

BROADCAST[®] engineering

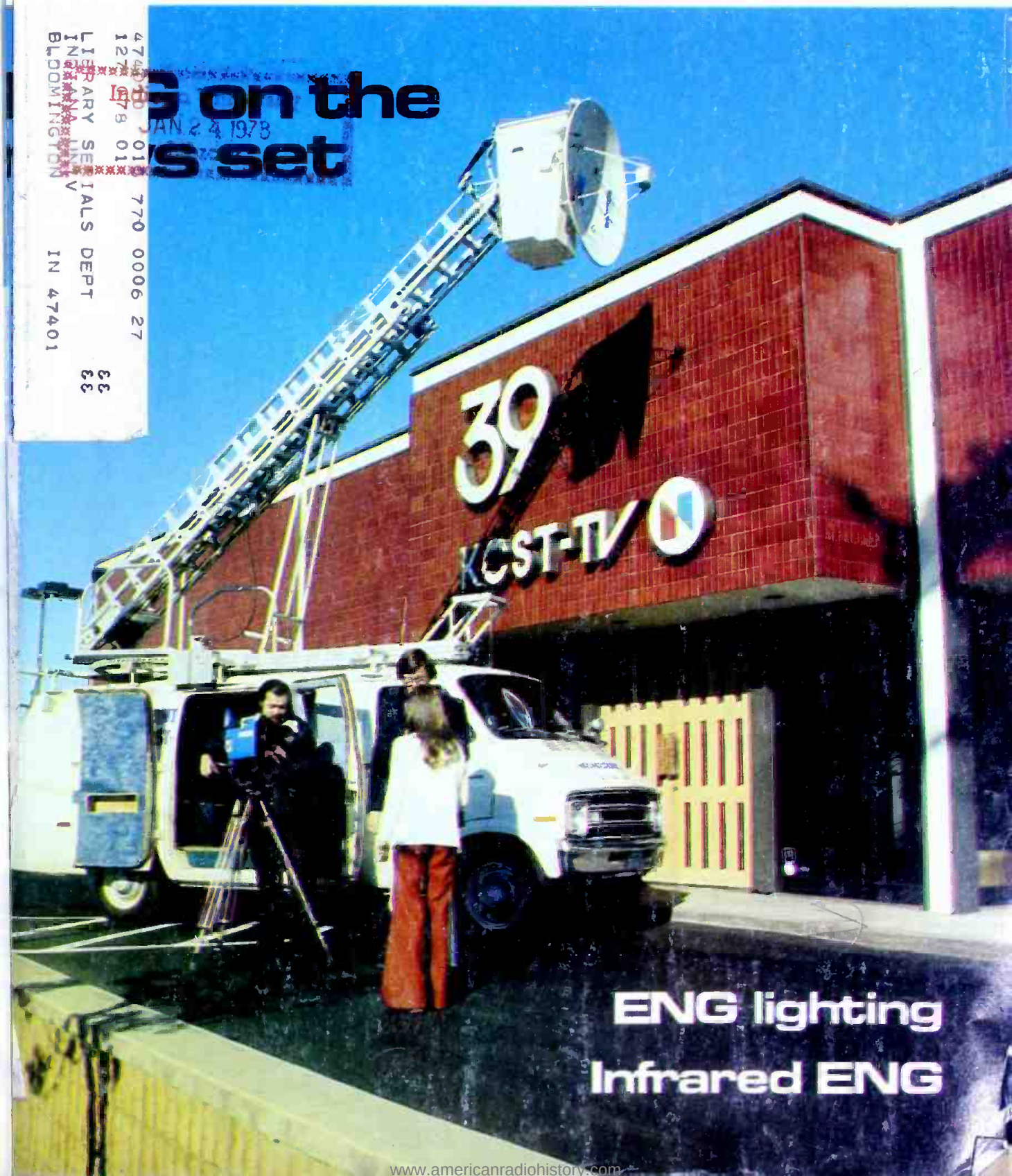
January, 1978/\$2.00

CPR

4740 010 770 0006 27
1278 010 778 01
LIBRARY SERIALS DEPT
INDIANA UNIV
BLOOMINGTON IN 47401

on the
set

JAN 24 1978



ENG lighting
Infrared ENG

At Home. Or Away.

At home in the studio, or away on location, Ward-Beck's flawless performance comes through for you.

The same engineering expertise, imaginative design concepts, and unparalleled craftsmanship, provide a depth of quality that is inherent in every Ward-Beck console, whatever its application.

For those who want a consistent winner, there is really only one choice.



Mobile multi-track recording console WBS Model 76042



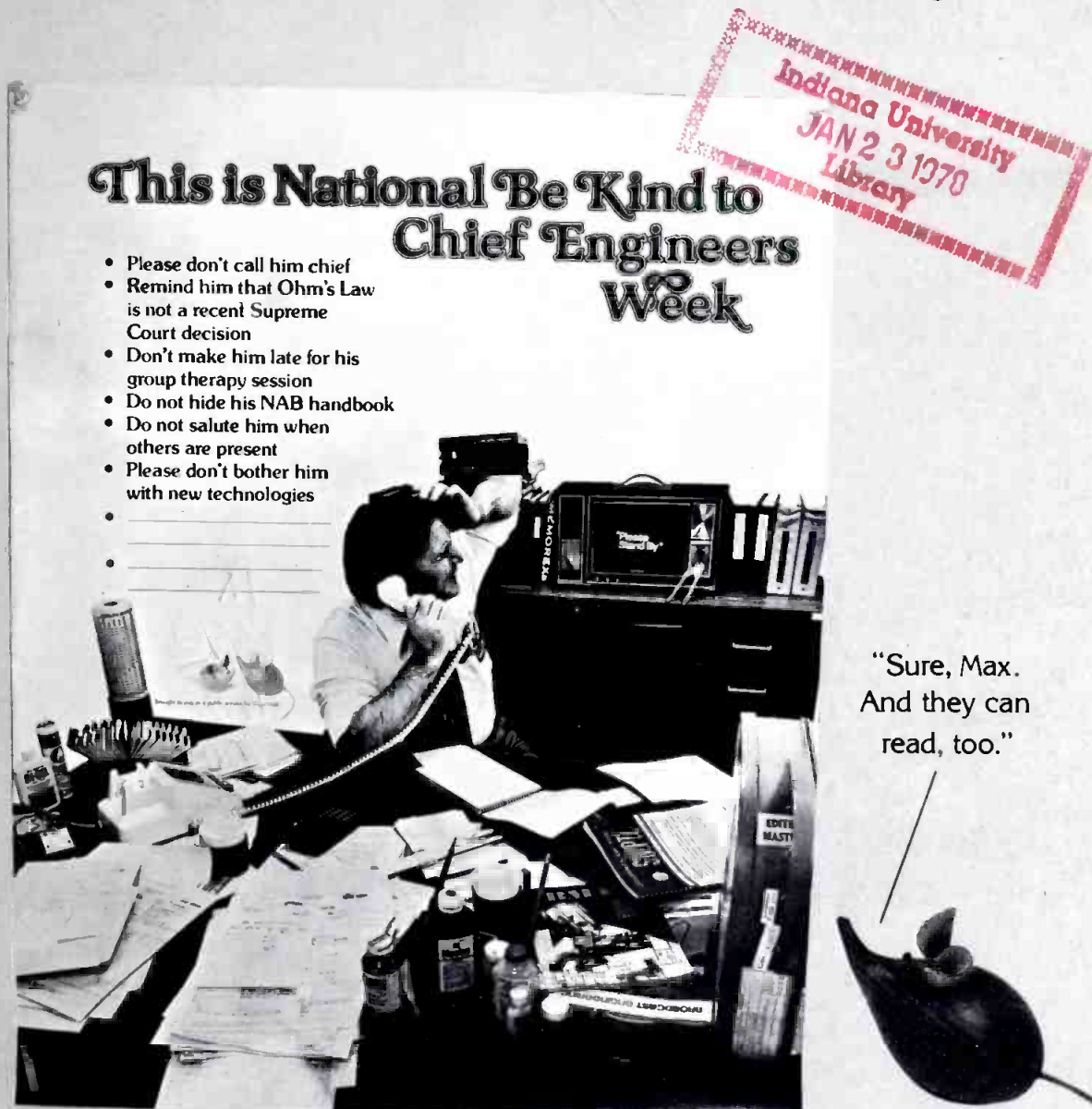
Tomorrow's Technology Today.

Ward-Beck Systems Ltd., 841 Progress Avenue, Scarborough, Ontario, Canada M1H 2X4
Telephone (416) 438-6550. Telex 065-25399

Ward-Beck Systems Inc., 290 Larkin Street, Buffalo, N.Y. 14210

YOU ASKED FOR IT!

Fourth in a series of posters roasting everybody from Tape Technicians to Chief Engineers.

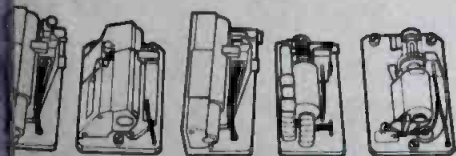


"e, do Chief
ers have a
of humor?"

"Sure, Max.
And they can
read, too."

When you do only one thing - you better do it well. Since 1970, Videomax has satisfied more client requirements for quad head refurbishment than any other firm in the field.

Call or write for your free poster.



VMX® videomax®

Videomax Corporation, An Orrox Company
3303 Scott Boulevard, Santa Clara, CA 95050
Phone: (408) 988-2000 Telex: 910-338-0554

ES & SERVICE—New York: (212) 947-8031, Los Angeles: (213) 980-7927, Atlanta: (404) 992-4490, Munich: (089) 96-76-22

For More Details Circle (3) on Reply Card

www.americanradiohistory.com

BROADCAST engineering

The journal of the broadcast-communications industry



Page 48

Contents

- 32 SMPTE Conference
Spotlights Digital TV,
Video Still-Store,
And 1-Inch Videotape.
- 36 ENG: The Road Show That Keeps Getting Better. *Ron Merrell.*
- 40 KCST Puts ENG On The Set. *Michael Scheibach.*
- 48 ENG Takes A Ride On Infrared Optics. *Ron Merrell.*
- 54 Crash Lighting For ENG. *E. Carlton Winckler and David M. Clark.*
- 62 Stereo-SCA Compatibility: Is It Really For The Birds?
James L. Tonne
- 70 Making RENG Work For You. *Peter Burk.*

About the Cover

One of the ENG vans operated by KCST, San Diego, is equipped with a ladder which extends the microwave dish 30 feet above ground. Coverage of KCST's ENG capabilities begins on page 40. (Photo by Danny Mendez.)

Departments

Direct Current	.....
Industry News	.....
News Briefs	.....
People in the News	.....
News Feature	.....
SBE Journal	.....
Radio Workshop	.....
Blue Bananas	.....
Station-to-Station	.....
New Products	.....
Ad Index	.....
Classified Ads	.....

Editorial, advertising and circulation correspondence should be addressed to: 9221 Quivira Road, P.O. Box 12901, Overland Park, KS 66212 (a suburb of Kansas City, Missouri); (913) 888-4664.

EDITORIAL

Ronald N. Merrell, *Editorial Director*
Michael Scheibach, *Managing Editor*
Ron Whittaker, *Production Spotlight*
Howard T. Head, *FCC Rules*
Joe Roizen, *Video*
Peter Burk, *Radio Workshop*
Dennis Ciapura, *Audio*
Robert A. Jones, *Facilities*
Carl Babcoke, *Technical*
Cindy Nelson, *Editorial Assistant*
Dudley Rose, *Graphic Designer*

CIRCULATION

Greg Garrison, *Director*
Evelyn Rogers, *Manager*



Member American Business Press



Member Business Publications Audit
of Circulation

ADMINISTRATION

George H. Seferovich, *President*
Mike Kreiter, *Publisher*

ADVERTISING SALES

Jan Winters, *Production*
P.O. Box 12901
Overland Park, KS 66212
(913) 888-4664
Regional advertising sales offices
listed on ad index page.

BROADCAST ENGINEERING is published monthly by Intertec Publishing Corp., 9221 Quivira Road, Overland Park, KS 66212.

BROADCAST ENGINEERING is edited for corporate management, technicians/engineers, and other station management personnel at Commercial and Educational radio and TV stations, Teleproduction studios, recording studios, CATV and CCTV facilities, and government agencies. Qualified persons also include consulting engineers, dealer/distributors of broadcast equipment.

SUBSCRIPTIONS: BROADCAST ENGINEERING is mailed free to qualified persons in occupations described above.

Non-qualified subscriptions in the U.S. are \$20.00 one year. Outside the USA \$26.00 one year. Back issues rate \$3.00. Adjustments necessitated by subscription termination at single copy rate.

Allow 6-8 weeks for new subscriptions.

Allow 6-8 weeks delivery for change of address.

Controlled circulation postage paid at Kansas City, Missouri.



INTERTEC PUBLISHING COMPANY

BROADCAST ENGINEERING

GRASS VALLEY GROUP 

PRODUCTION SWITCHING SYSTEMS

NOW AVAILABLE
WITH **DVE**

THE GRASS VALLEY GROUP, INC.

A TEKTRONIX COMPANY

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

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

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

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

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

DIRECT CURRENT FROM D.C.



January, 1978/By Howard T. Head and Harold L. Kassen

Commission Investigating Putting AM Directional Antenna Patterns on Computer

The FCC has instituted an inquiry to study the conversion of all existing standard broadcast directional antenna patterns to models which would permit greatly increased use of computers in making allocation studies. Over 2000 existing AM DAs are involved.

Although virtually all AM DAs can be represented and calculated by their electrical parameters, present procedures require that allocation studies be based on the latest version of the "measured" pattern rather than the computed pattern. Not only is the process time-consuming, it has led to numerous errors in the past as new and revised "measured" patterns are filed with the commission.

Numerous problems are involved, both technical and legal, involving definitions of service, interference, and protection. In addition, our treaties with other North American countries must be taken into account. However, the commission feels it *must* take some affirmative action to relieve the burden in processing applications. The best bet is that all AM stations employing DAs will eventually be required to file new patterns capable of machine manipulation.

Filings Heavy In VHF TV Drop-in Proposal

The commission has been deluged with filings in connection with its proposals to assign VHF television channels at short spacings to four markets. The markets involved are Knoxville, Tennessee; Charleston-Huntington, West Virginia; Johnstown-Altoona, Pennsylvania; and Salt Lake City, Utah.

Most parties commenting have opposed the commission's proposals on the grounds that massive interference losses would occur to existing broadcast reception and the desirability of exploiting the UHF TV band for future TV growth. Opposition came from trade associations and from both VHF and UHF licensees.

continued on page

INSTANTANEOUS Digital Command



30 Functions for only \$1995

TFT Model 7601 represents a major breakthrough in remote control systems. Now, you can get 20 channels of digital command functions plus 10 channels of digital telemetry functions for less than \$2000! And it's the same high quality, reliable design that has made TFT equipment a standard in the broadcast industry. Just check this line-up of features:

DATA SECURITY ASSURED

Full command-code redundancy, *plus* odd/even parity check, makes digital data errors virtually impossible. A TFT proprietary feature. Even lightning induced noise has no effect on integrity of command functions.

INSTANTANEOUS COMMAND

Less than 0.2 second marks the time for a complete command/execute function with the new TFT high speed data modem.

ONE MAN CALIBRATION

The front panel of the Model 7601R (Remote terminal) has a DVM and scaling potentiometers so that just one man, on-site, can perform the FCC required weekly calibration. A studio lock-out switch provides complete operator safety for on-site work.

CHOICE OF TRANSMISSION METHODS

Model 7601 interconnection can be either telephone lines or radio links which include STL, TLS or SCA.

MINIMAL SERVICE DOWNTIME

Quick-disconnect rear barrier strips allow fast removal of the 7601 from the rack without disconnecting any of the interface wiring between the remote terminal and the transmitter or alarm sampling points.

TEN OPTIONAL STATUS CHANNELS

In addition, 10 status indicator functions may be factory or field installed to provide instant status display and alarm.

The Model 7601 is just one of a full line of field-proven, reliable, fail-safe remote control systems offered by TFT. Other remote control systems designed for AM, FM and TV include the Model 7610, 120-channel digital telemetry/status/control system, the TELESCAN* auto-logging multi-channel CRT display and tolerance alarm system, and a complete line of remote control accessories. They're all available now from TFT. Call or write:

*Trademark pending

TFT

TIME & FREQUENCY TECHNOLOGY INC.

3000 OLCOTT STREET, SANTA CLARA, CA 95051 (408) 246-6365 TWX No. 910-338-0584

For More Details Circle (4) on Reply Card

DIRECT CURRENT FROM D. C.

continued from page 4

The next procedural step is the filing of replies to the initial comments, and these replies will be due early in 1978. The FCC may reach a decision during the year, although the complexity of the issues involved may delay final commission action.

Commission Institutes Inquiry On "Saturated" CATV Systems

The commission has invited comments on the problems created by its carriage and non-duplication CATV rules for cable systems having limited channel capacity. The inquiry stems from a growing number of instances where cable systems having only a 12-channel capacity find themselves required by the FCC's Rules to carry more than 12 channels of programming.

In adopting the present CATV rules in 1972, the commission originally provided a 5-year interval during which all cable systems would be required to expand to a minimum capacity of 20 channels. However, this requirement was abandoned last year and many systems find themselves with a practical capacity of 12 channels or often less.

A wide variety of options are available, including setting some system of carriage priorities, permitting carriage of some signals on mid-band frequencies at the request of subscribers, or other approaches.

Short Circuits

The NAB has objected to a proposal by a manufacturer of FM directional antennas which would classify as directional all FM antennas having a radiation pattern with circularity worse than +4 dB ...The report of the tests on AM Stereo Systems has been filed with the FCC...The commission has tightened its rules governing the determination and maintenance of output power...The commission now permits the unattended operation of FM translator stations...The commission has instituted an inquiry into the adoption of rules to provide for quadraphonic FM sound, asking "Does anybody want it?" ...It's-About-Time Department: General Motors has received an experimental license for transmissions in the FM broadcast band in an attempt to invent an automobile FM antenna that works.

We Are American Data Corporation

American Data joins the growing electronics family of *North American Philips Corporation* as a company dedicated to the principles of good products at competitive prices and backed by the kind of after-sales service that the Broadcast Industry demands.

From a single distribution amplifier or a simple input switcher to our most advanced computer-controlled distribution switcher or our sophisticated fourth-generation 558-3 Production Switcher, shown here, *American Data* is dedicated to quality and service. We can fill all your equipment requirements.

If you haven't considered *American Data* before, or don't know about the new *American Data*, why not find out now? Write us for more information or contact your nearest *American Data* representative.

American Data Corporation

A North American Philips Company
Research Park • P.O. Box 5228
Huntsville, Alabama 35805

ADC NORTHEAST

Bob Munzer, Regional Mgr.
P.O. Box 452
New Hartford, CT 06057

ADC MID-ATLANTIC

Dwight Wilcox
5504 Waterway
Rockville, MD 20853

ADC SOUTHEAST

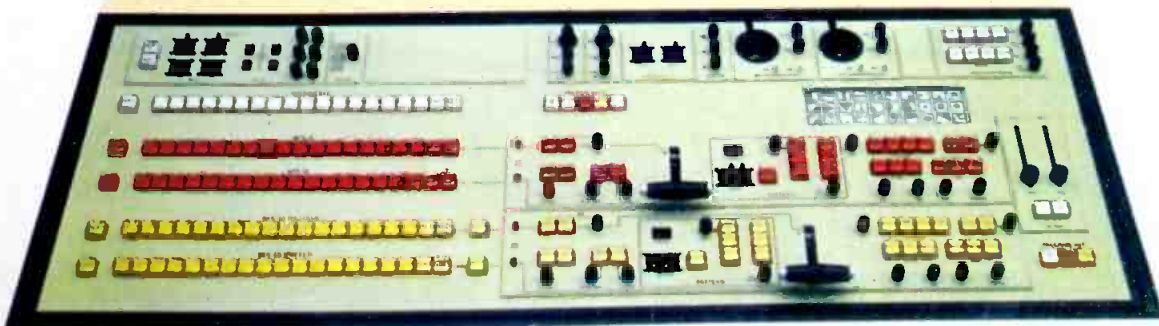
Joe Ryan, Regional Mgr.
2219 Oakawana Rd., N.E.
Atlanta, GA 30345

ADC MIDWEST

Jim Gardner, Regional Mgr.
P.O. Box 27324
Indianapolis, IN 46227

ADC WEST

3760 Cahuenga Blvd.
North Hollywood, CA 91604



For More Details Circle (5) on Reply Card



The Sony BVE-500A. It's the best editing decision you'll ever make.

Announcing the professional automatic editing control unit professional editors have been waiting for. The Sony Broadcast BVE-500A.

Already, the earlier BVE-500 has been accepted as the state of the art in control track editing by broadcasters around the world. In the new BVE-500A, we've made substantial improvements that increase the speed, versatility, and convenience of the editing process.

Compare these editing advantages with existing equipment, and consider the added creative capabilities you get with the Sony Broadcast BVE-500A.

1. BIDIREX control. The big news in the BVE-500A is BIDIREX: two self-return search dials that take the place of ordinary pushbutton search controls. Many control instructions have been built into these BIDIREX dials to allow an operator to shuttle tape in forward and reverse direction at various speeds.

BIDIREX eliminates mode selection error. And it gives Sony U-matic editing a true "film" feeling ordinary editing systems can't match.

2. Decision Prompter. The new BVE-500A uses lamps to prompt the operator to the mode and progress of all editing decisions.

Function lamps blink until the edit commands are made, then go automatically to "steady on." Even in a busy newsroom, with many interruptions, an operator can tell at a

glance the status of his last instruction as the BVE-500A prompts him for the next command.

3. Automatic Entry. The BVE-500A saves valuable time with a feature that automatically enters the "IN" point when the preview button is engaged.

If the operator has already selected an "IN" point, this auto mode has no effect; the editor may preview without disturbing his pre-selected "IN" point.

4. New Full Time Counter. The BVE-500A counts control track pulses from -79 minutes through 0 to +79 minutes. An operator need not concern himself with the count when he initiates an editing sequence.

5. Short Pre-Roll. When used with external sync, pre-roll is reduced from five seconds to three seconds, a further time-saving advantage.

6. Cue Control. The BVE-500A features built-in cue record and erase. This 1kHz tone is recorded on Audio 1, and is useful for both auto control systems and pre-cueing the tape to air.

These are just a few of the new BVE-500A features.

Others include auto shut-off, external interface of control logic, manual edit capability, and more. You can see them all in action when you ask for a demonstration of this versatile new editing control unit. To do that, just contact your nearest Sony Broadcast office.

Sony Broadcast

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

Sony® is a registered trademark of Sony Corporation of America

**For Literature Only Circle (6) On Reader Service Card
For Demonstration Only Circle (7) On Reader Service Card**

industry news

Mutual and Western Union sign satellite pact

The Mutual Broadcasting System, the world's largest radio network, has signed a seven-year contract with Western Union for the use of their Westar I satellite to bring direct programming to Mutual's affiliate stations.

Pending approval from the FCC, the contract will provide a carrier enabling Mutual programs to be delivered via satellite to more than 500 10-foot diameter receiving terminals at Mutual radio affiliate stations across the nation, as well as Alaska, Hawaii, Puerto Rico, and the Virgin Islands.

Mutual and Western Union will ask the FCC to permit Mutual's programs to be transmitted from Mutual's world headquarters in the nation's capital to Westar I, then

directly to each of the receiving terminals, and finally, to Mutual's more than 780 affiliate radio stations, in addition to the 90 affiliates of the Mutual Black Network, the first black network.

C. Edward Little, Mutual president, called the agreement a "momentous step" in radio history.

"This contract means that no longer will network radio broadcasts be fed exclusively through land lines provided by the telephone companies," the network president said. "Commercial radio network broadcasting will now move into the computerized space age for the first time in the history of the industry."

He added: "Within 18 months, following FCC approval, Mutual will be able to feed as many as three

simultaneous programs nationwide on three separate channels, or will have the capability to transmit in stereo. And in the future, Mutual will be able to feed as many as six programs at the same time," Little said.

"It means that in addition to the newscasts, sportscasts, sporting events, and other programs we now feed to our affiliates on a 'round the clock, seven-day-a-week basis we will be able to feed them other programs at the same time—football games, say, or continuous music programming, a congressional debate, a talk program, a rock concert or whatever."

"For radio stations and for radio listeners, there is a bright day coming—a day with incredibly wide latitude of program selection and network professionalism," the Mutual president said.

Gary Worth, executive vice president responsible for Mutual's affiliate relations and the satellite project, pointed out the unusual quality of Mutual's satellite signals to network affiliates. Because of being transmitted from space, he said, the signals will have "15 kHz quality."

"Never before in the history of the medium, have networks been able to feed their programs to local stations in the super high fidelity the Mutual satellite transmission will have," Worth said.

Looking back, the Mutual executive said, "If this quality had been available to radio networks in the past, particularly when television had its impact in the 1950s, perhaps the evolution of network radio to what it is now would not have happened, would have been entirely different."

Mutual provides hourly and half-hourly newscasts around the clock 365 days a year, along with daily sportscasts and live coverage of the nation's major sporting events—weekly Notre Dame football games, twice-weekly NFL football games, NCAA basketball, NBA playoffs, leading golf tournaments, and major tennis matches.

continued on page 1

Left to right: F. L. Pendleton, manager of applications engineering, California Microwave Inc., manufacturer of the satellite terminals; James T. Ragan, vice president for broadcast services, Western Union, whose Westar I satellite transmits to the antenna; Dr. David B. Leeson, president, California Microwave; E. Edward Little, president Mutual Broadcasting System; Jay Van Andel, chairman of the board, Amway Corporation; and, Gary J. Worth, executive vice president, Mutual Broadcasting System.



Neve

The world's foremost name in professional mixing consoles

The NEW AM/FM Radio Console

After nearly two years in the making, Neve is introducing model 5402 (CRC), a low profile console primarily designed for radio station applications, on-air and production. Configured with mono and/or stereo channels, mic and/or line inputs, simple plug-in circuit cards also offer facilities for voice-over, echo, foldback and DA outputs. And the price is very attractive starting around \$7,500* for a 10 input stereo configured console.



Model 5402



Model 5305

Model 5305 TV Production Console

Designed as a 4 bus 2 main output console, this model is ideal for the small to medium sized TV station for production as well as on-air use. Many optional facilities are available, enabling us to customize a console for your particular application and keep delivery lead times to a minimum. A fully fitted 12 input console with good equalization is priced at \$17,950*. This is exceptionally good value in the marketplace.

Custom Designed Consoles

Neve is believed to be the largest producer of sound mixing consoles in the world, employing around 400 dedicated people in two manufacturing plants and four subsidiary sales and service companies. Our consoles are in use in over 50 countries, many in network and station broadcast facilities in Canada and the U.S. We have the capability to design and build any type and size of console to the state of the art, and pride ourselves in keeping delivery promises. Please accept our invitation to discuss your custom console requirement with us.

Multitrack Production Consoles

Through our leading position in the field of music recording, we are able to deliver Broadcast Multitrack Production Consoles with optimum multitrack as well as broadcast facilities. 8, 16 and 24 track consoles are often in stock, and we are eager to please customers by incorporating special facilities on short lead time. 8 track consoles start around \$29,000*, 16 track around \$38,000*, and 24 track around \$66,000*. Check our competition, and you'll be surprised to realize our price competitive position!

*FOB Bethel, Conn.

Subject to change.

Call Tony Langley (203) 744-6230

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

The Neve logo, featuring a stylized 'N' symbol followed by the word 'Neve' in a bold, sans-serif font.

For More Details Circle (8) on Reply Card

The Only Solution for Sony Cameras



373 DX

Chromatic Production Switcher

Just Plug Them in and You Have the Most Advanced Studio

- Sony Camera Compatibility.
- Color Bar, Automatic Color Black and Color Background.
- 10 Wipes, Soft Wipe, Border Wipe, and Key.
- SYNC Generator.
- Front Panel Subcarrier Phase Shifter.
- Digital Tally Indicator, and Intercom.

SHINTRON

World Wide

Cambridge, Ma.

02142 U.S.A.

617-491-8700

Telex 921497

news

.....
continued from page 10

St. Louis station fined by FCC

The FCC has fined a St. Louis radio station \$5,000 for failure to log the actual duration of commercial announcements.

It also admonished the station for exceeding the amount of commercial time which it had stated would be broadcast each hour. The violations occurred on seven days in November 1976, and January and February 1977.

The commission said a comparison of the station's program logs with recordings made when the FCC was monitoring the station indicated that the time logged for various commercial announcements deviated substantially from the actual broadcast time. It said many announcements

were logged as 30-second spots or 60-second spots when they ranged from 42 seconds to two minutes for the 30-second, and 12 seconds to four minutes and five seconds for the 60-second spots.

Therefore, the commission said the station had violated Section 73.112 of the rules which provided that the duration of each commercial or the amount of commercial time in each hour be logged.

In addition to fining the station \$5,000 for the logging violations, the FCC admonished the station for broadcasting up to 26 minutes of commercial programming in one hour when the station's 1973 and 1976 renewal applications stated that it ordinarily limited commercial programming to 18 minutes each hour.

It added that the station was expected to adopt procedures to prevent such violations in the future and the matter was being made part of the station records.

Log Entries

January

18—New Jersey Broadcasters Association, annual Midwinter managers meeting. American Hotel and the National Broadcasters Hall of Fame, Freehold, New Jersey.

19-20—First US/Southeast Asia Telecommunications Seminars Program and Exhibit. Hyatt Singapore Hotel, Singapore.

21—Florida Association of Broadcasters, Midwinter conference. Errol Estate Inn, Orlando.

22-25—National Religious Broadcasters, 35th annual convention. Washington Hilton Hotel, Washington, D.C.

February

14-16—All Electronic Show. Grosvenor House Hotel, London.

14-16—Synergetic Audio Concepts, Seattle area sound engineering seminar. Sea Tac Red Lion, Seattle.

22-24—Synergetic Audio Concepts, San Francisco area sound engineering seminar. Holiday Inn, Belmont, California.

27-28—Worcester Polytechnic Institute, Project Management seminar. WPI campus, Worcester, Massachusetts.

March

13-16—Electronics Industries Association, annual spring conference. Washington, D.C.

13-17—IEA/Electrex, International Electrical, Electronic and Instrument Exhibition. National Exhibition Centre, Birmingham, England.

27-28—Worcester Polytechnic Institute, Project Management seminar. Hotel Sonesta, Cambridge, Massachusetts.

April

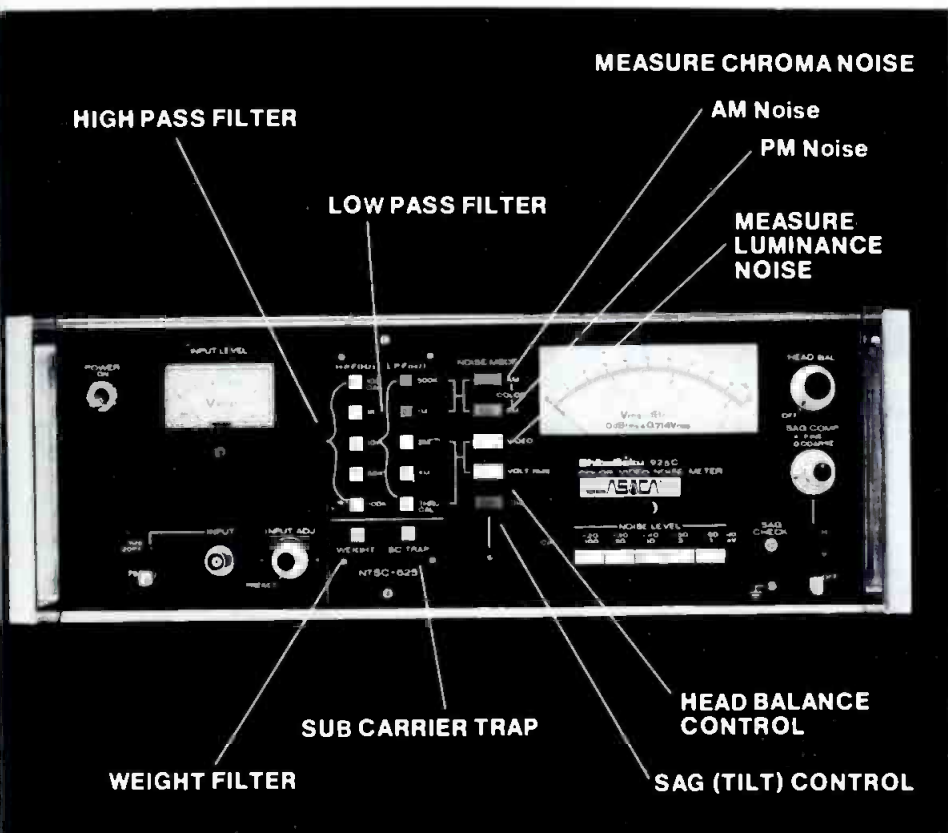
4-7—Communication Equipment and Systems Exhibition. National Exhibition Centre, Birmingham, England.

9-12—National Association of Broadcasters, annual convention. Las Vegas.

12-26—MIP-TV, 14th annual international marketplace for producers and distributors of TV programming. Palais des Festivals, Cannes, France.

For More Details Circle (9) on Reply Card

MEASURES CHROMA NOISE AND LUMINANCE NOISE



World's first Instrument to Measure Chroma Noise Generated In Color and Black and White Television Transmission Equipment, TV Cameras, VTRs, Video Disc Units, Digital Image Processors.

Measure the value of this unique instrument*, Model 925C Video Noise Meter, and you'll see why it has been purchased by a major USA network. It measures chrome band noise with a single color signal of desired level that contains both a sync signal and a color burst signal. Chroma noise can even be split into AM and PM components which can be measured separately. Unbalanced 2 head of VTR can be corrected for proper measurement.

A must for every station and production house in TV. Write for information.

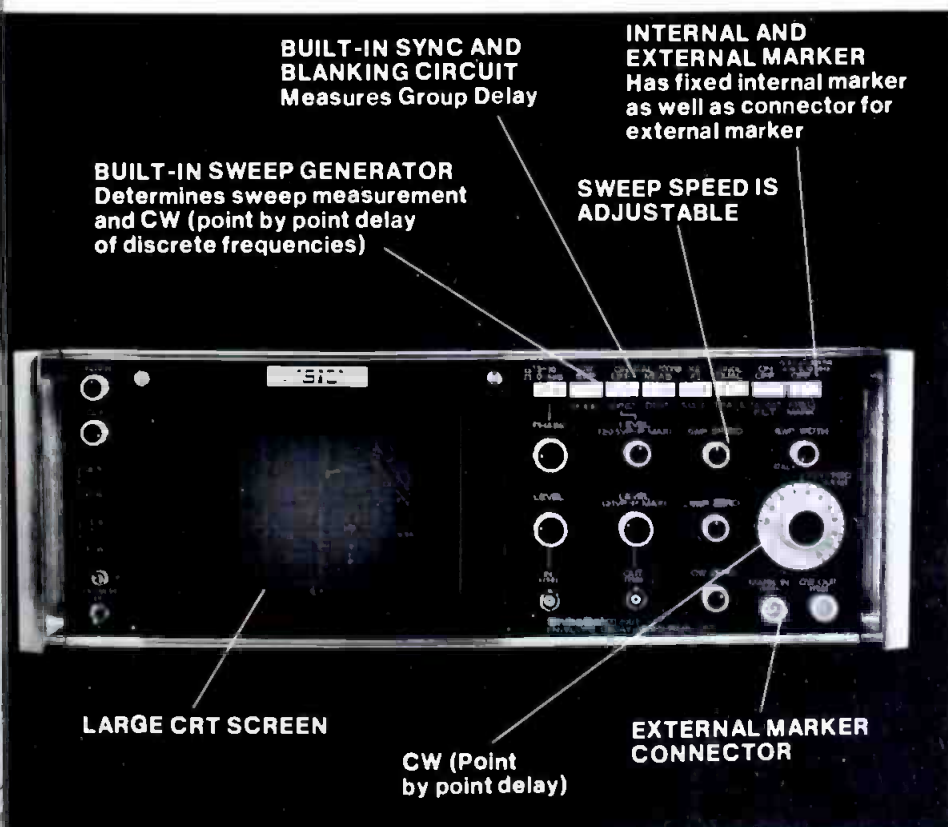
We create change

ASACA

ASACA CORPORATION OF AMERICA
1289 Rand Road, Des Plaines, Ill. 60016
Phone (312) 298-4380

*Product of SHIBASOKU—
sister company of ASACA

MEASURES GROUP DELAY IN TRANSMISSION SYSTEMS & LINES



At last! The Envelope Delay Measuring Set You've Always Wanted—But Which Technology Couldn't Develop Until now! Compare Performance With Equipment Selling For \$14,000.00. Our Price—Only \$5,900.00!

Our envelope Delay Measuring Instruments* feature large CRT screens, built-in sweep generators and allow spot frequency delay measurements from 50 KHz to 5MHz. Check out Models 763 NA and the new 201-1. Both are NTSC or PAL compatible. The 201-1 adds a built-in sync generator and blanking mixer.

Don't you delay in getting full information. Write.

We create change

ASACA

ASACA CORPORATION OF AMERICA
1289 Rand Road, Des Plaines, Ill. 60016
Phone (312) 298-4380

*Product of SHIBASOKU—
sister company of ASACA

For More Details Circle (10) on Reply Card

The Cetec Schafer 7000: Microcomputer power, unlimited versatility, and solid state reliability

Cetec Schafer's powerful new 7000 system brings a new generation to radio program automation. It's a major advance by the world leader in automation systems (with nearly 1000 operating systems in the field).

The 7000 is a complete system now, and it's expandable for tomorrow. You won't replace the 7000 with another system — you will simply expand it, with plug-in firmware boards from Schafer. Five years from now, the 7000 will still be state-of-the-broadcast-art!

Computer power designed exclusively for radio station operations

The third-generation multiprocessor 7000 gives you all the computer power you'll ever need, not only for advanced program automation, but for future station-related assignments.

This microcomputer system and its firmware are *dedicated* to automation and station operations. That means you have instant access to a great automation system at any time, but you're not paying for a lot of unused general-purpose computer time.

Talk to the 7000 in English; it answers you in English

Our video terminal displays information in plain English (with a broadcast accent). You instruct the 7000 in everyday language; it answers you in everyday language — not in "computerese."

The CRT terminal has a customized and color-coded keyboard that's fall-safe — you can't mis-program it by accident.

Take a terminal home for dinner

The 7000 can handle more than one CRT terminal at the same time. You can instruct the system minute-to-minute in the control room, while the program director is editing follow-on programming from his own office!

You can even keep a terminal in your den at home, and monitor the events as they happen via telephone and modem hookup.

The audio is extra-clean: isn't that what you're selling?

The 7000 produces super-clean sound — after all, that's the end-product your listener receives. Beginning with our own Audiofile I, the 7000 can handle 16 different audio sources (and that's expandable to 64).

The 7000 is ready to grow when you are

Starting with a basic 1000-event memory, the 7000 is expandable to 10,000 events, a thousand at a time.

There are separate channels for additional CRT's; there's a real-time clock option, and others for phone lines, modems, and logging systems. With the phone-line and modem line, Cetec Service Engineers can diagnose any irregularity in the system from hundreds of miles away!

The 7000 challenges broadcast creativity. Yours.

Radio program automation is for technical precision, freedom from error, cost-effectiveness, and improved profitability.

It is also for freeing news and entertainment talent for more productive work than babysitting, building a winning sound and station personality; and for adding depth and color to your broadcast day.

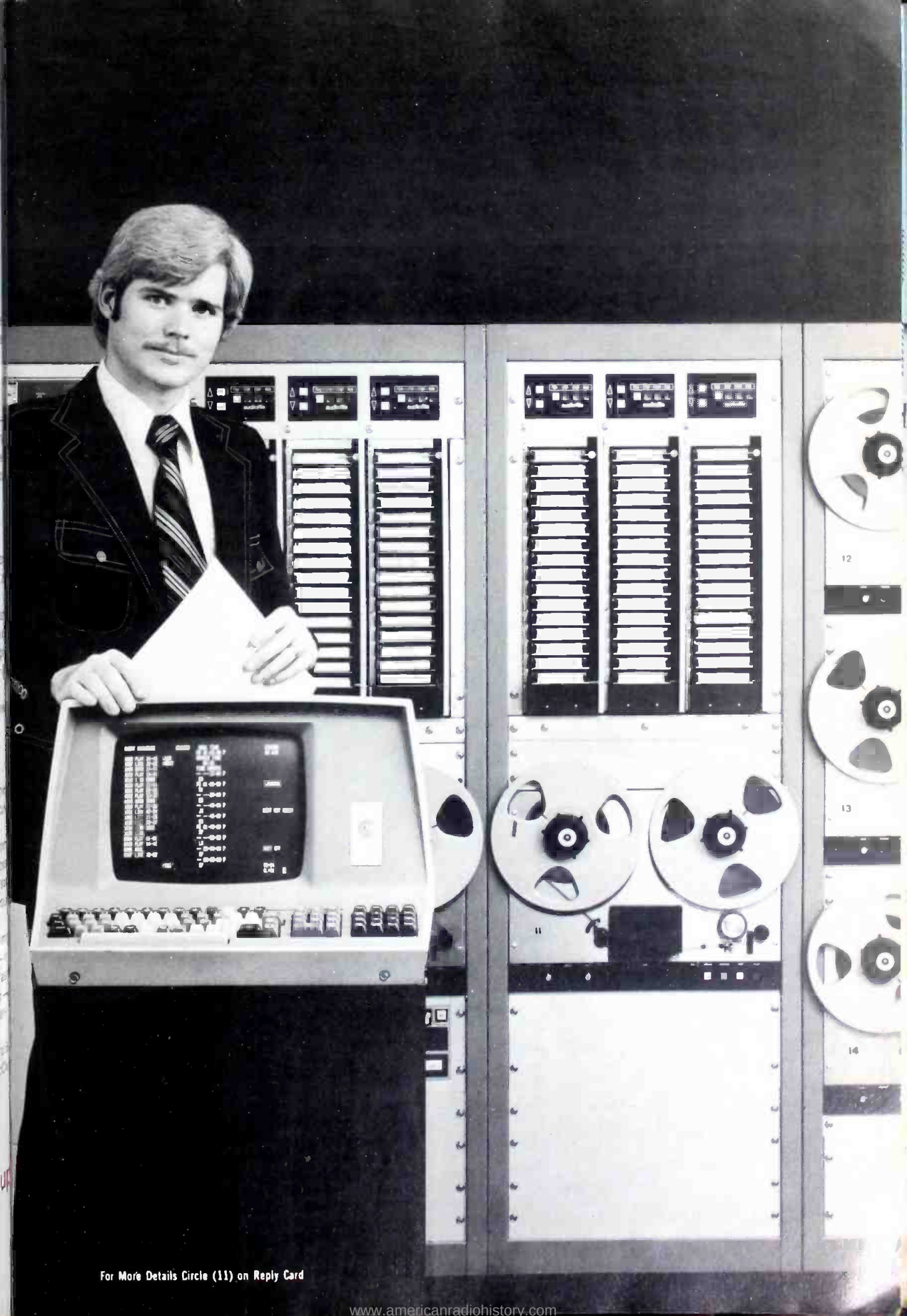
Cetec Schafer's 7000 has an almost limitless capacity for following your commands — instantly, accurately, flexibly, and with an astonishing memory. Tell it what you want it to do — and spend your own time on creative management.

For technical specifications and operating information, write or telephone Andy McClure today (805) 968-1561.



Cetec Broadcast Group

The Broadcast Divisions of Cetec Corporation
75 Castilian Drive, Goleta, California 93017



For More Details Circle (11) on Reply Card

Inquiry begun on conversion of AM radiation patterns

The possible conversion of authorized directional antenna patterns to ones which could be computerized, in an effort to simplify en-

gineering studies required in processing AM applications, is the subject of an FCC inquiry.

The commission adopted new rules governing the design of radiation patterns for AM stations with directional antennas in 1971. Subsequently, Section 73.150 was amended to provide for a defined method of calculation of radiation patterns that could be computerized; these patterns are called "standard patterns."

In addition, Section 73.152 was

amended to provide for the use of modified standard pattern to take into account deviations from the standard pattern when the directional array had been constructed and put into use. Recently, some minor changes were made in the method of calculating standard patterns.

The requirement of using a standard pattern applies only to applications for new stations and major changes in existing stations, however. As a result, the FCC said few stations actually have standard patterns instead of those using theoretical patterns with MEOV (Maximum Expected Operating Values).

According to the FCC, the number of pending AM applications has increased dramatically since the adoption of the standard pattern rules; this provides a strong incentive to find new methods of streamlining the processing of applications. On such method would be increased computerization of the processing.

The FCC said that if all domestic stations were converted to standard patterns, the savings in processing time would be significant both for stations and for applicants. Neighboring countries also would receive some benefits, since they would no longer use MEOV in their calculations. Concerning U.S. stations, it added,

Although processing time would be saved if all patterns were standard, there are still certain problems that must be considered before concluding all stations should be converted. For example, if all were converted, the predicted service areas and protection from predicted interference would be increased for some but decreased for others.

However, the FCC said the benefits to be derived from the simplification of the overall allocation process would outweigh the shifts in interference and service areas since these shifts would occur primarily on paper.

More than 2,000 patterns would have to be converted. This would involve: recalculation and replottings; checks for accuracy; and notification to foreign governments in accordance with international agreements.

The commission has invited comments on several methods of implementation, such as conversion being performed entirely by FCC staff; conversion being performed entirely by licensees; conversion being contracted out; or some combination of these methods. Comments are due January 23; replies February 22.

continued on page 13



WIN THE SOUND WARS

Commercial radio is a constant battle for listenership. A winning strategy consists of more than program format and content; there is sound quality and reliability to consider.

AMPRO Cartridge Tape Recorders and Reproducers. Designed and engineered by broadcasting professionals who know the critical needs of stations and studios.

Hearing is believing. You should hear the quality and examine the expert craftsmanship that goes into our equipment. Ampro can give you the ammunition to win your "sound wars". Put our Cartridge Tape Recorder/Reproducer to the test in your own facilities, under actual working conditions, for 30 days.

We call that Confidence, you'll call it Performance.

FREE TRIAL OFFER

Call Collect Ed Mullin or Joe Novik

(215) 322-5100



AMPRO BROADCASTING INC.

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

WE GET INVOLVED



Some suppliers want you to serve them. You know the type. All they're interested in is getting the order. Don't bother them with any problems. We know because this kind of supplier calls on us, too.

But we don't operate that way. We get *involved*. We'll work with you to solve your most vexing audio problems. If one of our standard systems won't do the job, we'll custom-engineer one that will.

We've been providing service like this for a long list of customers worldwide for more than 10 years. Now we're ready to do it for you.

AUDIO DESIGNS AND MANUFACTURING, INC.
16005 Sturgeon, Roseville, Michigan 48066
Phone: (313) 778-8400, Cable: AUDEX, TLX-23-1114

ADDITIONAL

DISTRIBUTED OUTSIDE U.S.A.
BY AMPER INTERNATIONAL OPERATIONS, INC.



news

.....
continued from page 16

FCC 1974 Fairness Report affirmed

The U.S. Court of Appeals for the District of Columbia has affirmed the FCC's 1974 Fairness Report, which exempts product commercials that do not "obviously and meaningfully address a controversial issue of public importance" from fairness doctrine obligations.

The federal appellate court also

affirmed the commission's decision to continue its policy of case-by-case consideration of fairness complaints, as well as its policies relating to licensee consideration of editorial advertisements, news slanting, and political editorializing.

However, the court pointed out that the fairness doctrine imposes a two-fold duty: broadcasters must devote a reasonable amount of time for the presentation of programs devoted to the discussion and consideration of public issues; and, coverage of these issues must be fair in the sense that it provides an opportunity for the presentation of

contrasting viewpoints.

To clarify this point, the court remanded the Fairness Report to the commission for further inquiry in two previously rejected proposals designed to overcome the difficulty of current fairness doctrine enforcement. The proposals were issued by the Committee for Open Media (COM), and by Henry Geller as an intervenor in the case.

COM had suggested a system whereby licensees would devote a specified percentage of their broadcast time to what COM called "first speech messages" and other public issue programming. This would have been an alternative to current fairness doctrine enforcement procedures.

Henry Geller urges the adoption of a requirement "that the licensee list annually the ten controversial issues of public importance, local and national, which it chose for coverage in the prior year, set up the offers for response made by the note representative programming that was presented on each issue."

Several difficulties with the COM access proposal were noted by the court. These included the fact that there is no absolute assurance that the issues addressed during access time would be the most important controversial issues facing the licensee's community, and even the assurance of balance in presentation of opposing viewpoints.

FCC issues television-interference handbook

The FCC has published a handbook providing low-cost remedies for the more common interference patterns.

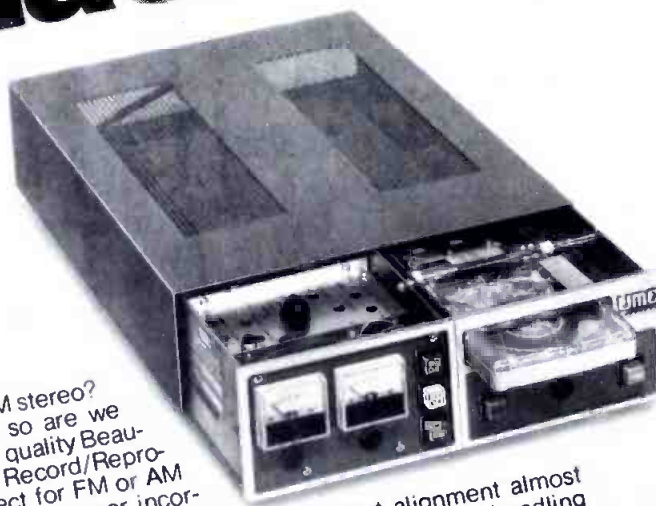
The handbook, "How to Identify and Resolve Radio-TV Interference," contains step-by-step instructions and diagrams for each remedy. A technical section is also included, in case the remedies do not resolve the interference and internal modification of the TV set is required. An internal modification to TV sets is dangerous and must be done by a qualified service technician.

According to the FCC, 83% of TV-interference complaints are related to CB radios. To help resolve these problems, the handbook has a special section for the CB operator.

A list of additional sources of assistance is included in the back of the handbook.

To order "How to Identify and Resolve Radio-TV Interference," send a check or money order for \$10 to the Consumer Information Center, 1051F, Pueblo, Colorado 81009.

Beaucart Stereo Machines.



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

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

UMC®

For More Details Circle (13) on Reply Card

THE BETTER WAY

Datatek ROUTING SWITCHER SYSTEMS

- ☐ Video-Audio Switching Systems
- ☐ Additional Audio Levels
- ☐ Video-only Switching Systems
- ☐ Audio-only Switching Systems
- ☐ SMPTE Time Code Signal Switching Systems
- ☐ Source-oriented Assignment Systems

Look to Datatek for all your routing switcher needs. We manufacture a high quality system to satisfy your initial requirements, with built-in expansion provision for future enlargement . . . as well as routing switcher-related systems with compatible control facilities.

FEATURES

- High audio output capacity with low noise (dynamic range)
 - Independent control system for each output bus
 - Built-in expansion — no group switching required
- Wide choice of matrix building block size — 20x10, 20x15, 20x20, 30x10, 30x15
- Differential (hum bucking) bridging video inputs with high return loss
- Multi-reference vertical interval video switching
 - Four section continuously adjustable cable equalization on both inputs and outputs
 - Standard BCD positive logic, computer-compatible control systems
 - Redundant Power Supplies*
 - Latch Retention Battery Supplies*

*Optional

For More Information, write or call

D
DATATEK
CORP.

1166 W. CHESTNUT ST.
UNION, N.J. 07083
(201) 964-3656

Other Advanced Datatek Products:

TV Transmitter Color Phase
Equalizers and Waveform
Correctors, Video Sweep
Generators, Envelope Delay
Measuring Sets, and
Distribution Amplifiers for
video, pulse, audio and
SMPTE time code signals

For More Details Circle (14) on Reply Card



In real time, it's the best helical. In slow motion, it's the only helical. VPR-1.

Ampex has the first one-inch helical VTR ever produced that records and plays back broadcast quality material in real time, slow motion or still frame.

VPR-1 is a High Band Color recorder designed to deliver the finest audio and video program material. Totally new signal concepts elevate the VPR-1 far above other helicals.

The real magic, though, comes from the optional Automatic Scan Tracking (AST) accessory. AST delivers slow motion and still-frame material, directly from tape, without a noise bar. And AST means absolute tape interchange, even across wide extremes of temperature and humidity. The pictures are sharp, color true, and just the ticket for special effects and instructional programs. AST even helps in post production editing, where the touch of a finger

unfolds a frame at a time in the manual jogging mode.

You'll want to add a TBC-1 digital time base corrector to your VPR-1 system; it's the only TBC on the market that can handle AST special effects work.

A companion unit, the new VPR-10 portable one-inch recorder, takes a full hour of battery-powered material in the field, automatically back-spaces every shot for a smooth assemble edit, and provides audio and video verification playback. VPR-10 tapes are compatible with VPR-1 tapes, so you can take advantage of all VPR-1 special effects capability.

It's been a long wait for a broadcast quality one-inch system with full special effects, but the wait is over. VPR-1 takes you all the way down to a frame at a time.



AMPEX

Ampex Corporation, Audio-Video Systems Division, 401 Broadway, Redwood City, California 94063, 415/367-2011.

For More Details Circle (15) on Reply Card

January, 1978

21

news briefs

RCA, Sony sign sales agreement

RCA Broadcast Systems has announced that a sales agreement has been reached with Sony. Under agreement, RCA will market Sony 1-inch line of non-segmented video tape recorders. Involved are BVH-1000, BVH-500, and accessories such as the BVT-1000 digital time base corrector.

This equipment will be marketed under the RCA label, and will receive product support from RCA, including spare parts, field engineering, and customer training seminars.

RCA will continue to market Bosch segmented helical scan recorder.

IVC continues operation

International Video Corporation with management and technical support from Video Logic, is now in full production, having cut its debt almost in half since June. Roy Woodman, IVC president, and executives from Video Logic provided the money and talent to convince IVC's primary creditors to rebuild the company. IVC is located in Sunnyvale, California. Service centers are available in Sunnyvale and Chicago, with full service engineering support in New York and Atlanta.

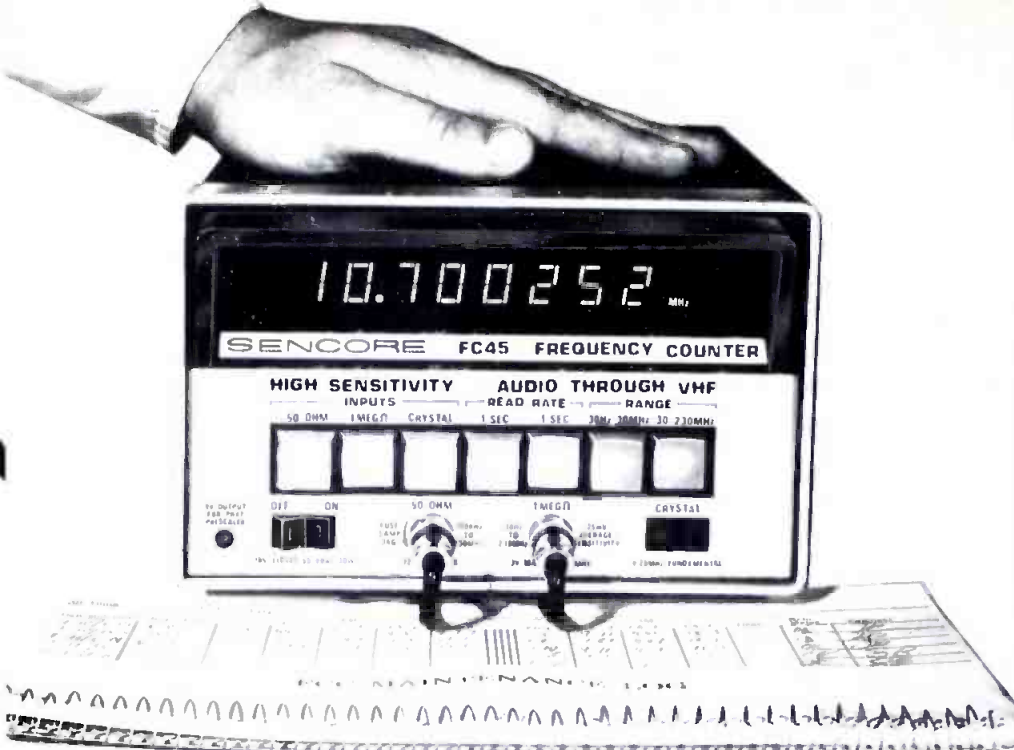
UHF coalition funds study to improve antennas

The Public Broadcasting Service Corporation for Public Broadcasting and the Council for UHF Broadcasting have commissioned Georgia Institute of Technology, Atlanta, to measure the performance of UHF receiving antennas. According to David Silliman, manager, engineering planning, PBS, "The purpose of the study is to provide guidance and support to the industry in the establishment of technically sound uniform standards for the measurement of UHF receiving antennas."

Eugene station ousts union

Station employees at KEZI-TV in Eugene, Oregon, have voted out the International Brotherhood of Electrical Workers, the Oregon Broadcaster reports. The 24 employees eligible to vote included members of the news department, technicians and production workers.

BROADCAST ENGINEERING



YOUR FCC DOCUMENTOR

Here's your number one standard source for documenting your FCC broadcast frequency at more than five times better than the FCC tolerance for your station. One part per million (.0001%) accuracy means there will be no doubt about your documentation when you use Sencore's new FC45 Frequency Counter. It's a counter you can really count on, yet saves you hundreds of dollars compared to other frequency meters and counters on the market.

You can make the FC45 your single source for every AM, FM, VHF, or UHF frequency check with a full, continuous spectrum range from 30 Hz audio through 230 MHz VHF. Use it with the plug-in PR47 600 MHz UHF Prescaler, too, for extended UHF range testing.

It's also super-handly around the studio for maintaining recorders and cart machines, VTRs, sync generators, and cameras. Extremely high 25 millivolt average sensitivity across the entire frequency range allows you to troubleshoot by "sniffing" frequencies with the exclusive PL207 "Snoop Loop", all without direct circuit connections that may cause frequency change and loading.

Plus every reading is pushbutton-easy to get on the big eight-digit direct-reading display that provides 10 Hz resolution at the highest VHF frequencies. You can get .01 Hz resolution at audio frequencies with the PR50 Audio Prescaler accessory.

So why pay more than \$448 for your FCC documentation? Order the new Sencore FC45 from your local Sencore Full Line Distributor, or use the order coupon below.

New FC45 230MHZ FREQUENCY COUNTER

SENCORE

3200 Sencore Drive, Sioux Falls,
So. Dak. 57105 (605) 339-0100
In Canada: Superior Electronics

- ☐ I WANT TO BUY IT. Send _____ FC45s
to me at \$448 each.
- ☐ Check/MO enclosed. ☐ Send C.O.D.
- Also send:
- ____ PR47 600 MHz Prescaler \$125.
- ____ PR50 Audio Prescaler \$125.
- ____ PA208 Power Adapter for PR47.. \$9.95.
- ____ PL207 "Snoop Loop" \$9.95.
- ☐ I WANT TO TRY IT. Have my nearest
Sencore distributor bring the FC45 to me.
- ☐ SEND FULL SPECIFICATIONS.

NAME: _____

COMPANY: _____

STREET: _____

CITY: _____

STATE: _____ ZIP: _____

PHONE: _____

For More Details Circle (16) on Reply Card

www.americanradiohistory.com

Don't settle for ENG-Only!



LDK-11 is an ENG and EFP Camera.

is the unique Philips camera that started everyone thinking ENG and Field Production. The one camera that does *both* without compromising quality or operational features. One of the many innovations that has earned Philips its reputation as "the INNOVISION company."*

With exclusive Philips design and performance, the LDK-11 outperforms those "mini" and "micro" ENG-Only cameras. It is lightweight, battery or AC powered, totally portable and easy-to-operate for ENG; with full production control either remotely or at the backpack. Yet the LDK-11 incorporates the Philips picture-determining features that go into our most advanced studio cameras.

Plus...the LDK-11 includes many additional unique features for difficult field production and ENG applications. Here are just a few:

Outstanding low-light performance; 6 to 12 dB additional gain to match

specific requirements down to 8 ft. candles.

- Bias-lit Plumbicon™ tubes for lowest lag.
- Lowest Delta T permits high ambient temperature operation.
- Ultra stable gamma circuitry for true color rendition down to black.
- Switchable gamma to .35 provides contrast compression.
- Production gen-lock capability up to 3000 feet.
- New 2/3" Plumbicon tubes with studio camera resolution.
- Up to 300' of 1/2" cable between camera head and backpack.
- Carry head only. Ideal operator's weight (14 lbs. with 10:1 lens).
- Change head-to-backpack cable length without adjusting registration or set up.
- True broadcast quality (27 MHz) 2-line contours with coring and

combining for maximum sharpness and minimum noise.

- Magnetic shielding as in studio cameras.
- Optional 5" viewfinder.

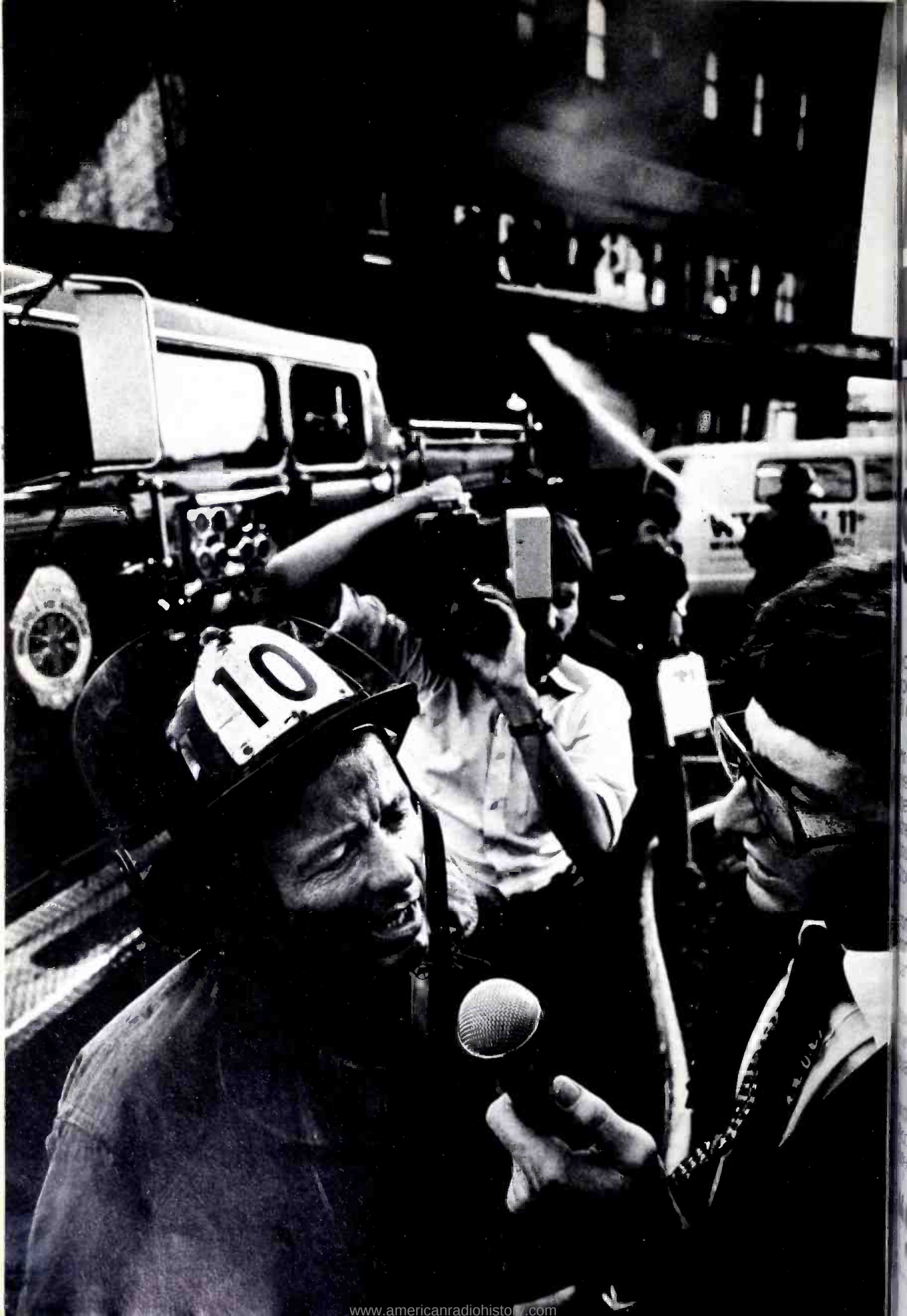
The broad application of the LDK-11 in studios, documentaries, sports, local spots *and* ENG confirms that broadcasters need—and want—more than just an ENG camera. Prove it for yourself. For more information or a demonstration of the LDK-11 call your local Philips representative or contact Philips Broadcast Equipment Corp., 91 McKee Drive, Mahwah, N.J. 07430 (201) 529-3800.

the
INNOVISION
company*

*Innovative Leader in World Television.

PHILIPS®
TM-N.M. Philips

For Literature Only Circle (17) On Reply Card
For Demonstration Only Circle (87) On Reply Card



ONE THING ABOUT THE NEWS BUSINESS: YOU NEVER GET A SECOND TAKE.

Here's a videocassette made for the people who make the news. It's the new "Scotch"® Brand Master Broadcast U-Matic videocassette. MBU for short. The first $\frac{3}{4}$ " videocassette designed specifically for tough ENG recording and the repetitive stress of editing.

We took the same high energy oxide videotape you've used for years and fused it to an incredibly strong backing. The result is a videotape that won't twist, tear or jam in the field. An unyielding videotape that won't stretch under the strain of tape editing's shuttling modes or degrade in extended stop motion.

And to protect it even under the worst conditions, "Scotch" MBU videotape comes packed inside a high impact cartridge.

Of course, "Scotch" MBU videocassettes have the same high signal-to-noise ratio and low headwear and dropout rates of our superb quad tapes.

So if you've ever worried about a good story and a videocassette breaking at the same time, record on "Scotch" Master Broadcast U-Matic videocassettes. They'll always back you up.



3M
COMPANY

"Scotch" MBU Videocassettes.

"Scotch" is a registered trademark of 3M Company, St. Paul, Mn. 55101, © 1977, 3M Co.

For More Details Circle (18) on Reply Card

www.americanradiohistory.com

PHILLYSTRAN®

The Tough Guys

Far surpassing steel guys in strength and durability, PHILLYSTRAN is manufactured from impregnated KEVLAR* and polyurethane. Completely non-metallic, PHILLYSTRAN eliminates electrical problems and the usual problems of RFI.

- **Non-interference**
Outstanding dielectric properties
- **Minimum Stretch**
New designs substantially reduce creep
- **Corrosion Proof**
Non-metallic construction: polyurethane jacket
- **Non-Conducting**
Outstanding insulation properties

PHILLYSTRAN . . . The Tough Guys in more ways than one.

*PHILLYSTRAN . . . proprietary resin impregnation process of Philadelphia Resins Corp.
*duPont registered trademark



manufacturers of Chockfast®, Phillystran®, Phillybond®, Wearax™

PHILLYSTRAN®

ROPES AND CABLES

PHILADELPHIA RESINS CORPORATION
20 Commerce Drive, Montgomeryville, Pa. 18936, U.S.A.
215/855-8450 • Telex: 84-6342 • Cable: PHILRES MMLL

For More Details Circle (19) on Reply Card

people in the news

Radio/Television

Norman Davis is the newest board member of Florida Association of Broadcasters. Born and educated in Florida, Davis is the area vice president of Post-Newsweek's WPLG-TV.

Larry Messick was appointed sales manager at KJ in Pendleton, Oregon. He had been a salesman at KGRL/KXIQ in Bend, Oregon. **Scott Hendricks** returned to KTX as program director. He previously worked at the station while attending college.

New president of the Nebraska Broadcasters Association is **Rhonda Maddox**, KCSR in Chadron. Her association, organized October 15, is open to all Nebraska broadcast station news department managers.



SPAIGHT



STEINER



WEINER

Tom Spaight has been named chief engineer at KR Radio, Iowa City, Iowa. Spaight joins KRNA after years as chief photographer for the Washington (D.C.) News Bureau of the Storer Broadcasting Company. His responsibilities will include maintaining 24-hour-per-day FM broadcast service provided in southeast Iowa, as well as news duties.

Edward Anderson Wheeler, president and founder of WEAU and WOJO Radio, Evanston, Illinois, died November 25 at the age of 55 after an extended illness. Beginning his career as an announcer for KPPC in Pasadena, California, Wheeler established Evanston's first radio station, WEAU-FM, in 1947. During the early years of WEAU's operation, Wheeler pioneered in stereo broadcasting and multiplexing, two new concepts in broadcast technology. He was a member of the Radio Advertising Bureau, the FM Development Association, the Radio Management Club, and a former board member of the National Association of Broadcasters.

Manufacturers/Distributors

As director of marketing for A P Products, **Edward Steiner III** will supervise all product marketing, advertising, and public relations for the company's line of electronic hardware and flat cable/connection systems.

Video Magnetics, Inc. has announced the appointment of **Gloria Weiner** as sales engineer. **Dean Leeson** is also a sales engineer.

continued on page 10

BROADCAST ENGINEER



**If you want
Plumbicon* picture quality
from your ENG camera—
specify Plumbicon TV camera tubes.**

As predicted, the Plumbicon $\frac{2}{3}$ -inch camera tube
changed the entire course of broadcast journalism
and helped make ENG the world's most
important medium of information.

Amperex

TOMORROW'S THINKING IS TODAY'S PRODUCTS

A NORTH AMERICAN PHILIPS COMPANY

AMPEREX ELECTRONIC CORPORATION, SLATERSVILLE DIVISION, SLATERSVILLE, RHODE ISLAND 02876 • TELEPHONE: 401-762-3800

* Registered trademark N.V. Philips of the Netherlands.

For More Details Circle (20) on Reply Card

www.americanradiohistory.com

some inventions SAVE you TIME, WORK & MONEY



THIS ONE DOES ALL THREE

Color sub-carrier burst phase requires close attention to prevent visible color faults (objectionable hue shifts) during a production or duping. Especially if you want to keep normal fleshtones when using special effects, supers and chroma key during color productions. Phase shifts greater than 5 degrees can distort normal fleshtones creating visible color faults. This can result from mis-adjusted video equipment or from various cable lengths and amplifiers which create delays and different burst angles according to their location in a color video system. Phase shifts could also result from normal aging of various components throughout the video system. You can check for phase shift the old way or the VACC way.



VACC's Burst Phase Meter (model BPM-1) is a \$599.00 replacement for most vectorscope applications. The unit requires only ac power, video and subcarrier inputs. An easy-to-read analog meter indicates phase shift in the video burst relative to the subcarrier over a full 180 degree range with 1/2 degree accuracy. (360 degrees phase range can be obtained with a coax delay line).

NEW! You saw it at NAB...now available for immediate delivery.

H-Phase Meter

Option 02...includes Burst Phase and H-Phase...all in one unit! \$729.00 list.



USA (303) 667-3301
Canada (Toll Free) (800) 261-4088
VIDEO AIDS corporation of colorado
327 E. 7th St.
Loveland, Colorado 80537

For More Details Circle (21) on Reply Card

people in the news

.....
continued from page 26

Jack Tolvanen will be jointly responsible for sales throughout the U.S.

Richard P. Boyd is the new director of marketing for Chyron's video products division. Boyd has been in the marketing area of the electronics industry for the past 20 years, and brings to the company an in-depth knowledge of the video industry and its unique distribution requirements.

Also at Chyron, **Don P. Cadora** has been appointed director of sales for the telesystems division. Cadora will be responsible for all domestic sales of titling and graphics equipment to the broadcast, industrial, educational and OEM markets.



BOYD



CADORA



YOUNG

H. Michael Smith has become earth station production specialist in Scientific-Atlanta's cable communication division's sales department. He will be located in Atlanta and will provide support for Scientific-Atlanta's sales representatives and customers in the Northeast, Midwest and Western regions.

In related action at Scientific-Atlanta, **Charles Steiner Young** has been elected vice president-instrumentation. Young will be responsible for product development, manufacturing and marketing of the company's instrumentation products. He also will supervise the company's New Jersey division and the marketing activities at several U.S. and international sales offices.

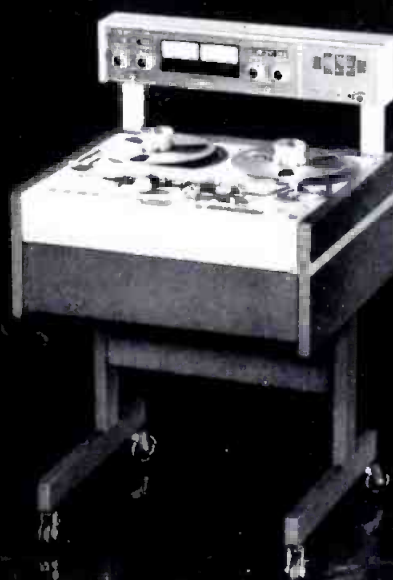
Perry Vartanian, Jr., recently appointed manager of manufacturing operations of Ampex's audio-video systems division, will direct the operations of manufacturing facilities in Colorado Springs, Colorado, Juarez, Mexico, and three operations in Sunnyvale, California.

Karol Freed has been promoted to the newly created position of vice president, engineering, at Unimed Corporation. Freed previously was chief engineer. Prior to joining the company, he held engineering management positions with Bell & Howell and Ampex.

Robert E. Leach is the new product manager, television transmitter products, at Philips Broadcast Equipment Corporation. Prior to joining Philips, Leach was director of engineering at WDAU-TV, Scranton, Pennsylvania. He is a member of the Broadcast Pioneers, SMPTE, IEEE and AFCCE.

Charles L. Martin has been named district manager for Micro Consultants, Inc. His area of responsibility includes California, Nevada and Arizona.

**Studer introduces the A80/RC
the quality defies comparison...
the price invites it**



From now on you don't have to pay more money to get Studer quality. The new Studer A80/RC two-channel recorder costs the same as or less than two of the other three popular names.

It sounds unbelievable. And it is the most perfect machine you can buy for any two-channel application you can think of.

Because nothing but a machine created by Willi Studer records, plays, handles, and lasts like a machine created by Willi Studer.

Now you have a choice: you can pay less for an A80/RC and get more tape recorder, or pay more for another brand and get less tape recorder.

Visit Studer for a hands-on experience with the A80/RC or for full information, call:

STUDER REVOX

Revox America, Inc., 1819 Broadway, Nashville, Tennessee 37203 / (615) 329-9576 • In Canada: Studer Revox Canada, Ltd. / (416) 423-28

January, 1978

The condenser microphone system that doesn't stop with the microphones. Electro-Voice System C.

It's many systems in one. A system of systems with interchangeable components, developed in the real world of the audio professional. Electro-Voice System C groups four high-performance condenser elements with two versatile preamps. And we know that a microphone is virtually useless to a professional unless accompanied by support equipment that works. That's why we sell these microphones in...

Packaged Systems.

Everything the professional needs with his microphone is included with the individual mike in a rugged, foam-lined case. Windscreens, shock mounts, and even a handle for our shotgun mike. And it's like getting all the "extras" free, because Electro-Voice packaged systems sell for about the same price as our competitor's mikes alone.

System C offers these four packaged systems—each, a ready-to-use, complete system.

CH15E
Hypercardioid Head
Response: 55-13,500 Hz.
With 315A windscreen.

CO15P Omni System
Includes CO15E head, PE15 preamp,
315A windscreen, 310A stand clamp,
15' cable with connector.

The CL42S Shotgun System.

Our shotgun reaches farther and rejects more ambient noise. In fact, on a side-by-side A-B test, you'll hear less ambient noise from Electro-Voice. It features an exclusive line bypass port that makes it more directional at low frequencies, without sacrificing the frequency response ideal for boom use. And unlike other shotguns which get very narrow at

high frequencies, the CL42S maintains high-frequency directivity through a series of diffraction vanes on the

CH15S
Hypercardioid System
Includes CH15E head, SE15 preamp, 315A windscreen,
304 mini-shock mount.

CS15P Cardioid System
Includes CS15E head, PE15 preamp, 315A windscreen,
312A stand clamp, 15' cable with connector.

CO15E Omni Head
Response: 20-20,000 Hz.
With 315A windscreen.

tube. Maintains sibilance if the
ent" gets a bit off-mike.
e CH15S Hypercardioid System.
r's two extreme nulls—in excess of
B at 120° off axis—create a tighter
ntal pickup pattern than conven-
al directional microphones. We're
ually more directional than a "mini"
gun mike, in a package half the
e. And our element and preamp
e designed together for boom and
pole use. Lightweight. Under
ches long. Compatible with
ntom and AB power. And all with
ady-to-go shock
unt.

The CS15S Single-D Cardioid System.

It loves the stage, has the best gain-before-feedback in the business, and puts sex appeal in any singer's voice with its bass-boosting proximity effect. And the shaped high-frequency response makes the CS15S equally at home in the recording studio. The phantom powerable preamp has wide-band response and high sound pressure level capabilities (140dB SPL for 1% THD at 1kHz)—ideal for the most demanding close-up vocal and instrument miking applications.

The CO15S Omni System.

It extends response to the very limits of audibility—20 to 20,000 Hz. Response that registers the deepest sonorities of a great pipe organ, mirrors all the subtlety of solo instruments. Does full justice to a symphony orchestra. And unlike even the most highly respected omni's the CO15S is truly omnidirectional at the very highest frequencies. Provides a spectral balance faithful in both close-up miking and distant pickups.

Electro-Voice includes all four of these high-performance, packaged systems in its...

Exclusive Warranty System.

Electro-Voice backs up its System C with the only unconditional warranty

in the business: for two years, we will repair or replace your System C microphones at no charge—no matter what caused the damage!

We can do it because System C, with its structural integrity through turned-steel cases, and positive mechanical nesting of internal components, more than meets the E-V standards for ruggedness. You'll experience less downtime, and prompt service if anything does do wrong. Prompt because we don't have to send things back to Europe for repair. Prompt because our modular design simplifies repair. Prompt, because we care.

We don't think the professional should accept anything less.

For complete information including an in-depth technical paper on Electro-Voice System C, just write to: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan, 49107



EV Electro-Voice
a gulton company

600 Cecil St., Buchanan, Michigan 49107

2S Shotgun System
Includes CL42E Cardiline® head,
3 preamp, 343 windscreen,
shock mount.



BS9
Remote battery
power supply.

SE15 Preamplifier
For boom or fishpole use.

PE15 Preamplifier
For stand or
hand-help use.

10 Attenuator

SMPTE conference spotlights digital TV, video still store, and 1-inch videotape

Sheraton-Atlanta Hotel, Atlanta, Georgia, February 3-4, 1988

The 12th Annual Television Conference of the Society of Motion Picture and Television Engineers (SMPTE), set for February 3-4, will feature two days of technical sessions on digital television, video still store, and 1-inch videotape recording. The conference is to be held at the Sheraton-Atlanta Hotel in Atlanta, Georgia.

The local-arrangements chairman for the conference is Eugene Myler, Eastman Kodak Company. Program chairman is Richard Streeter, CBS, New York. Topic chairman for specific subject areas are Frederick M. Remley, Jr., University of Michigan, for Production Experience with Broadcast Quality 1-inch Videotape Machines; Robert McAll, Vital Industries, for Digital Video for Production Use; and Al Chismark, WTUH-TV, for Recent Advances in Video Still Store and Slow Motion.

1-inch videotape

The papers that will be presented Friday, February 3, on Production Experience with Broadcast Quality 1-inch Videotape Machines are:

An introduction and orientation, Frederick M. Remley, Jr., University of Michigan;

"Videotape Program Production at CBS Studio Center," William Connelly, CBS Television Network, New York;

"Post-production and Production Experiences with 1-inch Videotape," E. Grey Hodges, Jr., Jefferson Productions and Jefferson Pilot Broadcasting Co., Charlotte, North Carolina;

"Technical Description of Sony's Portable 1-inch Machine, BVH 500: First Discussion of its Technical Parameters," M. Morizono, Sony Corp., Tokyo, Japan;

"Post-production Experience with 1-inch Videotape," Pat Pintus, CTP,

Salt Lake City, Utah;

"Operational Use of Synchronized 1-inch VTRs," John Lentz, CBS Technology Center, Stamford, CT;

"BCN Digital Store: Standalone Operations, Production and Post-Production Accessory for all Broadcast VTRs," Henry Zahn, Robert Bosch GmbH, Fernseh Group, Darmstadt, West Germany, and C. Robert Paulson, AVP Communication, Westborough, Mass.;

"Users' Experience with Type B 'BCN Helical' Portable and Studio Editing VTR" Bill Kelly, WNEW-TV, New York;

"CBS Television Network Edit-room Using 1-inch VTRs," William C. Nicholls, CBS Television Network, New York;

"Proposed SMPTE Type C Helical Recording Format: A Tutorial Paper," David Fibush, Ampex Corp., Redwood City, Calif.; and,

"Mechanical Design Considerations for Helical Scan VTRs," D. Ryan, Ampex Corp., Redwood City, Calif.

There also will be a panel discussion on this topic.

Digital television

The papers that will be presented Saturday on Digital Video for Production Use are:

"Progress Report on Digital Video Standards," R. S. Hopkins, RCA, Camden, New Jersey;

"The Role of the Digital Fieldstore Synchronizer in Television Productions," J. Brian Matley, Micro Consultants, Inc., Palo Alto, Calif.;

"Recent Innovations in Digital Special Effects," J. Kenneth Moore, A. Kaiser, H. W. Mahler, CBS Technology Center, Stamford, Conn.;

"An Integrated, NTSC, Teleproduction Switching Facility, Capable of Performing 'Film Type' Optical Transitions in Real Time,"

Robert McAll, Vital Industries, Inc., Hicksville, New York; and

"Frame Synchronizer Application in Production Switching," NE Tokyo, Japan.

Video still store

Papers scheduled Saturday on Recent Advances in Video Still Store and Slow Motion are:

"From Graphic Artists to Composite Scene—The Digital Way," Robert Mausler, NBC, New York;

"A Large Scale, High Retrieval Speed Holographic Still Picture Filing System," Akito Iwamoto, Toshiba Research and Development Center, Kawasaki, Japan;

"Video Slow Motion and Frame Storage Using Flexible Magnetic Discs," Lee Stratton, Arvin-Eckman, Mountain View, Calif.;

"Adda Corporation Electronic Still Processor," William Hendershott, Adda Corp., Campbell, Calif.;

"The Type B 'BCN' Film-style Editing System," Jurgen Heitmann, Robert Bosch GmbH, Fernseh Group, Darmstadt, West Germany;

"New Developments and Features on the ESS Digital Recorder," Justus, Ampex Corp., Redwood City, Calif.

Equipment exhibit

In conjunction with the technical sessions, there will be an equipment exhibit featuring equipment related to the subjects of the conference. Most of the manufacturers of 1-inch videotape, digital television, and video still store and slow motion equipment are expected to participate.

Additional information on the conference and exhibit is available from SMPTE Conference Dept., 8 Scarsdale Avenue, Scarsdale, N.Y. 10583.

TNG

TOTAL NEWS GATHERING SYSTEM

THE ANGENIEUX TOTAL LIGHTWEIGHT-COMPACT SYSTEM FOR ENG/EJ provides angles from super wide extreme telephoto as well as high magnification ultra close-ups. Centering around the Angenieux 9.5, 9.5-142mm, f/1.8 zoom lens, the system allows the cameraman to carry only the components which are necessary for his specific assignment. All focal lengths from 7 to 615mm are available with this unique system, including remote control capability. Objects as small as 0.7x0.9" (x22mm) can be covered while retaining zoom capability. All in a basic package weighing 5.5 lbs. (2.5kg) including servo zoom/iris and pistol grip.



angénieux corporation of america

1500 OCEAN AVE., BOHEMIA, NEW YORK 11716 • (516) 567-1800
 13381 BEACH AVE., VENICE, CALIFORNIA 90291 • (213) 821-5080
 4 HAVEN HILL SQ., AGINCOURT, ONT. M1V1M4 • (416) 291-2363

For More Details Circle (23) on Reply Card

www.americanradiohistory.com

ENG: The road show that keeps getting better

By Ron Merrell, Editorial Director for Broadcast Engineering

What's happening in ENG today? Anything new and exciting? Well, it's not exactly exciting, and the products are second- and third-generation.

As one network official put it, ENG is just a mop-up operation today. Translation: it's taken for granted that we are equipped for ENG. All we're doing now is latching down the details.

So there it is. From the top, that's

about all you can say for ENG. Right? Not quite!

ENG on the road

If you travel around the country these days, at the end of the day you'll find yourself parked before a hotel TV set for the evening news. And since you've heard so much ballyhoo about ENG, you expect to see examples of how other stations present solid ENG coverage of something...anything. But then the news comes on as the same old canned approach, dashed with a good laugh on the weatherman for causing the lousy weather, snickers for the sports editor because his favorite

team lost again, or a chuckle at some trivia fill news. Even the begin to look alike!

Another thing that isn't so around the news scene is the effectively splicing ENG into news requires a lot of time people-talent. It's one thing to r out, shoot a story, and either transmit it or rush it back ready-to-go tape. It's quite another trick to bring back something that's worth bumping the happy, comfortable news scene...much less regular programming.

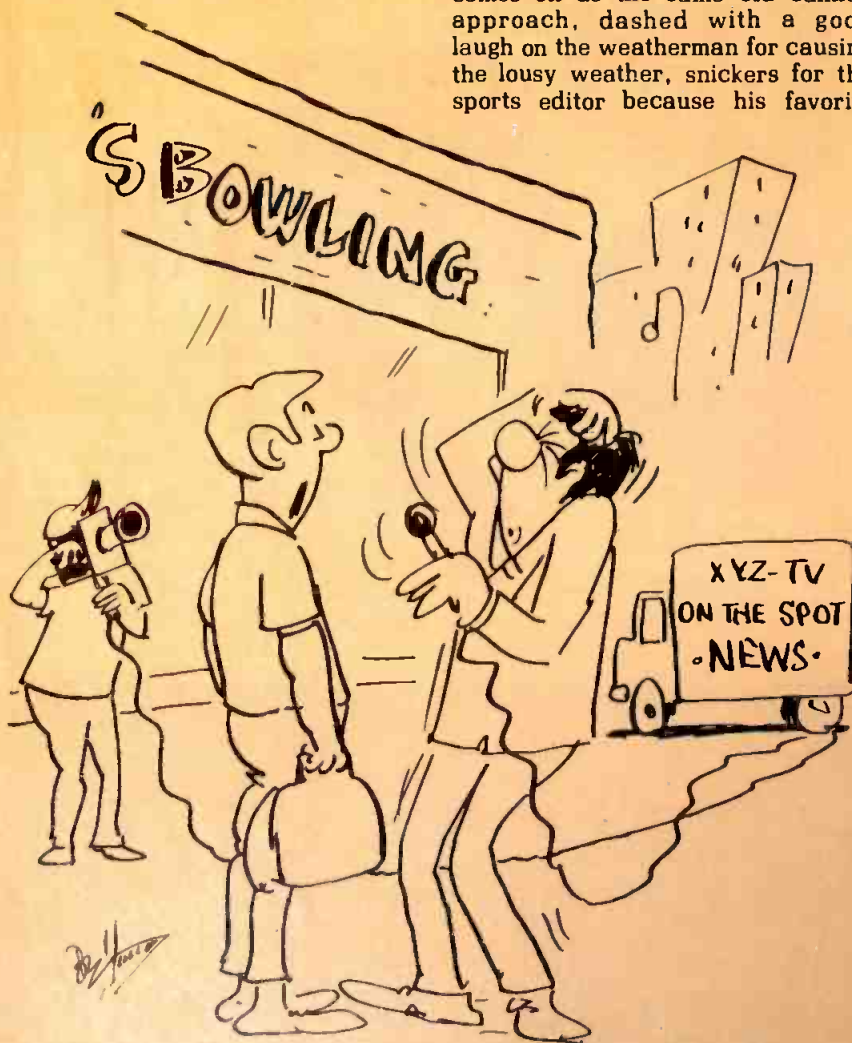
Creative talent is a requisite integrating ENG with the news takes talent on camera, on the mic and back in the editing booth. If it's live via microwave, the demand is greater. Better yet, it takes talent to sense when to pop up and go, and when to sit it out. It can be a huge commitment, so some stations have opted for using ENG equipment only for its economic side. And that means passing up feeds or rushing back late-break news. ("We'll have a taped report on the 10 o'clock news.")

In today's market, taking advantage of ENG gear may not be as important as it once was. Anyway, stations aimed at being first in the news ratings will make good use of whatever is available, and they will attract talent. And that top talent will keep them on top of the news. A network expert in this area of TV commented recently that he thought ENG was held back only by a lack of talent. I don't think that's complicated. The challenge is to develop talent, and a cut-and-run approach won't develop talent.

Open doors for EFP

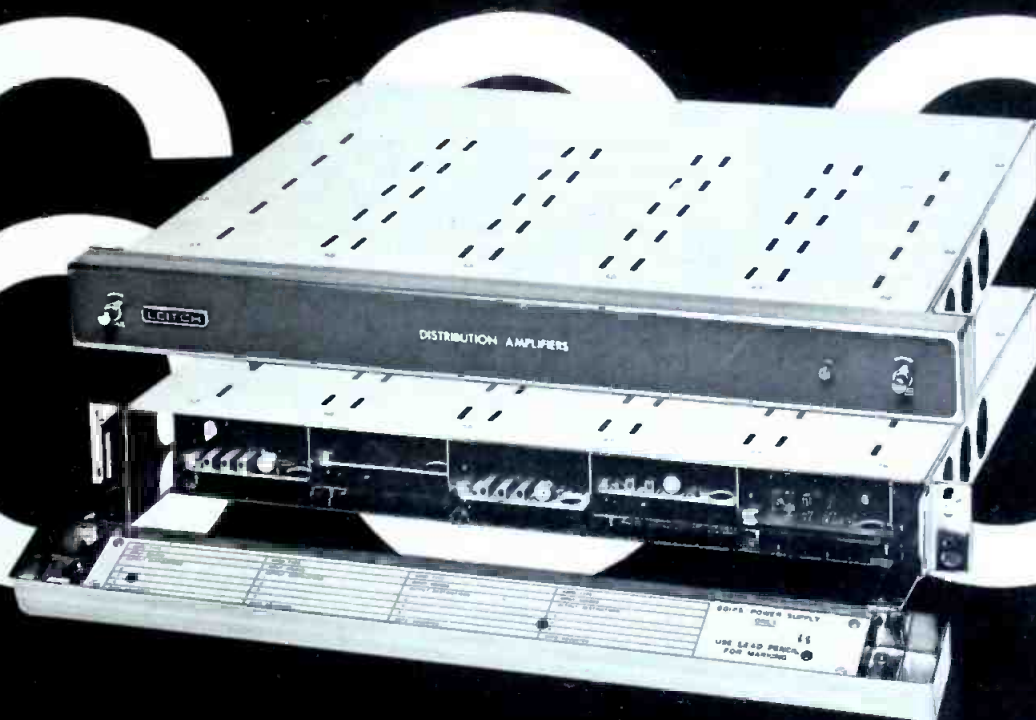
On the brighter side, many operations are shifting into electronic field production (EFP). In commercial and private television, they're taking their key from the ENG revolution and opting for producing in the field.

continued on page



"On the air or not, that's what my opponent said right after I made the tenth strike in a row."

Leitch proudly welcomes "Slim" to television's top-rated 600 Series.



Leitch engineers have responded to requests from fans of the very popular 600 Series. "Slim", a new single rack unit FR-601 Distribution Amplifier frame, has been introduced, adding a new level of versatility to the line-up of successful performers.

The standard FR-600 frame accommodates up to 10 amplifiers or delay cards, plus a power supply. Featuring an improved hinged front access panel, the new FR-601

mounting frame houses up to 4 cards with one power supply.

The new SVD-600 Switchable Video Delay module and the VCA-600 Video Clamping Amplifier are other welcome additions to the 600 Series modules.

Performance, reliability and designed versatility are all built into Leitch's 600 Series. Write to us for full details.

**LEITCH**

Leitch Video Limited, 705 Progress Avenue, Scarborough, Ontario M1H 2X1.
Tel.: (416) 438-5060

Leitch Video Inc., 210 South 8th Street, Lewiston, N.Y. 14092.
Tel: (716) 754-4349

For More Details Circle (39) on Reply Card

ENG

continued from page 36

Feeding ideas back and forth has led to some interesting inputs. And it has brought even more kinds of equipment to the news scene.

Just as the networks demanded, equipment improvements are being introduced at every convention. The 1978 NAB, scheduled for Las Vegas in April, will be no exception.

The changing ENG and EFP scene also has accelerated generation jumps in the equipment being used. Initial entries in the ENG market were models carried over directly from the educational, industrial, and CATV fields.

Meanwhile, more than a few manufacturers have paid attention to broadcast requirements. The result is evident in cameras that can be used in the field, or as backup or studio-effects cameras. And look at the progress made in recorders (not to mention the promise of a standard 1-inch helical format). Of course it helped when TBCs became affordable, and microwave and switching techniques were massaged by R&D. Then frame synchronizers and enhancers got into the act.

The list of ENG equipment available at the scene today tells us that a lot more than news could be shot in the field. But the option that always has set ENG apart is the live via microwave report. Once again, the manufacturers have developed improved equipment, and nudge ENG forward as a reliable way to collect the news.

Looking ahead

Last month we ran a short article on a Boston radio station that used a light beam to send audio on a short-hop remote. For that station, it was a gimmick, but it did prove in a live setting that an infrared optical carrier can do the job. Admittedly, until their range can be doubled or tripled, optical links in radio will be rare events. But how about video links?

In another article in this issue, an infrared link used at KSL-TV, Salt Lake City, is described. Even at KSL, the link is a short hop. But at KSL-TV it's not a gimmick. After all, the infrared link does solve the problem of crowded frequencies. The bandwidth is enormous, and no license is required.

The bottom line for ENG today is that despite all the past excitement

and innovative uses, most stations are doing little more with ENG than replacing film equipment. Without a commitment, talented people are not attracted to ENG, making it appear that there is a talent shortage on the news side of industry. But stations that have gone the full ENG route are finding a bonus in talent applications and electronic field production possibilities.

So what is happening in today is not that another station bought the equipment, or another station is using the equipment to cover something unusual. What is happening is that ENG is sliding into EFP, the door at many stations is propped open for talent people, and the equipment keeps improving.

Enter the laser-based optical technology, hold CCD cameras as a carrot for the future, and you see that ENG (or EFP) will remain a hot topic. But it also will remain a tough challenge even for the innovators. No matter how it's pitched to the public, it will never help the bottom line of the "me too, but barely" stations.

With ENG and EFP, the good keeps getting better.



We Offer Our Complements

Modular tape components and electronics.

When you design a custom tape system to record, to monitor or to play, specify reliable Telex tape components. You'll collect the compliments. With our complements. For detailed information please write.

PRODUCTS OF SOUND RESEARCH
TELEX
COMMUNICATIONS, INC.

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

For More Details Circle (40) on Reply Card

LOW LOSS CABLE BREAKTHROUGH



New LDF Series HELIAX® Cable



ANDREW

Lower loss, improved moisture barrier, plus all the traditional advantages of HELIAX foam-dielectric cable. New low density foam dielectric reduces attenuation, almost to that of air-dielectric cables. Annular corrugations, in conjunction with connector "O" ring seals, provide a positive longitudinal moisture block.

Connectors have been improved too. New features include self-flaring assembly, superior electrical contact, high resistance to pull-off and twist-off, moisture seals, and low VSWR through cable cut-off frequency.

Two sizes, 1/2" and 7/8" are available now for immediate shipment. For further information contact your Andrew Sales Engineer or ask for Bulletin 1160.

ANDREW CORPORATION

10500 W. 153rd St., Orland Park, IL, U.S.A. 60462
Telephone: (312) 349-3300

ANDREW ANTENNA COMPANY LTD.

606 Beech St., Whitby, Ontario, Canada L1N 5S2
Telephone: (416) 668-3348

ANDREW ANTENNAS

Lochgelly, Fife, Great Britain KY5 9HG
Telephone: (0592) 780561

ANDREW ANTENNAS

171 Henty St., Reservoir, Victoria, Australia 3073
Telephone: (03) 460-1544

ANDREW ANTENAS LTDA.

Av. Victor Andrew, 585, Caixa Postal 600, 18100 Sorocaba—
SP—Brasil Telephone: (0152) 28900

ANTENNES ANDREW S.A.R.L.

B.P. 44, 28400 Nogent-le-Rotrou, France
Téléphone: (37) 52 19 06

ANTENAS Y PERITAJES

Av. Reforma 445 P.B.—K., México 5, D.F. México
Teléfono: (905) 525-5443

For More Details Circle (41) on Reply Card

KCST puts ENG on the set

By Michael Scheibach, Managing Editor

KCST-TV, San Diego, California, like many stations, is gradually integrating electronic newsgathering into its overall news operation. Unlike some stations, however, KCST refuses to use the mini-cam in every newscast just for the sake of having a "live eye" report.

Bill Peterson, news director, feels that ENG is the way of the future in television news coverage, not merely in "live" reports, but in electronic field productions (EFP). "We feel that ENG is the future," Peterson said, "and eventually we will have to move in that direction. But at this time, I cannot say when the total conversion will be made."

KCST currently operates seven news units, including five traditional

film crews and two ENG units. The ENG systems, which have been in operation for 16 months, have proven their worth and versatility. Although there are only two units, they produce about 50% of the station's news reports.

ENG beginnings at KCST

Peterson came to KCST two years ago to transform a rather weak station, with a news staff of 10 persons and no ENG units, into a respected news operation that could compete in the San Diego television market. Today, KCST has 40 persons in the news department (with 11 technicians in the video-gathering unit) and excellent ENG capabilities.

Since another local station al-

ready had introduced ENG, Peterson decided to make KCST the best equipped ENG station. After looking at several systems, he finally chose an RCA TK-76 camera, a Sony BV-1000 videocassette recorder, a Nuraid microwave system, and two complete editing systems, including a Convergence editor controller.

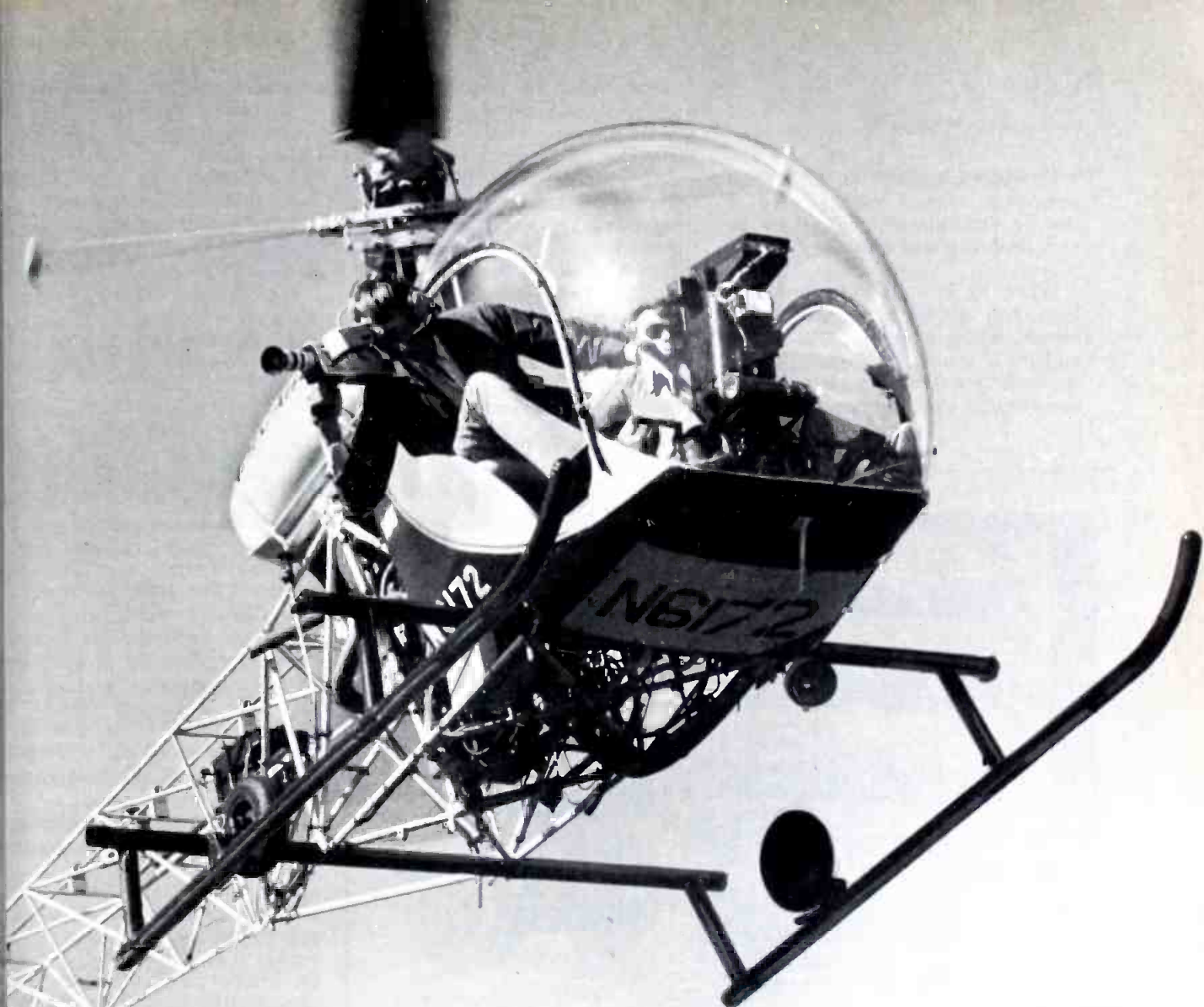
The Newscenter

Another element of KCST-TV's integrated news operation is the news set. At KCST, the set is the newsroom itself. This concept, developed by Peterson, puts the entire news operation on camera, adding realism, immediacy, and identity to the news function.

continued on page

The set for KCST's evening news is the newsroom itself, with newscasters located between the former studio and newsroom. Cameras and lighting are positioned on the studio side, while the newsroom serves as the background.





Take Me Anywhere'

That's a "no-strings" invitation from Hitachi's amazing FP3030 color camera. It's the first time a self-contained port-camera has packed so much quality into a lightweight, compact housing that, better yet, goes for such a painless price. No wonder, then, that the FP3030 has received such an enthusiastic reception from corporations, schools and hospitals. They find it gives them unrestricted mobility in all communications and training programs. Broadcasters are utilizing the FP3030's unique capabilities for everything from at-the-scene news gathering to field documentary production.

The FP3030's diverse current user list reflects the camera's ability to deliver results that meet the high standards America's top communicators...in broadcast, industry, and education. And we think that's quite an endorsement for a camera that runs less than \$5,000!

A few key features of the FP3030's design: • Easy to use. Just point and shoot. • Featherweight portability: weighs only 8½ lbs. complete. • Exclusive single Tri-Electrode Vidicon tube for registration-free color. • Internal NTSC, or external sync for multi-camera system use. • 3-way power—uses AC line, battery, or external DC (12V). • Can be used with any video tape recorder from cartridge to quad.

Your authorized Hitachi dealer will be glad to demonstrate the FP3030. Write or call for the name of your nearest dealer.



 **HITACHI**
Hitachi Denshi America, Ltd.
FORMERLY HITACHI SHIBADEN CORP OF AMERICA

Head Office: 58-25 Brooklyn-Queens Expressway, Woodside, N.Y. 11377 (212) 898-1281
Branches in Chicago (312) 344-4020—Los Angeles (213) 328-2110—Dallas (214) 233-7823—
Atlanta (404) 451-9453—Denver (303) 344-3156

For More Details Circle (24) on Reply Card
www.americanradiohistory.com

KCST

continued from page 40

"A viewer looks in on the actual newsroom, sees a report come in and be aired immediately. It can be very dramatic and effective," Peterson said.

When KCST's new facility was built two years ago, the Newscenter, which occupies 25% of the building's space, was designed so the wall between the newsroom and news studio could be removed.

After using the news studio for awhile, it was decided to change the format and remove this wall. Now, the Newscenter is one large room, with the newscasters sitting between the former studio and the newsroom. The newsroom provides the background, while the lighting comes from the studio side.

"Unlike the typical noise level of a newsroom," Peterson noted, "KCST's newsroom is relatively quiet as a result of careful planning. Editing rooms and teletypes are located in glass enclosures which

surround the newsroom itself."

By using wireless mikes, announcers can move around room during the actual newscast, which adds even more realism being "behind the scenes."

Peterson is proud of the professionalism and technical capabilities of the station's ENG operators. "We can be on-air within five minutes of arriving on a scene, a technique that includes setting up, orienting the microwave, and transmitting picture," he said.

ENG units

The quick set-up time is due only to the mobility of the station's two ENG vans, but to the crews that man them as well. Each van has a crew of three: camera operator, microwave/tape operator, and porter. The 11-member video-gathering unit is trained in both field technique and mini-cam operation. They can handle the camera, editing, production, and are learning film processing. When KCST does make the conversion to ENG, their technical staff will be fully capable of handling the new operation, Peterson said.

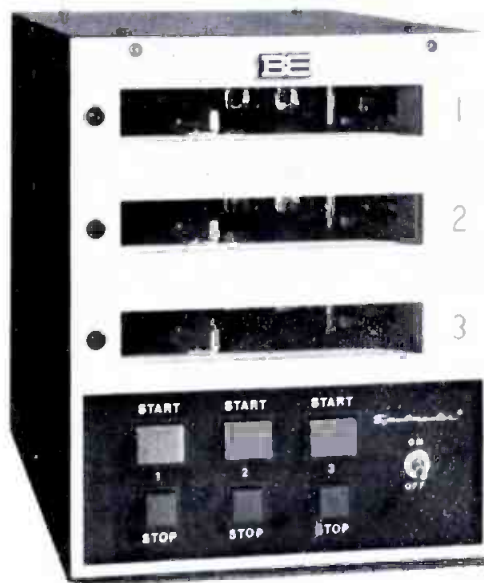
The effectiveness of the crew is aided by the vans themselves, which are completely equipped and can operate continuously for 12 hours on DC power. Although the vans can operate on AC, if power is interrupted they automatically switch to DC without any noticeable effect on the camera. The vans are charged each night in preparation for the next day's operation. On one occasion a van operated for 14 hours on a single DC charge.

One van also is equipped with a ladder which can extend the microwave dish 30 feet above the ground. This allows the remote unit to overcome hilly terrain and tall buildings and broadcast "live" back to KCST Newscenter.

Peterson pointed out that several times the crew has mounted a camera on the van ladder in order to overcome barriers or to get a better angle. This has been used quite effectively in covering news from the military bases in the San Diego area. Whenever news happens on a base, Peterson said, the military closes the gates. When this happens, KCST lifts its camera above the gate and zooms in on the scene.

With the microwave capability a live mini-cam report can be on-air directly. Or, if the action is in an area where direct transmission is not possible, the scene can be taped on site and the

continued on page



Nobody has it like the NEW Spotmaster 5300 A with Plug-in Decks

When we say "Nobody has it like Spotmaster," we mean it.

Here's the most advanced three deck on the market. It's our up-dated 5300A with *plug-in* decks for unsurpassed accessibility; and a new internal mechanical design which insures very stable and accurate deck and capstan positioning independent of front panel reference. And note the run lights next to each deck.



All leads to the deck go through this plug-in connector. There is nothing to disconnect to remove the deck.

More features? A premium, direct drive hysteresis synchronous motor; reliable low voltage, solid-state, solenoid switching, the superb Phase Lok III head bracket, FET muting, active cue tone filters and rear panel LED service aids. It's all there in the new Spotmaster 5300A.

For information call or write Broadcast Electronics, 4100 North 24th St., Quincy, IL 62301. Phone: (217) 224-9600.

BROADCAST ELECTRONICS, INC.
A FILMWAYS COMPANY



For More Details Circle (25) on Reply Card

FREE!

Your planning guide to a better sound

Whether you're in engineering or management, our newest catalog will prove indispensable when planning your audio requirements.

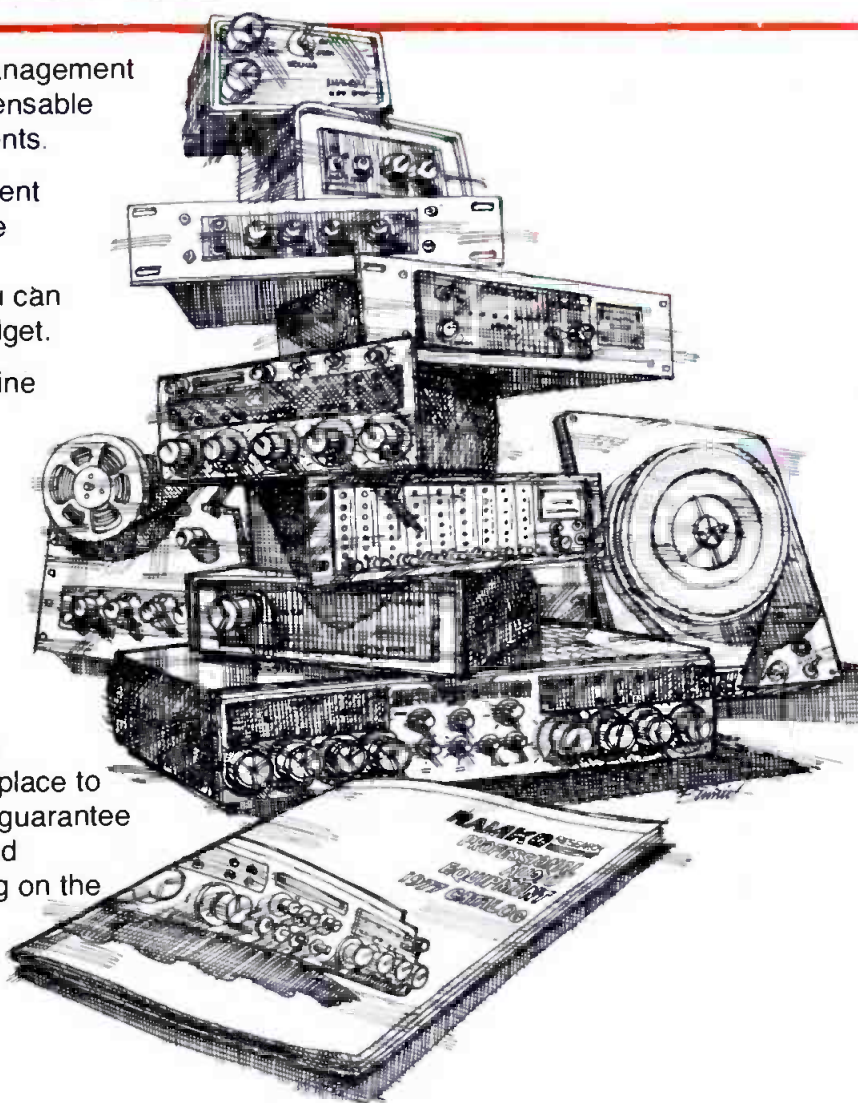
RAMKO manufactures over 70 different products designed specifically for the broadcaster and those engaged in Professional Sound. All at prices you can afford, no matter how small your budget.

Radio consoles, audio DA's, mic. & line amplifiers, turntable preamps, limiter/compressors, equalizing amplifiers, tape winders, solid state meters and much more. We also distribute some of the finest products in turntables, tape recording accessories and other broadcast products.

In addition to the vast array of products, you'll find quality of design and performance that takes second place to none and is ahead of most. And we guarantee this with our 2 week free trial period and warranties of 2 & 4 years (depending on the product).

Just write, or circle the bingo card, and pay for your free copy of our newest 24 page catalog. The technical descriptions, specifications and illustrations will show you why RAMKO designed equipment offers the best value/performance ratio in the industry.

Ramko understands your needs. After all, we're broadcast engineers.



RAMKO RESEARCH

11355 "A" Folsom Blvd.
Rancho Cordova, CA 95670
(916) 635-3600

For More Details Circle (26) on Reply Card

NEW . . .

Roh 1978 Catalog of Modular Audio Equipment



Over 50 audio components designed for broadcast service

The most extensive modular audio product offering available

Includes many new and revised models for exceptional system capability

Write for your free copy today or call (404) 449-0873

ROH CORPORATION
107 Technology Park
Norcross, GA 30071

KCST

continued from page 42



The newsroom (foreground) is part of the set on KCST's evening news. Newscasters are free to stand or move around, adding realism to the news operation. Editing rooms (left) are behind glass to minimize noise.

moved to a location where it can be transmitted to the studio for taping or for on-air use. If time permits, the crew can return to the studio with the tape for editing.

According to Peterson, the two ENG units have been one of the major reasons for KCST's improved news coverage, making the station more competitive with the other local stations. On one election night, for example, while another station did one remote, KCST did 14 remotes with one van, and at 14 different locations.

Communications system

Another vital element in the integration of KCST's successful ENG operation is fast, reliable communications, both in the field and between the field units and headquarters. KCST-TV has installed an extensive mobile and portable communications system to accomplish this.

Each of the news crew's vehicles and the news director's car is equipped with a two-way mobile radio for direct contact with the Newscenter. The mobile radios are used for dispatching crews, providing instructions to reporters on how to handle a particular story,

and receiving status reports on field assignments.

In addition, the radios often are used to provide details on a story while the crew is on the way back to the studio. These reports then can be integrated into a two-minute "tease" that KCST uses immediately preceding the evening news segment.

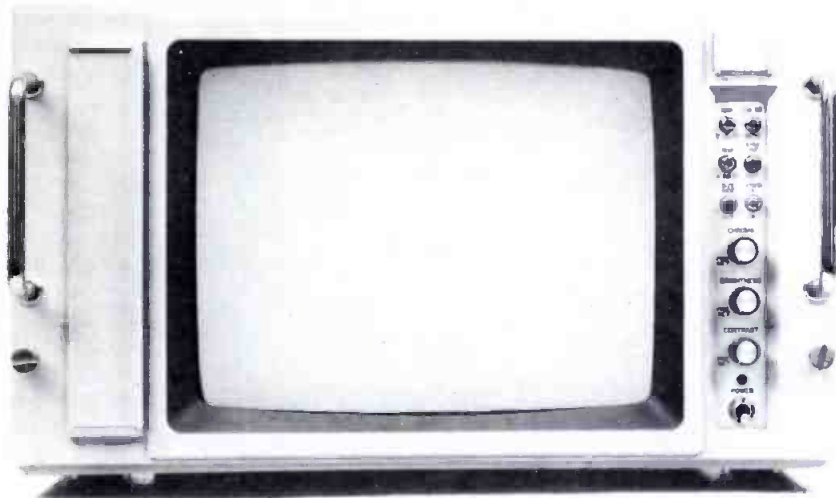
For communications on site, each news crew is equipped with hand-held radios which operate on a different frequency than the mobile radios. These portable units are used for technical operations, including orienting the microwave dish for best reception, and for cueing reporters and camera operators.

Two repeater systems in the two-channel radio network extend the effective range of the communications system to 30 miles, depending upon the terrain.

"Our radio network gives us complete control over our crews in the field, and often gives us a jump on the other stations," Peterson said. "The live voice-over radio reports directly from the field during our attention-grabbing lead-in and are proving very effective."

continued on page 43

It takes guts to run your video through an Ikegami broadcast monitor.



With twice as many image-making dots on its screen, an Ikegami color-tv monitor can show up in a nervingly high resolution a dozen or more things that could go wrong in your picture. Not just purple cows, but the smallest anomaly in clarity, the slightest picture distortion, the most marginal overload.

This one is our Model TM14-2RH. A comb filter helps maintain resolution to more than 600 lines. It gives you a choice of over- or under-scanned picture display.

Damage to its picture tube is prevented by power-protective circuits. Up front are all adjustments for its 14-inch CRT and inside are modular boards for simple servicing and maintenance. A keyed back-porch clamp system keeps the black level constant for maximum picture stability.

There are both pre-set and adjustable controls. Video response is from +1 to -2 dB from 60 Hz to 8 MHz.

It has extremely rigid, sturdy construction and is available in a free-standing cabinet or for standard 19-inch rack mounting. Its built-in degaussing circuit and magnetic shield to fend off external magnetic effects make it possible to move the Ikegami monitor without affecting its picture.

Also available from Ikegami are our Series 8000 monitors for broadcast studios. There are four models, 25, 20, 16, and 14 inches. All use in-

tegrated circuits for high stability, long service life,

and very modest appetite for power. Their picture tubes have black matrices for maximum contrast and best color fidelity. A keyed back-porch clamping circuit keeps pictures stable with proper black level. Video response is +1 to -2 dB from 60 Hz to 5 MHz.

You can get an optional remote control for brightness, contrast, and chrome.

We really shouldn't have to give you all the specs. The name Ikegami alone is enough to tell you how good they are. But if you do insist on more, ask Ikegami. Ikegami, the leading manufacturer of ENG cameras, manufacturer of the best in studio cameras, and now the best in monitors, too.



Ikegami

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

For More Details Circle (42) on Reply Card

"If you buy a routing switcher without talking to me first, we both lose."



Our business—our only business—is routing switchers. We at Utah Scientific have developed a new switcher that embodies both proven design principles and state-of-the-art components.

Our switcher has a rich heritage. It is based upon the same 10 X 10 matrix building block that I conceived and developed at TeleMation. This concept, as exemplified by the TeleMation switcher, has proven to be the most cost effective in the industry and has established an excellent worldwide reputation for electrical performance and reliability. I think we have succeeded in refining this design to provide a better product for less money.

Call me for a quote or demonstration and see if you don't agree.

Lyle Keys

US UTAH SCIENTIFIC, INC.

2276 South 2700 West
Salt Lake City, Utah 84119
Phone: (801) 973-6840

Dealer and representative inquiries invited.

For More Details Circle (43) on Reply Card

KCST

continued from page 44

Electronic field productions

For major planned news events, KCST-TV can use both ENG and EFP, tying them together for two-camera productions with direct on-air switching.

This was used recently when a federal judge threw out the San Diego Public Schools' integration plan, telling the school board that it would have to redesign the plan for next year.

The ruling came at 4 p.m., just one hour before the other station went on the air with their evening news. Because KCST-TV broadcasts its news at 6:30, however, the station had enough time to send out the ENG units for the story. By a little time, a complete report had been put together (using mini-cam equipment) which combined two new stories: the viewpoint of the school board to the court's decision; and the views of minority leaders.

Then, at 7 p.m., KCST preempted regular programming to broadcast a special report on the decision and its implications. Using both ENG and EFP units, connected to Newscenter viewers had the opportunity to call the station and discuss the issue with the school board, minority leaders, and the family who has brought the original suit against the schools.

KCST will be doing more in EFP, which Peterson sees as a natural extension of ENG applications. In fact, Peterson rejects the notion that ENG should be used just for "live reports during every newscast.

"If a news story warrants a live broadcast, we will do it," he said. "We don't want to do what some stations are doing, though; for example, going to the opening of an opera and standing in the lobby with a 'live eye' report."

Comments

As KCST moves toward total ENG, more emphasis will be placed on using tape rather than film in the production of in-depth news features. Restricting ENG only to "live reports is failing to utilize an important innovation in broadcast journalism.

Although the term EFP has been confined to non-broadcast medium until now, when stations, like KCST, learn to take advantage of the ENG equipment, they, too, will begin applying EFP techniques—a natural extension of present ENG use.

Used in 30 countries . . .

DYNAIR's RX-4B

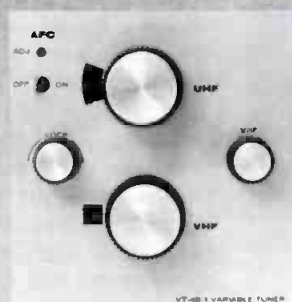
All Channel Demodulator

VT-4BU Plug-in
UHF Tuner



Model RX-4B Solid-State Off-Air Professional TV Demodulator
with Plug-in Tuner Front-Ends

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



FT-4B Plug-in
Fixed VHF Tuner



DYNAIR's Models RX-4B and RX-4BE, equipped with plug-in tuners, are now in use in over 30 countries around the world. In fact, they are compatible in 63 of the 136 countries with on-air broadcast television.

Designed for professional use, the demodulators have demonstrated excellent reliability and outstanding performance with over seven years of field use throughout the world.

The RX-4B is compatible with NTSC and PAL M color standards (system M and N) and the RX-4BE provides operation on PAL B color standards (system B). Both operate on 115/230V, 50/60 Hz and require only 40 watts.

For monitoring video modulation levels and for use in closed-loop operation, the optional solid-state video processor may be added.

For off-air broadcast monitoring, CATV, or relay service, select a DYNAIR demodulator.

Write or call us for complete details including a copy of our VIR applications bulletin.

DYNAIR ELECTRONICS, INC.

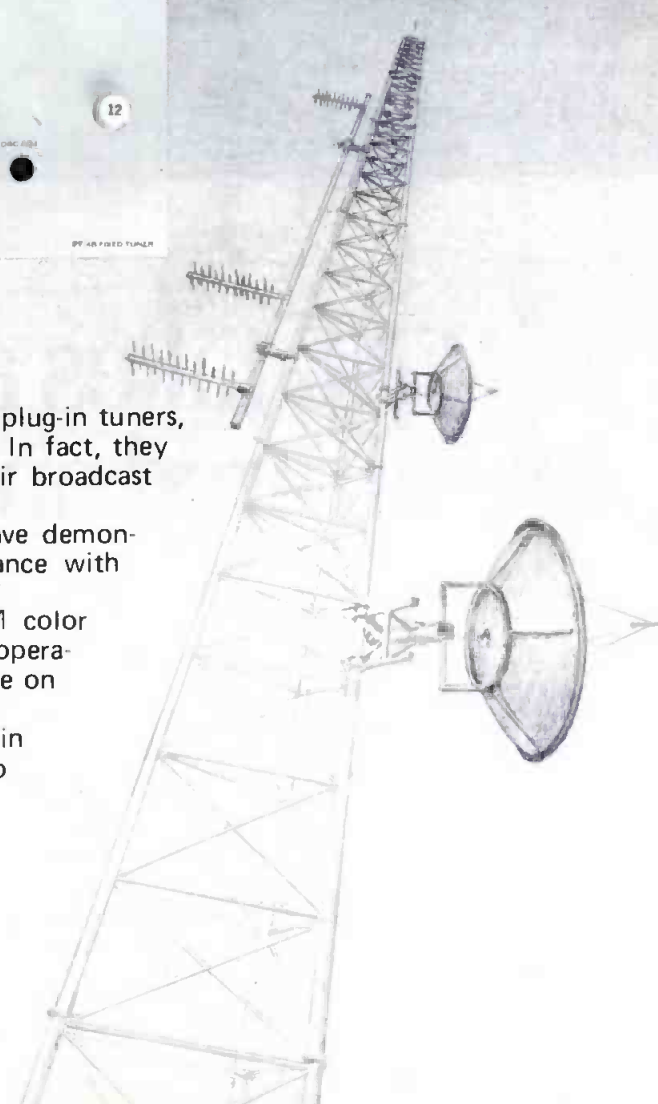
1555 MARKET ST., SAN DIEGO, CA. 92114

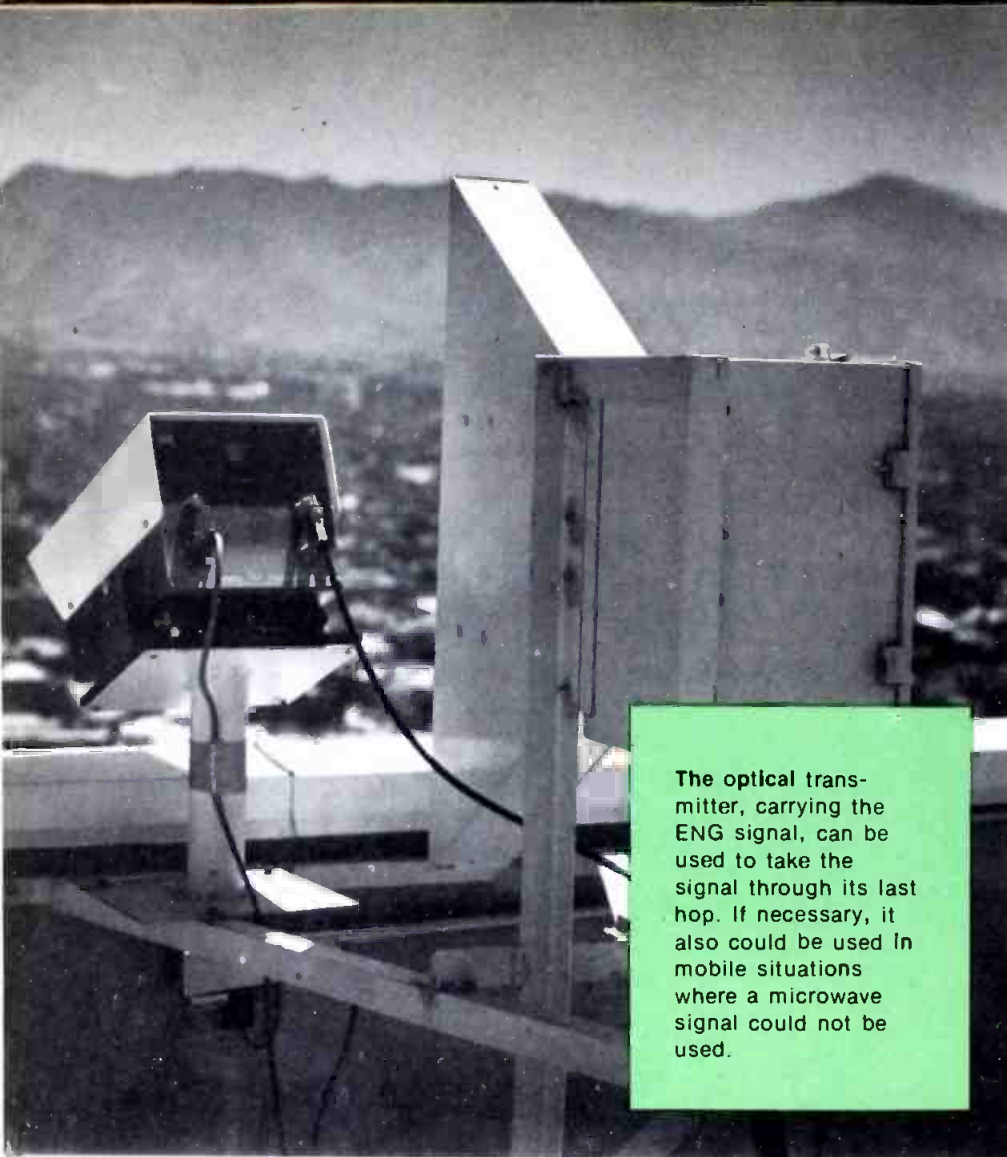
PHONE: (714) 263-7711; TWX: (910) 335-2040



More Details Circle (44) on Reply Card

www.americanradiohistory.com





The optical transmitter, carrying the ENG signal, can be used to take the signal through its last hop. If necessary, it also could be used in mobile situations where a microwave signal could not be used.

ENG takes a ride on infrared optics

By Ron Merrell, Editorial Director

TV signals can ride quite nicely on an optical beam. They were already getting a lift from fiber optics. Now they can take a ride on an infrared optical beam, and 2,000 feet later be received almost without a hitch.

This latest use of an infrared optical carrier is not as farfetched—or far out—as it may sound. Ask the engineers at KSL-TV in Salt Lake City or KSD-TV in St. Louis, and they'll give you different versions of how and when this technology can be used. But on this much they

agree, the systems do work, and the technology shows great promise for ENG broadcasting.

What makes the infrared optical carrier so interesting is that no license is required. Of course, it helps that present systems also are less expensive than conventional microwave units. But then there is no spectrum crowding in the infrared range. What's more, unlike cable, no conduits, permits, right of ways, or cabling labor is involved. Without regulatory restriction of bandwidth, the system is flat to

beyond 10 MHz without ringing overshoot. And, two audio channels can be used.

Infrared in Salt Lake City

Some of the first infrared optical broadcast video tests were run at KSL-TV. Chief Studio Engineer Howard Smith is quick to point out that "We are pioneers, but sometimes the pioneers take the pie in the ears!" What Howard means is that when you are running ahead of the field, especially in a new technology, you have nothing to fall back on except the belief that you can make the system work. During the initial trial runs, cooperative engineers can be severely questioned for the time, effort, and money spent on something that may not work at all. And even when the end result is a working system, seldom occurs to outsiders that there were any sacrifices by the station engineers.

The system used at KSL was built by American Laser Systems, a California operation based in San Barbara. Two models are available. The 761 is the ENG broadcast version. The 747 is an industrial quality system that sells for considerably less than the broadcast version. Based on field experience, the 761 has been modified to eliminate early test problems.

Getting off the ground

By mid-1976, Howard Smith had bought much of the equipment for the KSL ENG hookup. They had a van, had installed the Terrace microwave, and mounted the omnidirectional Nurad antennas at one of the tallest buildings in town—the 26-story Beneficial Life Tower. This building is across the street and down a block from the KSL television studio. The link was complete except for the relatively short 70-foot hop from the microwave receiver to the studio.

Costs for a coax cable in the downtown area proved prohibitive at the time, and licenses and frequency allocations for a permanent short-hop microwave were not forthcoming. An infrared optical transmission system using a low-power optical beam filled the gap for the short-hop application.

A pie from the West

From the beginning, it was obvious the system would answer the short-hop problem at KSL. That doesn't mean it all came off without a hitch. That the system did survive—with improvements to

continued on page

CANON ANNOUNCES THE ULTIMATE STUDIO LENS



	PV18x12B2 (for 1" / 25mm Plumbicon*)	P18x16B2 (for 1 1/4" / 30mm Plumbicon)
Focal length	12-216mm	16-288mm
with 1.5x range extender	18-324mm	24-432mm
with 2x range extender	24-432mm	32-576mm
Maximum relative aperture	1:1.6 (f=12-172mm) 1:2.0 (f=216mm)	1:2.1 (f=16-230mm) 1:2.7 (f=288mm)
Zoom ratio	18x	18x
Image format covered	12.8 x 9.6mm; 16.0mm dia.	17.1 x 12.8mm; 21.4mm dia.
Minimum object distance from front vertex	0.7m (27.6")	0.7m (27.6")
Object dimension at minimum object distance: Wide:	103.2 x 77.4cm; 129.0cm diameter	
Tele:	5.3 x 4.0cm; 6.7cm diameter	
Back focal distance	62.65mm (in air)	78.08mm (in air)
Glass compensation	69.2mm (BK7)	70.2mm (BK7)
Wavelength range for color correction	400-700nm	400-700nm
Dimensions	466.5mm length x 284mm width x 260.5mm height	
Focus and Zoom control	Manual, with plug-in interchangeable servos	
Range extender control	Plug-in servo / manual	

*TM N.V. Philips of Holland

The new Canon 18x series for major broadcast cameras. With the best relative aperture, superior wide angle and shorter M.O.D. Choice of manual or servo focus and zoom. Built-in servo/manual operated 1.5x and 2x extenders. And interchangeable, plug-in servo modules, for easier service. All at a competitive price.

Judge for yourself. Compare the specifications below. Factor in Canon's nationwide service and comprehensive loaner program. And see a demonstration.

For more information, please write or call:

Canon®

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

product—is a testimonial to KSL engineers and the system designer, Duncan Campbell.

But so you won't get the idea that these engineers (or this editor)

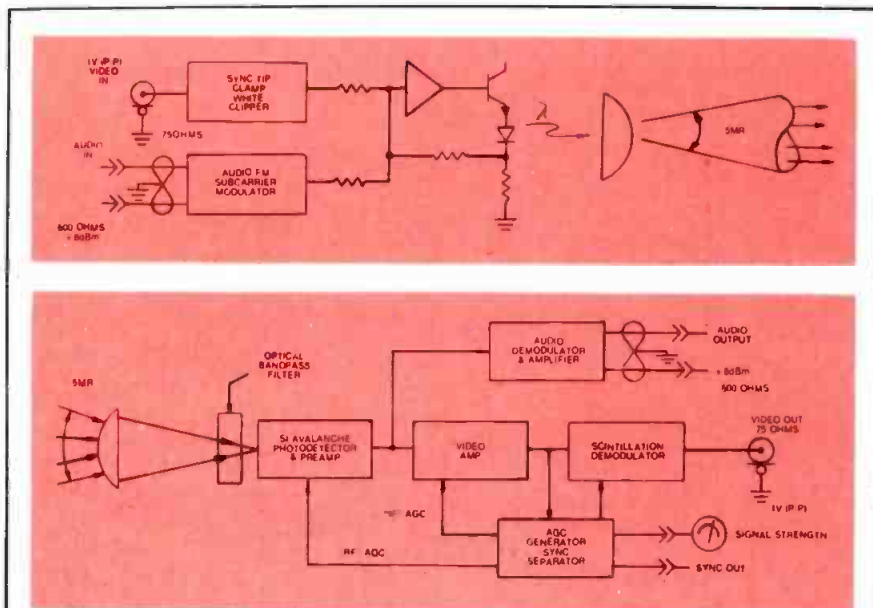
bought a pie in the sky, let's take a look at what the engineers at KSL ran into on the way to becoming infrared ENG pioneers.

The KSL installation happens to

be on a East-West radial, with receiver facing West, with inclination of 35°, due to the elevation difference between the transmitter and receiver. The KSL group noticed that during a short period of each day, for a week or in the summer, the signal became noisy, and the signal never fully recovered.

A staff member, who is an astronomy hobbyist, computed the sun's position, and found that, eight days of each year, the sun passed right through the receiver's field of view. Further investigation found that the lens in the receiver acted like a burning glass, and the sun's rays etched a path across the receiver's optical filter, degrading the system's performance.

It was the coincidence of being right on an East-West radial, combination with a high inclination angle, which contributed to the condition. Changes have since been made in the system to reduce or prevent such possibilities in the future. Although it was not possible at KSL, mounting the optical transmitter a few feet down on the side of the building would have blocked the sun and eliminated the problem.



A block diagram of the complete optical TV transmission system: Transmitter (top) and receiver (bottom).

Inside the black box

The transmission set referred to in this article works on the principle of an infrared optical light beam used as a carrier instead of the familiar RF carrier. Any signal bandwidth can be impressed on the carrier. The system is flat beyond 10 MHz, and this contributes to the transient response, because no bandwidth limiting filters are needed.

The video signal amplitude modulates the beam. On the audio side, the two 15 kHz channels FM modulate 10 MHz subcarriers which also ride on the beam.

The modulated light from the Infrared emitter is captured by the transmitter lens (an optical antenna). From there, the light is formed into a narrow beam which spreads to about 10 feet in diameter at 2,000 feet.

At the receiving end, a portion of the beam energy is captured by the receiving lens, where it passes through an optical bandpass filter and is focused on a silicon avalanche photodetector. The optical filter looks like a piece of flat black glass. It's really a tuned optical resonator which passes only the frequency of the infrared transmitter. This filter helps eliminate unwanted light sources, such as the sun, headlights, street lights, etc.

The silicon avalanche photodetector is an extremely sensitive device that both amplifies the signal and recovers the baseband signal (video plus audio subcarrier) from the optical carrier.

The video signal is amplified, hit with AGC and clamped to take out rapid fluctuations due to atmospheric effects. The audio subcarriers are separated, demodulated, and the resultant signal amplified to an +8dBm, 600 ohm balanced level.

The KSD-TV version

When the same system was installed at KSD-TV in St. Louis, the day came (by coincidence) when the sun hit the receiver lens at the same critical angle...with about the same results. In this case, the receiver was moved down the side of the building, and that did eliminate the sun interference.

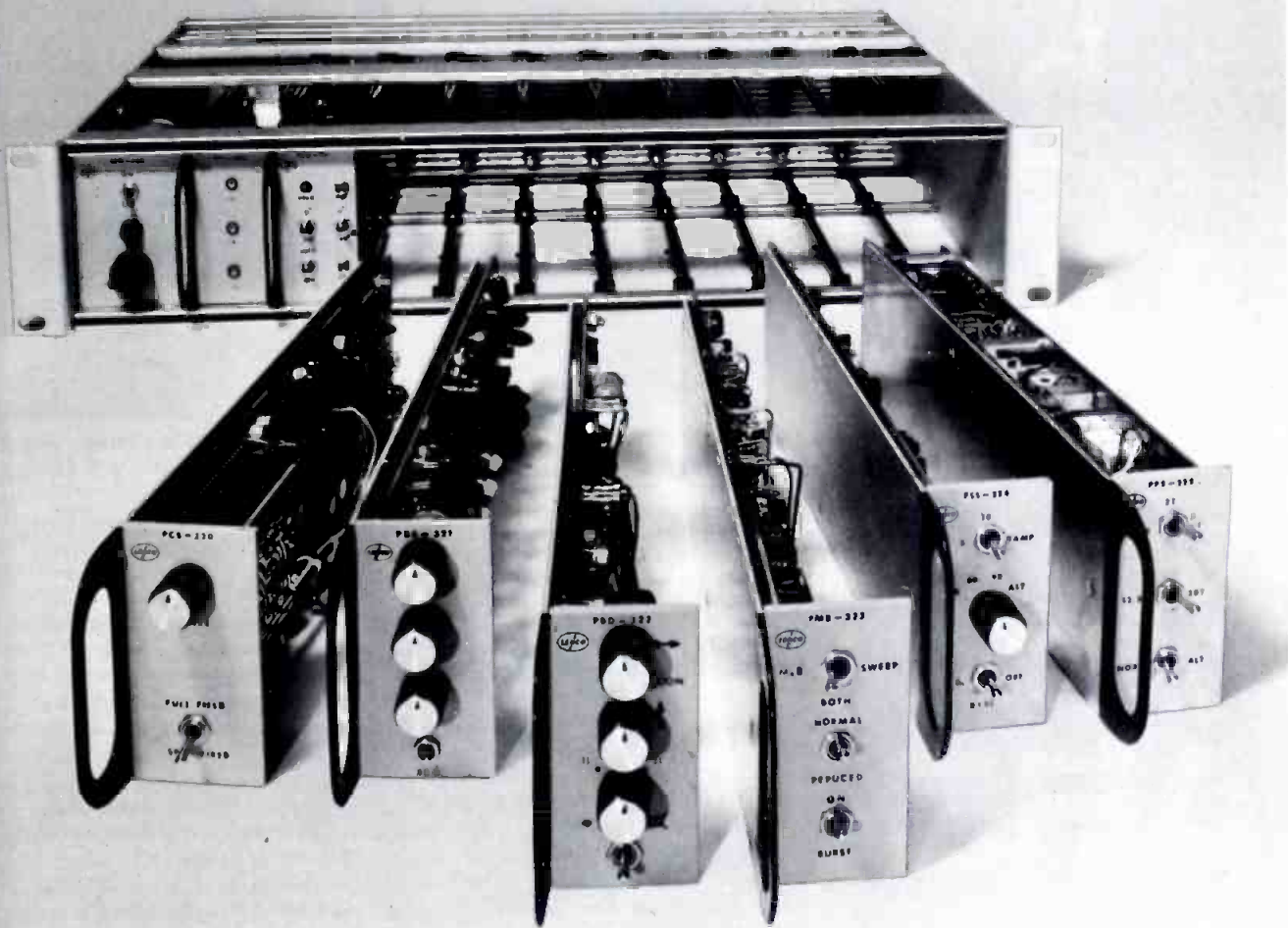
Monte Walpole, KSD's engineering manager, is extremely interested in following the development of optical transmission systems. But for the present, KSD's system is used as a backup in case the conventional microwave link goes down.

KSD-TV is one of those stations working hard to bring ENG into a more efficient and effective meld with the local news show. The fact that they use a backup final link system indicates how serious they are about getting the ENG report on the air. And the fact that the backup is an infrared optical transmission system tells us a lot about the interest in new technologies bumping into ENG.

This isn't one of those new products claiming to solve all your problems. It was designed as a

continued on page

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



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

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

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

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

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

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



LENCO, INC., ELECTRONICS DIVISION

300 N. Maryland St., Jackson, MO. 63755. (314) 243-3147 / 13670 Littlecrest Dr., Dallas, TX. 75234 (214) 241-0976 / P.O. Box 301, Atchison, KS. 66002. (913) 367-1146

For More Details Circle (29) on Reply Card

ABC

What you're looking at are the different typesstyles now available — all together — in the new Knox Multifont Module 246.

abc

This latest option in the Knox K128 System gives you unprecedented versatility in a medium budget character generator.

ABC

The alphabets in the Multifont 246 are designed on a matrix of 1536 elements, effectively doubling the already fine resolution of the K128.

abc

In addition to these three alphabets, the Knox Multifont 246 carries a full load of math and typewriter symbols, and enough accented letters to write in 9 Western European languages.

ABC

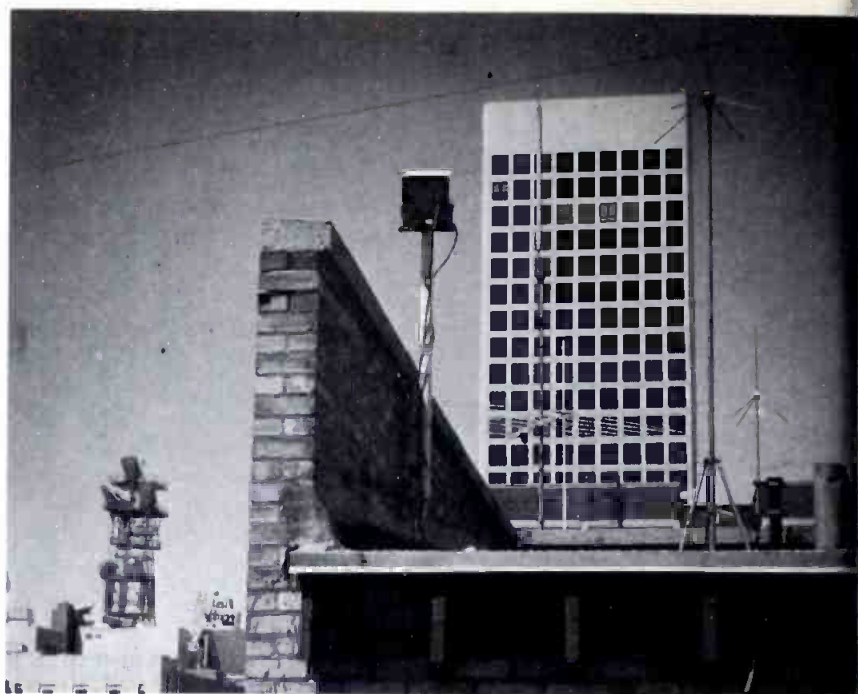
This whole electronic type case costs just \$1200. If you're already a Knox K128 user, your present unit can be readily upgraded. Thanks to Knox engineering, the 246 Module simply inserts in the back of the K128, replacing the existing font board. Addition of a single switch on the front panel completes the change. It's really as simple as...

...well, as simple as ABC.



16021 Industrial Drive
Gaithersburg, Md. 20760
(301) 840-1930

For More Details Circle (30) on Reply Card



This is the receiver end of the infrared optical link. It's a lot more critical than the transmitter end, in this arrangement, because the unit must lock up at the transmitter.

ENG

continued from page 50

additional ENG tool, not as a system to replace microwave. Fog is still a problem. While the effective range is 2,000 feet, heavy fog can degrade the signal below usable levels. Rain and snow normally don't cause major problems, but extreme weather conditions can have some bad effects. It should be brought out, however, that KSD has never lost their signal on the optical system due to weather.

The snow that caused snow

The system, built for all-weather operation, contains window and lens defoggers to melt ice and prevent condensation. But Noel Clark, of KSL, noticed that during a heavy wet-snow blizzard the signal gradually degraded and finally dropped out. When he went to investigate, Clark found a snowdrift in front of the receiver. The wet snow had been packed into the upturned receiver window, completely blocking the optical signal. After clearing the drift away, the signal returned to normal, even though the visibility over the 780-foot path was almost non-existent, due to the heavy snowfall.

It's in the field use that has brought on design changes, making the infrared technology even more viable for ENG. In fact, KSL is in the process of converting their ENG system, using two optical transmitters for out-the-window down

links to optical receivers on the vans at the news site. Meanwhile they have converted their fin down link at the studio to conventional cabling, with an optical fiber link on the side.

Newer versions of this optical transmission system include improvements based upon the experiences at KSL and KSD. What may be the biggest news is the KSL intent to use infrared systems at the ENG news site. Without bells and flashing lights, an alternative and or backup system has been introduced to ENG. After paying the dues, infrared is ready.

Acknowledgements

The editor wishes to thank Howard Smith of KSL, and Monte Walpole of KSD for their comments and ideas, based upon daily use of optical systems. And certainly, some credit should go to Duncan Campbell of American Laser who nearly inundated me with materials on the basics of infrared optical transmission techniques.

I also would like to acknowledge that using infrared to transmit audio and video signals was not a concept developed just months before ENG went to press. The system described in this article was installed almost two years ago. There are industrial uses of such systems in operation today that make the broadcast applications look simple.



Meet the Picture Catcher. By NEC. For Faster Search.



It's the editor's friend. The NEC NTC-5000 is a wide-window time-base corrector with unique, momentary locking circuitry that captures individual color-locked pictures whether the VTR is in pause, rewind or fast-forward modes. So you can zero-in on exactly the frame you want. Fast.

Utilizing PCM circuitry, the NTC-5000 provides universal time-base correction for any VTR including helical, regardless of color processing

technique.

Complete color processing is made possible by 3.58 MHz feedback to the VTR, or, optionally, without the feedback through use of a heterodyne adapter.

There are many reasons why this is the most versatile time-base corrector available anywhere. So, before you decide on any TBC, be sure to see NEC's picture catcher.

It's handy to have around. Like a friend.

NEC

Nippon Electric Co. Ltd

NECAmerica, Inc.

Broadcast Equipment Division

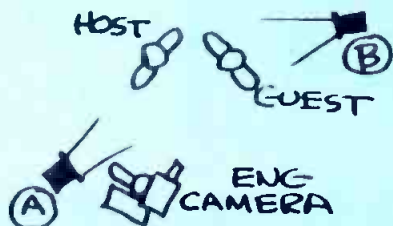
130 Martin Lane
Elk Grove Village, Illinois 60007
(312) 640-3792

For More Details Circle (49) on Reply Card

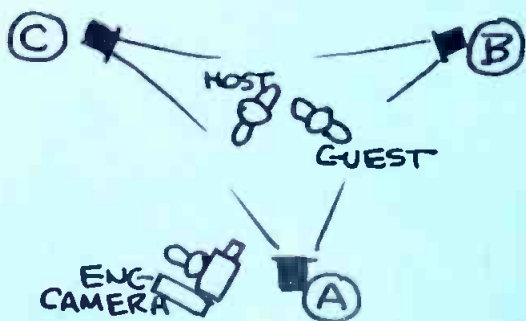
Crash lighting for ENG



Single speaker with two lights: (A) speaker and background; (B) speaker only, barndoor off camera.



Host and guest with two lights: (A) guest key, host side background; (B) host profile, guest rim light.



Host and guest with three lights: (A) front fill, background (if low ceiling, may bounce to avoid harshness); (B) host key, guest rim; (C) guest key, host rim.

By E. Carlton Winckler, Senior Production Consultant and Director, Education Division; and David M. Clark, Lighting Director and Graphics Arts Director, Imer Fiorentino Associates.

Today's electronic news gathering (ENG) cameras are absolute marvels of automatic operation. They can be made ready to operate with only the most basic human assistance. Their new freedom has placed the ENG camera in direct competition with news film cameras where it is doing very nicely.

Any slight difference between the ability of film or ENG cameras to accept what they are pointed at is negated by the fact that the home television receiver is capable of reproducing less than either camera can record.

If we accept the idea that both recording systems are roughly equal, why is it that the pictures we see are so unequal? Of course, it is because the cameraperson, not the camera, senses the dramatic composition and the detail that enhances our view of it. The ENG cameraperson has a lot of catching up to do to compete with film people, not in terms of hardware anymore, but in the very human selection and rejection of picture elements within the recordable range.

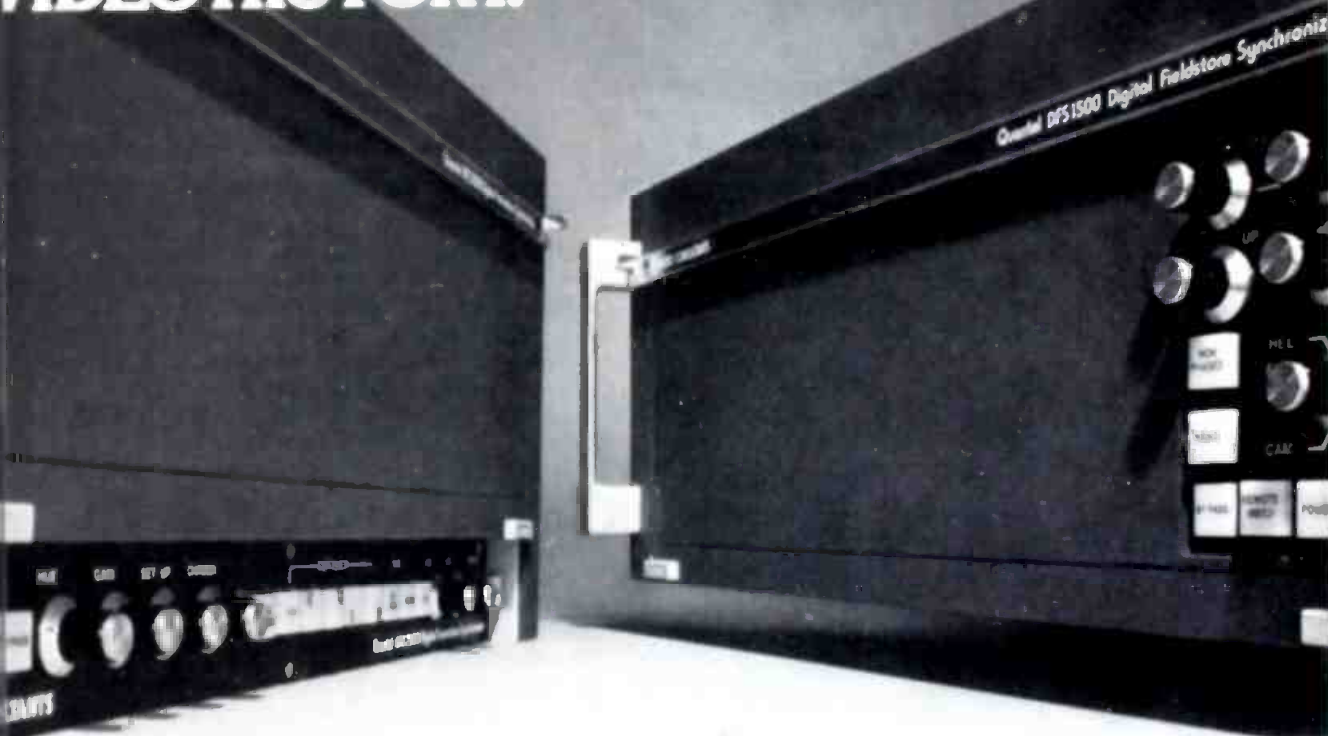
For example, let's consider the worst possible situation for a cameraperson: an assignment to cover the brief remarks of the mayor at City Hall as he leaves a budget meeting. Twenty cameramen are jammed together in a moving, jostling crowd, anxiously waiting to record two minutes of his Honor, who is trying desperately to feed the Six O'Clock News without saying anything he'll regret later. Precious little can be done about choice of background or composition; mere personal survival is paramount in the cameraperson's mind.

Why, then, were news pictures from actual war zones in Vietnam beautifully composed and sensitive to conditions of natural light? It is because the war film was shot by a person totally familiar with the camera and possessed of long experience in sensing the picture. Editing, if any, was lovingly done by another person with an experienced picture eye.

The tape of the mayor was shot by someone still preoccupied with the mechanics of the electronic camera, and whose eye has not yet mastered the ability to see as this camera sees. Add the intense impact of warfare contrasted to the predictable dullness of the mayor, and we begin to expose the human nature of newsgathering.

continued on page 56

GREAT MOMENTS IN DIGITAL VIDEO HISTORY.



THE SYNCHRONIZER BECOMES MORE POWERFUL. AND LESS POWERFUL.

AND MICRO CONSULTANTS IS THERE WITH THE QUANTEL DFS 3100 AND DFS 1500.

The new DFS 3100 is the successor to the DFS 3000, the world's most highly acclaimed digital framestore synchronizer. But the microprocessor-controlled DFS 3100 is more powerful. Its production control option puts a wide range of effects at the producer's fingertips. Effects like freeze with automatic updating. Video compression. Joystick control of compressed and full frame pictures. Automatic positioning to predetermined locations. Automatic tracking of chroma key for compressed images.

Automatic fast or slow wipes. Smooth cuts from compressed to full frame video. And more.

But if you need less, the new DFS 1500 gives you basic fieldstore synchronization and truly outstanding time base correction. It's ideal for broadcasters who don't need all the power of the 3100, as well as those who have a need to use it in addition to a 3100.

Both synchronizers are portable and rugged. Both dissipate only 250VA. Both are perfect for studio or OB van.

So whether you need more synchronizer—or less synchronizer—get in touch with Micro Consultants, Inc., P.O. Box 10057, Palo Alto, California 94303, (415) 321-0832.



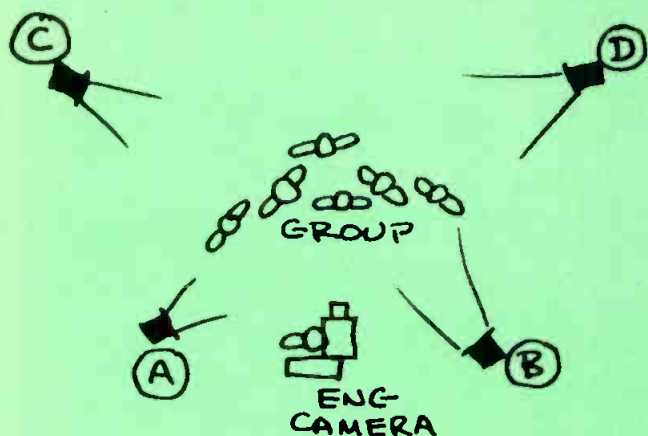
The digital video people



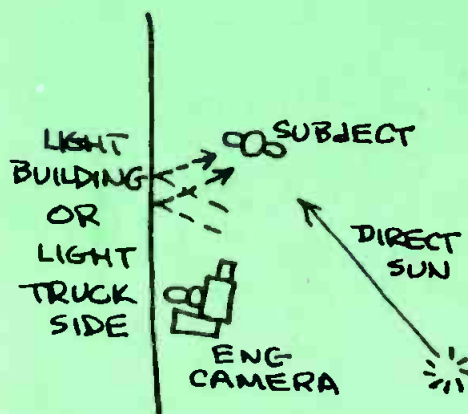
For Literature Circle (46) On Reply Card
For Demonstration Circle (106) On Reply Card

Crash lighting for ENG

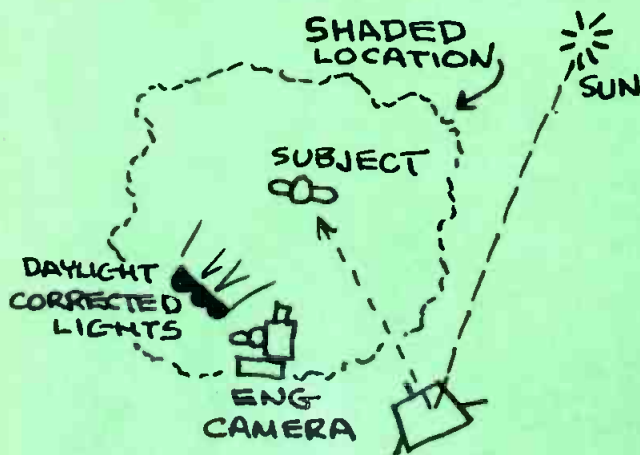
continued from page 54



Group with four lights: (A) and (B) cross fronts and background may tilt up to semi or full bounce; (C) and (D) cross backs—place as far away as room allows—flood scrim or tilt down to make about half as bright as (A) and (B).



Use of natural reflector to fill shadow side of subject.



Subject in shaded location to avoid harshness of direct sun.

Cameras and editing machines do not choose pictures, people do. In all cases, whether wartime or a routine political gathering, there is the opportunity to position some light, or place the camera in relation to existing light, so that the picture quality is enhanced.

And no excuses, either

Yes, we know about the tough news editor who dispatches the camera crew with instructions to get the story, and does not want to be bothered about the picture quality. He is the same fellow who drives studio production people crazy and then calls in a company expert to improve the lighting on the anchorman when a slight shadow is detected on his upper lip!

Of course, as lighting and production consultants, we are always ready to oblige. Getting rid of extraneous shadows is a minor specialty of the house. A critical look at remote news segments, shot in cities where some environmental control should have been practical, indicates a consistently similar pattern of poor judgment of backgrounds and a tendency to place portable lights and the camera in less than ideal positions.

Is this an inevitable result of the pressure and rush of getting coverage of the news event? In some instances, this may, indeed, be the case, but in the very large majority of cases, newspeople spend the time waiting and waiting for the event to take place and therefore excuses have little validity. Even in the coverage of a spontaneous event that is beyond the control of a crew, and almost always in a prearranged event or interview, camera placement allows some choice of background. Avoiding day-windows, murals or neon signs as part of the background is rarely an impossible task. Shooting against open sky (outdoors or through windows) has a tendency to make your subject somewhat invisible on the screen.

How to avoid the problems

If the news director/cameraperson will only keep these basic points in mind, a whole array of picture problems can be avoided before they get onto tape or film:

- The television screen is two dimensional, so light from more than one angle is needed to provide an illusion of the separation between picture elements;
- The eye of the viewer is always attracted to the brightest area in a picture (compositional elements and lighting); and
- An electronic camera on automatic iris will expose for the brightest large area in the picture. The exposure will affect the entire picture, not just the bright area. The more intense the bright area, the less detail will be visible in shadow areas.

Let's review these three points to disprove a popular theory that lighting is the cause of all picture problems. Actually, lighting is only at fault some times—but never underestimate its importance.

A remote news crew usually goes out with minimal lighting equipment—two, maybe three lights. Because current ENG cameras are extremely sensitive, it is hoped that even for interior shots the existing light will be enough. Sometimes, just to be sure, the crew unpacks a couple of lights and plants one on each side of the camera to make faces nice and bright—thereby

continued on page 57

**ARE YOU SATISFIED WITH YOUR
REFURBISHED VIDEO HEADS?**

**Now
you can get
a better head
for \$825!**

Are you completely satisfied with the refurbished heads you're using now for your Ampex or RCA quad machines? Surprisingly enough, you might not be if you could inspect and test them as completely as we can, part-by-part, and tolerance for tolerance.

So what's the point? When it comes to the quality of our refurbished heads, we'll put our money where our mouth is. You pay \$895 the first time around, which is itself a full 20 to 25% below the competition. Then the price for that head drops to \$825 thereafter for the exact same refurbishing procedures you got the first time.

How do we do it? Fourth generation tooling and 18 years of experience let us give you a better product at a lower price. So, if you're not completely satisfied with your refurbished heads, send us one or a bunch and let us prove why we're better.

Incidentally, if you're interested in finding out the condition of the head you send in, ask us for an Original Condition Report. It may surprise you.



155 SAN LAZARO AVENUE • SUNNYVALE, CALIFORNIA 94086 • TEL: (408) 737-9280 • TWX: 910-339-9362

For More Details Circle (31) on Reply Card

Crash lighting for ENG

continued from page 56

guaranteeing a dull, flat picture, accented by the washed out and featureless look of the subjects who end up nearest the lights.

Care should be exercised that the natural room light is allowed to supply the major part of the exposure, with just enough light added at a low angle to bring out facial detail. Since the only monitor available to the mobile ENG crew is the tiny camera viewfinder, the use of a light meter is vital. Faces are the important part of the picture, but where the people are located adds the reason for remote shooting in the first place.

At the scene

Instead of plunking your two lights next to the camera, try the more interesting approach shown in the sketches. Include bounce light, mis-focus to decrease light modeling from sides, not top (as in studio). Be sure, however, that one of the light sources isn't too close to a subject; you might even move the subject a bit in order to avoid overexposing that subject. Reducing the lens opening to compensate for the over-lit item copes with that problem just fine, but all the other items in the picture now are very dark. Don't add more light to these suddenly dark areas; instead, reduce the light on the bright area—it's both easier and more effective.

Now, in case the other one of the three basic points wasn't entirely self explanatory, let's just emphasize that in an interview or group conclave the faces are the important part of the communication; and, they

should be a little brighter than the background, but not so bright that we can't see the location.

More fun in the sun

For daylight exteriors the use of auxiliary light is just as helpful in balancing the highlight and shadow areas. But, outdoors we have a different set of conditions. The footcandles involved are tremendous variable. From bright sun at the beach to heavy overcast between two buildings, and everything in-between is a constant challenge to our ingenuity.

We must use the sun where it is and where it will move to while we are shooting. If direct sun hits a part of a face in a closeup, we will need more light than is regularly carried on remotes in order to bring out detail in shadow areas. Look for large reflector to help you. The large expanse of sand and the haze in the air near the water result in the lovely luminous picture everyone gets at the beach.

In a blacktop parking lot, things become much harsher. Look for a camera position near a white building to use as a reflector, or a big white truck. Don't use sunlit buildings or open sky as the background for a closeup. Foliage or shaded areas will allow the face to retain dominance.

If you have lights or commercial reflector panels position the subject in a shaded area. The open sky or hazy sun will provide a gentle rim light, and your reflectors or lights can fill the faces. Keep lighting angles very simple. Always stand in for the subject before shooting; your meter may tell you all is well when actually no one can stand on the mark without severe squinting or even panic.

continued on page 6

To make an impression that lasts use GE large screen TV projection



GE large screen
color TV projector
PJ5000

The ever growing use of data processing is providing an important planning and analysis resource for executives in a broad spectrum of business: from bankers, to bakers, to candlestick makers.

The computer's expanding involvement with daily operations produces a wealth of information that often requires frequent presentation to groups of six, sixty, or six hundred or more people.

Illustrate your data bank

The most valued and versatile component in your Information system could be the large screen color television projector... the incomparable General Electric PJ5000. Coupled to your computer facilities through suitable interface equipment, it can project Alpha-numeric data, graphic displays and computer generated images, in real time, for instant review and analysis. In addition, it can project information from all standard video sources.

Just visualize a 2 to 20 foot wide TV screen with fast breaking investment data, or sales information for immediate discussion and decision, being presented in color. Or corporate strategy ideas being immediately fed to the computer and their likely consequences projected as "war game" conclusions in TV graphs and charts.

All the advantages of utilizing computer data bank information as a decision making resource are greatly magnified by the use of large screen TV projection. The GE PJ5000 is designed to deliver a dependable professional performance with ease of operation. The GE exclusive single gun, single optical path system projects bright, natural color pictures with inherent color registration, on large screen for front or rear projection.

The PJ5000 is easily transportable and ready to move from your board room, to any other location, and it operates from standard 120v/20 amp appliance outlets. Its compact self-contained Control unit can be removed from the projector, for remote set-up and operating control, with the addition of an accessory control cable.

The PJ5000 solid-state, high brightness color video projector is engineered for excellent picture quality and power efficiency, with ease of operation, maintenance and service.

To find out more on how to present your data in a dynamic new light, call (315) 456-2560 or 456-2533 today, or write to:

Video Display Equipment Operation
General Electric Company
Electronics Park, 6-206
Syracuse, New York 13201

GENERAL  ELECTRIC

For More Details Circle (32) on Reply Card

Up to now you had to choose
between the turntable you wanted
and the turntable you could afford.



Introducing the MKII Series. Three new professional turntables: The SL-1300MKII, automatic, the SL-1400MKII semi-automatic and the SL-1500MKII manual. All with a totally quartz-controlled direct-drive system with one big advantage: a moderate price.

So to unparalleled speed accuracy, powerful torque and fast start-up action, Technics MKII Series adds quartz accuracy to whatever pitch variation you desire. In exact 0.1% increments. At the touch of a button. And instantaneously displayed by LED.

What's more, all this technology has been compressed into four high-density IC's. So the MKII Series' styling is low, lean and clean.

And our low-mass S-shaped universal tonearm has been made so accurate, friction is an incredibly

low 7 mg. (vertical and lateral). The MKII Series also boasts a double-isolated suspension system and anti-resonant base material to minimize feedback.

Compare specifications. Compare prices. And you'll realize there's no comparison for Technics MKII Series.

MOTOR: Brushless DC motor, quartz-controlled phase-locked servo circuit. SPEED: 33 $\frac{1}{3}$ and 45 rpm. STARTING TORQUE: 1.5 kg. per cm. BUILD-UP TIME: 0.7 seconds (= 90° rotation) to 33 $\frac{1}{3}$ rpm. SPEED DRIFT: Within $\pm 0.002\%$. WOW & FLUTTER: 0.025% WRMS. RUMBLE: -73dB (DIN B). PITCH VARIATION: $\pm 9.9\%$. SUGGESTED RETAIL PRICE*: \$399.95 (1300), \$369.95 (1400) and \$349.95 (1500).

The MKII Series. A rare combination of audio technology. A new standard of audio excellence.

*Technics recommended price, but actual retail price will be set by dealers.

Technics Professional Series
by Panasonic

For More Details Circle (33) on Reply Card

80 MHz and no controls: \$275.00



completely automatic counting.

A power on/off switch and a BNC connector are the only additions to the 8-digit LED display. High 20 mV sensitivity with automatic input attenuation provides stable counting with MHz, kHz and Hz groupings for quick reading.

Automatic triggering and noise suppression through the use of Philips LSI LOCOS circuitry is packaged in a rugged metal case for error-free counting. RF input signals of 12 Vrms can be handled without problems on the PM6661 counter.

There is also a 520 MHz version available at \$645.00

Want more information or a demonstration? Call our toll-free Hot Line number 800 631-7172 (New Jersey residents call 201 529-3800 collect) or contact:

Philips Test & Measuring Instruments, Inc.

A NORTH AMERICAN PHILIPS COMPANY



In the United States:
85 McKee Drive
Mahwah, New Jersey 07430
(201) 529-3800

In Canada:
6 Lewyn Road
Toronto, Ontario Canada M6A 1K2
(416) 789-7188

PHILIPS

For More Details Circle (34) on Reply Card

Perfect Timing



Presettable tape timer

If you do OFF-AIR taping, or if you want to start your recorder when you'd rather be elsewhere, ES 1296 is for you! Presettable up to 96 hours in advance, starts any machine you want, turns it off after an hour, and for only \$150. For \$25 more, you get an option to turn off your equipment in 16, 33, 66 or 138 minutes, or 33, 66, 138 or 250 minutes.

And for another \$25, we'll give you Sequential Turn-On, for solenoid operated recorders.



Write, Wire or Call: (213) 674-3021

505½ CENTINELA AVENUE • INGLEWOOD, CALIFORNIA 90302

For More Details Circle (35) on Reply Card

Crash lighting for ENG

continued from page 58

As a test of all this, take a 1000-watt quartz lamp and cover it with a dichroic filter or daylight blue mylar to approximate the color of daylight. Next, hold your meter near enough to read 1000 footcandle. Now put your face where your meter was and look just past the light and see if you can remember your name!

Out in the dark

The question, "What about night time?" arises, of course. Indoors it makes little difference, but outdoors we have lost the sun/sky combination as our main source and we have a whole new project. As a starter we can follow the techniques proposed in figures we've shown, but using enough wattage, and setting it very carefully, to provide even distribution.

Another consideration is background. A total black background does no special harm, except that it does nothing to establish where you are—so why go? The black background also tends to be dull and encourages video "noise" on less than ideally adjusted receivers. Much is gained by selecting a background with some interesting, but not distracting, highlights—or by providing this video "information" with spotlight across foliage or architectural detail.

Just remember that you are working with tremendous size, and you must choose to accent doorway or a shrub, unless you are carrying severe brute arcs and generators. Position your people close enough to the background to allow your accent light adequate coverage.

ENG cameras in the studio

ENG cameras turn up great pictures, are very flexible, and their small size makes them easier to use than the older, more bulky models that have been used for studio work. As you might expect, these attributes have caused them to be used more and more widely in studios. What are their problems there? Aside from the possibility that the cameraman's new freedom of movement and shooting locations can cause him to stand right in the key light where his shadow will fall upon the action, there aren't any problems. Remember, it's still a camera, but an advance to be welcomed because of the great flexibility it provides.

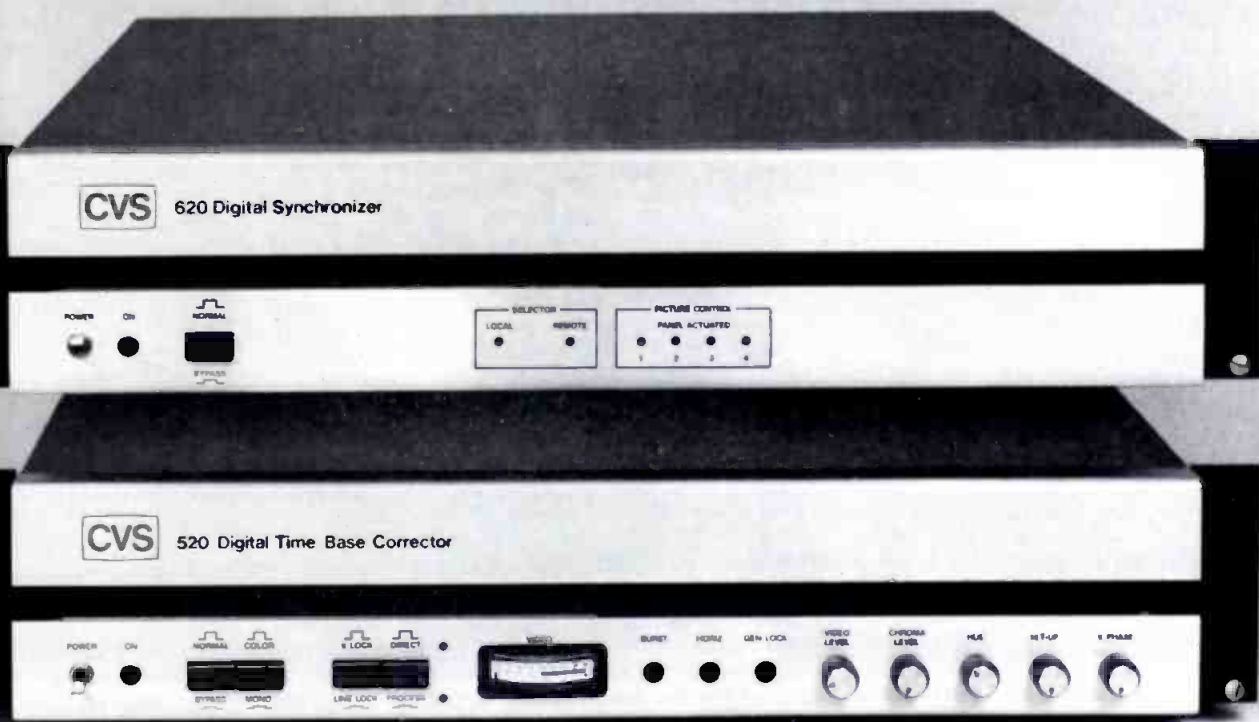
However, a word of caution to directors is needed. The hand-held camera will allow for some shots you just can't get with the studio pedestal camera. Try to plan the use of your hand-held only for these shots rather than ask your hand-held man to carry that weight through a whole show and "shop for shots."

Most of the time he will come up with the same shots the other cameras have, only wobbly! That assures that he will be too tired to do the best work that one low-angle tilt shot, when it comes up. Welcome the ENG camera to the studio as the special tool it is, not as something to be used everywhere because it's new.

Parting shots

Do we have any other words for the ENG cameramen? Well, we must admit, that as lighting professionals, we naturally regard all participants who appear in programs solely as objects on which light should fall effectively—but perhaps it's worthwhile for remote newsmen to devote a few spare thoughts to the storyline aspect, too.

There's an affordable frame synchronizer in your future,



if you buy the CVS 520 Digital TBC today!

Now, the TBC that corrects all your VTRs will soon synchronize all your sources. How? With the CVS 620, a compact module that operates from the digital interface of the CVS 520 and comes with full bandwidth color frame advance and "freeze."

With the CVS 620, your CVS 520 will become a true, microprocessor-controlled "infinite window" TBC. You'll be able to easily handle signals from network feeds, satellite and ENG microwave. It won't matter whether they're stable or unstable, heterodyne or direct color. You'll still get fully color framed, synchronous outputs. A picture processor will add even more versatility.

Future synchronization, however, is just one of the reasons why a large number of users already have a CVS 520. It does just about any TBC job you can think of. For VTR—segmented or non-segmented.

With the CVS 520, you can colorize old quads, bring quad quality to ENG, correct gyro errors without breakup or hue shift, handle noisy tapes containing multiple wrong field edits, and much more.

Of course, the CVS 520 has all the built-ins. Like a digital dropout compensator, a line-by-line velocity corrector, a gen-lockable sync generator and an adjustable proc amp. Plus simple, front panel controls that put you in total command of your video signal.

Of particular importance for ENG, the CVS 520 weighs only 30 pounds, is just 3½" high and uses only 150 watts. (The CVS 620 will be packaged the same way!)

In short, the CVS 520 is truly the TBC of the future. But you can get it from your Authorized CVS Distributor today! For details and a demonstration, call or write.



**Consolidated
Video
Systems, inc.**

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

For Literature Only Circle (47) On Reader Service Card
For Demonstration Only Circle (48) On Reader Service Card

www.americanradiohistory.com

Stereo-SCA compatibility:

Is it really for the birds?

By James L. Tonne

The subject of "whistles" in the output of stereo receivers when simultaneously receiving stereo and SCA is not exactly new. The problem is not peculiar to any one transmitter manufacturer; no method of modulation is secure; and no AFC scheme is sacred.

Most manufacturers are aware of the general problem, but are reluctant to discuss it. And most broadcasters are sure that since they can hear a whistle in their own receivers, and even their stereo monitors, they are transmitting it.

You can be transmitting a magnificent signal, clean and pure, indeed ideal, and you will probably

be blessed with a whistle (also known as a birdie).

If, using a tuneable voltmeter, you examine the wideband output (sometimes called the composite or baseband output) of the modulation monitor, you will see the total modulation on the signal you are transmitting. Assuming that the monitor is working properly, the only inaccuracies introduced will be caused by the transmitting antenna and feedline. Their possible effects will be ignored in this discussion.

If you modulate your multiplex transmitter with a 15 kHz tone in one channel only, with no SCA signal, the spectrum observed on

the wideband output of the monitor should look similar to Figure 1.

The signal at 15 kHz is the main channel component. The components at 23 and 53 kHz are the lower and upper sidebands, respectively, of stereophonic subchannel. Hopefully the 19 kHz component need not be explained here.

Now add the SCA subcarrier. A small liberty taken will be to leave the subcarrier unmodulated. The transmitted baseband spectrum depicted in Figure 2. Notice, and this is most important, that birdies at 9 or 10 kHz have been added. This is the signal you are transmitting, and it is free of birdies. At least it should be, and this article we are assuming that is as clean as shown (very achievable, believe me).

Enter the villain

Move the tuneable voltmeter to the output of the switching-type stereo demodulator. This type of demodulator is used in most currently available FCC-approved stereo monitors, as well as many stereo receivers; it is used primarily because of its stability, fidelity, reproducibility, and simplicity.

Looking at the output of the demodulator proper before the signal has passed through the 15 kHz lowpass filters, we see the spectrum of Figure 3. Logically such a spectrum would look complex on an oscilloscope; you can confirm this yourself.

Of special interest are the components at 9, 10 and 57 kHz. You are not transmitting any of these; they have been generated in the stereo demodulator. After this signal is passed through a 15 kHz lowpass

continued on page

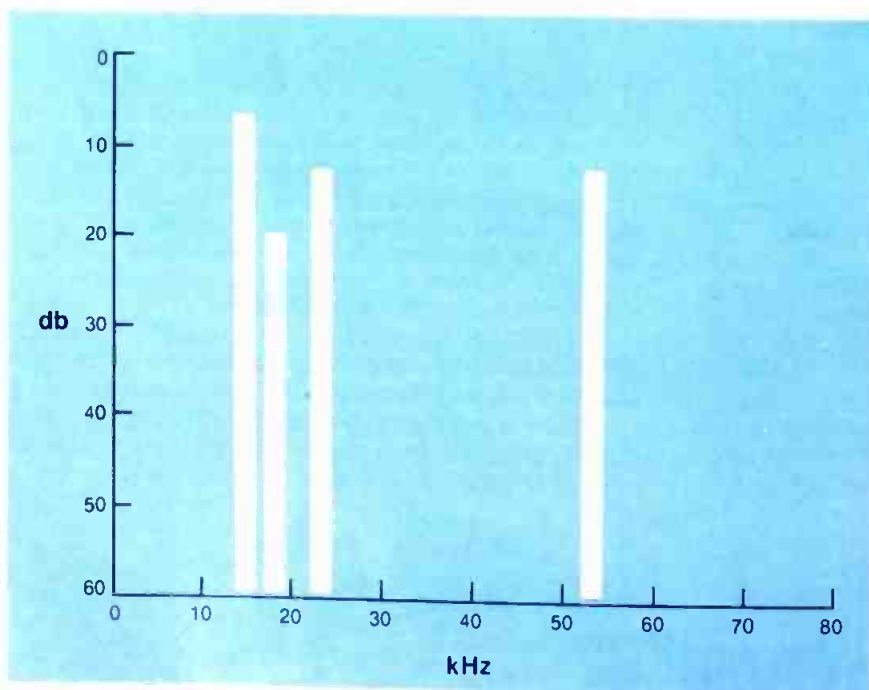


Figure 1 Typical spectrum of baseband signal of stereo station. 100% modulation, one channel only, at a modulating rate of 15 kHz.



Can a 39¢ part ever put the CEI-310 out of action?

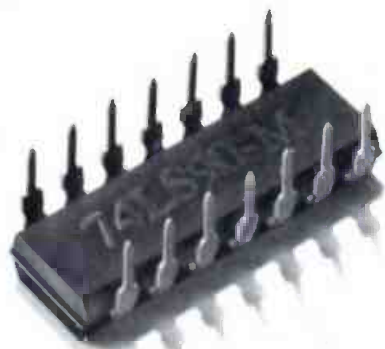
Not for long. If a 39¢ IC does the job, it's nice to know that the CEI-310 is American-made. Electronic components are American, and all readily available—from CEI or from commercial sources all over the country.

They don't have to come from the other side of the Atlantic, or from the Pacific.

And our schematics are American, too. Annotated in English. Probably a little more familiar to you than the ones from Holland or France or Japan.

But we're not just selling serviceability and easy-to-read schematics.

After all, a camera is ultimately judged by the pictures it makes. The CEI-310 gives you uncompromised full broadcast quality video performance, with outstanding signal-to-noise ratio, sensitivity, and resolution. And full production system control features.



Plus total modularity so it can do everything you've ever wanted a camera to do.

So we're not asking you to buy American because we're chauvinists. But because it's your best choice. For serviceability and for picture quality.

And **reliability**. Our customers think the CEI-310 is the most rugged, most reliable production camera on the market. Ask one of them.

Isn't it time you took a new look at CEI? Call your local CEI representative now. Or get in touch with us directly at 880 Maude Avenue, Mountain View, California 94043. (415) 969-1910.

Take a new look.

CEI

For Literature Only Circle (49) On Reader Service Card
For Demonstration Only Circle (50) On Reader Service Card



Communications Headsets... ...for whatever the job

Telex 1320 series headsets offers you six models for all general communications requirements, indoor or out. Single or dual dynamic drivers are impervious to environmental humidity or temperature changes. With optional boom mikes, noise canceling dynamic or carbon. Designed for comfort. Dependably made for heavy duty use. Complemented by the compact Telex IC-10, amplified common talk intercom system for dynamic mike headsets. For "whatever the job," please write for free information:

PRODUCTS OF SOUND RESEARCH

TELEX
COMMUNICATIONS, INC.

9600 ALDRICH AVENUE SOUTH
MINNEAPOLIS, MINN. 55420 U.S.A.
Europe: 22, rue de la Légion—d'Honneur,
93200 St. Denis, France
Canada: Telak Electronics, Ltd., Scarborough, Ontario

For More Details Circle (51) on Reply Card

Stereo-SCA

continued from page 62

filter, the 57 kHz component is removed but the 9 and 10 kHz components remain. The 57 kHz signal is generated in the demodulator by the "chopping" or de-commutating action on the pilot signal itself by the locally-regenerated 38 kHz carrier. The 10 kHz

signal is then a by-product of an intermodulation between that 10 kHz signal (generated in the stereo demodulator) and the 67 kHz SCA signal.

The 9 kHz signal, should it be present, is a result of the 38 kHz demodulating carrier having a second harmonic component. Normally the 38 kHz square-wave demodulating waveform has no even-order harmonics; if, however, a second

continued on page 63

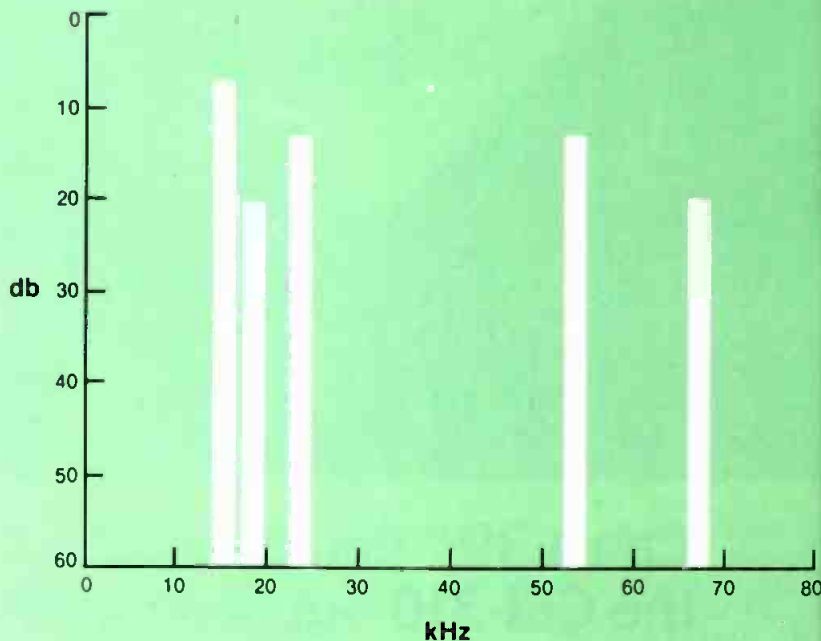


Figure 2 Same as Figure 1, but with added SCA subcarrier at 67 kHz.

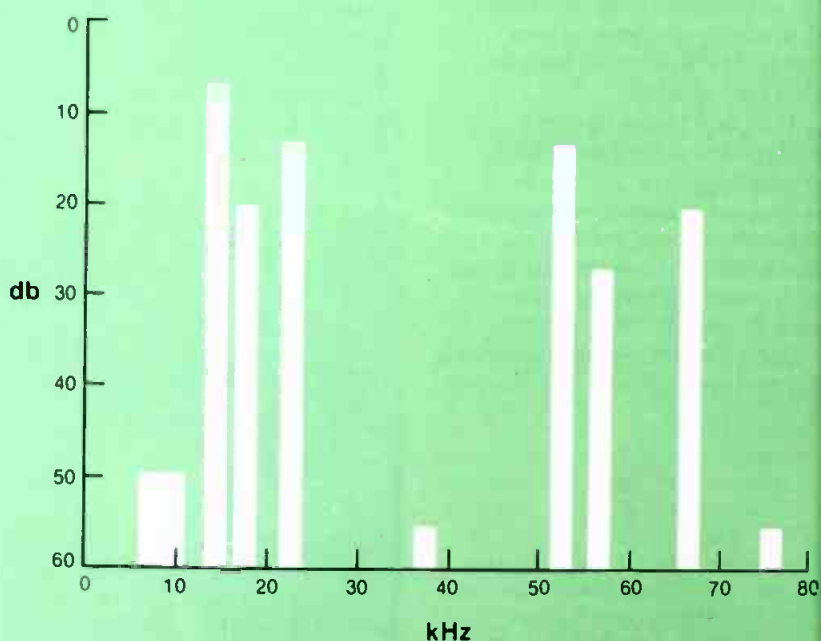


Figure 3 Signal of Figure 2 after passing through a stereo demodulator. Typical 9, 10, 38, 57 and 76 kHz spurious signals are shown.

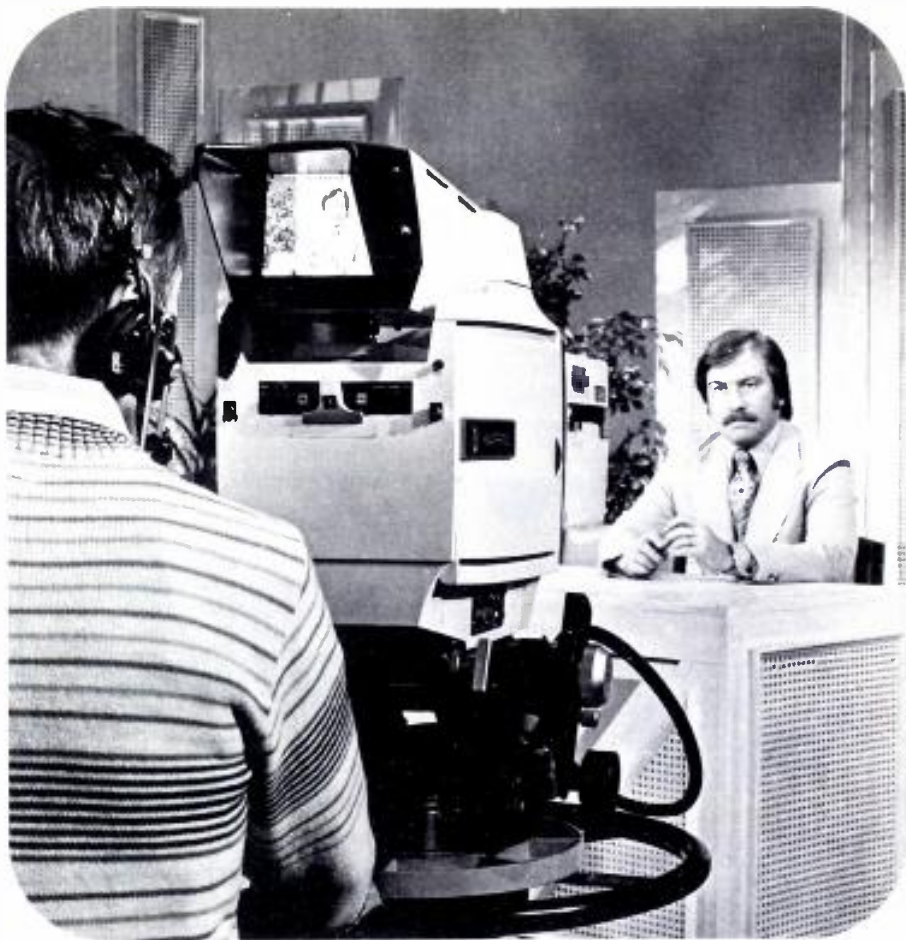
**Improve
Your
Image...**

With Harris TV Cameras

Harris' engineering accomplishments have led to such innovations as the first U.S. manufactured all Triax capability...first with electronic picture rotation...first to use field selectable Anti-Comet Tail tubes...increased reliability...and great economy through optimum performance at low light levels and reduced setup time.

Years of broadcast experience and advanced technology have gone into the design of the Harris line of television cameras. And, Harris cameras are user proven...over 200 in use in stations throughout the world where Harris equipment is building better images...creating better pictures...saving time and money!

For complete information write Harris Corporation, Broadcast Products Division, Quincy, Illinois 62301.



HARRIS

**COMMUNICATIONS AND
INFORMATION HANDLING**

For More Details Circle (36) on Reply Card

Here are the top rated early evening local news leaders.* Twenty-five of the twenty-eight stations on the list use **Comrex Equipment**.



For the ENG Van

Wireless Microphone Systems
Cue/IFB Transmitters
Pocket Cue Receivers
Off-Air Aural Monitors
Mixing/Amplifiers for ENG
Remote Control Systems

WTVJ Miami-Ft. Lauderdale • WTVT Tampa-St. Petersburg • KDKA-TV Pittsburgh • WAGA-TV Atlanta • WFLA-TV Tampa-St. Petersburg • KOMO-TV Seattle-Tacoma • WBAL-TV Baltimore • WRTV Indianapolis • WSB-TV Atlanta • WBZ-TV Boston • WJBK-TV Detroit • WJKW-TV Detroit • WJKW-TV Cleveland • KPRC-TV Houston • KSD-TV St. Louis • KTRK-TV Houston • WCCO-TV Minneapolis-St. Paul • WJZ-TV Baltimore • WPVI-TV Philadelphia • WXYZ-TV Detroit • KMOX-TV St. Louis • KSTP-TV Minneapolis-St. Paul • KKAS-TV Dallas-Ft. Worth • WCKT Miami-Ft. Lauderdale • WEWS Cleveland • WMAR-TV Baltimore • WTAE-TV Pittsburgh • WTOP-TV Washington • WWJ-TV Detroit •

*NSI, May 77 by ratings.

COMREX

60 Union Ave., P.O. Box 269, Sudbury MA 01776 (617)443-5077

For More Details Circle (37) on Reply Card

Legible Characters Enhance Quality

- Title window. One or two lines. Vertical interval switching between pages.
- Page roll.
- Crawl display.
- Character blink.
- Preview and program functions independent.
- Improved Crawl Control
- Isotropic Font Enhancement.
- 16 page memory. Each page consists of 8 lines with 16 characters/line.
- 2 character sizes. 18 or 36 scan lines selectable. Excellent legibility.
- Keyed titles. Stores up to 72 single line titles or 40 double line titles. Self-keying.
- Auto Bypass

Model 505 Videotypewriter



SHINTRON

World Wide

Cambridge, MA 02142 U.S.A. Phone 617-491-8700 Telex 921497

For More Details Circle (38) on Reply Card

Stereo-SCA

continued from page 64

harmonic component exists due to lack of waveform symmetry, that that component (at 76 kHz) can directly demodulate the 67 kHz signal and produce a birdie at the difference frequency of 9 kHz.

Other stereo demodulators, such as the "envelope" type, may have these same general problems, plus possibly a few of their own; for example, a horrendous amount of kHz feedthrough.

The case of people vs. dB

How far down are these 9 and kHz components? Typically, after de-emphasis, about 55 to 65 dB. An interesting point here is that some cases the human ear can hear the birdies, yet they do not show up as a degradation of system SNR. Evidently our ears are quite sensitive to these mid-high frequencies especially where the objectionable material is a single tone. The residual hum and hiss might measure greater on a voltmeter, but the human ear is more concerned with the high-frequency whistle.

If the 38 kHz demodulating and decommutating activity is prohibited, the 57 kHz and 76 kHz components (generated in the receiver) will disappear, and along with them the 9 and 10 kHz whistles. Note that a receiver without a stereo demodulator, as for example a small alarm clock radio, will not have these birdies.

The amplitude of the 57 kHz signal generated in the stereo demodulator is several times that of a terribly misadjusted pilot tone. The pilot should not have more than 10% total harmonic distortion. Even if you did transmit the pilot with that much distortion, and even if they were all third harmonic, at 57 kHz that distortion would still be small in comparison with the level of the 57 kHz signal generated in the stereo demodulator.

In a good stereo demodulator, the level of the 76 kHz component developed in that demodulator will be quite low, competitive with good stereo generator.

Harmonic content of the pilot, itself, cannot cause birdie generation. You must intermodulate (mix) the 57 kHz component with the SCA signal to generate the 10 kHz beat note. A 76 kHz component in the demodulating waveform unfortunately is capable of demodulating the 67 kHz signal on its own without the intermediate spurious-signal generation step. Even if you do

mit a 76 kHz component, it did not pass through the 19 kHz extraction bandpass filter in receiver.

The solution?

The stereo and SCA signals come on a 76 kHz component. The answer is, Yes, transmission-wise. But the receiver manufacturers are still playing the game of the blind following the blind in hoping truly birdie-proof stereo demodulators. Even the highly advertised integrated-circuit stereo demodulators commonly generate birdies. Further, it now appears these ICs frequently fail to meet the incredible "SCA suppression" specifications.

Reducing the level of the 67 kHz component by filtering in the receiver prior to the stereo demodulator may reduce the severity of the birdie by as much as 15 dB, at the expense of a severe loss of separation at the upper audio modulating frequencies. It is quite insensitive to reject the SCA signal and its sidebands while still passing the composite waveform to 53 kHz with a good degree of phase fidelity.

It appears that two items in particular need to be observed in the development of a birdie-resistant stereo demodulator. First, the 19 kHz pilot should not be distorted in the demodulator proper, or else the demodulator should use a sinusoidal "soft" switching waveform in-

stead of the brutal but stable and efficient squarewave.

Secondly, the 76 kHz component in the 38 kHz demodulating waveform must be eliminated. Some professional stereo demodulators use a bistable method of generating such a demodulating waveform. By not distorting the pilot, and so not generating the 57 kHz component in the waveform to be demodulated, and by having no 76 kHz component in the demodulating waveform, the 67 kHz signal can be rendered harmless.

In the meantime, I propose a temporary solution. Specifically, keep the average modulation level up so the stereo receivers' gain controls are kept turned down. In this manner the listeners will also turn down the level of the birdie developed in their receivers. The decision to transmit a restricted dynamic range program will be a painful one to make for a classical-music station.

By now it should be clear that adding traps, filters or other magical cures to a transmitter will have no effect if that transmitter was operating reasonably well in the first place. In order for these transmitter-oriented "fixes" to have any effect, the transmitter must have been in a sad state of disrepair.

On the basis of information presented here, I submit that the birdie problem (still) lies in the stereo demodulator. □

Who's Being Gored This Time?

Let's assume that the transmitters referred or alluded to in this article are well maintained and peaked or tweaked to specs. Without this presumption, the article is going to look like a whitewash for the broadcast manufacturers...with all the blame always falling on the receiver manufacturers. For sure, this is an old problem, and since the usual approach to the subject is to kick the broadcast manufacturer in the pants for another snafu, I thought Jim's version might even things up for a while.

If you've had a birdie and gotten rid of it, drop me a line. The response will be used in our Station-To-Station column.

Ron Merrell
Editor

SCHNEIDER



for colour cameras

30X FIELD
1 1/4" f/2.1
33-1000
1" f/1.7
26-800



30X UNIV.
1 1/4" f/2.1
20-600
1" f/1.7
16-480



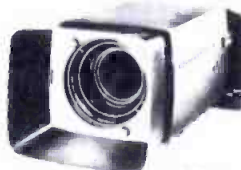
30X WIDE
1 1/4" f/2.1
16-480
1" f/1.7
12.5-375



15X WIDE
1 1/4" f/2.1
16-240
1" f/1.7
12.5-190



11X UNIV.
1 1/4" f/2.1
18-200
1" f/1.7
14-150



20X
1" f/2
17-340



10X
1" f/2
17-170



ENG
10x f/1.8
10-100



SALES — SERVICE — RENTALS

TELE-CINE INC.

5434 Merrick Road
Massapequa, New York 11758
(516) 798-2828

For More Details Circle (52) on Reply Card



SOCIETY OF
BROADCAST ENGINEERS, INC.
P.O. Box 50844, Indianapolis, Indiana 46250

The Society welcomes three new chapters to the rapidly growing list of active SBE chapters throughout the country: Chapter 46, Baltimore; Chapter 47, Los Angeles; and Chapter 48, Denver. Congratulations to the members for their time and effort in organizing their groups into

our newest chapters, whose aim is to encourage involvement at all levels of technical competence and increase the prestige of broadcast engineering. Many other areas throughout the country are organizing their members, recruiting new members, and scheduling first

meetings.

CHAPTER REPORTS

Chapter 2—Northeastern Pennsylvania

John Reiser, FCC, spoke on a variety of topics November 7 WVIA-TV/FM in Pittston. Some of the topics were: how to request change in rules and regulation; automatic transmitter systems; regulation; AM stereo; FM quad phonic; and upcoming clear channel hearings.

Chapter 3—Kansas

Clay Selthun of Consolidated Video Systems spoke on satellite earth receiving stations November 8 KTSB-TV, Topeka. The program dealt with the theory and application of digital time-base correction. Selthun used the CVS model 516 illustration and model 520 for demonstration.

Chapter 16—Seattle, Washington

At the November 9 meeting, Jim Shawcraft recapped the recent SMPTE technical conference in Los Angeles. Bob Dietsch, FCC, discussed current FCC activities in quadrasonic broadcasting, stereo and proposed revisions to FCC license exams. Russ Williams, Ampex and Bob Daines of S discussed the proposed SMPTE 1-inch Type A, B, and C formats. The Ampex VPR 1 and the S-BVH 1000 were demonstrated at the meeting.

Chapter 21—Spokane, Washington

Meter calibration was discussed November 15 at KUID-TV Studio (University of Idaho campus, Moscow, ID).

Chapter 24—Indianapolis, Indiana

The chapter met November 8 at the IU School of Dentistry for a joint meeting with the Audio Engineering Society. The program, presented by Caboose Productions, was a teaching and discussion session covering a musician's approach to the audio recording industry, engineering principles with musical applications, and varying the technical EQ for each particular music style.

Chapter 26—Chicago, Illinois

Salvatore Raia, Javelin Electronics, presented a program on broadcast station security and discussed the techniques used to protect stations at the November 30 meeting in WGN studios. He also presented and discussed surveillance cameras and starlite scopes used in viewing security or ENG applications.

NEW From **WILKINSON
ELECTRONICS**

NOW From **WILKINSON
ELECTRONICS**

the All Solid State 1 KW FM Transmitter

Our 14th Year of Progress with
248 Transmitters In Service and
6436 Clients from
Abu Dhabi to Zambia

**WILKINSON
ELECTRONICS, INC.**

P.O. BOX 738 · CHESTER, PA. 19013 (215) 497-5100 · TWX 510 669 3188

New as Tomorrow... Reliable as Today

For More Details Circle (53) on Reply Card

pter 28—Milwaukee, Wisconsin
 he guest speaker November 15
 WTMJ auditorium was Dan
 erts, Harris Corporation. Rob-
 slide presentation followed,
 an explanation of the new
 is MS-15 exciter, which utilizes
 ally-synthesized modulation and
 amic transient response filtering
 emes, and the Harris MSP-100
 o processor. He also spoke of
 future of digital audio devices
 the need for engineers and
 agement to understand audio
 essing terminology.

pter 39—Greater Tampa Bay

Everything you always wanted to
 w about videocassettes... but
 't know who to ask," was the
 e of the December 6 meeting at
 utive Square Office Park. Rob-
 J. Kerr, Du Pont magnetic
 ucts division, described eight
 ects of handling 3/4-inch video-
 ettes that will improve oper-
 n by reducing skew, eliminating
 s and minimizing mistracking.

pter 40—San Francisco Bay

quad VTR editing techniques was
 eented by Matt McGillicuddy,
 ex, at the November 23 meeting
 e Ampex Training Center Build-
 2. His presentation reviewed the
 ory of quad VTR editing prob-
 s and techniques, and included a
 onstration of the latest Ampex
 or, the EDM-1, using AVR-3
 otape recorders.

pter 43—Sacramento, California

he topic of the November 22
 ting in Studio C of KXTV in
 amento was "An FCC Forum"
 ey Landry, FCC western region
 f. It was an opportunity to meet
 y FCC officials, ask questions
 discuss actions currently before
 FCC.

forming chapters

O, COLUMBUS—William Orr,
 NS Stations, 770 Twin Rivers
 e, Columbus, OH 43216; (614)
 3700.

NSYLVANIA, ERIE—John Kan-
 WJET-TV, 8455 Peach Street,
 PA 16509; (814) 864-4902.

TH CAROLINA, CHARLESTON—
 Becknell, WCSC-AM/WXTC-
 Box 186, Charleston, SC 29402;
) 722-7611.

AS, CORPUS CHRISTI—John
 gel, KCTA Radio, PO Box 898,
 pus Christi, TX 78403; (512)
 3541.

TEXAS, DALLAS/FORT WORTH—
 Edward Bates, WBAP-AM/KSCS-
 FM, 3900 Barnett Street, Fort
 Worth, TX 76103; (817) 429-2330.
 Or, Gary Cooper, EEV, 371 Oakview
 Drive, Lewisville, TX 75067; (817)
 430-1373.

TEXAS, HOUSTON—Donald Nash,
 KYOK-AM, Box 8218, Houston, TX
 77004; (713) 526-7131.

VIRGINIA, NORFOLK—Albert Clag-
 gett, 1069 Norview Avenue, Norfolk,
 VA 23513; (804) 855-5957.

WASHINGTON, TRI-CITIES—Dave

Bauer, KNDU-TV, PO Box 2523,
 Tri-Cities, WA 99302; (509) 783-
 6151.

WASHINGTON, YAKIMA—Dow
 Lambert, KMWX-AM, Box 702, Yak-
 ima, WA 98907; (509) 248-1460.

WEST VIRGINIA, NITRO—James
 Martin, WMUL-TV, 301 Blackwood
 Avenue, Nitro, WV 25143; (304)
 722-2993.

CANADA, KITCHENER, ONTARIO—
 J. P. Firminger, CHYM/CKGL-FM,
 305 King Street West, Kitchener,
 Ontario N2G 4E4; (519) 743-2611. □

NEW

From **WILKINSON
ELECTRONICS**

NOW

From **WILKINSON
ELECTRONICS**

the All Solid State 2 KW FM Transmitter

Our 14th Year of Progress with
 248 Transmitters In Service and
 6436 Clients from
 Abu Dhabi to Zambia

**WILKINSON
ELECTRONICS, INC.**

P.O. BOX 738 · CHESTER, PA. 19013 (215) 497-5100 · TWX 510 669 3188

New as Tomorrow... Reliable as Today

For More Details Circle (54) on Reply Card

Making RENG work for you

By Peter Burk

Radio electronic news gathering (RENG) has skyrocketed in popularity over the past two years. The technology has been available for many years. In fact, a few pioneering stations have used high-quality remote pickup equipment complete with mobile repeaters and full duplex cueing systems for remotes and news gathering long before the term RENG was coined.

The problem was that it required considerable expertise to put together a working system. Much of the equipment had to be home-brewed or at least modified for broadcast use. Since many broadcasters lacked this expertise (or at least lacked the time to devote to such a project), RENG remained in the background.

The current popularity was perhaps spawned by television's race to do the same thing with pictures. This not only fired up radio people, it gave manufacturers the extra push necessary to produce ready-to-wear systems.

Whatever the reason, RENG has arrived! It is now possible to purchase a complete system, portable transmitter, mobile repeater and all, practically ready to operate. All you have to do is mount the antennas, connect a few pre-wired cables, and wait for the FCC to issue a license. Well, that's almost all; more on that later.

What do you want?

The first problem facing a station wishing to go RENG is to determine the objectives of the system. Every station will have a slightly different idea of what the system should do. A heavy news commitment might indicate a number of units designed to get tape and live voice reports back to the station quickly. A sports-minded station will tailor the system for coverage of various local sporting events with the emphasis on 100% duty cycle for hours at a time. A station wishing to carry live music will look closely at the system fidelity, etc. No one system is right for every station.

The station's needs, both present

and projected, must be considered carefully before the system is specified. Once these criteria are established, it's time to go shopping. If your experience in VHF and UHF communications is a little weak, fear not; the manufacturers of RPU equipment will offer all kinds of help. They're a friendly lot, and can be trusted to help you put together a successful system.

One station's approach

Rick Neace, operations manager at KRLD in Dallas, is enthusiastic about RENG. To back up what he says, the station has five mobile units and two airplanes equipped with 450 MHz RENG systems. The two airplanes are used to cover traffic during rush hour in Dallas and Fort Worth. The airplanes are each equipped with portable transmitters, pocket scanner receivers, and AM radios. A split headset is used to monitor talkback from the station and the AM program signal. Neace says that the system is working out well, with the reporters frequently cueing each other back-to-back on the air.

Golf tournaments give KRLD a chance to show off. Four Marti RPT-1 portable transmitters are used on the links to make sure there's always a reporter where the action is. With two-frequency units, communications is a snap. The simplest method utilizes one channel for on-air reports and the other for cueing and general communications. All reporters and the anchorman in the tower can hear each other on pocket scanner receivers.

A more elaborate scheme requires the reporters to alternate frequencies. This approach eliminates squelch tails between reports and allows two reporters to carry on an on-the-air dialogue. The channel that is not being used on the air can still be used for cueing. The four portable units combined with a line to the press tent and mixing facilities in the tower make for an impressive golf presentation. Neace says the people at the leader board keep a radio on KRLD to keep

up with the tournament.

What about problems?

Neace says that the biggest problem at KRLD is getting station personnel familiar with the system and its limitations. Any RF system is subject to propagation restrictions; it's not a magic black box that will work automatically from any conceivable location.

Most often, though, the problem are people, not hardware. If a newsman doesn't get an answer from the news room when he radios in, chances are the radio is working, it's just that no one is in the news room. It's the old tree falling in a forest bit: if no one is there to hear the transmission, did it really exist?

FCC delays are another problem facing RENG users. It seems as if it takes an eternity to get a license granted for an RPU system. It's either the commission's fault; they are severely overloaded. But, it's something to take into consideration when planning an installation. Allow several months for the paperwork to go through.

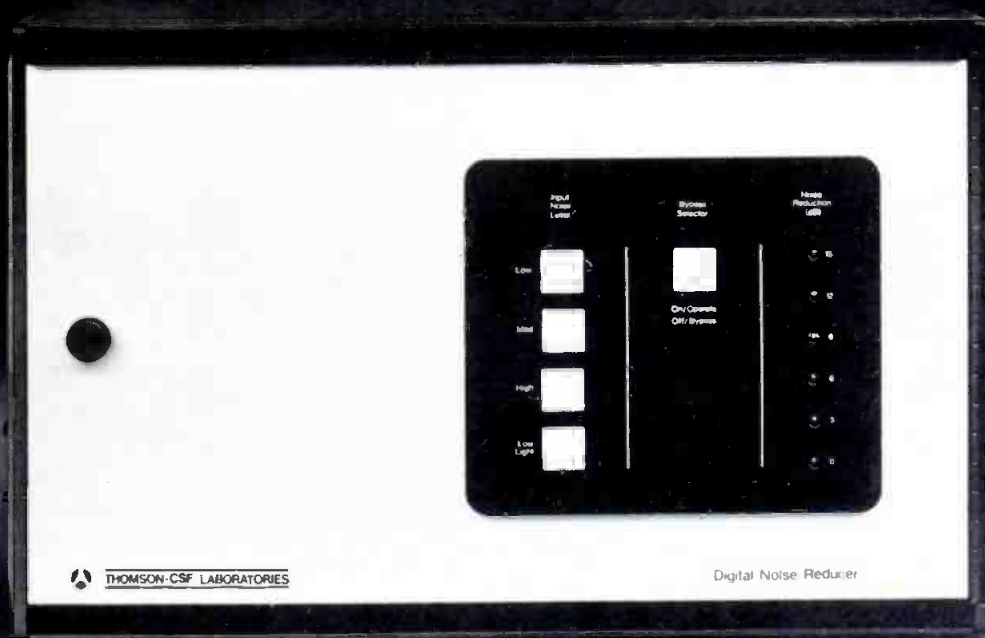
Increasing RENG reliability

One RENG failure can undermine an entire operation if it happens during an important event. It's essential to minimize system failures if you use a little common sense in setting up and operating the system.

Start with a simple plan and set the bells and whistles for later when you feel comfortable with a basic system. When the public judges a broadcast, they don't appreciate a difficulty factor like Olympic judges. No one says, "That sound pretty good, considering that it was a double-hop pickup over rugged terrain," or "My, what a fine sound considering that the path loss was over 90 dB and intermod from five other carriers was driving the discriminator crazy." 100% success on a simple remote scores much higher than 80% success on a complicated project.

continued on page

NOISE NOISE NOISE NOISE



Video noise used to be a major problem for television engineers. Not anymore. Now it can be detected and eliminated with mathematical precision.

Thomson-CSF Laboratories introduces the Model 9000 Digital Noise Reducer.

By analyzing incoming video signals on an element-by-element basis, the Model 9000 Digital Noise Reducer achieves a 12 dB signal-to-noise ratio, with optimal reduction upwards of 15 dB. Sounds amazing, and it is. That's the best in the industry!

It provides significant operational value where low-lighting or streaky chroma noise makes picture quality poor. With the Digital Noise Reducer, a marginal 40 dB input color television signal becomes a high quality 52 dB output signal. And no objectionable artifacts are introduced, high quality video exists.

You'll discover dramatic improvements in both studio

and remote applications. 2" Multi-generation video tape, U-Matic Multi-generation, Studio Cameras – Electronic film production, Microwave transmission, CATV, Satellite transmission, Off-air reception, Telecine film grain reduction and Electronic Journalism at low light levels are some examples.

Brighten up your picture with the Model 9000 Digital Noise Reducer. From Thomson-CSF Laboratories.



THOMSON-CSF LABORATORIES, INC.

37 Brownhouse Road, Stamford, Connecticut 06902
(203) 327-7700/TWX (710) 474-3346

For More Details Circle (55) on Reply Card
www.americanradiohistory.com

Charge 5 Frezzi Battery Packs automatically, unattended!



Only one Frezzi Sequencer Charger does the job. It brings each Frezzi Battery Pack in sequence to full-charge. Just unhook 1 or more Packs & go!

For information call (N.J. 201) 427-1160 (N.Y.C. 212) 594-2294



Frezzolini Electronics Inc.

Made in U.S.A.

7 Valley St. Hawthorne, N.J. 07506 USA

For More Details Circle (57) on Reply Card

Beau Replacement Motors.



More and more broadcasters are coming to UMC for Ampex and Scully replacement motors because they realize that the famed Beau inside-out design provides maximum performance as well as rugged construction and compact size. Beau offers unbeatable operating specs, outstanding reliability, long life, quiet operation, and unconditional factory support. No import can beat Beau, the original broadcast tape drive motor. To find out all about Beau Motors, just request our newly reprinted six-page Motor Bulletin. Or for fast delivery of replacements, call us at (203) 288-7731. We're the Broadcast Products Division, UMC Electronics Co., 460 Sackett Point Road, North Haven, Connecticut 06473.

UMC®

To order Ampex and Scully replacements, specify tape speed and model number:	Prices
Type and Models	\$225.00
Ampex-Model 440	\$240.00
Ampex-Models 350, 351, 354	\$225.00
Scully-Models 270, 275, 280, 282	\$225.00

For More Details Circle (58) on Reply Card

RENG

continued from page 70

Learn the RF limitations of your system. You may still have to buy an occasional telco loop, but that's better than having to bail out of a sold remote because of a poor signal.

Use a map

If your market presents some challenging terrain, it might be worthwhile to use a large map to indicate good and bad signal areas. Every time you set up to do a remote, stick a colored map pin in the map to indicate the performance from that location. Then the next time you're in that area, you'll know what to expect.

A topographic map comes handy for distant shots in rural areas. Draw a line from the intended site to your receive antenna then transfer the terrain height to the graph with distance as the x-axis. To be accurate you should plot the terrain on a four-thirds earth profile chart, but for fairly short distances you can get a reasonably good idea using a linear graph. Just be sure to allow a little margin for error.

If you're using a mobile repeater you'll frequently find situations where the remote site is hidden in terrain, but a nearby high point will be within range of both the receiving station and the portable unit at the remote site.

Check it out

No matter how carefully you plan on paper, there's still nothing like the real thing. Whenever possible, check out the shot well ahead of broadcast time. Once you get familiar with your own equipment, you can streamline the checkout so that it only takes a few minutes. For instance, the antenna mounted on the mobile unit puts a signal to the receiver that is just a few dB below what you'll accept, you know that using a directional antenna will provide sufficient increase in signal strength to make the shot work. You don't need to go through the exercise of actually setting up the antenna.

On the other hand, be sure to take into account anything that will be different at the time of broadcast. Rick Neace points out that one of the problems on a game course is the people in the gallery. KRLLD uses a 10-foot aluminum mast to get the antenna up above the people's heads.

If other stations will be covering the same event, it's a good idea

continued on page 71

Still manually monitoring VITS?



NEW • mi 2914A
Tighter Specs
\$11,500
U.S. Domestic Price Only

mi has the **AUTOMATIC** answer
whether your system is NTSC, PAL or SECAM

Adaptable to all national VIT waveforms including
CCIR #7 and FCC, the **mi** 2914A Insertion Signal
Analyzer has proven performance with broad-
casters and common carriers throughout the world.
For unattended operations the Analyzer interfaces
exactly with telemetry control systems. Combine
the **mi** 2914A with the optional Limits Comparator,
2915, and the **mi** 2917 Data Selector for a com-
plete monitoring, measuring and alarm system.
You can control or print out at a local or remote
terminal, and, our print-out is now available in

English, French or American. As a stand alone
unit, the **mi** automatic VITS Analyzer replaces
Waveform Monitors, Vectorscopes, Color Gain and
Delay test sets and Random Noise Measuring sets.
Even the most complex VITS measurement is per-
formed at the push of a button and the result
displayed with digital accuracy on the front
panel meter.

So if you are still manually monitoring VITS . . .
we have the immediate solution . . . contact **mi**
today for the new **mi** 2914A specifications.

mi **MARCONI INSTRUMENTS**
DIVISION OF MARCONI ELECTRONICS INC.

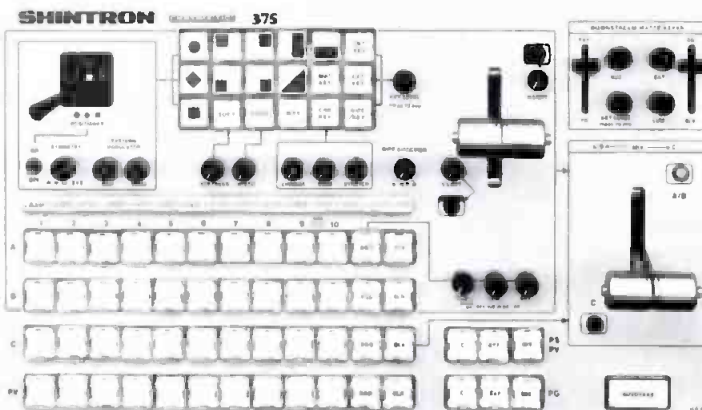
Stonehurst Court, Northvale, New Jersey 07647 • (201) 767-7250 • TWX: 710-991-9752

For More Details Circle (56) on Reply Card

A Classic is Born

12 Input, A, B, C, Independent Preview and Program Bus
Downstream Matte Keyer
Chromakeyer
10 Wipes, Soft and Edge Wipe
Pattern Modulator
2 Background Generators
Panic Fade to Black
Remote Control Package
PAL Version Available

375
Chromatic
Production
Switcher



SHINTRON 617-491-8700 Cambridge, Ma. 02142, U.S.A.
World Wide Telex 921497

For More Details Circle (59) on Reply Card

RENG

continued from page 72

find out what frequencies they'll using and coordinate with the There aren't that many RPU channels available, so the chances another station trying to operate the same frequency are real pretty high.

Also allow for interference from other services. There are usually quite a few two-way users at large event, and some may radiating 100 watts or more right next to you. About the only way around this problem is to move your receive antenna farther away. Cross polarization of your antennas helps too, if it's practical.

People problems

If you've done your homework you can sleep well knowing that your equipment will perform flawlessly. If you want to make sure that the event comes off without a hitch, though, you'll have to go one step further. Everyone involved must have a thorough understanding of the system. Five minutes before time is not a good time to be showing the talent what the switches do. A dry run ahead of time will go a long way toward a successful broadcast.

"But," you say, "this is great an event that can be planned well in advance. What about hard news? You can't plan ahead for a major fire."

Sure you can! You know that sooner or later, something major is bound to happen. Just because you don't know where or when it is, excuse not to plan ahead for it. Don't wait for a five-alarm fire to plan how you'll cover it. Work closely with the news director to formulate a disaster plan. Every newsman should be familiar with the equipment that he must use in such a situation. If you want to make certain that the coverage will be first-class, stage a couple of simulated disasters to get the people familiar with the gear. It'll help find bugs in the system, too.

On routine news beats, make certain that the newsmen formulate good operating habits. With a mobile repeater, for instance, a newsman should check the signal back to the station before he leaves the vehicle every single time.

Your just reward

RENG can add a lot to the success of your station. It's a lot of work to get started but once it's up and running you'll reap the rewards into the future.

Sintronic CORPORATION

212 WELSH POOL RD., LIONVILLE, PA 19353 (215)363-0444

Sintronic Corporation is a subsidiary of Singer Products Co., Inc.
Integrity and dependability since 1937

From blue bananas to tag tails

Getting on the stick

A few years ago, when I was in the service, I used moonlight with a small, independent TV station which did remotes of all the local high school sports events. We would arrive about 6 pm to begin setting up since most games began at 8 pm. This usually gave us a half-hour break; we would use this time by firing a hot dog roast, cooking the hot dogs by rotating them at the end of the microwave horn on moon sticks. This made the hot dogs sizzling hot in about 10 seconds.

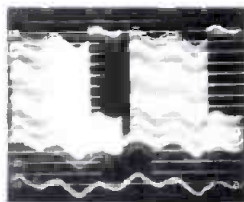
One night, about a minute after everyone had taken their places for the game, we heard a scream of organized terror outside the van. Our PD grabbed the camera hoping to catch a car-pedestrian accident in the news, only to find a kid rolling on the pavement with a hot dog stuck on the end of a car antenna firmly clutched in his hand; and, he was screaming that he had been hit by lightning.

We were going to take the boy to the first aid station and forget about the police, until our producer and out the antenna was from his car. Andrew Griffin, Springfield, Missouri. ☐

STOP GROUND-LOOP HUM!

VIDEO HUM STOP COIL...HSC 1

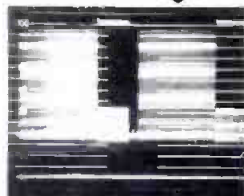
Will ELIMINATE HUM and other INTERFERENCE in Video Lines caused by differences in Ground Potential.



NEW!



\$140
F.O.B.
N.Y.



- For Color and Black and White.
- FLAT-DC to 6.5 MHz.
- No Low-Freq. or Hi-Freq. Roll-off.
- No Differential Phase Distortion.
- No Differential Gain Distortion.
- No Envelope Delay.
- Passive Device - Failure Free-Low Price.
- Small Compact Package 4" x 4" x 2-1/4"

ELIMINATES HUM AND INTERFERENCE:

IN STUDIO

- Between Buildings
- On long runs in Buildings
- Between Studio and Transmitter
- On Incoming Telco circuits
- On Outgoing Telco circuits

IN FIELD

- Betw. Remote Truck and Telco
- Betw. Remote Truck and Microwave
- For Intertruck Hookup
- For VTR Units
- For Monitoring Lines

Available on
10 day free trial

AUDIO-VIDEO ENGINEERING COMPANY
65 Nancy Blvd., Merrick, N.Y. 11566
Tel. (516) 546-4239

For More Details Circle (61) on Reply Card

Broadband or discrete - a better idea either way you turn...



Model 221 Audio Level Optimizer II

Is it smooth? Turn to the new Model 221 Audio Level Optimizer II, the "firm but gentle" AGC/compressor/limiter. Start with gain-riding AGC for smooth, gradual correction for output level variations. Go on to our unique auto-ratio compressor for unlimited control

over program dynamics. Then get absolute protection from over-modulation with a fast, phase-reversing peak limiter for AM and an independent high-frequency limiter for FM.

Model 221—a better idea at \$760.

Model 230 Multiband Audio Processor

Like it loud? Turn to the Model 230 Multiband Audio Processor. Make individual dynamic compression adjustments in eight independent bands. The results? Ultimate program density with a sound you have tailored. Gated expansion keeps the noise down.

For AM, the Model 230 features program-controlled phase inversion and adjustable limiting symmetry. Or switch in the separate frequency-selective limiter for FM.

Model 230—a sound idea at \$1500.

Inovonics Inc.

13-B Vandell Way
Campbell, CA 95008

Telephone
(408) 374-8300



no signal. This is important at t and on weekends, when the rol operator/disc jockey is the person in the studio and is not ally listening to the FM station. wise, the AM alarm is useful ing church services or pre- rded public affairs programs

when the operator may be in the newsroom, etc., and not really listening that closely to the program being aired. Note in Figure 3 that the Sonalert is wired through a set of relay contacts controlled by the mike switch to prevent the alarm

continued on page 78

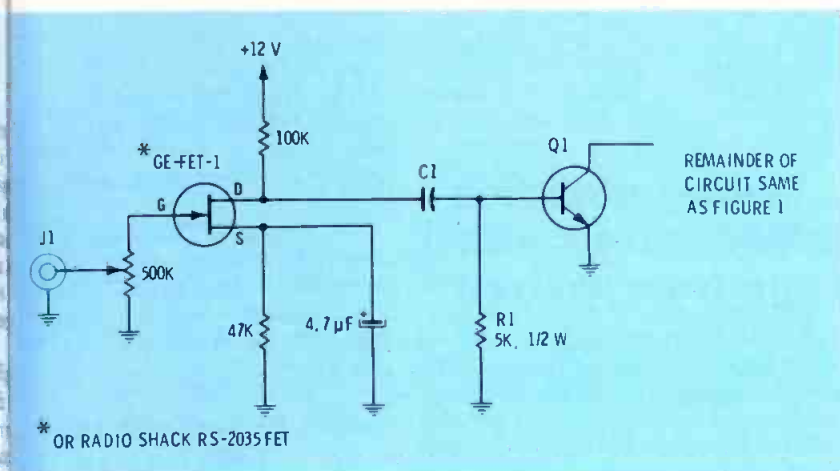


Figure 2

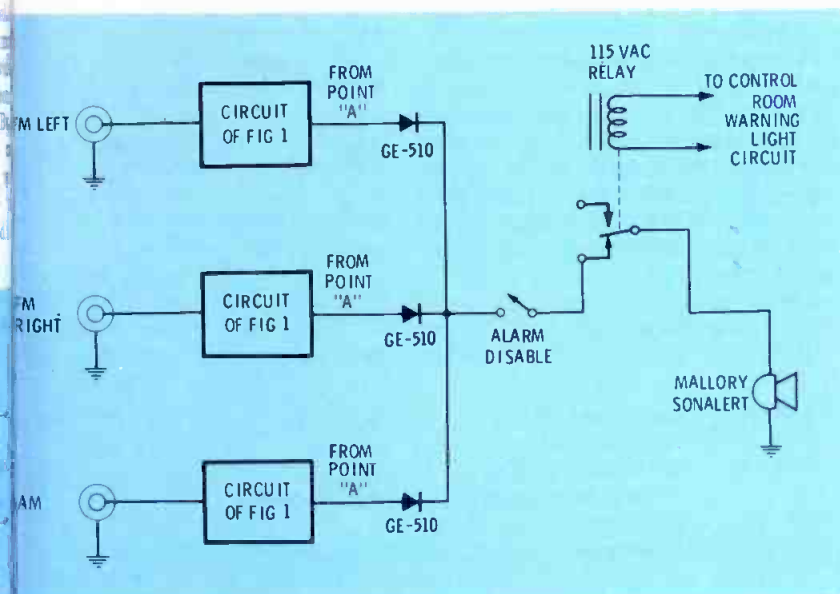


Figure 3

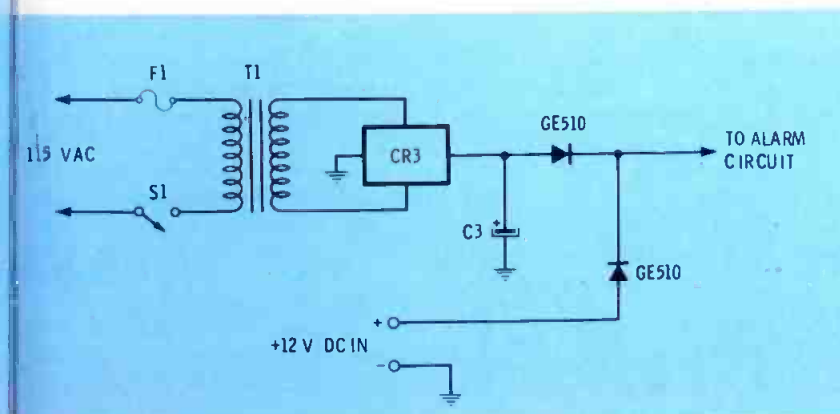


Figure 4



Camerman's Headset... Keeps the crew in touch

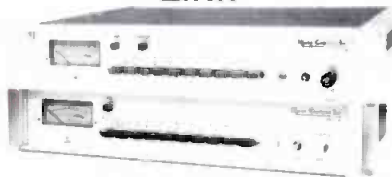
A professional TV Cameraman's Headset series specifically designed to interface with existing Western Electric circuits. Single side unit receives intercom only. Dual side, binaural unit receives intercom and monitors program. Carbon boom mike with optional push-to-talk switch. Designed for comfort and rugged dependability in every day use. Keeps the crew in touch—in or out of the studio. For complete information please write:

PRODUCTS OF SOUND RESEARCH
TELEX
COMMUNICATIONS, INC.

9600 ALDRICH AVENUE SOUTH
MINNEAPOLIS, MINN. 55420 U.S.A.
Europe: 22, rue de la Legion—d'Honneur,
93200 St. Denis, France
Canada: Telak Electronics, Ltd., Scarborough, Ontario

For More Details Circle (64) on Reply Card

have you
checked the competition?
NOW CHECK OURS!
**Studio-Transmitter
Link**



**For Transmission Of
Superior Audio Program Quality**

- A Full 10 Watts of RF Output Power
- Direct Reading Forward & Reflected Power
- 2 Watt Monitor Amplifier in Receiver
- Unique Oscillator Design Assures Maximum Stability
- Built-In RFI Modules on Transmitter and Receiver Input and Output

Available as either a Wideband Composite or as a Narrowband Single or Dual Channel system; this now STL employs modern day technology Using Phase Lock Loop Techniques in both the Composite STL transmitter and an accessory Sub-Carrier Generator, all MCI systems are enhanced by the use of the very latest chips available. Field tested and proven, these systems provide unmatched quality, attractive styling and superior performance.

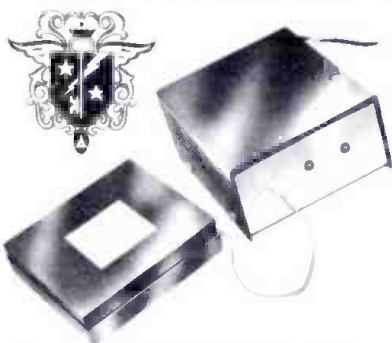
MICRO CONTROL

ASSOCIATES

P.O. Box 13250 Arlington, Texas 76013
817/265-2912

For More Details Circle (65) on Reply Card

**NICKEL CADMIUM
ENG. BATTERIES
AND ONE HOUR AUTOMATIC
CHARGERS**



For ALEXANDER Nickel-Cadmium REPLACEMENT BATTERIES For...

SONY (BP20) — JVC (PBP-1)
AKAI (PACK) — etc.

CHARGERS WILL AUTOMATICALLY
CHARGE IN 1 TO 4 HRS. DEPENDING ON
CAPACITY ... (SWITCHES TO TRICKLE)

Write Wire or Phone

ALEXANDER manufacturing co.

Box 1645 Mason City, Iowa 50401

Phone (515) 423-8955

For More Details Circle (66) on Reply Card

Station-to-Station

continued from page 77

from blaring forth during a live break.

By using a couple of extra diodes, as shown in Figure 4, the unit can be used in an auto, etc., and thus the chief engineer can know if the station is on the air without listening by connecting the alarm input to his car radio.

**Making distortion
measurements with a
spectrum analyzer**

By Mark Wharton,
Broadcast Audio Consultant,
Boulder, Colorado

In reference to Peter Burk's article on AM Proof-of-Performance measurements (June 1977), I'd like to take exception to the statement "there is presently no acceptable way to conduct an official proof-of-performance with a spectrum analyzer...."

I'd like to discuss my favorite method, because it is much simpler and faster. It relies on the use of a programmable pocket calculator, such as the HP25. The calculator is programmed to solve the equation for THD:

$$THD(\%) = \frac{\sqrt{A_2^2 + A_3^2 + \dots A_n^2}}{A_0} \times 100\%$$

where: A_0 = amplitude of the fundamental

A_2 = amplitude of the second harmonic

A_3 = amplitude of the third harmonic

Since the spectrum analyzer reads out the harmonic amplitudes

in dB below the fundamental, they must first be converted to ratios

$$A_n = 10^x$$

where $x = \frac{\text{harmonic amplitude (dB)}}{20}$

Note that if the spectrum analyzer is adjusted so that the fundamental frequency component reads 0, then $A_0 = 1$.

The keystroke listing for HP25 is given in Figure 1. To the program, follow the steps Figure 2. (For a new calculation, to step 2.)

For example, assume that spectrum analyzer shows the second harmonic to be down 40 dB from fundamental, and the third harmonic to be down 48 dB. What is the THD?

Input	Keystrokes	Output
40	R/S	1.00%
48	R/S	1.08% Answer

FIGURE 1.

Line	Code	Key entry
01	32	CHS
02	31	ENTER
03	02	2
04	00	0
05	71	+
06	15 08	g 10
07	25	Σ +
08	24 06	RCL
09	14 02	f $\sqrt{}$
10	33	EE $\times$
11	02	2
12	61	X
13	13 03	GTO

FIGURE 2.

Step	Instruction	Data input	Keystrokes	Data output
01	Enter Program		f PRGM	
02	Initialize		f REG	0.00
03	Input harmonic amplitude in dB below fundamental	a_n	R/S	THD (%)
04	Continue with step 03, using as many harmonic terms as is necessary for accuracy desired.			

is that simple! This method is just as fast as the conventional distortion meter, and is far more accurate. The conventional distortion analyzer notches out the fundamentals, and the meter reads all garbage left over. It responds to noise, and RF pickup; these signals are not properly classed as distortion components. The spectrum analyzer allows one to compute total harmonic distortion only; distortion + hum + noise + RF pickup that the conventional distortion analyzer gives.

If you have a spectrum analyzer and a pocket calculator, you'll find this method far superior to the distortion analyzer. It gives so much information and is a valuable troubleshooting aid.

Devising a bulk-delay system

Don McGuire, KYW, Philadelphia
Michael Russell's article in the November issue describing WTIC's show delay system reminded me of an idea I came up with 12 years ago at KYW that we used for making the transition from "live" to "played" program.

We had just switched to the "news" format, and management decided that all outside calls (Q & A reporters, etc.) should be delayed for protection. We used a similar delay cart machine, with

the amount of delay determined by the length of the cart, as normal. How to make the transition from live to delay as simple and fool-proof for non-technical types?

We simply recorded an announcement the exact length of the delay cart telling our listeners that the following was another KYW direct-line report. The cart was cued up to the start and left in the delay machine on standby for the next usage. Then all the airman did was to push the cart "start" button and immediately start talking on the phone.

Starting the delay also switched the transmitter feed from console out to delay-machine out. As the cart rolled, the listener heard the recorded promo followed immediately by the report. Initially, the announcement is played back by the first head, then immediately erased and the phone segment recorded on the second head. Then seconds later (the length of the cart we used), it has cycled around to the play head, tightly following the end of the pre-recorded promo.

Operation simple...one button...and timing of transition was perfect. The idea was so simple and obvious that it couldn't have been original with me, but I never have read or heard of anyone recording the transition fill on the actual delay cartridge. Why delay 10 seconds rather than the normal six or eight? It's much easier to mentally add 10 to your "dump out" time, whether looking at a digital or analog clock. Try it once. ☐

Does not compute!

Concerning the November article "Micro Computer Controls Traffic for KEZK," General Manager William Clark has asked that certain clarifications be made.

According to Clark, the article was misleading (and being the GM for KEZK, he ought to know). Specifically, the article discusses future objectives as if they are in practice at KEZK today.

As for system costs, Clark pointed out that the figures quoted in the article were not accurate. After all, most of the equipment described was purchased for experimentation only. Clark also feels, and rightly so, that any station venturing in this direction should not think that a few black boxes off the shelf can be stacked into a practical system. "The environment," Clark says, "requires much specialized skill, generally far beyond that which is available in all but the largest companies."

"Basic decisions," he continued, "had already been made by myself that if the system were to have the capacity and reliability that would be required in a broadcast station, substantially different equipment would have to be acquired at a greater cost."

Send us your

station-to-station

ideas. We'll send you the NAB Engineering Handbook



If your equipment tips or other operating ideas are selected by Broadcast Engineering to appear in Station-to-Station, you will receive a free copy of the prestigious NAB Engineering Handbook (or a cash payment, if you prefer).

The latest Handbook contains over 1,000 pages and 1,000 illustrations covering every aspect of AM, FM and TV operation and maintenance: recommended procedures, fundamentals, standards, rules and how-to instructions.

Station-to-Station affords you an opportunity to share your expertise with readers throughout the industry: how you solved a nagging technical or production problem, modified a circuit for more flexibility, redesigned a studio or facility, developed new test procedures or employed an operating idea to save time and money. By sharing your knowledge, you'll share in the wealth of information contained in the Handbook.

Send your items to: Station-to-Station editor, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. Please indicate if you want to receive the Handbook or prefer to receive a check.

The Handbook can also be purchased directly from the NAB at \$30 a copy for NAB members and \$45 a copy for non-members. Write to: Station Services Dept., NAB, 1771 N Street, N.W., Washington, D.C. 20036.

new products

Battery pack charger

Frezzolini Electronics Inc. now is offering the Frezzi model BC-77 "Rapid Charger" to full-recharge Frezzi-Belt™ model F-12-77 battery packs that power Ikegami HL-77 or 37 hand-held color cameras.

The unit, said to recharge in one hour or less, is a transformer-type model whose output is AC-source line-isolated. It weighs seven pounds and is housed in a functionally-designed metal cabinet with a carrying handle. All cables and plugs are permanently attached.

The standard Frezzi model BC-77 is priced at \$395 and requires 150 watts (maximum) input power from a 115-volt, 50/60 Hz AC source. Optical models operate from either 115/230 volts, 50/60 Hz sources; or from 230 volts 50/60 Hz sources.

For More Details Circle (88) on Reply Card

Remotely controlled ENG antennas

A different approach to microwave linking of ENG crews is being

taken by Tayburn Electronics, a manufacturer of complete microwave systems for the aerospace industry who has now entered the broadcast equipment field.

Unlike the currently available quad and super quad omnidirectional antennas, Tayburn specializes in remotely steerable antenna dishes, a number of which can be controlled from a central location such as the TV studio center or the station transmitter site.

A unique feature of this system is a highly sensitive receiver channel which can give an indication of transmitter operation even if the sending dish is pointed 180° away from the receiving point.

The Tayburn ENG package can include a TBM 100 Master Station and Remote Antenna Telecontroller which come in rack mount or desktop console form. This unit permits the operation of up to four TBA 300 remote dishes mounted in various locations to cover line of sight reception from all over a chosen service area. Ordinary telephone lines are used for the serial digital signals that control the antennas and provide system status feedback to the master station.

Because the system is of modular

design, the operator can start with a single link, then expand to greater area coverage as his needs or budget increases.

At the antenna end a model TM 100 remote station unit controls one or two ENG receive dishes and provides a local override feature for testing purposes.

For More Details Circle (89) on Reply Card

Filters

TTE, Inc. announces four filters specifically designed for broadcast stations, recording studios, and CATV applications. These are:

Cue Tone Rejection Filter (model B83); 25 Hz, 600-ohm impedance.

Low-frequency Noise Filter (model H198); minus 1 dB maximum from 10 Hz to 20 kHz, minus 30 dB at 25 Hz and below, 600-ohm impedance.

Stereo Generator Noise Filter (model J841); ± 0.5 dB from 50 Hz to 15 kHz, minus 30 dB minimum at 15 kHz, minus 50 dB minimum at 20 kHz, 600-ohm impedance.

Bandpass filters, Series K17 and K18 for CATV equipment, are available for any frequency from 100 kHz to 100 MHz, including 15.75 kHz.

For More Details Circle (90) on Reply Card

continued on page 10

ENG POWER ENG POWER ENG POWER



PORTABLE-MOBILE TRANSMITTERS RPT-25 and RPT-40

★ FCC Type Accepted

- ★ Continuous subaudible tone encoding (optional)
- ★ Broadcast quality Compressor-Limiter
- ★ 115 V AC or 13 V DC operation
- ★ Four mixing inputs
- ★ Continuous duty operation

BATTERY POWERED PORTABLE RPT-1/150 and RPT-1/450



★ FCC Type Accepted

- ★ Continuous subaudible tone encoding (optional)
- ★ Broadcast quality Compressor-Limiter
- ★ Battery capacity 3½ hours continuous duty
- ★ Three mixing inputs

MOBILE REPEAT RECEIVER RR-30/150 and RR-50/450



- ★ Internal subaudible decoder
- ★ 115 V AC or 13 V DC operation
- ★ Audio de-emphasis, filtering and equalization provides broadcast quality for line feed, recording or automatic repeat through RPT-25 or RPT-40

BROADCAST QUALITY RADIO
REMOTE SYSTEMS FROM

MARTI Electronics, Inc.

Box 661, 1501 N. M.
Cleburne, Texas 76031
Phone: 817/645-9111

For More Details Circle (70) on Reply Card

TerraCom has closed the loop for Electronic News Gathering

The TCM-7 "Miniwave" Transmitter and Receiver and the TCM-3 Programmable Receiver have joined the TerraCom team. They close the loop for highest performance microwave... from ENG camera, to O.B. van, to repeater, to radio. Now you can enjoy the satisfaction and cost benefits of using an integrated family of equipment from one source. TerraCom.

The new TCM-7 and TCM-3 along with the field proven and time tested TCM-6 Series, tunable or fixed tuned transmitters and receivers, will meet all

of your microwave requirements at any frequency—2, 7, and 13 GHz.

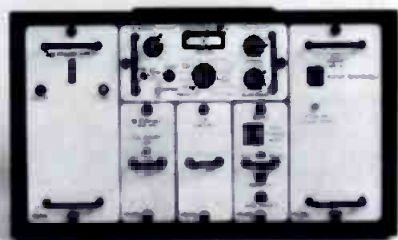
TCM-7 "Miniwave" is TerraCom's camera located transmitter and matching portable receiver. It is lightweight, easy to carry, simple to operate, and fast to set up. And it costs less. Designed for broadcast quality transmission with plug-in circuit cards for maintainability, the "Miniwave" is a new dimension in ENG.

TCM-3 Series Programmable Receivers are an important innovation for ENG systems. Imagine the flexibility of a receiver that can be remotely switched to any channel within the band... instantaneously. You are able to make the maximum use of frequen-

cies assigned, or those with least interference, at any one time. All from local control, remote control, or with a telephone circuit.

TerraCom portable microwave equipment won user plaudits at the recent Olympics (both Montreal and Innsbruck), primary elections, the Democratic and Republican conventions, Rose Parade, Rose Bowl, Super Bowl and in thousands of other daily events. And we're in satellite earth stations too!

You can close the loop now by calling Bruce Jennings or Bob Boulio at (714) 278-4100. And get the best service in the industry while you're at it.

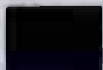


DIVISION OF CONIC CORP.
A LORAL SUBSIDIARY

9020 Balboa Avenue, San Diego, CA 92123

For More Details Circle (85) on Reply Card

TCM-3
programmable
receiver



TCM-7
transmitter

O.B.
van

studio



Erases video cassettes in 5 seconds!



NEW GARNER VIDEO'RASER

Now you can completely automate your video tape erasing jobs with Garner's new Video'Raser unit. It's a simple one-step, in-and-out operation. Tapes pass on a continuous belt over high flux coils, giving you tape erasure depth exceeding professional standards. Built rugged and compact, it easily handles video cassettes. You'll also like the Video'Raser's competitive price.



Look to Garner for quality electronic audio and video products. For more information, write or call:

GARNER INDUSTRIES

4200 North 48th Street, Lincoln, Nebraska 68504, Phone 402-464-5911

For More Details Circle (71) on Reply Card

new products

continued from page 80

Monitor loudspeaker system

A compact monitor loudspeaker system designed for broadcast applications, the 4301 by JBL, is useful detecting and controlling spurious noise, such as turntable rumble, a conditioning, and other acoustic interference picked up by open microphones, tapes hiss or cue tone leakage.

Specifications include: accurate smooth reproduction 45-15,000 Hz ± 3 dB; 39 dB SPL at 30 feet with 1-milliwatt input; 88 dB SPL at 1 meter with a 1-watt input; 8-inch low frequency loudspeaker; and 1.4-inch high frequency direct radiator.

For More Details Circle (91) on Reply Card

Monitor/intercom system

The model 8332 communication system by Automated Processes Inc., provides both intercom and monitor functions with broadcast quality audio. Each intercom terminal is connected by 4-wire telephone-type cable to solid-state cross-point switches in the central station rack. Two-way audio is carried on one pair, and the two-way digital data on the second pair.

All control functions are activated and stored in a microprocessor-based central processing unit, which sets up the cross-point signal routing and also indicates system status at all appropriate terminals. A tail lamp annunciator indicates source and destination of calls, conference calls, busy status, private call status and monitor status.

Features include: programmable selective lockout for live mike applications.

ATTENTION BROADCAST SYNDICATORS Real Time Duplication Quality 16-Times Faster

The ASCO 2400 produces copies at 7½ ips; 30KHz to 18KHz with less than 45 degrees phase error. Features: automatic recuing of master for preset number of cycles. Reload slaves while master rewinds. Precision-mounted ferrite heads. Head assemblies contain equalization level calibrations. State-of-the-art tape motion control includes constant tension holdback, motion sensing, dynamic, & mechanical braking. Two channel systems from \$7500. Write for our illustrated catalog.



accurate sound corporation
114 5th Ave., Redwood City, CA 94063
Phone (415) 365-2843



2400 SERIES

For More Details Circle (72) on Reply Card



RECORTEC, INC.

777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

For More Details Circle (73) on Reply Card

Still the industry's MOST WANTED

VIDEO TAPE TIMER

- Bright LED display
- More accurate tape time
- Optional remote display
- Hold button freezes display
- Available for all 2-inch VTRs

still
lowest
cost

tion; hands-off 2-way conversation (and conventional press to talk); and simultaneous monitor for timing.

For More Details Circle (92) on Reply Card

Miniature mike

The C090 microphone from Electronic Voice measures 3/8-inch diameter and 7/8-inch long, making it ideal for on-camera use, according to the company.

The microphone is supplied with a bar mount, windscreen, storage pouch and six feet of cable which connects the unit to its belt clip battery/transformer housing. A similar model, the C090E can be powered directly from wireless transmitters. Frequency response is 15,000 Hz with an output level of 10 mV at 1 kHz into a low impedance input. The microphone is covered by the company's two-year unconditional warranty.

For More Details Circle (93) on Reply Card

Program automation system

Automation Electronics, Inc., announces the Autotron/Cuerac. The system is a computer-controlled program automation system that features a 500-cartridge library for music and spot recordings in mono and stereo.

The system also features reel-to-reel, single-play and time-announce functions. Unlimited real time events and up to 30 day walk-away memory are offered as standard features.

The system is installed "stand alone" or in conjunction with Autotron for office and billing systems.

For More Details Circle (94) on Reply Card

Reverberation unit

The Quad/Eight CPR-16 computer-programmed reverberation unit gives the user control over many

continued on page 84

PERFECT TIMING

Low Cost ESE Right On Timers



- ES-300: Four digit incandescent display, one hundred minute timer (99:59) with six controls: Count Up, Count Down, Min-Set, Sec-Set, Stop, Reset. \$180.00
- ES-301: Identical to ES-300 except with planar, gas discharge display. \$198.00
- ES-302: Equivalent to ES-301 plus fast-set lever wheel programming. \$254.00
- ES-400: Three digit ten minute timer (9:59) with Start, Stop, Reset. \$105.00
- ES-510: Four digit sixty minute timer (59:59) with Start, Stop, Reset. \$134.00
- ES-500: Six digit, twelve hour combination clock/timer with five controls: Start, Stop, Reset, Fast Advance, Slow Advance. \$160.00

STANDARD OPTIONS AVAILABLE: Kit; Slave; BCD Output; Remote Connector; 6' Remote Cable and Pushbutton Set; 220V A.C., 50Hz; 9" or 19" Front Panel 3 1/2" high; 3 Wire Cord and Molded Plug. Tenths of seconds are available on all timers except the ES-500. Relay Contact Closure at Zero and/or Stop at Zero available on ES-300, 301, and 302. Crystal Timebase available for ES-500. Custom options and special orders available.



WRITE, WIRE OR CALL TODAY

505 1/2 Centinela Avenue

Inglewood, California 90302

(213) 674-3021

For More Details Circle (74) on Reply Card

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

For More Details Circle (75) on Reply Card

Still the industry's MOST DESIRED

VIDEO TAPE EVALUATOR



- Tape evaluation at 16 times speed
- World wide customer base
- Standard in the industry
- Leasing program available

RECORTEC, INC.

777 PALOMAR AVE. SUNNYVALE, CA. 94086 TEL: (408) 735-8821 TWX: 910 339 9367

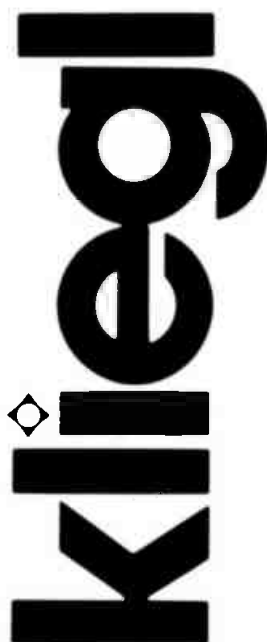
For More Details Circle (76) on Reply Card

Your TV Studio may as well be a radio station without the right lighting.

At Kliegl, we want your video to be up to par with your audio. Or even better. That's why we have a team of seasoned engineers who design studio lighting systems that meet your exact requirements.

Thanks to our experience in dealing with studio lighting, we have designed six standard TV lighting packages that meet normal needs for standard-sized studios. And since these are complete systems already engineered and in stock, ready to ship, they offer substantial savings.

So, if you don't want your viewers to turn on their radios, turn to Kliegl. For complete information on our TV packages or anything else, please write or call:



Kliegl Bros.
32-32 48th Ave.
Long Island City
New York 11101
212 786-7474

For More Details Circle (77) on Reply Card

new products

.....
continued from page 83

aspects of the reverberant field. Reverberation time can be changed from zero to 20 seconds in 16 steps even during operation. High and low frequency damping rates can be controlled over a wide range, previously possible only by rearranging a complex array of absorbers in live chamber or room. The impression of room size can be modified by adding a short delay before the first echo. And, the prominence and density of resonant modes and the density and diffusion of echo rates can be tailored to match any room.

In sound reinforcement and architectural acoustics, the CPR-16 can modify and supplement the room reverberation characteristics electronically without relying on any mechanical devices. Since the CPR-16 is a programmed system, the actual reverberation characteristic can be custom tailored to meet specific requirements.

For More Details Circle (95) on Reply Card



Waters MM faders mean more mixing in less space

With Waters $\frac{3}{4}$ -inch thin-line conductive plastic faders you can cram 24 channels into an 18-inch mix bay for high density recording studio applications, sound reinforcement and location mixers, and lighting control consoles.

Waters MM faders retain all the superior quality of our accepted LM series including choice of $2\frac{3}{4}$ -inch or 4-inch travel; 600 ohm or 10 k impedance; linear, audio or true log characteristic; and our famed trouble-free long service life. For more mixing in less space circle reader service number or call Don Russell at 617-358-2777 for more information about thin-line faders.



**WATERS
MANUFACTURING, INC.**

LONGFELLOW CENTER, WAYLAND, MA 01778 • (617) 358-2777

For More Details Circle (78) on Reply Card

Program switcher

Dynasciences has added a new compact program switcher (model 7400/A) to its line of television studio equipment. The 7400/A has all of the capabilities of the company's full-size, four-bus model 7400, plus two additional wipe patterns in a package approximately 75% smaller than the 7400.

Measuring 7 inches wide by 8 inches high, the 7400/A control panel is small enough to mount beside a video program monitor in a single 19-inch rack. The reduction in panel size is made possible through the use of a numerical keyboard for selecting video input wipe patterns, buses, and effects.

Light emitting diode (LED) numerical readouts display the video input selected for each bus as well as the selected wipe pattern. Other LED indicators show effect and bar status.

The 7400/A offers 26 wipes, joystick positioning, pushbutton controlled wipes, and many other features.

For More Details Circle (96) on Reply Card

$\frac{3}{4}$ -inch videocassette evaluator

The Recortec videocassette evaluator (VCE) tests a 60-minute cassette in under 9 minutes, giving

ANTENNA IMPEDANCE MEASUREMENTS WITH INTERFERENCE IMMUNITY

The Model SD-31 Synthesizer/Detector

Is...

NEW

... designed for antenna impedance measurements in presence of strong interference ■ High-level oscillator compatible with General Radio 916 Series, 1606 Series, and Delta OIB-1 Impedance Bridges ■ Special coherent detector circuit rejects interfering signals during measurements ■ Crystal controlled frequency, variable in 500 Hz steps from 100.0 kHz to 1999.5 kHz ■ Receiver for detector can be external or optional built-in RX-31 ■ Powered by rechargeable batteries ■ Self-contained portable package ■ Field proven ■ Versatile — can use as an RF signal generator for troubleshooting antenna systems; as a variable frequency oscillator for antenna site survey; or other applications requiring a precise frequency source ■ Price: \$1250 complete with RX-31 Receiver — \$995 without Receiver.



CONTACT US FOR DETAILS.

source selection, and client booth source selection.

Standard rack adapters provide a variety of pre-wired systems: 5 in, 1 out or 10 in, 1 out with solder terminal connections; 5 in, 1 out or 10 in, 1 out with screw terminal connections; and 5 in, 5 out with screw terminal connections.

Systems with screw terminal connections provide control looping between two or three switchers for multi-channel audio and single or dual audio-follow-video systems.

For More Details Circle (98) on Reply Card

Automatic transmitter switcher

A new, solid-state automatic transmitter switcher by CCA Electronics Corporation will work with parallel or alternate AM, FM or TV transmitters.

The switcher will automatically sense loss of RF, loss of audio, excessive VSWR, and programmed high or low power limits. It will initiate, and complete, a switchover from one transmitter to another, automatically performing intermediate steps.

It will remove high voltage, reconfigure the antenna switching network, and remove a parallel trans-

continued on page 86

POTOMAC INSTRUMENTS

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

For More Details Circle (79) on Reply Card

display of the number of gross video errors and edge damage areas on electronic counters. Individual LEDs indicate the maximum length of the cassette. An optional digital printer is available to produce a test record showing the location of each tape defect.

The VCE is installed on a new SP-200 player and is delivered ready to use. The unit can, of course, be used as a normal cassette player even with the VCE installed. The VCE employs the same principle of tape evaluation used by other units for reel-to-reel evaluation of ¼-, ½-, 1- and 2-inch videotapes.

For More Details Circle (97) on Reply Card

Audio switcher

The Dynair model SW-5985A five-input, one-output audio switcher provides on-air quality switch transitions. The switcher contains internal crosspoint latches and lamp drivers to permit the use of illuminated momentary contact control switches.

The SW-5985A will satisfy a wide variety of small switching requirements such as audio console preselection, audio tape recorder

Accurate Field Strength Measurements Can Be Easy

With the Model FIM-21, electromagnetic field strengths can be measured to within 2% across the entire 535 to 1605 KHz AM band. And to intensity levels as low as 10 μ V/m. Its integral shielded antenna in the cover, front panel speaker, large illuminated mirrored meter, and ganged oscillator/receiver tuning, make it easy to operate in the field. An optional telescoping stand adds convenience. It's also a versatile instrument — use it as a tuned voltmeter for RF bridge measurements.

Contact us now for complete details on our line of field strength meters.



POTOMAC INSTRUMENTS

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

For More Details Circle (80) on Reply Card

Operations Center



This is the operation center of the new World Video CR 6220 12" Color Video Monitor. All controls are here, at your fingertips. All features such as pulsecross and underscan are standard. We have no extra cost options hidden in small print.

Behind this control panel lies a rugged chassis, with modular circuitry designed for high quality display of your signals with no automatic this and that to disguise errors.

Behind this CR 6220 is ten years of World Video experience and a staff dedicated to give you an honest value for your dollar, and to service your needs and the equipment we build.



WORLD VIDEO, INC.

P. O. BOX 117, BOYERTOWN, PA. 19512
PHONE 215-367-6055

**NAB Convention
Booth 427, Washington Hilton**

For More Details Circle (69) on Reply Card

new products

continued from page 85

mitter from the circuit. It will also reapply high voltage after determining that no faults remain, and ultimately put the remaining transmitter back on the air directly into the antenna.

For More Details Circle (99) on Reply Card

ENG camera

Two new versions of the HL-77 ENG camera are available from Ikegami. Both cameras feature a 10% improvement in signal-to-noise ratio to 51 dB; additional features for remote controlled and systems operation of the camera; and other engineering improvements.

Equipped with Plumbicons as model HL-77AP, the camera provides high sensitivity and low lag. Even newer is model HL-77AS which is equipped with Saticon pickup tubes. The Saticon provides increased picture sharpness.

For More Details Circle (100) on Reply Card

Automatic transmitter control

Telesis, by Eric Small and Associates, combines the functions of a conventional remote control, tolerance alarms indicator, and auto-logger with integrated modules that bring the system into compliance with the current and the proposed automatic transmission system rules of the FCC.

All systems are customized to each station's requirements using a standard questionnaire. The hardware requirements are met by using standard off-the-shelf modules. The unit allows virtually unlimited metering, control and contact sensing channels. It also provides data and alarms to studio operators in clear English, with a minimum of abbreviations.

Several parameters can be displayed while the user adjusts a single parameter. For example, when balancing parallel transmitters by adjusting the power output of one, Telesis can simultaneously display forward power and VSWR for each transmitter.

For More Details Circle (101) on Reply Card

Color video system

The Merlin ME-88 high band color quad VTR is available as a complete unit ready for service, or as a kit to upgrade your existing Ampex VR-1100 or other older machine.

sound dynamics

SD-100 Transport



SHOWN
with
Inovonics
Electronics

The Sound Dynamics Model SD-100 is an updated version of an old reliable tape transport. Features include sealed motor capacitors, automatic equalization switching and edit features (Optional). The SD-100 is compatible with Inovonics, MCI or Ampex 350-440 electronics. In addition, parts are interchangeable with most Ampex 350/351 in use today. Thirty days is normal delivery time.

Sound Dynamics specializes in professional broadcast equipment featuring such items as: digital clocks/timers, recorder electronics, tape heads, microwave equipment, RF monitors, microphones, limiters plus several other broadcast products!

**FOR ALL YOUR BROADCAST
NEEDS CONTACT —**



(408) 926-3588

sound dynamics, inc.

P.O. Box 32055 • San Jose, CA 95152

For More Details Circle (67) on Reply Card

QUALITY TALKS FOR CKPT

Peterborough, Ont.



Continental's new 5/10 kW AM transmitter is setting records for acceptance. It has performance and efficiency, with the cleanest sound around. Listen to Continental: quality talks.

Write for brochure: Continental Electronics Mfg. Co. Box 270879 Dallas, Texas 75227 (214) 381-7161

**Continental
Electronics**

For More Details Circle (68) on Reply Card

BROADCAST ENGINEERING

ME-88 is based on a totally finished Ampex transport and tape. The transport is modified to conform to SMPTE specifications for cassette dimensions to insure interchangeability and proper tape loading. Merlin ME-08 torque motor assemblies and the ME-03 air motor with venturi vacuum generator are used.

The color video system interfaces directly to a standard Ampex MK-III air bearing video head. An Ampex vertical-lock servo, audio cue chassis, and two-speed motor are used. The overhead motor bridge is fitted with a vacuum video monitor, audio monitor and Tektronix 528 waveform monitor.

More Details Circle (102) on Reply Card

Optical videodisc

Philips and MCA, Inc., have developed an optical videodisc which has a one-hour playing time, using both sides of the disc.

The videodisc is about 2 millimeters thick and has improved environmental capability. The increased thickness of the videodisc requires player modifications which are underway at N.V. Philips and MCA.

More Details Circle (103) on Reply Card

Microwave system

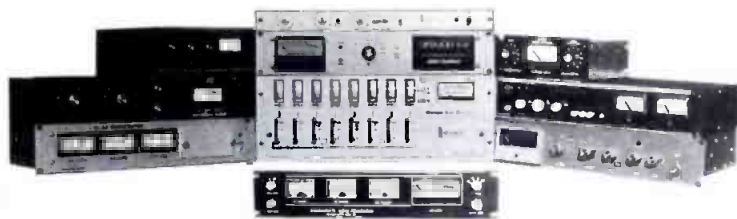
Farinon FV2-MF microwave system is designed to provide a high degree of transmission flexibility for ENG/EI operation or for hard vehicular remote operation. RF channel frequency is phase-locked to any of 12 pre-determined frequency controlled reference frequencies within the 1990 to 2110 MHz band. A phase-equalized low pass filter at the video input rejects radio and line noise at the sub-carrier frequency.

Numerous combinations of remotely adjustable aural subcarrier frequencies are available in the FV2-MF system. In environments where reflections are numerous, the use of 4.83 MHz subcarrier reduces the effect of multi-path and the resultant loss of carrier due to rotation. In areas where reflections are not a problem, the standard 6 to 7 MHz subcarriers can be employed. If split-channel operation is desirable, the 4.83 MHz subcarrier provides the required narrow transmitter band-

The basic transmitter (1-watt output) is completely self-contained, requiring aural carrier transmitters and relay units.

More Details Circle (104) on Reply Card

we've got the best in stock!



Optomod DAP Urei-BL-40
Inovonics 230 Urei-1176

**one of the country's
largest distributors
of broadcast and
recording equipment ...
representing over
60 lines...**

- *low prices*
- *trades*
- *service*
- *terms*



ALLIED BROADCAST EQUIPMENT

124 SOUTH 6th STREET • RICHMOND, INDIANA 47374 • (317) 962-8596

For More Details Circle (81) on Reply Card



**ALL SOLID STATE PORTABLE
MICROWAVE SYSTEM
SELF CONTAINED IN TWO
IDENTICAL BATTERY/AC
POWERED UNITS**

**INTERNATIONAL
MICROWAVE CORP.**
33 River Road, COS COB, CT. 06807
(203) 661-7655 TWX: 710-579-2925

For More Details Circle (82) on Reply Card

TAPE



1/4 INCH VIDEO CASSETTE-1/2 HOUR

\$9.50

Unconditionally guaranteed, brand new, sealed factory fresh 1/4" high-energy chromium dioxide polyester backed, Sony-type KCA-60 Stop-frame

Nobody, but nobody, knows tape like us. And nobody, but nobody, sells it at a lower price. For a catalog listing ALL brands and formats of audio and video tape, call or write:

DIMENSION 3 RECORDING CO.
Box 326 NEW MILFORD, N.J. 07646
(201) 265-5599

For More Details Circle (84) on Reply Card

professional services

VIR JAMES

CONSULTING RADIO ENGINEERS
Applications and Field Engineering
Computerized Frequency Surveys
345 Colorado Blvd.
Phone: (Area Code 303) 333-5562

DENVER, COLORADO 80206
Member AFCCE

MIDWEST ENGINEERING ASSOCIATES

Consulting Engineers
6934 A N. UNIVERSITY
PEORIA, ILLINOIS 61614
(309) 692-4233
Member AFCCE

BRADLEY ENGINEERING, INC.

Consulting Radio Engineers
APPLICATIONS &
FIELD ENGINEERING
Phone 918-245-5444
300 West 41st Street
Sand Springs, Okla. 74063

RALPH E. EVANS ASSOCIATES CONSULTING COMMUNICATIONS ENGINEERS

216 N. Green Bay Road
Suite 208
Thiensville, WI 53082
Phone: (414) 242-6000 Member AFCCE

McCLANATHAN & ASSOCIATES
Consulting Engineers
APPLICATIONS & FIELD ENGINEERING
TURNKEY INSTALLATIONS—RADIO & TV
DIRECTIONAL ANTENNA DESIGN
P.O. Box 750
PORTLAND, OREGON 97207
Phone: 503/246-8080
TWX 910-484-6112/Frontier

Applied Video Electronics, Inc.

STUDIO SYSTEMS DESIGN AND INSTALLATION ENGINEERING. REFURBISHING/MODIFYING COLOR CAMERAS AND QUADRUPLIX VIDEO TAPE RECORDERS
Post Office Box 25
Brunswick, Ohio 44212
Phone (216) 225-4443

SMITH and POWSTENKO

Broadcasting and Telecommunications
Consultants
2000 N. Street, N.W.
Washington, D. C. 20036
(202) 293-7742

James Tiner, President

TINER COMMUNICATIONS SERVICE, INC.

"We Specialize in Towers"
Complete Tower and Antenna
Installation and Service

P.O. Box 3827, 15201 Hickman Road
Des Moines Iowa 50322 (515) 278-5501

Joseph & Donna Roizen VIDEO CONSULTANTS

International TV Systems
Marketing/Technical Writing
800 Weich Rd., Suite 354
Palo Alto, Ca. 94304
Tel (415)326-6103

advertisers' index

Accurate Sound Corp.	82
Aderhold Construction Co.	88
Alexander Manufacturing Co.	78
Allied Broadcast Equip.	87
American Data Corp.	7
Amperex Electronic Corp.	27
Ampex Corp.	20, 21
Ampro Broadcasting, Inc.	16
Andrew Corp.	39
Angenieux Corp.	35
Asaca Corp. of America	13
Audio Designs & Manufacturing	17
Audio-Video Engineering Co.	75
Belar Electronics	83
Broadcast Electronics, Inc.	42
Broadcast Products Division	
UMC Electronics Co.	18, 72
Canon, USA, Inc.	49
Cetec Broadcast Group	14, 15
Commercial Electronics, Inc.	63
Comrex Corp.	66
Consolidated Video Systems	61
Continental Electronics Mfg., Co.	86
Datatek Corp.	19
Digital Video Systems	Cover 3
Dimension 3 Recording Co.	87
Dyma Engineering	88
Dynair Electronics, Inc.	47
ESE	60, 83
Electro-Voice, Inc.	30, 31
Frezolini Electronic, Inc.	72
Garner Industries	82
General Electric Video Display	
Equipment Op.	58
The Grass Valley Group	3
Harris Corp.	65
Hitachi-Denshi America, Ltd.	41
Ikegami Electronics, Inc.	45
Inovonics, Inc.	75
International Microwave Corp.	87
Johnson Electronics	76
Kliegl Bros.	84
Knox, Ltd.	52
Lenco, Inc. Electronics Div.	51
Leitch Video, Inc.	37
3M Magnetic Tape/MBU Video Tape	24, 25
Marconi Electronics, Inc.	73
Martel Electronics	80
Micro Consultants, Inc.	55
Micro Control Associates	78
Moseley Associates, Inc.	76
NEC America, Inc.	53
Rupert-Neve, Inc.	11
Panasonic Technics Div.	59
Philadelphia Resins Corp.	26
Philips Broadcast Equipment Corp.	23
Philips Test & Measuring Instruments	60
Potomac Instruments	85
ROH Corp.	44
Ramko Research	43
Recortec, Inc.	82, 83
Sencore, Inc.	22
Shintron Company, Inc.	12, 66, 74
Sintronix Corp.	74
Sitler's Supplies, Inc.	88
Sony Corp. of America	8, 9
Sound Dynamics	86
Studer ReVox America	29
Tele-Cine	67
Telex Communications, Inc.	38, 84, 77
TerraCom	81
Thompson CFS Laboratories, Inc.	71
Time & Frequency Technology, Inc.	5
UMC Electronics Company	
Broadcast Products Div.	18, 72
Utah Scientific, Inc.	46
Video Aids Corp. of Colorado	28
Videomagnetics	57
Videomax Div., Orrox Corp.	1
Vital Industries, Inc.	Cover 4
Ward-Beck Systems Ltd.	Cover 2
Waters Manufacturing, Inc.	84
Wilkinson Electronics, Inc.	88, 89
World Video, Inc.	86

BUILDS STUDIO

*AUDIO CONSOLES
*STUDIO CABINETS

DYMA

DYMA

BOX 1697
TAOS, N.M. 87571
505 758-2686

For More Details Circle (83) on Reply Card

BUILD A BETTER STATION

Call Aderhold Construction Company. A complete construction management team of architects, builders, engineers and designers. No problem too large or too small. 404/233-5413.



Aderhold Construction Company

3384 Peachtree Rd. NE/Atlanta, Georgia 30305
For More Details Circle (86) on Reply Card

50% OFF

G. E. & Sylvania

STAGE & STUDIO LAMPS

At Sitler's you pay
LIST PRICE LESS 50%

All transportation prepaid on \$100.00 or more net orders. Your satisfaction guaranteed. Order today, or write for Sitler's complete price sheet!

Sitler's SUPPLIES, INC.

702 E. Washington St., P.O. Box 10-A
Washington, Iowa 52353 Ph. 319-653-2122

For More Details Circle (105) on Reply Card

classified

Advertising rates in Classified Section are cents per word, each insertion, and must be accompanied by cash to insure publication. Each initial or abbreviation counts a full word. Minimum classified charge, \$4.00.

For ads on which replies are sent to us forwarding (blind ads), there is an additional charge of \$5.00 per insertion, to cover document number, processing of replies, and mailing costs.

Classified columns are not open to advertisement of any products regularly produced by manufacturers unless used and no longer owned by the manufacturer or a distributor.

TRAINING

FIRST PHONE in six to twelve weeks the tape recorded lessons at home plus one personal instruction in Boston, Philadelphia, Detroit, Atlanta, St. Louis, Seattle or Los Angeles. Our twentieth year teaching FCC courses. Bob Johnson Radio License Preparation, 1201 Ninth, Manhattan Beach, Calif. 90404 Telephone 213-379-4461.

GET YOUR FIRST TO GET THERE FIRST! MARTIN SCHOOL OF COMMUNICATIONS/1937, training Broadcasters for Broadcasting Phone training using latest methods and completely equipped Transmitter studio. Call for details and start dates. Don Martin Sr. 7080 Hollywood Blvd., 5th floor, Hollywood 90028. Call (213) 462-3281 or (213) 657-5866.

TRAINING (Cont.)

FCC first and second class exams with 1-lesson, 450-page course. Starts with electricity. Over 600 FCC-type, multiple-choice questions and sample exams included. No technical knowledge required. **Com** Radio Operator Theory Course, #15-01. \$5.95. Ameco Publishing, 275G Hillside Williston Park, N.Y. 11596. 8-72-1f

FCC EXAMS with Ameco books. Each contains FCC questions plus simplified plus FCC-type exams and answers. 3rd includes broadcast endorsement \$1.25. 2nd \$2.50, 1st class \$1.60. Free catalog. Ameco Publishing, 275G Hillside Ave., Williston Park, 11596. 8-72-1f

ers intensive but quality instruction for 1st and class FCC license preparation. State and for Veterans training. Student housing. 2402 Tidewater Trail, Fredericksburg, Va. 22401 or Phone 703-373-1441. 7-77-8f

THAM'S FCC LICENSE STUDY GUIDE—377 16 FCC-type practice tests, 1465 questions with answers and discussions—covering second, and first class license exams. \$2.50. GSE Publications, 2000 Stoner Los Angeles, CA 90025. 10-77-1f

RONICS DEGREE by correspondence. No coming to class. Study at your own pace. with basics and continue, first for A.S.E.T. then for B.S.E.E. For free brochure, write to Enrollment Desk, Grantham College of Engineering, 200 Stoner Avenue, Los Angeles CA 90025. 10-77-1f

HELP WANTED

urgence Corporation, the lead- manufacturer of Editing Control Systems, has the following employment opportunities immediately available:

REGIONAL SALES POSITIONS—Experi- ented sales managers wanted to assume responsibility for regional dealer/distributor and post production equipment. Requires background in video sales representing a manufacturer—TV production background helpful. BS in Engineering and/or selling and five years field sales experience preferred.

Salary/commission plan.

PUTER SOFTWARE DESIGNER—Out- standing opportunity for an aggressive top computer software designer who wants to advance his career. MSEE degree plus a minimum of five years experience in software development and development required. Prefer candidates who have high technology television broadcast experience. Strong management background necessary to be considered.

JECT MANAGER—Immediate need for an individual with extensive project management experience in high technology and video disciplines to head-up a new product development team.

Qualified candidate must have an MSEE degree and five years experience, or BSEE degree and 10 years experience.

Include excellent starting salaries commensurate with ability and experience. Benefit package which includes life, dental and dental insurance.

Qualified applicants submit your resume and recent salary history, in complete confidence to:

urgence Corporation, Personnel Department, 17935 Sky Park Circle, Irvine, CA 92714.

An Equal Opportunity Employer

SION—CCTV Video Maintenance Tech- nician. Full Benefits. Greater New York, Suffolk or New Jersey Area. Send resume to: P.O. Box 268, New Hyde Park, N.Y. 11040. 6-77-1f

HELP WANTED (CONT.)

ENGINEERING POSITIONS (\$15,000-\$40,000)— Openings at all locations coast to coast—all levels and disciplines. Over 1,000 firms represented. To cover ALL your immediate job possibilities in the "unpublished" market, send your resume with salary requirements now. No fee, confidential, professional. **KEY PERSONNEL, NATIONAL HEADQUARTERS,** South Main Towers, Wilkes-Barre, Pa. 18701, (717) 822-2196. 1-78-TFN

REMOTE TV ENGINEER. For studio and remote operations. FCC license required. Must have technical and operating background. Send resume and salary requirements to: Chief Engineer, WTCG-TV, 1018 West Peachtree St., Atlanta, Georgia 30309. 1-78-2t

TRANSMITTER SUPERVISOR—With minimum 3 years experience for an AM 5 KW 3 Tower directional. Break-in period can start immediately. Send resume to Chief Engineer, WMCA, 888 7th Avenue, N.Y., N.Y. 10019. An Equal Opportunity Employer. 12-77-2

AV TECHNICIAN: Immediate opening at Northeastern University. Will perform a variety of mechanical and electronic troubleshooting, diagnosis, repair and calibration operations on an AV CCTV microwave transmission equipment and synchronizing generators calibrated to FCC standards. Requires thorough knowledge of the technical field of electronics with training equivalent to two years of technical college. Need first class FCC radio-telephone license. Excellent salary and benefits including free college tuition. Send resume and salary history to K. B. Keeler, 101 Hayden Hall, Northeastern University, Boston, MA 02115. An Equal Opportunity/Affirmative Action Title IX University. 1-78-1t

WANTED: AN ELECTRONICALLY ORIENTED WHIZ KID. Combination videotape editor and maintenance man for offline system. We are a hot shop producing national commercials and shows. Only the best will do. All replies confidential. Send resume to: Bob Kiger, Videography Company, 8440 Santa Monica Blvd., Los Angeles, Ca. 90069. Salary Open. 1-78-1t

CHIEF ENGINEER/FM RADIO—Excellent career opportunity for FCC First Class Engineer—Major Broadcast Group, excellent benefits, 100,000 Watt Stereo. Should be experienced in transmitter work, STL and have strong audio background. Salary open depending on experience and ability. Equal Opportunity Employer. Contact 813-576-0950 between 9AM-5:30PM or P.O. Box 20147, St. Petersburg, Fla. 33742. 1-78-1t

VIDEO AND AUDIO ENGINEERS needed immediately for expanding tele-production facility. Experience with remote, commercial and sports productions preferred. Submit resumes to Dept. 399, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212. 12-77-2t

ASSISTANT CHIEF ENGINEER OF MAINTENANCE, independent videotape production facility. Emphasis on digital controlled equipment. Send resume and salary requirements to Dept. 400, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212. 12-77-2t

TELEVISION ENGINEER: KNMT-TV, Walker, Minnesota, NBC affiliate has opening for Engineering Supervisor. Person must be fully experienced in maintenance of studio, transmitter and microwave equipment. Permanent position in beautiful lake area. Excellent benefits. Address resume and salary requirements to Carl Iverson, Chief Engineer, KCMT-TV, Alexandria, Minnesota 58308. An Equal Opportunity Employer. 1-78-1t

WANTED: Combo-man with engineering ability, FCC First Class, able to maintain automation system and stereo FM operation. Contact Manager, WDBI-FM, Tawas City, Michigan. 1-78-2t

MANUFACTURERS REPRESENTATIVES. Ramko Research Inc., a major manufacturer of audio consoles and professional broadcast equipment is presently establishing a Rep. sales force. Exclusive territories are available in most areas. Send resume and line list to Jack M. Ducart, Sales/Marketing Mgr., Ramko Research, 11355-A Folsom Blvd., Rancho Cordova, Ca. 95670. 12-77-2t

HELP WANTED (CONT.)

TELEVISION ENGINEERING technician needed for new corporate communications center. Must be capable of operation/maintenance of color studio, EFP, quad, helical and editing facilities. 30% travel required. Reply with salary history to R. J. Hope, P.O. Box 538, Allentown, PA 18105. 1-78-1t

VIDEO MAINTENANCE and production engineer. Three job openings in industrial video production facilities. Various locations. Job requires extensive experience with helical or quad equipment, both set up and maintenance. Outstanding organizations. Opportunity for growth and advancement. Salary \$16,000 to \$25,000. Send resume, job objective and salary history to Willard Thomas, Organizational Media Services, 13904 South State Street, Riverdale, Ill. 60627. 12-77-1t

DIRECTOR OF ENGINEERING—Centrally located top fifty market equal opportunity employer. AM-FM-TV with subsidiary production company. Ideal career opportunity for number two person in major market who is now ready to assume complete responsibility for the total radio-TV technical operation, including supervising a staff of fifty-five. A degree and a minimum of five years experience in technical management of radio and TV are required. Salary is commensurate with experience. Excellent fringe benefits. Position is available immediately. Send a complete resume detailing experience, education, technical qualifications and salary requirements to Dept. 406, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212. 1-78-1t

UNIT SUPERVISOR. Major west coast video production facility needs experienced mobile unit Supervisor. Complete responsibility for equipment and crew performance as well as client interface on location shoots. State of the art cameras and video tape equipment. Send resume and salary requirements to Dept. 405, Broadcast Engineering, Box 12901, Overland Park, KS 66212. 12-77-2t

WE ARE PRESENTLY SEEKING a competent maintenance technician to occupy a supervisory position at our remote controlled transmitter. Studio experience helpful; professionalism necessary. Call 304/525-7661. Equal Opportunity Employer. 12-77-1f

CHIEF ENGINEER—quality oriented—for AM Directional and High Power FM station. Formal electronics training required. Send detailed resume and salary requirements to: Director Engineering, Box 6002, Roanoke, Virginia 24017. 1-78-2t

WE ARE LOOKING FOR A FIRST RATE EXPERIENCED TECHNICIAN capable of caring for a wide range of modern equipment in a large network affiliate. Must have a solid technical background and be heavy on EXPERIENCE in most of the following: cameras, switchers and production facilities; transmission equipment and microwave; quad and helical VTR; audio mixing and recording equipment; digital devices; E.N.G., etc. First Phone required. Swing and some night shifts. Send full resume to Bob Plummer, KOMO-TV, 100-4th Ave. No., Seattle, Wa. 98109, (206) 223-4027. Equal Employment Opportunity Employer. 12-77-3t

UNIT SUPERVISOR. Major west coast video production facility needs experienced mobile unit supervisor. Complete responsibility for equipment and crew performance as well as client interface on location shoots. State of the art cameras and video tape equipment. Send resume and salary requirements to Dept. 405, Broadcast Engineering, Box 12901, Overland Park, KS 66212. 12-77-2t

CHIEF ENGINEER for University telecommunications center. Will have technical responsibility for modern broadcast TV, FM and CCTV facility. Qualifications include: BS in related field, demonstrated state of the art technical knowledge, leadership ability, and FCC first. Equal Opportunity Employer. Send resume, references and salary requirements to: Dept. 407, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212. 1-78-2t

EQUIPMENT FOR SALE

MOTORS FOR SPOTMASTERS

NEW Paps hysteresis synchronous motor HSZ 20.50-4-470D as used in series 400 and 500 machines. Price \$49.00 each prepaid, while they last. 90 day warranty. Terms check with order only, no COD's. Not recommended for Tapecaster series 600 or 700.

TAPECASTER TCM, INC., Box 662
Rockville, Maryland 20851

1-72-1f

MICA AND VACUUM transmitting capacitors. Vacuum relays. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 305 Wisconsin Ave., Oceanside, Ca 92054, (714) 722-6162.

3-76-1f

RAZOR BLADES—Single Edge, Tape Editing, Raltec, 25884B Highland, Cleveland, Ohio 44143.

4-77-12f

CARTRIDGE LABELS: New, non-smear pressure sensitive labels. Fits all cartridges. Comes white & 4 colors. Write for FREE sample—MASTERTONE COMPANY, 1105 Maple, West Des Moines, Iowa 50265, (515) 225-6122.

8-77-1f

BROADCAST CRYSTALS for AM, FM or TV transmitters, frequency change, repair or replacement of oven types. Also vacuum types for RCA, Gates, Collins, etc. transmitters. Quality products, reasonable prices and better delivery! Don't be without a spare crystal. Frequency change and service for AM and FM monitors. Over 30 years in the business. Eidson Electronic Co., Box 96, Temple, Texas 76501. Phone (817) 773-3901.

12-74-1f

BROADCAST AND STUDIO EQUIPMENT. New and used. Cart and reel recorders, consoles, limiters, monitors, mic's, turntables, preamps, speakers, racks, furniture, reconditioning services, parts (including PT6). Authorized Spotmaster distributors. Contact us for best prices and trade-in deals. AUTODYNE, P.O. Box 13036, Orlando, Fla. 32809, (305) 855-6868.

9-77-1f

AUTOMATION SPARE PARTS for 500 system Automation. SESCO Inc., Mt. Vernon, WA 98273, (206) 424-6133.

10-77-4f

RCA TK-42 COLOR CAMERAS—Top working condition cable, lens, enhancers, power supply, control units, etc. Only \$5,900.00 ea. Originally sold at \$85,000.00 ea. LDH-20 available, complete; FACTORY NEW or demonstrator LEAD-OXIDE TUBES, TRANSMITTING TUBES, QUARTZ LAMPS offered at big discounts. Temtron Elec., (212) 978-5896 or T.F. 800-221-8376.

1-78-1f

TWO AMPEX VR-3000 Portable High Band Videotape Recorders, with three video heads, battery packs, battery chargers and body braces. Top operating condition and sensibly priced. Videocom, 617-329-4080.

12-77-2f

SONY D-100's. Grass Valley Switcher, Norelco Audio Console, Time Base Corrector and Datatron Editing Controller. Reasonably priced. Call 202-783-2700.

1-78-1f

TWO AVR-1's—One with editor. One Ampex VR2000C fully loaded. CMX 300 system also available. For information write Dept. 404, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212.

12-77-2f

BROADCAST AUDIO FROM STOCK. Scully, UREI, Revox, Spotmaster DBX, Shure, Electro-Voice, AKG Russco, Micro-Trak, Technics Beyer, Stanton, and much more from stock. WRH, Five Industrial Way, Riverside, RI 02915. Phone (401) 434-6272 today. Ask for our free lines card. 1-78-1f

IKEGAMI HL-331A FOR SALE. Includes 3 Frezzolini batteries, 1 charger, various lengths of camera cable, aluminum travel cases. New 10/75. 212-532-3193.

1-78-1f

REWARD

REWARD: INFORMATION LEADING TO ARREST AND CONVICTION of person or persons involved in theft of TK-76 camera, Serial #01261 and/or OM-8-A Audio Console, Serial #1165. Broadcast Engineering Company, Inc., 3000 West Alameda Avenue, Burbank, California 91523. Telephone: 845-7000, Ext. 2346.

12-77-2f

EQUIPMENT FOR SALE (CONT.)

GATES MO-2839 MODULATION MONITOR. \$100. Assorted Maggie PT-6 decks & amps for parts, make offer. 2 Gates SA-40 consoles, in service. IGM model 400 real time module, brand new. 4-K Radio, Inc., Box 936, Lewiston, Idaho 83501.

1-78-1f

LIGHTING DIMMER SYSTEM for sale. 32 - 3K dimmers, 32 faders with 16 preset memory console. Packed for touring. Must sell! BC & G Enterprises, P.O. Box 1036, Littleton, Colorado 80160, (303) 751-5991.

1-78-1f

REPLACEMENT PREAMPLIFIER for OTARI ARS-1000 tape deck. Highest quality, multiturn level adjustment, American I.C. in socket, glass P.C. board. \$80.00. Iowa Development Labs, Box 1913, Iowa City, Iowa 52240.

1-78-2f

FOR SALE OR TRADE: Teac tape recorder #A3340, 250' of 7/8" coaxial cable with hardware, Mosley Stereo Generator #SCG-3T, CBS Audimax III S, and Volumax 411. WTAO-FM, Rt. 5, Box 286, Murphysboro, Ill. 62966.

1-78-1f

FREQUENCY MONITOR—Gates AF-80 Digital Readout, Rack mount AM frequency monitor—Never used. Gates says freq. can be set for any freq. from 540-1600 KHz. by changing internal jumpers. Now tuned to 1240 KHz. Make offer. Tri-Tronics, P.O. Box 1067, Lillington, NC 27546.

1-78-1f

WANTED

WANTED: All surplus broadcast equipment especially clean A.M. & F.M. transmitters, capacitors, 112 Clark & Potomac Phase monitors, Field Strength Meters, etc. High prices. All custom duties paid. Surplus Equipment Sales at 2 Thorncliffe Pk. Dr., Unit 28, Toronto 17, Ont., Canada (416) 421-5631.

1-76-1f

WANTED: 4W20,000A tubes. Lloyd Erickson, Phone 701/282-0444.

1-78-1f

WANTED: 250-500 watts FM stereo transmitter. WTAO-FM, Rt. 5, Box 286, Murphysboro, Ill. 62966.

1-78-1f

WANTED: Pre-1926 radio equipment and tubes. August J. Link, Surcom Associates, 305 Wisconsin Ave., Oceanside, Ca. 92054, (714) 722-6162.

3-76-1f

WANTED TO BUY: Will pay cash for your excess tubes of any description; transmitting, klystrons, receiving, camera vidicons, lead-oxide, I.O.'s, etc. Can also use 1 watt microwave, RCA or equal; cameras and equipment. Reply to S & M Associates, 1231 Waterview Street, Far Rockaway, New York 11691.

1-78-1f

AMPEX VR2000, 1200, 1100 or AVR series to rent for at least six months or to buy. We will move, install and return machine. Mr. Lindsey, One Pass Video, Inc., 900 Third Street, San Francisco, California 94107. (415) 777-5777, collect.

12-77-2f

WANTED: Student radio station desires donations of studio and technical equipment of all types for AM and/or CA FM broadcasting. Donations will be acknowledged for tax purposes. Contact: WNDR Radio, Penn State University, Capitol Campus, Middletown, Pa. 17057.

1-78-1f

WANTED—10 WATT FM EXCITER or transmitter antenna, studio equipment, and coaxial cable for a black community center. Donations are tax deductible. Contact Mr. H. Johnson, Booker T. Washington Center, 24 Chapman Ave., Auburn, New York 13021, (315) 252-1842.

12-77-2f

WANTED: AMPEX VR 2000, 1200, 1100 or AVR series to rent for at least six months or to buy. We will move, install and return machine. Mr. Lindsey, One Pass Video, Inc., 900 Third Street, San Francisco, California 94107. (415) 777-5777, collect.

12-77-2f

NON PROFIT TAX EXEMPT ORGANIZATION about to build Christian FM radio station. Welcome contributions of good used equipment. Sound of Life Incorporated, 37 Henry Street, Kingston, N.Y. 12401.

1-78-1f

SERVICES

FREQUENCY MEASURING SERVICE—WEI—MONITOR REPAIRS—MOBILE UNIT—Northern 1/2 Ill., Eastern Iowa, Eastern 1/2 Southern 1/2 Wis., Western Mich., and W. Ind., monthly. Radio Aids, 528 Ravine Ave., Bluff, Illinois 60044, (312) 234-0953.

COMMERCIAL RADIO MONITORING CO. sion frequency measurements since 1932, and mobile service covering entire midwest. Test instruments, counters, monitors repaired and certified. Lee's Summit, Mo. 64063. 524-3777

ONE STOP FOR ALL YOUR PROFESSIONAL AUDIO REQUIREMENTS. Bottom line on F.T.C. Brewer Company, P.O. Box 8057, Fort Col., Florida 32505.

HELIAX-STYROFLEX. Large stock—best prices—tested and certified. Write for price stock lists. Sierra Western Electric, Box 1, Oakland, Calif. 94623. Telephone (415) 832-1111

BUILD YOUR OWN TV AND RADIO PRODUCTION EQUIPMENT. Easy, inexpensive (no IC). Plans or kits: Special Effects Generator, Automatic Logger, Vertical Interval Video Switcher, Solid State Lighting Board, Preset Video Board, Preset Lighting Board, Crystal Controlled Wireless Mikes with Matching remote Subsonic Tone Control for audio tapes, SOF Cameras and Projectors, Distribution Amplifiers (Sync. Video, Audio), Audio Control Board (Studio & Remote) Proc-Amp with compression and regeneration for adapting Helical Scan to broadcast standards. PLUS specialized correspondence courses in TELEPHONE ENGINEERING (\$39.50), and Integrated Circuit ENGINEERING (\$49.50). Plans from \$5.95 to \$15.50. CATALOG plus years updating of new devices. Mailed \$1.00. Don Britton Enterprises, Drawer G, Waikiki, Ha. 96815.

CARTRIDGE RECONDITIONING SERVICE—CLEANING—NEW PARTS—NEW TAPE. 12 Experienced Personnel. Write for additional information & price sheet. MASTERTONE CO., NY, 1105 Maple, West Des Moines, Iowa 50265. 515-225-6122.

SAVE HUNDREDS OF DOLLARS on high dependable, American Made, MATV Head-V/V, U/V Converters, Camera Modulator factory-direct prices. Send \$5.00 (or your installers Letterhead). "Information," Box Boynton Beach, Fla. 33435.

1-78

TOWER PAINTING AND LIGHTING: Service maintenance contracts offered. Pioneer Service, P.O. Box 253, Carrollton, Miss. 64633, (816) 542-0840.

Broadcast engineering.

Regional advertising sales offices

Indianapolis, Indiana—Roy Henry, 2469 E. St., Indianapolis, Ind. 46280, (317) 846-7026

New York, New York—Stan Osborn, 60 E. St., Room 1227, New York, N.Y. 10017, 687-7240

Mountain View, California—Dennis Triola, Bayshore Frontage Rd., Room 102, Mountain View, Ca. 94043, (415) 961-0378

London W.C. 2, England—John Ashcraft & 12 Bear St., Leicester Square, 930-0525

Badhoevedorp, Holland—John Ashcraft & John J. Lucassen, Mgr., Sloterweg 303, 6226

Tokyo 1, Japan—International Media Representatives, Ltd., Shiba-Kotohiracho, Minatoku, 0656

BROADCAST engineering.

For issue of January 1978—Use until April 1, 1978

After that date please contact manufacturer direct.

Use this handy card for more information on the products described.

Name _____ Title _____

Station or Company _____

Address/City _____

State _____ Zip _____ Phone (____) _____

3	25	37	49	61	73	85	97	109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
4	26	38	50	62	74	86	98	110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
5	27	39	51	63	75	87	99	111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
6	28	40	52	64	76	88	100	112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316
7	29	41	53	65	77	89	101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305	317
8	30	42	54	66	78	90	102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306	318
9	31	43	55	67	79	91	103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307	319
0	32	44	56	68	80	92	104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308	320
1	33	45	57	69	81	93	105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309	321
2	34	46	58	70	82	94	106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310	322
3	35	47	59	71	83	95	107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311	323
4	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324

Please check every section which applies to you.

BUSINESS OR OCCUPATION

- ☐ A. AM Radio Station
☐ B. FM Radio Station
☐ C. TV Station
☐ D. ETV Station
☐ E. CATV Facility
☐ F. CCTV Facility
☐ G. Consulting Engineer
☐ H. Educational Radio
☐ I. Recording Studio
☐ J. Distributor
☐ K. Government Agency
☐ L. Corporate Officer
☐ M. Technical
☐ Management/Engineering
☐ N. Other Management
☐ O. Other (specify) _____

READER SERVICE CARD

BROADCAST engineering.

For issue of January 1978—Use until April 1, 1978

After that date please contact manufacturer direct.

Use this handy card for more information on the products described.

Name _____ Title _____

Station or Company _____

Address/City _____

State _____ Zip _____ Phone (____) _____

3	25	37	49	61	73	85	97	109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
4	26	38	50	62	74	86	98	110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
5	27	39	51	63	75	87	99	111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
6	28	40	52	64	76	88	100	112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316
7	29	41	53	65	77	89	101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305	317
8	30	42	54	66	78	90	102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306	318
9	31	43	55	67	79	91	103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307	319
0	32	44	56	68	80	92	104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308	320
1	33	45	57	69	81	93	105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309	321
2	34	46	58	70	82	94	106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310	322
3	35	47	59	71	83	95	107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311	323
4	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324

Please check every section which applies to you.

BUSINESS OR OCCUPATION

- ☐ A. AM Radio Station
☐ B. FM Radio Station
☐ C. TV Station
☐ D. ETV Station
☐ E. CATV Facility
☐ F. CCTV Facility
☐ G. Consulting Engineer
☐ H. Educational Radio
☐ I. Recording Studio
☐ J. Distributor
☐ K. Government Agency
☐ L. Corporate Officer
☐ M. Technical
☐ Management/Engineering
☐ N. Other Management
☐ O. Other (specify) _____

READER SERVICE CARD

BROADCAST engineering.

For issue of January 1978—Use until April 1, 1978

After that date please contact manufacturer direct.

Use this handy card for more information on the products described.

Name _____ Title _____

Station or Company _____

Address/City _____

State _____ Zip _____ Phone (____) _____

3	25	37	49	61	73	85	97	109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
4	26	38	50	62	74	86	98	110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
5	27	39	51	63	75	87	99	111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
6	28	40	52	64	76	88	100	112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316
7	29	41	53	65	77	89	101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305	317
8	30	42	54	66	78	90	102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306	318
9	31	43	55	67	79	91	103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307	319
0	32	44	56	68	80	92	104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308	320
1	33	45	57	69	81	93	105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309	321
2	34	46	58	70	82	94	106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310	322
3	35	47	59	71	83	95	107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311	323
4	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324

Please check every section which applies to you.

BUSINESS OR OCCUPATION

- ☐ A. AM Radio Station
☐ B. FM Radio Station
☐ C. TV Station
☐ D. ETV Station
☐ E. CATV Facility
☐ F. CCTV Facility
☐ G. Consulting Engineer
☐ H. Educational Radio
☐ I. Recording Studio
☐ J. Distributor
☐ K. Government Agency
☐ L. Corporate Officer
☐ M. Technical
☐ Management/Engineering
☐ N. Other Management
☐ O. Other (specify) _____

PLACE
FIRST CLASS
POSTAGE
HERE

BROADCAST engineering

P.O. Box 17252
Denver, CO 80217

Attn: Engineers Tech Data Dept.

PLACE
FIRST CLASS
POSTAGE
HERE

BROADCAST engineering

P.O. Box 17252
Denver, CO 80217

Attn: Engineers Tech Data Dept.

PLACE
FIRST CLASS
POSTAGE
HERE

BROADCAST engineering

P.O. Box 17252
Denver, CO 80217

Attn: Engineers Tech Data Dept.

BROADCASTENGINEERING

P.O. Box 12901, Overland Park, Kansas 66212

FREE Subscription Form

IMPORTANT Do you wish to receive or continue receiving your free subscription?

Check One ☐ Yes ☐ No

To qualify fill out and return this form without delay. This information is needed for circulation verification and general marketing profiles. Your cooperation is appreciated.

Name Title

Station or Co.

Street

State Zip

Signature is required

NOTE: To continue receiving your free subscription, complete this form **ONLY** if:

(1) You have not previously done so within the current calendar year.
OR

(2) Your job situation, title, or address has changed.

You need to complete this form only **ONCE A YEAR** to remain on the subscription list.

If this is an address change, affix label

Is this your business address? ☐ Yes ☐ No
If not, please give us your business address below so that we can avoid sending duplicate copies

Name

Station or Co.

Street

City State Zip

TO QUALIFY, PLEASE COMPLETE THE FOLLOWING:

1. Please check your **PRIMARY** business classification

Check one only:

☐ V & AM & FM Station

☐ V & AM STATION

☐ V & FM Station

☐ M & FM Radio Station

☐ M Radio Station

☐ M Radio Station

☐ V Station, Commercial

☐ V Station, Educational

☐ Campus limited Radio Station

☐ CATV with studio facility

☐ FS, Microwave

☐ Recording Studio

☐ Teleproduction Facility, Film

☐ Teleproduction Facility, Video

☐ Consulting Firm (Engineering or Technical)

☐ Government Agency

☐ Dealer or Distributor of Broadcast Equipment

☐ CATV (If you check this category,

please answer details listed in 1(b) below.)

Other: Specify

2. Check the category that best describes your title.

☐ **Corporate Management.** This includes Board Chairman, President, Owner, Partner, other corporate management title, administrative official or corporate director, general manager (administration).

☐ **Technical Management & Engineering.** This includes technical director, chief engineer, engineering supervisor or director, engineer/technician or other engineering and technical job responsibilities.

☐ **Operations Management.** This includes station manager, production manager, program manager, general manager of operations (not administrative).

☐ **Other: Specify**

3. Does your occupational responsibility extend to more than one station or facility?

Yes ☐ No ☐

4. If none of the foregoing businesses or occupational categories fits your situations, please describe specifically your occupation or interest in BROADCAST ENGINEERING magazine:

5(a). Check the statement that best describes your role in the purchase of major communications equipment, components and accessories:

Make final decision to buy a specific make or model

Recommend make or model to be purchased

Have no part in specifying or buying

5(b). Is specifying and buying major equipment, components and accessories a group or committee activity in your facility?

Yes ☐ No ☐

5(c). If the response to the foregoing question is yes, indicate whether you are an active member of the committee or group.

Yes ☐ No ☐

6. Check your CCTV Applications:

☐ Business or Commercial

☐ for personnel & sales training)

☐ Industrial (for monitoring

☐ production & control applications)

☐ Security (surveillance)

☐ Educational or Instructional

☐ Academic or vocational institutions)

☐ Medical/Hospital

Other: specify

THANK YOU, NOW PLEASE FOLD, SEAL AND MAIL.

PLACE
FIRST CLASS
POSTAGE
HERE

BROADCASTengineering

P.O. BOX 12901

OVERLAND PARK, KANSAS 66212

Attn: Evelyn Rogers

Just fold, seal with tape, and mail - please **do not staple**...Post Office will not deliver.

BROADCASTengineering

BROADCAST ENGINEERING is directed to key persons actively involved in planning, managing, and operating broadcast facilities, recording studios, studio originating cable TV and non-commercial systems.

You are required to renew your free subscription periodically and this subscription verification form is provided for your convenience in doing so. You must fill in all appropriate spaces, date and sign this card in order to start or renew your subscription.

First in a new advanced class of digital processors!

The DPS-1
by Digital Video Systems.



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

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

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

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

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

Ask us for full details.



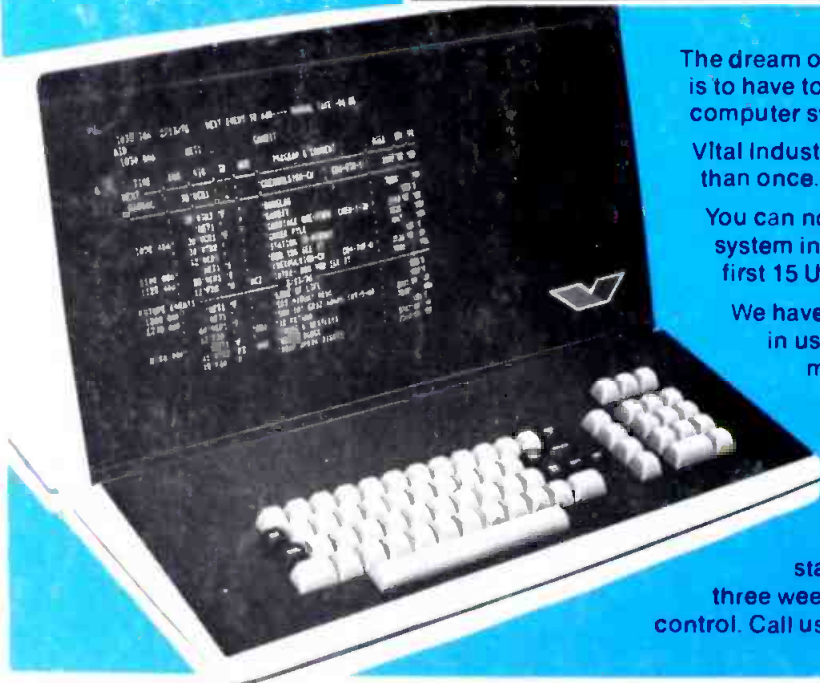
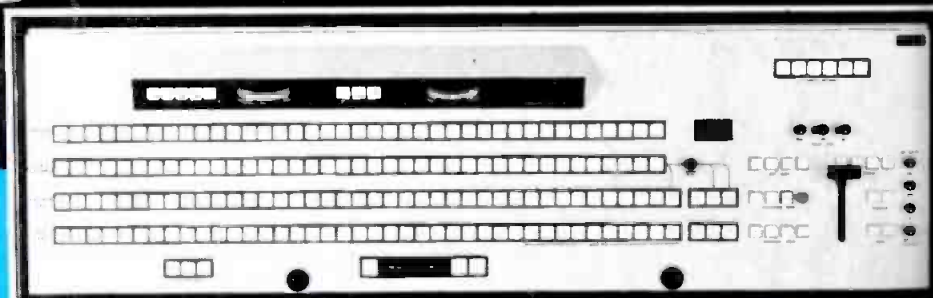
digital
video
systems

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

For More Details Circle (1) on Reply Card

Telephone: (416) 499-4826

THE VITAL BUSINESS CONNECTION MAKES TV AUTOMATION TOTAL = VIMAX-200



The dream of every TV broadcast station management is to have total automation married with a business computer system with minimum interruptions.

Vital Industries, Inc. has done it, and done it more than once.

You can now see our actual total TV automation system in use in one of several TV stations in the first 15 US TV markets.

We have over 30 technical automation systems in use since 1972. This total experience makes it also possible for us to offer a building block approach of a 32 event preset system to stations as a first step towards total automation.

We have installed a complete automation system, connected it to a business service, and trained station personnel to operate it in less than three weeks. We've got total TV automation under control. Call us toll free. 1-800-874-4608



VITAL INDUSTRIES, INC.
A HIGH TECHNOLOGY COMPANY

MAIN OFFICE: 3700 N.E. 53rd Ave., Gainesville, Fla. 32601 • Phone 904/378-1581

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

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

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

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

BARRY HOLLAND West C
7960 West Beverly Blvd
Los Angeles, California 90
Phone 213/653-9438

For More Details Circle (2) on Reply Card