October, 1977/75 cents

# Broadcast engineering®



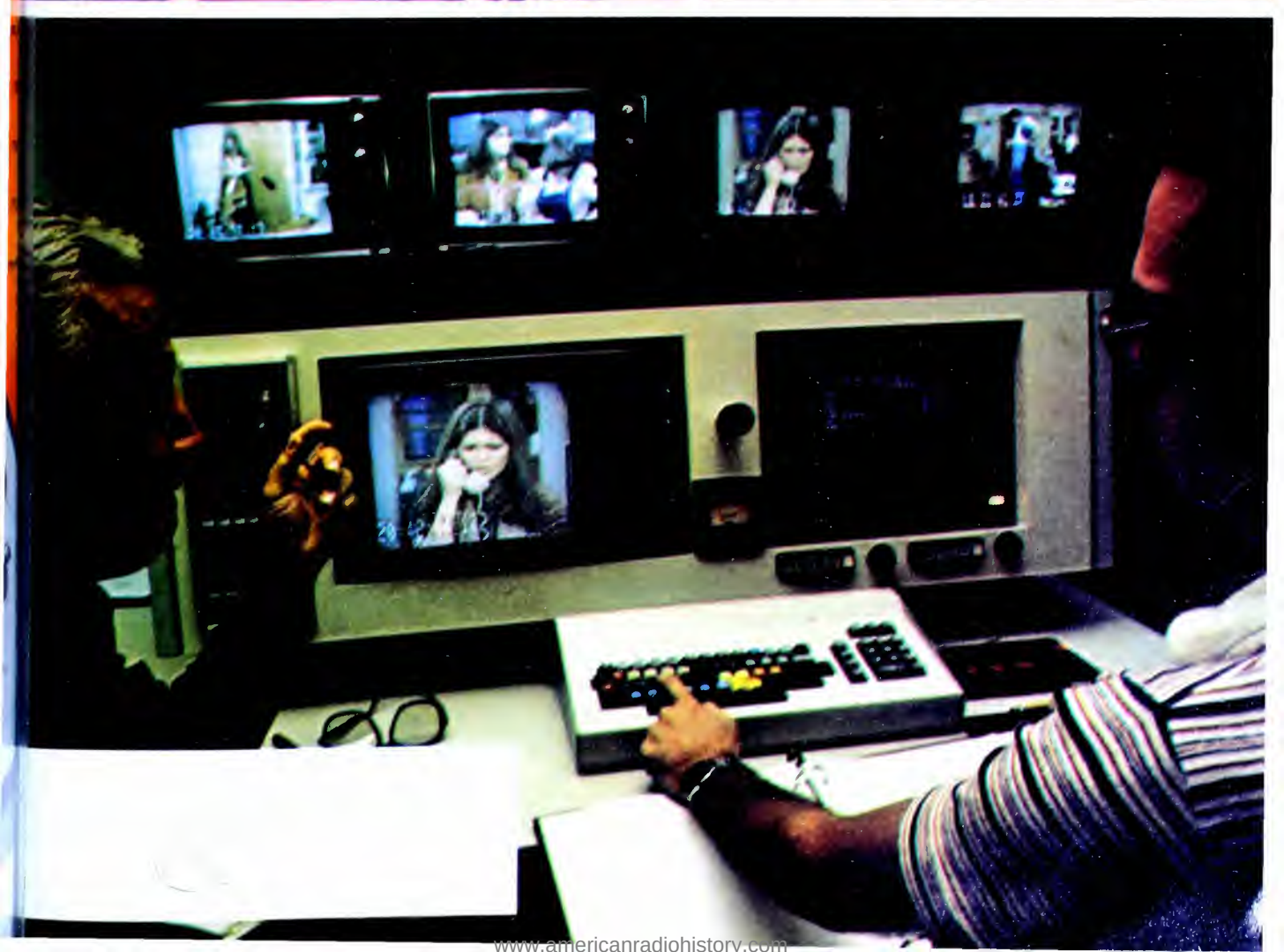
## POST PRODUCTION:
*one frame at a time*

Page 21

Automated Switching

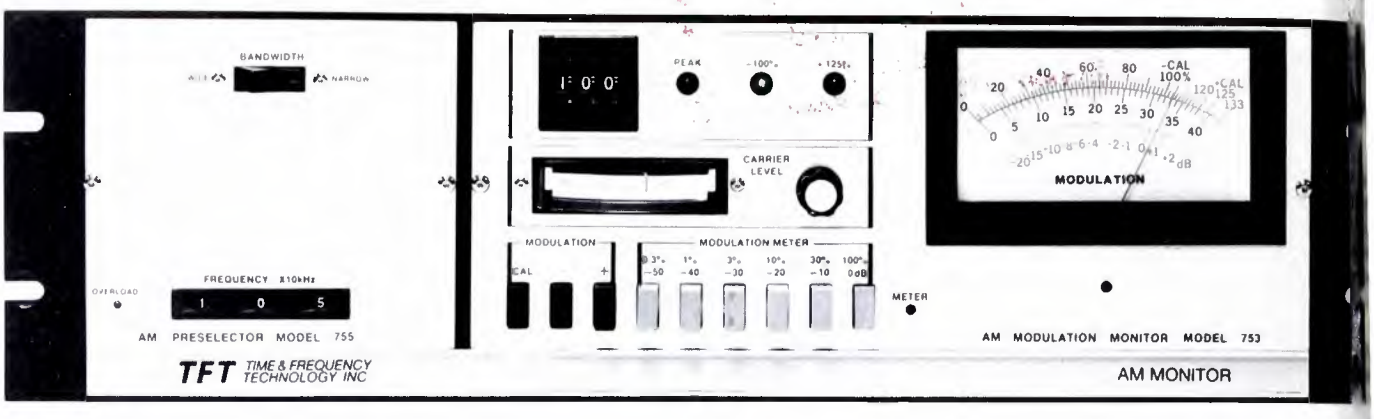
Compatible Automation

Control Room Designs



# Another TFT first in AM Modulation Monitors

# THE EXTENDER




## Extends Modulation Capability

TFT's new, competitively priced Model 753 precision broadband AM Modulation Monitor now accurately measures the +125% peak modulation and meets the new FCC monitoring requirements. A full complement of quality TFT features, for maximum transmitter modulation to the outer limits of coverage and for proof-of-performance measurements is also provided. The Extender is in a class by itself.

- Digitally settable peak modulation flashers for +125% and -100%.
- Built-in +125% and -100% calibrators
- Excellent transient response (no overshoot)
- Built-in meter attenuator for proof of performance measurements
- Modulation meter and peak flashers calibrate automatically over a ±40% carrier level change
- FCC Type Approval No. 3-234.

## Extends Monitoring Capability

By adding the new TFT Model 754 or 755 Preselector, broadcast stations, consultants, and regulatory agencies can tune in any AM station via thumbwheel switches. Then, they can precisely monitor them off-the-air. Exclusive features include:

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- Fast, accurate competitive comparisons


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For More Details Circle (1) on Reply Card

***most impressed with Cinema cts' approach to the design and facture of film equipment, as well as versity and dependability of their cts. CP-16R and STEADICAM are ime examples!"***

*Timothy Wolfe*
*Chief, Film Production*
*Maryland Center for Public Broadcasting*



land Center for Public ing is the production a network of PBS tations throughout the Timothy Wolfe, Chief, uction.

st of our programs are tailored to meet local ile others are pro- a national audience. oduction unit provides ge of materials for ng, from film inserts rolled into live or taped s, to hour-long dramas entaries."

***6R is the finest n camera of ."***

are well equipped for e of 16mm production. our inventory is a ... CP-16R/A reflex with viewfinder, a Model e and we have just J-4 zoom control r several of our lenses. e cameras are ex- uiet, well built, and service. Certainly the the finest production its kind, and we use double system sound extensively."

tion picture camera- n Weber concurs. "I en using the CP-16R on sis for the past year or ng community theatre, ad music presentations timore-Washington s Weber. "After hun- cation productions, R continues to function The camera is very nal, yet it retains a that makes it extremely

*Cameraman Kevin Weber (right) and Timothy Wolfe, Chief, Film Production, Maryland Center for Public Broadcasting.*

functional.

"I enjoy shooting from the shoulder, so I often utilize a 10mm lens, and jump right into the action on stage. From this vantage point, my camera can become another character who is in close touch with the performers. The CP-16R is one of the finest handheld cameras I have encountered: silent and reliable, capable of handling almost any filming situation."

***"Working with STEADICAM means developing a new technique of moving and shooting."***

Says Wolfe: "A recent assignment to produce a short film about the sport of Siberian Husky dog racing presented us with an excellent opportunity to explore the unique capabilities of Cinema Products' new STEADICAM camera stabilizing system. Especially since director Marian Siegel wanted to include both tracking and point-of-view shots of the race itself.

"From Brenner Cine-Sound (Washington, D.C.) we rented a Universal Model STEADICAM and Cinevid system for use with our own CP-16R, allowing cameraman Steve Dubin sufficient lead time to familiarize himself with the unit under the guidance and supervision of Brenner technicians.

"The evening before the shoot, Steve took a feed from the Cinevid and recorded his moves on a video cassette machine. Time well spent, since working with STEADICAM means developing a new technique of moving and shooting.

"Using 7247 color negative for maximum depth of field, Steve shot with an 85N6 on the Angenieux 12-120mm zoom lens at f/16, keeping the focal length between 12-25mm."

***"STEADICAM replaces costly and time-consuming methods of shooting."***

"Steve moved easily with his STEADICAM, in and around dogs and trainers as the teams were being prepared for a run. He was then strapped to the tailgate of the truck for some tracking shots, leading the teams along little used trails, and ended the day riding in the dog sled on a run through the woods

"With STEADICAM, Steve was free to make complicated shots on short notice with relative ease — shots which would have been impossible to make had he been limited to a dolly, tracks, and hours of crew rehearsals! And the finished piece has a remarkably fluid and refined quality.

"STEADICAM replaces costly and time-consuming methods of shooting," concludes Wolfe. "The Universal Model is especially attractive, since it can be used interchangeably with 16mm and 35mm motion picture cameras, as well as with video cameras.

"I am most impressed with Cinema Products' approach to the design and manufacture of film equipment, as well as the diversity and dependability of their products. CP-16R and STEADICAM are the prime examples! With products like these, filmmaking remains a viable operation for a television production facility such as ours

*Cameraman Steve Dubin with CP-16R and STEADICAM STEADICAM converts virtually any vehicle into an "instant" camera platform.*

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STEADICAM is covered under U.S. Patent No. 4,017,168 and other foreign patents abroad

October, 1977 □ Volume 19 □ No. 10

# BROADCAST ENGINEERIN

*The journal of the broadcast-communications industry*

Page 21

## About the cover

Our cover sets the sta for our lead article on post production. The article was made possible by the cast a crew of *One Day At A Time*, and by Donna a Joe Roizen. (*Main pho by Donna Foster Roiz top photo by Michael Feder.*)

## Contents



## Departments



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

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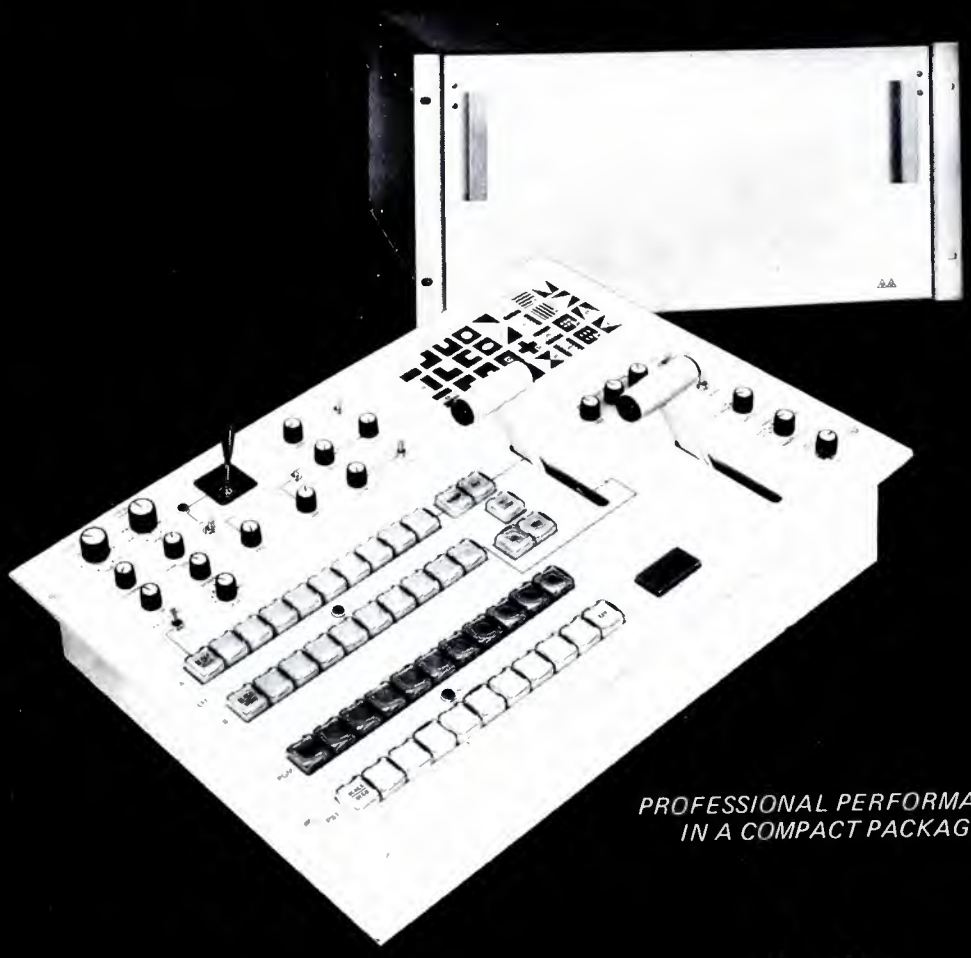
GRASS VALLEY GROUP

# MODEL 1600-1A SWITCHING SYSTEM



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# DIRECT CURRENT FROM D.C.

October, 1977/By Howard T. Head and Harold L. Kasse

## Windmill Interference

In work performed by three engineers of the University of Michigan under contract to the Energy Research and Development Administrati it has been established that interference, sometimes substantial, c be caused to TV reception by large windmills being used to generate power. The report indicates that the large blades being used on th new power generators will produce a multipath which varies with the size of the blades, their speed of rotation, and the direction of t wind. Of particular concern is the modulating waveform produced by the rotation of the blades which approximates sync-like pulses that occur every half-revolution of the blades. The effect is said to increase with frequency and, hence, is worst at the upper UHF chan- nels. Noticeable effects were observed up to two miles from a wind mill.

## FM Quadraphonic Report

After several months of testing, the FCC Laboratory has released th results of the tests it has conducted of quadraphonic audio systems. The tests were brought about by the fact that the staff of the FCC Laboratory decided, after examining the field test report of the National Quadraphonic Radio Committee, that the subjective tests co ducted by the committee did not compare 4-4-4, 4-3-4, and 4-2-4 (ma trix) properly because they did not use improved logic and phase ca cellation decoders for the matrix systems which were developed afte the committee's tests.

The Laboratory staff's assessment of their test results is that "th present 4-2-4 matrix systems using advanced logic and phase-cancell tion decoders compare favorably with the discrete 4-4-4 system with respect to musical preference quadraphonic localization." The repo went on to qualify this, however, by saying that the discrete 4-4-4 system was the majority choice although the preference in some case was slight.

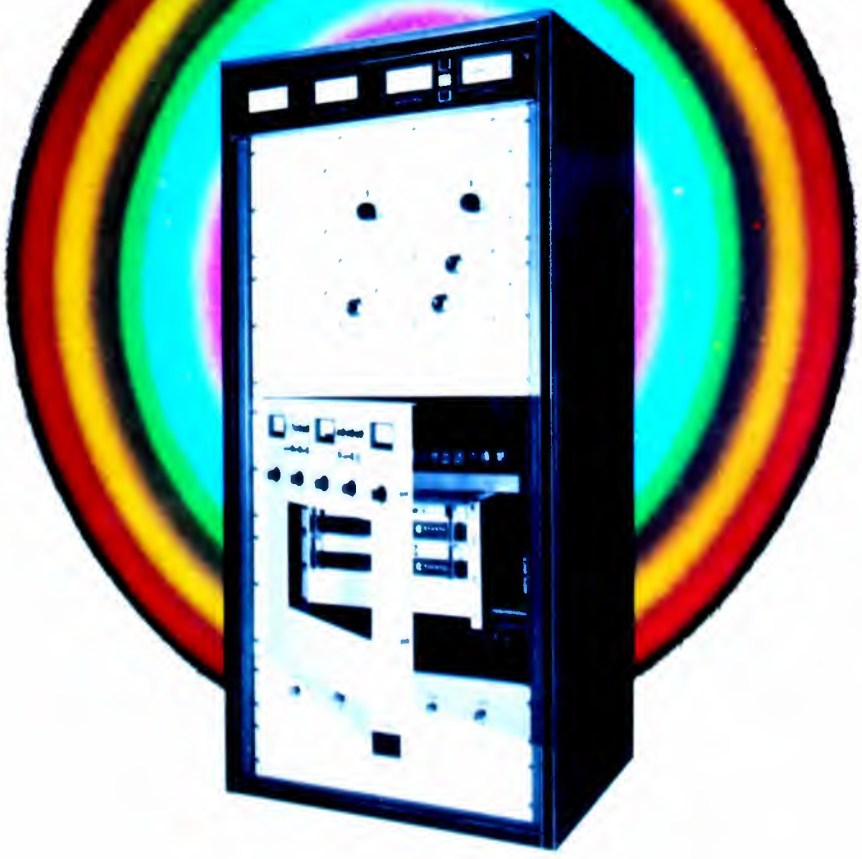
*continued on pag*

# CETEC Sparta's FM Transmitters are really worth listening to.

3CX3000A7 is an earful. ☐ That's the economical ceramic triode specifically designed for our 3 and 5 kW transmitters. Its 'grounded grid' use eliminates neutralization and continuous fine tuning in the 603 and 605B. ☐ Added stability factors: vacuum variable capacitors in the driver stage. Standard APC. ☐ The 603 and 605B, like all CETEC Sparta transmitters, interface with all makes of ATS. ☐ Reliability? Superior high performance from our solid state direct-FM 680 Exciter. It features advanced concepts such as digital temperature-compensated AFC. The 680 powers all our FM transmitters from 10 W to 25 kW. ☐ Operations? CETEC Sparta transmitters are a breeze. All important parameters are fully metered. All feature Tally Light fault locators with automatic recycle. All provide easy access to components. ☐ *Interesting fact:* only CETEC Sparta makes AM *and* FM solid state transmitters. ☐ Wouldn't you, as a *professional broadcaster*, prefer to talk to a *broadcast professional*? about the good group of products from Jampro, Schafer, and Sparta? ☐ Contact us. We're ready to listen to you.

Cetec Broadcast Group

The Broadcast Division of Cetec Corporation



For More Details Circle (5) on Reply Card

# DIRECT CURRENT FROM D. C.

*Continued from page 4*

The report also contains some comments concerning reactions of tho taking the tests and makes the interesting observation that their auditors (those taking the test) seemed to prefer the back sound t be only ambient or reverberated material for most music listening, rather than the surround sound which is being advocated by many in the recording industry. The report will be made a part of the Notice of Inquiry in Docket 21310 relating to FM Quadraphonic Broad casting.

## CB in Mexico

We previously reported that Mexican authorities were taking a dim view of U.S. citizens using their CB equipment in Mexico and were removing the units at the border. The Mexican government has adopted a new attitude and will now reserve three CB channels for use by U.S. tourists driving CB equipped vehicles. These channels may be used to contact other travelers or English-speaking Mexican officers who will monitor the channels to offer assistance.

## Short Circuits

The FCC has waived the operator rules for the northern-most AM sta tion in Alaska. It may use an operator with a first-class radio-telephone license who resides 300 miles from the transmitter site ...The Harris Corporation has announced the development of an AM stereo system which it will test and petition to the FCC. This makes 5 systems actively in the running...The FAA is looking seri ously into the possibility of requiring strobe lights on all towers over 300 feet above ground...At the FCC, type approval means to send the equipment in and the Commission will measure for complianc However, recent experience has been that 50% of the units fail so the Commission is now requiring measurements to be submitted with the equipment to demonstrate compliance...The Commission received its "Receiver of Tomorrow" from Texas Instruments on August 15th when due and promptly returned it for an agreed-upon modification ...All General and Advanced Class Amateurs licensed before April 1917 are entitled to credit for the Amateur Extra Class license. The Commission has decided that these individuals would now be at least 75 to 80 years old so they are now giving any eligible indi vidual until March 1, 1978 to apply.

# PEACE OF MIND.

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# Give the people what they want

...I hope that the Dolby FM effort does finally make it everywhere...

...Until now I doubted that Dolby could significantly improve FM. But the incredible brilliance and clarity and the extended dynamic range of (San Francisco station) is fantastic proof...

...I only hope the broadcasters in this area will convert to your system...

...I am behind you 100%. I want quality radio...

...I've been looking forward to Dolby FM and now my favorite (Pennsylvania station) is installing it...

...I am convinced of the great improvement Dolby can make to FM broadcasting...

...Good luck on your efforts to increase dynamic range on FM — it sure is needed...

...We have been enjoying the benefits of the Dolbyized FM programs of (New York station) for a long time. We noticed at the outset the richer and cleaner sound especially in the high frequencies...

...I hope that some day all stations will broadcast with your marvelous system...

...All audiophiles owe you much for making cassettes such a wonderful source of music. I trust that your positive campaign to improve FM sound quality will bear equally impressive results...

...I now listen to Dolby FM broadcasting on (Buffalo station). The difference in sound quality between (this station) and other FM stereo stations is remarkable...

...Bravo on your campaign...

...I could not believe what I heard: The sound was clear, clean, brilliantly defined. After several hours' listening, I am still awestruck...

...I feel this is a step forward in FM broadcasting...

# Dolby FM

The quotes above are selected and shortened from letters received on the subject of Dolby FM during the past year. Of 3,000 letters, only 5 have taken us to task — sample: "...(Dolby FM) smacks of nothing more than plain old commercialism."

August 1977 Dolby FM statistics. In U.S.A., FM stations in 10 metropolitan areas plus 101 other cities with Dolby FM encoders; 14 in Canada; 17 in other countries. 24 manufacturers with 62 different tuner and receiver models incorporating Dolby FM decoder circuits.

Write us for technical details, lists of products and Dolby FM stations.


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# Prove to yourself how Dolby FM solves the high-level high-frequency problem.

Remember the first cassette recorders with the Dolby system, back in the early 70's? The advantages were easy to prove to yourself. You flipped the Dolby NR switch. Now you heard it; now you didn't.

A few years later and along comes Dolby FM, which you are at least curious about. The same 10 dB's are still there. But, unfortunately for demonstration purposes, they are used in a more subtle way. Let's face it, the effect is hard to hear most of the time (that's compatibility for you). To make a rigorous and convincing test is tough: for example, you would have to make elaborate in-out changes at your station and simultaneously in the monitoring receiver – not the easiest thing to organize.

Well, here's how to overcome these problems and make a quick and convincing test of the effect of Dolby FM on high-level high-frequencies. The demo is artificial, but technically valid.

1. **Using a receiver with Dolby FM circuitry, defeat the interstation muting switch.**
2. **Tune to a vacant place on the dial to get pure high-level hiss as a test signal (the extreme ends of the dial are usually good for this).**
3. **Switch back and forth between Dolby FM and conventional FM.**
4. **Listen to the increased high frequency content in the Dolby FM mode. The difference should be very obvious.**

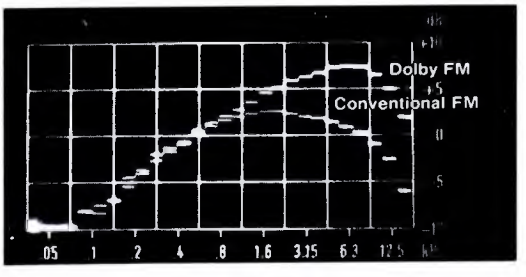
In the Dolby FM position the test signal will have a wide-range, open quality. The conventional FM hiss will be muffled. This is the high-frequency, high-level capability difference between Dolby FM and conventional FM. *All* the highs on the record at your station can actually get through to the listener. This allows the rest of your – and your listener's – equipment to do its job properly; all other specs become more meaningful.

The reduction of low-level transmission noises, the other half of Dolby FM, is harder to demonstrate at will. However, in due course you may wish to check out the fact that Dolby FM provides about 5 dB of CCIR weighted noise reduction.

This should help you get a better handle on Dolby FM. Not only a theoretical improvement, but one you can prove to yourself.

**Technical Note**

The use of wideband noise is becoming increasingly popular in testing audio equipment and acoustical characteristics. Interstation noise is equivalent to an FM carrier which is modulated with high-level white noise. This is a suitable signal for checking the high-level, high-frequency capability difference between Dolby FM and conventional FM. Relating the test result to actual listening, the difference shows how conventional FM muffles loud musical signals containing significant amounts of steady-state or transient high-frequency energy (for example, the steep waveforms of percussion and brasses).




Real-time analysis of Dolby FM receiver output when tuned to interstation noise, using Altec Hewlett-Packard 8050A analyzer. In a perfect FM system the trace would be a continuously rising straight line. Thus the results show that highly modulated high frequencies can be reproduced with significantly improved accuracy using Dolby FM.

**Commercial Note:**

Dolby FM is worthwhile primarily for stations who wish to use minimal amounts of conventional compression and limiting. The advantages of Dolby FM cannot be appreciated in highly competitive loudness-oriented market situations.

Dolby Model 334 FM Encoder Unit $1350

August 1977 Dolby FM statistics: In U.S.A., FM stations in 10 metropolitan areas plus 101 other cities with Dolby FM encoders; 14 in Canada; 17 in other countries. 24 manufacturers with 62 different tuner and receiver models incorporating Dolby FM decoder circuits. Write for details.

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# industry news

## SMPTE drafts specifications for 1-inch helical format

The segmented helical VTR standards worki group of SMPTE's Committee on Video Recording a Reproduction Technology has drafted five specifi tions for the 1-inch high-band helical VTR. T specifications describe basic system parameter dimensions and locations of video, audio and cont tracks, and video and audio electronic characteristi

The drafts have been submitted to the f committee for evaluation and comment, and sub quently will be passed to the SMPTE Standa Committee. The drafts then will be published in t Journal.

The format, introduced by the Robert Bos Corp./Fernseh Group and known as the "BCN" 1-in helical VTR format, is the basis for the dr specifications. In its policy to avoid reference commericalized terminology, the committee has p posed the format be formally identified as "One-In Type B Helical Video Recording." Portable and stu VTRs built to this specification are curren commercially available from several compan throughout the world.

SMPTE will publish details on the Type specification in the Journal following approval by t Standards Committee. A full presentation will be gi at the national conference, October 16-21, at the I Angeles Century Plaza Hotel.

## Permanent status requested for reregulation task force

The FCC has been urged to give a permanent stat to its Reregulation Task Force, a temporary bo which has assisted the Commission in the deletion amendment of more the 600 FCC rules and re lations.

The request was made in a letter from Vinc Wasilewski, president of the National Association Broadcasters (NAB), to Richard Wiley, FCC chairm

Wasilewski urged that the task force be ma permanent "so that it may continue to serve both t Commission and the public in the exemplary manne has in the past."

The NAB president said the reregulation progra "is proof that outdated and unnecessary FCC rules c be eliminated, that unnecessary paperwork can effectively reduced and that the Commission c succeed in its attempt to simplify or elimin needless, outmoded and overly burdensome rules.

## FCC changes application rule for EEO programs

In compliance with a federal court ruling, the F has changed its requirements for broadcast stati applying for EEO programs. Broadcast applican with five or more full-time station employees, now

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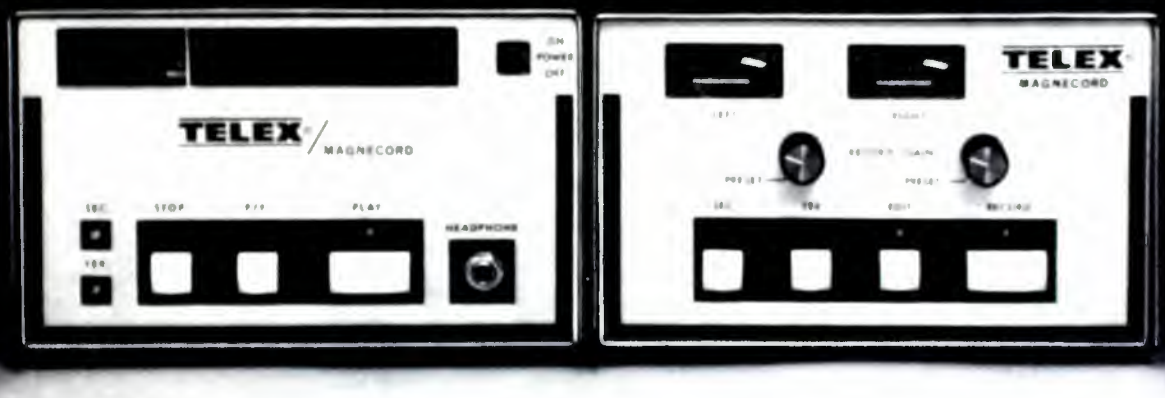
# At Last, a Cart Machine that keeps its cool




Telex/Magnecord broadcast cart machines run cool and steady. So cool no ventilation is required, so steady not even voltage or frequency fluctuations will alter their speed. Thanks to our dc servo flutter-filter drive.

The MC series offers broadcasters a host of options, including field convertability from mono to stereo or play to record and, of course, end of message, secondary/tertiary cue tones.

Designed for type A or B carts, the MC series meets all NAB specifications, offers full immunity to EMI and RFI, is remote controllable and automation compatible with CMOS digital logic. Audio muting, air damped low voltage dc solenoid and fast forward are standard features on every MC unit.

Eight broadcast cart machines to choose from in the Telex/Magnecord MC series. Running cool and steady. With a pleasant surprise—they're affordable.

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**Canada:** Telex Electronics, Ltd., Scarborough, Ontario

For More Details Circle (9) on Reply Card

## industry news

*continued from page 10*

be required to submit a written EEO program conjunction with their applications.

In June 1976, the Commission revised its equ employment opportunity rules and adopted a 10-poi EEO program to serve as a model to be followed a submitted by all broadcast applicants proposing to, employing, more than 10 persons on a full-time basi

Under this revision, all broadcast applicants with or fewer full-time employees were exempted from t written EEO filing requirement. Previously, on applicants with fewer than five full-time statio employees were excused from the filing.

On August 5, 1977, however, the U.S. Court Appeals for the Second Circuit (New York) partia set aside the FCC action raising the EEO exemption 10.

The court said the FCC's order of June 26, 1976 w arbitrary and capricious. It went on to say that t justifications the Commission cited were unsupport and inadequate.

## OTP the victim of President's reorganization plan

The Office of Telecommunications Policy (OTP), pa of the Executive Office of the President, will dissolved and its responsibilities redistributed to t Department of Commerce and Office of Manageme and Budget, if President Carter's reorganization pl is approved by Congress.

OTP is responsible for management of the gover ment-use frequency bands, as well as determini policy and advising the President on domestic a foreign communications issues, including mass med common carrier, privacy, and domestic security.

Under the Carter plan, the Commerce Departmen Office of Telecommunications Policy would assume t bulk of OTP's duties. The Executive Office wou retain final authority for domestic communicatio although it would rely heavily on the Commer Department's expertise.

## Public information sessions o NAEB's convention agenda

Public information (PI) basics will be covered the first time at the upcoming NAEB convention, to held November 13-17 at the Sheraton-Park Hotel Washington, D.C.

Art Singer and Bill Hallstead, development directors, have arranged a program to deal with t important subjects: "Writing that Moves" (for leased radio spots, ad copy, etc.) and "Living with Press" (TV reviewers, reporters, TV listings edito and *TV Guide*).

The 53rd annual NAEB convention also will inclu sessions for engineers who are responsible recommendations to management regarding the p chase of new equipment. Exhibitors will have opportunity to make technical presentations on

*continued on page*

# Don't settle for ENG-Only!


## LDK-11 is an ENG and EFP Camera.

...he unique Philips camera that ...ed everyone thinking ENG *and* ...l Production. The one camera ...does *both* without compromising ...ty or operational features. One ...e many innovations that has ...ed Philips its reputation as "the ...OVISION company."*

...*exclusive* Philips design and per...ance, the LDK-11 outperforms ... "mini" and "micro" ENG-Only ...eras. It is lightweight, battery or ...powered, totally portable and ...to-operate for ENG; with full pro...on control either remotely or at ... backpack. Yet the LDK-11 ...porates the Philips picture-deter...g features that *go into our most ...nced studio cameras.*

...s...the LDK-11 includes many ...ional unique features for difficult ... production and ENG appli...ns. Here are just a few:

- ...tstanding low-light performance; ...o 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 ⅔" Plumbicon tubes with studio camera resolution.
- Up to 300' of ½" 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 combing 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.

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# news briefs

**New satellite transmission rates**

Several new categories of sate television transmission service, a corresponding new rate sched will be offered starting Novembe by RCA American Communicati Inc. The proposed options (pen FCC approval) include protec unprotected or preemptible rates fixed term or occasional service.

**Attorney advertising controversy**

The National Association Broadcasters is opposing two posals excluding the broadcast dustry from attorney advertis Brenda Fox, NAB assistant coun testified before the Task Force the American Bar Associati which is considering the propos She said NAB is concerned that proposals would restrict the ad tising to the print media un overruled by the state court agency responsible for regula lawyers' conduct.

**Educational videocassette marke**

The president of Sony Corpora of America urged educational mo picture producers to transfer t libraries to videocassettes. Harr Schein said the introduction of Sony Betamax in schools has gered a huge market for pr corded educational programs. spoke to more than 100 softw executives attending a seminar the marketing of 16mm films video formats at the World Tr Center.

**Kuwait buys FM transmitters**

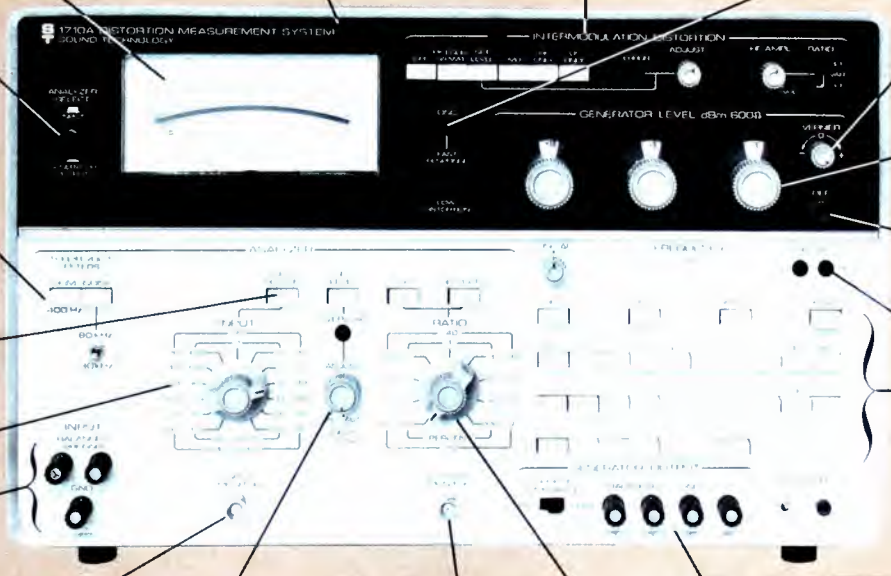
Kuwait has purchased two 1( parallel-operated FM transmitt giving the Arabian Gulf State first FM stereo broadcast serv The transmitters will be installe the island of Failaka off the coa Kuwait. The system will be remo controlled from the studios in Ku City by telemetry circuits, includes a specially designed console as well as a CCA-prov program feed from studios to tr mitter site.

**Paraguay joins INTELSAT**

Paraguay has become the American nation to join the I national Telecommunications S lite Organization (INTELSAT).

*continued on pag*

# Here's how useful a distortion analyzer can be




tvoltage, power, dis- r dB ratio.

No manual nulling controls required (the 1710A is always in auto-null, reaches a null in less than 5 seconds).

Intermodulation Distortion Analyzer optionally available.

Oscillator distortion is typically .001%.

generator signal at h the push of a

±1 dB Vernier adds fine level control.

Internal oscillator adjustable from +26 dBm to —89.9 dBm in 0.1 dB steps.

tle 18 dB per oc- ters reject hum and frequency noise.

Turn off oscillator for quick S/N measurement.

phbutton operation rset level, measure er power, then mea- dortion.

Tuning indicators help measure distortion of an external source.

u voltage or power Hz to 110 kHz.

Simultaneously select oscillator and analyzer frequency with fast-to-use pushbuttons. 10 Hz to 110 kHz.

Balanced Input.

Balanced and floating 150Ω or 600Ω Generator output.

put signal on a

Automatic Set Level is optionally available.

View distortion products on a scope.

Measure distortion down to .002%, voltage or S/N ratios with 100 dB dynamic range.

of the above features are so outstandingly uble that we especially invite your attention bm.

e is the fast, easy measuring you get with button-selected distortion-measuring circuits al source and measuring circuits are simulously selected with the **same** pushbuttons). buttons make it so simple to measure quickly to repeat measurements.

condly, you can drive virtually any type of it from the signal source output — whether balanced, unbalanced, off-ground or whatever. That's because the signal source output circuit is fully **isolated and balanced.**

**There is no output transformer** to introduce noise or distortion.

Besides these outstanding conveniences, you can have the Sound Tech 1710A with an option that enables you to measure **intermodulation distortion.**

Call Mike Hogue/Larry Maguire to get full information on an instrument recognized everywhere as the standard of the audio field.

**SOUND TECHNOLOGY**

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CAMPBELL, CALIFORNIA 95008
**(408) 378-6540**

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# The 119th SMPTE Technical Conference and Equipment Exhibit

**Century Plaza Hotel, Los Angeles**
**October 16-October 21, 1977**

This year's SMPTE national conference, scheduled for October 16-21 at the Century Plaza Hotel in Los Angeles, promises to be both a thorough updating on film and television technology and the largest equipment exhibit ever held by the society.

Sir Charles Curran, director of the BBC, will give the opening address on "Technology and the Consumer," and there are a number of papers from international broadcasting organizations such as the British Broadcasting Corporation and the Societé Francaise de Production to round out the program.

In addition, there will be technical sessions on film and electronic program production for television, post-production techniques of video and audio, the new technology in fiber optics, and teletext transmissions for TV and motion picture film products and processes.

More than 100 exhibitors will represent virtually every major name in the motion picture film equipment and electronic television product field. Equipment on display will include film and video cameras, sound equipment, lighting equipment, editing equipment, lenses, laboratory equipment, projection equipment, television equipment, ENG and EFP gear, and VTRs.

The SMPTE engineering committees and the standardization groups will hold meetings during the conference.

Social events include an awards luncheon, a series of sponsored cocktail parties and a banquet. □

## Program

**Sunday, October 16**
Registration, *afternoon*
Entertainment, *evening*

**Monday, October 17**
Interfaces, *morning*
Get-Together Luncheon, *noon*
New Products in Television, *afternoon*
New Equipment and Processes in Film, *afternoon*

**Tuesday, October 18**
Laboratory Practices, *morning*
Television Post Production, *morning*
Fellows Luncheon, *noon*
Laboratory Practices, *afternoon*
Television Post Production, *afternoon*

**Wednesday, October 19**
Television Sound, *morning*
Ecology for Laboratories, *morning*
Television Production, *afternoon*
Film-Sound, *afternoon*

**Thursday, October 20**
Corporate Uses of Motion Picture and Television Production, *morning*
Unconventional Imaging Systems, *morning*
Film Production, *afternoon*
Corporate Uses of Motion-Picture and Television Production, *afternoon*
Panel Discussion on Uses of Motion-Picture and Television Production, *afternoon*
University of Southern California, New Cinema Facilities Tour and Program, *evening*

**Friday, October 21**
New Television Technology, *morning*
General Television Subjects, *afternoon*

## Exhibitors

Adda Corp.
The Allen Products Co.
Ampex Corp.
Arriflex Co. of America
Arvin/Echo Science Corp.
Belden Communications
Bell & Howell Co.
Berkey Colortran, Inc.
Birns & Sawyer, Inc.
Bosch-Fernseh
Brumac Industries
Canon USA Inc.
Carter Equipment Co., Inc.
Century Precision Cine/Optics
Christy's Editorial Film Supply Inc.
Cinematics, Inc.
Cine Precision Engineering
Cine Production Equipment, Inc.
Cine 60 Inc.
Cinema Products Corp.
CMX Systems, Orrox Corp.
Coherent Communications Co.
Cohu, Inc., Electronics Div.
Commercial Electronics, Inc.
Consolidated Video Systems
Continental Camera Systems
Convergence Corp.
Dolby Laboratories
The Durafilm Co.
Dynair Electronics Inc.
Eastman Kodak Co.
Ehrenreich Photo-Optical Industries Inc.
Eigen Video
Eiki International Inc.
Electro-Voice
Elmo
Farinon Electric Co.
F & B/Ceco
Film Equipment Rental Co.
Frezzolini Electronics Inc.
Adolph Gasser
General Electric Co.
Goldberg Brothers
Alan Gordon Enterprises Inc.
Gould Inc.
GTE Sylvania
Hammond Industries
Hazeltine Corp.
Karl Heitz
Hitachi Denshi America Ltd.
Hollogon Optical Systems
Hollywood Associates
Hollywood Film Co.
Houston Fearless 76 Inc.
Houston Photo Products Inc.
Ikegami Electronics (USA) Inc.
Image Devices Inc.
Infotechnics
Jamieson Film Co.
J-K Camera Engineering Inc.
JVC
KEM Editing Systems Inc.
Kliegl Bros.
KLM Associates Inc.
Lab Methods Corp.
LaVezzi Machine Works Inc.
Lee Filters Ltd.
Lenco
Lisner Smith
Listec Television Equipment Corp.
Lowel-Light Mfg., Inc.
L.T.M. Corp. of America
L-W International
Magnasync/Moviola Corp.
Magna-Tech Electronic Co., Inc.
Matthews Studio Equipment
M B I Inc.
Merlin Engineering Works
Micro Consultants Inc.
Microtime, Inc.
Microwave Associates
Miller Professional Equipment Inc.
Mitchell Camera Corp.
Mole-Richardson Co.
Motion Picture Enterprises Inc.
Motorola Communications & Electronics Inc.
Multi-Track Magnetics Inc.
Nagra Magnetic Recorders Inc.
NEC America Inc.
Neumade Products Corp.
Norton Associates, Inc.
Nurad
O'Connor Engineering
Laboratories Inc.
Oxberry
The Perf-Fix Co.
Peterson Enterprises Inc.
Pioneer Marketing Corp.
Plastic Reel Corp. of America
David Pringle Cameras
Quick-Set Inc.
RCA Corp.
Recortec Inc.
Rosco Labs
Sachtler GMBH
Skirpan Lighting
Smith Victor Corp.
Sony Corp. of America
Soremec-Eclair USA Inc.
Strand Century Inc.
Super 8 Sound Inc.
Tele-Cine Inc.
TeleMation
Telescript Inc.
Television Equip. Assoc.
Tentel Corp.
Thomson CSF
Unimedia Corp.
Vega Electronics
Video Systems Network
Vital Industries
Vlahos-Gottschalk Research Corp.
Westrex
Wide Range Electronics Corp.
The Winsted Corp.

# IDEOCASSETTE DITING. MADE FOR PEED. MADE FOR CCURACY. MADE FOR UALITY. MADE by JVC.

# JVC INTRODUCES THE CR-8300U FULL EDITING VIDEOCASSETTE RECORDER..

**FOR FASTER EDITS**

Now you can significantly cut the time you spend editing 3/4U-format tapes, thanks to JVC.

The unique bi-directional search control of the CR-8300U Electronic Editing Recorder lets you fast-forward at 7 times normal speed. Reverse at 10 times normal.

And you can do it while the tape is threaded on the head. You don't have to stop to rethread.

The unique preview feature lets you pass the signal from a second source through the CR-8300U while it's playing, without erasing the tape. You'll cut down on false starts by knowing what your edit will be like.

**FOR MORE ACCURATE EDITS**

Accuracy is what the JVC CR-8300U is designed for.

The unique built-in Pre-Roll rewinds tape for about 4 seconds from the actual editing point, and puts the recorder in stand-by mode. When you push "Edit Start" the CR-8300U first plays back about 4 seconds of rewound program, then goes automatically into the recording mode at the edit point. You're assured of the highest accuracy.

When you assemble edit, video and audio signals are edited simultaneously. When you insert, you can edit video and either audio channel independently or in any combination. Either way, accuracy is ± 5 frames.

You want still frame and slow motion? You've got them. The forward speed can be adjusted from 0 to 1/15th normal speed. You'll always find the exact frame you want.

And the tape counter doesn't just count. It has a memory. When you know you'll want to find a particular point again you reset the counter to "000". Then when you rewind, it will automatically stop the CR-8300U right there.

No other moderately priced videocassette editor has this combination of features to give you the accuracy you're looking for.

**FOR THE HIGHEST QUALITY PICTURE**

But speed and accuracy are nothing without quality. And quality is what the JVC CR-8300U has most of. It has everything you need for NTSC-type color video *built-in*.

Automatic Phase Control and patented Color Dubbing assure generation after generation of duplicates with stable color lock and highest quality.

There's a built-in Dropout Compensator. There's a video S/N ratio of better than 45dB (unweighted) on the Rohde & Schwarz noise meter. An audio S/N ratio of better than 45dB. Independent Audio VU Meters and Controls for both channels (which can be operated either automatically or manually) help you upgrade the quality of low-level audio recordings.

Black & white resolution is better than 320 lines; color, better than 240.

And if "flag-waving" turns you off, all you have to do is turn on the CR-8300U. The frame servo locks on the odd field, so every edit is smooth and clean.

**JVC WORKS WITH YOU**

JVC has worked with broadcasters and producers to give you what you want, what you say you really need. Speed, accuracy, quality. And the features you need to get them.

Features like an external sync input for V-locking other sources. A built-in capstan servo mechanism for jitter-free, stable tape speed. An internal time-lapse meter to make regular maintenance easier. And new remote-control system you c learn about by reading the next pa

# AND...TO TIE IT ALL TOGETHER... THE JVC RM-83U REMOTE AUTOMATIC EDITING CONTROL UNIT.

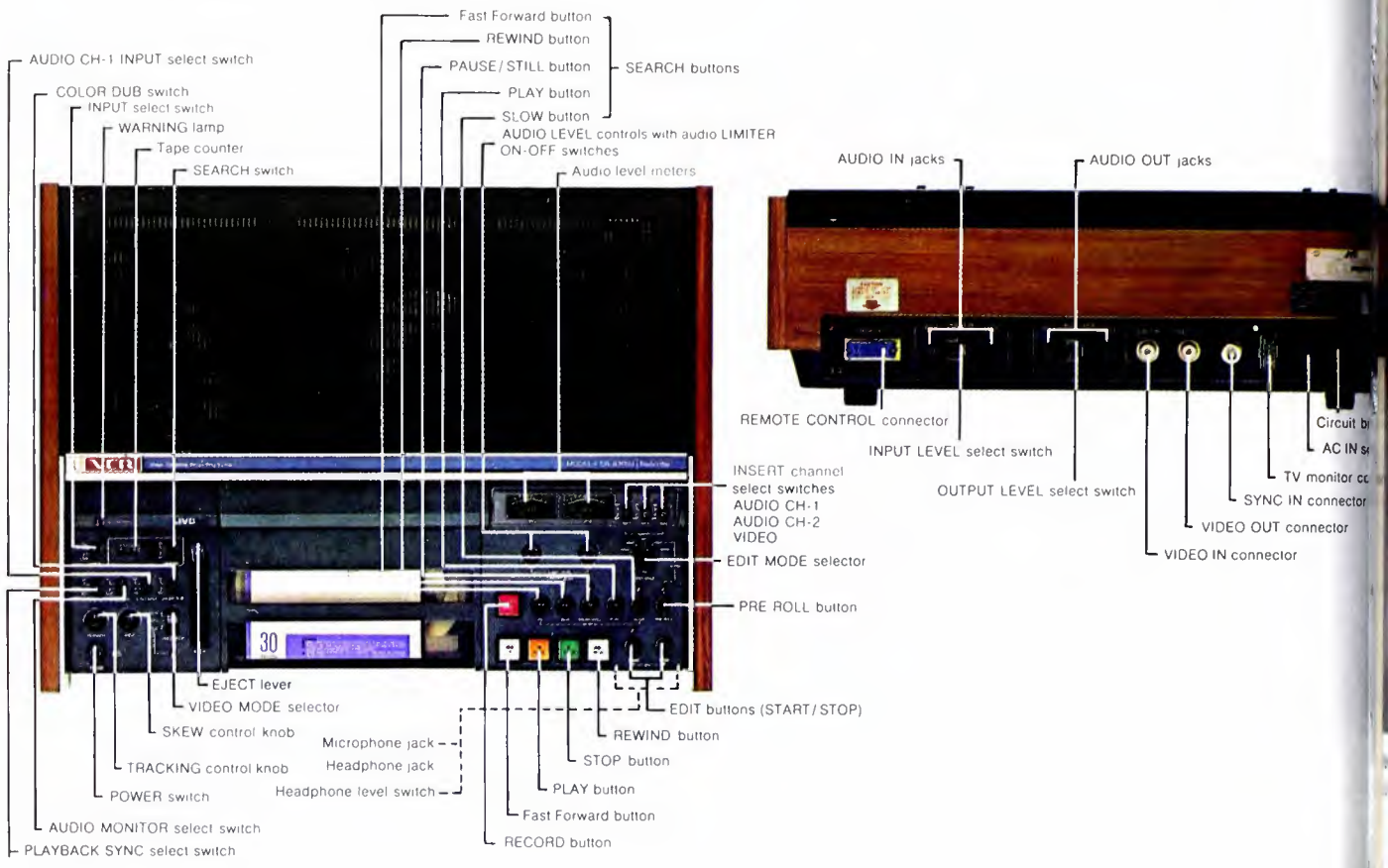
The RM-83U completely controls two JVC CR-8300U recorders for fast and accurate insert and assemble editing.

Its two independent LED timers (indicating minutes, seconds, and tenths of seconds) can be put on "Hold," so you can precisely identify the edit point. They then return to real time. "Hold" again at the end of the edit, and you've timed the length of your insert. Both clocks memorize the edit point—for fast and accurate review, you quickly return to it by touching "Search".

Not only can you *review*, you can *preview*. A unique rehearsal editing feature lets you see your edit without putting a signal on the tape. You can be sure you've got exactly what you want, exactly where you want it. After you've previewed, both machines go back to the edit point automatically. If you like what you saw, just push "Start" and you have it.

There are many more great features, such as the automatic safety device that shuts off both recorders if a tape is left in still-frame for 10 minutes. Get all the details on both the RM-83U and the CR-8300U by writing today to the address listed on the back page.

# SPECIFICATIONS OF THE CR-8300U EDITING COLOR VIDEOCASSETTE RECORDER




**GENERAL**

| | | |
|---|---|---|
| Video Recording System | : | Rotary two-head, helical scan system |
| Luminance | : | FM recording |
| Color Signal | : | Converted subcarrier direct recording |
| Video Signal System | : | NTSC-type color signal |
| Power Requirement | : | 120 V AC, 60 Hz 120 watts |
| Temperature Operating | : | 41°F to 104°F (5°C to 40°C) |
| Storage | : | −4°F to 140°F (−20°C to 60°C) |
| Operating Position | : | Horizontal only |
| Weight | : | 67.5 lbs. (30.6 kg) |
| Dimensions | : | 24-1/16" (W) x 7-11/16" (H) x 17-3/4" (D) (610 mm x 195 mm x 450 mm) |

**Tape Transport**

| | | |
|---|---|---|
| Tape Speed | : | 3-3/4 ips (95.3 mm/s) |
| Fast Forward Time | : | Less than 6 min. for 60 min. tape |
| Rewind Time | : | Less than 5 min. for 60 min. tape |
| Wow & Flutter | : | Less than 0.2% RMS |

**Video Signals**

| | | |
|---|---|---|
| Input | : | 0.5 V to 2.0 Vp-p, 75 ohms unbalanced |
| Output | : | 1 V p-p, 75 ohms unbalanced |
| Signal-to-Noise Ratio | : | More than 45 dBs (Rohde & Schwarz noise meter) |
| Horizontal Resolution | : | Color 240 lines<br>Monochrome 320 lines |

**Audio Signals**

| | | |
|---|---|---|
| Input | : | Mic −70 dB 600 ohi unbala |
| | : | Line −20/0 10k oh unbala |
| Line Output Level | : | −20/0 dBs (600 ohms unbalanced lo |
| Headphone Output | : | −28 dBs/−37 (8 ohms unba |
| Signal-to-Noise Ratio | : | More than 45 (@ 3% distor level) |
| Frequency Response | : | 80 Hz to 15 kH |

Be sure to write today to JVC for more information on the CR-8300U Electronic Editing Color Videocassette Recorder and also for a copy of JVC's new Glossary of Video Terms.

JVC

JVC INDUSTRIES COMPANY, a division of US JVC Corp., 58-75 QUEENS MIDTOWN EXPRESSWAY, MASPETH, N.Y. 11378 (212) 47

**For Demonstration Only Circle (16) On Reply Card**
**For Literature Only Circle (17) On Reply Card**

**ap of the fingers** is Kenwith's unique trademark in the TV directing field. Here he has just cued a cut for the post-uction editor Kris Trexler to put in the edit decision list. (*Photo by Donna Foster Roizen*)

# ost production: one frame at a time

**oe Roizen,** *TELEGEN*

e secret ingredient in the success of many ent situation comedy shows on television is fre-tly inserted after the studio is dark and the rs have gone home. It's called post production and volves complex equipment, skilled operators and tive talent to pull together the segments of nal recordings and shape them into fast-paced, ence-grabbing sequences.

levision's voracious and accelerating demand for lar programming has spawned a technical up-al in the way post production is accomplished. modern TV post-production centers do not have isticated computer-assisted VTR editing systems h involve off-line and on-line operations, auto-d assembly and the peripherals of slow/stop on discs, frame counting time codes, audio over- and video special effects.

get a good picture of how a post-production ity handles a contemporary show, it was decided lect a program in regular production at a well-pped TV production center. Norman Lear's rams certainly qualify among the top echelon of -impact sitcoms and *BE* was offered a choice of *n the Family* or *One Day at a Time* for a detailed ysis.

e chose the latter for several reasons, not the of which was that a typical 26-minute episode more than 250 scene cuts, averaging one every six nds. In fact, while watching the taping it seemed some cuts were less than one second apart!

Many of the Lear shows are both shot and post produced at Metromedia Square, a large, modern TV complex in the heart of Hollywood. Recently, an extensive computer-assisted time-code editing system, including on-line, off-line and multitrack audio sweetening capabilities, was installed at the facility.

### Production

While the thrust of this article is aimed at post production, there are enough interdependent factors between the way a show is produced and eventually edited that some background may be useful.

On Monday, the first reading with the cast involves 16-20 people with the director, four writer/producers and various on-hand assistants. Cast members make comments about their lines, discuss the impact on the audience, and generally try to agree on final wording with the writers. It's evident to any visitor that the members of this show enjoy working together.

On Tuesday, the corrected text is re-read and re-blocked with some concern about values and relationships between characters in this episode. Director Herb Kenwith sets the basic form for the show and everybody works from that. By Wednesday afternoon, Kenwith will invite Norman Lear to see the rehearsal, but he also admits, somewhat proudly, that Lear

*continued on page 22*

**The Metromedia facility** includes three off-line editing booths like this one. Equipment includes a CMX Systems 340-X computer-assisted editing system, Sony U-Matic cassette players, Amtron monitors, Convergence joystick and a variety of peripherals such as time-code generators, reader, audio and video controllers and speakers. (*Photo by Donna Foster Roizen*)

## One frame at a time

*continued from page 21*

trusts him enough not to take up the invitation too often. *One Day at a Time* periodically shifts its emphasis through the major characters and Lear usually will attend those shows which feature one of the particular members.

Thursday finds the four studio cameras being blocked-in for the 265 set-ups that they will have follow. Three cameras operate in a normal fash and one is assigned an isolated (ISO) function a tracks special shots which are separately taped potential insertion later.

On Friday, taping sessions are scheduled at 5 and 8:00 p.m. Some 14 people assemble in the cont room with script folders in hand and direct or obser the live action in front of the cameras on the sou stage below. The show is done in front of a l audience, minimizing the need for a laugh track reaction audio later on. A nice touch was floor-manager's introduction of the stage crew to audience.

### Never half safe

In the control room, Kenwith follows the l monitor and snaps his fingers for the TD to make cuts on the switcher. In the meantime, "Pinky" Fra the associate director, is calling the next shots o intercom system to the camera crew. If somethi goes wrong, there is an instant decision to accomm date the error or cover it up from another angle, the action continues.

Since two separate tapes are made of the sa sequences, the errors in the first take can discussed during the break and eliminated in second. The best takes of both tapings are th selected for the final assembly of the finish program.

The rest of the people in the control room a meticulously following their scripts, monitoring dialogue, checking timing and performing a quali control function on behalf of the writer/produce who contribute to the show.

By late Friday, the show is completely recorded

*continued on page*

## Herb Kenwith: *Profile of a director*

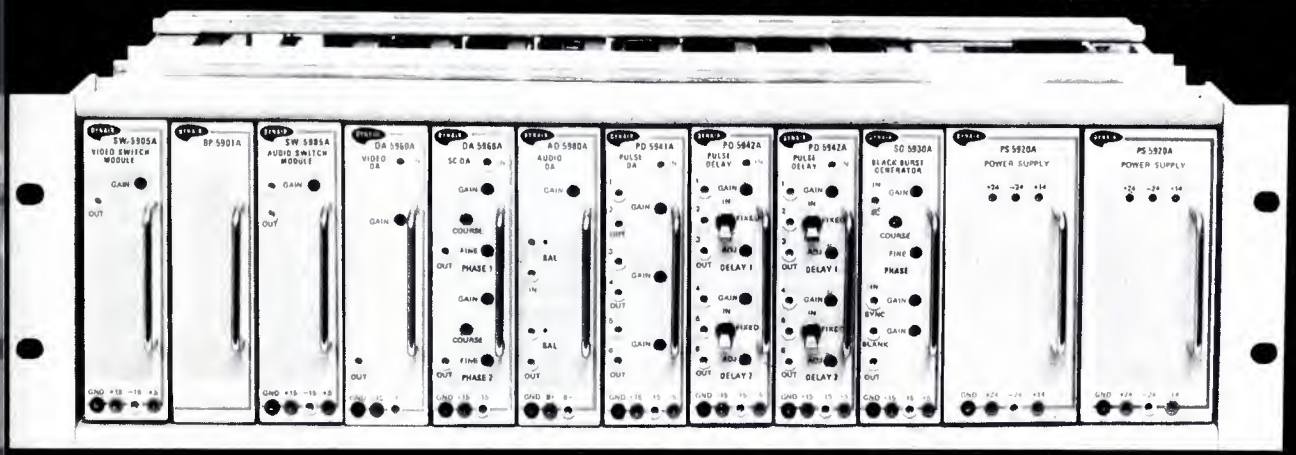
Lucy called him the Godfather of Desilu, Albert Einstein brought Robert Oppenheimer and Ms. Joliot Curie to his plays, Frank Stanton gave him his TV start at CBS and he's probably the only TV director with a very calloused thumb and forefinger!

He's done it all, from location shooting of *Death Valley Days* to the space saga of *Star Trek*. His talents encompass a diversity of shows like *Daktari* and *All That Glitters*, and of the latter, he remembers doing 65 episodes in 11 weeks by working incredible hours. His Sitcom hits include a 3-year stint on *Good Times* and his current top-rated show, *One Day at a Time*, which has had two great seasons and is now starting its third.

His style is uniquely his own; the more than 250 camera cuts in a 26-minute episode are initiated by a staccato of finger snaps given with millisecond precision. When asked about this odd method of directing a TV crew, he explains that it's faster than a verbal command, and since all the camera shots are preset, his TD can follow his finger pops with amazingly short reaction time. The precise timing of these camera cuts that follow the fast pace of the dialogue is what gives *One Day at a Time* its major humorous impact when they are trying to be funny, or its dramatic intensity when the script calls for some tear-jerking trauma. Herb knows how to motivate his actors, but he also knows how to milk a scene for its maximum viewer attention by the expedient of precise post-production manipulation. It's a skill he has honed to a fine edge in his distinguished career.

He admits to being immensely intrigued by modern TV technology, while feeling somewhat buffered by its complexity. Nevertheless, he doesn't miss a trick in putting the most sophisticated computer assisted editing system through its digital paces in order for it to keep up with his demands for a superbly finished program. The air copy of the on-line master is a vivid testimonial to his directing talent, and, of course, to all of his associates, who emote on cue, push the right buttons and sweat out the 20 frame pull-ups when Herb wants a scene tightened long after Ms. Romano, Julie, Barbie and Schneider have gone home.

# If distribution is *troubling* you... use *DYNAIR'S 5900 SERIES* for *FAST* relief!



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Mounting space for redundant power supplies and ten modules in any combination

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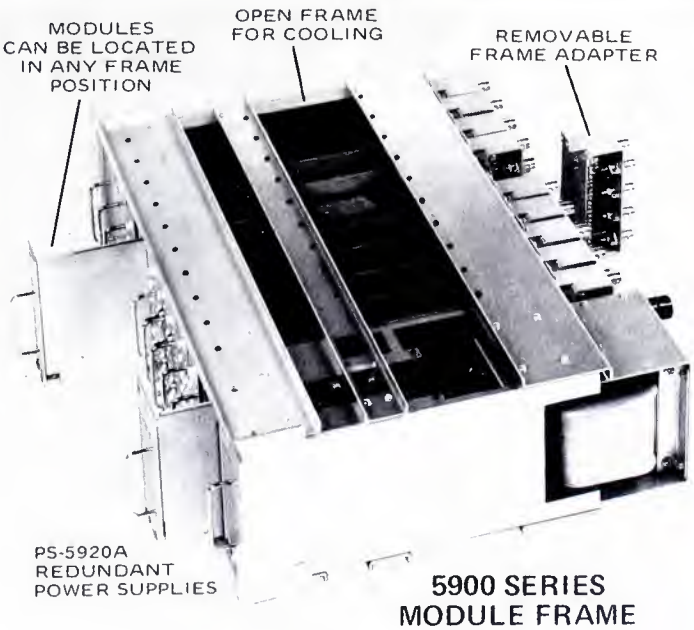
Up to 60 outputs in 5¼ inches of standard 19-inch rack space




## MODULE VERSATILITY

- **AD-5980A**, 1 looping in, 6 out, Audio DA
- **DA-5960A**, 1 looping in, 6 out, Video DA
- **DA-5966A**, 1 looping in, 6 out, Subcarrier DA
- **PD-5941A**, 1 looping in, 6 out, Regenerative Pulse DA
- **PD-5942A**, 1 looping in, 6 out, Regenerative Pulse Delay DA
- **SG-5930A**, 3 looping in (sync, blanking, subcarrier), 2 out, Blackburst Generator
- **SW-5905A**, 5 in (looping or terminating), 1 out, solid-state remote control vertical interval Video Switcher, available in 5x1, 10x1, 5x5 configurations
- **SW-5985A**, 5 in (looping or terminating), 1 out, solid-state remote control Audio Switcher, available in 5x1, 10x1, 5x5 configurations

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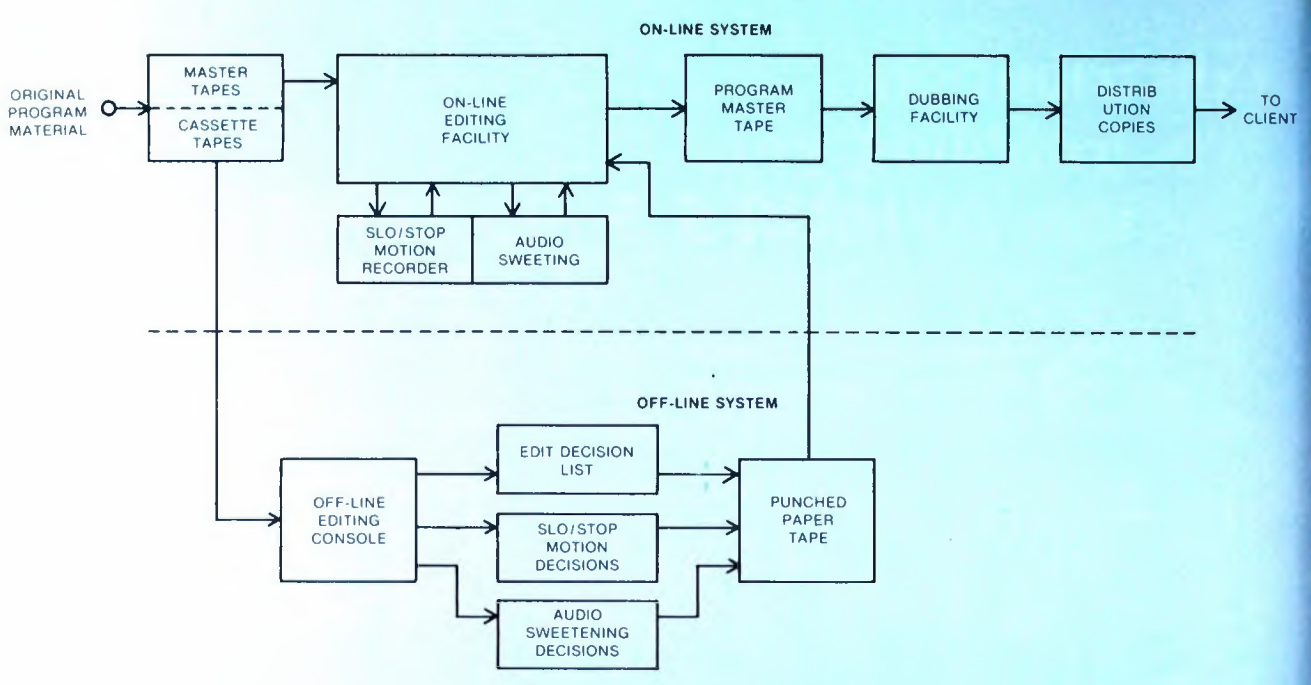


## One frame at a time

*continued from page 22*

master reels of 2-inch tape and on the ¾-inch cassettes from which the edit decision list for the program master will be developed. Kenwith now has his diamond in the rough which must have its many facets carefully polished until each scene sparkles with the brilliance that the writers and actors worked for.

### Post production

There is an analogy that TV production is like putting the words into a dictionary, while post production is the art of taking those same words and forming them into succinct sentences or paragraphs.

Early Monday morning, Kenwith meets with Pinky, and Kris Trexler, videotape editor, in the CMX-3, a small room in the bowels of Metromedia Square. This enclosure houses an off-line editing system with four U-Matic type cassette VTRs. The working material consists of six or eight recorded cassettes containing the same program sequences that are on the 2-inch quadraphonic master tapes. However, there is one small but important difference. The cassette tapes have an overlay of the SMPTE time and control code (frame address) right in the picture, so that when the cassettes are replayed at any speed or are in freeze frame mode, the frame number is clearly visible in the lower left quadrant of the picture.

Every individual image or frame on the tape has a unique number by which it can be searched out, cued or selected by the human editor. A computer with a memory bank is then brought into play, and it can follow instructions to initiate the appropriate electronic editing functions.

As the director, Kenwith gets the first cut at the tapes. For the next few hours he will select the points at which the edits are to be made, decide on where the ISO camera shots are inserted, suggest trimming certain takes if the pace slackens or add pieces whe the continuity requires it. As he and Frank build the final show, Kris is noting frame addresses a entering them in the computer memory. While he dc this, the display terminal on the edit console sho the edit decision list accumulating on the screen.

If there is any doubt as to how a particular e may really look, Trexler can manipulate the cassett with a bi-directional control (joystick) and program preview edit at the selected frame addresses operating the console keyboard like a typewritter. If doesn't look acceptable, he can jog frame by fra through a sequence until Kenwith says, "that's t spot I want." With the tape showing a still frame that point Trexler can read off the time code a enter that number in the log or edit decision li While as much as possible has been done to cut camera, it still takes 80 to 100 edits and many hou of work to produce the finished program.

The editing session will include such add attractions as selected freeze frames used under t titles or credits at the beginning and end of the sho These selected frames must be identified carefu (each one is a little different) and transferred to HS-100 videodisc for insertion into the progra master. Commercials and three second "bumper have to be added and Frank usually puts together t 30-second closing montage over which the closi credits crawl across the screen.

Great pains are taken to be sure the audio is ju right. A scene in the local malt shop caused Kenwi to ask for some "hamburger noise" to be overlayed f authenticity. Audio levels are matched careful between takes and can also be individually controll to add or subtract emphasis. All of the audio chang are done in a separate editing room equipped wi

*continued on page*

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just slightly ahead of our time.

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## One frame at a time

*continued from page 24*

multitrack audio recorders which can run synchronously with the VTRs being used.

After Kenwith is satisfied he has shaped the s adequately, he now leaves the actual editing wor Frank and Trexler. As they assemble the ac list, they also produce a punched paper tape computer can read to direct the on-line equipment

However, before the completed show can be c mitted to the program master tape, there is another session when the four writer/producers review Kenwith's masterpiece and suggest change it. These usually are not major alterations and modified edit decision list is now ready to do its w

### The on-line sequence

The punched paper tape carries all of the decisions needed to make the program master. As computer starts reading the tape it directs the hu operators to load certain reels on the quadraph VTRs. It then proceeds to find the correct seques by the address codes entered earlier and initiates record reel on which the program material will assembled. The computer can direct a programm switcher to do cuts, fades, dissolves or special eff at desired places in the program. It also can cor the synchronous audio recorders so they add edited audio tracks properly.

All of this is done through a mechanism known dedicated interface, a box with a microprocessor a read-only memory which attaches to a VTR, a recorder or other studio device. This interface programmed into it the pertinent characteristics of device it is controlling. For example, in the case quadraphonic VTR, it would remember its star time, reel ballistics, pre-roll requirements, etc., perform the necessary functions to follow an command from the computer with precise allowa for these factors. If the interface was controllin U-Matic or a telecine machine, obviously t characteristics are different and the PROM contain different instructions in its memory.

While a segment is being transferred on one on- VTR, the editing system can look ahead on the o machine and cue it up to be ready when its seque is needed. This facility considerably reduces t editing time by minimizing wait periods.

The program master, assembled on the "rec quadraphonic machine, can now be used to n distribution copies. In the case of *One Day at a T* three such copies are made: one for CBS, the netv that airs the show in the USA; one for Cana distribution, and one for Australia, where the sho also popular. The NTSC tape sent to Australi transcoded down under into the 625-line, 50-field color system for airing.

### Summary

Watching the Kenwith/Frank/Trexler team produce a zippy show from the segmented t makes it seem almost too easy. Paradoxically, nothing of the sort, for between them there i wealth of experience producing a whole which is n than the sum of its parts.

Kenwith admits to having felt more comfort when things used to be simple enough that he c manipulate the "slant tracks" (as he called th himself. Today he is at the mercy of a lot of h ware, software and a maintenance regimen to kee

**...last reviews** the script at the first reading with Herb Kenwith, the director. Left to right: Kenwith, Valerie Bertinelli, ...enzie Phillips and Pat Harrington, Jr. (*Photo by Donna Foster Roizen*)

...h. Nevertheless, he has mastered the technique of ...ng all of this technology do his bidding. He is now ...e point where he flatly states that he can do ...thing on tape he used to do with film and do it ...r and faster!

...ink and Trexler suffer no such threshold inhibi... Both are of the television age and adapt quickly ...hnical innovations. Selig Frank, whose nickname ... from a high school incident when a bucket of ...paint ended up on his head and took six days to ... out, cut his TV teeth at KAKE in Kansas and ... in Los Angeles. To him the operations involving ..., slo-mo discs, audio trickery and the like are ...iar and comfortable, and are to be used when ...ble to spruce up the production. He takes evident ... in describing the painstaking hours that have ... into some difficult editing sequences and remem... a recent musical concert of two 30-minute ...ents that had to be edited out of 32 reels of tape! ...s Trexler, the youngest of the trio, was doing his ...h show, yet he seemed very competent at the ...ole controls. He claimed the keyboard entry to the ...outer was easy to learn because it closely ...llels a standard typewriter. It took a little longer ...rst, but now he finds this method of editing ...ol fast and efficient. Most of all he likes the wide ...ty of effects he can produce which he could not do without computer assistance. Considering that he is new enough to tape editing to say that razor blade cuts on quadraphonic tape were before his time, this virtuoso on the keyboard taps out a fine time code.

Computer-assisted post-production editing is widely used and spreading further because it offers greater program production flexibility, a wider range of visually attractive results and economies in time for both the VTR duty cycles and the human editors involved.

While this article selected a specific show and a single facility, there are dozens of similar set-ups with equivalent equipment all over the United States, Canada and elsewhere, turning out the TV hits of today and tomorrow.


### Acknowledgements

This article was made possible through the co-operative assistance of the following people: Barbara Broghatti, vice president, Media TAT Communications Co., who arranged the visits and photo clearances; Herbert Kenwith, director; Selig (Pinky) Frank, associate director; and Kris Trexler, videotape editor.

The title, "One Frame at a Time," is from a series of humorous out-takes of the show which was put together for internal amusement.

The post-production analogy is a quote from William Orr, president of Orrox/CMX Systems.

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RCA

# Standard switching interface surfaces for total automation

By Phil Dean
*New Rochelle, New York*

Total automation, long considered the ultimate goal in efficiency and performance for TV and radio stations, has been "just around the corner" since computers first appeared on the broadcast operations horizon.

This "corner" was finally turned earlier this year, however, when the BIAS (Broadcast Industry Automated System) division of Data Communications Corporation announced it had perfected an automated interface system which would be compatible with all major makes of switchers.

Some industry experts, systems operators and manufacturers are now predicting that many stations will take the total automation route in the near future.

A number of TV stations have already gone "total automation" via specialized system hook-ups. Metromedia stations, particu WTCN-TV, Minneapolis, were of the first groups to go to a automation system with a cus built interface developed by station engineers, using a switcher. WNEW-TV, New Y another Metromedia station, lowed shortly thereafter wit custom-built interface.

Despite this early move tov automation, the potential for in try-wide total automation was ther evident nor viable until development and testing of a sy which could be interfaced with types of production switchers.

**WNAC-TV goes automated**

The BIAS development was qu ly absorbed by a number of

*continued on pag*

**In WNAC-TV control room** are Ron Caron (left), station engineer, and Ronnie Wilkes of BIAS. Bottom left is a CDL master control switcher console.

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## Interface surfaces

*continued from page 30*

stations, including WNAC-TV, Boston, the RKO-general station there, which in January 1977 began the conversion to total automation using the BIAS business system interfaced with a CDL technical switcher.

The Boston marriage of the business automation system, via BIAS, and the technical automation system, via a CDL system through the new BIAS interface, was begun on January 3, when a BIAS conversion team began the installation of the hardware/software for total automation.

On February 3, exactly one month later, WNAC-TV went on the air "live" with its total automation system. For the first few weeks the station maintained a parallel operation until the system was fully de-bugged. By the first week in March, the BIAS-CDL total automation system was in full operational control.

The decision to go to total automation was a major one for WNAC-TV's management and engineering staff. For the engineers it was a natural extension of the fast-changing state-of-the-art in broadcasting operations. For management, it came down to a "bottom-line" decision.

James Coppersmith, then vice president and general manager of WNAC-TV (and now head of WNEW-TV, New York) believes that the advantages offered by a total automation system more than offset the financial expense.

*"The end product of total automation was far greater efficiency in the overall operation of the station." James Coppersmith, WNAC-TV [now with WNEW-TV]*

"The end product of total automation," Coppersmith said, "was far greater efficiency in the overall operation of the station. It provided us a competitive edge in the highly competitive (Boston) market, and upgraded our on-air attraction, which was our major goal."

Coppersmith noted that the TV audience often has the "What you see is what you get" syndrome, and that a station with a sharp, precise and consistent picture, with no "black space" in the continuity of its presentation, would make a big difference with viewers. "It's that upbeat, on-the-ball atmosphere that often makes a difference to a viewer," said Coppersmith, "and the total automation concept offers that."

### Operational changes

The conversion to total automation at WNAC-TV has brought a number of operational changes to the station, particularly in the traffic department. The station has been on the BIAS system since 1975, so much of the detail work was in training the staff in procedural changes.

Since all the data flows from the BIAS host computer in Memphis through the minicomputer in the traffic department and then on to the technical computer in the control room, maintaining the station logs accurately is imperative. Before introduction of the automatic switching system, traffic was required only to input all spot orders and commercial instruction, entering the name of the advertiser, the length of the spot, and the media. The master control engineer on duty would consult his operational log and roll the right commercial at the proper time. Exact timing of each log element was not essential from the traffic department.

With the total automation system, the computer controlling the technical switcher must know not only what commercial is running, but also detailed instructions as to the time and content of each commercial program element on the log. It is their responsibility to time out the log and include more detail on the commercial data needed for the exact timing for on-air status.

This puts a greater load on the traffic department, but as Dave McCracken, traffic director for WNAC-TV, notes, "The traffic people have had to learn a new language and have had to use that language precisely. The increase in responsibility has brought about an increase in morale and our staff enjoys the feeling that they are an important segment in the overall operation."

In the WNAC-TV operation, the log is held in the traffic department until it is fairly certain there are no additional changes. Then McCracken calls master control to see if they're ready for the log. When they say okay, the BIAS Nova II computer transfers the log to the CDL-PDP II technical switching computer which then takes over contro the airing of the schedule.

### Other benefits

Although the traffic depart staff must spend more tim guarantee the absolute accura the timing segments to be sent t master control computer, the ripheral benefits from the automation system are obvious.

The man-hour savings in neering and accounting are stantial, and this savings ena the engineering staff to devote time to creative efforts and important duties. The accou department is relieved of most reconciliation duties as the a mated system records all log davit data and transmits it bac BIAS' host computer for future voicing.

The computer elements inv in the total automation sys

*"The increase in responsibility has brought about an increase in morale and our staff enjoys the feeling that they are an importan segment in the overall operation." Dave McCracken, WNAC-TV*

include the host computer at E headquarters in Memphis, and Burroughs Tri-processor "67 models, which handle the more t 160 stations on the firm's custo list, and a Honeywell Multics tem. The BIAS system is an on-l real-time, fully dedicated serv and access to the host compute via a Data General Nova m computer based at the station. third computer element is the n computer controlling the techn switcher in the master control r which is interfaced with the B system.

### Versatile interface

While the WNAC-TV total a mation system was undergoing shakedown phase in Boston, BIAS conversion team was wor on an even more exotic link-up station WEWS-TV, the Scri Howard station in Cleveland, O The WEWS-TV conversion was ideal opportunity to demonstrate

satility of the BIAS interfacing cept. Though all of the technical ipment at WNAC-TV was made one switching manufacturer, CDL , the WEWS-TV technical set-up uded a Grass Valley Group es 1400 switcher driven by Vital ustry's VIMAX 200 software xage.

he conversion was initiated in March when John Moore and t McCommons from BIAS ar- d in Cleveland to do the pre- ersion survey work which in- ded the establishment of all nd codes and a time table for actual conversion. On April 18, re and Madeline Simonetti be- the actual physical conversion otal automation. On April 27, VS-TV ran its first "live" auto- c switching log.

Unlike WNAC-TV, the Cleveland on did not run a parallel eation but decided to put its t in the automated system for at parts of its program for the sday. Although there were a lot crossed fingers around the sta- or everything went smoothly with a few minor crises to mar the sion.

Within a few days the full sched- with the exception of local s, was being carried by the on and all hands were feeling comfortable with the new ept. Jim Bloyd, WEWS feeling comfortable with the new cept. Jim Bloyd, WEWS vice sident and chief engineer, was usiastic about the cooperation a existed between the BIAS and people and his own staff. "I r that's why the transition ran noothly," he said.

Byd, who has felt for a long that total automation is the answer to a number of TV station problems, had been biding his time until many of the technical production problems were solved. "We wanted to go into total automation in the 1960s," he said. "But due to the inexact timings of the commercials (films, slides, VTR), the inherent accuracy built into the computers would have caused problems. When the computer controls the switcher, a 30-second spot is just that—30 seconds. And in those days many of the spots were not timed exactly. The situation is a lot better today and the majority of the commercials we receive are timed out pretty much on the nose."

**Tough beginnings**

The conversion to total automation is not without is traumatic effects, however, particularly in the traffic department. George Cerveny, traffic director for WEWS, tabbed the early days of conversion as "controlled chaos," but looks back on it now as a vital experience.

*"We learned more about accuracy, cues, and gained a greater understanding of the flexibility of the computer. . . ."*
*George Cerveny, WEWS-TV*

"It was quite an education," Cerveny said, "both for me and my staff. We learned more about accuracy, cues, and gained a greater understanding of the flexibility of the computer and a more thorough knowledge of the importance of a strong link-up between the business side and the technical side of our station operations."

One of the benefits that came out of the conversion, according to Cerveny, was a better understanding of the engineering function at the station. "We now have an open communications policy with the engineering department," he said, "which will allow us to continue to fine tune the operation. It's been a revelation."

With conversion of WNAC-TV and WEWS-TV accomplished, BIAS is working on conversion of a third TV station with a third and different master-control switching product to interface with. This is station KTLA-TV, Los Angeles, and the initial surveys and projection studies have already begun.

The importance of proper preparation was underlined by James McKee, president of the BIAS division of Data Communications, who stressed, "Conversion to total automation is an exact science. There is no room for guesses or errors. It is important that prior to each conversion every person connected with the operation be fully briefed and trained."

To accomplish this, an intensive training program is conducted for the station personnel. The new computer is explained, the operation of both hardware and software is covered in detail, and the need for complete and total accuracy is impressed upon the staff. During the conversion, the staff people from BIAS, the switching manufacturer, and the engineering department from the station along with the traffic people work closely together so that everyone will understand all facets of the conversion program and its end result.

**Looking ahead**

McKee thinks that the introduction of the standard interface concept, which has been accepted by the three major technical switching manufacturers, will open the doors to many TV stations which are now in a semi-automated status and which can be converted fairly rapidly in a short period of time.

"The custom-built, made-to-order tag has been removed from the field," McKee said. "The technical sophistication that set total automation apart for so long is now standardization. . . for total automation, the future is now." □

**y Van Camp** (left), engineering liaison, WEWS-TV, and James E. Bloyd, vice sident and chief engineer, WEWS-TV, check out master control room of new l automation system.

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| Western Electric | Lisle, Ill. |
| WFBC | Greenville, S.C. |
| WFMJ | Youngstown, Ohio |
| WFRV | Green Bay, Wisc. |
| WFTV | Orlando, Fla. |
| WGAL | Lancaster, Pa. |
| WGBH | Boston, Mass. |
| WGBY | Springfield, Mass. |
| WGNO | New Orleans, La. |
| WGR | Buffalo, N.Y. |
| WHYN | Springfield, Mass. |
| WIBW | Topeka, Kansas |
| WIS | Columbia, S.C. |
| WISH | Indianapolis, Ind. |
| WJZ | Baltimore, Md. |
| WKBN | Youngstown, Ohio |
| WKBW | Buffalo, N.Y. |
| WKPT | Kingsport, Tenn. |
| WKRG | Mobile, Ala. |
| WKYC | Cleveland, Ohio |
| WKZO | Kalamazoo, Mich. |
| WLS | Chicago, Ill. |
| WMAL (Evening Star Broadcasting) | Washington, D.C. |
| WMAQ | Chicago, Ill. |
| WMAR | Baltimore, Md. |
| WNBC | New York, N.Y. |
| WNDU | South Bend, Ind. |
| WNEP | Avoca, Pa. |
| WNET | New York, N.Y. |
| WNEW | New York, N.Y. |
| WOTV | Grand Rapids, Mich. |
| WPIX | New York, N.Y. |
| WPVI | Philadelphia, Pa. |
| WRAL | Raleigh, N.C. |
| WRC | Washington, D.C. |
| WSAZ | Huntington, W.V. |
| WSIL | Harrisburg, Ill. |
| WSM | Nashville, Tenn. |
| WSYR | Syracuse, N.Y. |
| WTAR | Norfolk, Va. |
| WTMJ | Milwaukee, Wisc. |
| WTNH | New Haven, Conn. |
| WTOL | Toledo, Ohio |
| WTTG | Washington, D.C. |
| WTTW | Chicago, Ill. |
| WTVD | Durham, N.C. |
| WTVF | Nashville, Tenn. |
| WTVT | Tampa, Fla. |
| WUFT (U of Florida) | Gainesville, Fla. |
| WWLP (Springfield, TV) | Springfield, Mass. |
| WXEX | Petersburg, Va. |
| WXXI | Rochester, N.Y. |
| WXYZ | Southfield, Mich. |
| ZDF Network (Republic of Germany) | Washington, D.C. |

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For More Details Circle (23) on Reply Card


**Russ Wood**, KSL-AM sales manager, gets the latest avails from the terminal in his sales area. The sales staff at each station is provided a terminal from which they may access avails, spot locations in individual breaks, day-parts or total schedules and pre-logs. These are "retrieval" terminals only and do not permit input of any kind.

# Can TV and radio automation be compatible?

**By Joe Meier***

In July, 1975 an article appeared in **Broadcast Engineering** describing a "minicomputer" traffic and accounting system developed by the engineering department at KSL Television in Salt Lake City, Utah. Prior to that time, in-house development of a reliable system capable of handling all of television's traffic and accounting needs was regarded by many as too expensive and too expansive. But, having done it, the development team was asked to take on what seemed to be an even more unlikely task: make the same system work for radio.

*Information supplied by Bill Loveless, technical director of KSL Inc., and Brent Sylvester, system programmer

**Could it handle radio and TV?**

The question that needed to be answered was simply: Could a single software and procedures package effectively meet the needs of both radio stations and television stations? Most of the group sales managers felt it could not. The programmers felt that it could. Both were right.

On the "sales" level, the dynamics of AM radio, FM radio and television are vastly different. On the "computer" level, these differences are less distinct, and while the system did require some modification, the basic software remained intact. The key to s the problem was the system fle ity.

During the past two years Bonneville Traffic and Accou (BTA) system has been install 10 radio stations within the g and since the formats employe the various Bonneville stations widely, the capability as well a flexibility of the new General mation 16/440 minicomputer the software package develope the Bonneville programmers undergone a broad and metic evaluation by the station mana sales personnel and engineers. result, according to Bill Love director of engineering for KSL and supervisor of the Comp Development Project for Bonne International, is a system provides a full range of options strategies tailored to the spe needs of both radio and televisio a single package.

**Serving mixed formats**

The system is now operat with a variety of formats, fou which might serve to illustrat depth and versatility.

KIRO Radio in Seattle, Was ton has a newsradio format carries a full 18 minutes per commercial load. The station does extensive public affairs sports programming and is a affiliate. KIRO program logs ru 60 pages daily with 366 similar stored in the system.

KMBZ Radio in Kansas Missouri has a strong "MOR sonality" format, plus heavy by-play sports coverage of professional and collegiate s (about 300 games per year), and CBS Radio Network. Maximum mercial load, again, is the orde the day (no pun intended), wit the usual problems of rotation separation.

KBIG-FM in Los Angeles, use Bonneville, "Beautiful Music" mat, with the commercial restricted to a maximum of minutes (or 10 units) per hour. format puts a premium on each location as well as tight contr all "talk" segments. The sy produces 23 to 25 pages of log day for this format, each log c for the automation computer, t by effectuating a total opera control mechanism.

At KSL Television in Salt City, the prototype for the software is efficiently handle the same system. For television

*continued on pag*

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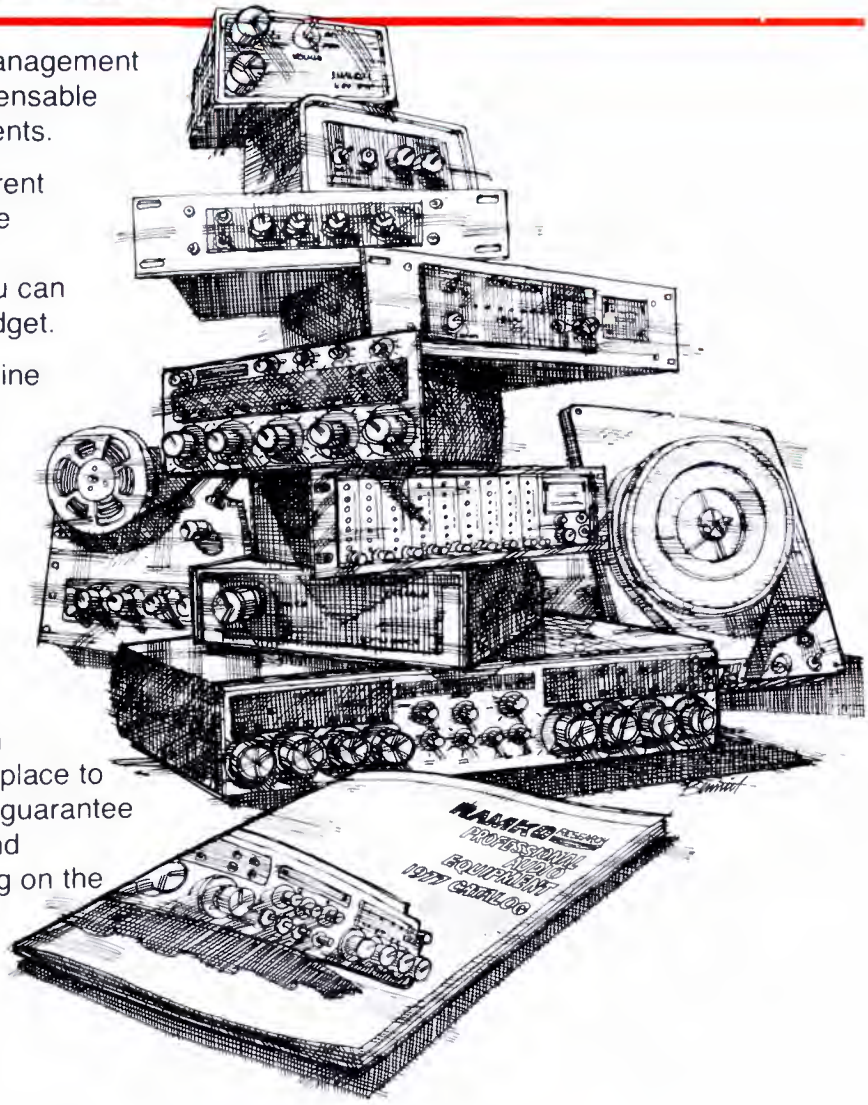


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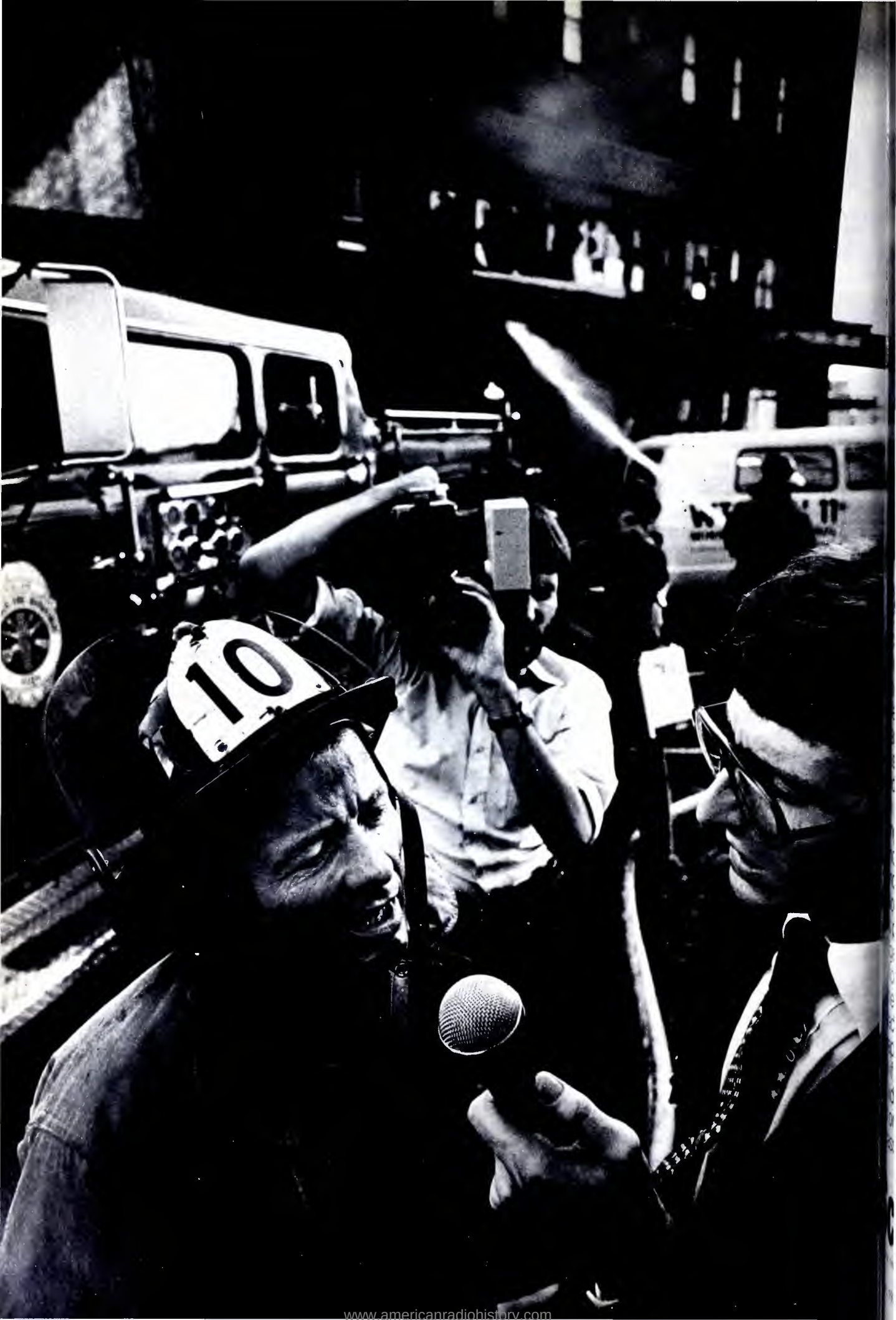
For More Details Circle (24) on Reply Card



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# OU NEVER GET A
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For More Details Circle (25) on Reply Card

## Automation

*continued from page 36*

only addition is one terminal dedicated to continuity control.

In every case, the system provides instant availabilities, long-range and short-range forecasts, a variety of sales and budget reports and comparisons, invoicing statements, aging reports and accounts receivable controls, in addition to the daily log.

"We have developed a system with the capacity and flexibility of the 'on-line' systems," said Loveless, "with the economy and control of an in-house minicomputer."

### Software language

One of the secrets of this success was the use of "Assembly Language" in the development of the software. Even though this dedicates the program to the particular hardware used (in this case the General Automation 16/440) and takes longer to write, it does make maximum use of the hardware capability by coding at the machine level. This pays off handsomely in more efficient use of core and bulk and delivers faster execution.

Going "Up" in a new station
not been a problem. The ven
drop-ship the hardware to
designated site and the local st
engineers handle the shaked
and pre-test. (In addition to
computer, each station install
employs two Wangco T2221
Drives for 20 Mega bytes of stor
three Hazeltine 2000C CRT te
nals, two Centronics 306C prin
with two fonts and autostart,
Penril 300A modem and one D
mation M200 card reader.)

Once the hardware has b
installed and is operational,
software is installed by sim
loading two boxes of pre-pun
cards into the card reader
pushing the button. In a matte
minutes the software resides on
disc. The data base is then
through the CRT terminals.
broadcast and commercial for
are loaded into the model week
copied throughout future logs.
vidual items such as programs,
PSAs and promo announcem
may also be copied.

Next the broadcast orders
entered from forms filled in by
sales department. As each orde
entered on the CRT, automatic
placement occurs in future
Immediate feedback on the
shows the future time, position
date for each spot placed on
log, with an indication of
preemptions that may occur.
operator has the option of modif
or canceling the order at any ti
At the conclusion of the ente
process, or whenever the oper
chooses, a single command at
CRT brings out a hand copy of
newly entered or modified order
four- or five-part confirmation
tract forms pre-loaded into
designated printer. The two prin
are shared via CRT comma
rather than patch cords.

Continuity instructions, avail
mats and sales budgets are
entered. In three to five wor
days, depending on commer
load, the station's traffic perso
have constructed the first hal
the data base and have learned
to operate the system as well. D
program logs are now genera
and the traffic operation proce
on the computer system.

Near the end of the first mon
operation on the system, the
counting portion of the data bas
inserted. All prior accounts rece
ble information is entered via
CRT terminals. This updates
computer files by placing all unp
invoices in the system. At this po

*continued on pag*

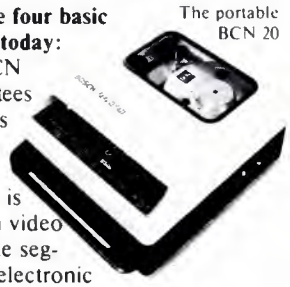
# The VTR Format of Tomorrow. While others are still talking about it... Bosch already has it: the BCN System.

## Since the BCN was first introduced, more than 370 of these systems have been ordered from all parts of the world. More than 150 of them have been delivered and are in operation.

The four basic requirements placed on a new VTR
hat:
**Top broadcast quality for all TV standards.**
**Universal applicability.**
**Reel-to-reel and cassette handling.**
**Adaptable to future developments.**

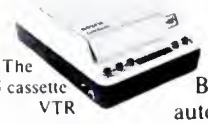
he secret of success:
CN scanner

**The BCN System meets these four basic requirements for a new VTR format today:** The compatible and economical BCN 1" format produced by Bosch guarantees broadcast quality in all TV standards and color systems (PAL, PAL-M, SECAM, NTSC). For all fields of telecasting and VTR applications. It is adaptable to future developments in video tape and video head technology. The segmented-field process makes purely electronic switching of writing speeds possible. As a result, the BCN is already an economical and universal VTR with a guaranteed future today.



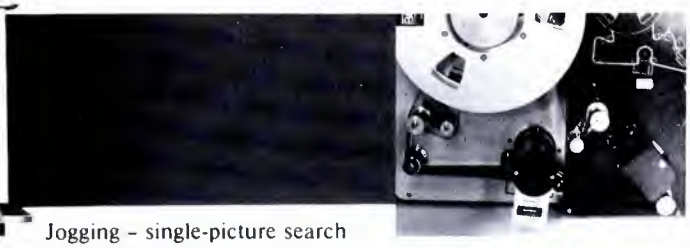
The portable BCN 20

**The BCN System offers two different portable versions:** the portable BCN 20 with a tape capacity of more than 60 minutes on one reel - and the BCN 5, the 20-min. cassette recording and play-back version. Both versions operate under all conditions with full broadcast quality. In the future, the BCN cassette version will also be used in an automatic multi-cassette VTR.



The BCN 5 cassette VTR

**The BCN System features electronic editing with:** Single-picture display - for an unlimited time with no danger to the tape.



Tape guidance system in the BCN 20

Jogging - single-picture search mode, forward and reverse.
Slow-motion, fast-motion - variable take-search mode.
And all this with a state-of-the-art digital store.
The BCN format also offers the possibility of filing over 100.000 single pictures (for example, slides) on a 90-min. video tape with an extremely short access time to each single picture.

**The BCN System is not only a broadcast VTR:**
also the electronic alternative to film. For the quality- and nomy-minded industrial user, and for all professional n-broadcast applications.

**The BCN System is offered by four leading manufacturers broadcast" equipment,** and it is produced in both Europe and USA.

**The BCN System is designed for both basic tape-handling methods:** reel-to-reel and cassette handling in full broadcast quality, in both portable and stationary VTR's.

### BCN - a format with a guaranteed future.

**See us at Booth 26 and 27, SMPTE show, Oct. 17-20, Century Plaza Hotel, Los Angeles.**

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For More Details Circle (27) on Reply Card

**All terminals** are plug interchangeable and traffic managers may operate any of the systems in the event of an emergency. The disc packs are also interchangeable and redundant. The terminal in the foreground has push-button access to all three systems and is used by all three traffic managers to generate print commands. This leaves the regular terminal free for input chores, permits simultaneous printing of various forms and maximizes the real-time capacity of the system.

**The "computer room"** at KMBZ/KMBR in Kansas provides a clean, cool atmosphere with complete "around" access to all hardware. Lin Harper (top), ness manager, and Bob Minter, operations dire inspect the system prior to bringing it "up."

## Automation *continued from page 40*

invoices, summary of invoices, statements and aging reports may be printed.

The entire process takes two, one-week training segments; the system is fully operational and the station staff has been trained. A detailed "Operations Manual" is then given to each staff member for further reference and the station is on "stand alone" status with complete control in-house.

### Automatic softward features

While it is true that computers can't think, it is just as true that they do have a certain definable structure, intelligence and personality. The software is, of course controlling element that gives system its identity. The Bonne system has been revised, expa and enriched many times in the four years and the resulting "e matic" features have proven t extremely useful. Some example

*continued on pag*

AN INDUSTRY FIRST

# DIAL-A-WATTmeter

. . . or dial for an RF load or plug-in element. Dielectric Communications now offers toll free dialing for easy ordering and quick shipment of its complete line of RF instruments.

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- **Easy** — dial 800-341-9679 to order
- **Reliable** — Full two-year-warranty on all RF wattmeters, loads and elements
- **Convenient** — Use MasterCharge or (BankAmericard) VISA


A complete line of terminating loads:
5 to 150 watt dry loads, 100 watt to 10 kilowatt liquid filled load, 10 to 250 kilowatt water cooled heat exchanger type.

Accurate and portable insertion wattmeters measure forward and reflected radio frequency powers. Large scale, easily read meter movement with plug-in power detectors and quick match RF connectors.

Equipment is tested and serviced to exact specifications. Now it's covered with two-year warranty.
Terms of warranty available upon request.

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**Full Two**
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For More Details Circle (29) on Reply Card

# The small machine for g stations. The big machine for small stations. AVR-2.

s what it has to do. There's an Ampex 2 for every videotape assignment in station.
you already have a complete pro- on/editing setup, you probably don't a lot of accessories for your AVR-2. it with basic manual controls, and ady to go to work.
ou might want Super High Band Pilot. nes with optional switch selection to ent the standard High Band Color ts, and it adds valuable depth to your generation production work.
you're just now growing into more ced production work, then you're to want the EC-2 Edit Controller.

This complete, sophisticated stand-up time code editing accessory can put you in command of as many as seven additional (similarly equipped) machines working in any combination of master/slave for production or multiple dubbing service.

Modular construction means an easy fit for your AVR-2, no matter where you want to use it—at a remote location, in your tape room, or out in the mobile van.

AVR-2 is the quad recorder that grows. Every accessory for this machine is available upon initial purchase or at any time in the future when you're ready. Tell us what it has to do, and we'll recommend the model that suits your needs.

AMPEX

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

For More Details Circle (30) on Reply Card

**The BTA 101** traffic computer generates logs precoded for entering into KBIG/KBRT automation computer (a general automation spec 16). Interfac the two systems is part of the Bonneville computer division's long-range pla

## Automation

*continued from page 42*

• A program "Sprayer" permits special programs, sponsored or unsponsored, (e.g., public affairs or sports broadcasts) to be inserted into the regular log format instantaneously. The program "Special" so inserted will have the proper commercial format and spots already scheduled and the time segment that is preempted will be rescheduled or placed in the preempt file at the option of the operator.

• Development of a pre-log for radio as well as television. The pre-logs reside in the system and can be printed out or reviewed page by page on the CRT. The pre-logs, in two formats, may be called up for any day or day-part for up to a year in advance.

• A "place" program has been developed which, at the option of the operator, can be called at any time prior to the printing of the final log. When the place program is called, all spots on the log and all spots in the preempt file are reviewed by the computer. High priority spots are automatically placed (preempting spots of a lower priority if necessary) and any "holes" in the log are filled from the preempt file. The process takes j minutes.

### Complete redundancy

"One of our big concerns," s Loveless, "has been the protect of the data base and stati operation in the event of failure. took a giant step forward in solv this problem when we construct the software in 'Assembly La guage.' This gave us maxim speed, capacity and efficiency the outset. We then developed method of 'talking' to the compu that avoids both the time consumi 'question and answer' format a the cumbersome, 'fill-in-the-blan transactional system. This made possible for us to develop all of t features specified by the stations a system that would operate norm ly on a single disc drive."

"Since the hardware config ration was designed for two d drives," Loveless continued, "co plete redundancy was achiev without limiting speed or capaci The redundant disc drive, of cours provides the needed protection."

Each drive has a "fixed" and "removable" disc pack. Normal only the two fixed discs are used

data base. The two removable ks are spare copies of the data e and since they are removable, y can be saved for any specified th of time. The two printers and e CRTs are plug interchangeable are also redundant.

he system has been reliable, and extremely fast. The servo trolled magnetic heads in the drive fly on a thin film or air in ean air environment and never h the disc surface. Average ess time is 30 milli-seconds. ncumbered by "line" limitations, system operates at a speed of 0 baud, which means more tions can be performed faster with greater economy than st" computer systems that must re their "real-time" capacity many other stations.

**Computer advantages**

ccording to Loveless, the de-pment team has had the same ctive from the beginning of the ect to the present: "Develop a em that will provide manage-t with the tools to optimize the ion's sales capacity, accurately itor all business and program vity and provide positive custom-erifications."

ere are some of the ways the neville Traffic and Accounting em has met those objectives.

vailabilities are projected in week increments, up to one year he future. These avails are esented multi-dimensionally by by time (hour or day-part) by s and by percent of time sold.

anagement and sales projections be pulled out, up to one year in future and reported in many ensions, including day-date parisons, year-to-date compari-, sales projections, variance in get by percent or actual amount.

e "place" command optimizes log by automatically exchang-spots in the preempt file with s of lower priority and/or lower r value, all within contract meters.

"find" feature locates all spots a particular client and displays prints) the date, time and tion for all spots in the schedule. command may be given at any and may be further refined to any spots in the schedule that have been preempted.

e continuity system operates the clients spot rotation in-tions and flags missing copy on the pre-log and/or a separate g that can be called up to show

*continued on page 48*

## Automation

*continued from page 47*

only those accounts for which continuity has not been assigned.

• Many powerful sort options are provided that greatly simplify the management of sales and accounting. For example, the cash flow system generates customer reports sorted in sequence for each sales person, showing all accounts delinquent, with the name, address and telephone number of the person to contact, an excellent report to help the manager stimulate cash flow.

• Sales orders may be sorted by sales person, dollar value, in descending order and contract end date. Sales managers find this a useful tool in obtaining renewals prior to contract expiration.

• The system maintains a computer model of the physical broadcast materials in the station. It can sort in three dimensions and produce lists of carts in any desired sequence. An "inactive" or "erasure" list can be produced easily by sorting inventory by sequence number, contract expiration date, and name.

• Sales commissions are report by either sales amount or ca collection.

• The system produces six a counting journals: cash receipt unapplied cash, cash applied invoice, debits, credits, and pr duction invoice journals.

• The addition of a CRT in the sal department provides them with the own avails access. Furthermore, t modem may be connected into t national TWX network for dial-u computer avails in all sales r offices. It may also be connected a data phone for any number dial-up CRT terminals outside t station. Changeable security ke and option locks in the software a provided for each CRT and t modem.

• With the exception of generati of invoices and statements, a functions of the system may be pe formed simultaneously, providi phenomenal real-time capacit Cash, contracts and continuity ma be entered at the same time avoi ing the necessity of having to set u special work hours for individua or departments.

### Interchangeable options

Even though the sales needs ar business dynamics vary widely b tween AM, FM and TV, the a vantages of a single package syste are readily apparent. At KSL Inc the three systems are located in th same physical area. Terminals f all three stations are places in room adjacent to the hardware. Th printers (the only "noise" pr ducers) are housed with the com puters, but a high degree of visibi ity is maintained through a larg window that separates the hard ware from the terminal room.

Since the same basic system an procedures are in effect at all thre stations, personnel can be inte changed if necessary, to cover sick ness or vacation periods. In ad dition, each systems' hardware plug interchangeable. In the even of a breakdown, the unaffecte systems can easily pick up the slac until repairs can be made. To cu down the number of terminal necessary in multiple system ope ations, a CRT terminal switcher i installed to access any of th dedicated computer systems fro any of the CRTs.

"All of the radio and televisio systems currently available hav some degree of compatibility," Love less said, "but this may be the onl totally unified computer syste effectively handling AM, FM and T in existence today."

**Production engineers** at KFRC now have two compact but efficiently designed studios in which to produce the many tape cartridges used by KFRC and her sister stations in the RKO Radio chain. Special care has been taken to insulate studios from surrounding noise because of the closeness of other facilities. (*Photograph courtesy of Ampex Corp.*)

# Remodeling, ot rebuilding, the answer for KFRC

By Robert M. Kanner*

hough the trend in recent has been for radio stations to new facilities rather than del old ones, such was not the at KFRC, San Francisco. king their existing structure, a ing which was erected after 906 earthquake, personnel at station KFRC completely re- led and upgraded its broadcast production facilities over a ear period, without losing a e of broadcast air time.

ch a project is not easy to ute, but the rewards are well the price paid in temporary venience.

### Extensive use of tapes

contemporary music station, C utilizes a tight broadcast at that relies heavily on tape cartridges. Except for air personalities, news anchormen and selected phone callers, everything broadcast on the station is prerecorded on tape.

Similar work for KFRC-FM, along with the responsibility of producing automation tapes for four other FM stations that are part of the RKO Radio chain, meant an almost 24-hour-a-day work schedule in one production studio. Existing equipment was outdated, space was being used inefficiently, and the decision was made to go to a combo broadcast operation.

The need to upgrade and expand broadcast and production facilities became pressing as KFRC's business and responsibilities continued to grow. Like most older radio stations, KFRC added equipment and rearranged facilities as the need arose, until it reached the point where the sum of the parts wasn't adequate to serve the whole operation.

After studying the options, management decided it would be more economical to remodel the existing structure. For starters, ceilings were pulled down and replaced, walls were rearranged to get maximum use from the space available, and a false floor was built to house all the wiring.

### "Permanent" temporary facilities

Because both stations continued regular operations during the upheaval, logistics became a special problem—and temporary facilities became a permanent way of life for two years.

For example, temporary editing facilities for the news department were rigged up in master control, and the news staff was moved into the sales area while work proceeded. Air personalities took over a production studio while the broadcast facility was ripped up and rebuilt for the combo operation. At one point it was necessary to rig up a warning system so that carpenters would cease pounding when a record ended and resume their

*continued on page 50*

Engineer, KFRC AM/FM, ancisco

**An air personality** at KFRC is pictured from the adjoining news studio as prepares to go on the air. When the radio station went to a combo operation freed space for the news studio in space formerly occupied by broadc engineers. (*Photograph courtesy of Ampex Corp.*)

## Remodeling

*continued from page 49*

work when the next one came on.

The major challenge came in the design and construction of a block of four studios that would share common walls. Facing two production studios, where sound frequently reaches 110 dB in intensity, would be a studio for the recording of public affairs programs and the main broadcast studio.

Isolating each studio from the noise generated by its three neighbors was of paramount importance, and it was decided to solve the problem by following the room-within-a-room concept. Walls that separate the studios were built of sheet rock bonded to lead (two pounds of lead per square foot) and heavy metal doors were installed to further reduce the noise. Acouspa-pane® , a very dense glass that deadens sound, was used in the studios where needed. And wall speakers were mounted on springs to prevent the energy generated by bass notes from penetrating the walls.

### Efficient use of space

While studio space was increas during the rebuilding, it didn reach the point where technic personnel had to worry about u used space. Special attention w given to the layout of the producti facilities, and the result was effi ent use of the space available.

Careful planning left ample roo in each production studio for t key equipment—a customized M Curdy console, an Ampex ATR-1 professional audio recorder, and s Ampex AG-440 master recorder/r producers—and still enough spa for easy movement by producti personnel.

The end result is a model facility with two well-equipped pr duction studios that will serve t needs of the dominant radio stati in three markets for years to com And it's all housed in a remodel building that rents for substantial less money than other availab space.

## tation-
## o-station

# Program line equalizer

*Paul H. Bock, Jr., WSSV/WPLZ, Petersburg, Virginia*

One common complaint of AM managers is a lack of "crispness," or high frequency response, in an AM system, particularly with a compression amplifier and peak limiter in the audio chain. At WSSV, the program chain looks like that shown in Figure 1, and under normal compression and limiting gives some bass boost and high frequency rolloff, particularly above 7500 Hz. To overcome this deficiency, a variable equalizer as shown in Figure 2 was inserted in the program chain at the point marked "X" in Figure 1. Actual component values were derived experimentally, although a chart of inductive and capacitive reactance

*continued on page 52*

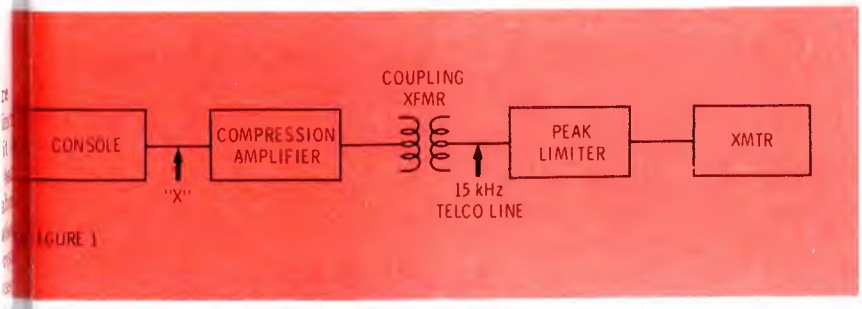


FIGURE 1

TABLE 1

| | $X_C$ | $X_L$ |
|---|---|---|
| 0 | 2650 | 9.42 |
| 0 | 1590 | 15.7 |
| 0 | 795 | 31.4 |
| 0 | 198.75 | 125.6 |
| 00 | 79.5 | 314 |
| 00 | 31.8 | 785 |
| 00 | 15.9 | 1570 |
| 00 | 10.6 | 2355 |
| 00 | 7.95 | 3140 |
| 00 | 6.36 | 3925 |
| 00 | 5.3 | 4710 |

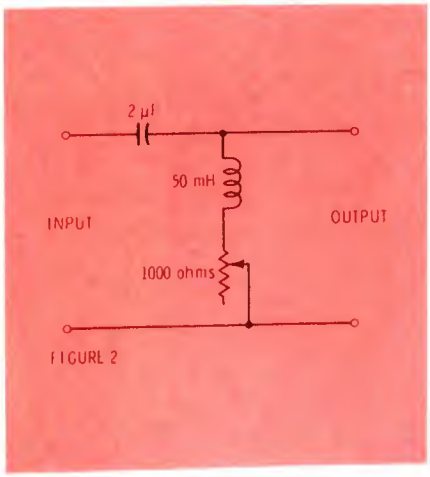


FIGURE 2

## Program line equalizer

*continued from page 51*

values is shown in Table I for reference. It should be remembered that the actual reactance values at the point of insertion may vary depending on circuit constants in the equipment located on either side of the equalizer; that's why the final values were determined experimentally, after numerous frequency response runs on the system.

As shown in the graph of Figure 3, the equalizer combines bass rolloff and high frequency boost. This graph, incidentally, was made for 50% modulation with the compression amplifier set to zero compression and the limiter disabled, and is a duplicate of the 50% modulation Proof of Performance curve from microphone input to antenna.

By increasing the amount of resistence (R) in the circuit, the curve contour can be varied. In actual practice, the potentiometer is adjusted until either the 100 Hz or 5000 Hz limit falls within 0.1 to 0.2 dB of the ±2 dB limit as prescribed by the FCC. The system response then meets FCC specifications over the 100-5000 Hz bandwidth. When the compression is set to the normal operating position and the limiter enabled, the curve tends to flatten out, thereby providing a more nearly uniform response over a wide frequency range. Needless to say, the improvement in signal quality is obvious, and the cost is negligible.

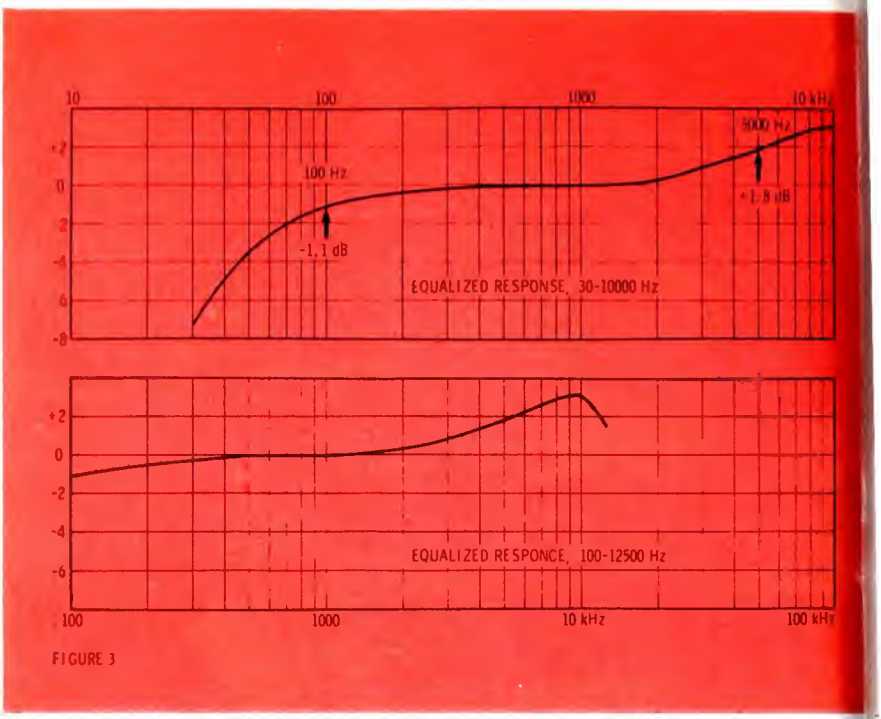


FIGURE 3


# CALLING ALL STATIONS

ll those whose equipment tips operating ideas are accepted by **oadcast Engineering** for use in ron-to-Station will be given the n of receiving a cash payment copy of the latest edition of the *NAB Engineering Handbook*.

The *NAB Handbook*, long considered the "bible" of the industry, is over 1,000 pages and 1,000 illustrations deep into the business of operating and maintaining AM, FM and TV stations. Written by many of the industry's leading experts, the *Handbook* includes thousands of recommended procedures, fundamentals, standards rules, and how-to working instructions on virtually every phase of radio and television.

**Broadcast Engineering** made this arrangement with the NAB to help engineers do a better job. If we share our industry ideas, we will benefit. And since the *NAB Handbook* is such an excellent engineering reference work, all station personnel whose items are selected have a chance to benefit from sharing their knowledge by reading the handbook. In this way, both readers and participants are winners.

Station-to-Station offers all readers an opportunity to send engineering ideas and operating tips through a station-oriented magazine. This includes how you solved a nagging problem, modified a circuit for more flexibility, redesigned a studio or facility, developed new test procedures, built a new problem-solving black box, or used an operating idea that saves time and money.

There is very real evidence that the lack of such a general exchange of ideas has stunted the acceptance of various station titles as professionals. Keeping these kinds of ideas locked in the station—or a lack of sharing—means that those who could have benefitted will have to learn the hard way. Meanwhile, without the knowledge they could have had, everyone comes up appearing less professional.

All you need to do is send your Station-to-Station items to: Station-to-Station Editor, Broadcast Engineering Magazine, PO Box 12901, Overland Park, Kansas 66212, and indicate whether you would prefer payment by check or by receipt of the latest *NAB Engineering Handbook*.

If you don't have any items for the Station-to-Station column, the *NAB Handbook* can be purchased directly from the NAB by writing to: Station Services Department, NAB, 1771 N. Street, N.W., Washington, D.C. 20036. The price for non-NAB membership people is $45. For NAB members, it's $30. □

**Announcer** Jim Shanahan is shown doing a show at WHCN. Visable are the three McCu SP-10D turntables, three ITC cart machines, and the close proximity of the carts.

# Control rooms *can be* designed for operators *and* engineers

***By Lawrence Titus,*** *chief engineer, WHCN*

The studios at WHCN were designed around the needs of an active announcer and the demands of the engineering department for ease of equipment replacement and repair. The move of the studios to a previously unoccupied suite allowed me to create a studio design that incorporated the best of the studio designs of the past 10 years at WHCN.

The format of this station required the announcer to monitor the transmitter functions as well as handle records, carts and the board. I designed the studio around the announcer's needs to perform these responsibilities. The console is designed so the announcer does not have to move more than a few feet in any direction to get a record or cart for air play. Normally this would lead to a studio that would make the announcer feel closed in. The placement of the windows to adjacent studios and into the reception area, however, give the feeling that the room is much larger than it really is.

### Stand-up operation

The console is a stand-up type that allows the announcer to either stand or use the bar-stool chair to sit during his show. The board is directly in front of the announcer, raised off the console top by an inch to allow for copy and records to fit under the board. The copy rack is made of clear plexiglass so the announcer can see through it into the news studio.

There are three McCurdy SP-10 D turntables clustered around the announcer. The turntables are direct-drive and have a digital logic start-stop circuit with triac mo control[1]. They are remoted to pu button switches located under respective pots for the turntabl The turntables have been furth modified so that the leads to table are on plugs. This allows to pull any table within a f seconds and get out of the stu and out of the announcer's ha Having three tables in the stu will leave the announcer with tw one should need to be removed.

The turntable preamps are cated under the turntable as a p of the pedestal. The pedestal c tains 250 pounds of sand sealed i the base. The bottom of the pedes is mounted on a layer of fo rubber so the slower buildi resonances will not get into turntable. This is due to the re tively large mass of the pedest

…ering the inertial moment of the …t.

### Cart removal

…he cart machines are located to …t left of the announcer. I have …ee ITC cart machines. Each one …t be removed in case of failure …d not leave the announcer …banded. The machines are located …n wooden frame that allows them …be pulled forward enough for …aning, without removing them …m the wooden rack.

…here was a shadow created on …e turntables when the cart ma…hines were placed above the turn…les, so I placed a number 47 light …each cart machine on the under…E. This light shines onto the turn…les from a vent hole cut in the …om of the wooden rack. This …ates an effect of slight spotlight…of the tables.

…he board is an Autogram IC-10, …channel board. This board has …ugh versatility so that a patch …el was not necessary in this …dio. All of the audio processing is …ne in the engineer's office, which …ws repairs on the processors to …lone without inconveniencing the …nouncer, makes the repairs easi…since the processors are located …r the test equipment), and keeps …processing out of reach of un…horized hands.

…he monitor rack is located just …ve the board. This wooden …osure contains the remote con… the off-air monitors, and the …monitors. At a glance, the an…cer can see the state of the …smitted signal and take the …ropriate corrective measures if …essary, all within arms reach of …re he is sitting.

### Lighting the CR

…e monitor rack has two spot…s which shine on the copy rack. …e studio has surface-mounted …ndescent spotlights that are …mer controlled. The announcer …set the mood for whatever he …s. The air conditioning and …idifier for the studios is also …rolled from this location.

…have found there must be a …y high percentage of humidity in …studios for adequate static …tricity control. I have the system …or a level of 80%, which keeps …dust off records, reduces the …c level to the point that the an…ncers aren't drawing arcs with …fingers, and is comfortable to …k in. It pushes in cool air with…the noise of a high-velocity

*continued on page 56*

**Announcer** Jim Shanahan does his show on the Autogram IC-10.

## Control rooms

*continued from page 55*

system. It uses fiberglass ducts which reduce any transferred noise from the system or from studio to studio to an imperceptible level.

### Ease of operation

The accent in the design of these studios was on the ease of operation and the ease of maintenance. With any component failure, the engineer is in the studio only long enough to remove the defective unit. The announcer is in control of his environment and can contour it to h personal taste. The proximity of t equipment and the material to programmed generate more time f the announcer to spend doing show, not concerning himself wi the motion involved in location a airing that material.

**Larry Titus**, chief engineer, and his assistant, Neil Portnoy, make final alterations on monitor rack.

1. Titus, L. L., "Remote Start f Turntables," Broadcast Engineerin November 1972.

**Editor's Note:** It's always interesti to see how other stations view the need for major facility change This control room certainly offe some distinct advantages for st tions operating under circumstanc similar to those at WHCN. course any change should be base more on operating and engineeri than on color cameras and contou aimed at impressing VIPs.

If you have suggestions for facili changes, send them to our Statio to-Station department. If they' accepted, we'll either send you check or a copy of the new NA Engineering Handbook, whichev you desire.

If you've recently undergone major facility change and want share the details with the industr drop a line to the editor. Yo efforts may turn into an articl After all, sharing our experienc will help make all of us mo professional.

# The antenna: AM's "final filter"

*Peter Burk*

Recently there has been a lot of interest in AM antenna bandwidth. Stations that have been operating "dumb, dumb and happy" for years are suddenly deciding that the antenna system is causing *audio* problems. Frequently, the antenna is responsible for at least part of the problem, but before we blame all of our poor sounding audio on the final link in the chain, let's see if we can look objectively at the system.

### Why now?

The antenna bandwidth problem is not by any means a recent discovery. Doherty wrote a very thorough paper on the subject 18 years ago! AM stereo may have triggered the most recent wave of concern. Indeed, any of the proposed AM stereo systems will demand flat antenna systems, but the concern is valid even for a station that intends to remain mono. The effects of a sharply tuned antenna are the high-end frequency response, distortion, and modulation depth can be severe enough to cost rating points in a competitive market.

An antenna system that produces higher impedances in the sidebands than at carrier leaves you wide open for a citation if your modulation monitor isn't connected at precisely the right point. That is, it is possible for the modulation monitor at the transmitter to indicate less than 100%, but out in the field (where the R.I. makes his measurements) you might be substantially over 100%.

If the impedance goes higher in the sidebands, you won't have to worry about overmodulation...you'll have to worry about the program processor instead. The effective modulation depth in the field will be less than it is at the transmitter.

Sidebands that are different from each other cause another set of problems, chiefly high distortion.

### Other problems

The bandwidth of the antenna system can be responsible for some less obvious problems, too. If your transmitter is blessed with a reflectometer in the output, you may have faced the problem of VSWR shutdowns with modulation. The reflectometer is a wideband device. If the antenna system is narrow, the reflectometer will see high VSWR every time the audio frequency is high enough to get out of the antenna's passband. The audio peaks are too fast to move the VSWR meter, so you don't see any change in the VSWR. But if the shutdown circuit is very fast (Harris MW series, for example), the peaks will be enough to dump the transmitter.

### How to find out

First, determine if your station really does have an antenna problem. There are numerous approaches including the classic cold bridge measurements of 30 kHz on either side of carrier frequency. This information is useful, but there are several limitations inherent to the procedure.

First, in a directional system the RF generator used with the bridge may not produce enough energy to bring the mutual impedances into play. In a nondirectional, sources of re-radiation may exist which affect the antenna system but do not show up on the cold bridge.

Even if the bridge measurements reflect the true system characteristics, it is a little difficult to determine just how much effect any specific mismatch has on the audio without the aid of a computer. Just how flat does the curve have to be for reasonable performance?

Several standards have been written for "normal" load impedances. Years ago, the RMA specification called for resistance to be within 5% at ±5 kHz and 10% at ±10 kHz. Reactance was to be less than 18% of the midband resistance at ±5 kHz and less than 35% at ±10 kHz. The EIA specification isn't much different. Both specifications

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*continued from page 57*

were written to provide the manufacturers with a guideline for designing output networks and broadcasters with an idea of what range of load impedances their transmitter would be content with.

Making the transmitter happy and making the G.M. happy can be two different animals. Let's find another way to look at the problem.

### Look at the sidebands

Since the object of the exercise is to make certain that both upper and lower sidebands are reasonably flat and nearly identical, the best approach might be to *look* at the sidebands. A spectrum analyzer comes in handy here, but don't go away if you don't have one...there's another way.

We'll want to look at several locations in the field to be sure we gather meaningful data. Arrange for several monitoring points (in the major lobe if directional) at least a couple of miles from the transmitter. You'll need power for the spectrum analyzer and communications with the transmitter, so plan ahead.

An operator at the transmitter should send a set of tones for you at a precise level of modulation. Use something less than 100% modulation, both for the sake of the transmitter and to make certain that all field readings stay within 100%, even if the modulation depth happens to be greater in the field.

Take a picture of the analyzer display at several frequencies. (The FCC proof-of-performance frequencies are spaced about right.) You can superimpose all sweeps on one exposure if you like.

Don't have a spectrum analyzer? Meaningful results can still be obtained with a field intensity meter or even a communications receiver with a fairly narrow bandwidth, provided the receiver has a good signal strength meter.

Modulate the carrier as before, then tune either side of the carrier for the sidebands. You will see three distinct signals (just like the book says!). Measure the amplitude of all three signals, and repeat for several audio frequencies. Five, 10, and 15 kHz should be adequate.

If you're unsure of the bandwidth of the receiver, you can check to see if it's narrow enough to accurately measure the frequency in question by tuning one of the sidebands, then removing the to The signal strength should drop at least 20 dB. If it doesn't, it mea that the receiver is too broad. You have to confine your measureme to higher audio frequencies.

### Analyze the data

After taking several sets of rea ings at various locations, compu the difference between your o servations and the indications your modulation monitor at t transmitter.

The power in each sideband c be figured from the formula:

$$P_{sb} = \frac{m^2 P_c}{4}$$

where:

- $P_{sb}$ = Power developed in o sideband
- $m$ = modulation percenta divided by 100
- $P_c$ = carrier power

The voltage you should read in t

d for each sideband can be
ıd from:

$$E_{sb} = \frac{mEc}{2}$$

re:
sb = voltage measured for one sideband
c = voltage measured for carrier

ne sidebands should be sym-
rical and, ideally, should show
equal 'or higher percentage of
ulation in the field than at the
smitter. If they're reasonably
e, go look somewhere else for
audio problem. If not, you've
some work to do.

### The cure

here are several approaches to
ng this problem. Like anything
the "cheap" cures usually are
effective than the expensive
. Most likely you'll have to
promise (unless you'd planned
ıt up new towers anyway!).
ıe classic approach is the "line
tching" technique. A phase shift network is installed at the output of the transmitter to swing the resistance and reactance curves around to something more desirable for the transmitter. In many cases, this will mean an additional "T" network in the line, but it's possible that an existing impedance transforming network can merely be readjusted to provide the proper phase shift.

The amount of phase shift desired can be determined by plotting the ±30 kHz bridge measurements on a Smith Chart. The "horseshoe" is then rotated so that it opens to the top (sidebands at a *lower* impedance). The necessary amount of phase rotation can be read directly from the Smith Chart. More information on using the Smith Chart can be found in several of the references at the end of this article.

**One word of caution here: The amount of phase rotation necessary is that which will put a symmetrical load on the plates of the final, not the output tuning network of the mitter. The inherent phase shift in the output tuning netowrk of the transmitter must be taken into account, either mathematically or by actual measurement.**

Once the proper phase shift has been introduced, another set of field measurements should be made to confirm your findings. You might have to trim the phase shift slightly to get symmetrical sidebands in the field.

### Monitoring the modulation

Having symmetrical sidebands is nice and having them go lower in impedance than carrier is nice too, but it puts another responsibility in our laps. If you've done everything right, you'll have higher modulation in the field than you might be reading at the transmitter.

In case you haven't already discovered it, the modulation monitor will read differently when connected to different points along the transmission line. You'll also get a different indication if you switch from a voltage sample to a current sample or vice-versa (unless your antenna system is perfectly flat).

The reason is that a voltage sample alone (the usual type of pickup in the transmitter) doesn't give you a true picture of the *power* being developed with modulation unless the load is perfect. For any system, there is one point along the

*continued on page 73*

*This is the official column of the American Society of TV Cameramen (ASTVC). The ASTVC can be contacted by writing to P.O. Box 296, Sparkill, NY 10976 (914) 359-5985.*

**Take 1... Letters from John Francis Lehman, WSYR-TV**

From time to time, portions of our column will be "guest-scripted" by members of the ASTVC. This offering is by our newly appointed regional representative for the upstate New York area.

I have just finished shooting 1700 feet of *Kiss Me Kate* on 16 mm for the Newman Chaplain at Syracuse University. I also shot two 20-minute segments on a Sony DXC 1600 with a ¾-inch VTR cassette and one 10-minute segment to be incorporated into studio sequences with a TK 76.

I was pleased to read the story of "JS" in a recent issue of **BE**. I originally filled out a standard network job application form and was interviewed by someone. I cleared by NABET, and if memory is right, the network pe said that I would be contacted. was 15 years ago.

I did a forerunner of *WV Sports* (some time back) at A bald Stadium at Syracuse Univ ty. The "action" camera had a handle on it that was 48 in long. From the press box roo could fill the screen with stitches of the football on the yard line. We spent most of the looking at buildings a good t miles away.

Where are the cameramen tomorrow going to come fr Certainly not from where they come from for the past 25 years it is with a questioning eye tha take a look at the workshop will be sponsored by the New outlets of the American Federa of Television & Radio Artists, N.Y. branch of Screen Actors G Writers Guild of America, DGA Brooklyn College. The proje workshop kicked-off its first pr in September, teaming with " fessional actors, writers, direc and college students majoring in production and management."

In case anyone is a member of Theatre, TV and Film Ligh Committee of the Illuminating E neering Society, they will hold t national symposium November 1 in Miami, under the chairman of George Gill. Focus will be developments in the field of en tainment lighting and energy servation through the use of n efficient sources.

**Take 2... In line with the preceding article**

The *New York Daily News*, i recent editorial, printed the foll ing: "With $500,000 in fed money, the (N.Y.) State Correc Department has set up an ambit program to train convicts for job television reporters, cameramen, rectors, producers, and comm tators."

**Take 3... Open invitation**

Zoom In invites all cameramen join ASTVC's goal of furthering professionalism of cameramen. not share your ideas on to camera situations with others? this way you'll help another cam men, and you'll keep the AS lines open for feedback. You contact the ASTVC at the add at the top of the column, or phoning (914) 359-5985.

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

# SBE backs law for interference-free receivers

The Society of Broadcast Engineers is urging adoption of legislation that gives the Federal Communications Commission authority to require inclusion of interference-rejection components in consumer electronics devices. Senate Bill 1754, introduced by Senator Barry Goldwater of Arizona, would amend section 302 of the Communications Act of 1934 to give the FCC authority to regulate the sale, shipment, import and use, as well as manufacture, of consumer electronic devices, and specifically to require use of "protective components which are capable of reducing interference to such equipment from radio frequency (RF) energy."

Citing the burgeoning growth in the use of personal communications devices and FCC studies that show almost all interference problems can only be cured at the receiver, the SBE states that legislation is needed to protect both the right of the nontechnical citizen to interference-free use of home electronic devices and right of individuals to use properly functioning personal communications devices.

FCC field offices received over 100,000 complaints last year, and current projections indicate over 800,000 will come in next year. FCC studies also show that for each complaint actually received there are at least 14 others who are annoyed and disturbed by RF interference in their daily lives because inadequate design of home electronic ference in their daily lives because inadequate design of home eletronic equipment allows it to pick up signals it should not be receiving.

Further, many radio and television stations and thousands of amateur radio operators, not to mention millions of citizens band, are unduly accused and harassed for causing interference when, in fact, it is the fault of the receiver. In case after case, broadcast transmitters and amateur radio transmitters are being operated in the same building or adjacent to properly built home entertainment equipment with absolutely no interference, yet the neighbors are subjected to RF interference. The broadcast station and the ham or the CB operator can do little about it if the neighbor's phonograph or intercom decides to act like a radio receiver bacause of poor design.

A few manufacturers of home electronic devices recognize the problem and include interference-reducing components in their equipment. This shows that the components can be included and marketed at competitive prices. A large number, however, still do not include these components.

Adoption of the Goldwater Bill is a means of insuring that the nontechnical public will have avail-

*continued on page 62*

able consumer electronics dev
that are capable of interfere
free operation in the vicinity
properly operating personal
munications devices and broad
stations.

## Goldwater to spea at SBE convention

Chapter 35 (Kentucky) annou
that its 1977 "State of the
regional convention will be
November 30 through December
the Marriott Inn, Clarksville, I
ana (in the Greater Louisville ar
More than 3,000 broadcast e
neers are expected to attend.

Highlights will include the pre
tation of papers on the new 1-i
helical format, digital televisi
and much more. In addition,
proximately 50 exhibitors are
pected to display their "state of
art" equipment and to be on h
to answer questions.

"Such national names as Amp
Harris, Sony, Tektronix and Pa
sonic have already reserved t
spaces," Bob Cossavella, exhib
coordinator, said.

Senator Barry Goldwater (
UGA) will be the main speaker
the Friday night banquet. His spe
will include comments on the cha
ing role of engineers in broadcas
and a look at the communicati
re-write now going to Congress.

Admission to the show is f
Lunches and dinners also will
available at the show. Rooms h
been reserved. Anyone interes
in attending, contact: Robert Kl
KET-TV, 600 Cooper Drive, Lexi
ton, KY 40502.

**More regional conventions scheduled**

Pittsburgh, Pennsylvania—O

21. Contact Roy Hoover, KDKA-(412) 391-3000.

ottsdale, Arizona—November 8 (in conjunction with the Ari- Broadcast Association's Winter vention). Contact Joe Manning, T-TV, (602) 965-3506; Roger son, KOY, (602) 258-8181; or Al trom, KOOL, (602) 257-1234.

*on-members are always wel- at SBE regional conventions: and meet the broadcasters in area.*

**r happenings**

ew SBE chapters are being nized in Huntsville, Alabama; on, Gerogia; Miami Beach, Flor- Columbia, Missouri; Corpus istie, Texas; and Tri-Cities, hington. Anyone interested in information can contact the nal SBE office for the name of appropriate person in your .

**PTER REPORTS**

**ter 25—Indianapolis, Indiana**

e August 23rd meeting featured esentation by Hewlett Packard. Alt and David Hayes, of the office, discussed and demon- ed digital circuit testers and zers. Several of the testers are t additions to the HP line.

**ter 43—Sacramento, California**

apter 43 met on August 27th tour of the Grass Valley Group and demo video studio in s Valley.

**ter 44—Shreveport, Louisiana**

e Society welcomes the new ter 44 and congratulates Chair- Carr Stalnaker for his constant t toward getting the chapter nized. Congratulations are also ded to KRMD Radio for its ort of Chapter 44 by helping mailing expenses during the ning period" and treating all members to dinner the night of third meeting. □

# industry news

*continued from page 12*

formal convention agenda and on the exhibit floor.

James Fellows, NAEB president, said more 3,000 public broadcasting and technical executive well as representatives for the military services, l state and federal government, foreign embassies, medical profession, business, and industry expected to attend.

## Video Disc '77 scheduled for November 8-9

Video Disc '77, to be held November 8-9 at British Academy of Film & Television Arts, feature the first public demonstration of the Phil MCA video disc system in the United Kingdom.

In addition to the presentation by Philips, infor tion will be available on RCA and Thom technologies, as well as the German-invented system.

Representatives of video disc developers manufacturers will speak at the conference. scheduled are representatives from companies volved with disc mastering and pressing, TV bro cast international program sales, engineering, p lishing, copyright, and video disc program explo tion.

## Western Union to expand audio program channels

On November 1 Western Union will expand Audio Program Channel Service for radio bro casters to include 13 additional cities, subject approval by the Federal Communications Commissi

The 13 cities will be served with a combinatio Westar satellites and Western Union's land-ba microwave facilities. The cities are: Kansas Boston, Buffalo, Cincinnati, Cleveland, Detroit, Ph delphia, Denver, St. Louis, Houston, Baltim Pittsburgh and Columbus, Ohio.

The new cities join seven original cities from wh Western Union's Audio Program Channel Service been available for more than a year, via We satellities.

Type I (4 kHz) audio program channels will offered to the broadcast industry for point-to-p service using the Westar satellites, land-ba microwave or a combination of the two. Point multipoint service will be offered only via We satellites.

Type II (8 kHz) audio program channels will als offered for point-to-point service using the We satellites and/or land-based microwave facili Point-to-multipoint 8 kHz channels will be offered via Westar satellites.

James T. Ragan, Western Union's vice presid broadcast services, noted that the expansion of company's Audio Program Channel Service will r in "more flexibility and higher broadcast quality networks, packagers and independent stations w seek programming variety.

*continued on pag*

# troducing the Technics ST-9030 tuner.
# rists would feel better if it cost over $1,000.

ob some, tuners that offer 0.08% THD, 50 dB stereo
paration, a capture ratio of 0.8 dB and waveform
delity should demand a price tag of over $1,000.
ut with the ST-9030 this performance can be yours
or under $400.*

That's quite a feat for a tuner. But then the
T-9030 is quite a tuner. It has two completely
dependent IF circuits: A narrow band, for ultra-sharp
lectivity. And a wide band, for ultra-high separation
nd ultra-low distortion. It even selects the right band,
epending on reception conditions, automatically.

Both bands give you the same extended flat
equency response. Because, unlike conventional
ners, the ST-9030 utilizes an electronic pilot cancel
rcuit that cuts the pilot signal, without cutting any of
e high end. It's ingenious. And a Technics innovation.

The Technics ST-9030 has one of the quietest,
ost sensitive front ends of any tuner. With an
dvanced linear frequency 8-ganged tuning capacitor
nd 3 double-tuned circuits, plus dual gate MOS FETs in the 2-stage RF amplifier and balanced mixer circuit. What's more, there's a servo tuning circuit that locks into the tuned frequency, regardless of minor fluctuations. The result: Negligible drift distortion and maximum stereo separation.

Technics ST-9030. Compare specifications. Compare prices. And you'll realize there's really no comparison.

THD (stereo): Wide—0.08% (1kHz). Narrow—0.3% (1kHz). S/N: 80 dB. FREQUENCY RESPONSE: 20Hz—18 kHz +0.1, −0.5 dB. SELECTIVITY: Wide—25 dB. Narrow—90 dB. CAPTURE RATIO: Wide—0.8 dB. Narrow—2.0 dB. IF, IMAGE and SPURIOUS RESPONSE REJECTIONS (98 mHz): 135 dB. AM SUPPRESSION (wide): 58 dB. STEREO SEPARATION (1 kHz): Wide—50 dB. Narrow—40 dB. CARRIER LEAK: Variable −65 dB (19 kHz). Fixed −70 dB (19 kHz, 38 kHz). SUGGESTED RETAIL PRICE: $399.95.*

Technics ST-9030. 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 (110) on Reply Card**

continued from page 64

## Increasing commercial trend by noncommercial stations

Erwin G. Krasnow, general counsel of the National Association of Broadcasters (NAB), told the Federal Communications Commission that "there has been a disturbing trend of increasing commercialism by noncommercial radio and television stations."

He noted that educational licensees encounter difficulties in obtaining adequate financial s port, but urged the Commissio consider the adoption of rules "will truly ensure the mainten of the essentially noncommer nature of educational broadcasti

In some instances, Krasnow proper enforcement of existing r would be adequate, citing as example announcements promo the sale of a product or ser However, he stated that there need for more specific guidel and restrictions on fund-rai schemes constituting an abuse noncommercial service.

Krasnow said he agrees with Commission that educational tions should be permitted to br cast community bulletin boards similar programs, or announcem of cultural or entertainment ac ties available in the area. Howe he said announcements provi details on ticket prices or ur attendance should not be allowe



## NAB tires of FCC's Chinese puzzle

The general counsel of the tional Association of Broadcas (NAB) has labeled some Fed Communications Commission inst tions "as easy to fathom as a th tiered Chinese puzzle" and as that they be amended.

Erwin G. Krasnow was refer to the requirement that stati make semimonthly announcem of their responsibilities and in audience comment, plus lice renewal notifications. These t four types of announcements specific times of the day and d of the month.

He said there are ways simplifying the wording and sch uling requirements "without in way derogating whatever va these announcements may have the public."

He said NAB's approach is have only one rule and give bro casters greater flexibility in wording and scheduling of announcements.

Krasnow said the Commission had three years to evaluate effectiveness of these requirem and they now can be amen without a rule making procedure

# New! For heterodyne VTRs


# a broadcast quality, digital TBC

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

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

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

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

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

If all that's not enough, add our optional, moderately ced Image Enhancer/Noise Reducer. This plug-in card substantially reduces luminance and chroma noise and significantly improves subjective resolution. And, to tame even the wildest instability, you can add our optional 16 line window.

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

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

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

**CVS Consolidated Video Systems, inc.**

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

For More Details Circle (111) on Reply Card

continued from page 14

**Nashville station dedicates new facility**

WDCN-TV/8, Nashville's public television station, celebrated its 15th anniversary last month with the dedication of its new Telecommunication Center. The station moved into the Center last November, but final installation of equipment took place recently. The building, built at a cost of $1.4 million, is a full-color state-of-the-art facility containing production, broadcast and offices.

**WNEW-TV buys 1-inch VTRs**

WNEW-TV recently installed three new 1-inch videotape recorders, including a built-in edit system and one 1-inch portable videotape recorder.

**American Satellite expands operations**

American Satellite Corp. (AS was granted authority to build t earth stations on the island of Oa in Hawaii and one near Stockt Cal. ASC, digital communicati service to various government ag cies, also has requested FCC auth ization to construct an earth stat in the Washington, D.C. area.

**U.S./Southeast Asian Telecommunication Conference**

Raymond E. Spence, Jr., F chief engineer, will deliver t keynote speech at the first U.S Southeast Asian Telecommunicatio Conference and exhibition to be h January 19-21, 1978 in Singapore.

**RCA markets four-hour videocassette recorder**

RCA is offering the electron industry's first four-hour videocassette recorder/player, optiona priced at $1,000. The unit capable of recording two or fo hours of program material, live off-the-air, on a single cassette. T RCA "SelectaVision" videocasse recorder unit is priced about $ below the current leading compe tive VCR instrument.

**Connector symposium announced**

The 10th annual Connector Sy posium will be held October 19 a 20 at the Cherry Hill Hyatt Hou Hotel, Cherry Hill, New Jersey. T symposium is sponsored by t Electronic Connector Study Gro with cooperation of more than connector manufacturers.

**People's Republic of China joins INTELSAT**

The People's Republic of Chi acceded to the Agreement of t International Telecommunicatio Satellite Organization (INTELSA August 16, 1977. The agreeme designed to establish a global co munications satellite system, w signed by the Peking Administrati of Long Distance Telecommuni tions. China, the 98th member, h been using the INTELSAT syst since 1972.

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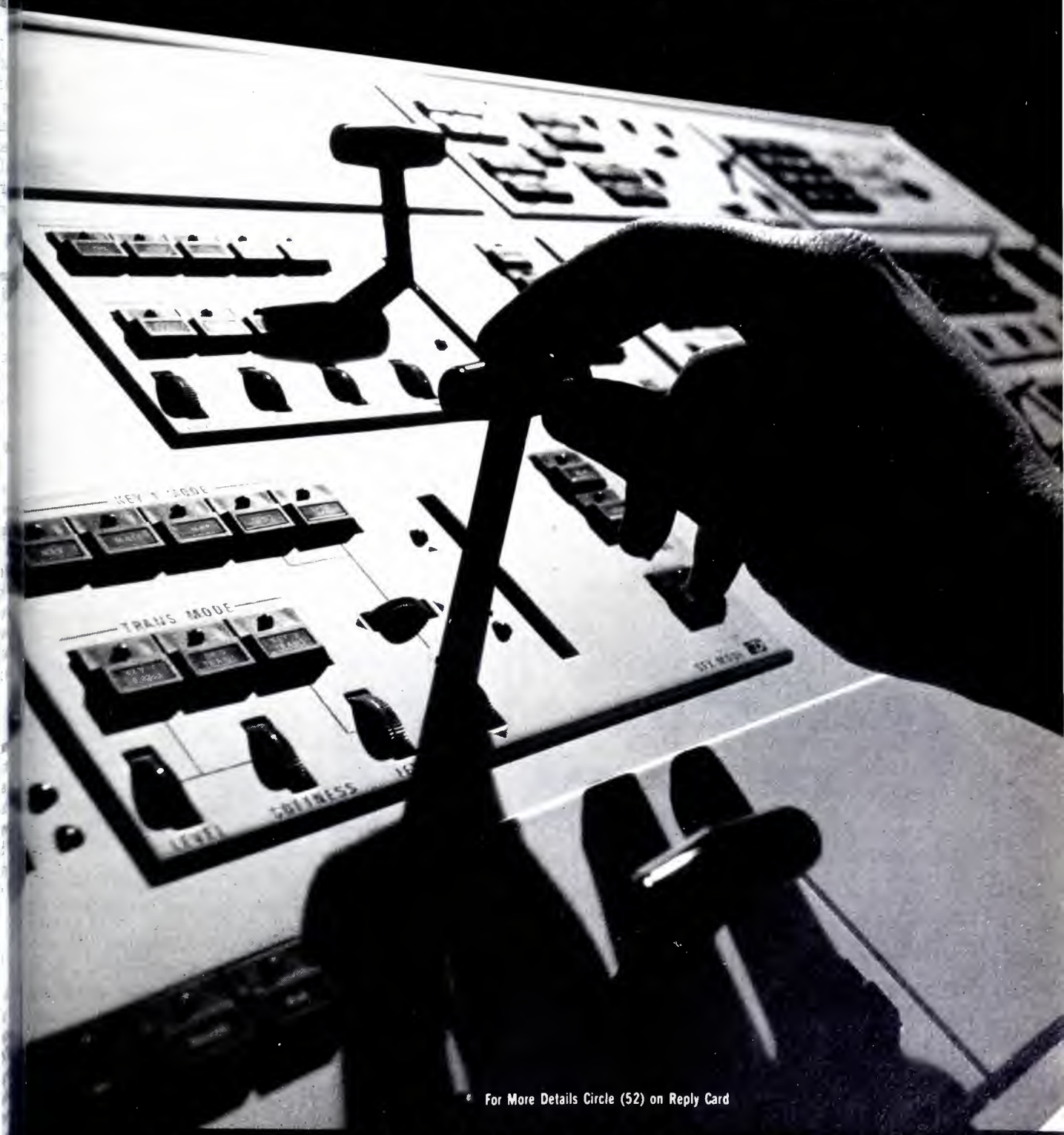


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Phone—514-697-0811
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# people in the news

The promotion of **Andrew M. Hilliard** to manager, a vertising and promotion, a new position in the RC commercial communications systems division, h been announced. Hilliard, who has been with RC since 1956, will have advertising and promotion responsibility for the division's Broadcast Systems a Mobile Communications Systems businesses.

**Harvey Schein**, president and chief executive offic at Sony Corporation of America for the past fi years, has been promoted to chairman of the boar He will continue as the company's chief executi officer.

In related corporate action at Sony, **Kazuo Iwam** president of the parent company, becomes chairm of the executive committee. **Akio Morita**, chairm and co-founder of Sony, is the new chairman of t finance committee of the American subsidiary.

In his new capacity as director of marketing for Ti and Frequency Technology, Inc., **Robert Cochran w** assume responsibilities for the marketing of t corporation's full product line. Cochran joined TFT director of sales for the Communications Produc line.

**Carl P. Hollstein, Jr.**, moves from Information Store Systems to Consolidated Video Systems, where becomes vice president, engineering. Hollstein, w has also been associated with IBM, holds sev patents relating to data recording technology.

**Terry L. White**, formerly with Tektronix Inc., is t new national program director for microprocess products at Leasametric, a division of Met Resources Corporation.

HOLLSTEIN

WHITE

HUDSON

As director of operational planning at Altec Corp Lansing sound products division, **Don Hudson** will responsible for coordinating the efforts of marketin engineering and manufacturing during developme and start-up operations of new products.

Telex Communications Inc. announces the promoti of **Richard D. Larson** to director of training a service. Larson's responsibility includes expand service training programs both domestically and int nationally for the company's Aviation, Audio/Visu Professional Audio and Personal Communicatio product groups.

**Franklin C. Snyder**, vice president, The Hearst Cor ration, and chairman of the Association of Maxim Service Telecasters, Inc. (MST), has announced t appointments of **Jack B. Everette** and **William**

...less as members of the association's engineering ...mittee. Everette is executive vice president and ...surer, Midwest Television Inc., Champaign, Illi... Loveless is director of engineering, KSL-TV, Salt ... City, Utah.

... manager of marketing and export programs for ...western division of GTE Sylvania is **Evan Baker**, ...er manager of the division's Springfield, Virginia ...ty. Baker succeeds **Richard Brockway**, recently ...ointed director of export programs, Western ...pe, for GTE Sylvania electronics systems group.

...ON

HUBER

APPLESON

...appointment of **Edward H. Huber** as eastern ...d States regional sales manager for the broad... division of American Electronic Laboratories, Inc. ...) has been announced by **Thomas Keffer**, com... ...ial and industrial marketing director. Huber will ...esponsible for all sales of AM and FM ...mitters east of the Mississippi, as well as the ...gement of all field sales representatives in that ...

**...ppleson**, president of Appleson Studios Inc., in ... Miami Beach, is this year's chairman of the ... Engineering Society's South Florida Chapter. ...eson is a broadcast/recording veteran with more ... 14 years in the industry and is active in ...munity and industry events.

...new director of marketing for CEI is **Robert P. ...man**, formerly the product manager for the ...many's broadcast color television camera line. ... to joining CEI, he was product manager for the ...-video systems division of Ampex.

**...ony Fulford** joins TerraCom as international sales ...ger. Fulford had been with Farinon Electric for ... ears in international sales management.

**...ey Hubinek** has been named electronic marketing ...alist for Belden Corp.'s electronic division. ...ek, who joined Belden in 1969, has been a field ... representative in the New York sales region. His ... responsibilities will focus on the needs of the ...uter industry and the sale of such products as ... transmission lines, point-of-sale terminal cable, ...hielded power cords.

**... J. (Steve) Crane**, who joined the FCC in 1972 as ...oadcast specialist, has returned to his former ...on of broadcast specialist, reregulation staff, ... of chief, policy and rules division, broadcast ...u. Crane has served as chief of the policy ...sis branch since October 1976.

*continued on page 72*

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ntained character generator gives
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munications group, with responsibilities for techn
direction.

**Carolyn Alk** joins CCA Electronics Corp. as marke
services manager after spending three years as
vertising and sales promotion coordinator for Chi
Company. She will be responsible for coordinating
advertising, public relations, product literature, tr
shows, and sales support materials.

**J. L. (Jack) Neff** of Neff Communications Inc.
assumed the position of vice president, North Am
can marketing, for Consolidated Electronics Indust
Pty. Ltd., an Australian firm. Neff is the former pr
dent of Broadcast Electronics, Inc.

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flectors • 8-foot junior stand with 5/8" stud • 9-foot
senior stand with wheels and brakes • custom-built
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(716) 694-3332

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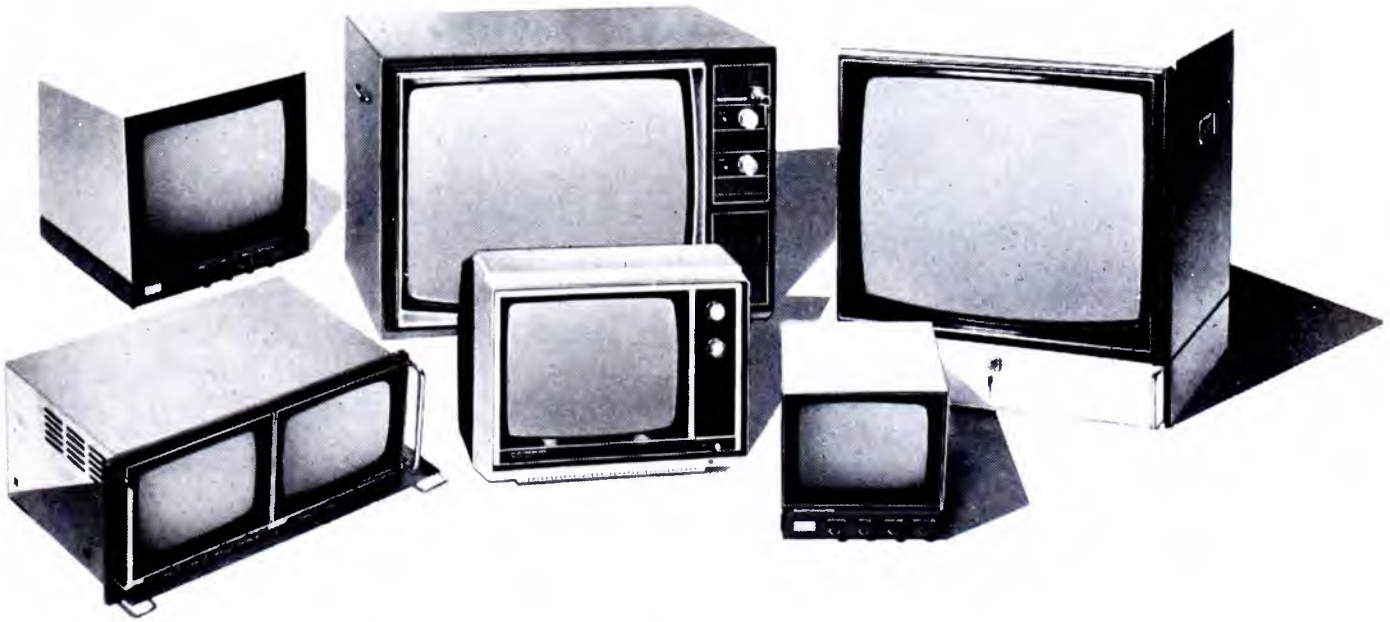

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For More Details Circle (80) on Reply Card

# new products

*continued from page 75*

and black-guard grille for bright sharper pictures, even under verse lighting conditions.

For More Details Circle (87) on Reply Card

### Ferrite circulator

*Microwave Associates, Inc.* marketing a new coaxial ferr circulator. The MA-7L943-S001 designed to operate in severe bro band E.C.M. environments at 4.6 9.9 GHz. It has small, comp packaging for integration into f quency multiplexer filter banks.

The MA-7L943-S001 is complet magnetic and R.F.I. shielded, w location of connectors an option the designer to accommodate spec system requirements.

Features include: rugged comp construction; optional direction circulation; and magnetic and R.F shielding.

For More Details Circle (88) on Reply Card

### Digital Photometer

A new booklet from *Tektro* describes various applications researching, designing, installi and maintaining optical commu cations equipment using the J Digital Photometer/Radiometer.

Specific test descriptions includ in the booklet are: measuring t output of visible and infrared LE and laser diodes, checking fib attenuation and splice loss, testi detector responsivity and adjusti systems for peak efficiency.

For More Details Circle (89) on Reply Card

### Frame storage/retrieval systems

ADDA Corporation is marketi its new line of digital, computer controlled, NTSC frame storage/r trieval systems. On-line storage c vary from 200 to 3,000 frame depending upon user needs. T systems have full editing capabiliti for the broadcast, institutional a industrial markets.

Engineering applications inclu elimination of slide handling (p vention of damaged and lost slide centralized slide storage with slid accessible from four separate mote locations; relief of teleci peak loads; and reduced floor, re and control panel space requi ments.

Newsroom applications inclu instant slide creations from origi artwork, ENG sources, VTR, te

cine chains, or character generator; and 12 dB random noise reduction in original artwork and studio stills.

Production applications include the ability to incorporate stills from new sources for incorporation into final takes. This capacity is particularly effective for animation and other special effects.

For More Details Circle (90) on Reply Card

### Transmission test set

*Telecommunications Technology, Inc.*, has introduced the model 1120 Transmission Test Set, a portable instrument that meets all the requirements of Bell System Technical Ref. PUB 41009 for the measurement of transmission level, frequency, noise and notch noise.

The 1120 is a third-generation digital instrument which is controlled by its own on-board microprocessor. All measurement and transmit functions are handled by the microprocessor, as well as a self-diagnostic routine for checking all internal and analog circuitry. Twelve seconds after pushing the self-test button, the 1120 will display the results in English. For example, if all major circuitry is operating properly, the display will indicate "PASS ALL."

For More Details Circle (91) on Reply Card

### Video clock/calendar

The *QSI* Television Master Clock/Calendar is a standard video time and date generator designed to add numerical clock and calendar information to any standard video signal.

The QSI-600 displays the time and date in 12 seven-segment digits in the following order across the television screen: month, day, year, hour, minute, second. Time may be set by selecting one of the six times and holding a fast or slow advance control until the time you want appears on the TV monitor. Once placed into the run mode all the time and date functions occur automatically throughout the year.

The time base is controlled by the 50/60 Hz power input. Automatic time correction occurs whenever the power frequency is updated.

Features include: 12-digit clock/calendar in two sizes; display positionable to any screen area; automatic timing functions; loss of power resets all digits to zero.

For More Details Circle (92) on Reply Card

### Frequency counter

In the frequency monitor GU 027, Rohde & Schwarz has designed a

*continued on page 78*

# new products

*continued from page 77*

frequency comparator plus freq cy counter for systems perfor precise frequency measurement line with CCIR recommendati The equipment is particularly s ble for remotely measuring frequency of transmitter signals can be used in conjunction with receivers over the whole RF r of 10 kHz to 1000 MHz.

The measuring methods us offset-frequency method for substitution method for FSK, i carrier method for FM—are i pendent of receiver characteri such as setting accuracy and c lator stability. Measurement is curate to within 0.1 Hz.

The large screen of the GU can show Lissajous figures and quency markers for AM, FM spe in the modes FM broad and narrow, frequencies for FSK intercarrier levels with lin triggered X deflection. The freq cy display is given by six LEDs. outputs of the frequency mo enable frequency and phase rec ing plus data output of offset center frequencies in BCD code.

For More Details Circle (93) on Reply Card

**Test monitoring switcher**

The *QSI*-800BC Test Monito Switcher (TMS) lends itself a broadcast television video qua control monitoring device.

A typical application is at video operators positions. Vi sources from studio cameras studio switcher effects busses made available to the QSI-80 inputs, where they are autom ally programmed and sequenced color matching, level monitoring phase comparisons.

In the case of two or more qu control positions (video operat camera/studio selection are grammed via the flick of a f panel switch into the autom sequencing arrangement. Mo tarily pressing any of the eight i buttons stops the sequence at position for long term observa An LED indicator above the i button, plus an inserted chara in the video indicate which so you are observing and measurin

Momentarily pressing the quence button activates the pre grammed sequence. Adjusting front panel dwell control sets up most convenient rate of video s

ling.

Remote switching and rate sampling is made available by an external trigger input. For high rate sampling and slow rate observation a time lapse videotape recorder may control the switching rate, plus record the switcher output.

For More Details Circle (94) on Reply Card

### Line surge protector

Protection of sensitive electronic equipment from destructive line voltage surges and spikes is the aim of a new product developed by *DYMA Engineering*.

The DYMA AC Line Surge Protector protects television, hi-fi and CB equipment, computers of all types, microwaves, broadcast electronics, solid-state memories and logic, and telephone equipment against these surges. It is particularly valuable when used with equipment installed at remote sites.

The unit contains a state-of-the-art suppressor coupled with an exclusive ferrite filter. The surge suppressor absorbs the energy from transients that exceed the protection level and the surge protector. Power line hash, glitches and RF interference are thereby reduced to a minimum.

For More Details Circle (95) on Reply Card

### Camera pedestal

The "PortaPed" from *Vinten* combines the main attributes of studio and outside broadcast camera mountings: smooth pneumatic counterbalance with low-weight portability. It incorporates a levelling device for the central column to ensure correct vertical support despite uneven terrain or awkward locations. When used with ENG and portable cameras, the PortaPed can be moved and relocated without removing the camera.

The pneumatic counterbalance system employs a self-pumping action and requires no external charging equipment. The control column is fitted with a knurled screw friction control and snap-action brake to lock the column at any point in its 48-centimeter (18-inch) travel. Balance is quickly achieved by pumping the center column up and down, then shutting off a valve.

For More Details Circle (96) on Reply Card

### Logic state analyzer

The new model 1610A keyboard-controlled logic state analyzer from *Hewlett-Packard* is a general purpose analyzer for design and

*continued on page 80*

A group of the staff meet in the Broadcast Studio of the Station

# It was a College broadcast facility; Now it's a public radio station; KUSC, Los Angeles, still has a Stanton in every table...

It is interesting that the station which provides top quality classical music service to Los Angeles was an outgrowth of a College Radio Station.

It now has been incorporated into the public broadcasting system and serves all of Los Angeles, Ventura and Orange Counties, with a format of 85% classical music and 15% informational programming primarily from the National Public Radio Service. KUSC goes direct from disc to air and uses the Stanton 600E on its turntables.

Since the station has received substantial university support for upgrading their sound, which includes a new transmitting system .. new tower antenna ... new control board ... new turntables ... and new cartridges ... KUSC plans to install Stanton's Calibrated 681SE cartridges in all their turntables.

So, their sure-to-improve sound is certain to have a favorable impact on their growing audience.

Stanton's 681 Calibration Series cartridges offer improved tracking at all frequencies. They achieve perfectly flat frequency response to beyond 20 Kc.

Each 681 Series cartridge is guaranteed to meet its specifications within exacting limits, and each one boasts the most meaningful warranty. An individually calibrated test result is packed with each unit.

*Write today for further information to: Stanton Magnetics, Inc., Terminal Drive, Plainview, N.Y. 11803*

STANTON

For More Details Circle (73) on Reply Card

# new products

*continued from page 79*

troubleshooting of digital systems—from the most elementary to the most complex. Powerful triggering capability assures that the desired data is captured in digital systems ranging from basic logic circuits through microprocessor-based systems, computers and computer systems.

With the 1610A keyboard, the user can trace events in as many as 32 channels at rates up to 10 MHz, selecting only the particular occurrences, coincidences or logical sequences that are of interest, with results displayed in an organized format on the CRT screen.

A memory 32 bits wide and 64 bits deep can be commanded to capture everything that went on for 63 clock-periods after the trace point of interest or for 63 periods before; or the trace point may be selected to be in the center of a trace. It can also measure absolute or relative time intervals between events, count events, produce documentation and has a graph mode for an overview of all 64 words in the memory.

For More Details Circle (97) on Reply Card

### Phono cartridges

*Audio-Technica U.S., Incorporated*, has introduced its first professional phono cartridges for broadcasters, discotheques, audio-visual producers and institutional users.

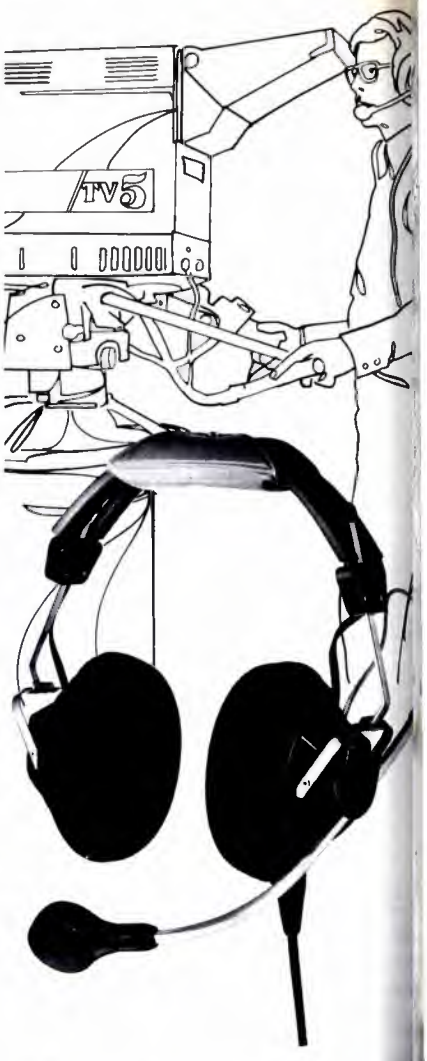
The new stereo series, the Professionals, employs the "dual magnet" system. This gives each stereo channel a separate generating system, resulting in superior channel separation and low-moving mass that means lower record and stylus wear, less distortion, and extended high frequency response.

Stylus cantilevers are designed for problem-free backcueing and eliminate stylus "sag" at the higher tracking forces required by some records and studio conditions. All models come with tapered cantilevers for rigidity with low mass.

A highly visible coating on the cantilever tip allows cueing under low lighting.

Stylus replacement is simple and the stylus damping mechanisms are hand-tuned to compensate for any variation in materials or dimensions.

For More Details Circle (98) on Reply Card



# Cameraman's Headset... Keeps the crew in touch

A professional TV Cameraman 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 everyday use. Keeps the crew in touch in or out of the studio. For complete information please write:

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**Canada:** Telak Electronics, Ltd., Scarborough, Ont.

For More Details Circle (69) on Reply Card

# technical data

**Telecommunications Technology, Inc.**--The SAS-2 Switched Access System which provides instant access to communications circuits in Class 4 and 5 telephone offices and similar applications is described in a full-color, 12-page illustrated brochure.

The literature illustrates a typical test sequence while providing general and technical information, applications data, diagrams and specification describing the SAS-2, which handles all types of circuits including private lines, message trunks and subscriber lines.

For More Details Circle (99) on Reply Card

**International Rectifier Corp.**--A technical bulletin providing users of solid-state relays with detailed information of the thermal characteristics, repetitive surge, fuse selection and duty cycle of SSRs is now available.

Bulletin No. 500-11 was developed specifically for IR's Crydom Series 3 for more comprehensive, thorough application information.

The data sheet also allows a designer to select a fuse on a sound engineering basis by showing a curve of maximum allowable $I^2T$ versus pulse basewidth.

A curve relating duty cycle and current is also shown. The graph relates on-time in seconds to the percent of continuous current rating for duty cycles ranging from 12.5% to 75%.

In addition to a photograph of the device in use, the literature includes dimensional drawings, a system schematic and application notes regarding the surge rating and the use of snubbers.

For More Details Circle (100) on Reply Card

**Sony Corp. of America**--An eight-page brochure outlining the total systems approach to video production is now available. The brochure, "Put It All Together In a Sony Production System," explains the advantages of a Sony U-Matic color video system.

Seven different, totally integrated video systems that cover any need from electronic field production (EFP) to in-house production are discussed.

The brochure is designed for the newcomer to video as well as the veteran expanding or updating his facilities.

For More Details Circle (101) on Reply Card

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