AA5001 Programmable Distortion Analyzer.

Two new members in our TM 5000 family of modular, IEEE-488 compatible instruments. The SG 5010 is the first oscillator to offer both GPIB programmability benefits and less than 0.001% (-100 dB) total harmonic distortion. Plus all the standard IMD test signals and high level, fully balanced, fully floating output. Together, the SG 5010 and AA 5001 make a completely automated audio analysis system with the highest performance available today. Fully automatic even when the oscillator and analyzer are separated, by yards or by miles.

## 2236 100 MHz Portable Oscilloscope.

Measurements that had taken three or four instruments can now be done with one: the 2236 with integrated counter/timer/digital multimeter. It's a whole measurement system packed in a portable scope that's lightweight, versatile and easy

to use. Priced-right performance for tasks from circuit continuity testing to gated frequency, time and event counting. Standard features include TV field and TV line triggering.

## 2445 150 MHz Portable Oscilloscope.

The new industry standard with more performance for the dollar than you've ever seen before. Four-channel capability. Auto level "hands-off" triggering. Standard  $\Delta$  time and delay sweep. 1 ns/div sweep speed. Overdrive aberration of only 0.5%. Extensive CRT readout. Plus more. And state-of-the-art microprocessor design keeps the 2445 simple to operate. It's everything that a portable scope should be and the only one that is.

Contact your nearest Tektronix Field Office (listed in major city directories) for more information. Or call 1-800-547-1512 for descriptive literature. (In Oregon, 1-800-452-1877.)

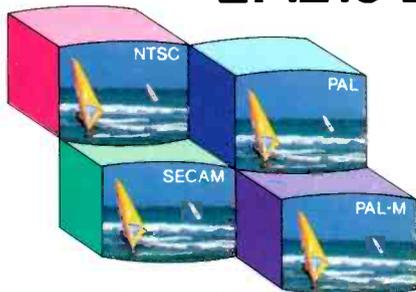
Tektronix, Inc., P.O. Box 1700, Beaverton, OR 97075. In Europe: Tektronix Europe B.V., Postbox 827, 1180 AV Amstelveen, The Netherlands.



# Cost-Performance to Oki Doesn't Mean Less Performance for Lower Cost. Performance Takes Priority!



## LT1210 Digital Television Standards Converter



LT1015Σ

Professionals demand an uncommon level of picture quality in TV standards conversion. And production on the road requires a compact, reliable unit. Oki Electric built the LT1210 to deliver. It's the world's smallest converter able to handle NTSC, PAL, and SECAM, with PAL-M conversion as an option. Yet it incorporates every function and feature needed for producing studio-quality programming. The image enhancement function, for example, ensures a high-definition picture with outstanding image clarity. This converter is also a totally integral unit so no adaptor or changing of encoder/decoder modules is required for conversion between NTSC, PAL and SECAM.

The cost-performance of the LT1210 is nothing less than outstanding. Oki Electric's proven expertise in standards conversion combined with the latest in LSI technology results in a highly reliable, easy-to-use converter. The LT1210. Check it out. Anywhere.

Oki also produces the high-end LT1015Σ Digital TV Standards Converter.

*In the U.S.A. and Canada, contact:*

Oki Electric Overseas Corp.  
One University Plaza,  
Hackensack, New Jersey  
07601 U.S.A.  
Tel: 201-646-0011—0015  
TWX: 7109905004 OKI ELEC HAK

*In other areas, contact:*

Head Office:  
Overseas Marketing & Sales  
10-3, Shibaura 4-chome,  
Minato-ku, Tokyo 108, Japan  
Tel: (03) 454-2111  
Telex: J22627  
Cable: OKIDENKI TOKYO

**OKI**  
**electric**  
**industry**  
**company, Ltd.**

## NEWS FEATURE

called DataSpeed, based in San Francisco, is going to operate with pocket-held SCA receivers for customers who want instant stock market or commodity information. The receiver will incorporate enough computer memory to hold the latest quotations in the area of the customer's interest. The information is updated continuously via the SCA channel to which the receiver is tuned. The user simply keys in for the data he wants at any time, and gets a digital readout.

Telemet, based in Alexandria, VA, has announced a similar service. The Dow Jones Company is doing essentially the same thing, using desktop receivers for the customer.

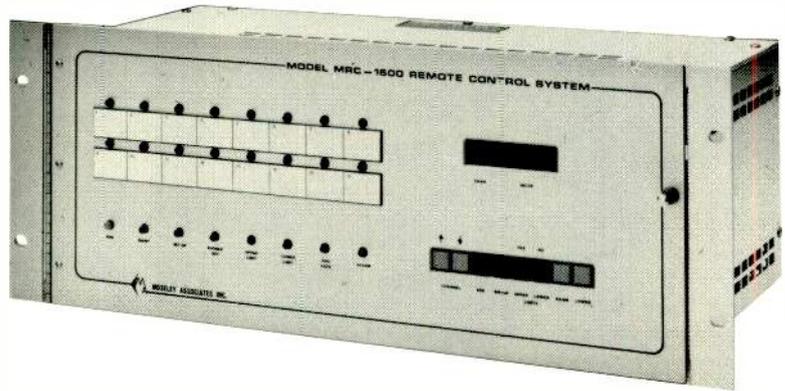
National Public Radio has organized a new department called "Business Service," which will seek to exploit the combination of the NPR satellite net and the new SCA powers for the benefit of member public stations. The satellite-SCA combination should be watched—it is a particularly potent one for information distribution. It makes the service completely insensitive to distance; the satellite circuit transmits the information from city to city and the FM SCA channel reaches all points within the station's coverage.

Another service, in use in Europe for some time, is making a debut in this country, adding another way for SCAs to be used. It is automatic road information, or ARI, in which a special car receiver tuned to a local SCA channel can be keyed on for delivery of up-to-the-minute traffic and road information to the driver. The German firm Blaupunkt is making the receivers and beginning to promote the service in this country. It is already available in a number of American cities.

The emphasis on data transmission arises from the huge and growing market for this service and the ease of handling several channels of data on one SCA channel. But it is important to remember that a subcarrier at 92 kHz, say, can have the bandwidth for high-quality music or any other similar material. The main problems for the FM broadcaster using subcarriers in the future will be making choices among all the possibilities that have opened up, and setting up proper, long-term business relations with the organization selling the service to customers.

Finally, it is worth pointing out again that the new rules allow any method of modulation to be used on an SCA subcarrier. This means that the modulation can be FM, AM, FSK, slow-scan video, a part of quadraphonic, or any other system the broadcaster wants to use. It is part of the super-versatility of the new SCA. **BM/E**

# ECONOMY AND RELIABILITY



- 16 CHANNELS EACH, STATUS AND TELEMETRY
- 16 RAISE AND 16 LOWER COMMAND LINES
- SETUP DATA BACKED UP AUTOMATICALLY

## MRC-1600

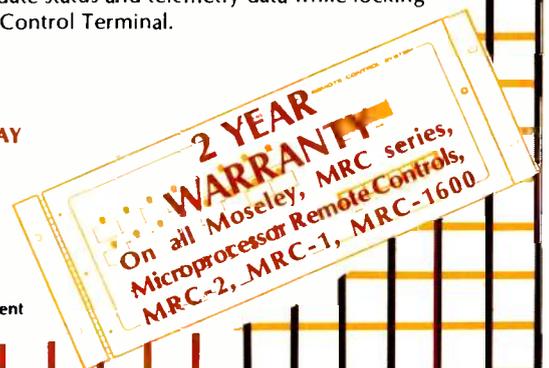
Already the top-selling Microprocessor Remote Control, the MRC-1600 offers flexibility and reliability in a highly economical package. The MRC-1600 provides 16 status channels, 16 telemetry channels,

and 16 raise/lower relay-isolated command channels. In case of a temporary power-down of either terminal, all setup data is stored at both Control and Remote Terminals to avoid memory loss. Plug-in modules allow the MRC-1600 to be used with almost any interconnection network, including 2- or 4-wire telephone line, subaudible, FM subcarrier, or a combination of these.

Status inputs may be set to alarm on rising, falling, rising and falling waveforms, or muted completely. Each telemetry channel can be calibrated in one of four modes: power, indirect power, linear, or millivolt. Upper and lower telemetry limits may be set or disabled independently. In operation, telemetry data is checked against these limits. Exceeding these limits enables visible and audible alarms. Data needed to bring telemetry back within limits is automatically displayed when an operator acknowledges an alarm.

The MRC-1600 has full control fail-safe features and maintains special channels to monitor data link conditions and A/D ratios. A maintenance override mode continues to update status and telemetry data while locking out command signals from the Control Terminal.

- ADAPTS TO ANY INTERCONNECTION NETWORK
- ALL TELEMETRY LIMITS MAY BE SET OR DISABLED INDEPENDENTLY



For further information,  
please contact our Marketing Department

**EM MOSELEY ASSOCIATES, INC.**  
A Flow General Company . Santa Barbara Research Park  
111 Castilian Drive . . . Goleta, California 93117  
(805) 968-9621 . Telex: 658-448 . Cable: MOSELEY

Circle 160 on Reader Service Card



## For 10 seasons now, you've taken the performance of Shure's remote mixers for granted. We haven't. Announcing the new Shure M267.

Over a decade ago, Shure introduced the M67 Microphone Mixer. Designed to provide on-location audio for major sporting and news events, the M67 became the most well known and widely used remote mixer in the broadcast industry.

Then came the new Shure M267. One look will tell you why we moved ahead.

Here are all the improvements audio engineers have asked for.

Every channel on the mixer now has a mic/line level switch for maximum flexibility. There's also a built-in limiter to keep the M267 from overloading at critical moments. The unit contains a built-in battery pack that utilizes three standard 9-volt batteries. Simplex (phantom)

power and a peak LED are standard, too.

The M267 oscillator provides a clean 1 kHz tone, and is located on the front of the unit for simple access. The headphone output is also on the front and includes a level control.

And IC design, along with active gain controls, provides greater headroom and quieter operation.

For location work or even studio post-production, the M267 carries on Shure's reputation for reliability and ruggedness.

After all, just because you create one legend doesn't mean you can't build another.

For more information on the complete line of mixers, call or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204, (312) 866-2553.

# SHURE®

THE SOUND OF THE PROFESSIONALS... WORLDWIDE

# Montreux Symposium Reveals Europeans Hungry for Technology

By Robert Rivlin, Editor

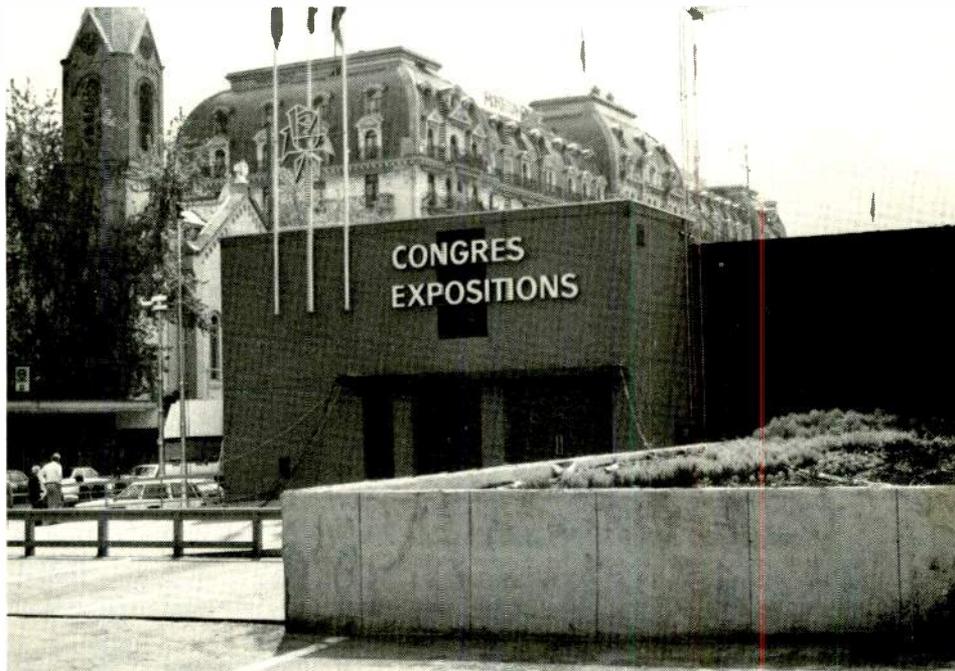
"AMERICAN BROADCASTERS are a strange lot," mused an exhibitor at the recent International Television Symposium held in Montreux, Switzerland in early June. "On the one hand they want the very latest gadgets that technology has to offer—any bell or whistle that will give them a competitive edge. On the other hand they're woefully ignorant of the most basic advances that are being made in broadcasting technology—digital recording, HDTV, satellite delivery, and the rest. If it can't give them an immediate increase in bottom-line profits, they're just not interested."

This exhibitor's feelings were shared by many: technology in Europe is making enormous strides, and the Europeans seem ready to accept it; but their counterparts across the Atlantic must now meet the challenge and become involved. Not to do so will surely result in a situation such as what almost happened with the digital sampling standard when the EBU was on the verge of adopting its own component coding scheme before the Americans woke up and realized that they had better make their feelings known. The same could happen with virtually all the other technologies being advanced.

The Montreux symposium itself helped prove the international commitment to technological progress. The conference was organized into all-day sessions (the morning part dealt with more theoretical aspects, the afternoon part with actual hardware) on high-definition TV, direct broadcast satellites and program distribution, broadcast television production innovations, and digital studio and recording systems. Other sessions dealt with some of the major work that is going on in cable television and wideband signal distribution.

## High-definition progress

One of the most significant demon-



Montreux, Switzerland, home of the bi-annual TV Symposium.

strations of the new technology at Montreux was the screening of six experimental HDTV tapes produced by six individual countries last year, including the Soviet Union. Sony HDTV equipment and a technical crew visited London, Paris, Salzburg, Montreux, Venice, and Leningrad, inviting each country to produce a segment of the tape, which included opera, ballet, light entertainment, and documentary programming. The tape was shown at the symposium on a range of HDTV monitors and projection TV systems from manufacturers such as Sony, Ikegami, and Panasonic.

As Joe Flaherty of CBS observed in his opening presentation of the 1125-line system demonstration, the new medium of HDTV has four characteristics:

- Vastly improved definition. In fact, the picture has approximately five times more information than a normal TV picture.
- Significantly better color fidelity without many of the color distortions visible in a standard picture.
- A wide-screen aspect ratio of 5x3.
- Multichannel stereophonic sound.

The Montreux demonstration marked the first time the NHK 1125-line system has been seen publicly in Europe, although both Sony and Ikegami demonstrated components of the system at the recent NAB show, the same system which CBS demonstrated to groups of broadcasters last year.

American broadcasters' interest in HDTV is perhaps best summed up in a report from International Resource Development Inc. of Norwalk, CT, which

## NEWS FEATURE



Outside the exhibit hall, mobile vehicle and satellite receiver manufacturers showed their wares.



The Ampex/Nagra VPR-5 was one of the show's highlights.

Thomson-CSF's Vidifont Graphics V.



states: "For a somewhat marginal benefit to consumers—a better TV picture with less-evident lines across the screen—HDTV threatens to turn the consumer electronics industry upside down." The report goes on to assert that broadcast operations will be hurt by HDTV because of the large capital investment required to get started. For the Europeans and Japanese, however, capital investment is less of a problem, and the Japanese can be expected to begin HDTV satellite broadcasts to large-scale audiences in 1985. As a speaker at one of the technical sessions put it, "It is the *responsibility* of engineers in broadcasting to understand HDTV developments and learn to be proponents of the system."

The problem faced by HDTV at this juncture is one which confronts most new technologies: the urgent need to set a standard so that real development

work by manufacturers can proceed with the confidence that products will not be made immediately obsolete. In the case of HDTV, there are actually three standards: a production standard that would allow the actual users of the equipment (producers) to operate on a single worldwide system such as the 1125-line scheme proposed by NHK and developed by Sony/Ikegami/Matsushita; a standard that would operate at the studio level so that signal processing of material submitted to the studio by outside producers would all be handled in the same way; and, finally, a transmission standard, probably linked to satellite distribution, that would allow consumers to receive the HDTV signals either over the air or perhaps through cable TV. Of the three, the production standard is the closest to being actualized, although it is possible that a cable television operation that combined two existing medium bandwidth channels could transmit HDTV programming (movies, for example) in the near future; few homes, of course, would be able to afford the receiver necessary to see the wide-screen picture at this time.

The standards issue is being very hotly debated in countries around the world—particularly as it relates to existing television standards. On the one hand, the Japanese manufacturers seem to be convinced that changing over to an HDTV signal will benefit all, especially the broadcaster and certainly themselves as manufacturers of not only the production/studio/transmission equipment but also home TV receivers. On the other side of the coin, there are those who maintain that a system which cannot be received on existing home receivers of today is doomed to failure; why, they ask, should we not improve current PAL, NTSC and SECAM standards for enhanced TV reception, rather than ask the broadcaster and the consumer to radically change over to another system? "What we're doing at RCA," said a representative during a question-and-answer session, "is to look at what viewers want on their home sets, then we'll look at what transmission standards can do to give them what they want, then we'll see what production tools can be used to deliver an appropriate signal to the transmission system. But beginning with the production gear [as is being done with the 1125-line system] is going at it backwards."

Some of this worldwide debate will surely spill over into the deliberations of a brand-new committee which has been set up in the U.S. to study HDTV. Like the National Television Standards

**When you  
absolutely,  
positively,  
unequivocally,  
categorically  
need to look  
your best.**

**FUJI**  
**VIDEO TAPE**  
MADE IN JAPAN

Available in 2", 1",  $\frac{3}{4}$ " and  $\frac{1}{2}$ " Beta and VHS.

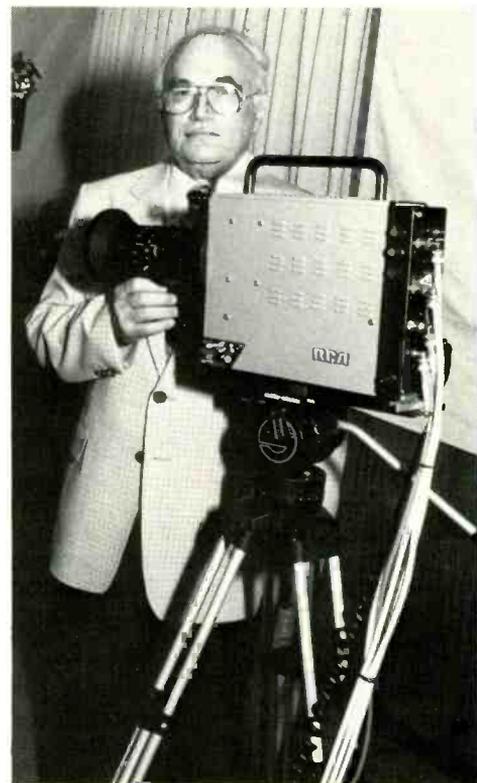


Circle 162 on Reader Service Card

## NEWS FEATURE



Europeans have pulled ahead in areas such as CD technology.



RCA engineer Sid Bendell demonstrates the RCA CCD camera. The version shown at Montreux was housed in a Hawkeye body.

Committee (NTSC) which originally drafted the 525/60 standard for the U.S., the Advanced Television Standards Committee (ATSC) is an all-industry group that will be looking at the future of television with an eye to setting standards. Meeting under the auspices of the National Association of Broadcasters (NAB), the group will specifically examine three areas: improvements which can be made in the current 525-line NTSC system; enhanced 525-line systems which are being proposed by Philips and RCA, among others, in which a higher resolution signal would be transmitted but which would not require consumers to purchase new television sets unless they wanted the improved-quality service; and, finally, high-definition systems such as the NHK-proposed 1125-line standard.

Of major significance in this committee is its all-industry stature, which will involve active liaisons with groups such as the IEEE (expected to have an input on the design of future TV receivers) and SMPTE.

America, of course, is not alone when it comes to interest in establishing HDTV standards. As speaker after speaker at the roundtable discussion emphasized, broadcasters must begin thinking in the worldwide dimension when it comes to HDTV and must arrive at worldwide standards now, before individual countries' tastes and preferences become too set. Only then

will the ultimate advantage of HDTV—a truly international medium for the exchange of high-quality electronic programming, such as is not offered by film—be achieved.

At the BBC, it was revealed, interest in HDTV has been high not only among engineers "who are always interested in new technology," but also from the program development people, who find the 5x3 aspect ratio particularly appealing.

The official line from the EBU is that there are many problems but also many opportunities in HDTV. The group's main activity in this direction has been to closely follow the NHK developments, and to begin exploring how HDTV signals might be transmitted—either through the reallocation of the 20 GHz spectrum space or else by combining two 12 GHz channels.

The prevailing attitude was perhaps best summed up by a speaker representing the U.S.S.R. "We are hungry for HDTV," he observed, "but not starving. We must not be like the man who plants potatoes on the morning, then expects to harvest them that evening."

### Digital recording

Besides HDTV, and other areas of technology such as DBS, which drew crowds at an all-day technical session, another area of major interest was the demonstration of digital video recording put on by Sony in a separate demon-

stration area. The demonstration used equipment developed by Sony Broadcast in its U.K. headquarters, coordinated by Sony in Japan.

The heart of the system is Sony's Type C one-inch recorder, although it has been substantially modified to accommodate digital recording, particularly in the configuration of the heads. Video heads are fixed in position, meaning that there is no dynamic tracking at this time. Significant advances in digital processing to allow shuttle mode operation have been achieved, however, allowing small packets of data to be sampled and interpolated into a visible picture at 10 times play speed in both forward and reverse. The same kind of processing enables operation at one-quarter play speed forward or reverse.

Another significant advance is that the machine will record *four channels* of digital audio, enabling simultaneous stereophonic soundtracks in two separate languages. Audio fidelity and quality is quite impressive, and is recorded at the 48 kHz/16-bit sampling standard which will probably become the international digital audio standard.

The version of the recorder demonstrated at Montreux conforms to the international digital video sampling standard of 13.5 MHz, with a 4:2:2 interrelationship among the luminance and two color difference signals. Its multistandard format, switching virtually instantly between NTSC and PAL,

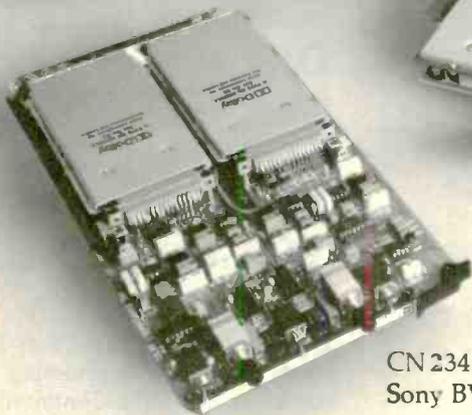
# DOLBY® NOISE REDUCTION FOR THE 1980'S



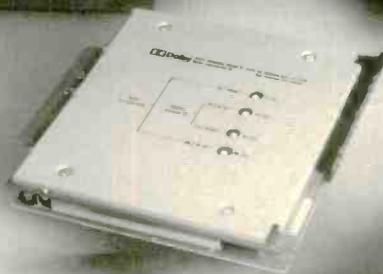
SP multi-track unit



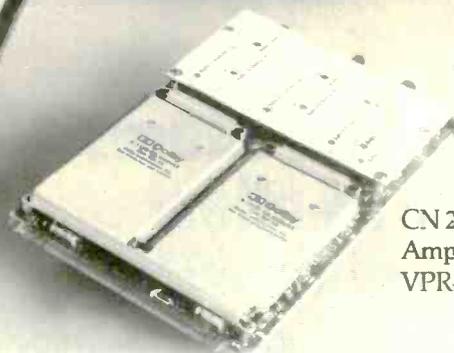
360 single-track units



CN 234 for  
Sony BVH 2000



CN 221B for  
Sony BVH  
1000/1100



CN 226 for  
Ampex  
VPR-2

Dolby noise reduction is keeping pace with today's demand for high-quality sound — everywhere. With the introduction of such products as plug-in modules for VTRs and the SP multi-track unit, it is easier than ever before to protect *all* your irreplaceable audio tracks from hiss, hum, and print-through. From broadcasting to music recording, from video sweetening to motion picture dubbing, Dolby A-type NR reliably continues to fulfill its original promise: effective noise reduction combined with complete signal integrity.

Dolby Laboratories Inc., 731 Sansome St., San Francisco, CA 94111.  
Telephone 415-392-0300. Telex 34409, 346 Clapham Road, London SW9.  
Telephone 01-720-1111, Telex 919109. "Dolby" and the double-D symbol  
are trademarks of Dolby Laboratories Licensing Corp. 583/5050

 **Dolby**®

## NEWS FEATURE

is perhaps the first demonstration the world has seen of what an international sampling standard can offer in terms of standards compatibility.

Perhaps equally important to the recorder itself, however, was the amazing digital standards converter which Sony developed to go along with it—only an experiment at this point, but a system which had definite commercial possibilities. Operating on the 13.5 MHz/4:2:2 standard, the 625/50 to 525/60 converter incorporates no less than seven field stores, yet is housed in around two feet of rack space! (Sony also demonstrated an experimental digital standards converter in conjunction with the HDTV project, downconverting from the 1125/60 HDTV signal to 625/50.)

### RCA's CCD camera

Still another significant advance in new technology at the show was RCA's first demonstration to the press of its CCD camera (shown to only a very few at the recent NAB show). This camera is radically different from other solid-state systems which have been shown to broadcasters over the past couple of years (including RCA's own previous

efforts), in that the camera uses a brand-new kind of CCD sensor—a frame transfer device in which the contents of the multiple solid-state data registers is read out during the video picture's vertical interval.

The advanced development model camera demonstrated at Montreux incorporates three 8 mm diagonal chips to replace the three half-inch tubes in a Hawkeye; otherwise the camera was virtually identical. But the performance is astonishing: signal-to-noise ratio is greater than 65 dB; static and dynamic resolution are equivalent to  $\frac{2}{3}$ -inch tubes in the 0 dB gain mode, and dynamic resolution is much greater than  $\frac{2}{3}$ -inch tubes when 18 dB gain is used; and sensitivity is 590 lux at f/1.4, 60 percent reflectance in the 0 dB gain mode, 73 lux at f/1.4 in the 18 dB mode. Best of all, perhaps, is that the CCD sensors mean absolutely no picture lag, even in extremely low lighting conditions, and the incredibly high dynamic range that allows the camera to see, for example, specular highlights from the sun's reflection off a car hood and the interior of the car at the same time with no blooming. Geometry and registration are also excellent, and nev-

er need to be aligned once preset at the factory.

"We will manufacture a product out of these developments" said an RCA spokesman, stressing, however, that this version of the camera is only experimental.

The product will presumably be marketed principally to ENG operations, where its highlight handling and no-lag characteristics can be brought to bear on tough ENG assignments when there is little time to set up, and the camera has to be able to roll with the punches that actuality shooting brings. In this context, the lighter weight and lower power consumption characteristic of solid-state CCD technology may also be an asset to news crews, although the Hawkeye version demonstrated in Montreux does not yet incorporate any significant weight or power savings.

In short, American broadcasters will likely be forced to abandon some of their arrogance and come to realize that, even though the Europeans operate from within a generally well-protected cocoon of government subsidies and nonprofit organizations, theirs is a valuable contribution to the technology of broadcasting. **BM/E**

## NEC introduces the smallest 30-mile 7GHz microwave link ever.

Only NEC could create the TVL-800-6F, the smallest revolution ever in ENG microwave link technology.

The TVL weighs just 4.4 lbs., with an antenna as small as 13" in diameter. But on just 1 watt of power, it has a range of up to 30 miles, 2 standard audio channels and 10 switchable channels in the 7GHz band. For even greater range, an optional 5 watt amplifier is available.

Call NEC at 1-800-323-6656. And get the big picture on the smallest microwave link ever.

**NEC**  
IMAGINE WHAT WE'LL DO NEXT.

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

Circle 164 on Reader Service Card

## DAY and NIGHT SERVICE FOR Continental AM & FM TRANSMITTERS

Continental Electronics offers 24-hour professional engineering service and parts for Continental and Collins AM & FM transmitters.

Whenever you need service or parts for your Continental or Collins equipment, phone our service numbers day or night.

**(214) 327-4533**  
**(214) 327-4532 parts**

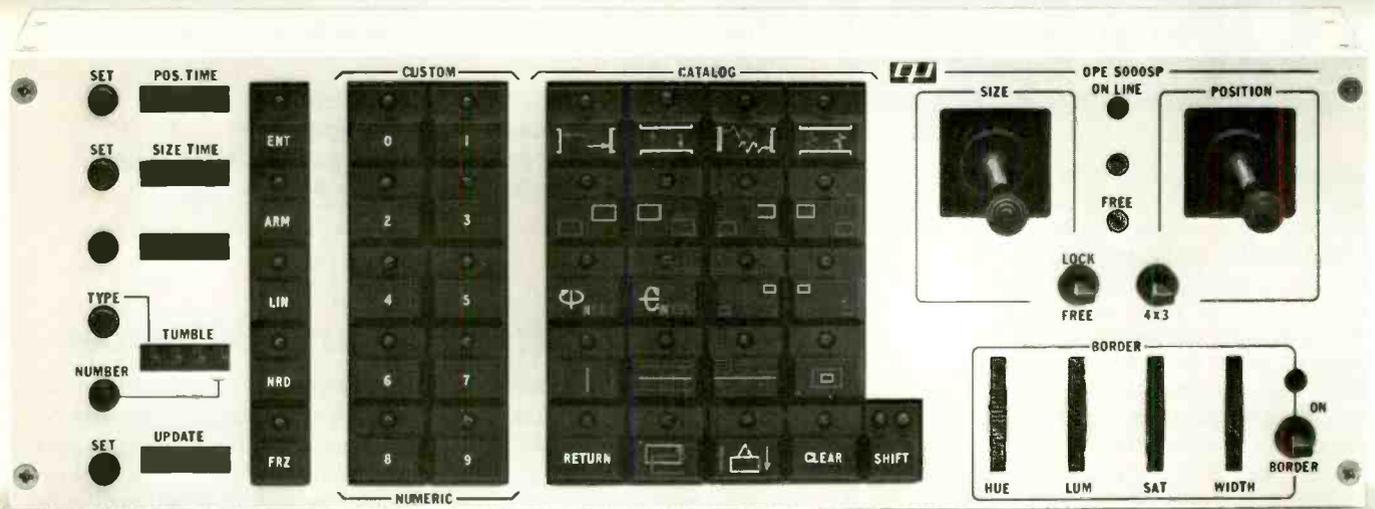
Continental Electronics Mfg. Co.  
Box 270879 Dallas, Texas 75227  
Phone (214) 381-7161

Continental Electronics 

1 kW thru 50 kW AM & FM transmitters and related equipment  
©1983 Continental Electronics Mfg. Co./5332

Circle 165 on Reader Service Card

# The Quantel DPE 5000/SP.



## Now every broadcaster can afford digital effects.

The Quantel DPE 5000/SP makes digital effects affordable by every broadcaster. Every facility.

This exciting single- or multi-channel system gives you infinite compression. Zoom expansion. Variable picture positioning. Freeze and update. Variable border generation. Horizontal squeeze. Vertical squeeze. Even picture splits.

Not bad for a unit that's only 8¾ inches high. Perfectly sized for your studio—or mobile unit.

But you get more. Like pre-select of picture position, size, and transition rate. A choice of linear moves or camera-line Quantel-style moves. Noise reduction. And "Digiflip" tumble-flip.

And more yet! Forty moves instantly selectable at the touch of a button—30 pre-programmed and 10 of your own creation.

And now, with "Multilink," you can connect up to five SPs into a multi-channel system. Or use an SP to add a second channel to your DPE 5000. That's flexibility.

On top of all this you get Quantel's superior picture interpolation for the smoothest moves available.

"SP" stands for "special performance." Almost an understatement. Call your local MCI/Quantel office for details. Or get in touch with us directly at 415/856-6226. Micro Consultants, Inc., P.O. Box 50810, Palo Alto California 94303.



**MCI/QUANTEL**  
The digital video people

MCI/Quantel, "Digiflip," and "Multilink" are trademarks of Micro Consultants, Inc.

Circle 166 on Reader Service Card

# GREAT IDEA CONTEST

Here's a chance to share your own personal solutions to some of broadcasting's most vexing engineering needs . . .

Each month, *BM/E* presents two engineering problems and invites you to submit solutions complete with diagrams. *BM/E's* editors will read the entries and select the best for publication—giving readers an opportunity to vote for the idea they consider best by using the ballot area on the Reader Service Card.

We will pay \$10 for each entry printed. In addition, the solution in each month's competition receiving the most votes on our Reader Service Card will win \$50.00. So put on your thinking cap and submit an answer to either of the problems outlined below . . . and be sure to watch this section for the solutions.

**\$50.00 FOR  
EACH CONTEST WINNER!**

## Problem 22: Commercial Production Automation

When producing a tape for a commercial spot, it is often necessary to coordinate the different audio elements located on different tape decks. Design a system that will allow the insertion of audio sources from several different cart machines, in the proper order, onto an audio or video master tape.

**Solutions to Problem 22  
must be received by  
September 21, 1983 and will be  
printed in the November 1983 issue**

## Problem 23: Moisture Detector

Moisture is probably the worst enemy of electronics equipment, in both large devices such as transmitters and in smaller units such as cameras and recorders. Design either a macro or a micro moisture detector/alarm that can run on dc current in case of emergencies. Describe its applications and give its dimensions and mounting procedure if designed to be placed inside another device.

**Solutions to Problem 23  
must be received by  
October 24, 1983 and will be  
printed in the December 1983 issue**

### CONTEST RULES

- 1. How to Enter:** Submit your ideas on how to solve the problems, together with any schematic diagrams, photographs, or other supporting material. Entries should be roughly 500 words long. Mail the entries to *BM/E's* Great Ideas Contest, 295 Madison Avenue, New York, NY 10017. Use the official entry form or a separate piece of paper with your name, station or facility, address, and telephone number.
- 2. Voting and Prizes:** *BM/E's* editors will read all entries and select some for publication; the decision of the editors is final. Those selected for publication will receive a \$10 honorarium. Each month, readers will have an opportunity to vote for the solution they consider the best by using the Reader Service Card. *BM/E* will announce the solution receiving the most votes and will award the winner of each month's competition a \$50.00 check.
- 3. Eligibility:** All station and production facility personnel are eligible to enter solutions based on equipment already built or on ideas of how the problem should be solved. Consultants are welcome to submit ideas if they indicate at which facility the idea is in use. Manufacturers of equipment are not eligible to enter. Those submitting solutions are urged to think through their ideas carefully to be certain ideas conform to FCC specs and are in line with manufacturers' warranty guidelines.

Mail Official Entry Form to:

#### **BM/E's Great Ideas Contest**

295 Madison Avenue, New York, NY 10017

Solution to Problem # \_\_\_\_\_

Your Name: \_\_\_\_\_

Title: \_\_\_\_\_

Station or Facility: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone: (\_\_\_\_) \_\_\_\_\_

I assert that, to the best of my knowledge, the idea submitted is original with this station or facility, and I hereby give *BM/E* permission to publish the material.

Signed \_\_\_\_\_

Date \_\_\_\_\_

# The first 8-days-a-week logger.



## The Dictaphone Veritrac SL.

Whether charting the hits or checking the spots, Dictaphone's new Veritrac SL voice communications recording system is practically indispensable. Here, in a package you can lease for as little as \$99 a month, is recorded testimony to what you've aired. Uninterrupted by tape changes. 24 hours a day.

What's more, the Veritrac SL is modular. It can be configured to meet your station's specific needs. Providing recording time of up to 8 days. And it has something else going for it. Dictaphone reliability and service.



**Dictaphone**

A Pitney Bowes Company

For more information on the Dictaphone Veritrac SL system, fill in the coupon or call toll-free:

**800-431-1708**

Except in Hawaii and Alaska  
(in New York call 914-967-2249)

Name \_\_\_\_\_

Title \_\_\_\_\_ Phone \_\_\_\_\_

Station \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**Mail to: Dictaphone Corporation  
120 Old Post Road  
Rye, New York 10580**

Dictaphone and Veritrac  
are trademarks of Dictaphone Corp., Rye, N.Y. PBME-93

# ADVERTISER'S INDEX

Use Reader Service Card on Facing Page ►

Manufacturer	Page No.	Circle No.	Manufacturer	Page No.	Circle No.	Manufacturer	Page No.	Circle No.
ADM Technology, Inc.	C-2	—	Dolby Laboratories, Inc.	99	163	Lake Systems Corp.	24	116
Alden Electronics	5	102	Dynavid Corp.	113	177	Laumic Co., Inc.	112	175
Ampex AVSD	13	107				Leader Instruments	30	159
Ampex MTD	74	149				Lowel-Light, Inc.	108	170
Angenieux Corp. of America	41	129	Electro-Voice	81	152			
Anton/Bauer, Inc.	20	112				3M/Magnetic Tape Div.	56-57	—
Associated Press	49	135	Fidelipac	33	123	3M/Pro-AV	25	117
Avcom	40	145	Fortel, Inc.	43	158	Marti Electronics	112	176
			Fujinon Inc.	63	142	Maxell Corp. of America	68-69	147
BBL Industries, Inc.	89	157	Fuji Photo Film USA, Inc.	97	162	MCI/Quantel	101	166
Belar Electronics Lab, Inc.	111	173				MCI (Div. of Sony America)	28-29	120
Beston Electronics	46	134	Greene Crowe & Co.	111	174	Merlin Engineering	34	124
Bosch (Fernseh)	21	113				Midwest Corp.	17	109
	83	161	Harris Broadcast Products Div.	19	111	Moseley Assoc., Inc.	93	160
Broadcast Electronics, Inc.	32	122	Harrison Systems	11	105			
			Hitachi Denshi American Ltd.	58	137	NEC America, Inc.	61	141
Camera Mart, Inc.	4	101					100	164
Canon USA, Inc.	27	119	Ikegami Electronics USA, Inc.	8-9	104	Nurad, Inc.	54	138
Central Dynamics Corp.	38	127		53	140		55	139
Cetec Vega	26	118	International Tapetronics Corp.	44-45	180			
Comtech Data Corp.	12	106				Ok Electric Industry Ltd.	92	125
Continental Electronics Mfg. Co.	100	165						
Countryman Associates	42	131				Panasonic/Matsushita	36-37	126
Crosspoint Latch Corp.	66	128				Philips Television Systems, Inc.	65	144
						Potomac Instruments	104	168
Dictaphone Corp.	103	167				Professional Products, Inc.	109	172
Digital Video Systems	C-3	178	U.S. JVC Corp.	70	148			

Quanta Corp.	1	100
Ramko Research	7	103
RCA Broadcast Systems	23	115
RCA E/O	87	156
Reach Inc.	84	154
Schneider TV Lenses	86	155
Sennheiser Electronics Corp.	108	169
Shintron	51	136
Shure Bros., Inc.	94	153
Sigma Electronics	42	130
Sony Broadcast	2-3	—
Studer Revox America, Inc.	22	114
Swiderski Electronics, Inc.	109	171
TDK Electronics/Ind.	35	121
Tektronix, Inc.	14-15	108
	91	132
		133
Telesource Comm. Services, Inc.	67	146
Telex Communications, Inc.	64	143
Videotek, Inc.	18	110
Ward-Beck Systems Ltd.	C-4	—
Winsted Corp.	113	179
Yamaha Combo	77	150
	78	150

## The AUTOMATIC Audio Test System That Measures...



MODEL AT-51  
AUDIO TEST SYSTEM

- Harmonic Distortion
- Intermodulation Distortion
- Volts
- dB
- Signal + Noise / Noise Ratio
- Wow and Flutter
- Stereo Phasing
- Differential Gain in Stereo Channels

Contact Us Now For Complete Details And Descriptive Literature.

# POTOMAC INSTRUMENTS

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

Circle 168 on Reader Service Card

# interpreting the FCC rules & regulations

## Class Operation Restructuring Under Deregulation

By Harry Cole, FCC Counsel

AFTER ALMOST THREE and one-half years of deliberation, the Commission released its Report and Order in BC Docket No. 80-90 in mid-June, 1983. As a result of that decision, adopted by a 4 to 1 vote on May 26, 1983, the FM radio industry is likely to be in for some significant changes over the next few years, changes to be caused by an influx of new stations made possible by the FCC's action. However, in an impressive demonstration of creative control of paperflow, the Commission appears to have averted the deluge of channel allocation proposals and new station applications which, many thought, threatened to paralyze the Mass Media Bureau in much the same way as the onslaught of low-power television applications did in 1981-1982.

The changes adopted by the FCC closely tracked the proposals first advanced by the Commission in February 1980. The changes include the following:

- Class A stations will be permitted on channels previously reserved for Class

B or C operation.

- A new class of station—Class B-1—will be allowed to operate in Zones I and I-A, where only Class A or B stations were previously permitted. Class B-1 stations will have maximum facilities of 25 kW ERP and 328 feet (100 meters) HAAT, and will enjoy an expected service range of about 28 miles (45 kilometers).

- Two new classes of station—Class C-1 and C-2—will be allowed to operate in Zone II, which was previously reserved for Class A or C operation. Class C-2 stations have the same maximum facilities as Class B stations (i.e., 50 kW ERP and 492 feet (150 meters) HAAT) and thus represent, in effect, the potential of utilizing Class C channels for Class B stations. Class C-1 stations have maximum facilities (100 kW ERP and 984 feet (300 meters) HAAT) somewhat greater than Class C-2 stations, but somewhat lower than Class C stations. Class C-1 stations are expected to have a service range of about 45 miles (72 kilometers), and Class C-2 stations are expected to reach approximately 32 miles (52 kilometers).

- Existing Class B and C stations with less than maximum facilities will be required to meet certain minimum facility requirements within three years or face reclassification to a lower class of station. For Class C stations, the minimum requirements will include antenna height of 984 feet (300 meters).

- The Commission's FM rules have been amended to reflect conversion to the metric system (which explains the numerous parenthetical additions in the foregoing).

The likely effect of the first three changes noted above is fairly easy to predict—stations which, under the old standards, could not be squeezed in will now fit, and thus we can expect to see new stations springing up all over. Just how many new stations to expect is hard to say. Estimates run from a low of about 200 to a high of 1200 or more.

In reference to the fourth change, existing Class B and C station licenses are likely to be concerned about the mandatory upgrading. Under the old rules, when you got a Class B/C authorization with less than maximum power and antenna height, you had an unlimited

### MINIMUM DISTANCE SEPARATION REQUIREMENTS in kilometers (and miles)

Relation	Co-channel	200 kHz	400/600 kHz	10.6/10.8 MHz
A to A	105 (65)	64 (40)	27 (17)	8 (5)
A to B1	138 (86)	89 (55)	48 (30)	8 (5)
A to B	163 (101)	105 (65)	69 (43)	16 (10)
A to C2	163 (101)	103 (64)	55 (34)	32 (20)
A to C1	196 (122)	129 (80)	74 (46)	32 (20)
A to C	222 (138)	169 (105)	105 (65)	32 (20)
B1 to B1	175 (109)	114 (71)	50 (31)	24 (15)
B1 to B	211 (131)	145 (90)	71 (44)	24 (15)
B1 to C2	200 (124)	134 (83)	56 (35)	40 (25)
B1 to C1	233 (145)	161 (100)	77 (48)	40 (25)
B1 to C	259 (161)	193 (120)	97 (60)	40 (25)
B to B	241 (150)	169 (105)	74 (46)	24 (15)
B to C2	237 (147)	164 (102)	74 (46)	40 (25)
B to C1	270 (168)	195 (121)	79 (49)	40 (25)
B to C	274 (170)	217 (135)	105 (65)	40 (25)
C2 to C2	190 (118)	130 (81)	58 (36)	48 (30)
C2 to C1	224 (139)	158 (98)	77 (49)	48 (30)
C2 to C	249 (155)	188 (117)	98 (61)	48 (30)
C1 to C1	245 (152)	177 (110)	82 (51)	48 (30)
C1 to C	270 (168)	209 (130)	101 (63)	48 (30)
C to C	290 (180)	241 (150)	105 (65)	48 (30)

# FCC RULES & REGULATIONS

amount of time to improve your station to maximum facilities. Those days are now gone, and, in order to retain full Class C status, you will have to obtain, or at least apply for, 100 kW ERP and 984 feet (300 meters) HAAT. Class B status requires a minimum of 25 kW ERP, with no minimum antenna height applicable. The minimum for Class C-1 stations is 50 kW (with no limit on antenna height), and, for Class C-2 and B-1 stations, it's 3 kW (again, no antenna limit). The precise date by which all these upgrades will have to be accomplished, however, is not clear, for reasons which will be explained below.

Another important factor regarding the changes, as adopted by the FCC, is that they do not include any substantial reductions in minimum mileage separations between stations. The original proposal had included such a reduction for Class B separations, but that proposal was rejected. A table of the new minimum mileage separations is included in this article. Despite the Commission's decision not to alter its separation scheme substantially, it should be noted that the conversion to metric measurements did result in some minor reductions both in mileage separations and in maximum antenna heights.

The changes effected by BC Docket No. 80-90 are very likely to have major repercussions throughout the industry. The timing of those repercussions, however, has been carefully controlled by the Commission through an ingenious system by which the changes are to be phased in. The system will work as follows: The new rules, although adopted in May 1983, will not become effective until next fall, probably in October or November. Between May and the effective date (whenever that may be), the Commission's staff will put together its own list of proposed channel allocations based on the new rules. It is anticipated that this list will contain as many as 500 to 600 new channel allocations to communities across the country. When the new rules are formally made effective, the Commission will issue (as a Notice of Proposed Rule-making) its proposed list of allocations, and will invite reply comments from interested parties. Once all comments are in, the staff will review them and begin to issue a series of orders.

In view of the various procedural delays normally inherent in any rule-making proceeding, much less one of this enormity, it is unlikely that any new channel allocations under the re-

vised rules will be adopted before June 1984. This in turn means that applications for use of those channels will not be filed until mid-1984, at the absolute earliest, and new stations on those channels are thus not likely to be turned on until 1985, again, at the absolute earliest. This long-term phasing-in of the BC Docket No. 80-90 changes is a creative means by which the Commission can, to a degree, retain control of the workload to be generated by those changes. Had the FCC simply made the new rules effective upon their adoption, it would have been flooded by hundreds, and possibly thousands, of channel allocation proposals within weeks of the rules' effective date. All such proposals would have required evaluation not only on their own merits, but also as they related to one another, i.e., to determine if any proposal was mutually exclusive with any other(s). In turn, counterproposals would have to have been invited and considered. The resulting deluge of paper, and the extremely complex process of sorting everything out and processing it all, would almost certainly have slowed the FM allocations process to an absolute standstill. And this does not even include any applications that might

## MINUSCULE.

Until you use it.



SHOWN ACTUAL SIZE

The job of a good lavalier microphone is to be heard and not seen. So we're introducing the new MKE 2 micro-miniature electret lavalier mic—our smallest ever. It comes with a variety of clothing attachments and can even be taped to the wearer's skin. So whether your talent is fully costumed for an epic or scantily clad, they'll hardly know it's there.

You'll know it's there, though. Thanks to Sennheiser back-electret technology and an extremely thin, low-mass diaphragm, the MKE 2 gives you uncanny transient response, and frequency response from 40 to 20,000 Hz, all with low sensitivity to mechanical noises. Which means you hear clear voices, not ruffled clothing. See the MKE 2 for yourself, but be prepared to look closely.

**SENNHEISER®**

Sennheiser Electronic Corporation (N.Y.)  
10 West 37th Street • New York, N.Y. 10018 • (212) 239-0190  
Manufacturing Plant: D-3002 Wedemark, West Germany

© 1983 Sennheiser Electronic Corporation (N.Y.)

Circle 169 on Reader Service Card

## GOOD THINGS COME IN SMALL PACKAGES



LOWEL VIDEO KITS, LIGHTWEIGHT & EXTREMELY PORTABLE. UNQUESTIONABLY THE STATE-OF-THE-LIGHT.

LOWEL-LIGHT MFG., INC. 475 TENTH AVE., N.Y., N.Y. 10018. 212-947-0950.  
LOWEL WEST, 3407 W. OLIVE AVE. BURBANK, CA. 91505. 213-846-7740

**lowel** 

Circle 170 on Reader Service Card

# FCC RULES & REGULATIONS

have been filed for proposed upgrading by existing licensees in a position to upgrade without having to change channels.

Instead, to avoid just such a breakdown in its processing lines, the Commission has forced proponents of new allocations to advance their proposals within the specific context of the FCC's own proposed allocations. In other words, rather than let itself be controlled by the haphazard order in which individual proponents might file their proposals, the FCC will be taking the lead in determining where the newly available channels should go, and interested parties whose proposals conflict with the FCC's will have the burden of convincing the FCC to change its omnibus proposal. Further, by establishing its own proposed allocation listing, the Commission has provided itself, and all commenting parties, with a definite framework to assist in the processing of the multitude of proposals which will doubtless be submitted.

All of this having been said, it remains to be determined what interested parties can or should do now in preparation for the release this fall of the Commission's proposed allocations list. The first thing to do, of course, is to no-

tify your consulting engineer and communications counsel of any interest you might have in particular allocations or in the possibility of adding new service, or expanding existing service, in any particular area. A discussion with such experts will assist you in understanding what facilities may be available as a result of the new rules. It will also assist your engineer and attorney in understanding the nature of your interests, and can further assist them in preparing the studies necessary to assure that any proposal you might wish to make is fully set forth to the Commission. No matter how much preparatory work is done, however, nothing can be filed with the Commission until it issues its listing of proposed allocations and makes the new rules effective. Once the FCC's list is released, you and your advisers should review the Commission's proposal to see whether your own interests would, or could, be satisfied under the Commission's plan. If you are interested in dropping in a new channel and the specific proposal you had in mind appears in the FCC's list, it might be a good idea to submit some appropriately supportive comments.

An additional consideration comes to bear if you are the licensee of a Class

B or C station currently operating with less than maximum facilities. In that case, you will be under an obligation to upgrade within three years of the effective date of the new rules or face reclassification as a lower class of station. Such reduction in class could, because of minimum mileage separation considerations, inhibit your ability to improve your station beyond certain levels. Thus, it is advisable to familiarize yourself with the minimum facilities requirements which must be met to avoid reclassification, and to review the possibility of upgrading within the three-year time limit.

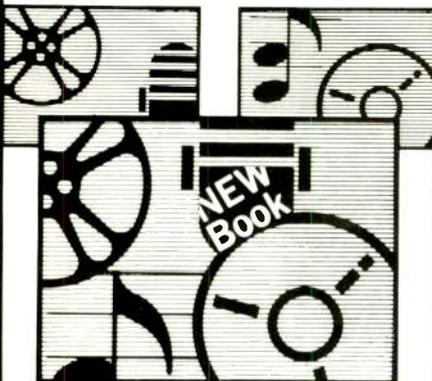
BC Docket No. 80-90 is the classic instance of a situation which potentially has major advantages and equally major disadvantages for all concerned. Fortunately, the FCC has provided everyone with a reasonable period of time in which calmly and objectively to assess their own needs and interests before the FCC's allocation list appears next fall. Broadcasters would do well to make use of that reasonable period. If you have any questions about BC Docket No. 80-90 or its particular effect upon you, you should contact your consulting engineer or communications counsel. **BM/E**

## Videotape Editing

*Videotape Editing-Communicating With Pictures And Sound* answers every videotape editing question:

When to edit? When to (and when not to) use a **dissolve** or **wipe**? How to cut? How to use complex **sync roll** editing and **audio sweetening**? How to affect the mood and pace of a **show**? Why and how to perform **computer** editing without losing **creative** control? It even takes the mystery out of **time code** and **user bits**.

Beginning editors, experienced pros, film editors and media managers will all appreciate *Videotape Editing*. This new book is your guide through the world of videotape editing including time code and computer assistance.



*Videotape Editing-Communicating With Pictures And Sound* By Michael D. Shetter

• 165 pp. • 144 illus. • 6"x9" Hardbound  
\$32.20 (\$34.00 in IL.)

Order Today! • Major Credit Cards Accepted  
Brochure Available • (312) 364-1900 Ext. 825

**SE Swiderski Electronics**  
Audio/Video Engineers

1200 Greenleaf Ave • Elk Grove Village, IL 60007 • (312) 364-1900

Circle 171 on Reader Service Card



Our reputation (and success) is a result of providing client services of the same quality as the products we sell. Perhaps it's time you consider that the people you buy from are at least as important as what you buy...

**Professional Products, Inc.**  
4964 Fairmont Avenue, Bethesda, Maryland 20814  
(301) 657-2141  
Richmond, Virginia (804) 794-2585  
Baltimore, Maryland (301) 298-7111

**Sales • Design • Installation**  
**To Broadcast**  
**Industrial**  
**Government**  
**CATV**

Circle 172 on Reader Service Card

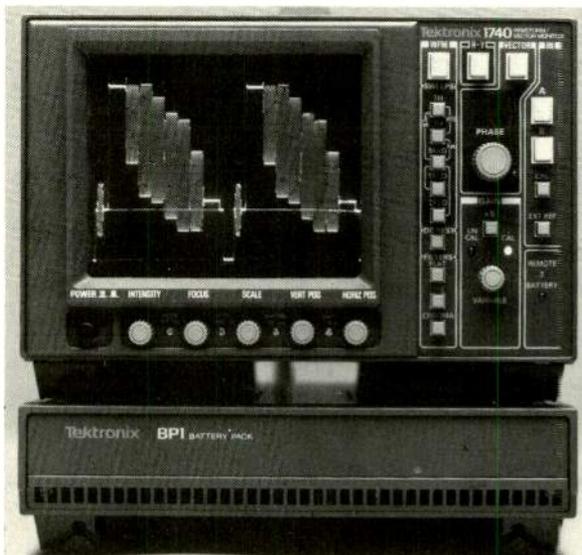
# broadcast EQUIPMENT

## Tektronix Develops Single-Unit Waveform Monitor/ Vectorscope

250

A portable, single-unit waveform monitor/vectorscope, Model 1740, was designed for use by television engineers and measurement engineers in all NTSC system countries. The new device provides similar performance to that previously available in the company's 528A waveform monitor and the 1420 vectorscope, but contained within a half rack size and at a lower price.

The new series, including the 1740, is suitable for video signal monitoring in camera control units, VTR bridges, production switcher consoles, mobile vans, and field production equipment. Features offered on the 1740 are dc operation, two-in-one measuring functions, and bright CRT display.



Options for the instruments provide a dc input for powering the monitor from a 12 V dc power source as well as offering the BPI battery pack power source that mounts to the bottom of the portable case.

## Anton/Bauer Adaptor 251 Operates Light/Camera

The camera light power adaptor (CLPA) from Anton/Bauer was designed to provide portable lighting and camera power through a single Snap-On battery. The unit mounts directly between the bracket and battery on the rear of any camera and the integral cable plugs into the company's LG-U Black Beauty lighting head.

The LG-U uses a new high-efficiency 14 V bulb, the FLP, codeveloped with Anton/Bauer by Sylvania. At

70 W, the bulb offers light within a half-stop of a standard 100 W bulb while operating 70 percent longer.

Typical camera run time, with the light in use approximately one third of the time, will be over one hour. Also, the FLP bulb has an expected life of over 50 hours, which, according to the company, is eight times that of currently available video bulbs. The CLPA lists for \$125 and the FLP bulb for \$46.

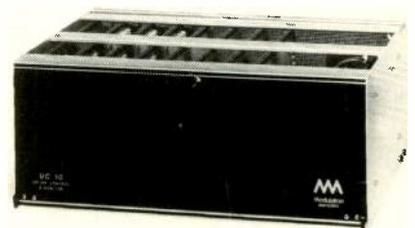
## Cetec Vega Introduces 252 New Wireless Mic Receiver

The new Model R-42 Pro Plus wireless microphone receiver features what the company calls infinite gain technology. Low noise, true dual-receiver diversity, and switch-selectable Dynex II audio processing are primary developments of the new receiver. With Dynex II, the A-weighted dynamic range is typically 108 dB (maximum deviation

to noise floor). With Dynex II switched out, the unit has a 92 dB S/N.

Highest adjacent channel rejection is achieved with 16 poles of IF filtering. The preselector is a true four-pole, silverplated helical resonator filter. The design eliminates hum and powerline noise with Mu-Metal shielding for the power transformer and other critical circuitry. The companion nondiversity receiver is designated the Model R-41, and both work in conjunction with the 77 Dynex II bodypack transmitter or the Model 80, 81, or 82 hand-held transmitter.

## Modulation Assoc. 253 Develops Uplink Controller



The new UC 10 is a control and monitor system for remote satellite uplinks. Designed to accommodate system expansion via plug-in modules, the system can dial automatically the systems engineer in case of alarm, reporting the fault condition.

Uplink voltage, current, and temperature monitor points may be checked with the unit, and backup systems can be switched in or out. The UC 10 also has the capacity to read the frequency of up to 16 MAI SM 710 modulators.

A standard CRT terminal and a 300 baud modem can control the system. The company offers the compatible terminal with integral modem and an optional printer. The package will automatically dial the uplink phone numbers from a list or dial a number entered from the keyboard. The system status can be displayed on the screen or can be dumped onto the printer.

## Amtel Unveils 254 Evertz VITC Unit

The new Model ECM 4000 edit code master with VITC is designed as a combination generator and high-speed reader for both longitudinal and VITC with nearly all active components on plug-in modules. For simplified use, the company has included a format



■ FOR MORE INFORMATION ■  
circle bold face numbers  
on reader service card

keypad which allows the unit to be quickly configured to specific operating requirements.

Features on the 4000 include presettable time and user bits, high-resolution character generator/keyer, and programmable remote control. Additional functions in the unit are the presence of an RS232 serial port interface to keyboard computerized editing systems, alphanumeric user bit data capability, and a wide speed range for longitudinal and VITC reader.

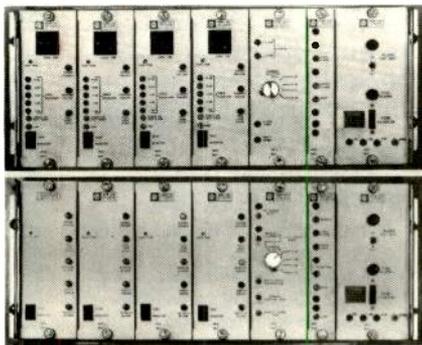
Also featured are programmable output level, jam sync modes, color frame correct code, and optional full-function remote-control unit with display. The list price for the ECM 4000 is \$5900.

■ FOR MORE INFORMATION ■

circle bold face numbers  
on reader service card

### Karkar Offers **255** Digital Multiplexer

The digital stereo program channel multiplexer for multiplexing up to four program channels onto a DS-1 line is designated the KDM-415. The unit is



compatible with both D3 and Fe framing formats and is designed to meet or exceed both AT&T and CCITT recommendations.

The KDM-415 can be configured in either one- or two-way systems and is designed for remote-to-studio and STL uses via wires, telephone digital network, or microwave link. The unit is just as suitable for interfacing with satellite systems.

Also, the unit provides switchable preemphasis and deemphasis, built-in

cable equalizers, and switchable attenuators. Effects of random errors and error bursts are minimized through use of special algorithm. The KDM-415 has a built-in test unit at either end for single-ended level adjustments and trouble-shooting as well as comprehensive alarms and indicators at both the system and converter levels.

### NEC Offers **256** Graphic Equalizer

The new DG-802X digital graphic equalizer permits independent control of phase and amplitude, octave by octave, with CRT display and provisions for memorizing equalization characteristics. Using a recently developed signal processing IC, the unit has a soft touch key pad which electronically controls phase and amplitude independently of each other at 10 center frequencies.

In conjunction with a personal computer, the two-channel system provides a graphic display for tracing active sound fields, with both measuring parameters displayed at each frequency. A wave form memory can store up to nine wave forms, and random access to the memory allows for instant recall by pushbutton.

The DG-802X has a dynamic range of more than 90 dB and separation between channels is better than 90 dB. Distortion is less than 0.01 percent.

### Harris Introduces **257** LPTV Transmitters

A new line of low-power UHF and VHF television transmitters has been introduced and designated the TV Series. Included in the series is the TVH VHF high band, the TVL VHF

## When accuracy Counts...Count on Belar for AM/FM/TV MONITORS



**BELAR**  
AM MODULATION MONITOR



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

Circle 173 on Reader Service Card

Due to the purchase of new equipment

## Greene, Crowe & Company

has available for sale

## 4 RCA TK-47 CAMERAS

with Fujinon lenses and related equipment.

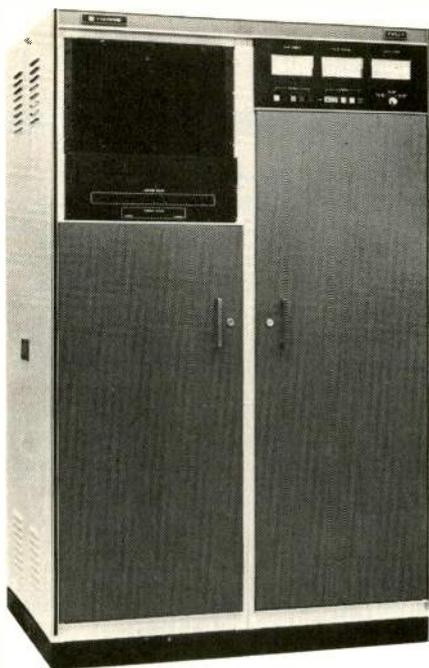


For further information contact:

Kevin Hayes  
Greene, Crowe & Company  
3083 N. Lima Street / Burbank, CA 91504 / (213) 841 7821

Circle 174 on Reader Service Card

# EQUIPMENT



low band, and the TVU UHF models in 1, 2.5, 5, and 10 kW units.

The TV Series transmitters feature low-level IF modulation and diplexing, wideband modular design, long-term adjustment-free RF amplifiers, plug-in RF assemblies, and fully automatic op-

eration. Each style in the series is adaptable for remote-control operation.

Each transmitter is equipped with Harris's MCP-2 visual exciter with an improved video saw filter for vestigial sideband shaping. A quadrature corrector provides compensation for several types of tube nonlinearities, such as differential gain, incidental phase, and intermodulation distortion.

## For-A Redesigns 258 Time Code Reader

The TCR-3500 is a new unit which provides SMPTE and EBU time code and user bit data reading functions plus character display and timer functions. The character display permits automatic superimposition of the time code readout onto the picture without the use of a title generator.

Two time code memories permit freezing any point in the videotape, identified by BCD time code, for push-button retrieval. The unit can also superimpose tape numbers from 00 to 99 onto the picture, providing an editing aid when several tapes are used in teleproduction. The TCR-3500 has two time generators. A count up/down fea-

ture with frame and tape number display has up to three start times which can be preset and put into memory. This includes a time freeze and reset function.

A built-in battery is standard for accurate real time measurement, even in the event of power failure. The TCR-3500 is priced at \$3000.

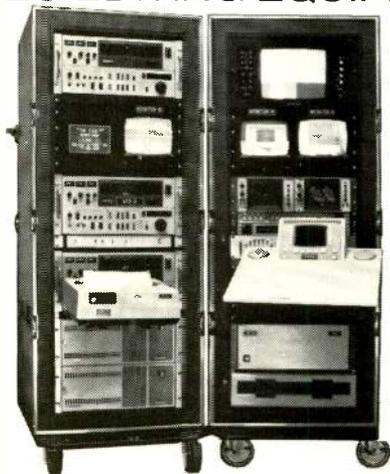
■ FOR MORE INFORMATION ■  
circle bold face numbers  
on reader service card

## Electro-Voice Adds 259 to Monitor Line

The release of the new Sentry 505 studio monitor speaker, featuring an angled enclosure for ceiling/wall mounting, adds another model to the Sentry line of monitors. The 505 is an acoustic match for the larger 500 as a result of calculated rolloff of the system's low frequencies at a rate that compensates for the bass boost which occurs when a speaker is mounted at a two-surface intersection.

The speaker's efficiency is measured

## LAUMIC HAS THE EDGE IN VIDEO EDITING EQUIPMENT



Now you can **RENT** a CMX Portable 3 machine system from Laumic Company

"THE EDGE"™ computer assisted editing system with internal memory, re-edit, list ripple, time code/pulse count editing, auto assembly, floppy disk, printer, GPI and built-in A/V dissolver; interfaced with ADDA's TWIN TBC and DIGITAL EFFECTS SWITCHER; WAVEFORM & VECTORSCOPE; 3 SONY 5850's SYNC GEN.; and VIDEO & AUDIO MONITORS.

It's yours for short or long term rental. Call today.

**SALES, SERVICE AND RENTALS OF JVC, SONY, HITACHI. INDUSTRIAL/BROADCAST VIDEO EQUIPMENT SYSTEMS DESIGNED AND INSTALLED.**

**LAUMIC COMPANY, INC.**

306 EAST 39th STREET, NEW YORK, N.Y. 10016 • TEL. (212) 889-3300

Circle 175 on Reader Service Card

## Live Remotes

Marti's 2.5 watt RPT2 battery powered RPU Transmitter brings difficult remotes back **LIVE**. Equally important, Marti delivers clean broadcast-quality audio and continuous-duty operation. The RPT2 will operate with Marti Mobile Repeaters and Automatic Repeaters to form a wide coverage system.



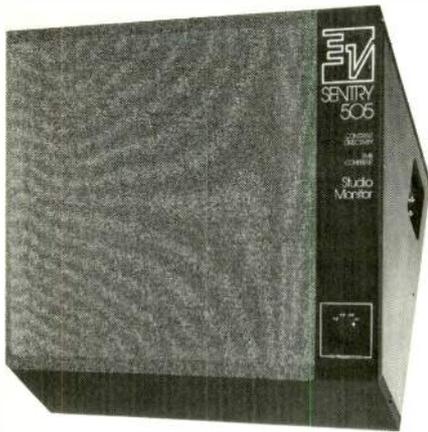
### RPT2 FEATURES:

- ★ Type accepted on all VHF-UHF RPU channels
- ★ 2.5 watts continuous output
- ★ Dual frequency provision
- ★ Sub-audible encoder
- ★ Built-in metering
- ★ 3-way power option
- ★ Internal ni-cad battery
- ★ Internal charger and AC supply
- ★ FM Compressor-Limiter
- ★ Mixing mic and line inputs

VHF-UHF  
Model RPT2  
Transmitter

**MARTI** MARTI Electronics, Inc.  
1501 N. Main • P.O. Box 661  
Cleburne, Texas 76031  
(817) 645-9163 • Telex 794 835

Circle 176 on Reader Service Card



at 96 dB (1 watt, 1 meter, anechoic), and offers frequency response from 40 Hz to 18 kHz (extendable to 28 Hz on the low end with a kit). Power handling capacity is claimed to be 100 W average long-term and 400 W short-term peak load.

A two-way speaker, the monitor contains a 12-inch, high-excursion woofer and a tweeter capable of handling 25 W. Crossover of the 505 is 1500 Hz. The speaker weighs 60 pounds, includes mounting brackets, and comes in a matte black vinyl-covered enclosure.

## Lang Video Updates One-Shot ENG Unit

The One-Shot is a field mixing unit designed to function as a video switcher, source identifier, and audio mixer in a compact device. The system comes in a portable or rack-mount version and is suitable for installation into vans or helicopters.

Featuring modular plug-in components, it is a four-input video switcher, a digital NTSC color bar/eight symbol programmable character generator, a balanced four-input audio mixer with limiter, and a color black generator.



Options for the unit include a vertical interval switcher, a 12 to 30 Vdc power supply, a SMPTE color bar generator, a one-inch video monitor, and a modulator for channels 3, 4. The One-Shot, with all options, sells for under \$3700.

## Automatic Level Control From Kennedy Space Center 261

A new automatic level control circuit has been developed to protect against signal overshoot. In the new circuit, two zener diodes, connected back-to-back in series with a capacitor, feed back signal that reduces the circuit gain.

The overshoot voltage spike causes the voltage across the zener diodes to exceed their breakdown voltages.

When this happens the diodes turn on, preventing the voltage spikes from appearing at the circuit output. When the spike voltage drops below the breakdown voltage of the diodes, they turn off. The initial output level is determined by the zener breakdown voltage and the capacitance of the series capacitor.

## BROADCAST EQUIPMENT LIQUIDATION SALE

COMPLETE ENG RECORDER/CAMERA PACKAGE — \$5,995!

Purchased from a major broadcast chain. All equipment completely refurbished and in top operating condition. Instruction manuals and complete maintenance records furnished. 30 day limited warranty. Price includes shipping and handling — anywhere in continental USA. Complete system includes:

- SONY BVU 110 Recorder/Player
- SONY BC 210 Multi-Battery Charger
- HITACHI SK-80 3 tube camera with Fujinon 10-100 lens
- HITACHI AD-80A AC power supply
- FREZZOLINI Ni-Cad Battery belt with rapid charger
- COMPLETE cable and accessory kit
- READY TO SHOOT Broadcast Quality System

Order now — quantities are limited! Call toll free!

**1-800-428-5558**  
(In Indiana 317-842-5718)

**dvc**  
dynavid corp.

5603 E. 82nd Street, Indianapolis, IN 46250

Circle 177 on Reader Service Card

# Winsted

THE PERFECT MATCH  
for your video equipment



**SYSTEM/85**  
MODULAR  
VIDEO  
CONSOLES

A new generation of professional modular systems, developed by Winsted for use with the Sony "800 and Type 5" series video equipment.

These rugged 19" EIA modular units offer easily assembled welded and bolted stability. Units assemble in any configuration to suit your needs. The basic module is expandable to any size system with add-on-units.

FOR FULL-LINE CATALOG of the most complete line of customized videoproduction equipment, call or write:

THE WINSTED CORPORATION

9801 James Circle • Minneapolis, MN 55431 • 612-888-1957

PHONE  
TOLL-FREE **1-800-328-2962**

Circle 179 on Reader Service Card

# BUSINESS BRIEFS



Montgomery Publications' LPTV station K6KZ in Junction City, KS recently completed equipment installation with video systems design by Lines Video Systems.

**Kaman Broadcasting Systems** plans to demonstrate its new software programs for automation at the twenty-third annual conference of Broadcast Financial Management. The new Kaman software shows advancements in its automation of traffic, accounting, and billing for television and radio.

**RCA** had higher second-quarter earnings on record sales. Earnings for the three months ended June 30 were \$66.2 million, compared with \$60.5 million in the second quarter of 1982.

**Soundcraft Electronics** has announced the formation of **Soundcraft Canada Ltd.**, a move to offer multinational distribution and new warranty programs.

**Studer** has expanded its west coast operations with the opening of a new northern California office and the appointment of a second sales engineer to the staff of the southern California office. . . . **Varitel Video** has opened its Los Angeles office and editing facilities and has incorporated into its San Francisco office new Betacam half-inch equipment.

**Pierce-Phelps** has formed a new arm to the company, the Audio Systems Division, which has been appointed as representative by **Sony/MCI**. The new division will distribute Telex, E-V, and TOA, as well as act as dealer for major lines such as Altec, JBL, Crown, Otari, and Yamaha. . . . **AFA Systems**, a division of A.F. Associates, has completed its installation and final testing of the **Empire Video** one-inch computerized editing facility that it designed in New York City.

**Atlantic Research** has completed

the sale of its subsidiary, **Datatronix**, to **Switchco, Inc.** in exchange for an \$800,000 demand note convertible into 64,000 shares of Switchco common stock.

**Channel 18**, a new LPTV station serving the cities of Sulphur Springs, Greenville, and Commerce, TX, has purchased the 22-foot mobile television production system featured by **Shook Electronic and Magnetic Media** at the recent NAB show. . . . **TFT, Inc.** has shipped the single largest order in the company's history. The shipment consisted of STLs and accessories bound for Taiwan.

**NEC America** held groundbreaking ceremonies in June to celebrate construction of its new corporate headquarters, to be opened in 1984, in Melville, NY. . . . **Altec Lansing** has relocated to another facility in Anaheim, CA after selling its previous facility there.

In the personnel department: **MCI/Quantel** has expanded its efforts by naming Kevin Prince as engineering manager, a new position reporting to George Hamilton, VP engineering services. . . . **Cetec Broadcast Group** has promoted Gary Persons to director of marketing, Ali Mahnad to antenna design engineer, and Edward Fitzgerald to FM sales product manager.

James Twerdahl has been elected president of **JBL, Inc.** after having served as executive VP and GM of JBL marketing. . . . **Lang Video Systems** announced that Ron Golick has joined the corporation as director of sales. . . . **Dynair** has appointed Richard M. West to the position of director of operations.

Three new personnel developments at **Channelmatic** have been announced: Tom Walsh is the new operations manager, overseeing design and manufacturing operations; Al Taylor has been named advertising director; and Dwain Keller has been appointed to oversee new product development and applications.

**DigiVision** has reorganized its top management, with John Cambon being named president of the company. . . . **Scientific-Atlanta** has elected John H. Levergood to the title of president and chief operating officer, in addition to naming him as a director of the company. . . . **Edward Bolger** has been named product manager at **CMX/Orox** and will be responsible for large-scale videotape editing systems. . . . **Artel Communications** announced two major personnel changes: Richard Cerny was recently elected chairman and CEO, and Tad Witkovicz was elected president and chief operating officer.

## SALES OFFICES

# BME/E

### Broadcast Management/Engineering

295 Madison Ave.  
New York, New York 10017  
Telex: 64-4001

#### Eastern & Central States

James C. Maywalt,  
Vice President, Sales

295 Madison Avenue  
New York, New York 10017  
212-685-5320

James C. Maywalt  
Gene Kinsella

#### Western States

Neal Wilder, Associate Publisher

1021 South Wolfe Road, Suite 290  
Sunnyvale, CA 94086  
408-720-0222

Neal Wilder  
Charleen Kennedy

5015 Birch Street, Office One  
Newport Beach, CA 92660  
714-851-1461  
Neal Wilder

#### United Kingdom/Europe

28 Eaton Row  
London SW1W 0JA, England  
Telephone: 01 235 8431

Bronwyn Holmes  
Derek Hopkins  
Ruben Veksner

#### Japan/Far East

Eiraku Building  
1-13-9, Ginza,  
Chuo-Ku, Tokyo 104 Japan  
03 (562) 4781  
S. Yasui  
K. Yamamoto  
Y. Yozaki

# TIME BASE CORRECTION RE-DEFINED

Introducing the first totally different approach to time base correction in 10 years.

Until now, the TBC has only been as good as its weakest link - the analog circuitry. So we have eliminated the input clock and introduced the industry's first totally digital sync separator in a TBC.

The DPS-103 single clock TBC uses component processing and an advanced interpolation technique to breakthrough to "picture perfect" video.

Designed to work with 3/4" heterodyne VTR's, the DPS-103 is the long-awaited solution to conventional time base correction. Only \$8950.

## Features:

- Maintains lock through 40 times normal speed in forward and reverse
- Maintains color through 10 times play
- Velocity compensation
- 16 line window
- Auto color framing
- RS 170A output
- Internal test generator

DIGITAL DPS-103 COMPONENT TBC

VIDEO SET-UP CHROMA HUE  
LOCK REF GEN. INTAL SPLIT. COMP. TEL. BYPASS COARSE FINE SYSTEM PHASE

Contact your local dealer to see "picture perfect" video - with the DPS-103 Component TBC. Or call Digital Video Systems.

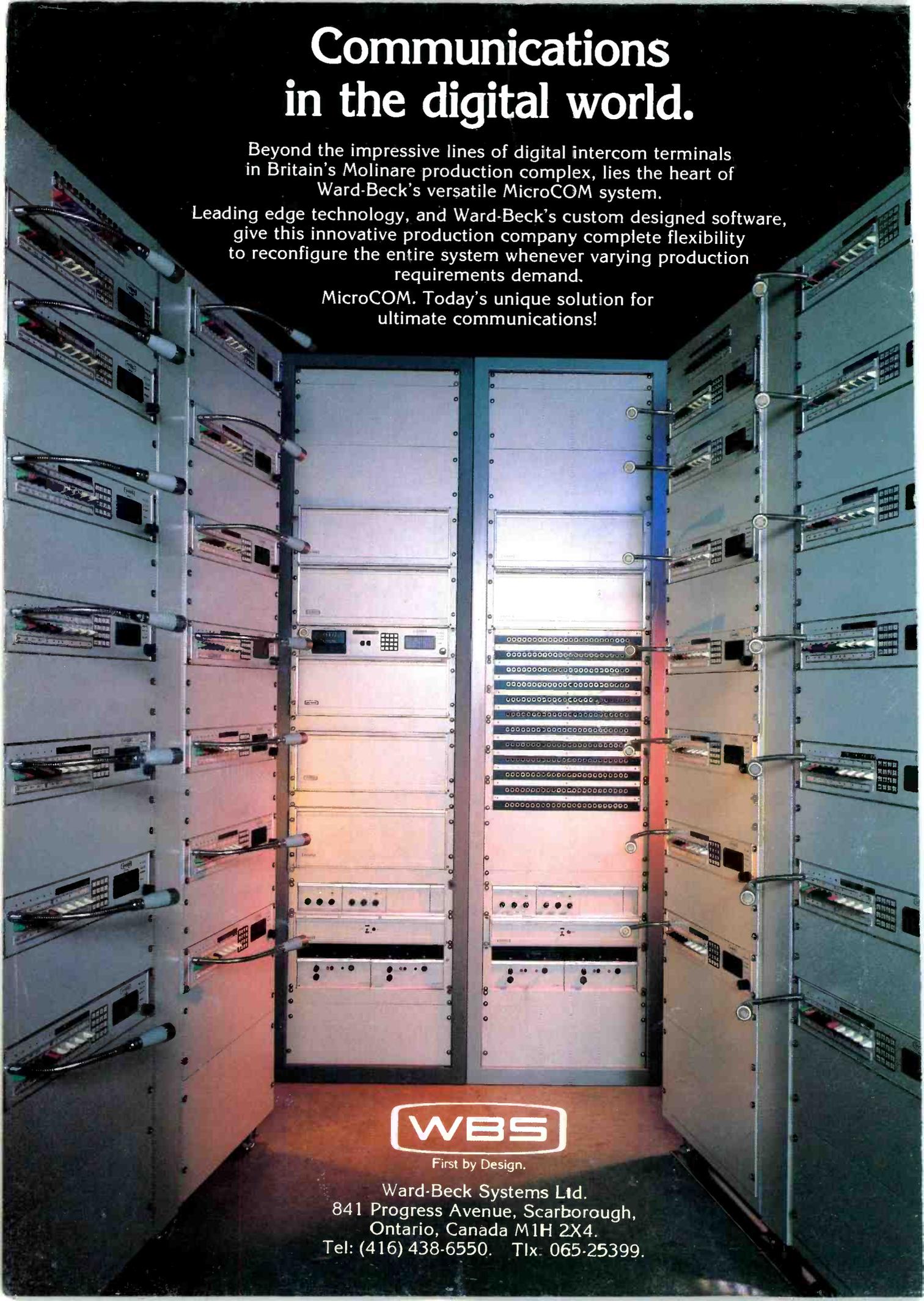
New York (212) 695-5311  
Los Angeles (213) 462-6153  
Toronto (416) 499-4826

# Communications in the digital world.

Beyond the impressive lines of digital intercom terminals in Britain's Molinare production complex, lies the heart of Ward-Beck's versatile MicroCOM system.

Leading edge technology, and Ward-Beck's custom designed software, give this innovative production company complete flexibility to reconfigure the entire system whenever varying production requirements demand.

MicroCOM. Today's unique solution for ultimate communications!



**WBS**

First by Design.

Ward-Beck Systems Ltd.  
841 Progress Avenue, Scarborough,  
Ontario, Canada M1H 2X4.  
Tel: (416) 438-6550. Tlx: 065-25399.