AUGUST 1975

# BME

BROADCAST MANAGEMENT ENGINEERING


**If you have trouble placing these commercials, you need a computer.**


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■ System 90 is a complete program automation control package, with many standard features that are usually considered optional in other systems.

■ All programming is handled from a single control console, which can be conveniently located up to 150 feet away from the system. The console also provides continuous display of important operating data.

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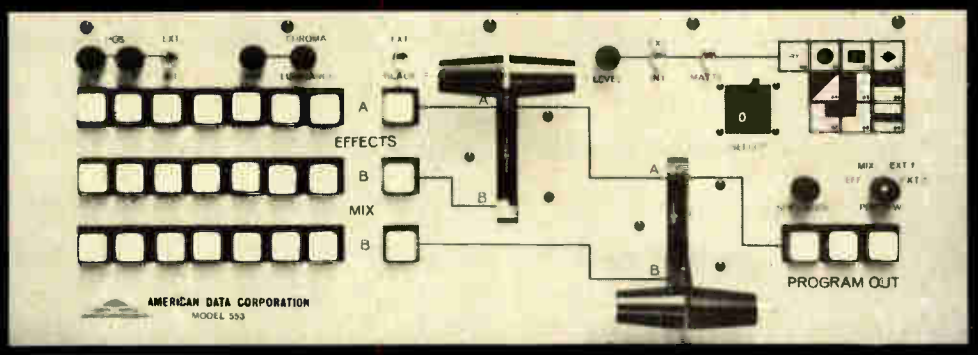
HARRIS

COMMUNICATIONS AND INFORMATION HANDLING



Circle 100 on Reader Service Card

# THE ADC 553




## A TOTALLY NEW PACKAGE DESIGNED ESPECIALLY FOR:

- ★ THE LARGE MARKET
- ★ THE SMALL MARKET
- ★ THE MEDIUM MARKET
- ★ CABLE, CCTV, MOBILE
- ★ ONLY $3,950

The ADC Model 553 Vertical Interval Color Production Switcher is designed to provide small studio and remote van operators with a broadcast quality switching system that incorporates the latest state-of-the-art advances. SOFT WIPE and LINEAR KEY are standard features, but a new development from ADC allows the combining of two 553 systems for a system of unmatched capability and economy.

The special effects generator provides nine wipes, including a circle, square, diamond, diagonal, H&V splits and corner inserts. In key mode, the special effects generator provides a choice of self or matte key on internal or external sources, and an external chroma keyer may be used on the external input. True SOFT WIPES are provided, with control for degree of softness. The keying system is LINEAR in nature so that edge crawl and key breakup are minimized.

The Model 553 is self-contained and designed to mount in a standard 19 inch console or rack housing. Input selector buttons are momentary contact, illuminated with relegendable lens caps. A blackburst and color background generator is included in the switcher to provide fades or wipes to any color or black, and in conjunction with the matte keyer, will provide colored insert keying.

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BM/E
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*If you've played Compu/Net's game you know how its done. With a system of priorities, a computer can place commercials optimally. Make aces highest priority, kings next, etc. With the 12 o'clock slot as position 1 the answer is:*

1. AH, KS, 10C
2. QH, JC, 9S
3. AD, KC, 10S
4. QD, JS, 9C
5. AC, KD, 8C
6. QC, JD, 7C
7. AS, KH, 8S
8. QS, JH, 7S

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**AUGUST 1975/VOLUME 11/NUMBER 8**



**Enter the Best Station Award contest—**
**see page 6 for complete information**

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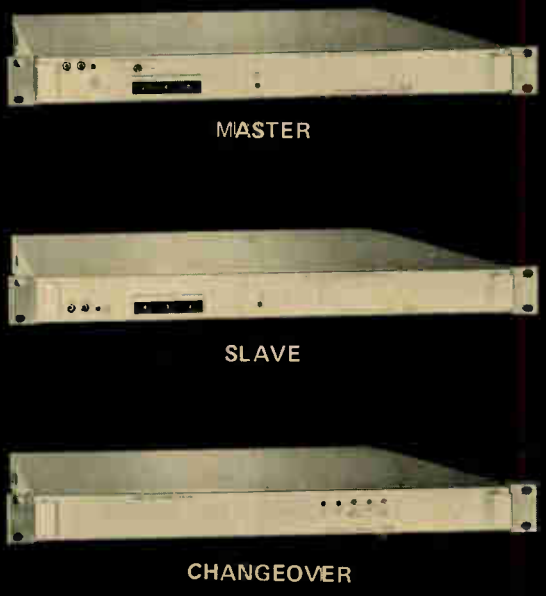
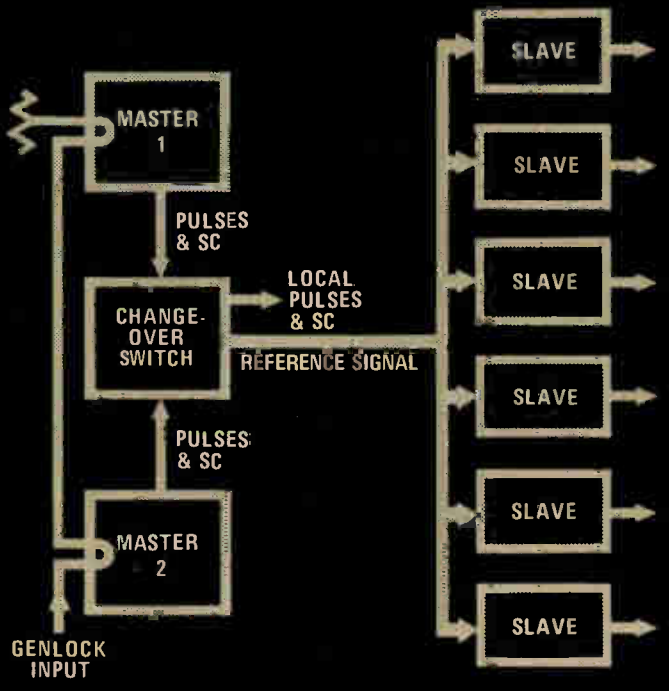
# 3250 SERIES

## EQUIPMENT FOR SINGLE-LINE PULSE DISTRIBUTION SYSTEMS




Excellent stability, *plus* color frame accuracy, can be achieved with GVG 3250 Series single-line pulse distribution system components.

The master sync generators include genlock facilities and provision for an external rubidium input--complete with slewing controls. The outputs of two master generators can be applied to a changeover switch to provide automatic transfer to the standby generator in the event of failure of an input signal.

Slave generators lock to a unique reference signal provided by a master unit, and outputs can be either *advanced* or *retarded* with respect to this reference. In the absence of this signal, a slave unit continues to provide normal outputs, referenced to an internal crystal standard.

The equipment utilizes digital techniques throughout, including a custom-designed LSI integrated circuit. Systems are available for both NTSC and PAL applications.

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# BROADCAST INDUSTRY NEWS

## FCC Makes More Room For New AM Services

Reaching the conclusion from recent hearings on the subject that the rules on licensing of new AM services were too tight, the Federal Communications Commission has issued modifications that make it easier in many situations to get a new AM station on the air or to enlarge the service of an old one.

The new rules, going into effect August 22, 1975, change the basis of acceptability from the older requirement that 25% of the area to be served lacks *any* interference-free AM or FM signal, to a new standard: new service will be acceptable if the area presently has less than two services during the time period of the proposed addition. The new rule applies to proposals for daytime-only operations, for unlimited time stations, for nighttime operation for existing day-only stations, and for increases in power that enlarge service areas. Furthermore, the FCC said an application would be considered for an unlimited time station that would be within the two-services limit at night, even if that would result in more than two services during the day.

The service-rule relaxation does not mean, the FCC emphasized, any change in the existing overlap and nighttime interference regulations.

Another restriction removed was one requiring applicants for suburban AM stations that would put a 5 mv/m daytime signal into an adjoining community of 50,000 or more, with at least twice the population of the suburb, to rebut the presumption they were proposing to serve the larger community. This burden will no longer be imposed when an application is uncontested, the FCC said.

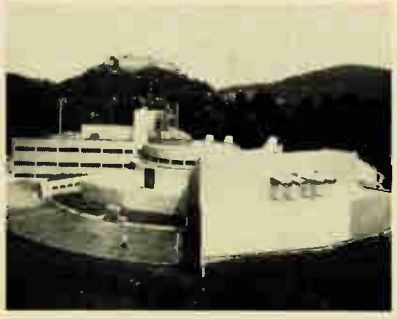
A further change is the addition of a 2.5 kW power rating to the AM series, which previously had 250 watts, 500 watts, 1 kW, 10 kW and 50 kW.

## Prize-Winning Broadcast Building in Austria

The roughly circular building shown at right is the home of the Austrian Broadcasting Corporation's ORF radio and television center in Salzberg. The main idea of the design is the arranging of the wedge-shaped studios, offices and technical rooms around the central two-story hall. Aluminum is used throughout the building, for structure, piping, etc. The building won the R.S. Reynolds Memorial Award for the architect, Gustav Peichl of Vienna. The $25,000 prize, donated by the R.S. Reynolds Metal Co. in memory of its founder, is administered by the American Institute of Architects, which chose the jury and gave the award to Mr. Peichl at the annual AIA Convention in Atlanta on May 18th.

The large wedge with stepped roof to the right of center holds the main TV studios. Other wedges, moving counter-clockwise, are the disc and tape production studios, the radio studios, the master control area. Two-story office complex is at the left.

Aluminum piping and structure are left exposed wherever possible, as can be seen in photo of central hall.



## Television Hit Dollar Peak in 1974

The television broadcast industry took in more money and kept more in 1974 than in any previous year, according to a survey reported in June by the National Association of Broadcasters. The "typical" station, meaning the middle one in the series of 365 that answered the NAB questionnaire, had time sales of $2,337,500 and net revenue of $2,114,400, up 8% and 7% respectively from 1973, and above $2 million for the first time in history.

Pre-tax profit of the typical station was also at an all-time peak of $358,600, although the profit rate was down slightly, from 17.4% in 1973 to 17% in 1974.

Revenue of the typical station came from $1,082,00 in local advertising (up 7.6%); $937,300 in national and regional spot (up 11.9%); and $317,900 from network sales (up 0.9%).

Especially significant was the fact that UHF stations, reported separately by the NAB, also rode up the profit scale. The typical UHF, says the NAB, was in the black with revenue of $1,473,400 and profits of $69,700. That put the profit rate at 4.7%, up from the 2% of 1973. The UHF survey was based on data from 82 stations, or about 44% of all UHF stations on the air.

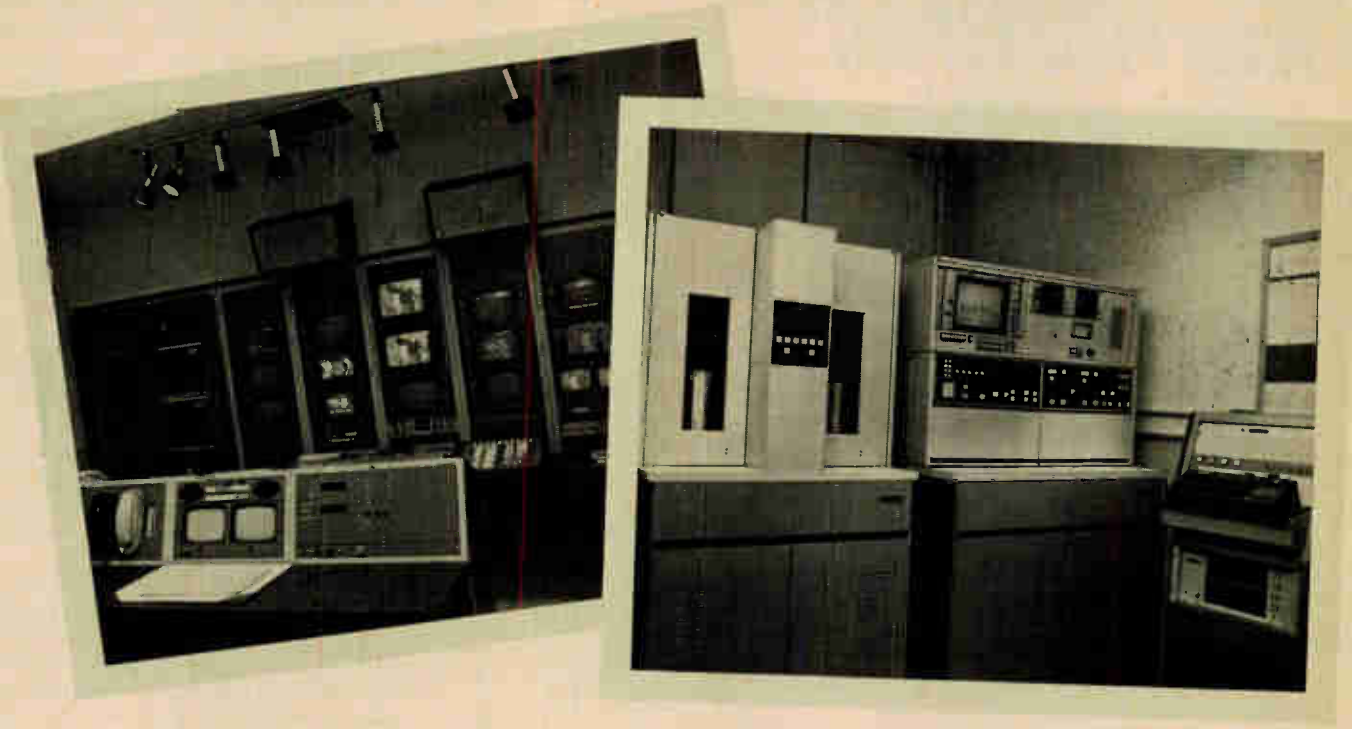
## Entries Invited for BM/E's 1975 Best Station Award

BM/E will repeat in 1975 the "Best Station Award Contest" which had a highly successful run in 1974, its first year.

The objective of the contest is to show broadcast studio or overall plant designs or modernizations that increase operating efficiency, to assist dollar-smart operation. A complete broadcast plant, or any important sector, could be the subject of an

continued on page 8

# Total station automation one year later: SMOOTHER ON-AIR LOOK



## Ampex ACR-25s with ADA contribute to system success at Metromedia stations.

When Metromedia committed itself to complete station automation, it took the courage of an industry leader.

Who could be sure automation would actually work?

Of its 6 stations, WTCN-TV, Minneapolis, was the first to receive the full automation face-lift. All others are following suit; latest to update is WNEW-TV, New York.

In July of last year, WTCN-TV went on stream with an Ampex ACR-25 Automated Cassette VTR, and early this year, an Ampex ADA, Automation Data Accessory. Also in the system loop is a BCS traffic management system, a CDL APC 610-200 switching system, and a DEC PDP-11 minicomputer.

Keyed to ACR-25's exclusive "total station automation" compatibility, the entire system can now program a spot from order confirmation to air-time with split-second timing and accuracy.

Technically, the purpose of the automation was two-fold: (1) achieve a more finished-looking on-air product, and (2) achieve higher manpower efficiency.

WTCN-TV's master control function is now performed by just three people: one at the master control console, one in the film projection room, and the third in the tape room.

Other benefits have surfaced. No more daily spot reel. Reel-to-reel machines are freed for revenue-producing assignments. The tape operator just loads cassettes at random in ACR-25's empty bins, so he is free for other duties. More ways to increase and vary outside production hav been found, and more tape room time is available.

The management of WTCN-TV is convinced tha they are definitely transmitting a better looking product. And morale has been boosted considerably. But it goes deeper than that. The sales people believe that the enhanced production capabilities and improved look have given them a considerable edge. Time buyers and sponsors are impressed, both locally and nationally.

These experiences and others proved to Metromedia that their commitment to automation was a wise decision, especially in today's economy.

Like Metromedia's WTCN-TV and WNEW-TV, you can discover that today's economy is not your enemy i it helps you discover the Ampex ACR-25 and ADA. Station managers in markets of all sizes are looking to automation today, not in the future, in order to save overhead dollars righ now.

For details, contact your local Ampex Broadcast Video Sale Engineer, or write for information

AMPEX

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



**Circle 102 on Reader Service Card**

## NEWS

entry. For example, among the winners in the 1974 contest was a combined console and studio design of FM station WNHU, at the University of New Haven.

The contestant should describe the design or modernization fully enough to make clear the logic, in cost effectiveness, of the main design choices. However, BM/E is setting an upper limit of 1500 words to make possible the the publishing of as many entries as possible. Schematics, floor plans, photos should be included as judged desirable; because of space limits BM/E may be forced to select from among them.

All entires deemed acceptable by BM/E's editors will be published in the December, 1975 issue. Readers will be asked to vote for the top entry in each of three classes: AM, FM and TV. The winners will be announced in the March, 1976 issue. Each of the three winners will get a plaque designed to enhance any studio, visitors' lobby or manager's office.

Smaller stations should not fear that their designs or improvements will necessarily lose out to the more elaborate and expensive projects. Experience indicates that readers vote for the plan on its appropriateness to the station's requirements.

Entries must reach BM/E no later than October 20, 1975. Address: Best Station Award, BM/E, 274 Madison Avenue, New York, N.Y. 10016.

**PRESS TIME BULLETIN: FCC calls off '77 Cable Re-build Rules.**

### Develop Quality of Children's TV

Bob Keeshan, Captain Kangaroo of TV, urged broadcasters to begin serious efforts to develop the quality of children's programming at the recent National Conference on Children's Television.

Keeshan emphasized that television has an "enormous influence" on children. He said that 10% of their lives are spent watching TV by the time they enter the first grade.

The TV personality also urged his audience to stop thinking about the competition and program in the interests of young people.

### Conference Scheduled

The National Communications Forum (NCF) and National Electronics Conference (NEC) have been scheduled for October 6-7-8 at Chicago's Hyatt Regency O'Hare.

The conference program will include

continued on page 10

# Future Shock... Now!

## The tempo is increasing and the response time is decreasing.

You're handling a schedule with 600 to 900 events per day that requires thousands of manual operations . . . loading *and reloading* machines, verifying *and reverifying* material, sorting *and rearranging*, deleting *and inserting new events*, checking *and rechecking*, making machine assignments *and reassignments*, multiple prerolls, and complicated audio/video switching sequences . . . *all by different people* . . . and this schedule must be accurately confirmed on an FCC log.

**Today's near impossible task . . . is rapidly approaching the impossible.**

## Help is Available... Now!

CDL's System 100 TV Automation System, *under your control*, will store and retrieve the schedule with entry error checking, make automatic time corrections, perform complicated audio/video switching sequences, assign machines, verify material, and print the "As-Aired" FCC log . . . **all automatically.**

*In addition, optional modular accessories are available to automatically control the Ampex ACR-25, and to communicate directly with a Business/Traffic Computer System.*

**Sooner or later you'll need this type of system to manage and control your station. It's just a matter of time!**

Send for our brochure and data bulletins.

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## NEWS

18 Technical Paper sessions, reflecting the current state of communications technology and 12 New Technology Seminars providing more detailed treatment of selected topics. In addition to the papers, there will be panel discussions and lectures.

For further information, contact the NEC office, Suite 103, 1301 W. 22nd St., Oak Brook, IL 60521; (312) 325-5700.

### Phoenix To Get New Pay-TV Service

American Cable Television and Microband Corp. of America have jointly announced a new pay-tv service for the Phoenix, AZ metropolitan area called The Private Channel Club. The service will be distributed to cable systems, apartment houses, condominiums, hotels and motels through a microwave service called Multipoint Distribution Service, which is authorized by the FCC to operate WPF47 which will deliver a full color, closed-circuit television picture to hundreds of points within a 25 mile radius of its Phoenix transmitter.

First run motion pictures, uncut and without commercials, will be shown each evening and on weekends along with special live events from time to time.

### New Satellites Will Cut TV Transmission Costs

When Western Union's Westar satellites begin video transmission this summer, they will offer broadcasters savings ranging up to 66% over land-based transmission. Rates for various arrangements of satellite video channel service were filed with the FCC. The rates were scheduled to go into effect July 14.

Service for the Westar system, which includes two satellites, was begun last July. Rates for voice/data circuits and wideband service, up to whole transponders, already are providing businessmen savings of up to 50% over land services. Rate savings will depend on the type of service and the service route selected.

Initially, service will be provided in the Westar access cities of New York, Los Angeles, Chicago and Dallas.

### Color Phase Matching Wins Patent for CMX

The CMX color phase matching system, used in that firm's videotape editing equipment, is the subject of a U.S. Patent, No. 3,890,638, issued June 17, 1975, according to Donald E.

continued on page 12


# Introducing a Color Corrector for Electronic News Gathering.

Electronic News Gathering makes tough demands upon the broadcaster. Color imbalance and colorimetry problems are frequently encountered. Matching remote camera shots to indoor studio programs or assembling tapes from different locations or cameras is "chancy" at best. Often that fast-breaking story doesn't allow for camera rebalancing!

Thomson-CSF Laboratories now provides a solution to such difficult encoded signal color problems. With the Model 5500A Color Corrector, you'll be able to rebalance and match video signals *after* encoding. It can be used either after the play-back tape machine or following the microwave receiver during live coverage. In most cases, a noticeably improved color picture will result. For ease of operation, a Remote Control unit is included as standard equipment.

As an added feature, an optional automatic Sensor unit is also available to control the Color Corrector for telecine use.

Whether for Electronic News Gathering, tape production or telecine use, the Thomson-CSF Laboratories Color Corrector System should be working for you. Interested? Give us a call.

**THOMSON-CSF LABORATORIES, INC.**

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

Circle 107 on Reader Service Card

## NEWS

Prather, general manager of CMX.

The method, says Prather, "derives color frame identification from the recorded time code, then matches it to a system reference. The system automatically controls the capstan servo to insure that splices will occur at those points where color bursts will be in phase."

This eliminates "color whip" and luminance shift from color phase shifts, which have often caused repeated attempts at finding the edit point on some earlier systems. Prather added that CMX will offer licensing of the system to other manufacturers.

### Exhibit Space Going Fast For Radio Conference

Exhibit space at the National Assoc. of FM Broadcasters' 1975 National Radio Broadcasters Conference & Exposition to be held September 17th through 20th in Atlanta was 75% sold out by mid-June.

A NAFMB spokesman reports that virtually every exhibitor that participated in last year's show has signed up for this year's show and most have taken more space than last year.

Nearly every important manufacturer and supplier of radio equipment and hardware will exhibit.

### FCC ACTIONS
### Further DeRegulation Announced by FCC

The Commission issued in June, with an effective date of June 18, some additional relaxations of the broadcast rules, in continuation of the reregulation program of the last two years. Among the June 18th actions were the following:

- Changed the requirement that frequency measurements be noted weekly; the new rule is for frequency measurements at intervals of not more than 40 days.
- Eliminated the requirement that stations immediately terminate remote control operations if a malfunction develops; the new rule allows a station up to one hour to make corrections, before operation must be terminated.
- Removed the requirement that stations must have type-approved antenna phase monitors by June 1, 1974, if the station has made timely efforts to obtain the monitor, and could not get delivery from a supplier.
- For stations operating by remote control, which presently use monitors made after January 1, 1965, and which could not get delivery of new ones, the date is moved up to June 1, 1976.

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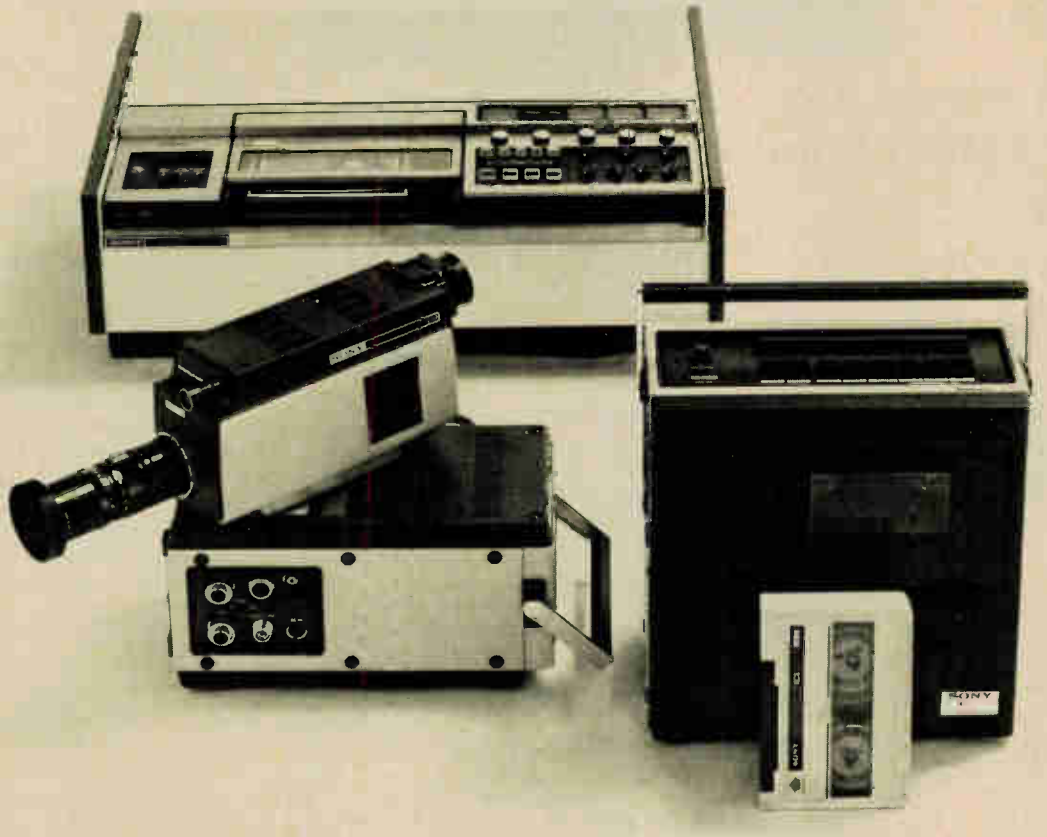
# NAB Show-stopper:



The ENG (Electronic News Gathering) sessions stood them in the aisles. And Sony stood them on their ears with the complete ENG System.

Things like this were said at the Show: "If you don't invest in ENG now, your news department may be obsolete in just a few short years."

So write now for information about the only ENG System that goes all the way through editing using videocassettes.

On your letterhead to Sony Corporation of America, P.O. Box 1594, Trenton, New Jersey 08607. Attn: Broadcast Services BM/E-085-221

**Circle 110 on Reader Service Card for more information**
**Circle 111 on Reader Service Card for a demonstration**

# The Sony ENG System.

## NEWS

- With respect to the new rule allowing use of lower-grade operators for routine transmitter operation, if under supervision of a first-class operator, the Commission removed ambiguity in the rules that seemed to leave certain classes of stations out of this—the new rule applies across the board.
- Removed was a rule requiring logging of the amount of time spent in transmitter inspection.
- Also eliminated the requirement that all "original" data in rough form be retained—the FCC says it is no longer necessary to keep "match-book covers, paper tissue boxes, shirt cuffs and assorted scraps of paper."

### Inquiry On CATV Access and Channel Rules

Cable groups have won their fight to get reconsideration of the rules adopted March 31, 1972, which require older cable systems to meet, by March 31, 1977, certain standards. As originally adopted, the rule required, among other things, a minimum 20-channel capacity; four "public" channels; equivalent non-commercial bandwidth for each broadcast channel; technical capacity for two-way operation; program origination facilities for the public channels.

The Commission has opened an inquiry to consider alternatives to the rule, inviting comments from all interested parties. Among the possible alternatives listed by the Commission were: simply advance the date; require compliance when a system had a "natural rebuild" underway; eliminate the requirements of the rule, and let stations meet demands. Comments were originally due by July 18, but it seems likely as this is written that the date will be extended.

### AES Meeting Reflects An Active Industry

The largest number of exhibitors ever assembled for an Audio Engineering Society convention gave evidence of a flourishing audio industry at the Society's meeting May 13-16th at the Los Angeles Hilton Hotel. The 101 firms on the exhibit floor represented an increase of more than 20% above the previous peak exhibit roster.

Attendees at the convention were at a high level too, with more than 4,000 persons paying for registration. The attendees came for active participation; a number of the technical sessions put the SRO sign out, and the only complaint was that the time for questions and answers was too short. Among the most popular sessions were those on ar-

continued on page 16

Broadcast equipment designed today for the day after tomorrow.

# AN RCA F-LINE VHF TRANSMITTER IS LIKELY TO DO EVEN MORE FOR YOU YEARS FROM NOW THAN ON THE DAY YOU BUY IT.

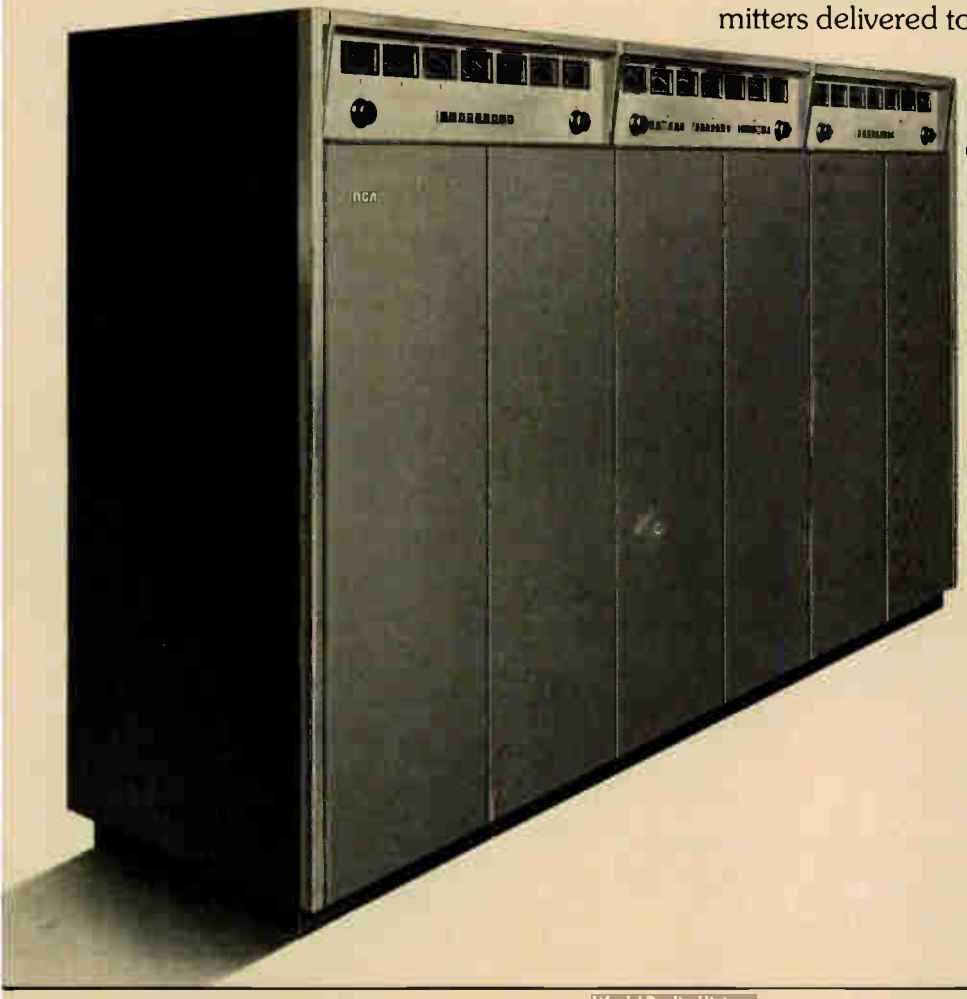
**No wonder it's the best-selling transmitter in the country.**

It's your investment in the future. Because the next transmitter you buy should last you a long time. And it will, if it's RCA.

F-Line transmitters are designed for savings both now and in the future. They use far fewer tubes and blowers, fewer tuned linear amplifiers, and have more "solid-state" content than any other transmitter for the same power level.

A new unit of comparable power will probably take less than half the floor space of your original transmitter. Further F-Line savings can come with remote control now and the prospect of "unattended operation" in the future.

No wonder the F-Line is the country's best seller—with more than 100 transmitters delivered to date.



So plan ahead, if you are not already a most satisfied customer, chances are you will be. Your investment in the future can begin right now. See your RCA representative.

RCA

chitectural accoustics and on sound reinforcement techniques.

Among the exhibits were the usual consoles sporting modular construction with, in some cases, dubious human engineering; although there seemed to be fewer than last year. No new microphones or monitor loudspeakers incorporating revolutionary principles were evident. Amber Design Ltd. from Montreal showed an audio spectrum display. Europa Film displayed its advanced disc-plating machine. Electro Sound demonstrated a high-speed semi-automatic 8-track cartwinder, also an automatic tape splicer. Sheffield Products showed the Marshall Time Modulator, a catch-all/do-all device that does phase, frequency and time base shifting, among a multitude of other audio gimmickery.

Also, at last perhaps thanks partly to opinions expressed in these pages, an array of sound reinforcement gear was in evidence. The AES has finally awakened to the fact that commercial sound is a part of the audio world. Notable was an omni-directional spherical speaker for use with certain musical instruments from Sculptured Sound, boasting 360° horizontal and 240° vertical dispersion, 500 watts RMS capacity over 30-2kHz bass frequency. High-power amplifiers and mixing consoles designed for field audio were abundant. Hopefully this aspect of the AES exhibits will be on the increase. Well done.

## UHF "Taboos" To Be Examined by FCC

Advances in receiver design are the main factors in leading the Commission to re-examine the "taboos" on UHF assignments designed to eliminate interference. The new inquiry asks such questions as: "Considering the performance of contemporary television receivers, can taboos be reduced or eliminated without degradation of service?" "What receiver improvements would help?" "What other techniques would be useful against taboos?" Comments are due August 29, and reply comments September 17.

## TelePrompTer Still Barred In Johnstown

The Commission has refused to remove from Teleprompter the onus of illegality in obtaining the franchise for a cable system in Johnstown, Pa., that arose from the bribery of Johnstown officials in 1966 by Irving Kahn, former president of TelePrompTer. The FCC has recently refused to certify a

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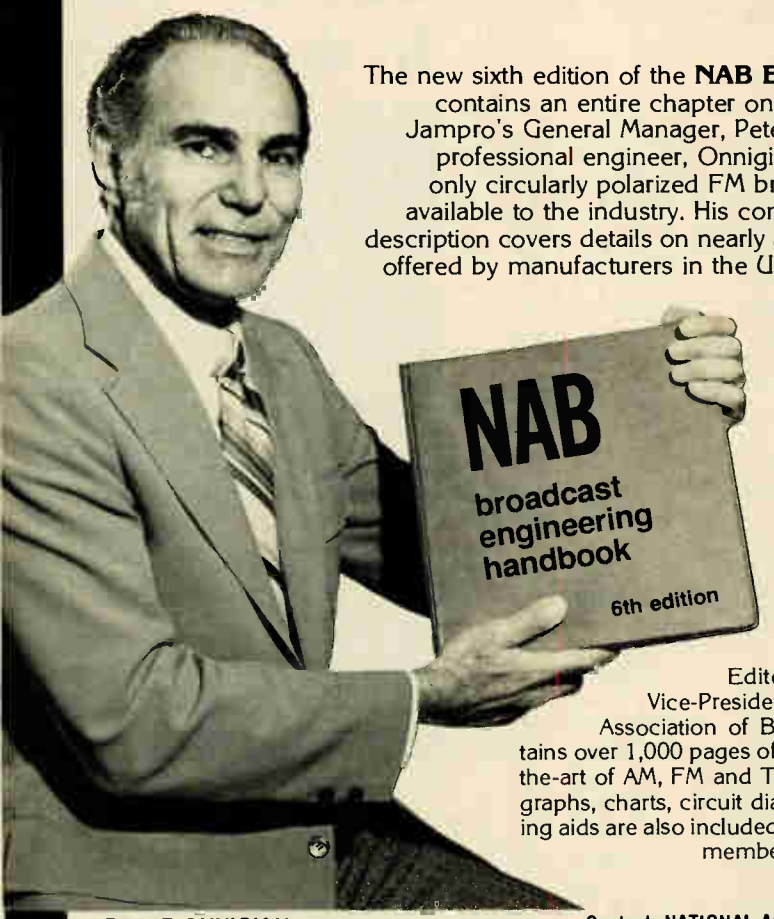
# We wrote the book on FM Antennas!




**It's a fact.**

The new sixth edition of the **NAB Engineering Handbook** contains an entire chapter on FM antennas, written by Jampro's General Manager, Peter Onnigian. A registered professional engineer, Onnigian holds a patent on the only circularly polarized FM broadcasting antenna now available to the industry. His complete in-depth technical description covers details on nearly all FM antennas currently offered by manufacturers in the United States and Europe.

**YOURS FREE!**

You can have a free copy of the **NAB Engineering Handbook** if you buy and take delivery on a Jampro FM antenna between August 1 and December 31, 1975. If you're not in the market for an FM antenna, we suggest you buy a copy of this excellent broadcast handbook, anyway. Edited by George W. Bartlett, Vice-President of Engineering, National Association of Broadcasters, the book contains over 1,000 pages of information on the state-of-the-art of AM, FM and TV. Many illustrations, photographs, charts, circuit diagrams, and other engineering aids are also included. The price is $45.00 to non-members and $30.00 to members.

**PETER ONNIGIAN**
General Manager, Jampro Antenna Co.

**Contact: NATIONAL ASSOCIATION OF BROADCASTERS**
**1771 N. Street Northwest, Washington, D.C. 20036**

**This same expertise in FM broadcasting antennas also allows JAMPRO to offer the most complete line of antennas. SO WHY NOT BUY YOURS FROM JAMPRO — THE PEOPLE WHO WROTE THE BOOK.**

**JSCP — THE PENETRATOR**
As its name indicates, this most popular model of the Jampro line has the penetrating power of the best circularly polarized FM antenna on the market. Each bay is conservatively rated for 10 KW of input power, with excellent VSWR bandwidth of ±200 KHz under 1.1 after mounting on the tower! It also has an excellent axial ratio, for better signal penetration into all sorts of FM receivers. Available for deicers or radomes.

**JLCP — THE PERFORMER**
For Class A stations, and low power educational stations, this ring stub antenna is an excellent elliptically polarized performer! Each Bay is rated at 3 KW, is lightweight, and may be mounted on smaller towers. Like all Jampro FM antennas, it comes complete with galvanized mounting hardware for normal uniform cross section tower mounting. Electrical deicers are available for moderate or heavy ice conditions.

**JHCP — THE BRUTE**
Each single bay of our JHCP line can handle full 40 KW, so we've named it the Brute! . . . excellent as a standby antenna, or for that 5 bay antenna with a 40 KW transmitter for 100 KW ERP, in the most difficult terrain. Not affected by snow, ice, heavy fog or rain. No corona or flash overs. The Brute is available with deicers for heavy icing conditions. A single bay with its own ten foot support pipe has an azimuth circularity of ±0.5 DB!

**JSD — MULTI-STATION ANTENNAS**
Designed to be mounted on the three sides of a triangular tower, or the four sides of a square tower, the JSD series operates throughout the 20 MHz FM band, with a VSWR of under 1.1 across the entire band! This antenna is supplied with two input connectors, and accepts as many as six stations operating on different frequencies, each with a 40 KW transmitter. Diplexers and radomes are available.

**JAMPRO**

**ANTENNA COMPANY**

A SUBSIDIARY OF
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SACRAMENTO, CALIF.
95828

Circle 116 on Reader Service Card

## NEWS

Teleprompter system for the city, although Johnstown has agreed to franchise Teleprompter under a totally new arrangement.

The FCC contends that even the new franchise was "illegally" obtained, and that certification would therefore not be in the public interest.

## Briefs

**INTV,** the Assoc. of Independent Television Stations, Inc., has moved to larger offices at 19 W. 44th St., N.Y., NY 10036, telephone (212) 575-0577 . . . . **Cramer Electronics, Inc.** international distributor of electronic components and video equipment to industry, has announced that the firm's Video Division products are now available through all 40 Cramer divisions worldwide . . . . **WFAA Radio,** Dallas, TX, a strong M-O-R/personalities/news/sports station has become a CBS Radio Network affiliate . . . . **Blonder-Tongue Laboratories** is celebrating its 25th year.

Reynold Johnson, a video sales veteran, has opened **A-VID Electronics Co.** to specialize in video equipment sales (Sony) , service, rentals and the complete design and installation of closed-circuit and broadcast television systems. A-VID is located at 1655 E. 28th St., Long Beach, CA 90806; telephone (213) 426-5526 . . . . The operations of **Jerrold Int'l,** a subsidiary of General Instrument Corp., with European headquarters at 70 Chaussée de Charleroi, 1060 Brussels, Belgium, will be expanded with new facilities in the Brussels area for warehousing, a fully-equipped engineering/test laboratory and customer demonstrations . . . . Jack Valenti, President of the Motion Picture Assoc. of America, will be the guest speaker at the Get-Together Luncheon of the 117th Conference of **SMPTE,** set for the Century Plaza Hotel in Los Angeles Sept. 28 to Oct. 3.

The Broadcast Products Division of **Harris Corp.** has announced the recent sale of two Harris MW-50, 50 kW medium wave transmitters—one to WCAW, Charleston, WV and one to the Security Agency of Iran . . . . The Gov't of Iran has recently adopted the **SECAM** color television process for its national color service . . . . Polish Radio and Television, a state-owned network reaching viewers/listeners in Poland, has installed three of **RCA's** most advanced AM radio transmitting systems.

The new warship U.S.S. Nimitz is equipped with a **C-COR Electronics**

continued on page 20

# TRENCH OR PLOW WITH ONE MODULAR UNIT... THE DITCH WITCH COMBO!


When you leave for the job site, there may be an uncertainty as to whether the job calls for plowing or trenching. It makes no difference if you own a Ditch Witch Combo. Switch from one operation to the other and back again without changing or adding attachments, turning your machine around or leaving the operator's seat. The Combo is a combination vibratory plow and offset trenching module all in one neat package that mounts on the rear of Ditch Witch Modularmatic vehicles. It plows in material to 36" deep and trenches to 42" deep. The modular Combo concept originated with Ditch Witch and is available only from Ditch Witch. It's available for Ditch Witch Modularmatic vehicles in power ranges from 30-HP to 65-HP. Tell your Ditch Witch man you want a free job-site demonstration of the Combo. He can show you just another reason why today, more than ever, Ditch Witch Makes $ense!

"Ask the man you see wearing this emblem how Ditch Witch Makes Sense for *you*!"

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

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DITCH WITCH

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## NEWS

CATV system which will be used for entertainment purposes . . . . The first turnkey Commander III signal-processing system, manufactured by **Jerrold Electronics,** has been installed at Video Enterprises Inc., Holyoke, MA . . . . **Ampex Corp.** has established an 11-region U.S. sales representative network to market its video disc recorders for video image storage in scientific applications such as medical and industrial x-ray analysis, educational instruction, meterology and communications.

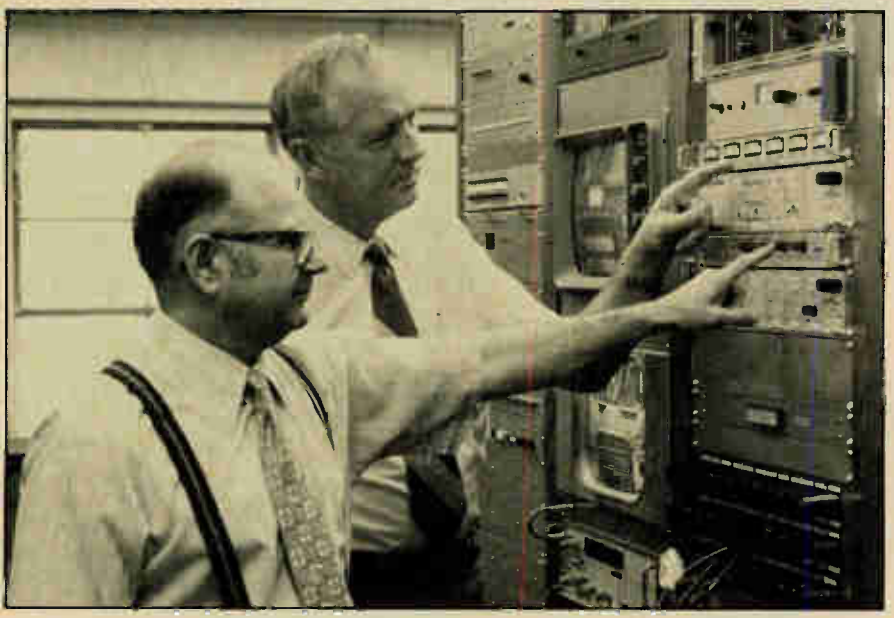
## People

**Gene Edwards** has been promoted to the position of Vice President-Marketing of Harris Broadcast Products Division . . . . **William C. Bollinger** has been named Director of Marketing for Capitol Magnetic Products, recording taped division of Capitol Records, Inc. . . . . **D. Brainerd Holmes** has been elected President of Raytheon Co. . . . . General Cable Apparatus Division recently appointed **Roger J. Waindle** to the position of International Manager.

Warner Cable Corp. has named **Kenneth L. Tryggestad** as system manager for its CATV complex in Kern County, CA. . . . . The newly elected officers of the Catholic Television Network are: **Msgr. Pierre Du Maine,** San Francisco, president; **David Moore,** Los Angeles, vice-president; **Sr. M. Irene Fugazy,** New York, treasurer; and **Charles E. Hinds,** Chicago, secretary . . . . **Dr. Michael Retsky** of Zenith Radio Corp.'s Display Device Research and Development Laboratory has been awarded "first prize for scientific importance" in a micrographic competition recently sponsored by the Royal Microscopical Society of Oxford, England. Retsky's winning entry was an electron microscope picture showing single atoms of silver on a thin carbon film.

The following promotions and appointments have been announced at International Video Corp.: **Bert H. Dann** has been named Vice President, Engineering; **Robert G. Marmiroli** has been named National Distributor Sales Manager; and **Hugh H. Gillogly** has been appointed Direct Regional Manager for broadcast sales in the Central Region . . . . **Larry Deovlet** has been appointed national sales manager for Uher of America, Inc. . . . . **Norman H. Hansen** has been appointed product manager in the professional audio products group for Telex Communications, Inc.

# Our customers get results from the 1440 Automatic Video Corrector.



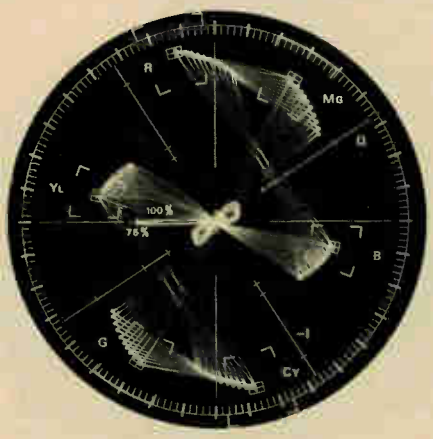
The 1440 Automatic Video Corrector takes the work and worry out of video signal quality control . . . with fully automatic correction of overall video gain, black level, color saturation, burst phase and gain, and sync level. *You can take our customers' word for it.*

**"A must for every video installation."**

"The most remarkable device for video control to appear on the market in the last decade is, without challenge, the TEKTRONIX 1440 Automatic Video Corrector.

"Together with all of its bonus features, this instrument is a must for every transmitter installation."

*William Vandermay,*
*Chief Engineer*
*KATU Channel 2,*
*Portland OR*



**"A most convenient way to automate modulation levels and signal parameters."**

"We have found that a most convenient way to automate modulation levels and signal parameters is to use a TEKTRONIX 1440 Automatic Video Corrector in a closed loop mode around a transmitter such as an RCA TT-30FL or TT-50H."

*T. M. Gulyas, Staff Engineer*
*RCA Broadcast News, Oct. 74*

**"The 1440 has revolutionized our transmitter operation."**

"To be able to adjust power with no apparent sync or video level changes is something I am not used to yet.

"Our Hartford transmitting operation has become precise and nearly automatic. The power output stability exceeds FCC standards by a factor of ten to one. The VIR operated signal corrector is the major reason."

*John Kean, Vice President*
*Connecticut Educational*
*Television Corporation*

**"Our transmitter is about nineteen years old. The TEKTRONIX 1440 automatic color corrector has stabilized our output signal to a degree never before attainable."**

"The one most noticeable improvement is the maintenance of proper sync-video ratio during line voltage variations and changes in transmitter excitation.

"Our transmitter has some differential phase, but having the 1440 match burst to VIR phase results in a very acceptable picture. In fact, a comparison of transmitter output and microwave receiver output does not indicate any difference in the two pictures.

"When the show on VTR is a network playback, the VIR will control the six parameters available. The most impressive thing here is that the VTR operator can vary the color phase control on the VTR with no noticeable change of color phase being observed on the air picture.

*John Hitt, Chief Engineer*
*KSLA-TV, Shreveport LA*

**"I just wanted to let you know how pleased we are with the 1440 Automatic Video Corrector."**

"This unit will be the key to allowing us to have automatic power control of our UHF transmitter. As we automatically control the 110 KW optput with a computer control system, the 1440 will maintain the correct percentage of modulation."

*Robert F. Schlieman,*
*Engineering Manager*
*KMHT-TV, Schnectady NY*

Call your Tektronix Television Field Engineer for a special packet of information about automatic video correction. He can demonstrate how the 1440 and other correction products will work for you at incoming network feed, remote feeds, master switcher output, transmitter input, and other key points. Tektronix, Inc., Box 500-A, Beaverton, Oregon 97077.

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**Circle 123 on Reader Service Card for literature**

INTERPRETING THE FCC RULES & REGULATIONS

# Sponsorship Identification Rules

By Frederick W. Ford and Lee G. Lovett
Pittman, Lovett, Ford and Hennessey, Washington, D.C.

A little more than a decade ago, a prominent politician decided to run for Governor of a southern state. A local television station soon thereafter carried a program critical of this gubernatorial hopeful's past record. The program was sponsored by "The Committee for Good Government." The television station announced that the program was sponsored by this Committee, although it knew that the Committee was actually a front for the opposition candidate's campaign organization.

As sometimes happens, the true story came to the public notice. Eventually, the Commission found the television station liable for forfeiture for violating its Rules requiring sponsorship identification of the person "in whose behalf such agent (here meaning the Committee) is acting." Although the Commission was effectively overrules in the Federal Courts (due, primarily, to the imprecise wording of the Commission's Rules), this case is significant for two reasons. First, the court decision prompted the Commission to institute a rulemaking proceeding[1] to precisely define the type of identification required for political and controversial issue broadcasts. Second, the case illustrates the dangerous ground tread by stations when broadcasting political and controversial issue programs—especially in our Country's current post-"Watergate" atmosphere.

## Proposed Rulemaking

The Commission's *Notice of Proposed Rulemaking*[2] proffered two amendments to the existing sponsorship identification rules. The first dealt directly with the "true sponsor" identification problem and was precipitated by the gubernatorial campaign case discussed above. Very simply, the proposed rule was designed to "close the loophole" in the existing rule which permitted the broadcast of political and controversial issue programs without requiring identification of the person or organization really "behind" them.

The Commission explained that the purpose of the rule change was

> . . . to clear up any misunderstanding about whether the statute and rules require a licensee who knows or has reason to know the facts, to adequately identify the person or persons paying for or furnishing the material broadcast. We believe it clear that the requirement for full and fair descriptions of the person or persons paying for or furnishing the consideration for the matter broadcast is reasonable and dictated by the public interest; and that where a political broadcast is presented promoting one candidate directly or through criticism of his opponent, by a committee which is really a campaign instrumentality for a candidate or a political organization, the public should be made plainly aware of the latter fact. The public's basic right to know by whom it is being informed, particularly as to a political matter or controversial public issue, is too basic to need lengthy discussion here.[3]

The second amendment dealt with relaxation of list retention requirements for noncommercial broadcast matter. The thrust of this proposal was to eliminate some burdensome paperwork and record keeping for stations that was of negligible benefit to the public in trying to identify the true sponsors of a program.

## Amendments Adopted

The Commission adopted its proposed amendment to close the "true sponsor" identification loophole. Henceforth, a broadcast must announce (1) the name of the person (or organization) that is paying for the air time or (2) the name of the person (or organization) "on whose behalf" the program is being sponsored.[4]

*Example 1:* John Doe is running for State Senate. He personally purchases air time on a local television station to acquaint voters with his platform. The broadcast must announce that it was paid for by John Doe.

*Example 2:* Joe Jones is also running for State Senate. The "Committee for Popular Laws" purchases air time on a local television station during which a spokesman

continued on page 24

[1] *Notice of Proposed Rulemaking in Docket No. 19513*, 34 FCC 2d 1104 (1972).
[2] Id.
[3] Id. at 1105.
[4] *Report and Order in Docket No. 19513*, ____ FCC 2d ____, 33RR 2d 2d 975 (1975).

# Why is Datatron the leading supplier of Electronic News Gathering Systems?

## Here are five good reasons

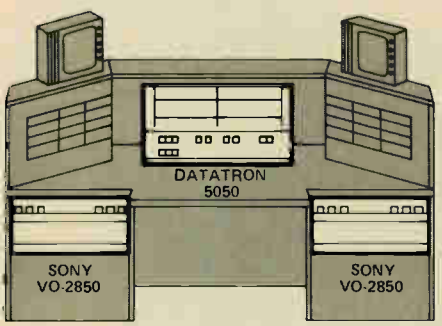
1. **Vidicue is the simplest system to operate**
2. **It offers complete expandability**
3. **It can be interfaced to any servo controlled VTR — Quad, helical or audio**
4. **It can operate manually or automatically under computer control**
5. **It features our exclusive jam-sync eliminating pre-recording of SMPTE edit code on tape**

Ralph Hucaby, Vice President & Director of Engineering at WLAC-TV, Nashville, Tennessee operating his Electronic News Gathering System which includes a Datatron Model 5050.

**Here's what WLAC-TV says about Vidicue**

We asked Ralph Hucaby, Vice President & Director of Engineering at WLAC-TV why Datatron's editing system was chosen.

"Because it's more accurate and easier to use," replied Hucaby. "Single frame accuracy is very important — particularly in audio where we often need to edit between words. Also we found we could easily train non-technical people to use the editor. Several of our news personnel became very proficient on the Vidicue with only a short period of training."




Datatron offers this complete Electronic News Gathering System including a $25,000 Vidicue editor and two $6000 Sony Model 2850 Cassette Recorders for only $32,000.

**System can be expanded at will**

The beauty of the Datatron editing system is its simple expandability. It defies obsolescence. You can expand from two to three machines at will. Or move up in logical steps to a completely automatic on-line, off-line system where edit times are stored in a computer and a punched tape prepared. Using this tape, a precisely edited show can be automatically transferred from low cost helicals to quads in minutes. Our system can handle up to 9 VTR's. And special effect switcher too.

**A complete system including VTR's for $32,000**

Here's an offer you shouldn't refuse. Datatron's $25,000 Model 5050 Vidicue Editing System and a pair of $6000 Sony Model 2850 Cassette Recorders, all interfaced and ready to save you time and money for only $32,000!

Why are we making this offer? To give you an incentive to move into Electronic News Gathering now. We think it's one of the most powerful tools a TV station can have. And forward thinking stations like WLAC-TV in Nashville agree.

With portable minicams, mobile vans equipped for microwave transmission and Datatron's 5050 Editing System, Electronic News Gathering is revolutionizing the nightly newscast and providing instant coverage of important events as they occur.

So phone Datatron today. Or send for our complete list of features. There are many more than we've described here.

**datatron. inc.** **EDITING SYSTEMS DIVISION**

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Circle 124 on Reader Service Card

criticizes John Doe's campaign platform. The "Committee for Popular Laws" is a straw entity for the "Joe Jones Election Committee." The broadcast must announce that it is being aired on behalf of Joe Jones.

*Example 3:* Assume the same facts as above except that the "Joe Jones Election Committee" directly sponsors the broadcast. An announcement that the "Joe Jones Election Committee" is the sponsor is sufficient because it clearly informs the public on whose behalf the program is being aired.

The second proposed amendment was also adopted. The list retention requirements was relaxed for sponsors of programs that do *not* (1) advertise commercial products, (2) contain political matter or (3) address controversial issues of public importance. The rule change was directed at easing the paperwork required of ostensibly public interest programming matter presented by organizations such as the Red Cross. Such organizations need no longer maintain listings of upper echelon officers and directors at a local broadcast station's offices. However, an announcement must still be made during the program identifying the sponsoring organization.

### The Rule As Revised

The above-discussed rule amendments must be understood in the context of the sponsorship identification rules as a whole. The Commission consolidated the previously separate AM, FM and TV rules[5]. Cable television is covered by a separate but similar rule[6].

In general, all broadcasts for which a station charges for the air time must contain an announcement identifying the sponsor or the person on whose behalf the broadcast is in reality being aired. Such an announcement need not be made if the station airs the program for free so long as the sponsor is not providing use of the film or tape to secure "free advertising" for itself or someone else. The broadcast station has the duty to use "reasonable diligence" in obtaining the program sponson's name (or the name of the person on whose behalf the program is aired) to make the required identification announcement. The Commission specifically recognized problems inherent in determining a straw organization's true source of funds. Did the funds emanate from the opposing candidate's campaign organization or from one of his/her supporters? The Commission answered this question by saying:

> In those instances a licensee must exercise reasonable diligence to ascertain the facts. We do not require more of him. But we do not condone less.

A program of five minutes or more that addresses a political matter or a controversial issue of public importance must be preceeded and followed by a sponsor identification announcement. A program of less than five minutes duration need only make one such announcement at the program's beginning or conclusion. A commercial product advertisement that at least once clearly

[5]New Section 73.1212.
[6]Section 76.221

continued on page 26

# Despite the unprecedented demand, you don't have to queue up for our CP-16R's.

**The reason? Our spacious, modern facilities and automated production techniques make it possible for us to meet the ever growing demand here and abroad. Easily.**

After all, we are the largest manufacturer of professional motion picture camera equipment in the United States. And, of course, we use the most advanced and sophisticated technologies in design, engineering and manufacturing to deliver to you the most outstanding 16mm reflex and non-reflex sound camera systems.

At competitive prices. With no compromise on quality. And with a full range of options and accessories to suit all your requirements: newsfilm, documentary, television commercial or studio-type film production.

With more than 2000 reflex and non-reflex cameras actually delivered in a mere three years, our CP-16's have already proven themselves in the field beyond any question.

Furthermore, our CP-16's are backed by a world-wide network of dealer service centers, staffed by factory trained technicians, and well stocked with critical replacement parts.

**Our CP-16R is the quietest, most reliable 16mm reflex camera system ever. And it is available here and now.**

**So, why settle for "pie-in-the-sky" promises from various camera manufacturers whose highly touted prototypes never quite seem to make it to the production line?**

**Don't wait. See your local CP-16 dealer now.**

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*Technology In The Service Of Creativity*

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states (1) the product's name, (2) the sponsor's trade name or (3) the sponsor's corporate name is deemed to have complied with the identification rule. Even if the advertisement exceeds five minutes in length, it is still deemed in compliance and two identification announcements are not required.

Licensees broadcasting political material or matter dealing with a controversial issue of public importance that was paid for or furnished by a "corporation, committee, association or other unincorporated group, or other entity" must compile a list of the "chief executive officers or members of the executive committee or of the board of directors of such organizations." The list must be placed in the licensee's public inspection file for two years. While organizations such as the Red Cross and United Giver's Fund are exempted from this "listing of officials" requirement, they are still subject to the sponsor identification announcement requirement.

### Exceptions To The Rule

The identification announcement rules do not apply in three situations.

First, "want ads" or classified ads sponsored by an individual are exempted. Businesses, be they individual proprietorships, partnerships, or corporations, are not deemed to be within this exception. However, when the exception does apply, the station must do the following.

(1) List the name, address and phone number of the individual advertiser;
(2) attach a copy of the list to the station's program log for the day the advertisement was aired; and
(3) permit access to the list to any person having "legitimate interest" in the material contained therein.

Second, the sponsor identification announcement need not be given regarding any "feature motion picture film produced initially and primarily for theatre exhibition."

Third, any program filmed or recorded on or before June 20, 1963 is exempted from the identification requirement rules.

### Conclusion

The November elections, bringing with them the fall campaign season, will be upon us shortly. Commission Rules relating to the broadcast of political matter and controversial issues of public importance should be reviewed by licensee personnel immediately.

The single most important point to be gleaned from the newly amended sponsorship identification rules is that the license must exercise "reasonable diligence" to discover on whose behalf campaign candidate or controversial issue material is being broadcast. "Reasonable diligence" means making a bona fide effort to discover "straw" organizations. Licensees should always keep in mind the principle underlying the sponsor identification rules:

> ". . . the public has a basic right to know by whom it is being informed, particularly as to a political matter or controversial public issue."

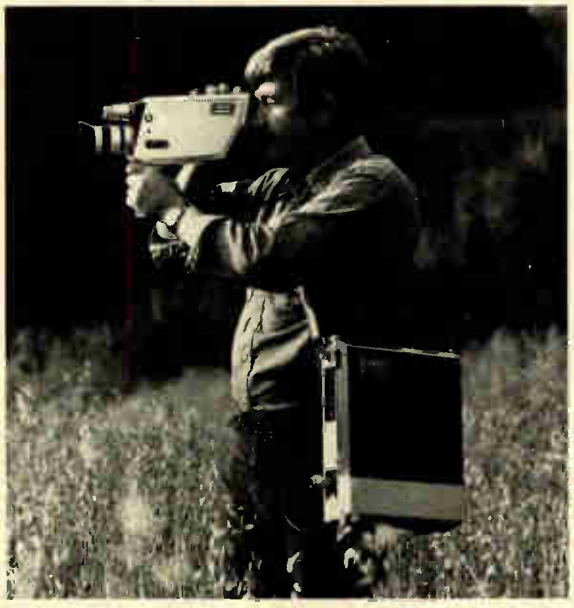
# When you've got something as good as the Akai VTS-150, you change it.

## Introducing the Akai VTS-150B.

We call our VTS-150B the Hustler. And it has 5 things our VTS-150 doesn't (servo vertical lock, video AGC and sync stabilizer, battery condition warning blinker, exposure indicator and RF output for dropout compensator).

But some things you don't change.

The Hustler is just as small as our VTS-150 (the 16 pound recorder fits into one neat little package you sling over your shoulder).



It's just as light (the camera weighs a mere 6 pounds).

And just as easy to use (pull the trigger, edit the tape automatically, dub in new sound).

The Hustler from Akai. It's been a change for the better.

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Circle 128 on Reader Service Card

# Radio Automation: The Good Right Arm of the On-Air Man

A survey of new radio automation hardware in use shows that management can choose to give a station a "local," "live" personality, with the automation making the job easier, less error-prone, more creative, than manual operation.

Syndicated programming is available for radio stations that will do everything but announce visitors at the station's front door. Automation hardware can run a station for days without the touch of a human hand. Put the two together and a radio station can be a highly efficient machine for transmitting programming assembled elsewhere, with almost no in-house effort. Along with the programming often come centrally-hired on-air personalities to flavor the material, set the backgrounds, even do some station promotion.

Many stations are running that way, and in smaller markets it often makes sense. The syndicated DJ's may well be more valid and interesting than any talent the station could find locally, or could afford to hire from out of town.

But a good number of stations, especially among those in medium and larger markets, have the resources and the management desire to create an individual voice, one that listeners will learn to know and seek out. For such stations the latest automation hardware can do a tremendous job. The whole programming effort can be more creative, less subject to error, much freer of operational burdens, than "manual" operation.

This theme appears—not by BM/E's planning—in every one of the stories on radio automation in the July issue and in this issue. In July we told about the Schafer/NTI computerized systems going into all seven of the CBS-owned FM stations. The very large memory available in these systems is used to give the live DJ one-button control of music sequences, commercials, PSA's, ID's, etc., with up to several days of events storable. The memory is also a very big aid to each program director in assembling programs that are fine-tuned to his market (each of the seven stations has its own, locally-oriented format). The title and 20 other parameters of each cart are stored in the memory, so that lists of "compatible" music can be had in short order.

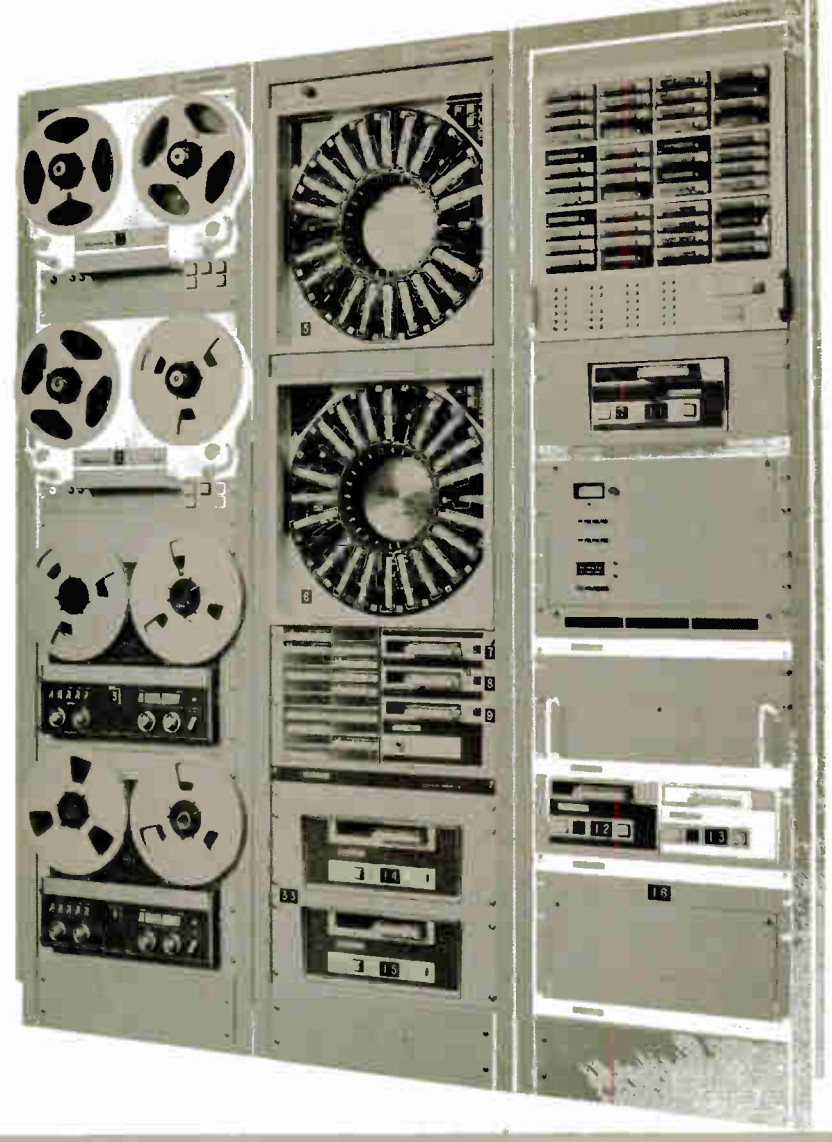
Also in July Gerald Klabunde of WBEN, Buffalo, described their carefully designed system, largely custom built by Ward-Beck and the station staff, that gives a nearly free hand to the DJ. He talks for the approximate time assigned, expanding or contracting the time as the creative need dictates. Then he pushes the button for the next music sequence or cluster of commercials. The system alerts him when to go on "live" again; he knows at every moment what is being aired, and what the following items in the sequence are. Setting up the sequences is easy and leaves personnel the time to "enjoy being broadcasters," says Klabunde.

In this issue Robert Groome tells a somewhat similar story about WERE in Cleveland. There the automation system, custom designed by the engineering staff using mostly Gates equipment, allows the talk-show host to control the automated sequences. Again, the system tells him when to come on live again, and exactly what is being done at every moment.

The same theme appears in other stories of automation equipment in use. The following in-use stories concern items introduced at the recent NAB show in Las Vegas.

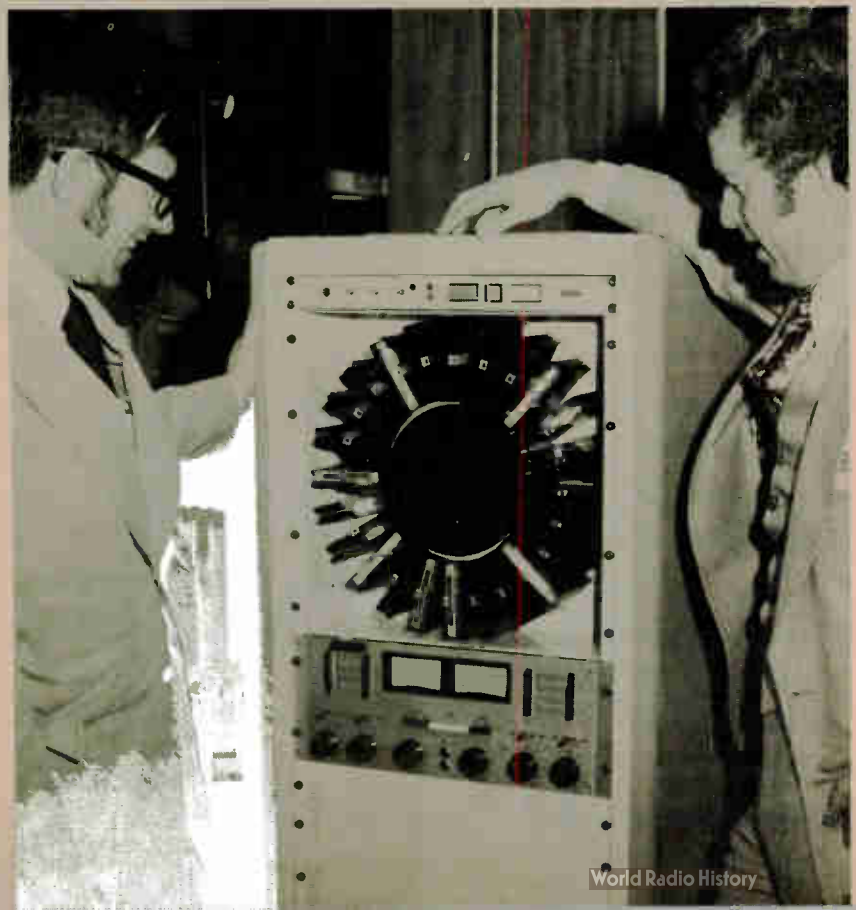
**Audio Services System 1**—In use at WGPR-FM in Detroit, this new system is run by a microprocessor. It stores up to five events. The combo man starts the sequence with one button. It can interface to any multi-cart system, or to open-end machines. The on-air man can hold the sequence, repeat any item, reject one. A digital readout tells the operator what's on and what's coming. WGPR makes a special use of the system on remotes. There are many remotes in the program schedule, and the remote material has to be synchronized and sequenced with recorded material. Errors were greatly reduced, operation made smoother and surer, with a portable push-button control that operates the automation from "outside." Signals from the portable box reach the station over telephone lines using FSK digital modulation. The remote man has the same control functions as a man in the studio.

**Harris System 90**—Run by a micro-computer, this system has a standard input capability of 16 sources, and memory of 1200 events (expandable to 32 sources and 3700 events). The software allows program entries to be made on a time basis or sequence basis; the computer puts them in the right order, regardless of entry order. True time and "compare time" are both shown on the control console, along with the item on-air and coming



*Harris System 90 (left) has minicomputer, memory, audio switching and power supply in third rack, below multicart machine. Example shown has one audiofile, two Carousels, four reel-to-reel machines; other configurations are readily made (system handles up to 16 inputs).*

*Control console for Harris System 90 (below) can be remote from main racks; two or more consoles can be used. System is fully operated from keyboard; displays include real time, "compare" (or running) time, current event, next event, edit operation, system status.*

*Control box for Audio Services' System 1 automation system (above) can be used remote from studio, connected to studio by FSK digital signals over telephone lines. Remote man has same control of system has in studio.*

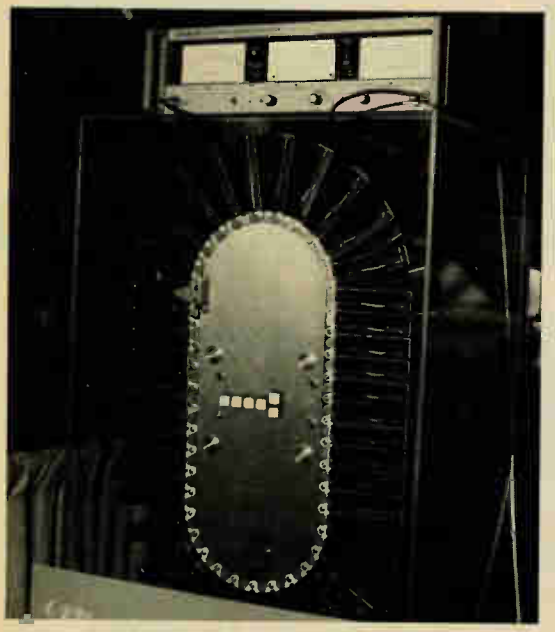
*"Rotocart" (left) is new rotary cart machine introduced at NAB 1975 by Ampro. Drum holds 24 carts has random access of 7 seconds maximum.*

up. Random access to the memory makes last minute changes available.

The system includes all the operation features found desirable in "full" radio automation systems—automatic network join, automatic voice tracking to sequence recorded voice with music; time announce built in; many others that make this one of the most convenient, most fully "automated" systems available. Is also has full provision for operation by a "live" DJ, who can call up any individual item or any sequence using the console. This allows the on-air man, again, to create the show. The extremely extensive array of automation features make program assembly and operation simple. Such powerful aid to program creativity was a major consideration for Lake Enterprises, in Fresno, California, who are installing the system in their newly-acquired FM station there.

**Schafer Stand-Alone Control for Audiofile**—This new unit is designed specifically to give the DJ intimate control of the Audiofile multicart machine, outside of, or alongside, an automation system. At KVOO, in Tulsa, Oklahoma (see BM/E, December, 1974), the management wanted the DJ to make his comments "live," to answer the phone, again to create the show. A new


*Shafer 903 system (above) with MOS memory is shown with two Audiofiles (third rack), six reel-to-reel machines, complete control electronics (first rack).*



*IGM's new moving-cart machine (above) is called the "Go-Cart," holds 42 carts, with option for expansion to 100.*

*New fixed-cart system, the Carostat (above), was introduced by SMC at Las Vegas. It has 12 or 24 carts, each with own playback system. The cart cued in moves 1/16th inch to drive system.*

*A random-access memory system (right), the RAM from IGM, holds 2048 events, (expandable to 4096), and can switch up to 19 sources, with each controlling up to 79 sub-sources. Unit can be a master controller or sub-controller in automation system.*

pushbutton unit allows him to call up any cart from 96 on two Schafer Audiofiles. Within certain broad restrictions set by the format, the DJ can play any music he wants, as often as he wants. The "automation" makes it easy, eliminates all panic and scrambling to load playing equipment.

### Full automation—the main sources

Serving program creativity in their several ways are, of course, full automation systems that have been available for a number of years. Those most familiar to the industry have come from Schafer, IGM, Harris (Gates) and SMC; and more recently from Control Design and RCA. Simple but effective systems are marketed by Autogram, CCA, and Sparta. Also available is the "Semi-automation" of Broadcast Electronics' cart sequencer, which can play a series of carts with a one-button start.

Also, backing up the movement to "creative radio automation" is the proliferation of new multi-cart machines that appeared in Las Vegas, as noted in the May Show-In-Print issue. Reviewing briefly, we have new multi-cart systems, plus older ones, as follows:

New in 1975

**Ampro Rotocart**—24-cart rotary, "Carousel" type, maximum access time 7 seconds.

**IGM "Go-Cart"**—42-cart assembly, expandable to 100 carts; micro-processor chooses fastest access to next cart; second playback position can be added for back-to-back spotting.

**RCA "Kartwheel"**—24-cart rotary, drum removeable for loading/storage, random access 7 sec. max.

**SMC "Carostat"**—A fixed-position system, with 12 or 24 carts in "bookshelf" configuration, each with its own playback system, each pulled up about 1/16 inch to drive shaft, giving instant access.

Among the older multicart systems in very active use are the following:

**SMC "Carousel"**—the one that started the rotary cart movement; used in many of the "full automation" systems.

**IGM "Instacart"**—Fixed-cart system, with 12, 24, or 48 carts in flat trays.

**Schafer Audiofile**—Vertically-stacked, fixed-position carts 16, 32, or 48, with playback mechanism moving vertically in back of each stack.

### Other new hardware

Another unit introduced at NAB with important potential for high-creativity automation is the IGM RAM, a random access memory system which can act as the automation master or sub controller—even storage and switching—with almost any combination of tape transports, cart machines and other audio sources. The standard system has 2,048 directly addressable, directly programable events, expandable to 4,096. There are up to 19 audio sources, with sub-source capability of up to 79 within each source. The unit is programmed through its own integral front panel keyboard. A number of operation features allow for flexibility and ease in setting up, repeating, changing, program items.

Control Design added to its systems two reel-to-reel audio machines designed especially for automation use, with cue tone generators built in. **BM/E**

# Automation Lets the Talk Host Run the Whole Show

by Robert R. Groome

WERE, in Cleveland, had to get more "Competitive" with the one-man, combo operations at other stations in the area. Properly planned automation put their talk host in control, while maintaining his on-air, live spontaneity.

First, let's examine the problems confronting WERE that made us even consider automating our all-live talk operation.

- The Cleveland radio market has moved over the past few years from the traditional engineer-announcer, two-man operation to "combo," meaning that one man now does it all, much as it has always been in medium and small markets
- The very nature of talk radio makes it more expensive than music stations. WERE's adult audience dominance has been proven for over two years. Our listeners are held by talk hosts, not music. There are so few announcers who hold good ratings day in and day out that they are expensive. Add to this the entire engineering crew necessary for good operation and the profit margin is squeezed by the more competitive combo music stations. We had to become more competitive. And we did!

To summarize briefly, our successful system does this: the talk host runs totally live, and can shape the program, respond spontaneously, without a rigid time pattern within which he must operate. When the (approximate) time comes for commercials, PSA's, ID's, etc., he pushes one button, and the automation takes over until that sequence is completed. The system alerts him to go on the air again—and at the end of another segment of his program, he starts the automation again to run through the *next* sequence of recorded material.

Many technical obstacles had to be overcome on the way to this goal. In combo music stations the announcer has time, while his records play, to set up commercials, PSA's, etc. There is no such set-up time with live talk.

Editing undesirable telephone calls or guest comments is usually done by a delay recording technique, recording on an endless tape cartridge and playing back continuously. This allows time for the engineer to delete objectionable material.

WERE has been using a full one minute delay for several reasons: the longer delay time gives longer tape life, typically three days at 20 hours of delay broadcasting a day, before the tape begins to show wear. Fewer passes of the splice allow less chance for splice breakage; and fewer changes of the delay tape mean fewer program interruptions. And the 60-second delay allows easy entry/exit from delay without any interruptions.

Many sales orders require accurate time records to be kept. Whatever changes are to be made, accurate, easy-to-read records must be kept automatically. Remember the operator doesn't have the time to keep these records and do a great show.

Some method must be provided to allow automatic recording of the CBS network delayed broadcasts, promos, news feeds, etc. And a back-up must be used to record them if the main one fails.

WERE's transmitting facilities are remote controlled. So provision was deemed necessary to alert the announcer that the transmitter site had been entered. The burglar alarm provides total perimeter control. There are no shunt keys used. If someone enters who is cleared (such as the FM or TV station personnel to whom we rent space), they know the alerting procedure which prevents us from calling the police.

As most announcers are not skilled in technical operations, all systems must take care of themselves. Automatic generator switch-over at studio, STL, and transmitter and switch-over in case of failure of the main is necessary. Signaling of those events is necessary also.

Some means was desired to 'cue' the announcer when (1) live copy is coming up soon (2) when to read the live copy (intros, donuts, and tags). In addition, we had to have automatic control of all levels without bringing up background noise.

But most important, as already indicated, *any system change was not to restrict the air talent.* Nothing except scheduled news is geared to time. The programming must stay spontaneous and flexible.

### How we went about it

Here is how these objectives were met. Obviously, station management was committed to the proposal, or you wouldn't be reading this article. The scheme would reduce operating expenses by over $56,000 per year.

Several systems capable of holding in memory our daily commercial and PSA loads were investigated. By format checks, we found we need about 900 events of memory per day which would call up random accessible cart players (Carousels). We needed to use special codes

**Mr. Groome** is Chief Engineer, WERE.

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ur system consists of the remote-
and SSC-X in combination with a
ke pre-amps and a combiner card
with automatic gated gain-controlled

puts are as follows:
(selectable 1 to 5) plus our telephone

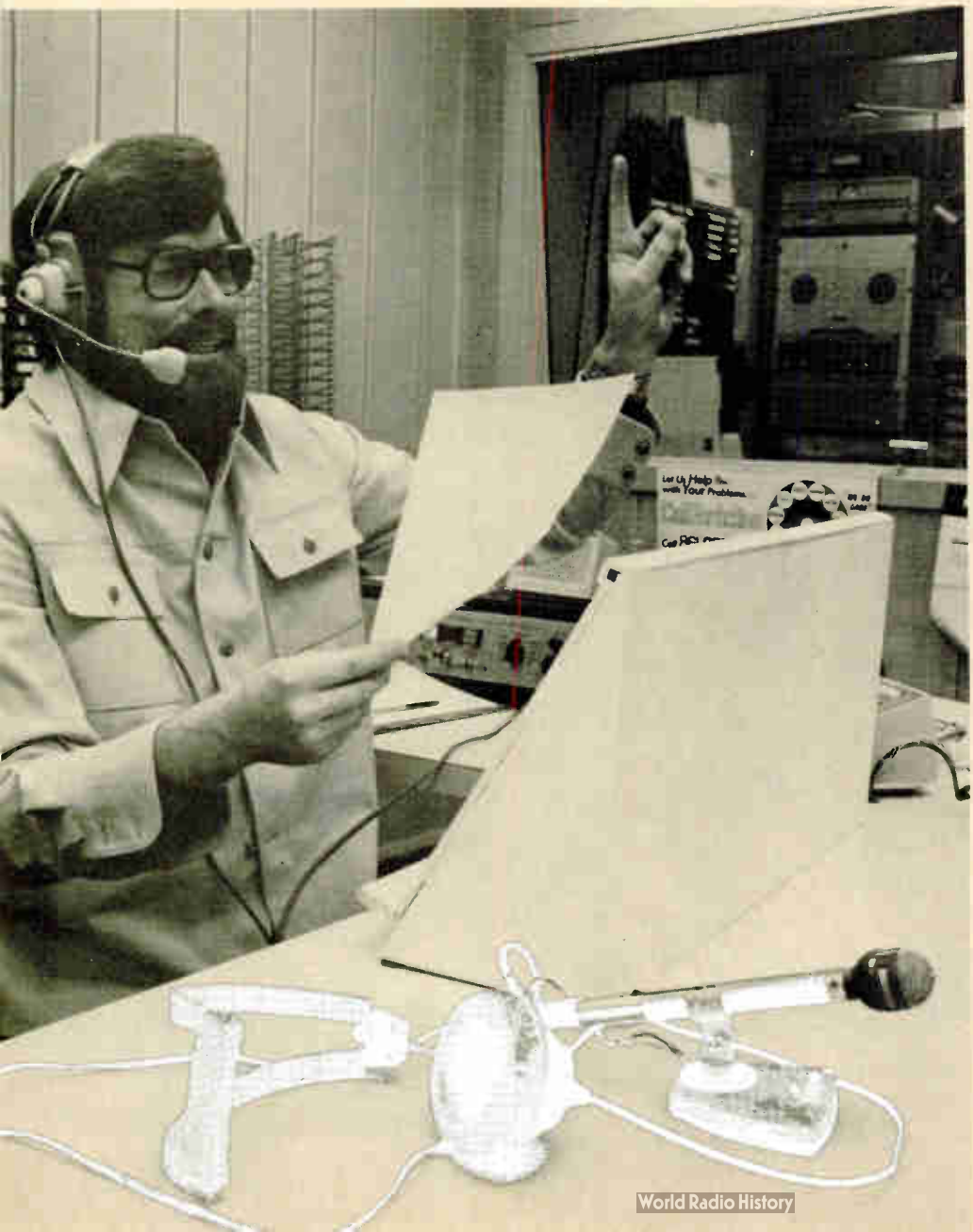
RA-10 controlled Carousels.
-Ampex AG350.
10 & 11—Gates CB1200 turntables.
12—Ampex 351. 13—Remote line (used many times daily). 14—Revox. 15—Two-way receiver (copter reports and news). 16, 17 & 18—Gates CCIII—3 deck cart player.
19—CBS network.

Because we use live-talk telephone programming 20 hours a day, our phone equipment is critical. We own our ITT telephones and equipment, which are interconnected as provided by Bell tariffs to the eight outside lines, plus two switchboard extensions of our main nine-trunk PBX.

The phones are set up to cross-conference any number of calls at once. Each conference tie-in drops the level by about 3dB and we seldom conference more than three callers. The person on the incoming phone call hears our studio announcer and guests by way of a ROH summing card at the output of the mike pre-amps through an AGC amplifier. This is true, regardless of whether the studio is on or off the air.

A selector switch prevents the calling party from getting on the air until *we are ready* (so we can alert him he's on the air *before* he gets put on, if we called him).

We are the only station in Cleveland providing traffic reports via helicopter. We use a duplex system whereby our copter reporter hears pre-delay audio at a low level and when it's time for a report, the announcer in the studio touches a button to increase the copter receiving level. Both carry on telephone-type conversations, and



*One of the control boxes for automation system at WERE is in foreground, with engineer Peter Chin aiding telephone-talk host Merle Pollis, in studio, rear (a rare two-man operation). Pollis also has control box on studio desk (turned around for visibility in photo).*

*Talk host Gary Dee reads a live commercial; his box for automation control is hidden by other equipment in picture. Guests on "live" talk shows use mikes in foreground, from seats in front of console.*

both can be heard on WERE; or just the copter reporter.

By way of patches, we are able to have an announcer do his normal show in another city (we've been to San Francisco, Toronto, Pittsburgh and New York City, etc.) via simple telephone circuits. This means the distant host can talk to Cleveland callers as if he were actually in the studio. We can take live talk telephone radio anywhere!

Another difficult project was editing. As already noted, our scheme uses a 60-second audio delay tape cartridge. And we have another delay 55 seconds long with constant tone applied. If the tone is eliminated, 55 seconds later there will be a loss of program.

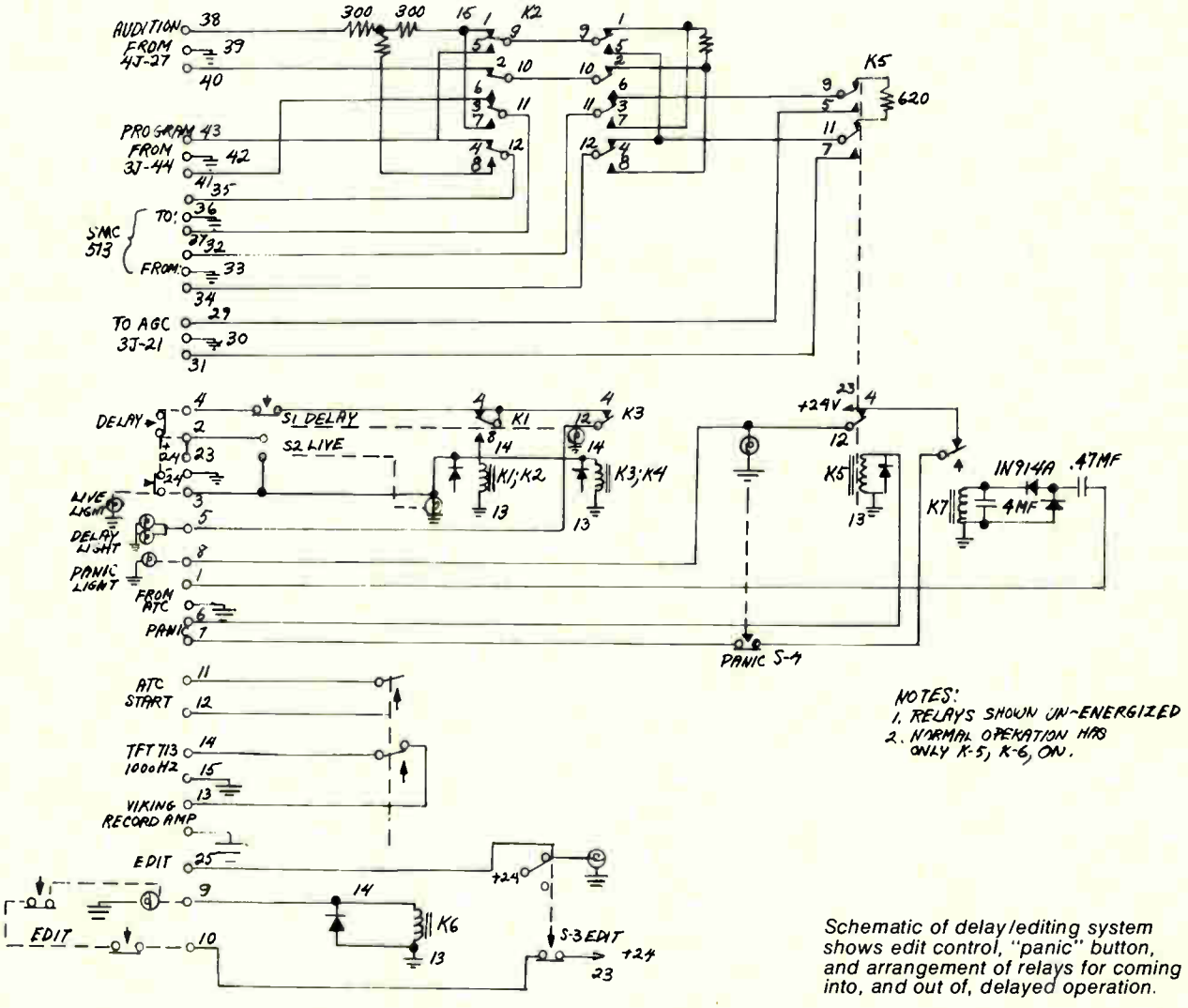
So, the announcer who wants to delete some part of programming has 5 seconds to react. He then holds the edit button for the desired time. He continues his show, knowing that later the material will be deleted. If for some other reason, he decides at some time beyond the 5 second reaction window that material must be cut, it can still be done. He plays some 60 second commercial, PSA or whatever and listens to program after delay in his headphones. By pushing the PANIC button, the objectionable material is deleted. We wipe a minimum of 5 seconds of programming automatically, plus the time the operator held the EDIT b[utton] to be sure we get the words dumped.

As mentioned earlier, a fun[ction] the announcer that he has live [tape] decided to use a 25Hz tone on the [cartridge] our production manager to cue the [announcer] host will know when to read. In prepa[ration] tridge, the production manager, John Pre[to] alert the recorded material (on the program track) which illuminates a light when copy (donut, i[tem] is to be read.

The Gates RA-10 sub-programmer is not ke[yed] time. We can run commercials anytime. If serious e[mergency] (presidential resignation, weather crises, etc.) occ[urs] during the special program, we can simply reprogram the RA-10, if necessary.

To catch the network db's an automatic clock comparator was chosen. When the proper preset time comes along, a Revox Recorder is started. The machine will stop when (1) the tape runs out, (2) it is manually stopped, or (3) when the Revox sees clear leader tape spliced in the tape supply. In addition, a cartridge recorder is set up for news room operation via a clock to pick-up direct-to-cart special news feeds and is our back-up.

The automatic log covers anything run in the seven




*Schematic of delay/editing system shows edit control, "panic" button, and arrangement of relays for coming into, and out of, delayed operation.*

on commercials placed in the memory to alert the announcer that live copy was involved. Automatic program logging was mandatory and at least 19 audio inputs were needed.

Many suppliers could provide all this. It became a simple matter of costs and delivery; so, we bought the Gates package. This made up a part of our automatic console. The heart of our system consists of the remote-controlled Gates SSC and SSC-X in combination with a ROH package of mike pre-amps and a combiner card used in conjunction with automatic gated gain-controlled amplifiers.

The nineteen inputs are as follows:

01—5 mikes (selectable 1 to 5) plus our telephone system.

02—08—RA-10 controlled Carousels.

09—Ampex AG350.

10 & 11—Gates CB1200 turntables.

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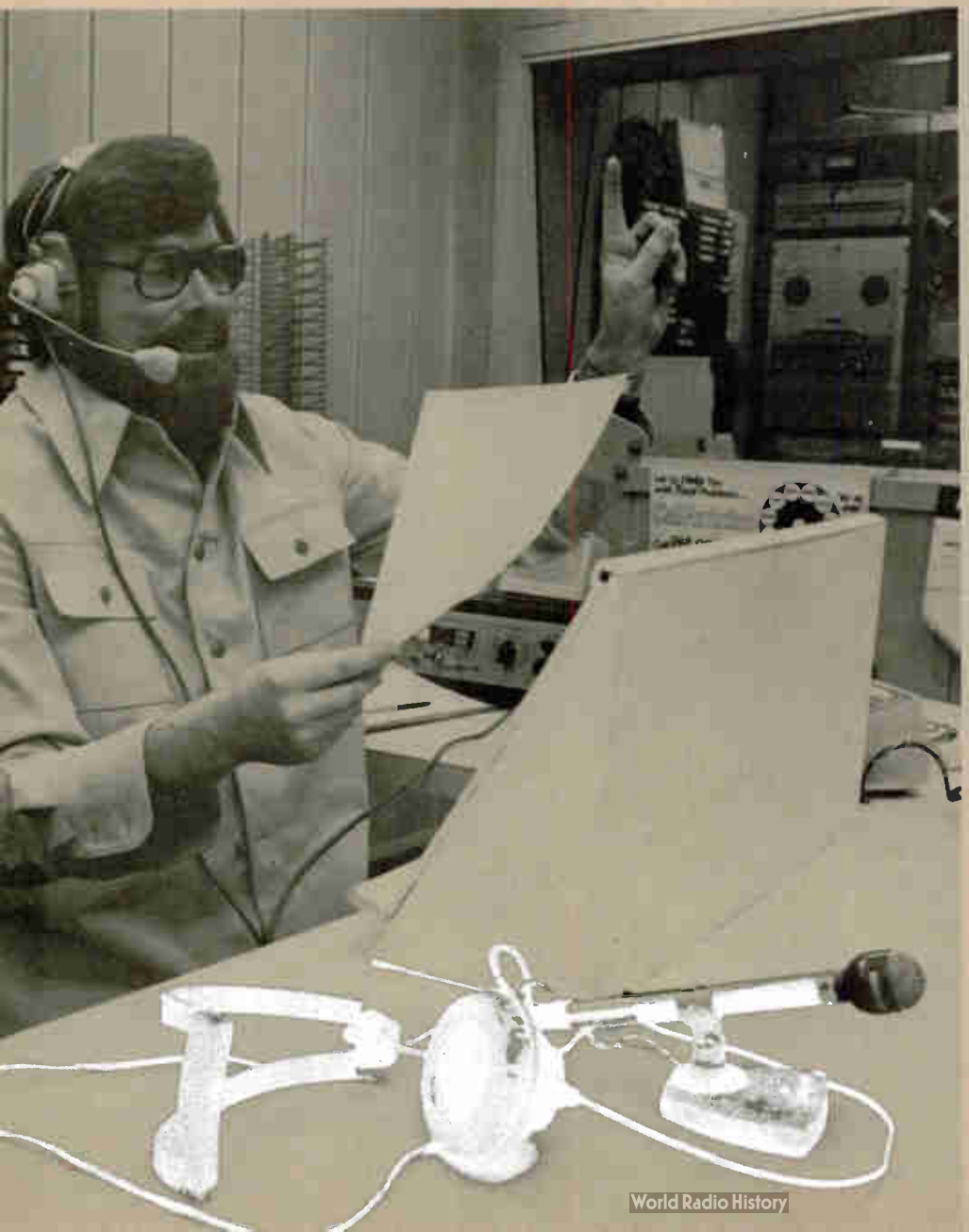

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As mentioned earlier, a function code is used to alert the announcer that he has live copy to read soon. We decided to use a 25Hz tone on the program track to allow our production manager to cue the cartridge so the talk host will know when to read. In preparing the tape cartridge, the production manager, John Preuter, puts under the recorded material (on the program track) a 25Hz tone which illuminates a light when copy (donut, intro or tag) is to be read.

The Gates RA-10 sub-programmer is not keyed to time. We can run commercials anytime. If serious events (presidential resignation, weather crises, etc.) occur, during the special program, we can simply reprogram the RA-10, if necessary.

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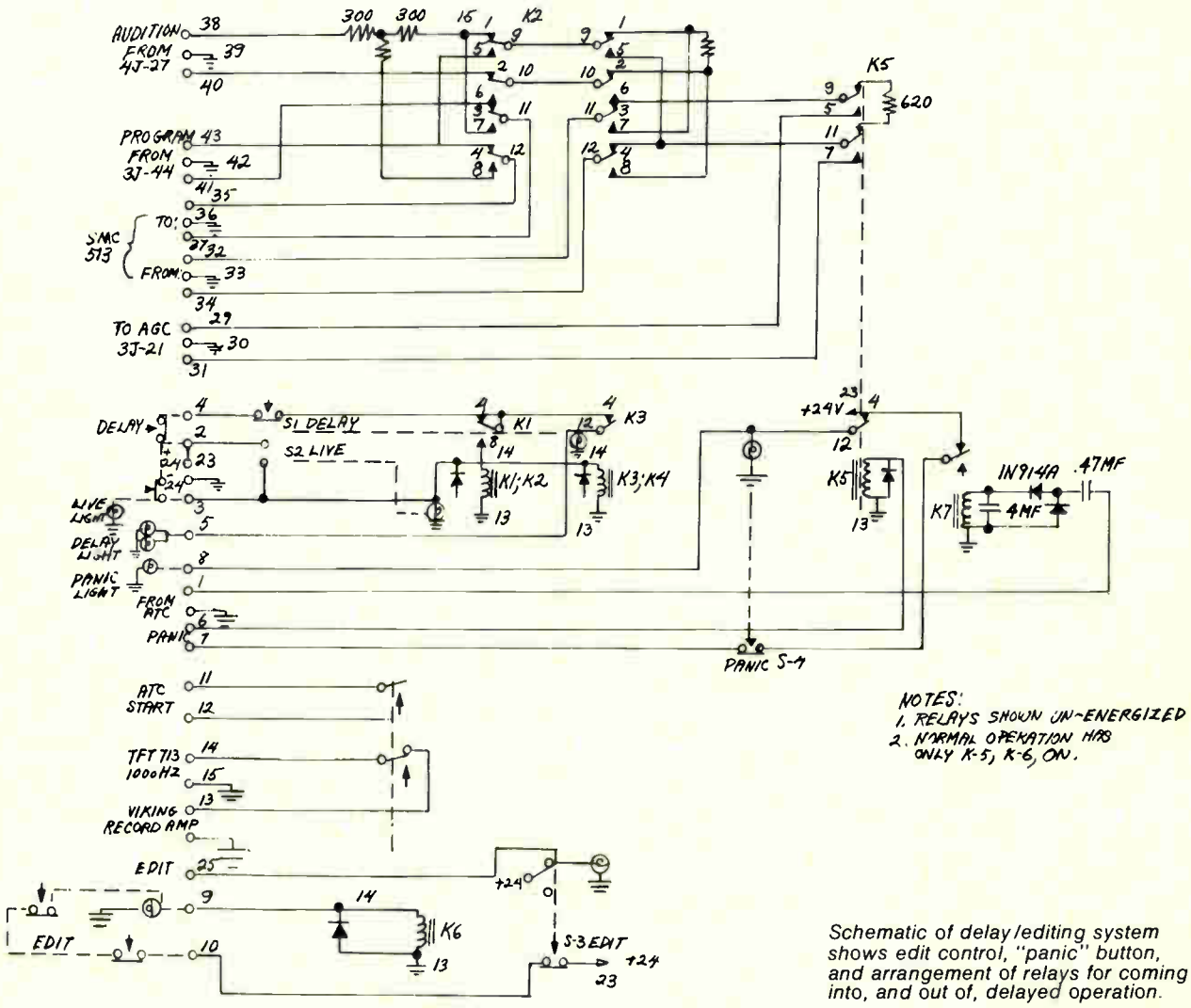
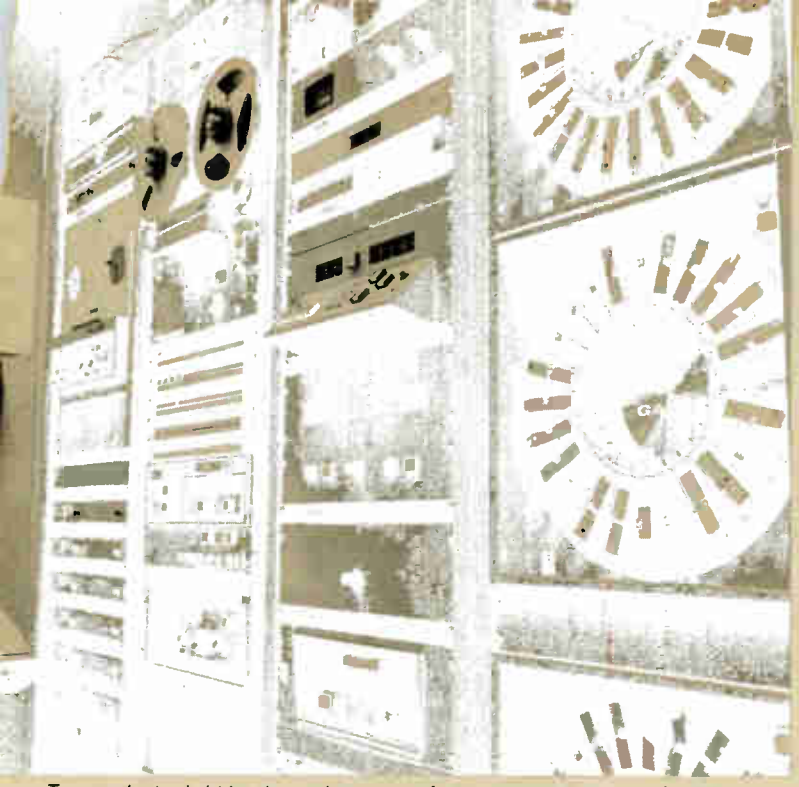



*Schematic of delay/editing system shows edit control, "panic" button, and arrangement of relays for coming into, and out of, delayed operation.*



Two racks to right in photo show part of main equipment used for automation at WERE. Harris (Gates) control, memory, and electronic switching equipment are in third rack; three of the seven rotary cart machines are visible in the fourth rack.

Author Groome studies a print-out from the ASR-33 machine to check out operation of all units in system.

John Preuter, production manager, puts the 25 Hz cue tone on a commercial which will alert announcer for "live" talk.

carousels, three deck playback, or the network logger deck. Provisions are made in the FCC rules to allow a separate log sheet for live commercials. This is attached to the automatically kept log at the end of each shift.

The burglar alarm uses a telco provided LPL circuit. When our transmitter perimeter is broken, the device rings up the LPL and feeds audio from the transmitter site (a microphone pick-up). The announcer will hear the phone ring when the control room mikes are off and can pick up this phone without moving from his chair. There is also another phone to allow off-air call-ins by authorized people who enter the transmitter site. The burglar alarm is reset from the studio via remote control.

We have also provided closed-circuit TV to the only after-hours access to our studios. The door is solenoid-operated by the announcer when authorized people are to be allowed to enter.

Many backups are used. The studio has a diesel generator, which can operate all AC except the large building air conditioner. A small air conditioner is used to cool the studios during a power failure. The switch over is automatic . . . both ways. Our clock system works off a crystal oscillator with Gates Master Clock and will not lose time during a power failuer and keeps good time when we operate off our generator which is not always 60Hz. The E.S.E. 100K slaves can run on the AC line should the Master Clock fail.

The STL site has back-up power. The entire system works off two trickle-charged batteries when commercial power is off. By simplexed phone lines, we can observe at the studio when AC service is on/off, plus the condition of the battery (volts).

The transmitter site is a bit more elaborate. In case of power failure, the generator switches over automatically and the transmitter goes back on, also automatically. If the main transmitter fails, the auxilliary is warmed up and switched on-the-air automatically. The only ways to get off the air are: 1) to damage the antenna system; 2) destroy both transmitters; or 3) to turn the system off by remote control.

### A few operational details

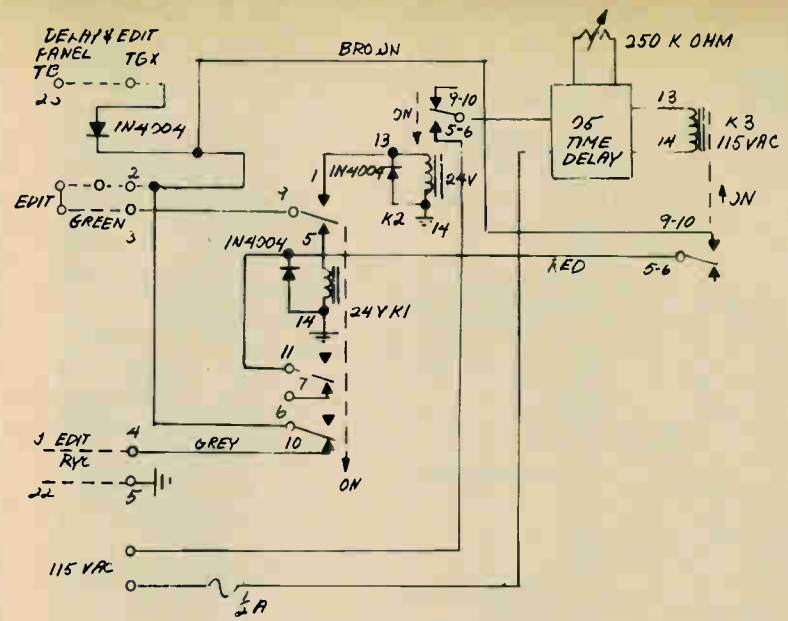
Some operation notes might give more insight into our system. The SSC and SSCX audio system is operated by remote control. The labels are in clear English (CART-1, TAPE, etc.) rather than numbers to reduce operator error. The five mike circuits have gated AGC on each channel to provide constant levels. The mikes used by the announcer and news man have expansion turned off to reduce background noises. These are combined with AGC-controlled telephone (receiver) audio to form one input to the system. The mike preamps (ROH) are also fed to a combiner so set up that the output of a 213 combiner is controlled by a Gates AGC to feed the modified PCI-55B Speakerphone so the caller can clearly hear what's happening in the studio.

We also have our pre-delay programming arranged, so the waiting caller on "hold" can keep up with what is currently being discussed. The announcer can call out by using the normal phone set or a special switch (automatically turns off speaker phone) if the party called is not to be heard on the air. We use a VIP number which is given to city government officials, civic boosters, and other Very Important People. This gives these people a direct line to call and jump in on the current discussion.

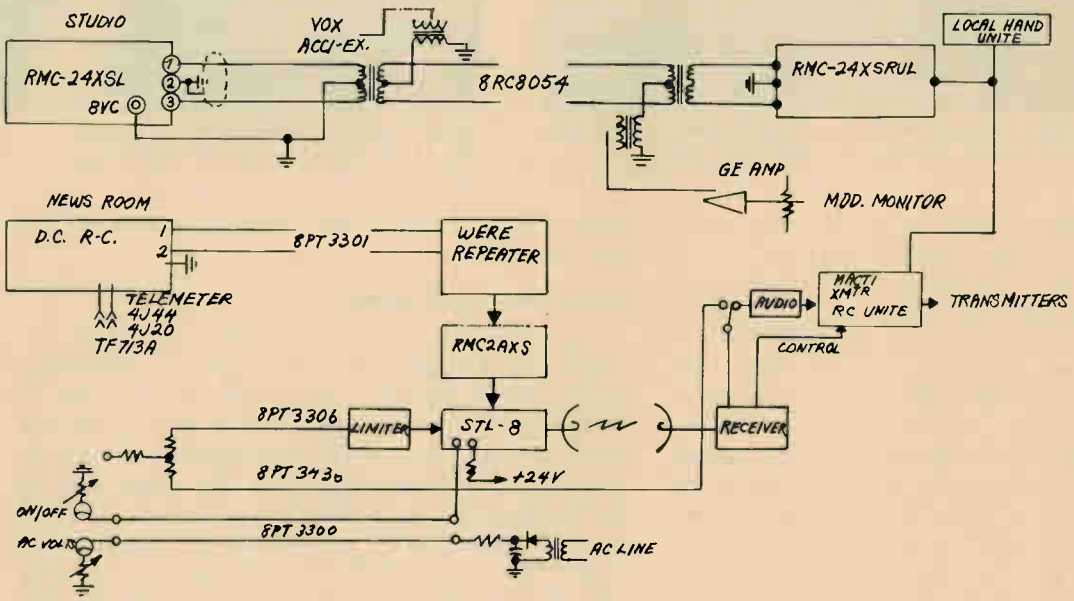
The daily system sounds difficult to operate, but it isn't. To go live from delay, the operator stops doing anything for one minute and then pushes the LIVE button. He is now live. To go from live to delay, the operator loads two sixty second items in the three deck and starts them at the same time. After sixty seconds, he pushes the delay button and is now operating in delay.

An override circuit is used to allow the announcer to be on the air with any other source. In this way, we can have patter between the announcer and copter reporter with both conversations heard on the air. A similar tech-

*Modifications to E.S.E. 100 KHz clock allow the clock to be synchronized with AC line or with the master clock in the Gates automation system.*




*Block diagram shows main features of remote control system, together with metering for the STL transmitter.*




nique is used to handle our morning sports which is done by phone lines. An equalized line connects the sportscasters with the studio. The announcer calls him by phone and puts the call on hold, so the sportscaster can hear pre-delay audio. Both can talk on the air at the same time.

We use two logger (audio) systems. One is a Metrotech triple reverse four track machine, that we change every other day. The other is a Sony TC-105A. The higher quality tapes from the Sony machine are used to make "Best of Tapes" for later rebroadcast. Both also come in handy when we have to answer alleged personal attacks.

Our studio is unfortunately box shaped. Acoustical treatment uses high density concrete blocks on all four walls with plaster studs—acoustical fiberglass and (audio) transparent perforated wall material on both sides of the walls. The floor is poured concrete covered by heavy industrial carpet and pad. There is a double ceiling, the two layers separated by about 6" of aid space. The topmost has acoustical tile glued to plaster over wire mesh and fiberglass. Lighting is flourescent with all ballasts located external to the room in a wall-mounted box for easier service and a quieter control room. To keep our announcer's quality consistent, we use headphones with attached mikes (Astrolight). This not only sounds good, it allows the announcer more freedom in moving about, without ever being off mike.

In conclusion, after installing well in excess of a mile of wire, numerous relays, and lots of equipment, we believe we have successfully automated a live-talk radio format. We have substantially reduced our operating expenses and now can be quite competitive with the music stations for profitability.

In retrospect, it would behoove any station considering this type of operation to give more than two weeks of training to the end users . . . the announcers. The more time they play with it, the more creative each becomes. Our system has been on the air since July 1, 1974 and we've had no serious problems. This must reflect the more than three months of planning and three months of installation and check-out we put in before we went on the air.

Yes, live-telephone talk can be automated! **BM/E**

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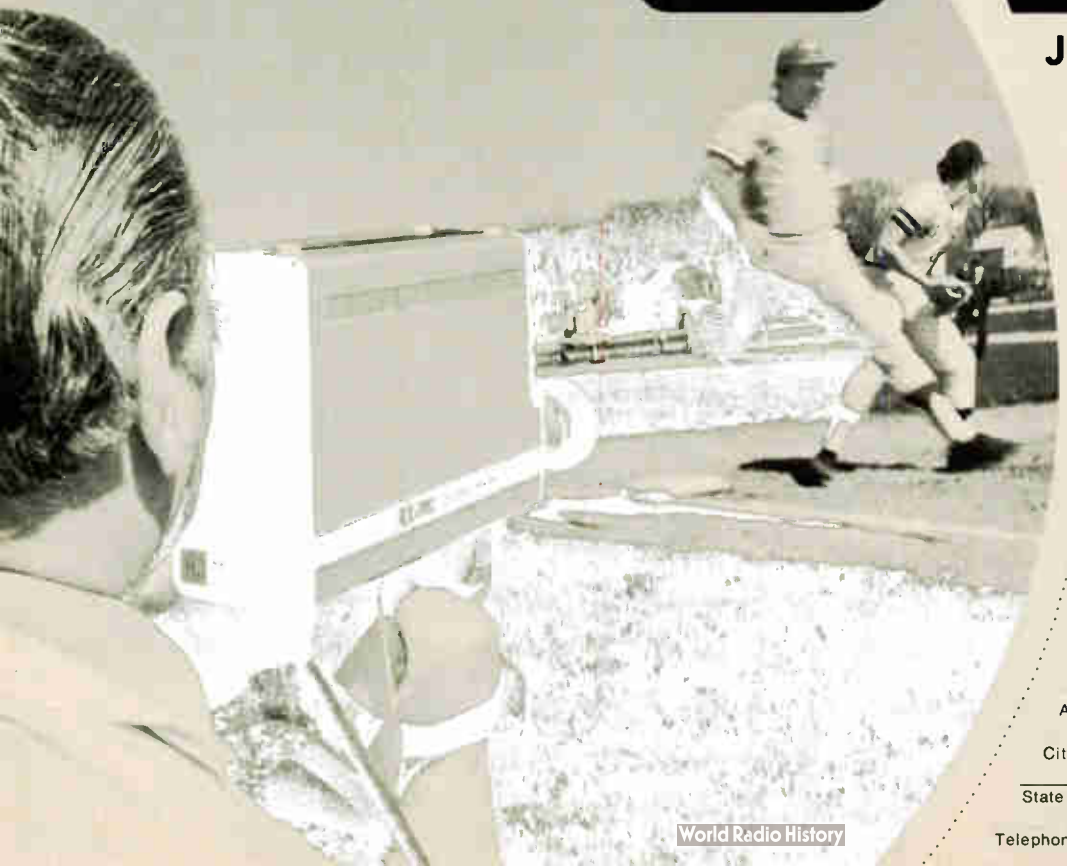

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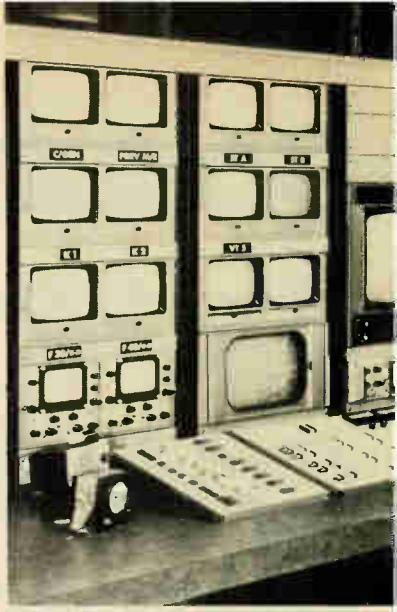
# Progress Report on "Total" Automation



It's beginning to happen:
1. At WTCN, from one input an order goes through sales, scheduling, switching and back to billing with only minor human intervention.
2. At CBS stations in Hollywood and Chicago new automated A-V switching systems will be interfaced with the company's broadcast management information system.
3. Data Communications Corp. is moving toward a system that can be an industry standard—for reps, agencies, and stations alike.

## "Total automation. Period."

This material was prepared by Kaman Science.

On May 30, Kaman and Central Dynamics, Ltd. effected a hard-wired interface between the BCS 1100 business automation system and the CDL APC 610/200 switcher at WTCN, Minneapolis (BM/E July, 1975). Now for the first time in broadcast history, orders are going from initial sale through final log and billing—all by computer. Here's a brief look at how it works.

The BCS mini feeds complete schedules to the CDL mini (both are DEC PDP-11s) with instructions for each event to be aired. It specifies event title, scheduled air time, agency instructions, event source and type, duration, in-house facility code, and the audio/video source and effects. This schedule file is also retained by the BCS mini for on-line editing and modification by the traffic department until shortly before air-time. Last minute changes can still be entered on the CDL system until minutes before actual air-time, and these changes are flagged on the log file to show traffic and accounting exactly what aired—a feature that all but eliminates billing discrepancies.

As an added bonus, the final log can also be archived on microfiche by BCS, at the option of the station.

Metromedia management is excited about the benefits of the BCS-CDL interface. Hal Christiansen, Metromedia Vice President, calls the system as it operates at WTCN, "The only total automation system within the reach of virtually every station." He notes some of the tangible advantages WTCN is already realizing. "Reliable preemption reporting, greater dependability in billing due to more precise log maintenance, and significant management aids at both the local and group levels." Summing up Metromedia's reaction to the historical interface, Christiansen concludes, "This is more than auto switching and auto traffic—this is what every broadcaster dreams of when he hears 'total automation.' From one input, an order goes through sales, scheduling, switching and back to billing without significant human intervention. Who could ask for more?"

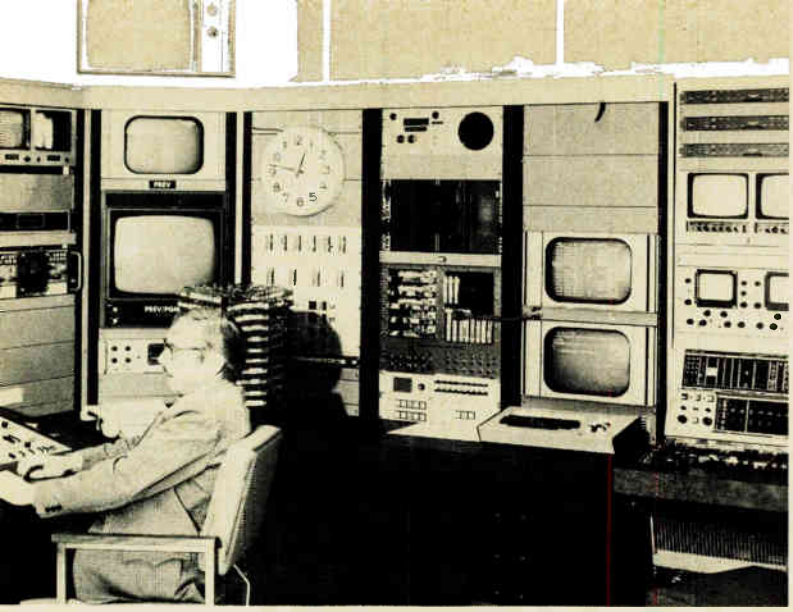
At WPIX-TV, New York, BCS and CDL have completed two of the three phases in totally automating that station. That is, logs now can be produced with exact event timings and machine assignments. All that remains is to link the hardware—a step that will occur as soon as the vendors and WPIX agree on the physical medium of exchange. At this writing, the principal candidate is cassette tape.

The fact that both WTCN and WPIX use CDL switching system is significant, but not essential to their successful interfacing with the BCS 1100. The BCS technical staff has designed their interface to be compatible with virtually every switching system on the market . . . and some that haven't yet been released.

Vital Industries, Inc., Gainesville, Florida and Computer Image Corporation, Denver, are both actively working on a BCS interface. The Grass Valley Group, one of the front runners in computerized switching, has already demonstrated its ability to link its APC 2000 to the BCS 1100. The Grass Valley Group's NAB exhibit in Las Vegas held quite a surprise for unsuspecting delegates, who watched the APC 2000 switching a schedule sent from the BCS booth across the aisle. BCS fed two-hour schedule blocks to the Grass Valley switcher on demand, assisting the Grass Valley switcher throughout the show in displaying its large repertoire of special effects.

According to Al Larrabee, Kaman's Director of Systems for the BCS group, the ready acceptance of their interface is evidence of its versatility and generalized format. "Our communications protocol and data transfer format have been adopted almost verbatim by all switching vendors we've talked with to date. As we expected last year when we designed the interface, our format is now stabilizing and standardizing traffic-to-switching communications for the industry," he says.

A closer look at the BCS 1100 system will help explain how it talks to switchers—early. First of all, the 1100 is based on the distributive processing concept (BM/E, July 1975). This means the station has its own minicomputer in-house to handle the on-line responsibilities and a large-scale computer at a remote site to handle the large processing jobs that don't require up-to-the-minute response. This approach saves phone line costs and puts the appropriate level of computing power



*Master control room of WTCN showing Central Dynamics switcher, CRT display and as-aired program log.*

*The BCS 1100 syste computer which interfaces with the Central Dynamics computer (not shown*

*The BCS 1100 input terminal.*

to work where and when it's needed.

In the case of the 1100, however, the concept allows some unique advantages that go beyond the norm. For example, using a Digital Equipment Corporation PDP 11/05 as its in-house minicomputer, the BCS 1100 system has the extra processing capacity to support both hard-wired and telephone communications with other computers while handling virtually unlimited CRT and printer terminals at the business end.

This means an 1100 user can place CRTs and printers in remote sales installations, rep offices, corporate headquarters or anywhere else he chooses. He even has the option to provide briefcase terminals to his salesmen. What's more, for group stations, a minicomputer network is readily available between stations for interaction between group and station management, and both radio and TV can run on the same system. The 1100 also boasts a new conversational data base management system that gives traffic and accounting increased flexibility and control in file maintenance and inquiry, plus a selective printout feature which allows a station to receive only those reports which fit its particular method of operation.

Users report favorable results with the new system. KOOL-TV, Phoenix, the first BCS customer back in the days of batch processing, was also the first station to upgrade from a BCS 800 to the new 1100. Operations Manager, Eve Hatounian, talks about the advantages of her new system. "As pioneers in broadcast automation, we have welcomed each new breakthrough BCS has made. Now we believe we have it all—five terminals, super-fast log editing, selective printout—we're even adding radio on the same system. And, even though we think the system works great, BCS is always improving it. That's the beauty of BCS—they never stop enhancing the system." KOOL radio will be put on the 1100 system next month to run simultaneously with TV. This will add two more CRTs, bringing the total to seven.

Other recent 1100 installations include WXIX-TV, Cincinnati and WNEW-TV, New York. WTTG-TV, Washington, D.C. is soon to go on the system.

Jack Finlayson, BCS Manager for Kaman, attributes the quick acceptance of the new system to its greater flexibility. He says, "It's the only system on the market that can interface with switching, support remote terminals, print all reports and billing right in the station at ultra high speed and communicate readily with other computers. And, it does all that while still offering the most comprehensive rotation package we know of."

The rotation scheduling and other traffic features of the 1100 are based on the system's forerunner, the BCS 800. Kaman still actively markets and supports the 800 system for stations who don't require the added features of the 1100.

# TV Switching Automation At CBS: A Second Generation

The material in this section was prepared by Adrian B. Ettlinger, technical consultant, Hastings-On-Hudson, N.Y.

A milestone in the history of television switching automation is being reached during the current year as CBS is embarking on a second generation of installation at its network and owned-and-operated stations. Pioneer automation station KNXT, Hollywood, is getting a new computer and a new A-V switching equipment. WBBM-TV, Chicago, will follow suit.

The earliest history of television switching automation began in the 1950's, with punched paper tape programmed systems. The very first was designed and installed by NBC in 1956 at WBUF, a UHF station it then owned in Buffalo, N.Y. Subsequently, RCA marketed systems based on the NBC work, and a number of installations were made, including major ones at WKRC-TV, Cincinnati and NBC-owned WRC-TV in Washington. Other vendors and some stations independently created a small variety of switch-programmed and pinboard-program devices which were used at scattered stations around the country. These systems established the basic viability of switching automation and most were operated successfully for several years, but later generally discontinued or replaced because of their relative lack of flexibility as compared to that offered by newer technology becoming available.

## TOTAL AUTOMATION

When CBS in 1959 began planning a new broadcasting plant for KNXT at Columbia Square, in Hollywood, it was decided to automate the program continuity switching function, and the result was television's first computer-operated switching system. This system went on the air on December 31, 1960. It subsequently became CBS practice to install switching automation at its network and station facilities in all newly-constructed installations. In sequence, the network Broadcast Center in New York, which also serves WCBS-TV (1964), WCAU-TV in Philadelphia (1968), and KMOX-TV in St. Louis (1968), all of which were complete new television plants, were equipped with switching automation in various forms. The fifth CBS owned-and-operated station, WBBM-TV in Chicago, whose present plant had been originally designed and built in the middle 1950's, remained a manual operation.

The pioneer computer installation at KNXT in Hollywood used a computer manufactured by TRW Computers Division of Thompson-Ramo-Wooldridge, which in the late 1950's and early 1960's was the leading supplier of industrial process control computer installations. The computer is a so-called "second-generation" vintage machine, i.e., using solid-state discrete components, (but not, as of then, integrated circuits), and a rotating drum memory-processor. The system has a capacity of 220 events, and data is loaded manually by the technical operating personnel.

The system which CBS placed in operation in New York three and one-half years following the KNXT installation, on July 20, 1964, may be considered as a direct lineal descendant of the KNXT system. Two TRW computers, of the same generation as the KNXT unit but of more advanced design, (TRW model 330) were used to operate two independent program continuity switching facilities, and, in addition, an audio-video-control routing switcher of 100 inputs by 100 outputs is operated for automated assignment of facilities to using studios. Switching data for the New York system is prepared off-line on punched paper tape and entered into the computers from a traffic service area.

Automation installations made at CBS stations WCAU-TV in Philadelphia and KMOX-TV in St. Louis a few years later represented the technology available at their time, also. A system manufactured by Hancock Telecontrols, based on core memory technology but employing hard-wired logic rather than a computer, was installed to control WCAU-TV's program continuity switching in 1967-8. This system has a capacity of 30 events and data is loaded manually by technical per-

continued on page 51

### BIAS, Which Grew Up In TV, Starts in Radio With WHN, NY

The BIAS computerized automated data system for broadcasters, developed by Data Communications Corp. of Memphis and in use by more than 125 television stations, recently added the first major-market radio station to its roster by going on-line at WHN-AM, Storer station in New York City.

As described in last month's BM/E, BIAS II, the current version of the system, is based on a high-speed Burroughs 6700 computer at headquarters in Memphis, connected by 24-hour, dedicated telephone lines to BIAS subscribers around the country. Each subscriber has input and output equipment, plus an in-station minicomputer (a Nova II), which does many routine, day-to-day jobs on the spot, and speeds the flow of data to and from the central computer.

At WHN, input is through two keyboard-CRT units, and output to the CRT's and two high-speed line printers. The high speed of the system has delighted the management of WHN and brought the advantages of computerized traffic, sales, and accounting in full measure. Pat Munson, Traffic Manager, says: "We can do so many things so fast—provide more clearing time for clients, verify avails far more quickly, give the sales manager much more time for decisions . . . We can also manipulate the inventory to achieve maximum benefit long before we even air the spots. This flexibility, with our high volume, is extremely important to our competitive stance in the New York market."

DCC's BIAS II, compared with the earlier BIAS, operates about four times as fast, with greater throughput as input devices operate independently of the print-out. DCC, according to Norfleet Turner, president, plans a major expansion effort in the AM radio field.

### COMPU/NET Spreads from Radio to Television

Moving toward service to both radio and television in the counter direction from BIAS (see accompanying story), is COMPU/NET, Inc. With more than 40 radio stations on-line for automated data handling, COMPU/NET recently signed up Nationwide Communications, Inc. for service to all eight radio and three television stations of this multi-station operator.

The COMPU/NET system is based on two large computers at their processing center in Los Angeles. Clark Pollock, vice-president and general manager of NCI, says that NCI will be the first broadcast group to interconnect multiple radio and television stations to a single on-line data-handling computer system. "Management information systems and research information for more creative selling will be the major benefits of the system to NCI stations," he added.

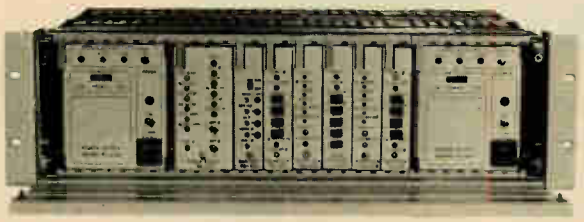
Dick Jansen, who was sales manager at NCI's WGAR in Cleveland when business automation first began and now heads up all radio operations for the system, says instant access to availabilities is extremely valuable. Jansen likes the way the computer can juggle a large number of orders and optimize scheduling.

He says the television system has the ability to automatically select and schedule, reschedule and handle makegood scheduling for both horizontal and vertical rotation plans. It also assists in selecting, scheduling and makegood scheduling for orbit plans. COMPU/NET has recently added another feature to its system which gives radio stations an on-line research capability for analyzing competitors' schedule proposals and evaluating its own rate card based on each new market survey.

Nationwide's television properties include WXEX-TV, Richmond, VA.; WATE-TV, Knoxville, TN.; and WBAY-TV, Green Bay, WI. Its radio stations are WGAR (AM) and WNCR-FM, Cleveland, OH; WNCI, Columbus, OH; WLEE, Richmond, VA.; and WPOC, Baltimore, MD.

# Instrumentation Precision in Broadcast Terminal Products

## TeleMation's *Precision* Line Terminal Equipment



Within TeleMation's "525 Series" audio and video terminal product line, certain units are designated *precision* as distinguished from their *broadcast* counterparts. The *precision* designation is much more than a simple "marketing label". *Precision* is a demarcation assigned through TeleMation R&D that puts a particular product into a separate, unique attention category, from design concept through manufacture and quality-assurance verification. All this to assure the buyer that the product not only meets or surpasses all known competitive products in its performance parameters, but also that it is designed to operate for months and even years without need for periodic adjustment or any other routine maintenance. This philosophy and practice, then, take the *precision* units in the 525 Series terminal equipment into a quality/stability/reliability realm that is usually associated with instrumentation electronics.

TeleMation has used a number of design techniques in accomplishing the high performance and stability achieved by these products. For example, one-percent-tolerance resistors having a temperature coefficient of 20PPM/°C are generally used as gain-determining elements and wherever drift would affect stability. They provide both freedom from temperature drift and freedom from the effects of aging that are common to the less expensive resistors normally used in video products. Junction matching – each PN junction being matched with an NP junction to cancel the characteristic 2.2mv/°C drift of silicon junctions – is also employed to improve stability and prevent offset drift in DC-coupled outputs.

Feedback is extensively used in *precision* grade units as a means of insulating performance characteristics from the effects of component variables. Audio amplifiers are typically high-gain op-amps inside 100-dB feedback loops, while video amplifiers are typically transistor pairs inside 40-dB feedback loops. In these applications, a 2:1 change in the gain characteristic of any active component will have negligible effects on overall circuit performance.

The advantages of push-pull, cascode, and complementary symmetry circuits are exploited to provide low distortion, wide bandwidth, and high signal handling capability. Current-sourcing techniques are also employed as a means of minimizing distortion that otherwise can result from operating semiconduction junctions over wide current ranges.

TeleMation engineers also have successfully coped with capacitor leakage (another source of long-term drift) in the *precision* series designs. Capacitors are either operated with minimum DC voltage drop or the effects of increased leakage with age are otherwise eliminated, as in the TVA-524 and TVA-525 video distribution amplifiers where the capacitance of a small capacitor having extremely low leakage current is "amplified" by a high-gain op amp; the result—longer time constant, less tilt, and greatly improved long-term stability.

Our TVA-525 video distribution amplifier, whose performance characteristics are listed below, is a representative application of the quality and stability factors inherent in the *precision* series product.

**TVA-525 PERFORMANCE SPECIFICATIONS**

| | TYPICAL | PUBLISHED |
|---|---|---|
| Differential Phase @ 3.58 or 4.43MHz | 0.12° | 0.2° |
| Differential Gain @ 3.58 or 4.43MHz | 0.11% | 0.2% |
| Frequency Response to 5.5MHz | 0.05 dB | 0.1 dB |
| Frequency Response to 10MHz | 0.20dB | 0.25dB |
| Hum and Noise | 72dB | 66dB |
| Distortion, 50Hz Squarewave DC Mode | .1% | <.15% |
| Distortion and Tilt, 50Hz Squarewave AC Mode | .20% | <.25% |
| Output return loss @ 5.5 MHz | 38dB | 35dB |
| Input return loss @ 5.5 MHz | 43dB | 40dB |
| Bounce and Overshoot DC Mode | 1% | – |
| Bounce, AC Mode (Monotonic) | 8 sec. | 5 sec. |
| Overshoot, AC Mode | None | None |
| K Factor | .25% | 0.5% |
| Input Offset Compensation Range | >3VDC | >2VDC |
| Common Mode Rejection, 60Hz | >70dB | >60dB |
| Common Mode Rejection, 5MHz | >43dB | >40dB |

A functional schematic of this amplifier along with a product description is available on request. We suggest you compare this circuit to that of any competitive product. We feel you will agree that the stability and long-term quality performance intrinsic to our *precision* design will justify whatever small additional initial cost might be involved through including such quality electronic devices in your broadcast system.

TeleMation®
P.O. BOX 15068, SALT LAKE CITY, UTAH 84115
(801) 487-5399, TELEX: 388-352

# International Interest in TV High; Broadcasters From 50 Countries Attend Montreux Symposium

Solid-State CCD cameras, ENG, direct-to-home satellite broadcasting, dual audio, more conversion of equipment to digital, were topics of widespread interest. Digitally coded news on TV sets begins in U.K., CATV filled 20 per cent of program.

There were visitors from every continent and about 50 countries at Montreux May 23 to 29—altogether over 4,000 eagerly seeking out the latest information on what's happening in TV and cable TV technology. In the exhibit area, the wares of 130 companies hailing from 15 countries were poured over—especially so by large delegations from the People's Republic of China, Kenya, Zambia, Rhodesia and various Persian Gulf states. These statistics made the 9th International Television Symposium, held under the auspices of Swiss Posts, Telephones and Telegraphs, the leading TV symposium in the world. The success of the event shows clearly, said Mr. F. Lochner, Dir. of Swiss PTT, "There is a need for personal contact and discussion, in an age whose mass of information may be one of the causes of increasing human isolation."

The Montreux Symposium is different from NAB Conventions in several aspects. The International TV Symposium is all technical but whereas the NAB technical papers cover what is or has been, participants at Montreux talk about the future; what will be—hence the emphasis on future cameras, satellites, and digital techniques. In the U.S. the technical directors of the three commercial networks are not likely to reveal precisely what new equipment they are developing or funding for obviously competitive reasons. There is no such proscription holding back technical directors of nationalized PT&Ts. Further, since the latter are in charge of the only game in town, they function independently of commercial pressure and can set the timetable on what will happen when. Indeed they can set the rules. Thus a PT&T can declare that direct satellite to home broadcasts are to become operational at sometime in the future on purely technical grounds. Such an event could not happen in the U.S. because there is no way, politically, that the rules would be changed to eliminate the need for over 700 privately owned stations. Similarly, individual countries can edict that stereo be broadcast nationally and it will happen. By the same token they can hold back on the number of program channels that can be broadcast—or carried by cable TV. Thus on the one hand one sees exciting techniques emerging by government fiat. On the other hand, some changes come more slowly and Montreux sessions on automation, for example, would be old hat to American visitors.

### More flexible cameras of keen interest

From the lecturns, engineering heads of various countries tended to play down the need for instant electronic news gathering. News viewing hours are later in the evening in Europe (during prime time in the USA) so that there is ample time to develop film. Further, there's little competition to scoop. But in terms of interest shown in ENG cameras on exhibit and in attendance at ENG sessions (chaired by Joe Flaherty, CBS), Montreux attendees are extremely interested in ENG—if not for news, for on-location production. As was pointed out on the first day, it is getting less costly to take portable equipment out on location, than to create artificial scenery. Thus portable cameras and particularly mini ENG types got lots of attention.

Ampex unveiled at Montreux a new ENG entry, the BCC-2. This is a mini unit with the head weighing 15 lbs. and the backpack under 18. Ampex went for full quality using three 1-inch Plumbicons, including an extended red Plumbicon. Thus high sensitivity is offered. Ampex says a usable picture is obtained in 2 to 3 seconds from standby mode or 1 minute from cold start.

Ampex stressed a complete ENG at Montreux: the BCC-2 in conjunction with the VR3000B quad recorder and the TBC-800 time base corrector. The system price was about $125,000.

RCA stressed ENG most heavily and, as at NAB, showed nearly all of the components of a complete system: The TK-76 camera, the TR-1000 U-matic recorder, the TBC-1000 time base corrector, the TVM-1000 portable microwave system and two-way FM radio for communication. For use with OB vans; RCA, showed its portable TK-45P cameras.

Bosch-Fernseh showed off prominently its KCN "hand-held" camera (displayed at NAB) but sensing that production was perhaps bigger than news in Europe called it a electronic production/journalism unit. Bosch also had new hand-portable VTR but more on that later.

Philips had a model of the LDK-11 shown prominently at NAB on hand but it was off in a corner and not demonstrated. In the portable category Philips stressed the LDK-15. Similarly, Thomson-CSF stressed the TTV

1515, and Marconi the Mark III portable. Sony's DXC-1600 was also shown.

One of the newest hand-held cameras on display was a portable high-quality one-tube design from Siemens. Called Interplex, this promising camera uses new silicon diode vidicon tubes developed by Siemens. The tube features high sensitivity and linear characteristics. A special stripe filter and a special decoding circuit produced a camera with high color fidelity.

In the studio class, prominent new cameras were the Ampex BCC-1 (unveiled at Montreux), the Bosch-Fernseh KCK (unveiled at NAB), the Philips moderately priced LDK-25 (unveiled at NAB.) Other major camera exhibitors were Thomson-CSF, Marconi, and Link Electronics. Link showed the type 110 which was introduced at the London International Broadcast Convention last September. As a current generation camera, it offered good stability and features fast line-up. The Link 110, like most other cameras, intended for international sales, was shown operating in both PAL, SECAM, through the use of a transcoder. A low cost color camera designed for mobile vans was shown by Schlumberger. A number of exhibitors had CCTV tube cameras.

### Solid state cameras discussed

Charged coupled devices (CCD's) captured a lot of attention at Montreux. RCA demonstrated its experimental color camera (the same one shown at NAB, Las Vegas). The three CCDs in the RCA camera are 512 × 320 element devices. (163,000 picture elements). At Montreux, Bell Labs described a CCD camera with 250,000 picture elements. The imaging area was designed to be equivalent to one-inch tubes. The chip measures 16 × 20mm. It has 496 vertical interlaced lines and 475 horizontal picture elements.

J.H. Scott of RCA, M.F. Tompsett, Bell Labs, and P. Rainger of the BBC, explored the future of CCD devices in various papers and on the panel concerned with future developments. All agreed that broadcast quality units for color were about five years away. Resolution of 525 lens is no problem, registration is perfect, and CCD devices have no lag. They can also handle bright reflectors without smears. There are problems in spectral response, yields, and dark current.

Sensitivity is good but right now there is absorption of blues because light has to pass through the electrode structure and blue is attenuated considerably. A solution to the problem would be to make the substrate thin so that the optical image can be formed on the rear face of the substrate.

Tompsett of Bell Labs said major problems are blemishes or defects in the structure, which should be perfect over the whole chip area, and dark current. He saw dark current being controlled to less than 5 nA $cm^{-2}$, but to equal Plumbicons, device coolers in the 50°C range might be necessary. This would be a small price Tompsett said. The Bell Lab's camera consumes only 4 watts of power. An electron beam exposure system was used to make the photolithographic mask.

Consensus of opinion was that CCDs are likely to appear on the market first as memory devices and then in surveillance cameras but they will eventually replace tubes in broadcast cameras.

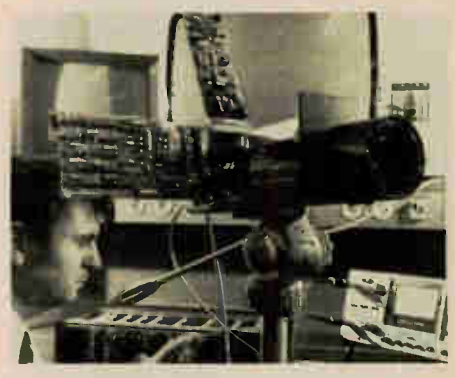
### VTRs—more and more formats

Following Montreux of two years ago something of a show down was expected in VTRs. The EBU issued guidelines for compatible recorders which it thought had to be helicals: low operating cost, low initial cost, video and audio equal to quad and two full quality audio tracks.

IVC in consort with Rank Cintel in the UK and Thomson-CSF in France said its segmented helical scan format on 2 inch tape was the ideal answer. But at the

*Distant signal CATV antenna outside the Maison des Congrès set up by Catec AG.*


*Chip on shoulder of model is RCA's charge-coupled device for the solid-state camera of the future. To left is ENG camera the TK-76.*



*Inside view of the new broadcast quality single-tube color camera, the Interplex, demonstrated by Siemens.*

same time Philips and Bosch were collaborating on a 1 inch helical format which they said was the lowest cost approach to meeting EBU requirements. RCA dampened some of the enthusiasm toward helicals by talking about Quad II which could offer the best of both worlds and Ampex cautioned broadcasters about the pitfalls in moving away from standard quad. The race was on.

By Montreux 1975, however, there was no winner—indeed the issue was more confused. The IVC consortium's IVC 9000 machine did not sell as expected apparently because the price was too high but it was still in there pitching. Philips and Bosch had split with each company offering differing approaches. New on the scene was Echo Science introducing Pilot-1 and claiming for it "What the '9000' should have been for EBU . . . Pilot 1 is!" Ampex had unsettled things further last year by introducing the AVR-2—it only partially met EBU requirements, but was attractive in size, price and convenience. Ampex demonstrated it could go further by adding super high band and pilot tone. The result was good multiple generation copies at 7½ ips. RCA demonstrated a working Quad II approach (for both the TR-70 and TR 600): super high band and pilot at 7.8 ips and two channel audio. (Ampex also offered two channels of audio but did not claim them to meet EBU demands.)

*New Bosch BCN 20 hand-held VTR which can be used for field production recording.*

## Satellite Broadcasting Foreseen; Planning Underway

While there is no urgent need to go to satellites for extra programming channels, most Europeans feel satellite broadcasting will be adopted in the future. Satellite broadcasting is viewed as more economical than terrestrial distribution methods. And it's likely that developing countries will want to use satellites soon. Anticipating the need, the International Telecommunications Union will convene a Planning Conference on satellites in 1977. The E.B.U. now has studies underway to report at that conference. Several companies—Mullard, Valvo, Philips—have been studying converters and antennas for direct reception.

The assumption is that each country will have its own satellite service (carrying four channels) and the coverage pattern will be pretty much restricted to individual countries. The 12 GHz band rather than 2.5 GHz will be used because there are no power flux density limitations with the former. (The 2.5 GHz band may be used for some educational purposes.) For direct reception, the power of the transponder should be in the 400 Watt vicinity and the cost of the receiver adapter to convert the 12 GHz (FM) is expected to be in the $120-300 range. (The signal-to-noise ratio for the picture would be at least 33 dB and for audio, 50 dB.)

Among the studies underway are how to calculate optimum antenna beams, orbit positions, and frequency assignments.

There was no compatibility among these varied offerings except that modified quad approaches could play standard quad. Although RCA and Ampex approaches were not identical it was assumed both would agree to an SMPTE set standard.

Philips offered the one-head,one-inch BCR model demonstrated in 1973. It discussed three models: BCR 40 the heart of the system; BCR 50 with time base corrector and BCR 60, a unit with a monitoring bridge. Bosch showed three units also: the BCN 20, the 40 and the 50. Bosch, too, took a modular approach but each module was its own separate transportable package similar to the AVR-2 approach. The smallest unit, the BCN 20 was a 44 lb. hand-carried unit that could be taken with Bosch-Fernseh's KCN handheld camera. Its one-inch format included 3 audio tracks plus one for control. Bosch elected to go with 2-heads and a segmented scan approach.

Bosch's tape deck design was patterned after the US Echo Science machine and it was clear that there was some agreement and license between these two companies. But Echo Science (now a part of Arvin Industries) who didn't go to the NAB convention this year did travel to Montreux to introduce yet a different format in its six models of Pilot 1. The scanner was similar to that which it has sold successfully to the military (400 units and which Bosch adapted) but to the recorder was added a pilot tone. Echo Science said that very super high band circuitry with pilot gave signal performance superior to quad and enhanced interchangeability.

All three companies, Philips, Bosch and Echo Science, indicated they would be at NAB next year to probe the U.S. market. There was some speculation at Montreux that Bosch and Echo Science might reach an agreement on an interchangeable format.

What will be the likely outcome? The Philips machine operates from the handicap of being susceptible to tracking problems due to tape stretch, etc. Bosch was not using pilot and it may have banding problems. Echo Science has no track record with broadcasters. IVC does not have portable models and its teleproduction model is expensive. Thus all helical contenders have handicaps. The modified quad approaches (Ampex and RCA) have to make some compromises for audio. In the face of this confusion—no new compatible standard meeting all EBU requirements may ever emerge. In the meantime its becoming clearer that European broadcasters are willing to settle for less than the whole cake and modified quad without ideal audio meets many requirements.

### Test Equipment Plentiful

Generally speaking U.S. monitors weren't of high enough quality for European demands and European units are too high priced for the U.S. market. This pattern was broken this year with the Belgian made Barco unit being imported by the U.S. (Kallman Associates). At Montreux, a reverse flow was noted. Conrac was there with a completely new color TV monitor designed especially for PAL and SECAM, "intended for precision

continued on page 46

# RCA BEGINS THE COUNTDOWN.

**This winter, the first of a new generation of domestic communications satellites will be launched by RCA —the people who pioneered them.**

The RCA Satcom System was the first to provide coast-to-coast satellite communications—and at substantial savings.

We've been providing this service for 20 months—and this is just the beginning.

Our new advance-design satellite will handle twice the traffic of any satellite now in orbit, operating with a growing network of earth stations in major cities. It will make the RCA Satcom System even more cost-effective. And it will be followed by other RCA-designed, new generation satellites.

**The RCA Satcom System. Here's what it can do for you now.**

Today's most advanced means of voice, data and video communications offers these benefits:

Major rate reductions in voice-grade, coast-to-coast leased-channel communications;

High-speed data transmission for low-cost computer interface;

More private-line switching systems for company-wide telephone systems;

Fast communications and processing of data from offshore oil rigs to land-based headquarters;

Expanded use of video transmission for business.

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Pad 17A, Kennedy Space Center

## MONTREUX SYMPOSIUM

broadcast applications." As a new generation solid state device the Conrac 6000 was extremely compact and at the same featured the "utmost in stability" and precise color imetry through the use of a newly designed fully active convergence system. The 6000 uses a special picture tube with 625 line shadow mask and matched EBU phosphors.

New lines of test equipment were introduced by several companies. Philips showed five new instruments: a TV demodulation PM5560 (which features both envelope and synchronous detection); a text generator PM5542 (which inserts text automatically such as station identification or messages "we regret the breakdown in sound"), a stable TV modulator (crystal controlled); a color analyzer (to measure primary colors) and an ITS generator (made to a German standard).

Systems Video Ltd. showed the new PAL and NTSC generator in compact 3½-in high-rack packages. SVL also showed a new ITS waveform analyzer with high brightness and digital indication of line number.

Among American manufacturers present showing test equipment were Tektronix and Telemet.

### New telecine shown

One of the big crowd pullers at Montreux was a silent telecine unit, the Rank Cintel Mark 3 which uses a superior flying spot conversion technique at a new low cost. A sprocketless capstan drive results in silent operation and minimum wear. Designed to handle both 16mm and 35mm film, the Mark 3 has a 10 times forward and reverse shuttle speed. Unit can be used with either 625 or 525 line systems.

Another new telecine system at Montreux was the OMY 40 designed by Bosch-Fernseh. Its feature was the variety of combination of 2 outputs and 4 inputs available: one camera, two cameras/16mm, 35mm, Super 8, slides. The two camera set-up allows color preview monitoring.

Eastman Kodak described its new video news film 7420 and the VNF-1 process for lower cost and process simplification. The new American company, Hollogon Optical Systems Corp., was there showing its Rotary Projection System for shutterless, flickerless projection.

*New Rank Cintel flying spot telecine.*

*Experimental solid-state TV camera shown by Bell Labs. Chip is charged-coupled image sensing device.*

*TV set modified with decoder to pick up data transmitted during horizontal blanking. Numbers are different "pages" viewer can select.*

### Digital Comes On Strong

The British Post Office has used PCM since 1972 to distribute stereo signals to various FM transmitters in England and the service is being extended to Scotland. At the International TV Symposium, speakers were speculating that radio and TV systems would be all-digital right down to the transmitter. Some eleven papers were read describing work being done in one or another area. In discussing the impact of digital technology on program production in the studio, Frank Davidoff, CBS Television Network, said there are three steps to digital: 1. introduction of digital black boxes that do things better than analog black boxes; 2. using digital black boxes that out perform analog boxes for a given function; 3. adopting a completely digital plant.

Examples of the first are TBC's and synchronizers. So far there are no examples of the second. The third is of keen interest to Europeans one reason being the simplification of handling different color standards such as PAL, SECAM and NTSC. Davidoff said the cameras output signal would likely be a luminance and color difference signal (YIQ or YUV) format. At the transmitter modulator the program would be converted to analog.

A sampling rate of four times the subcarrier frequency is considered desirable for many functions but this uses a lot of bandwidth and digital video recording becomes expensive. How to get around this problem has not been

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solved. Another disadvantage is difficulty in monitoring the picture.

However, the advantages are numerous in terms of the elimination of adjustments, increased stability and reliability, elimination of non-linear distortion, etc. Other factors, said Davidoff, are initial and operating costs. It is expected that the initial cost would be high although in the long run digital equipment will be less expensive than analog. Operating costs should be reduced except for VTRs. Maintenance should be less, all in all. Davidoff said CBS feels certain the future of the television industry lies in digital technology.

A specific example of how digital TV is affecting the industry is in the area of standards conversion. And preeminent in this role is DICE which stands for Digital Intercontinental Conversion Equipment designed by engineers of the Independent Broadcasting Authority (UK).

The latest version of DICE will convert 525-line NTSC color pictures as used in the USA and Japan into 625-line PAL or SECAM pictures used in most other parts of the world, and vice versa. DICE is described as the world's fastest computer.

The standards conversion is essential not only for "live" relays via satellite but also where program material or videotape is exchanged between countries working to different picture standards.

A number of different types of standard converters have been developed over the years, but Independent Broadcasting Authority engineers were the first to develop the unit based on digital techniques to eliminate the need for careful alignment and adjustment and to provide conversion without perceptive picture impairment.

DICE solves the technically complex process of conversion between systems using 30 pictures a second—as in North America and Japan—and those using 25 pictures a second as in Europe—entirely electronically and without picture distortion and is capable of satisfying a global demand for high quality pictures by satellite. It also lets program companies making television recordings for world-wide sale to offer high quality pictures no matter which standard was used during production.

The original DICE, designed for conversion from 525-line to 625-line pictures only, was first used for the US Presidential Election relays to Europe in November 1972. In March 1973, although originally intended only as a one-way prototype, it was installed in the London studios of Independent Television News and has been in regular operating use since then. (This work earned IBA the Geoffrey Parr Award of the Royal Television Society, and the Pye Color Television Award for "The most significant technical contribution during the year to the development of color television."). An agreement signed on February 3rd, 1975, gave Marconi Communication Systems Limited, a GEC-Marconi Electronics Company, exclusive world-wide manufacturing and marketing rights of DICE. DICE equipment was on display in the Marconi exhibit area.

Another important piece of digital equipment at Montreux was the NEC FS-20 Frame Synchronizer on display in the TeleMation booth. (The FS-20 is an improved version of the FS-10 introduced at the NAB Convention in Houston in 1974.) The word "digital" popped up in many exhibits. Marconi talked about the European debut of a digital vision mixer (production board) the B3730. The special effects generator used digital techniques. Siemens showed a modular A-V distribution system which was digitally controlled.

A "first" at Montreux was the aural program distribution transmission system using digital techniques shown by Moseley Associates. Digital techniques overcome the limitations of the classical analog distribution methods (baseband, FM subcarrier, or frequency division multiplex) such as signal-to-noise ratio, low-end audio response (under 50 Hz), and for stereo and four-channel quadraphonic, the phase relationship between channels. Digital pulse code modulation (PCM) techniques overcome these and a number of other transmission difficulties. Moseley pointed out that in digital transmissions, "the degradation of the received signal by the transmission system does not alter the information content until the degradation becomes so severe that the receiving equipment reads a pulse as no pulse or vice versa . . . (further) the signal can be regenerated before the degradation becomes severe." The system Moseley demonstrated at Montreux provides two audio channels, such as might be used for stereo. It was a full PCM transmission system, providing two 7500 Hz channels, whose SNR is in excess of 70 dB, distortion of less than 0.5% for optimum input levels, and low-end response to 10 Hz.

One of the new services possible through digital techniques is the insertion of news, weather, travel in-


*The large outside broadcasting van so popular in Europe gets trimmed down. This 17-foot RCA outfitted unit carries two portable color cameras and two transportable VTRs.*

*Smart industrial design was apparent at Montreux, but this Thomson-CSF microwave system was outstanding.*

formation, etc. into the field blanking interval of the television signal. Such systems, known heretofore as Ceefax and Oracle, have been experimented with by both the BBC and the Independent Broadcast Authority in the UK. The experiment is "going public" now under the name of "Teletext."

Decca Radio & TV Ltd. is producing a color TV set with a decoder in it to display digital coded information which will be transmitted by the BBC and IBA. Information will include news, weather, sports, stock market prices, etc. Nobody knows just how many decoder equipped sets will be sold (price addition will run about $100 initially) or whether the audience will use the new service. But the service is off and running. P. Rainger of the BBC described the bit rate as 6.9375Mbits/s. He said each line has 40-characters per row, with 24 lines per page. The system accommodates 60 pages total which would require a maximum access time of 15 seconds.

### Other Digital Equipment

Editing was a much hotter topic than ever before at Montreux. Two years ago Central Dynamics and Albrecht Electronik (Germany) were the only exhibitors showing editors. This year Bosch Fernseh showed a computer controlled system capable of both off-line or on-line operation using a mixture of quad and helical machines. Datatron was present showing its 5050 system coupled to AVR-2.

Similarly, special effects got more attention at Montreux this year. Prowest showed some interesting dynamic wipes. Various wipe patterns were based on multiple rectangles which were progressively wiped from input A to B over preset time scales.

Thorn Lighting, one of the worlds principal suppliers of electronic control systems for stage and TV studio lighting showed a new portable system known as the Thorn QT 120 for outside broadcast use. It's a compact floor standing desk in two parts.

A growing competitor to Thorn in lighting control is Dynamic Technology Ltd. The DataLite 300 is a digital computer controlled system and the South African Broadcast Authority has one of the most elaborate systems installed to date. Through digital storage the control panel does not grow in size. DataLite includes a mimic panel to display at all times what is going on. A feature of the system is a CRT mimic display operated

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This means a signal coax can distribute status information with an optional color CRT: red shows what is "on," green the preset lights.

### Cable TV Big at Montreux

In terms of sessions, exclusive of the roundtable conferences on the opening weekend, cable TV was the single most important topic at the International Television Symposium dominating one third of the program for two days. One of the key subjects was system considerations for multi-channel capacity. (In Europe, using the CCIR B standard on VHF, only six programs can be received due to frequency allocations and standard IF.)

Interestingly, in contrast to developments in the USA, is the European effort to use uhf distribution systems. This means that the uhf tuner on the TV set can be used and there is no need for a set-top converter. This approach is reasonable in Europe since uhf tuners are on a parity with vhf tuners and reception of 20 channels or more without interference is possible. For large systems, there is the problem of uhf attenuation. This is overcome by carrying the channel in the vhf band (including midband) on trunks and using block converters for uhf distribution on feeder lines.

There is hope that new generation TV receivers will appear on the market to receive midband and top band channels with adjacent channel operation possible. Ideally for adjacent channel operation, the bandwidth should be 8 MHz—identical to the CCIR G standard.

This position was advocated by W.M. Mathijssen, an engineer with Philips of Eindhoven. Such pleas for an ideal receiver would go unheeded in the U.S. as impractical. In Europe, the public can be convinced to buy more expensive sets (they are viewed as a long-term investment and not what is the cheapest buy) and a few PTTs might be able to nudge manufacturers.

One of the highlights of the CATV program was the rundown of CATV in the countries of West Germany, Italy, Austria and France. In general, one could conclude that while there is keen interest in all of these countries and some building of limited channel systems in non-metropolitan areas, cable systems for the denser areas lie sometime in the future. The various PT&Ts which regulate cable's development are experimenting (in a limited way) with what might eventually become the national system. Italy, for example, is considering a switched wideband network as part of overall integrated telecommunication system.

Italy's proposed system would carry TV signals in the high frequency band, each of 24 to 48 channels transmitted separately on a pair of telephone wires. The network configuration is described as tree-star—integrated with the local telephone network and electronically switched.

France is considering a 15 channel system. In Germany the interest is in a system of plants with each plant operating in an area defined by a circle about 15 km in diameter. The objective is a 43 dB signal to noise ratio at the home receiver. **BM/E**

## TOTAL AUTOMATION

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sonnel. The system which went into service in July, 1968 at KMOX-TV is interesting in that it anticipated a number of the characteristics of present-day switching automation technology. It employed an early model minicomputer (the original Digital Equipment Corp. PDP-8), and used an early version of a CRT display for status read-out.

A major innovation pioneered by this system was the "associative memory" concept, by which the computer identifies the technical source of program material by correlating a material identification number input to it from the source. The technique was implemented by use of a credit-card size plastic punched card prepared in the traffic department for each item of program material, which is fed into and read by an individual card reader at each film projector and VTR machine. The KMOX-TV system has its data prepared off-line on punched cards. The computer itself has a limited memory capacity of 20-30 events, depending upon content, and memory is updated by automatic period loading from a punched card reader.

### Early systems now being updated

This first generation of CBS automation installations, all of which have remained in operation continuously to the present time, is now destined for replacement or major updating. In New York, the operational interface will remain as initially installed, but the computers themselves are being replaced by more modern machines. CBS is now testing the first of two Bunker-Ramo 1018 computers (Bunker-Ramo acquired the successor organization to the old TRW Computers Division) which will replace the twelve-year-old 330's. For its owned and operated stations, CBS has placed the first two orders for completely new automated audio-video switching systems which will replace the pioneer KNXT system in Hollywood and equip WBBM-TV in Chicago. These systems will be supplied by the Grass Valley Group, Inc., and will consist of the master control version of Grass Valley's new 1600 video switcher, operated by a Digital Equipment Corp. PDP 8-E computer. These systems will have a capacity of 2000 switching events, and will receive data over data communications circuits directly from CBS's "BMIS" (Broadcast Management Information System) in-house computerized traffic accounting system. Each automation system will also be interfaced to two Ampex ACR-25 cartridge VTR's, and will use the ACR-25 Automatic Data Accessory to identify and play cartridge announcements by correlation of material identification numbers.

The original KNXT system, which will be replaced, is believed to occupy a unique place in the history of computer process control applications. So far as is known, it represents the longest period of service yet achieved for any computer in a process control application, and will have given fifteen years of service by the time it will be shut down early in 1976. Thus, despite the fact that computer automation applications cannot exactly be said to have proliferated in the television industry over the

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past fifteen years, television broadcasting has nevertheless given computer process control one of its most enduring installations.

# Update: DCC's Automatic Switching Interface

Material in this report submitted by Patrick Choate, Data Communications Corp.

*Howard A. Shepard (far left) and John R. McConkey (near left) of CDL discuss standards with Don Rogers (standing) and Jim Cook (right) of DCC. First station to have CDL/BIAS interface will be WNAC-TV, Boston.*

Data Communications Corporation (DCC) parent company of the BIAS (Broadcast Industry Automation System) system has, for the last two years, been actively promoting an industry standard interface, between all makes of automatic switching equipment and all business computer systems. Details of how this standard interface would accomplish the joining of the engineering and front office logging operation were printed in the August, 1974 edition of BM/E magazine.

As is almost always the case in any burdgeoning field, and particularly in an area so volatile as electronics the proposed standard interface has not been met with swift acceptance. However, presently DCC's research and development department is working with two manufacturers of switching equipment, Central Dynamics, Ltd., of Canada, and Vital Industries, Inc., Gainesville, Florida, making the necessary hardware and software changes needed to accomplish the connection between the switcher and the BIAS system.

Commenting on the progress made in this area, Jim Zielger, DCC's vice-president of research and development says, "We're satisfied with the progress made in recent months, and we feel this new BIAS system feature (automatic switching) will be ready for marketing by late fall."

Although DCC has been talking with most major manufacturers of switching equipment over the past three years, most of the actual development bolt-and-nut work has been done during the last six months with Vital Industries, Inc. According to Jim Ziegler, "Vital Industries is so enthusiastic about this project that we've made great progress in a short amount of time."

Standardization has always been one goal of automation, and in the broadcasting industry it has been an uphill battle. Broadcasters have been, through the years, forced to resort to having their equipment and operational tools custom-made to fit their unique requirements. With 110 BIAS customer TV stations, the front office sales, traffic and accounting operation is standardized—only the master control switching equipment varies from station to station. The obvious answer to the problem is a standardized interface.

Another major manufacturer of switching equipment, Central Dynamics, Ltd. (CDL), is currently working with DCC ironing out design specifications in an attempt to further facilitate the standard interface.

Howard A. Shephard, CDL's product manager, states, "Both CDL and DCC are committed to establishing a working interface within a 9 month time frame." The 9 month time table relates to CDL's response to a request by WNAC-TV (RKO, Boston, Mass.) for an automated switching system which will tie-in with the BIAS system (WNAC-TV is a BIAS customer station). Shephard and his associate, John R. McConkey, supervisor, automation software, are impressed with DCC's standard interface specs; quoting Shephard again, "DDC's approach to a standard interface shows a good insight into the technical problems experience in the engineering/operations area of a TV station."

## Automating Both Tape and Film in the Station Breaks

Automation has a long history at WBRE-TV, in Wilkes-Barre, Pa. An RCA TSA-1 allowing 15 events to be set up on the relays for automatic sequencing, was installed in the late 1950's. A Sarkes-Tarzian system, allowing the set-up of 40 events in advance, went on line in 1967, and is still in use.

Added in 1972 was the RCA TCR-100 for automatic play of video carts. And in April of this year the management installed an RCA TCP-1624 automatic film cart player.

*The TCP-1624 being loaded at WBRE-TV.*

With all these units on line, the Sarkes-Tarzian system controls the TCR-100, the TCP-1624, and, if wanted, the film island, the open reel machines, etc. But most of the load of commercials, PSA's, etc., is divided between the TCR-100 and the TCP-1624. George Andresky, chief engineer, says that having film cart play available saves time and money for many advertisers who maker commercials originally on film—no transfer to tape is needed. He finds the film machine handling about 80 plays a day, and the TCR-100 tape machine handling about 100 carts a day.

The lesson is: any station operation pattern (including use of a lot of film material) can get the particular advantages of automation.

# GREAT IDEA CONTEST

**Share your good ideas with other broadcasters.**

## 21. TP-66 Cueing System Modification.

*Richard Kihn, Engineer,*
*KFDM-TV, Beaumont, Texas*

**Problem:** To automate notification of director of news story endings without the use of visual cues.

**Solution:** Until the circuit modification was made, a man stood beside the TP-66 film projector and informed the director of approaching end-of-film. A cue at the head of each story stopped the projector, as the cueing system was designed to do.

With the modification system in use, a cue is placed seven seconds before the end of the news story, and another cue is placed on the film at the head of the next story.

When the seven-second-to-end cue is sensed, TB701-8 (to which the cue sensor was moved from TB701-7) is momentarily placed at ground potential, causing relay K1 to pull in. The sequence: Relay K1 contacts 11 and 7 to hold it in; contacts 9 and 5 turn the buzzer on; contacts 10 and 6 complete the ground circuit for the coil of K2.

The coil voltage for K2 starts to build up and reaches sufficient potential to pull K2 in. With values shown, this delay is about ⅓ second. This is sufficient time to allow the ¼-inch wide cue tape to clear the cue sensor.

Relay K2 contacts 11 and 7, then connects TB701-7 to TB701-8, effectively putting the projector into the "normal" operating mode. Contacts 1 and 9 then cut the buzzer off.

When the start-of-next-story cue is sensed, the projector stops. The −12 volts obtained from K111 (cue defeat relay) is removed; K1 drops out, and the circuit resets itself.

The local state indicator lights (I1, I2 and I4) are mounted in the bypass switch, and are intended to indicate the state of the relays and to expedite trouble shooting if it becomes necessary, as well as to serve as on/off indicators during operation.

The remote state indicator lights (I3 and I6) serve as on/off indicators only for benefit of the director. Resistors R1, R4 and R6 are used to extend the life of the 327 lamps.

Separate buzzers could be used for each projector, but it was desirable to use the same buzzer for the complete system in our installation. Although designed for use on our projectors, this system should be adaptable to others.

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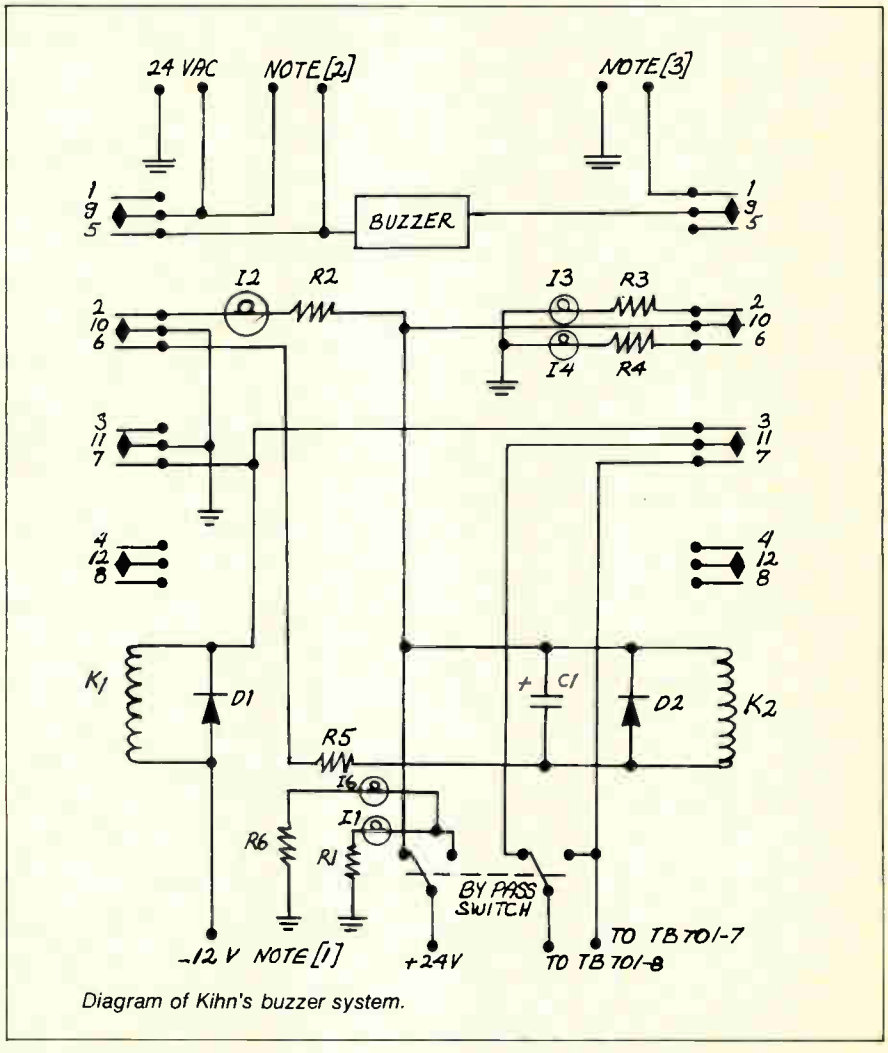



*Diagram of Kihn's buzzer system.*

## GREAT IDEAS

### 22. Novel Control Circuit Needs No Common Bus.

*Jeremy R. Burnham, Engineer, KKDJ-FM, Hollywood, Calif.*

**Problem:** To use a single-pole momentary-contact pushbutton switch to remote-start cartridge machines and reset a common digital electronic clock in a situation where no ground or common bus can be used.

**Solution:** Series diodes are placed on both sides of the pushbutton switches in both the clock and cart machine circuits, with proper polarity to isolate the two circuits from each other. The clock floats with respect to ground because of it's internal power transformer. It makes no difference if either side of the cart machine circuitry sees a ground.

For simplicity, the clock re-set and the cart machine remote start circuits have been re-drawn with their equivalents. The circuit is easily understood when we realize that, with the switch open, no current flows in either circuit. When a button is pressed, current flows in both the clock and cart machine circuits independently. Since the two circuits are effectively coupled at only one point, there is no interaction between the two whatsoever. Any number of machines using any combination of direct current control

## GREAT IDEA CONTEST 1975: RULES

1. **Eligibility:** All station personnel are eligible. Consultants to the industry may enter if the entry indicates the specific station or stations using the idea or concept. Manufacturers of equipment or their representatives are not eligible.

2. **How to Enter:** Use the Official Entry Form on this page or simply send *BM/E* a description of your work. State the objective or problem and your solution. Include diagrams, drawings, or glossy photos, as appropriate. Artwork must be legible but need not be directly reproducible but not exceeding three in number. Camera reproducible material is preferred. Length can vary, but should not exceed 500 words. *BM/E* reserves the right to edit material. Entry should include: Name, title, station affiliation, and the class of station—TV, FM, AM. Indicate if idea is completely original with you.

3. **Material Accepted for Publication:** *BM/E* editors will make all decisions regarding acceptability for publication. If duplicative or similar ideas are received, *BM/E* editors will judge which entry or entries to accept A $10 honorarium will be paid for each item published.

4. **Voting:** Every reader of *BM/E* is entitled to rank the ideas published. This can be done on the Reader Service Card in the magazine or by letters or cards sent to the *BM/E* office. To vote, readers should select the three ideas they like best and rank them 1, 2, or 3.

5. **Winners:** Relative ranking of each month's entries will be published periodically. Top-rated entries for various categories will be republished in late 1975 for a second and final round of scoring. Final winners will be picked in February 1976 and notified by mail. Winners will be published in the March 1976 issue of *BM/E*.

6. **Prizes and Awards:** Three top prizes will be awarded: a color TV set for the entry receiving the most votes in the respective categories of AM, FM and TV. Ten AM-FM radios will be awarded as secondary prizes for the highest voted entries in the following additional categories (except the three top winners): audio (three prizes one each in categories AM, FM, TV; (three prizes one each in the categories of AM, FM, TV); Control (three prizes one each in the categories of AM, FM, TV); Video (one prize in TV).

See April or May for Entry Form

**Mail to: Editors, BM/E**
**274 Madison Avenue**
**New York, New York 10016**

**Entry Form**

**Name** _____ **Title** _____

**Station Call Letters** _____

**City** _____

**State** _____ **Zip** _____

**Telephone No.** _____

**Licensee** _____

**Class of Station at which idea is used (check one) TV** _____ **FM** _____ **AM** _____

**Category: Audio** _____ **RF** _____ **Video** _____ **Control** _____

**Objective or Problem:** *(in few words; use separate sheet for details* _____

_____

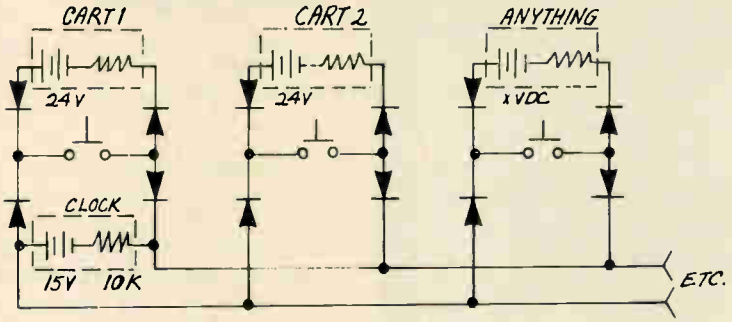
_____

**Solution:** *(Use separate sheet—500 words max)*

*I assert that, to the best of my knowledge, the idea submitted is original with this station; and I hereby give BM/E permission to publish the material.*

*Signed* _____ *Date* _____

voltages can be connected in this manner, and any number of buttons may be pressed simultaneously. KKDJ employs a Heathkit GC-1005 digital clock inexpensively modified to re-set to zero, coupled to six ITC cart machines, and controlled with touch switches.



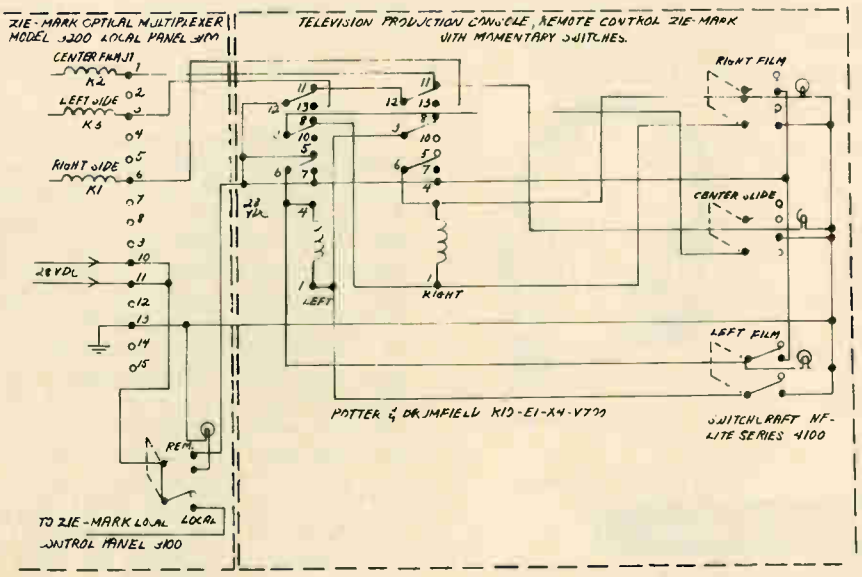

*Burnham's Control Circuit*

## 23. Optical Multiplexer Features Remote Control.

*Roderick E. Davis, Engineer, KUSV-TV, Lawrence, KS.*

**Problem:** To remote control a Zie-Mark model 3200 optical multiplexer used in conjunction with a television film and slide telecine. The manufacturer offers a remote control unit, model 3100-4, but it does not have momentary switches as do our slide and film projectors. Our control circuit was built for about $20 including two Potter-Brumfield relays, and three Switchcraft lighted momentary switches.

**Solution:** The circuit was designed to function with momentary switches. I mounted two relays on the local Zie-Mark model 3100 tray. First, identify the supply wires and plug J1 that conducts the control voltage to K1, K2, and K3. It made good sense to use the existing power supply. When both left and right relays are relaxed, the multiplexer will be in the center port or slide. When the left relay is energized the left film will show, and when the right relay is energized the right film will show. Mu right/left relationship is reversed as normally considered. Reason is, I had to have the same relationship to the telecine as the remote TV producer's console.




*Optical Multiplexer remote control designed by Davis*

*Great Ideas continued on page 56*

## GREAT IDEAS

### 25. Keeping Slides in Order on a TP-7.


*J. Richard Severe, Engineer, Maryland Center for Public Broadcasting, Owings Mills, Md.*


**Problem:** To keep slides from getting out of order when double-punching a TP-7 slide projector. When using an RCA TP-7 slide projector, the machine alternates from drum to drum each time the slide-change button is pressed. When changing slides in a remote location, such as a studio control room, you must be careful not to double-punch the slide projector. Chances are, only one drum will rotate, throwing your slides out of order. Since the projector has a capability of 36 slides, you have to punch the slide advance button through all your slides, one at a time if you make a mistake.

**Solution:** This modification of the TP-7 will keep your slides from getting out of order. Also, by holding down the pushbutton, your slides will re-cue themselves in the shortest time possible, and at the same time keep the drums in order. This is accomplished since the change command is enabled only after rotation of the drums is completed. Two diodes sample voltage from ready lights I104 and I105. These lights only light up when the drum rotation has completed its cycle.

## Great Idea Feedback

*BM/E readers respond to Great Ideas*

Dear Sirs:

In the Great Idea Contest section of BM/E magazine (June 1975) a circuit was given for a "Waveform Generator Synthesizes Steady Tones" (Great Idea #12). I thought the circuit was very clever and inventive and intend to use it for a few projects I have in mind. I would suggest using a 74159 instead of a 74154 as shown in the circuit diagram. Use of the 74159 instead of the 74154 will prevent the setting of one pot from affecting the adjustment of the other pots. Use of the 74159 will also make the diodes unnecessary.

The 15 volts at the top of R1 should be changed to 5 volts or you stand a good chance of zapping the 74159. With these two changes the circuit should work quite well and I'm looking forward to building it.

**James F. Reid**

# Crowd controller.

**Talk about trouble-free remotes! The Shure SE30 Gated Compressor/Mixer gives you mixing, "hands-free" gain riding, and 600-ohm line output capability—*all in one portable, professional package.* Its unique Gated Memory circuit licks the "pumping problem" by holding the compression level constant during program pauses, and releasing it when the signal returns—eliminating crowd noise build-up between words and sentences. In news, sports, and special events remotes, the SE30 compresses *in the field,* so signal-to-noise ratio is optimized for superior telephone line transmission and higher program quality—without manual gain riding! Functionally engineered, with self-contained standby battery power supply, built-in tone oscillator, VU/dB compression meter, and full compatibility with associated professional equipment. For complete information, write:**

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SHURE



Circle 147 on Reader Service Card

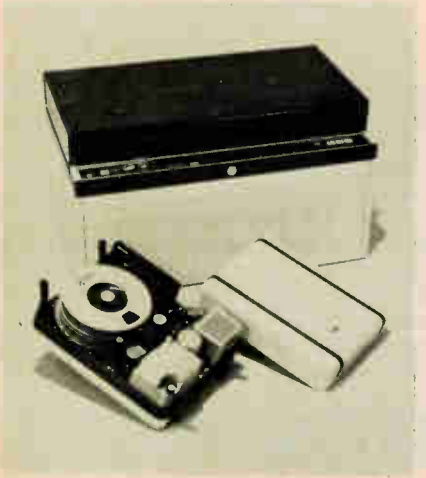
# BROADCAST EQUIPMENT

**For more information circle bold face numbers on reader service card.**

**Videotape editing system** designed specifically for electronic news operations provides frame accurate edits, jogging (frame advance), 100-edit memory. System 40 uses Sony U-Matic format, reads time code in

fast modes, is available for two or three VTR's. Options include a full monitor console. System allows re-edit and auto-assemble from a decision list. $20,500 to $44,375 depending on options. CMX SYSTEMS **300**

**New VTR system** uses one-inch tape, segmented helical scan, very-super-high band color, and pilot tone, in aim for top quality. "Pilot 1" system will be available in several forms, including a studio console, a back-pack portable, a desk-top console. Writing speed is 1470 ips, with 7-segment interlace on 60 Hz field rate. Heads are



hot pressed ferrite for 1000-hour life. Pilot tone, at 5.3 MHz, is added to baseband before modulation and used for time base correction, and for color phase correction. Claimed specifications include frequency response ±0.5 dB, 30 Hz to 4.2 MHz; differential phase, less than 3 degrees; differential gain less than 3%; s/n ratio, greater than 47 dB; moire, greater than 46 dB; time base stability, (correction built in) ±3 ns. Also: continuous drop-out compensation, insert and assembly editing, output sync processing, genlock sync generator, full automatic color edit framing, continuous velocity correction, two audio channels. ARVIN/ECHO **301**

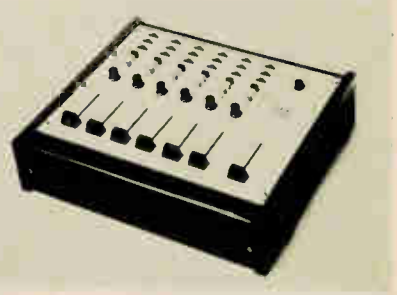
**Search-to-zero accessory** allows setting of a zero or cue point anywhere on an audio tape, with automatic push-button return to that point as wanted. Accessory for the MM-1100 multi-channel recorder controls speed automatically to prevent overshooting. Digital readout indicates whether tape is ahead or behind the zero point. Machine can also be set to go immediately into play after reaching the zero point. Kit can be installed in the field by a qualified technician. $895.00 AMPEX **302**

**Digital logging system** will record up to 20 parameters plus time of day in

columnar form at preset time intervals. Model DLS-1 also records out-of-tolerance conditions. It has selective channel muting and external digital input. It can be used independently or in connection with the Model DRS-1A remote control system. MOSELEY ASSOCIATES **303**

**Portable high sensitivity frequency counter** has 9-digit LED display, frequency range 5 Hz to 520 MHz. Model 1920A has direct and pre-scaled inputs color coded to match function switches. A "rapid-access" gate cuts measurement time by "free-running" to open promptly when a signal is sensed. Optional pre-scalers extend range to 1000 MHz and 1250 MHz. RF bursts of 2 ms or longer duration can be measured. JOHN FLUKE MFG. CO. **305**

**Multi-channel mixer** provides six inputs, four outputs. Model 2 has high



and low cut filters, panning on each input, and cue out, buss in, accessory send/receive patch points. $299.50 TEAC **304**

**True RMS digital voltmeter** reads directly in decibels as well as in volts. Model 3630A operates from 0.1 Hz to 1 MHz, with 4½ digit readout, giving 0.01 dB resolution on decibel ranges and 1 microvolt resolution on the 10 mV range. Autoranging is standard. The 19,999-count meter uses analogy computation to determine the true RMS value; signals with crest factor up to 50:1 can be handled; accuracy is maintained with distortion of 5% or greater. $2450. BALLANTINE LABORATORIES **306**

**Adapter makes "C" mounted lenses compatible** with the TGX-16mm cine sound system. Model GCM-101 takes all existing "C" lenses. $175.00. GENERAL CAMERA CORP. **307**

**Wireless sound system** consists of a lavalier microphone, transmitter and receiver. The "All-Purpose" wireless system converts any sound system or audio input to wireless operation. EDCOR **308**

**Spectrum analyzer** gives CRT readout of absolute frequency with counter accuracy. Model 7L5 covers a range to 5 MHz. Built-in microprocessing provides "intelligence" to decode control settings and process readings for CRT readout of parameters. Calibrated reference level is read out in 1 dB steps over the range −1125 dBm to +21 dBm. A dBv and linear volts mode are also provided. Average or peak can be displayed, with the averaging ad-

justable from bottom to top of signal. Digital storage makes displays easy to read and photograph. $4200. TEKTRONIX **309**

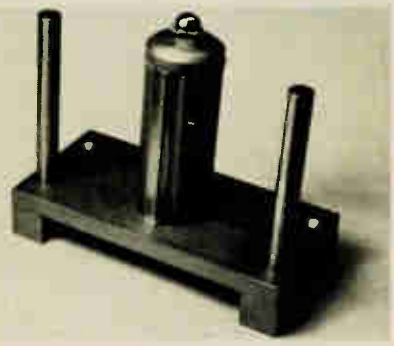
**Electronic sound modules** produce dependable sound effects. Gunfire, explosion, airplanes, police siren, crowd cheer, many more, are created without tape, disc or other memory systems. UNIVERSAL RESEARCH LABORATORIES **310**

**Wireless microphone** for single-system movie cameras attaches to side of camera. Swintek "Hitchhiker" uses highband VHF crystal-controlled transmitter and crystal front-end receiver for operation as close as 50 kc to other systems without interference. Transmitter mounts on such cameras as CP-16A, General, and Frezzolini, also on Nagra recorder or MA-11 amplifier, adding only ¾" in width and 15½ ounces in weight. ALLAN GORDON ENTERPRISES **311**

**Message generator** for TV alphanumeric displays has 16 pages of memory, each 8 lines of 32 characters a piece. Model CG-1000 has a 10 × 14

dot character, character blink, full editing capability, standard typewriter keyboard, time and temperature inputs, 2-speed crawl, page printout for news, two colors. $2995. VIDEO DATA SYSTEMS, INC. **312**

**Tape cleaning device** includes four-edged saphire blade, precisely ground to remove debris without damage to tape. The "NOVA BLOCK" is attachable to almost any video or audio



tape recorder, in most cases by user's technician. The block provides an alternate tape path, eliminating wear on head stack, guides, etc. during cleaning passes. $340, 2 inch; $240, 1 inch; $140, ¾ inch; $100, smaller sizes. N.O.V.A. CORP. **313**

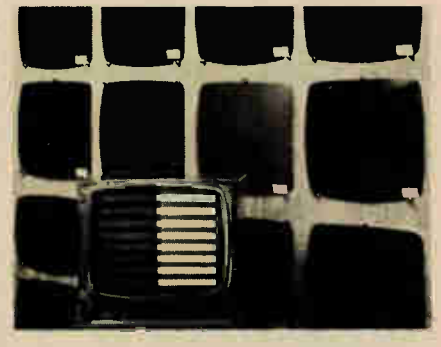
**New tape** for ¾-inch video cassettes claims improved color performance and higher resolution than earlier tapes. Beridox iron-oxide tape uses a new coating, berthollide iron oxide which has high-density magnetic particle dispersion. The maker says it is superior in chroma level, video sensitivity and s/n ratio to chromium dioxide. FUJI PHOTO FILM USE **314**

**Studio switcher/special effects generator,** the 200 series, is a six-input, three-buss effects/dissolve switcher and mini teleproduction center. All buss switching is performed during the vertical interval. Functions included are horizontal and vertical wipes, corner wipes, mix (lap-dissolved type) and external key. A key level control is provided to set the gain on the key input buffer amplifier. A pushbutton fade-to-black switch is provided on both effects channels. The unit is available with or without 2:1 sync, in black and white or color. List price starts at $995. VIDEO CONCEPTS **315**

continued on page 6

## PRODUCTS

**Thermo-formed glare suppressant filters** eliminate reflections and improve the contrast and visibility of color or monochrome video images. They are formed to the exact shape and size of cathode ray tubes and cost less than non-glare glass faceplates. The filters



are available in colors for all phosphors to enhance contrast and sharpness of the image. The formed filter can be adhered to the face of the tube which provides maximum sharpness of the video image. PANELGRAPHIC CORP **316**

**Electronic interface,** named Auditec II, is designed to link the MM-1100 and AG-440 series recorder/reproducers with the RA-4000 automatic programmer. It permits the multiple tracks of voice, music and sound effects to be recorded and mixed in synchronization with the video. Electronic splices may be set up, previewed and executed or maintained in memory so that entire audio-video edit sequences may be accomplished in a single continuous operation. Price is $6,500. AMPEX **317**

**Reel tape deck accessory** for use with the MM-1100 and AG-440 recorders inserts edits in multichannel recording. Called Pick Up Recording Capability, the accessory permits the editing or dubbing of new material over previously recorded material without creating errors at either end of the new insert. Prices range from $170 to $675. AMPEX **318**

**Stereo generator,** model SCG-9, offers a front panel peak-reading dB meter and stereo/mono mode selector.

Circuitry is all solid-state. It may be used with most direct FM exciters. MOSELEY ASSOCIATES **319**

**Video delay package** accommodates any delay from 10 to 2,120 ns. The series 5.25 consists of a 5¼-inch Vero card frame which accepts eight cards

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## PRODUCTS

and is supplied with BNC connectors. The cards are delivered with the final 150 ns. of delay unconnected for completion by the installer. Cards for mounting pulse and blanking delays are also available. TELEVISION EQUIPMENT ASSOCIATES **320**

**Composite noise barrier materials** are suitable for direct application to equipment and enclosures. Designated type KC Single and KC Double Composition, the materials are composites of limp, flexible, loaded PVC with one or two permanently laminated polyester urethane absorption foam layers. These materials are available with or without pressure-sensitive adhesive backing on one foam surface. Maximum continuous operating temperature rating is 200°F. Single composite materials are available with two types of barriers and three foam thicknesses. Standard rolls are 54-in. wide and 50 or 60 feet long. CONSOLIDATED KINETICS **321**

**Low leakage connectors** have been specifically designed for the following Belden bonded foil shielded coax cables: 9280, 9281, 9310, 9293-9296, 9283-9289. The two-piece connectors use a captive pin, instead of the cable conductor, and are available in 50-ohm, 75-ohm BNC, TNC and F styles. TROMPETER ELECTRONICS **322**

**Flexible cable lens drive system** for the Sony DXC-5000 color camera gives individual control of zoom and focus. The handles can be attached to a dual handle tripod head. The price, $600, includes cables, zoom handle and clamp, focus handle and clamp. EAST COAST CAMERA CENTER **323**

**Sound-on-film projectors,** in Super-8 and 16 mm format, the ST-1200TC and F-16TC respectively, project directly into a color vidicon TV camera. Both projectors accommodate magnetic and optical sound and feature remote control forward projection. Reel capacity of the Super-8 model is 1200 feet, that of the 16 mm projector is 2000 feet. The 150 watt projection lamp in the Super-8 model offers high-low brightness control; the 16 mm model projection lamp is rated at 250 watts. ELMO **324**

**Cartridge record/playback** offers continuous program delay, network program delay, normal recording, and normal playback. A separate third head/amplifier is used in the delayed playback mode. RP Delay takes A-, B- or C-size carts, and can be cued by automation or network trip tones. Price of the mono version with 1 kHz cue is $1,500. ITC **325**

# NEW LIT

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

Technical data sheet on **IF Amplifiers** for Telecommunications Applications describes amplifiers where very low group delay, very low VSWR and extremely flat amplitude characteristics are required. Microwave Power Devices. **250**

A revised short form catalog describing **closed-circuit television products** is now available. It includes information on the 7300 series ISOCON and Intensified ISOCON low light television cameras, 4410/4415 series compact self-contained cameras, and the Model EES-1 Edge Enhancement System. Cohu. **251**

**New frequency modulation broadcast receiver standard,** IEEE Std 185-1975/IHF 200-T, 1975, Standard Methods of Testing Frequency Modulation Receivers, has been published by cooperation of the Electronics Industries Association, Institute of Electrical and Electronics Engineers, and Institute of High Fidelity. It provides the first up-to-date standard method for testing and comparing FM receivers that has received endorsement from all segments of the industry. The single copy price is $6.00 and can be obtained from the Institute of Electrical and Electronics Engineers, 345 East 47th St., N.Y., NY 10017.

Short form catalog listing 35 unique **video instruments**, including slow scan equipment, video digitizers, quantizers, disc memories, and video x-y devices is now available. Colorado Video Inc. **252**

**Television, Motion Picture Lighting and Production Equipment** price list and brochure describing new lensless Follow Spot design is now available. Berkey Colortran. **253**

**WTFDA TV Station Guide,** a comprehensive reference of North and Central American television station data, features maps (by channel) showing the location, call letters, network, and offset frequency for almost every TV station in those areas. The price is $5.00 postpaid and is available from WTFDA, PO Box 163, Deerfield, IL 60015.

Eight-page brochure and price list on **digital equipment** describes complete line. ESE. **254**

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MARY LOU REX, Village Clerk, Village Hall, Main Street, Naples, New York 14512, 315-374-2435

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| 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 |
| 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 |
| 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 |
| 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 |
| 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 |
| 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 |
| 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 |
| 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 |
| 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 |
| 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 |
| 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 |
| 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 |
| 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 |
| 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 |

**Use until November 30, 197**


# BM/E READER SERVICE CARD August 1975 Issue

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Tell us what you like or dislike about the issue

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**100-249: ADS** **250-299: LITERATURE** **300-399: EDITORIAL**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 |
| 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 |
| 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 |
| 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 |
| 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 |
| 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 |
| 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 |
| 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 25 |
| 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 27 |
| 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 29 |
| 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 31 |
| 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 33 |
| 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 35 |
| 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 37 |
| 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 39 |

**Use until November 30, 197**


# COMPLIMENTARY SUBSCRIPTION QUALIFICATION CARD

1. I would like to receive BM/E ☐ Yes ☐ No

2. My company is: (Please check ALL items which pertain to your firm.)

- ☐ AM Station(s)
- ☐ FM Station(s)
- ☐ TV Station(s)
- ☐ Instructional TV or CCTV
- ☐ Campus Limited Radio
- ☐ CATV Facilities
- ☐ Telephone Company
- ☐ Program Sources
- ☐ Recording Studios
- ☐ Government
- ☐ Consultant
- ☐ Lawyer
- ☐ Distributor/Manufacturer dealer
- ☐ Other (please specify) .....

.....

3. Are you responsible for more than one station or facility?

☐ Yes ☐ No

4. My primary area of responsibility is: (Please check one)

- ☐ Corporate Management
- ☐ Engineering & Engineering Management
- ☐ Operations Management
- ☐ Station, Production or Program Management
- ☐ Other (please describe)

.....

5. Your signature .....

Title ..... Date .....

Name ..... Title .....

Station or Co. .....

Street .....

City ..... State ..... Zip .....

If this is an address change, affix label

Is this your business address? ☐ Yes ☐ No

If not, please give us your business address below so that we ca avoid sending duplicate copies.

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Station or Co. .....

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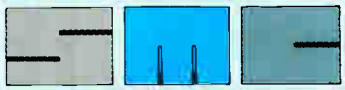

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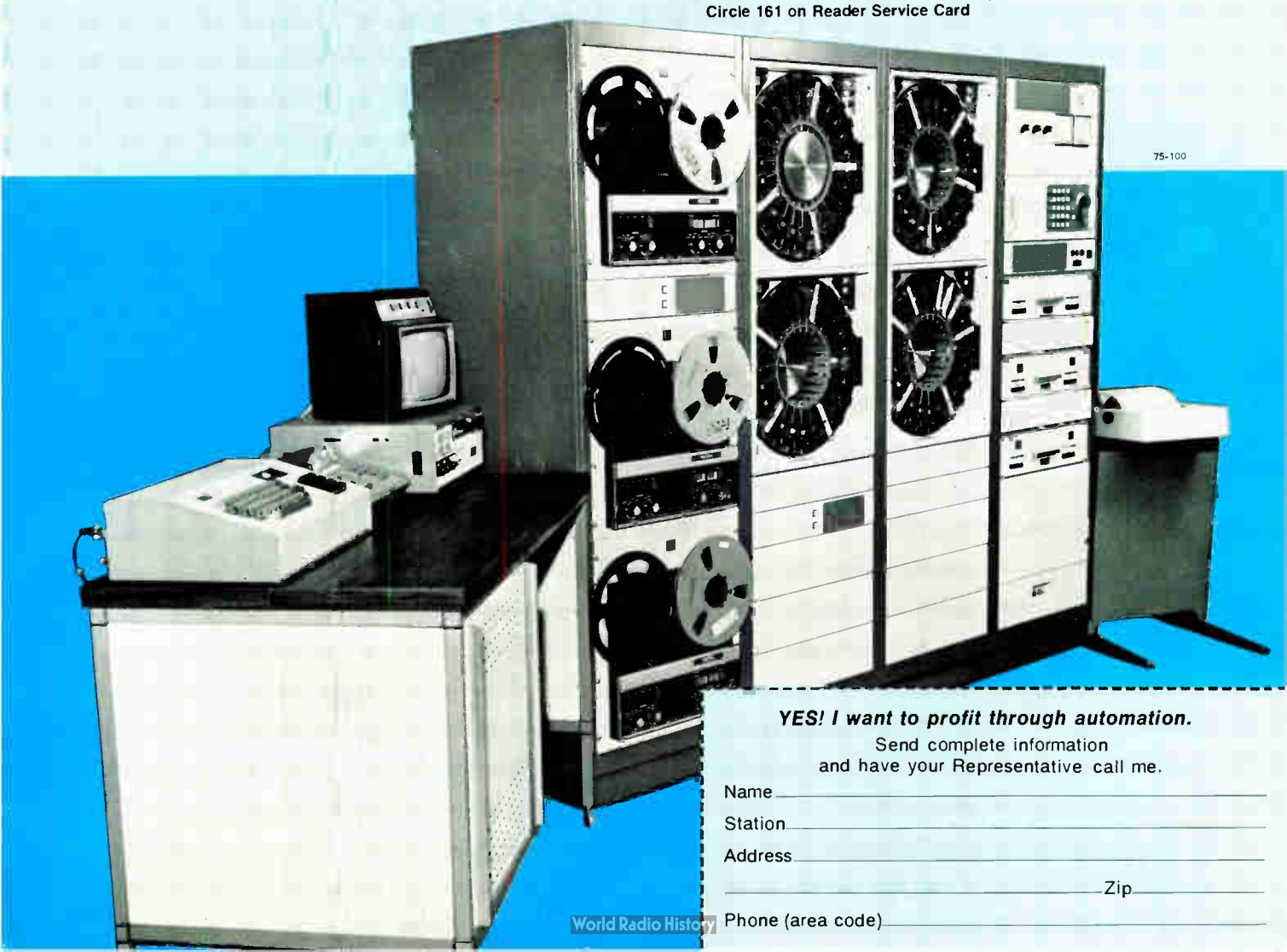


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