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February, 1976/75 cents

EBS Deadline Is Firm

page 26

Building
TV Sets

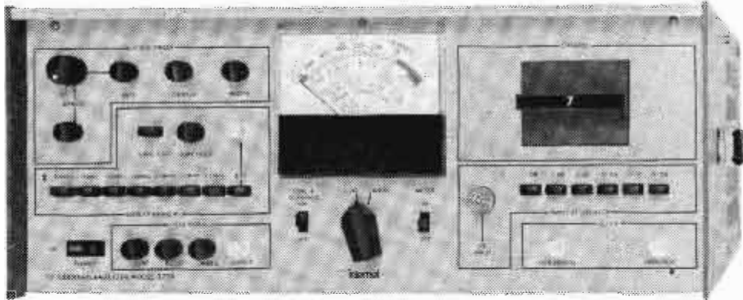
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Inspection

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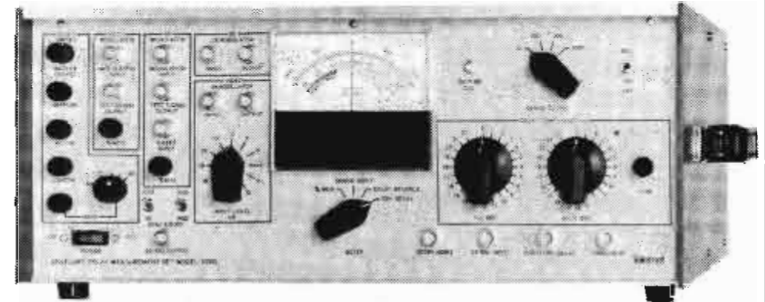
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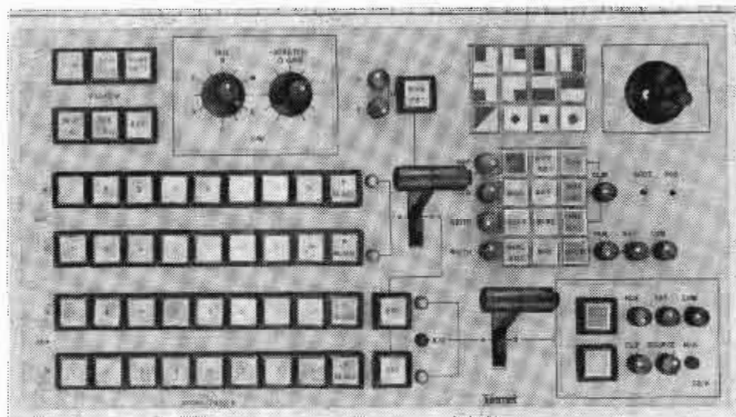
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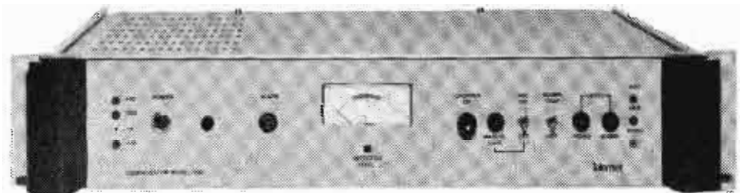
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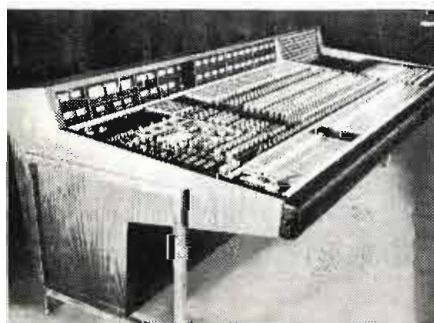
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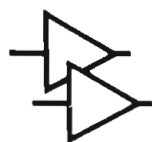


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- 26 **The New EBS Rules.** Answers to the most often asked questions on the new EBS rules and equipment. Includes a list of manufacturers currently offering type-accepted equipment. **Joseph Wu.**

- 32 **Set Construction Techniques.** Tips on how to build portable and permanent sets for television. **Ron Whittaker.**

- 41 **Be Prepared For a Station Inspection.** A consulting engineer reviews the rules most often violated—according to the FCC—and includes a checklist that should help us all avoid ulcer gulch. **John Mullaney.**

- 49 **Solid State Relays.** An update on what's been happening in the development of new components. Includes example circuits and tips. **Pat Finnegan.**

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- 53 **When You Goof, Keep It Moving.** An old timer in the industry recounts some humorous incidents in broadcasting and opens the door on a new BE column: Blue Bananas. **Phil Whitney.**

- 55 **Television At The Pan Am Games.** Our Video Editor reports on the Pan Am Games that were televised in Mexico. **Joe Roizen.**

About the Cover

Our cover picture comes to us from WIPR-TV, San Juan, Puerto Rico. But the big news is on page 26 and the new EBS Rules and equipment.

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EDITORIAL

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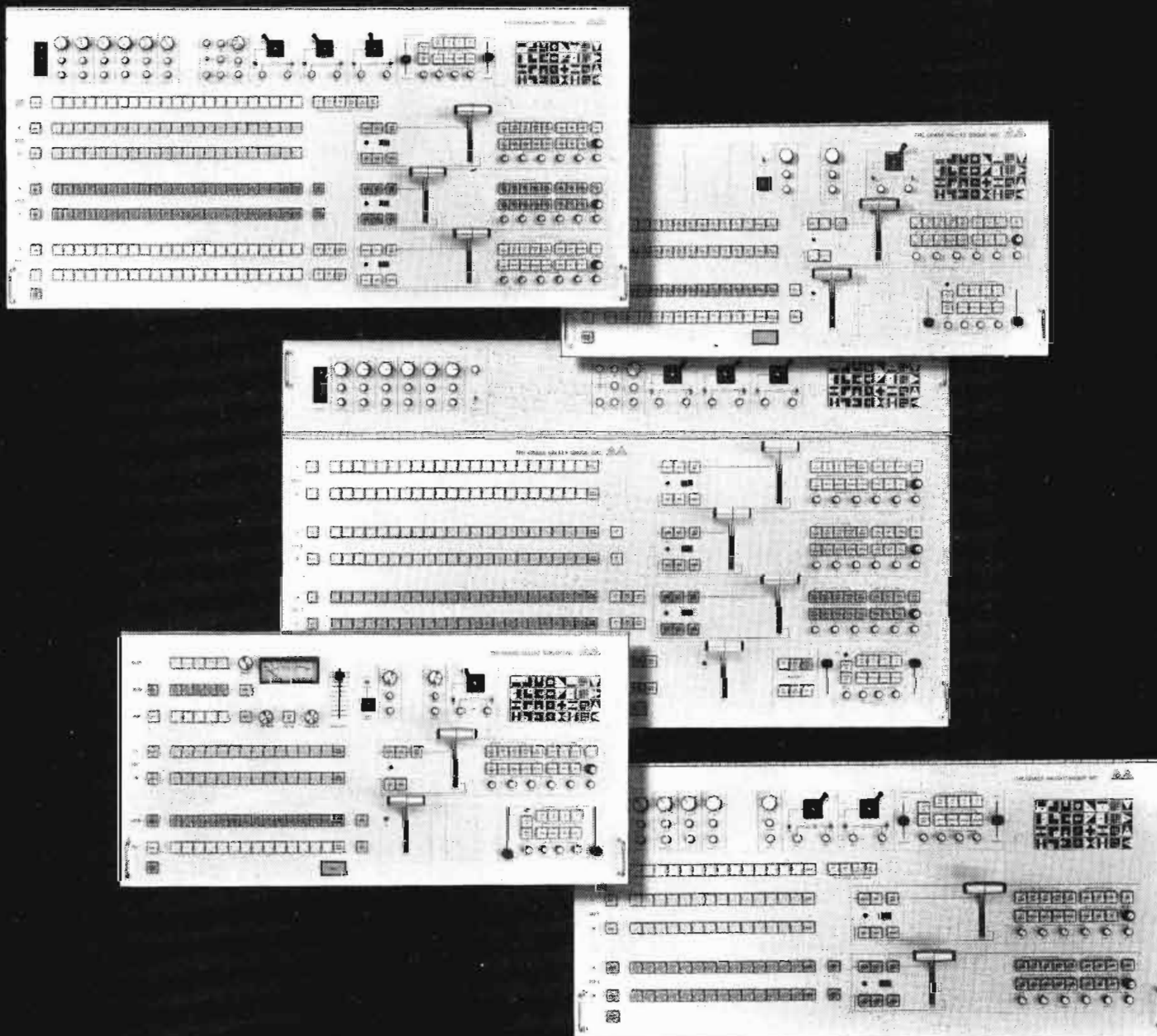
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DIRECT CURRENT FROM D. C.



February, 1976/By Howard T. Head and Harold L. Kassens

EBS Keeps Up Its Record

In keeping with the finest tradition of the Emergency Broadcasting System (EBS), the Commission is struggling to unravel an increasingly involved snafu generated by the adoption of the new two-tone signalling system for EBS.

The present deadline for the adoption of the system is April 15 of this year. NAB asked the Commission to extend this date for at least six months stating that the broadcasting industry is "in a state of confusion" and is "ill prepared" to meet the April 15 deadline. NAB insists that stations asking what the cost of new equipment would be have been given answers in the \$100 to \$700 range, and were also informed that the Government would issue a schematic from which station engineering personnel could build the required units for as little as \$50.

Several manufacturers of the signalling units have been granted FCC type-acceptance, and at least one of them has shouted "foul", stating that he has proceeded with the production of the units in good faith and has accumulated an expensive inventory. Commercial units are in the \$300 to \$700 price range.

It is going to take more than the Commission's usual wisdom to unravel this one. With the deadline so close at hand, some sort of extension seemed inevitable, it didn't happen. The deadline stands firm as we go to press. An article answering the most asked questions on EBS and including a list of manufacturers offering type-accepted equipment is included in this issue of BE.

Congress Gets Into the TV Allocations Act

The House Communications Subcommittee is making plans to let a research contract for a major study of the Commission's TV spectrum management. The study will concentrate on a review of the present TV channel allocations structure set up in 1952, and the need for and desirability of standards governing the performance of TV broadcast receivers.

The Subcommittee's action comes just as the Commission has been

(Continued on page 6)



Out In Front



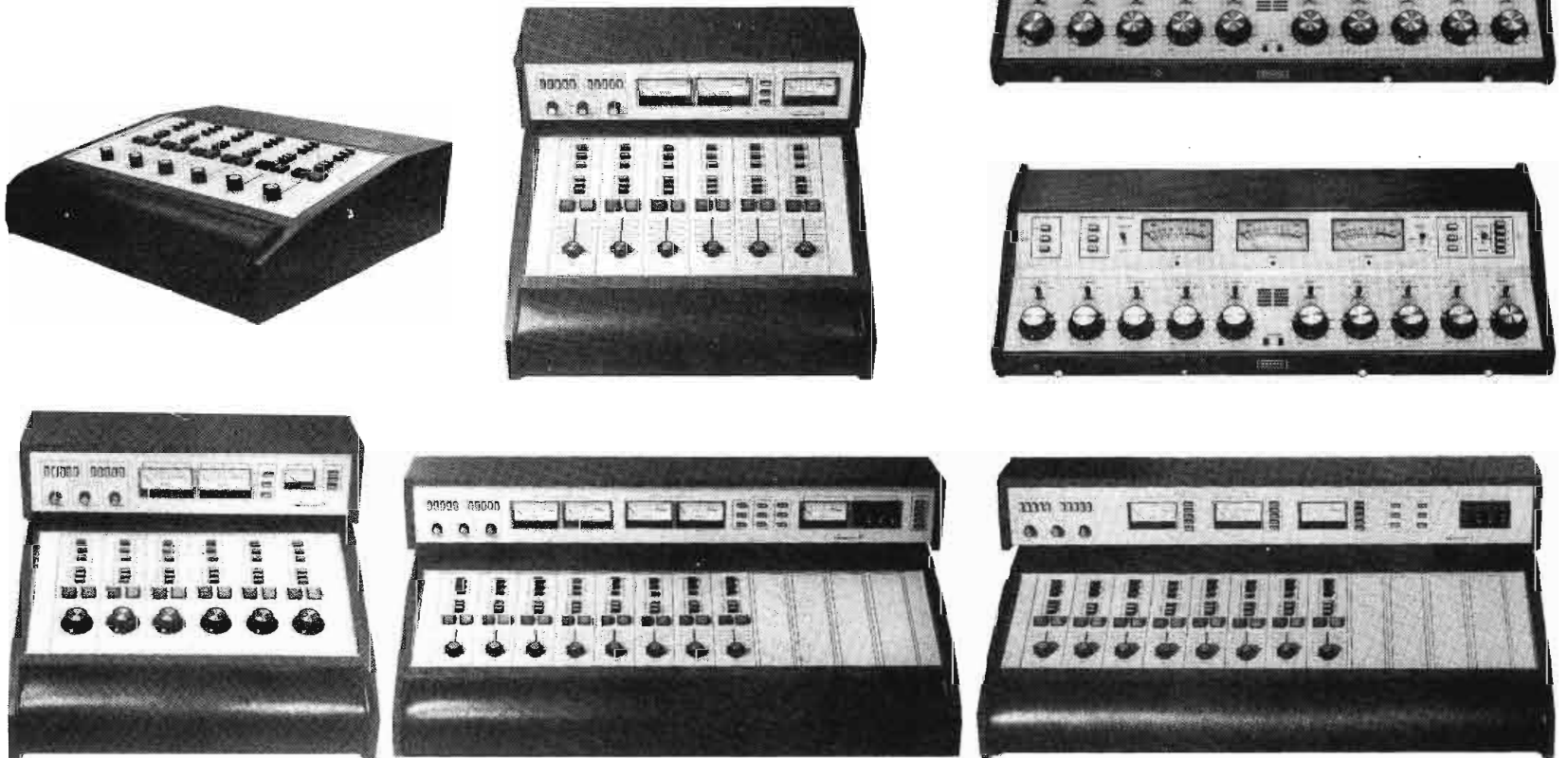
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(Continued from page 4)

deluged by thousands of pages of comments in its own inquiry into the VHF-TV allocations standards, occasioned by a report of the White House Office of Telecommunications Policy (OTP) insisting that a substantial number of additional VHF channels could be "dropped in" the top 100 markets. The Commission may reach some sort of decision this year, but there is an awful lot of papers to sort through in the process.

Expansion of FM Broadcast Table Under Study

The Commission has under study a proposal which would increase the number of FM broadcast channel assignments. A report is being prepared by the Commission's Chief Engineer's office which studies the effect of reducing the present 200 kHz separation between FM broadcast carriers to 150 kHz or even 100 kHz. A reduction from 200 kHz to 100 kHz could double the present 100 FM broadcast channels available in the 88-108 MHz band.

The Chief Engineer's report will be based on computer studies which calculate service radii and assignment "efficiencies" for the various frequency separations. Multiple interferences are combined by the use of the computer program, and the resulting efficiency is given in statistical terms.

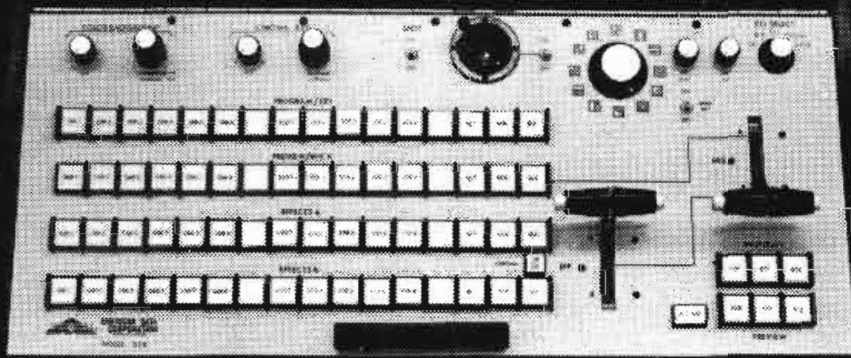
Don't expect early action on this one either. Both the Commission's Broadcast Bureau and the Commissioners themselves will have to be convinced that the overall effect of reducing the channel separation is in the public interest.

Short Circuits

The Commission has instituted an inquiry into the effects of automobile ignition interference...The Commission has declined to delete the requirement for the "beep tone" on telephone recordings although an exception has been made in the case of broadcast networks...The Commission has proposed to require TV stations to transmit emergency notifications visually as well as aurally for the benefit of the deaf...The Commission in a letter to a manufacturer has emphasized that r.f. amplifiers used to drive remote modulation monitors are not subject to FCC type approval, but the overall monitoring system must meet the requirements...It's time to plan for the NAB convention in Chicago. The Chicago Flower and Garden Show will be held at the same time. Their attendance numbers are staggering, so it will pay to keep this in mind. This magazine will give special pre-show coverage in the March issue and post-convention wrapup in the May issue.

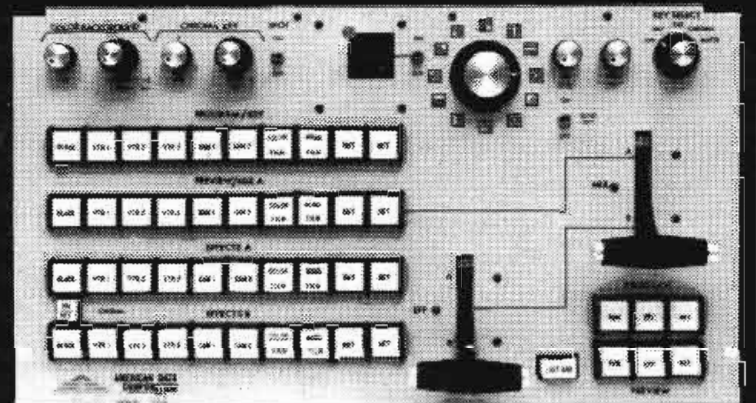
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For More Details Circle (51) on Reply Card

Ascertainment guidelines Have been revised

The Commission has revised its guidelines for ascertainment of community problems by commercial broadcast renewal applicants to provide a simplified procedure by which these applicants can carry out their required ascertainment of community problems and needs on a continuous basis.

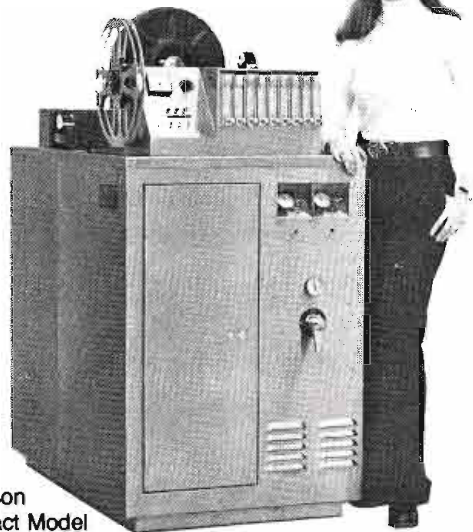
The action was the result of a further inquiry and rulemaking proceeding begun on May 6 to develop standards for the ascertainment of community problems and needs by commercial applicants. Ascertainment guidelines for non-commercial educational licensees have been proposed in a further inquiry and rulemaking in Docket 19816.

Under the new guidelines, the Commission eliminated the require-

ment that an applicant compile a compositional survey, and instead will require licensees to maintain, in their public files, a listing of certain demographic aspects of the city of license including total population figures, and numbers and proportions of males, females, minorities, youth and the elderly in the community.

The Commission also compiled a list of structural and institutional elements common to most communities—agriculture; business; charities; civic; neighborhood and fraternal organizations; consumer services; culture; education; environment; government (local, county, state and federal); labor; military; minority and ethnic groups; organizations of and for the elderly,

(Continued on page 10)



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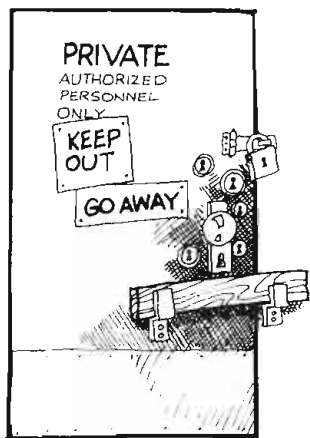
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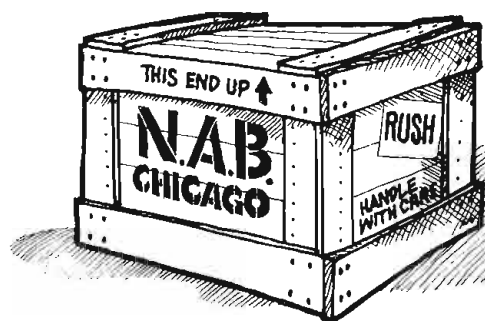
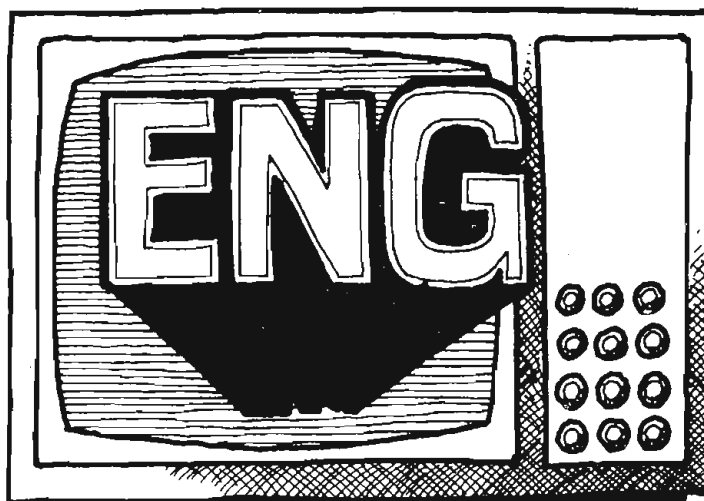
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A second **SECRET** has been uncovered!



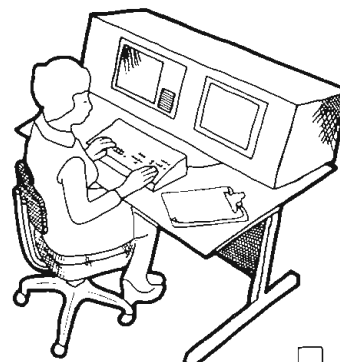
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For More Details Circle (8) on Reply Card

women, youth and students; professions; public safety, health and welfare; recreation and religion.

Interview Checklist

A licensee will be required to interview leaders from each of the elements on this checklist unless it can show an element is not present in its community. The Commission also included an optional category "other" in the checklist to make

allowances for certain elements not on the checklist but peculiar to a given community.

Interview Numbers

While it did not set a minimum on the number of interviews, the FCC established a reasonable number of interviews required to preclude a challenge to the "gross quantitative sufficiency" of a community leader survey. For cities of

license with populations under 25,000, the number would be 60 community leader interviews; for cities of 25,000 to 50,000, the level would be 100; for populations of 50,000 to 200,000 the number is 140; 200,000 to 500,000, 180; and over 500,000, the level is 220.

The Commission said it now would allow up to 50 percent of the community leader interviews to be conducted by non-management level employees under proper supervision.

The remaining interviews to be conducted by management should be allocated in such a way as to bring the officials and principals of a station into contact with a variety of leaders, particularly those who speak for the interests of racial and ethnic minorities and women, the FCC said.

While it retained face-to-face interviewing as a staple of leader consultations, the Commission said it was liberalizing the format of these interviews to allow licensees to include less formal contacts.

The Commission said while it expected the ascertainment process to be continuous throughout the license term, it was requiring licensees to submit their community leader checklists only with their renewal application.

It said based on these interviews, a licensee must present programming to meet some community problems. The Commission said it was extending to all commercial licensees, the current requirement that television licensees annually list no more than 10 problems they have discovered and the programs broadcast to meet these problems. These annual lists must be kept in the station's public file and submitted to the Commission with the renewal application.

The Commission said it was retaining the requirement that licensees conduct general public surveys of their community. These surveys may be conducted at any time during the license term and are to be placed in the licensee's public file together with a narrative statement of the sources consulted and the methods followed in conducting the survey, it said.

It said it would experimentally exempt all stations located in

(Continued on page 12)

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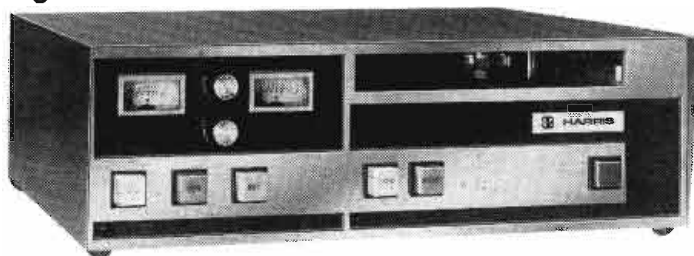
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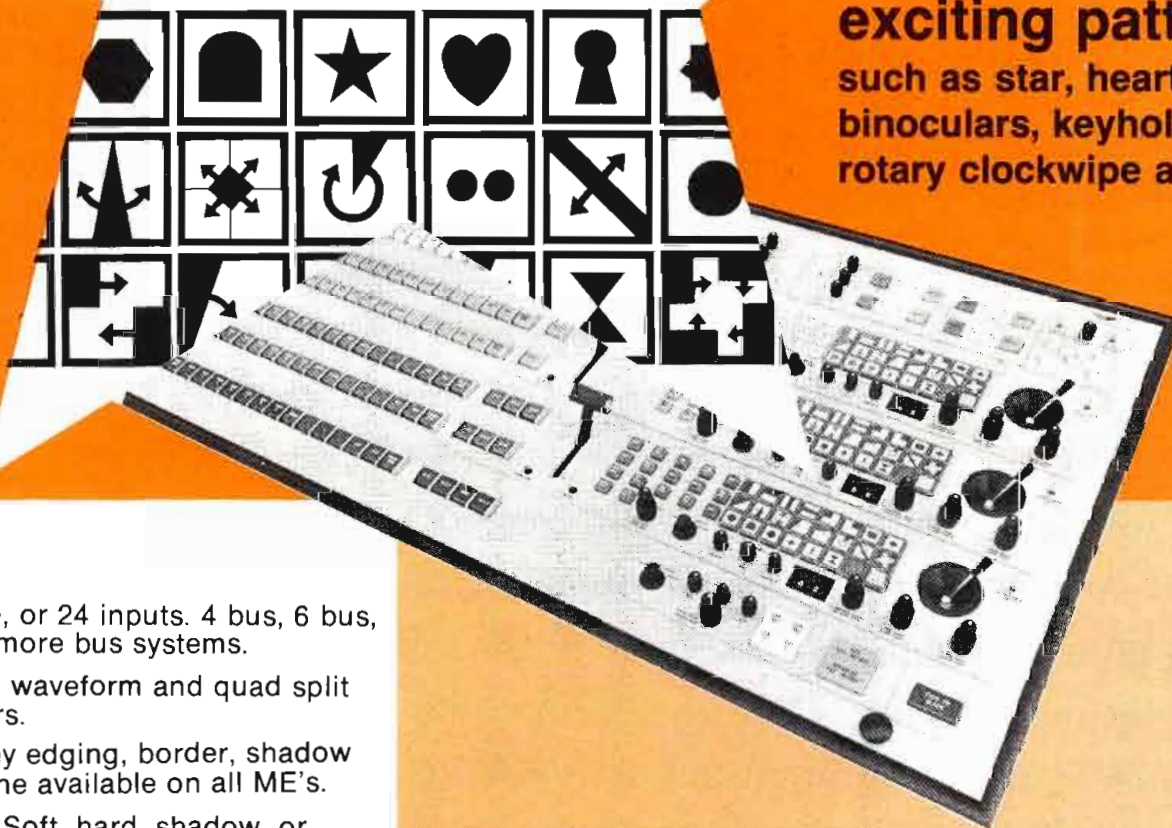
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Renewal Changes

(Continued from page 10)

smaller communities—those with populations of under 10,000 persons, and not within a Standard Metropolitan Statistical Area—from Commission inquiry into the manner in which they became aware of community problems and needs.

It said these licensees still would be required to remain conversant with community problems, but the exemption would allow the licensee to choose the method by which it becomes aware of these problems. It said licensees in these small markets would be required to prepare annual problems-programs lists and to submit them to the FCC with their renewal applications.

The Deadline

The Commission said any interview for which credit is sought on a renewal application must be recorded and available in the public file no later than the day the renewal application is filed with the Commission.

The revisions will become effective 30 days after Federal Register publication for licensees whose authorizations expire on or after December 1, 1976.

The Commission said renewal applicants whose licenses expire prior to December 1, 1976, would be expected to follow existing guidelines in the 1971 Primer on Ascertainment of Community Problems by Broadcast Applicants.

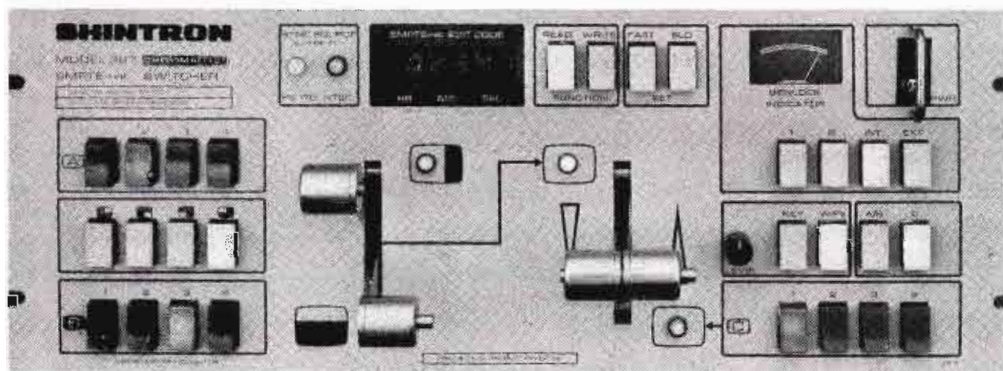
At the same time, the Commission adopted a Primer on Ascertainment of Community Problems by Broadcast Renewal Applicants setting forth in question and answer form the guidelines to be followed in conducting community leader and general public surveys. The purpose of ascertainment is to ensure that licensees fulfill their obligations to "operate in the public interest" by a "diligent, positive and continuing effort to discover and fulfill the problems, needs and interests of the public within its service area," the FCC said.

FCC proposes Antenna changes For AM

The Commission has proposed amending its rules governing certain aspects of the design of directional antennas for AM stations, to allow the antenna designer increased latitude in developing a radiation pattern meeting FCC allocation requirements.

The ability to assign a station to a particular community which will render the minimum service required by the rules, and at the same time, afford adequate protection from objectionable interference to existing stations, the FCC said, may depend on the employment of a directional radiation pattern of the proper shape and size. However, it said, in the mathematical design of the pattern, shape and size are interrelated, and a pattern of the necessary shape may be unduly large.

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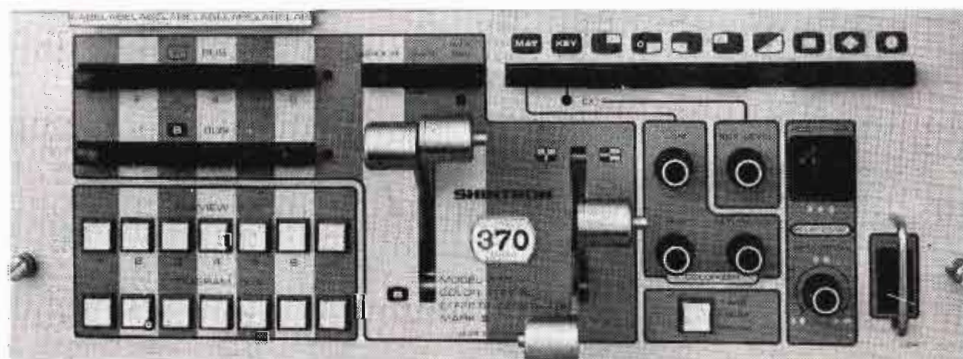
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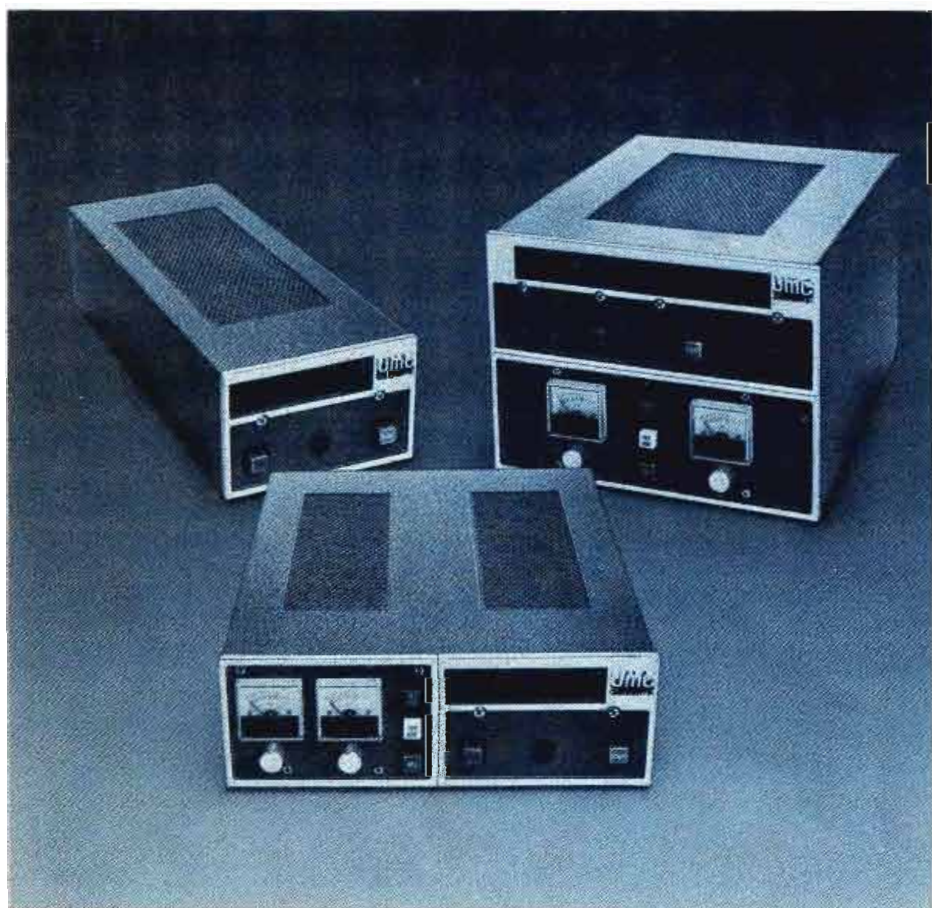


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The long wait for a superior broadcast audio cart machine is over. We've built all the most wanted features into our complete new line of mono and stereo A, B, and C-size cartridge tape recorders and reproducers. Compact size, reduced flutter and wow, and lowest operating temperatures are just some of the many advantages. And Beaucart meets the new NAB standards, too.

What makes this hot new machine the coolest cart machine you can buy? Beaucart was designed by the manufacturer of the quality BEAU motor and incorporates our low profile, patented pancake hysteresis synchronous direct drive motor. You've never seen anything like it. And you've never seen a cartridge machine like Beaucart either.

For complete information and pricing, write or call today. And look for us at Booth No. 712 at the Chicago NAB Convention.

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Chapter growth booming

The **Signal** office has received word of more Chapters forming around the country. Close to home, the old Philadelphia Chapter is being revitalized by Larry H. Will, acting president, who works for the State of New Jersey, Public Broadcasting Authority, at 1573 Parkside Avenue, Trenton 08638. He may also be reached at (609) 882-5252. Farther out in Central Pennsylvania, a group is gathering under the leadership of Chuck Baker who lives at 761 Wertzville Road in Enola, Pennsylvania 17025. Down the coast, in Atlanta, Georgia, Bob Wehrman, also an SBE Board

member, is organizing some people, and he may be contacted at Radio Station WSB, 1601 W. Peachtree, Atlanta 30309. Finally, in the Midwest, contact Greg Smith if you live in the St. Louis area. He works at KPLR-TV, 4935 Lindell Blvd., St. Louis, Missouri 63108; the telephone number is (314) 367-7211.

The SBE **Signal** office has received many letters regarding subscriptions. As a rule, **The Signal** is not available to non-members of the Society, however, for further information, please contact Vince Flanders, SBE, P. O. Box 88123, Indianapolis, Indiana 46209. SBE

members who have missed an issue should also direct their questions to Vince Flanders and let him check the computer mailing list.

A reminder to all Chapters considering a Regional Convention in 1976—the closing date for SBE confirmation is March 15, 1976. This process includes notifying all the Chapters in the area and then contacting both Vince Flanders in Indianapolis, and SBE President Glenn Lahman in Pittsburgh. Lahman's address is: KDKA, One Gateway Center, Pittsburgh, Pennsylvania 15222.

Welcome, Chapter 40

Congratulations go out to the San Francisco, California, group which has now become SBE Chapter 40. Art Leberman is chairman; Chuck Taylor, vice-chairman; and Robert Daines, secretary/treasurer. All correspondence should be directed to Bob Daines, Telemet, Western Regional Office, 1261 El Curtola Blvd., Walnut Creek, California 94595 or (415) 938-8887.

(Continued on page 16)

SPECIAL OFFER EXTENDED UNTIL MARCH 15th!
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\$595. complete all models

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REMOTE DISPLAY

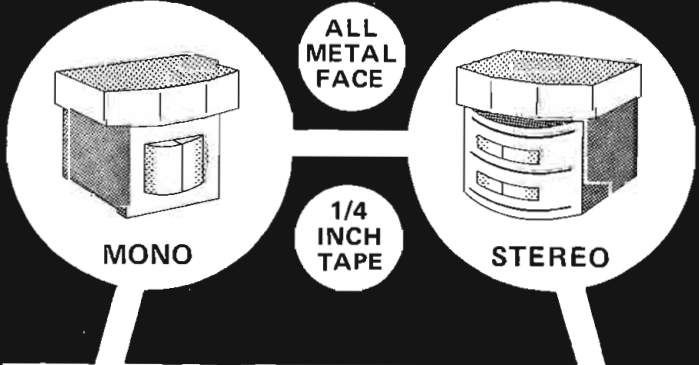
- + SEPARATE HOLD & RESET CONTROLS
- + SMALL SIZE, 2" x 2" x 4"

TIMER FEATURES

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- + EDITOR ACCESSORY OPTIONAL.
- + FITS VIDEO CART WINDERS.
- + AVAILABLE FOR IVC & OTHER MODELS.
- + RUBBER DRUM PREVENTS TAPE DAMAGE.
- + DRUM TOLERANCE +0.001 inches.
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SEND US YOUR ASSEMBLY. We will ultrasonically clean everything — install new heads if yours cannot be relapped — replace any worn or missing minor hardware — adjust — test — ship back PRE-PAID your assembly (not some other).

36 HOUR SERVICE — LOANERS AVAILABLE

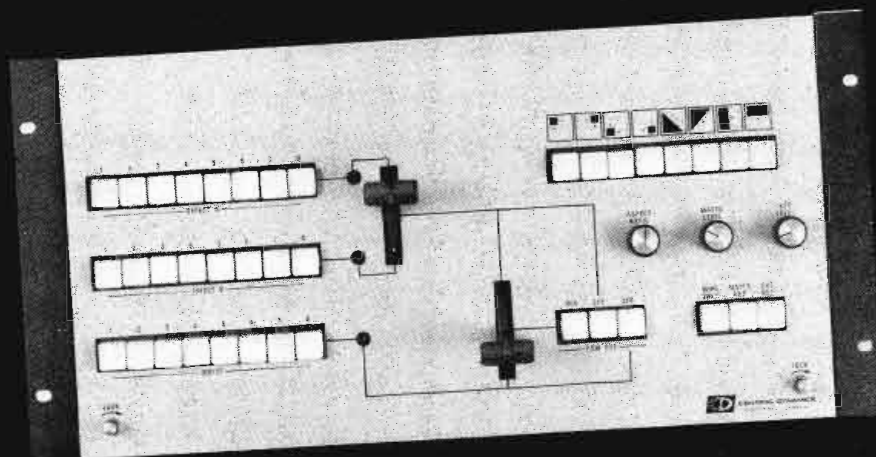
INSTALL YOURSELF. Buy MMI heads with complete written and pictorial instructions.

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small... is sometimes BIG ENOUGH!

Central Dynamics Introduces the New VS-10 TV Color Production Switcher for Mobile, CATV, Industrial and Educational Applications



Priced at Only \$3350,
we believe it represents
a major value break-
through for professional
programming with true
broadcast quality

You don't always have to be big and sophisticated to make it as a TV Color Production Switcher. The low cost VS-10 is an 8-input, 3-bus, compact, self contained, vertical interval, solid state switcher with ample sophistication for professional programming with *true broadcast quality*. Impressive special effects, mix amplifier, wipe/key amplifier, output selector and broad operational capabilities provide real production talent. A unique automatic special effects preview allows presetting keys and wipes for smooth, dramatic transitions to effects. The VS-10 lets you chroma key, matte key, wipe or dissolve to keys, dissolve or wipe between program sources, dissolve to special effects, or insert titles. Other standard features include a Cut Bus and true On-Air tally system. The VS-10 is compatible with NTSC, PAL-M and PAL color systems. All this... plus the proven reliability of the largest and most sophisticated Central Dynamics Production Switchers.

Sometimes . . .
SMALL is Big Enough!

Control Features

- Wipe** - Fader positions A & B signals. Aspect Ratio. Control varies configuration of 4 corner patterns.
- Keys** - Wipe Keys on or off. Key Level Control adjusts slicing level of key signals. Matte Level Control adjusts luminance value
- Mix** - Fader proportionally controls output signals from the Direct Bus and the Key/Wipe Amplifier.
- Switches** - Crosspoint and Output Selection switched in vertical interval with illuminated momentary pushbuttons. Wipe, Key Mode & Pattern switches are mechanically inter-locked pushbuttons. Tally lights on each input bus indicate "on-air" signal.

Specifications

- Video** - 8 loop through inputs (BNC) externally terminated.
1 V p-p composite or 0.7 V p-p non-composite synchronous signals.
1 External/Chroma Key input terminated internally. (CDL Chroma Keyer Module is optional)
- Pulse** - 1 Sync input (BNC) externally terminated, 2 to 6 V p-p.
- Tally** - Relay interface with 14-pin Amphenol connector with mating connector.

Power - 115 VAC $\pm 10\%$ 60 Hz or 230 VAC $\pm 10\%$ 50 Hz (switchable), 50 VA.

Mounting - Rack frame mountable with hinged front panel.
19" (483 mm) W x 8- $\frac{1}{4}$ " (22 mm) H x 7" (178 mm) D. All external connections are on rear of frame. 18 lbs. (8.5 Kg.)

Unit includes module extender.
Operating & Maintenance Manual.

Central Dynamics has earned a reputation as one of the unquestioned leaders in TV Broadcast Equipment. Our standard line of production switchers are priced from \$11,000 to \$70,000.

The VS-10 is the first of a series to be *engineered* and *priced* to fill the gap between inexpensive, inadequate switchers and the more sophisticated, expensive ones.

Solid-state technology, and volume production techniques allow the VS-10 to be offered at this remarkable price.

However, you purchase the VS-10 with complete confidence that it is backed by the engineering experience, integrity and reputation of Central Dynamics.

We are convinced, as you will be, that the VS-10 *Broadcast Quality*, TV Color Production Switcher is the best value available on the market. We're delivering production units now.

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(Continued from page 14)

SBE CHAPTER MEETINGS

Chapter 2 — Northeastern Pennsylvania

Chapter 2 met January 12 to hear Clarence Beverage, a representative for Collins Radio and also an SBE member, present a paper on intermodulation distortion, a hands-on demonstration of the Collins 310Z-2 FM exciter, the Crown IM distortion analyzer, the Sequerra monitor receiver, and the new TFT FM monitor. The meeting for February has scheduled a program by Harris Intertyne. (*John Kowalchick, Chairman, RCA Solid State Division, Crestwood Road, Mountaintop, Pennsylvania 18707, (717) 474-6761.*)

Chapter 15 — New York City

Members of Chapter 15 met January 8 to hear Mr. Kip Farmer, video sales manager for Western Union along with an engineering guest speak on "Networking by Satellite." Mr. Farmer discussed the Western Union domestic satellite network for both video and audio and showed the economics of such programming as opposed to copper or microwave tie-lines.

In February, Mr. Leonard Kahn of Kahn Research Laboratories will speak of his AM stereo system, and the March program will introduce Mr. Jack Hughes of NBC, who will discuss multiplexing.

Chapter 15 also announces that their local election of officers was moved from December to February to coincide with SBE national elections. (*John Lyons, Chairman, WWRL Radio, 41-30 58th Street, Woodside, New York 22377, (212) 335-1600.*)

Chapter 16 — Seattle, Washington

In December Seattle members of SBE welcomed Mr. Joseph Wu, president and founder of Time and Frequency Technology, Inc., to learn about TFT's new EBS 760. January's meeting, also held at the Norselander Restaurant, featured a representative from RCA who spoke on circular polarization of TV

(Continued on page 20)

BROADCAST ENGINEERING

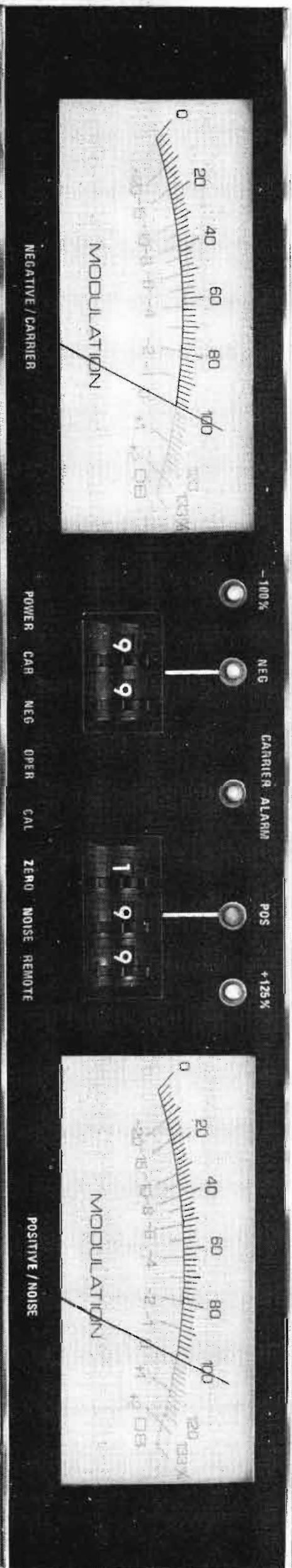
The AMM-3 is the best AM monitor available.

Ask Arno Meyer for a demonstration at the NAB - Booth 509.

FCC Type Approval No. 3-231

\$1300.

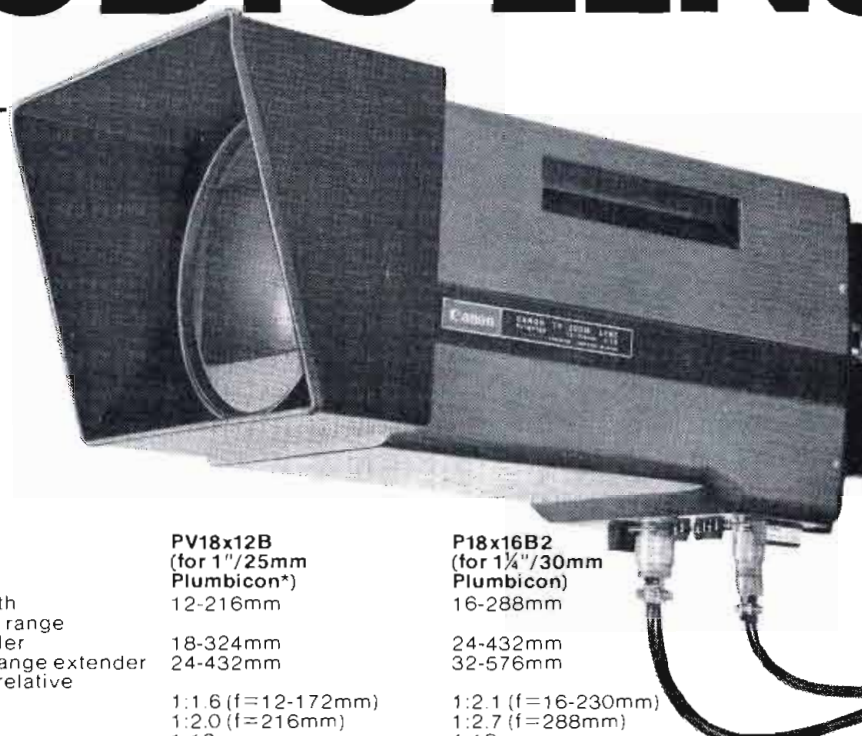
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BELAR
AM MODULATION MONITOR

CANON ANNOUNCES THE ULTIMATE STUDIO LENS



| | PV18x12B (for 1"/25mm Plumbicon*) | P18x16B2 (for 1 1/4"/30mm Plumbicon) |
|--|--|---|
| Focal length | 12-216mm | 16-288mm |
| with 1.5x range extender | 18-324mm | 24-432mm |
| with 2x range extender | 24-432mm | 32-576mm |
| Maximum relative aperture | 1:1.6 (f=12-172mm) 1:2.0 (f=216mm) | 1:2.1 (f=16-230mm) 1:2.7 (f=288mm) |
| Zoom ratio | 1:18 | 1:18 |
| Image format covered | 12.8 x 9.6mm; 16.0mm dia. | 17.1 x 12.8mm; 21.4mm dia. |
| Minimum object distance from front vertex | 0.7m (27.6") | 0.7m (27.6") |
| Object dimension at minimum object distance: Wide: | 103.2 x 77.4cm; 129.0cm diameter | |
| Tele: | 5.3 x 4.0cm; 6.7cm diameter | |
| Back focal distance | 62.65mm (in air) | 78.08mm (in air) |
| Glass compensation | 69.2mm (BK7) | 70.2mm (BK7) |
| Wavelength range for color correction | 400-700nm | 400-700nm |
| Weight | 17kg (approx. 37 lbs) | 17kg (approx. 37 lbs) |
| Dimensions | 466.5mm length x 284mm width x 260.5mm height | |
| Focus and Zoom control | Manual, with plug-in interchangeable servos | |
| Range extender control | Plug-in servo/manual | |

*TM N.V. Philips of Holland

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

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February, 1976

17



On March 21, Sony will reveal a major commitment to the broadcast industry.

That date is the opening of the 1976 National Association of Broadcasters convention in Chicago.

At the show, Sony will exhibit eight new video products specially designed for the broadcast industry. They represent the largest investment in broadcast equipment ever made by Sony.

But the new products are only part of the important things we will introduce at N.A.B.

A new organization. Formed specifically by Sony to serve the broadcast industry and headed by Dave MacDonald, our team of broadcast specialists is knowledgeable, experienced and eager to apply our technological leadership to your problems.

A new service policy. Sony recognizes that the broadcast industry cannot afford "downtime." At the show, we'll explain how we plan to service our equipment quickly and efficiently.

A new name. Sony Broadcast will begin to appear in many places. It's there to assure you that we're dedicated to the product and service standards necessary for the broadcast industry.

What this all adds up to, of course, is a major commitment on the part of Sony to the broadcast industry.

Sony Broadcast

A division of Sony Corporation of America, 9 West 57th Street, New York, New York 10019

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the little mother



dbx new 160 compressor/limiter

She's got a compression ratio you can set anywhere from 1:1 to infinity. And she's got a very low distortion figure even at high compression ratios. You can set her threshold from -38 to $+12$ dBm, and her two red LEDs let you know whether she's above or below threshold. Her meter range is from -40 to $+20$ dB, and you can set her meter zero at any line level between -10 and $+10$ dBm. Her illuminated meter is switchable to read input, output, or gain change.

She uses true RMS level detection, which you know is more reliable and accurate than other methods. Her dynamic range is enormous and her noise contribution practically negligible. Her output is automatically ground loop compensated and she is protected against turn-on and turn-off transients. She is beautifully packaged and small enough that you can take her with you wherever you go. Or you can bolt her into the rack where she'll give you a lifetime of faithful service.

You're going to love this little mother, especially when you learn her price. She costs only \$300.00, which is a lot less than you pay for those other mothers. She's available now at your dbx professional equipment dealer's. For complete spec information including the little mother's measurements, circle reader service card or contact:

dbx dbx, Incorporated
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Waltham, Mass. 02154
617/899-8090

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(Continued from page 16)

antennas. (Bob Ingalls, Chairman, 5441-187th Avenue, N.E., Redmond, Washington 98052. (206) 543-7774.)

Chapter 17 — Minneapolis / St. Paul

The December meeting of Chapter 17 was held at the University of Minnesota. Mr. Harold Allen, FCC Engineer in Charge of the District Office, led the evening's discussion on the two-tone EBS system and fielded other questions regarding FCC Rules and Regulations. (Lance Raygor, Chairman, Route 1, Box 337, Chisago City, Minnesota 55013, (612) 373-4807.)

Chapter 22 — Central New York

In Syracuse, New York, the December 18 meeting featured electronic news gathering equipment as Bob Powers of Videosound led the discussion/demonstration on the JVC and Magnavox cameras and associated recorders. Mr. Powers pointed out common pitfalls of the equipment and made suggestions for assembling the systems.

In January, Bill Bingham, president of Northeast Broadcast Labs, gave an informative program on AM-FM installation, offered ideas on testing and proof-of-performance techniques for AM and FM systems, reviewed the latest on EBS signaling requirements, and demonstrated some of the new EBS equipment.

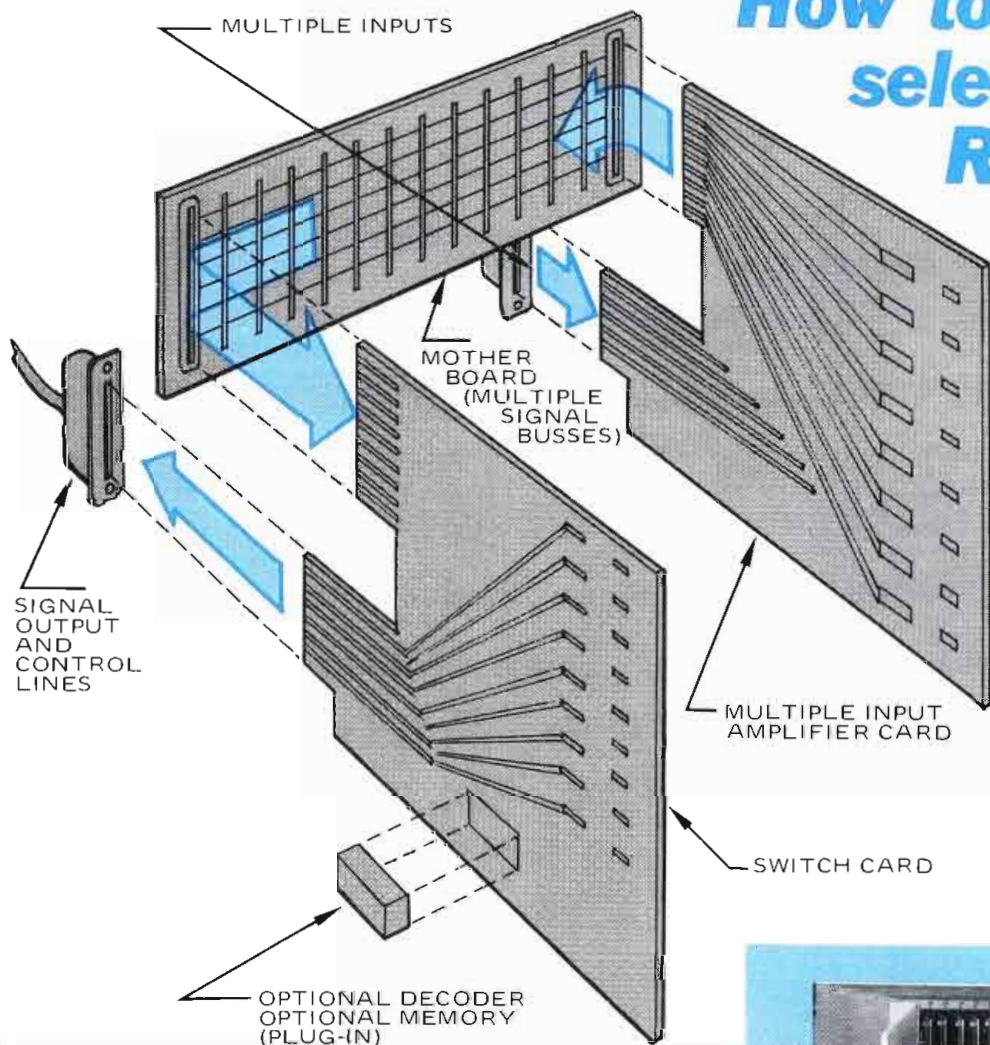
The meeting in February will feature Bob Griffiths from Telemet with a slide presentation and report on the history of television and test gear. (Gary Hartman, Chairman, WSYR, 1030 James Street, Syracuse, New York 13203. (315) 474-3911.)

Chapter 32 — Tucson, Arizona

Mr. Glen Hills, chief engineer of KGUN-TV, hosted the program December 9 as representatives from Broadcast Communications Devices held a program on electronic news gathering. Members had the opportunity at this meeting to see the new system using the "joy stick editor." (H. J. "Bart" Paine, Chair-

(Continued on page 22)

How to select a ROUTING SWITCHER!...



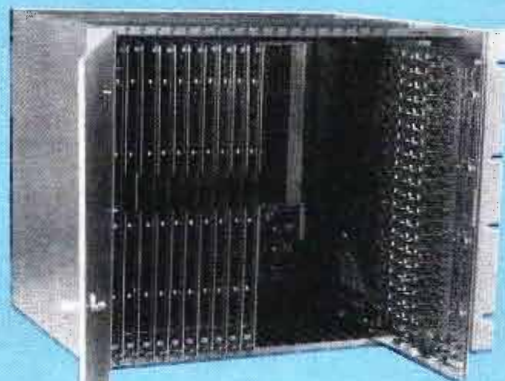
- Select for PERFORMANCE
- Select for COST EFFECTIVENESS
- Select for RELIABILITY
- Select for EXPANDABILITY
- Select for RELIABLE SOURCE

Select **DYNAIR**



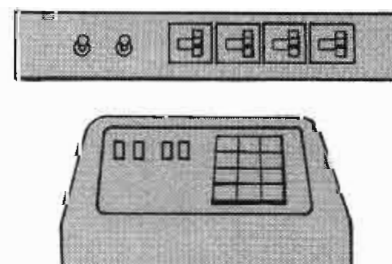
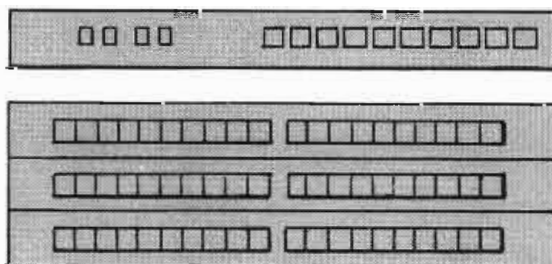
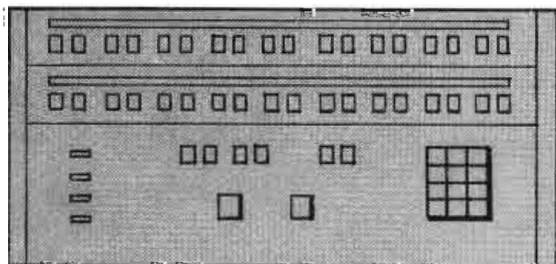
SERIES 8100 AUDIO SWITCHER

Frequency Response ± 0.15 dB (20 Hz to 20 kHz) — Harmonic Distortion less than 0.15% — Hum and Noise 85 dB below maximum output — Crosstalk better than 70 dB



SERIES 1400 VIDEO SWITCHER

Frequency Response 8 MHz ± 0.1 dB, 12 MHz ± 0.5 dB — Differential Phase 0.1° — Differential Gain 0.1% — Crosstalk better than 60 dB



Pushbuttons to computers control our switches. Specify from an inventory of standard controls, describe your desired control, or invent your own. Our crosspoints are addressed discretely or with BCD so flexibility comes naturally. **DO IT YOUR WAY!**

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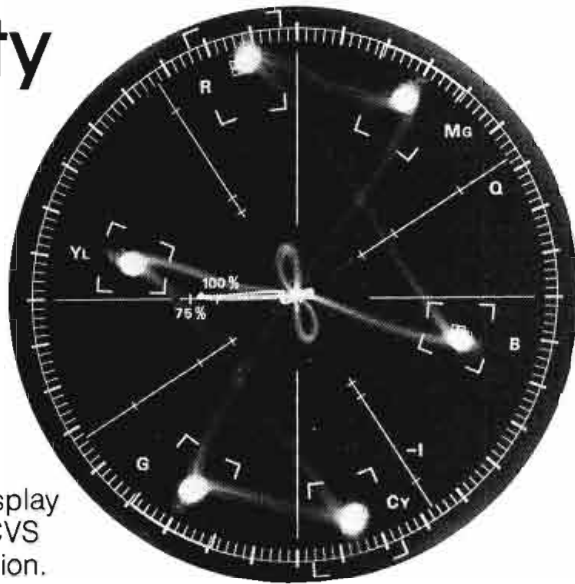
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The new CVS 504B Digital Time Base Corrector

Our quality
is easy
to see



Typical Vectorscope display of VTR playback after CVS 504B time base correction.

Gyroscopic effects, when running or turning, with portable ENG systems, poor stability of tape, and chroma level instability are but a few of the real world problems of video. The CVS 504B solves these problems.

And let's look at operation and maintenance. The CVS 504B requires only front panel control in all standard operations. Every PC board requires only seconds to install. These are just two examples of our strict adherence to modular design.

Then consider the fact that CVS has delivered more than 1,200 digital TBC's. That speaks for itself.

Know what to look for when you buy a TBC? CVS can help. Just ask. We will send you a "TBC Buying Guide" to assist you in evaluating the real world of digital time base correction.

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SBE

(Continued from page 20)

man, Chief Television Engineer, University of Arizona, College of Medicine, Tucson, Arizona 85724, (602) 882-6644.)

Chapter 37 — Alexandria, Va./ Washington, D.C.

Members of Chapter 37 had an excellent program prepared for them by Floyd Daisey, chief engineer of WFBR, Baltimore, who discussed experimental stereo broadcasts through WFBR-AM, using the Kahn AM stereo system. This evening meeting was held at the University of Maryland in College Park, beginning with dinner at 6:30 and the program following at 8.

Clarence Beverage, Collins Radio representative, who in the meantime had returned from visiting Chapter 2 in Pennsylvania, [see above] spoke to members of his own Chapter on January 28 on intermodulation distortion with a hands-on demonstration of the Collins 310Z-2 FM exciter, the Crown IM distortion analyzer, and the Sequerra monitor receiver.

This Chapter informs us via its newsletter that members are contemplating a Regional Convention, hopefully early in the year. (Charles Riley, Chairman, Tele-Color Productions, 708 N. West Street, Alexandria, Virginia 22314, (703) 683-3203.)

Chapter 39 — Tampa, Florida

On January 13, Tampa people welcomed Ralph Barlow, Engineer in Charge of the District Office, to hear a report on the various functions of the local office. The Chapter is hoping that they may be able to set up a regular feature with Mr. Barlow and have him give a 5-minute report every meeting. (George Shideman, Chairman, 1561 South Jefferson Avenue, Clearwater, Florida 33516, (813) 442-9133.)

Orlando, Florida

In December, Central Florida met at the Channel 24 studio to hear a program conducted by Don Anglin, chief engineer at WNBE/WBJW in Orlando, with assistance

(Continued on page 24)

AKAI RELIEVES BACK PAIN.

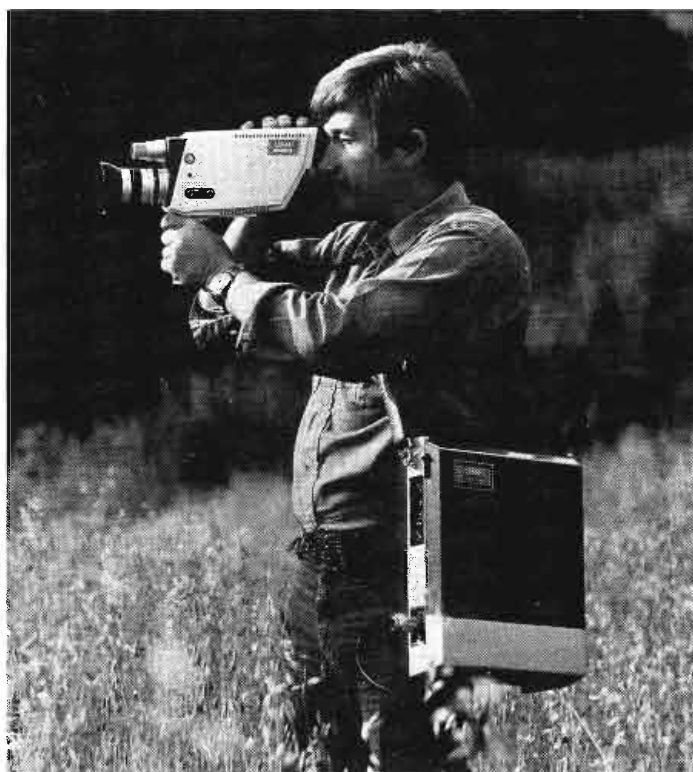
One of the common discomforts due to excessive videotaping is back pain.

Lugging around those 35 and 40 pound VTRs through crowds, down stairways, up stairways, up hills, steep hills.

Well, no more. Akai has a remedy — our new VTS-150B we call the Hustler.

The Hustler doesn't weigh 35 or 40 pounds like other recording units. It doesn't weigh half that.

In fact, it doesn't even



need to go on your back.

The Hustler is a 16 pound color videotape recorder you sling over your shoulder, and a 6 pound color camera you can carry in one hand.

No wonder 63 TV stations are now using our little Hustler.

The lightweight, two-piece, one-man operation that isn't a pain in the back — or anyplace else.

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Fast!



Don't Panic! Berkey Colortran Delivers Dimming Systems

Fast. Custom electronic lighting control systems in 90 days or less.

The control console shown above was completed in only 6 weeks—part of a 60 dimmer 5 scene preset system complete with dimmer racks, patch panel, power distribution equipment and lights.

Memory? Takes a few weeks more—Ask about our Memory Center.

Berkey Colortran can deliver the finest custom lighting control system in 90 days or less. Try us.

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(Continued from page 22)

from Ransome Welborne, assistant chief. Their seminar was an introduction to integrated circuits, history, design, construction, and practical application. A handout, passed out that evening, contained the building blocks of the IC application as Mr. Anglin discussed his personally designed IC bench tester equipment, along with current available literature on RTL, DTL, ECL, CTL, CML, HNIL, CMOS and I²L logic.

Mr. Joseph Lang, vice-chairman of the Orlando Chapter, conducted a seminar in January on loud-speaker design and application. (John Weyrick, Chairman, 5765-F Kingsgate Drive, Orlando, Florida 32809, (305) 857-3729.)

Squeeze Coming On Program Duplication

The FCC has instructed the staff to prepare for later release new rules to further curtail the amount of allowable program duplication carried on both AM and FM radio stations owned by the same licensee and located in the same local area.

The present rule (Section 73.242) limits FM stations in cities of over 100,000 to no more than 50 percent of the average FM broadcast week to programs duplicated from an AM station owned by the same licensee in the same local area.

Effective January 1, 1977, program duplication will be limited to 25 percent for all stations if either the AM or FM facility is licensed to a city with a population of more than 100,000 and duplication will be limited to 50 percent if either AM or FM station is licensed to a city with a population of more than 25,000 but not more than 100,000.

Effective January 1, 1979, the allowable amount of duplication the 25,000-100,000 category will drop to 25 percent.

Duplication is the simultaneous broadcasting of a particular program over both the AM and FM stations or the broadcast of a particular program by one station within 24 hours before or after the identical program is broadcast over the other station.

If your studio operates one or more helical scan recorders, a time base corrector is virtually a necessity. And now, cost is no longer a reason to restrict the versatility of your operation with a TBC that has limited flexibility.

The Edutron TBC-110A is more than a time base corrector. It's a total signal processing system including: -Time Base Corrector -Video Processing Amplifier -Sync Generator with Pulse Driver Outputs -Heterodyne Corrector and Velocity Compensation.

The TBC-110A will improve the time base stability of any helical VTR. It will make H locked VTRs broadcast stable, and timed to either studio sync or the internal crystal reference. Many V locked VTRs can also be corrected to stringent broadcast requirements in the H lock mode by supplying our variable



V Rate Recorder Driver pulse to the video input of the VTR. The less stable V locked, and all line locked recorders, can still be dubbed up to quad or helical broadcast recorders through the TBC-110A with rephased chroma, or distributed on cable systems with processed chroma.

The internal digital sync generator is clocked by a temperature controlled 14.318 MHz oscillator that surpasses

broadcast requirements and provides a full complement of synchronizing outputs. This provides an excellent primary sync generator or backup for either broadcast or production studio.

As you can see, the TBC-110A has all the credentials to make it perfect for small distribution systems or the most demanding studio requirements. The TBC-110A is remarkable! Send for our specs today.

At last.
A time base corrector
perfectly suited for
the most demanding studio situation.
At a price you can afford.



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EBS Countdown Is Nearing Deadline

By Joseph Wu

Mr. Wu is president of Time & Frequency Technology. Along with other manufacturers, he worked closely with the FCC on development of the new EBS equipment. He has a BSEE from Purdue, and a MSEE from Illinois Inst. of Technology.

During 1975 TFT had been actively involved with the FCC's Emergency Broadcast Division and the broadcasters in defining the specifications of the new two-tone EBS equipment required to be operational on April 15, 1976. In the engineering development phase of the EBS equipment many broadcast engineers and consultants were consulted by TFT regarding their daily use and interfacing problems of the EBS equipment in the broadcast facilities.

Because of our familiarity with the new EBS requirements, TFT has been invited by several regional Society of Broadcast Engineers to speak and give slide presentations on the subject at their meetings. A list of most frequently asked questions and answers have been compiled and condensed. These questions and answers might be timely EBS information for the readers in order to give them a better understanding of the EBS operations and also to help them to choose the right type of EBS equipment for meeting the April 15 deadline.

Q. 1—What is the purpose of The Emergency Broadcast System?

A—The EBS is designed to allow instant access to the broadcast media by the President of the United States and responsible officials in the state and local government in case of national, state or local emergency.

Q. 2—How does the EBS work?

A—The Emergency Broadcast System is a voluntary program initiated by the Federal Communications Commission in cooperation with the White House and the office of Telecommunication Policy. All broadcast stations are classified as either a participating station or a non-participating station. It is based on the chain principle. In each state there are key stations. These stations are called Common Program Control Stations (CPCS). These are the main stations that originate national and state level emergency broadcast, although any station in the EBS system may originate such a message, these are the designated key stations. The next station in the chain is called a Primary Relay station. The function of these Primary Relay stations is to

monitor the CPCS stations and when an emergency message for broadcast is received, relay it on to the next station and so on until all stations in the chain have received the message. For that reason it is very important that every station monitor the correct station or one that is assigned by the FCC. That way all stations are assured of receiving emergency messages.

Q. 3—What are the obligations of the broadcast station?

A—Every station must perform the following functions:

a) Conduct tests once per week between 8:30 a.m. and local sunset.

(b) They must monitor the station specified in the state EBS plan. This requires every station to have an EBS monitor receiver tuned and operating to the station so specified. Note that this applies to non-commercial educational stations as well as commercial stations.

(c) Log the weekly EBS test in the station's operation (transmitter) log.

(d) Keep the EBS **Checklist** (Big Yellow Folder) in a readily accessible place and known to all employees.

(e) Keep the Operational Map for your area as supplied by the FCC in a readily accessible location.

Q. 4—What are the routine obligations of a PARTICIPATING station?

A—In addition to those items listed in the question above, a participating station must additionally do the following:

(a) Participate in closed circuit tests. These tests are scheduled by the White House and the National Industry Advisory Committee on a random basis not more than once a month nor less than once every three months. It consists of live test messages sent down the AP/UPI/Mutual/NBC/ABC/CBS Audio wire networks. These national level tests will originate from the White House or a point selected by the White House with a program feed connected to the telephone company toll test center. The telephone company will interconnect as required the facilities of all audio networks. Additionally, the AP/UPI radio wire teletype network will be acti-

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vated for these tests. Upon receipt of this test, continue to monitor the radio network or the teletype line for further information.

(b) Enter the time of receipt of the closed circuit test in your station's operation log. (Remember the FCC may request a report of your station's participation in the closed circuit test.)

It should be noted at this point that non-affiliated stations to any of the above listed networks may order a loop from the local telephone company for use during activation of the EBS only.

Q. 5—Who initiates the EBS?

A—At the NATIONAL level it would be the President of the United States. At the STATE and LOCAL level, local officials, state officials (such as the Governor of the State) the local meteorologist in charge of the weather station, the local or state Civil Defense Director, or such other official as the station licensee deems appropriate. The Commission leaves it to the discretion of the station licensee as to who is a qualified local or state leader within that definition. It might be noted at this point that all 50 Governors have been advised of the existence and use of the EBS.

Q. 6—How does a station initiate the Emergency Broadcast System for its area at the present time?

A—The station begins by transmitting the ATTENTION SIGNAL. This consists of the following procedure:

(a) Cut the transmitter carrier for 5 seconds; (sound carrier only for TV stations).

(b) Return the carrier to the air for 5 seconds.

(c) Cut the transmitter carrier for 5 seconds (sound carrier only for TV stations);

(d) Return carrier to the air;

(e) Broadcast 1,000 cycle steady state tone for 15 seconds.

(f) The announcer then proceeds to announce the emergency condition as relayed to him by the state

or local official.

By this procedure other stations monitoring this station will know of the emergency condition and will repeat it for their area. They would follow essentially the same procedure as above. For example, suppose the local weatherman contacts the General Manager of Station A and advises him that there is a tornado warning for his section of the state. The General Manager would then proceed to initiate the EBS system as above described and then make the appropriate announcement. Other stations monitoring that station would do likewise.

Q. 7—Must the non-participating stations go off the air in the event of an EBS alert?

A—Non-participating stations do not go off the air in LOCAL or STATE emergencies and furthermore they may participate in the EBS during STATE or LOCAL emergency situations. However, in the event of a NATIONAL emergency, all non-participating stations must broadcast an announcement advising listeners to tune to one of the participating EBS stations. These participating stations appear on the State Operational Map which are supplied by the FCC. Upon this advisory to their listening audience in the event of a NATIONAL emergency, they must go off the air until the emergency is over.

Q. 8—May a participating station re-broadcast the message of the station it is monitoring in an emergency?

A—Yes. Stations operating emergency communications shall be deemed to have conferred re-broadcast authority on other participating stations. (FCC Rule 73.1207).

Q. 9—What should every station have in its possession to be within present FCC rules regarding EBS?

A—Every station must have the

following items at its station's studio location:

(a) The EBS Checklist (Big Yellow Folder) and the Authenticator Word List (Red Envelope).

(b) Special instruction card (White poster);

(c) A copy of the EBS Rules dated January 30, 1974;

(d) A copy of the STATE EMERGENCY BROADCAST SYSTEM OPERATIONAL PLAN;

(e) EBS (FCC) authorization posted with transmitter license.

All of the above items have been sent to every broadcast station licensed by the FCC, including non-commercial and 10 watt educational FM stations. If you do not have any or all of the above listed items readily available at your station, you should immediately contact the Emergency Broadcast Office of the FCC at 202-632-7232 and request the missing items. Or you may send a written request for these to Mr. Ray Seddon, Chief, Emergency Communications Division, Federal Communications Commission, Washington, D.C. 20554.

Q. 10—What is the Authenticator Word List?

A—This is a list of words contained in the red colored envelope in the inside front jacket of your EBS CHECKLIST (Big Yellow Folder). This is a list of code words that verify the use of the NATIONAL EBS system. They are contained in the red envelope. Do NOT open the red envelope until you receive an EBS Emergency Action Notification via UPI/AP any of the radio audio networks/or off-the-air monitoring of another station. The authenticator word lists are used to protect the integrity of the system and to prevent unauthorized activation of the system.

Q. 11—Are the Authenticator Word Lists changed periodically?

A—Yes, the lists are changed two times per year. Every station is required to keep this red envelope

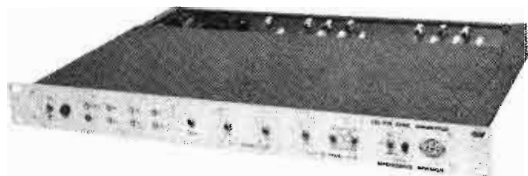
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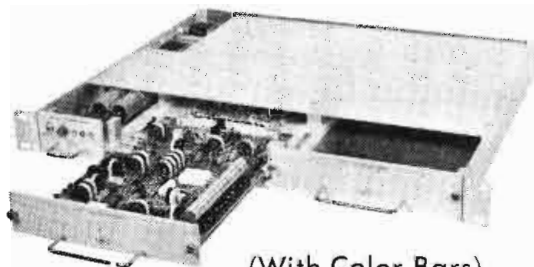


(With Dual Outputs)



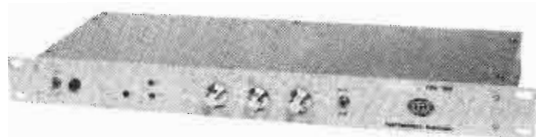
(RS-170 or Helical Genlock)

NTSC COLOR ENCODERS



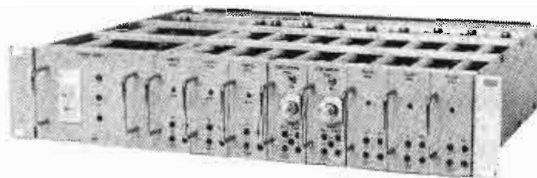
(With Color Bars)

COLOR STABILIZING AMPLIFIERS

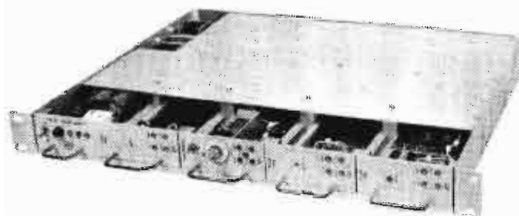


(Video AGC & Chroma Control)

VIDEO, PULSE, SUBCARRIER DISTRIBUTION



8 Unit Frame



4 Unit Frame

VIDEO PRESENCE DETECTOR



(A-B Automatic Video Switch)

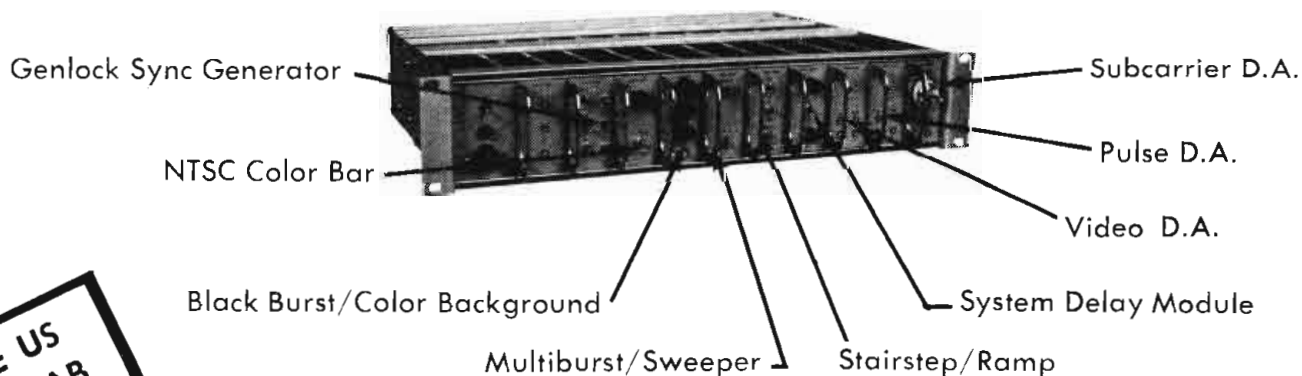
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with its CHECKLIST whether the station is participating or non-participating station.

Q. 12—When is the ATTENTION Signal transmitted?

A—The ATTENTION signal is used only in (1) off-the-air monitoring tests; or (2) in an emergency situation (either National, State, or Local emergency).

Q. 13—When a station receives a "CLOSED CIRCUIT TEST" message over the news wire, what should the station employee do?

A—The operator should log the receipt of the message in the transmitter (operation) log and NOT THE PROGRAM LOG.

Q. 14—Could I schedule the weekly test so that it falls on the same day of the week?

A—No. The tests are to be RANDOM, that is, not scheduled at any particular time each week. The idea here is to permit all employees to be exposed to the procedures required in an emergency should they be on the air at the time of the emergency. The employees should be reviewed on the procedures periodically and should be reminded of the location of the EBS CHECKLIST.

Q. 15—I understand that the EBS station to monitor is assigned by the FCC. What should I do if I can't receive that station?

A—If you are having problems receiving your primary relay station, you should notify the FCC for another assignment giving them your preferences, if any, of other stations to monitor.

Q. 16—What are the highlights of the FCC Rules released by the Commission in August 1975 regarding the two-tone EBS?

A—a. The attention signal is changed to 853 and 960 Hz two-tones.

b. Each of the two tones shall separately modulate the transmitter at no less than 40%.

c. The Two-Tone Encoder must be typed accepted by the Commission.

d. The Two-Tone Decoder must be certified by the Commission.

e. All AM, FM, and TV stations must have the equipment installed by April 15, 1976.

f. The 10-watt educational stations are exempt from generating the two-tone signal, but are still required to have the receiver and decoder.

g. Stations wishing to build their own encoder and decoder are required to file for Type Acceptance and Certification; however, if the quantity is five or less and not for sale, they are not required to pay the fees.

Q. 17—What are the FCC Technical Requirements of the Two-Tone Encoder?

A—a. Frequencies: 853 and 960 Hz ± 0.5 Hz.

b. Harmonic Distortion: less than 5%.

c. Output Level: +8 dBm (600 ohms).

d. Period of Two-Tone: 20 to 25 seconds.

e. RF Environment: 10 V/m AM Frequencies, 0.5 V/m FM and TV frequencies.

f. Operating Temperature: 0° to +50 C°.

g. Line Voltage: 100 to 135 VAC.

h. Indicator Device: Visual or aural indicator to show system is activated.

i. Switch Guard: COMMAND switch must be protected from accidental activation. Same applies to remote COMMAND switch.

Q. 18—What are the FCC Technical Requirements of the Two-Tone Decoder?

A—a. Time Delay: 8-10 seconds.

b. Operation Bandwidth: ± 5 Hz.

c. Reset Ability: a switch should

be provided to reset receiver to a muted state.

D. Operating Temperature: 0 to 50° C.

The author wishes to thank Mr. Perry, the publisher of the Perry Publications, for the permission of using a portion of the materials published in the June 15, 1975 issue of **Perry's Broadcasting and the Law**.

**EBS Equipment
Manufacturers with
FCC type approval
(encoder and decoder)**

A. C. Radio Co.
370 South West 13th St.
Pompano Beach, Fla. 33060

Audio Engineering Co.
4112 Oak Lane
Gary, Ind. 46408

Avcom Inc.
P.O. Box 29153
Columbus, Ohio 43229

Bald Mountain Lab
230 Bellevue Rd.
Troy, N.Y. 12180

Branco div., Ledex Inc.
P.O. Box 706
Piqua, Ohio 45356

Elcom Engineering Co.
13161 Barrett Hill Circle
Santa Ana, Ca. 92705

Gorman-Redlich Mfg. Co.
6 Curtis St.
Athens, Ohio 45701

*International Nuclear Corp.
608 Norris Ave.
Nashville, Tenn. 37204

McMartin Industries Inc.
4500 So. 76th St.
Omaha, Nebr. 68127

Neff Electronics Inc.
P.O. Bx 317
Beltsville, Md. 20705

Rivers Associates P.O. Box 58
Leominster, Mass. 01453

Telco American
P.O. Box 10207
Knoxville, Tenn. 37919

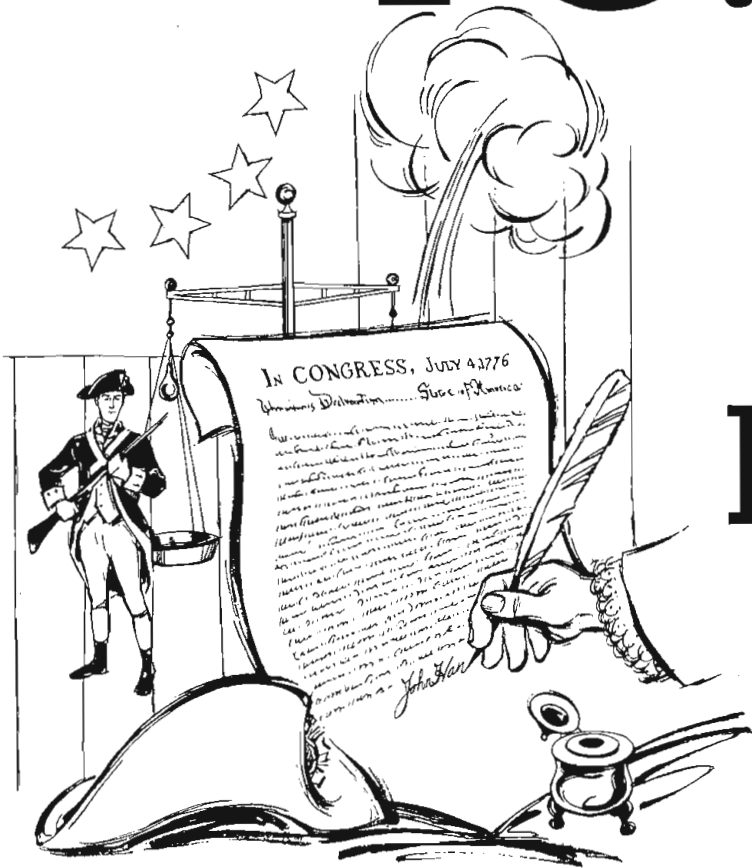
Time & Frequency Technology, Inc.
3000 Olcott St.
Santa Clara, Ca. 95051

The Waldon Co.
810 Dyches Dr.
Savannah, Ga. 31406

*Decoder approval not confirmed at press time.

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- ✓ Dual STL for FM Stereo
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- ✓ Digital Transmitter Remote Control System
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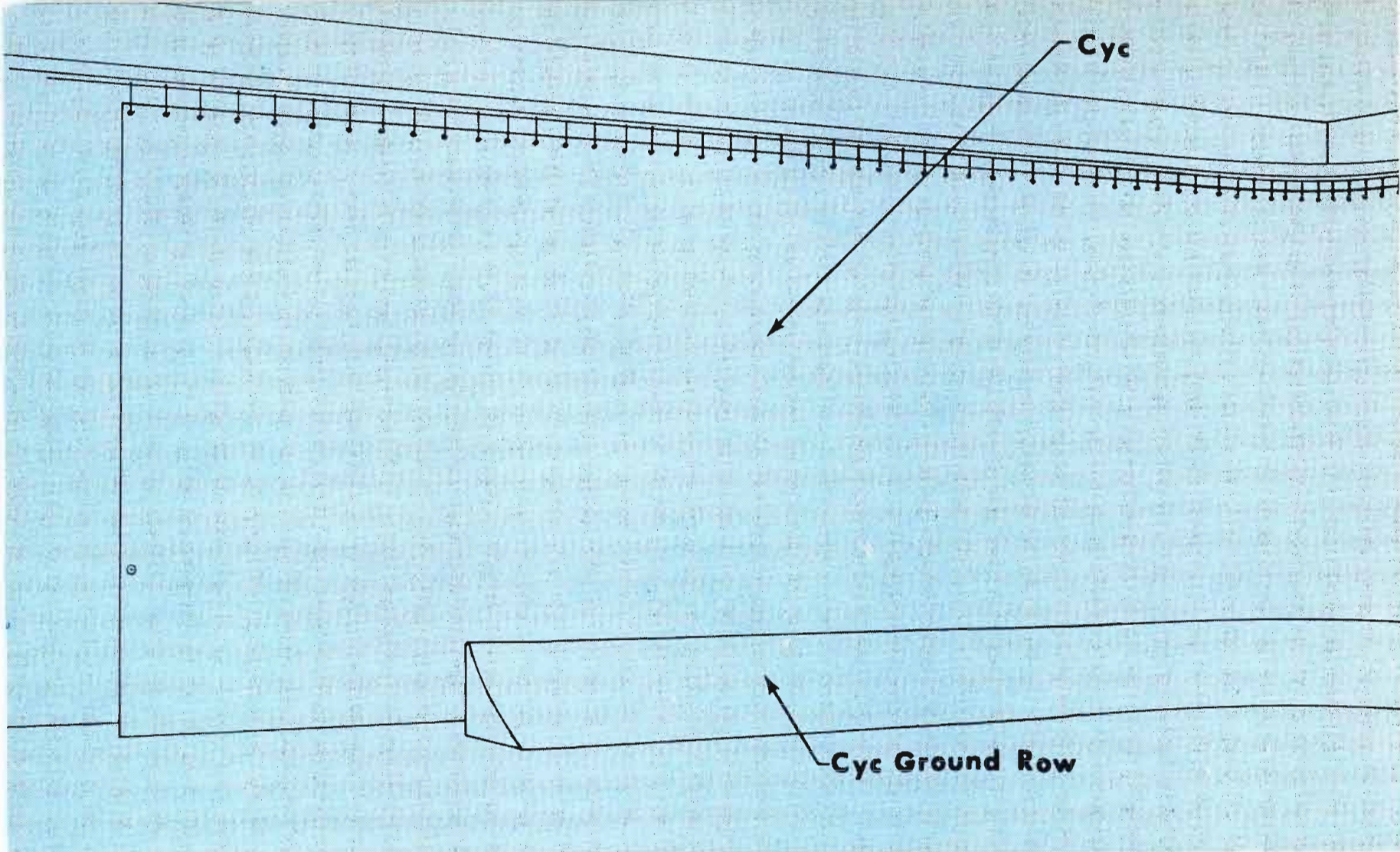
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Design and construction notes

Basic Set Types

First of all, some background information. There are four basic categories of studio sets: Neutral, Representational-Supportive, Suggestive, Realistic and Fantasy.

The first two, Neutral and Representational-Supportive, are the most used. Often, "Neutral" would be better called "nothing," since this type of set is usually represented by a blank wall, often painted chroma key blue. Other terms used to describe the completely Neutral set are "limbo" (nothingness) and "cameo" (a completely **black** background, as opposed to limbo, which can be **any** solid tone or color).

The completely neutral set is easy to "construct", since all you need is a smooth, unbroken wall and a bucket of matt-finish paint. This type of set, of course, is pretty unexciting and it is about as far from an original idea as you can get. It definitely has its place, however, when used creatively and

sparingly. Since there is nothing present to divide attention or distract viewers from your center of pictorial interest, this type of set can be reserved for focusing total attention on a picture's subject. The subject matter, therefore, has to be strong enough to hold interest and attention by itself. But, remember, even a diamond looks better in an appropriate setting.

When the neutral set is used for chroma key purposes, the background doesn't have to be one solid, unbroken color or tone. As long as tonal qualities remain within reasonable limits, you can try out patterns of relief in the surface of the background by including, for example, letters, logos, etc. In this way, when the wall isn't keyed out, the viewer will be able to see something more interesting than blue nothingness. When using relief patterns, just remember that the lighting on the background will have to be fairly

flat and consistent from show to show. Otherwise, you may find that a key is correctly adjusted (clipped) in one area of the picture, while another area exhibits a "tearing" effect.

Generally, chroma key makes use of a royal blue colored background, a color which has been found to be the most practical and successful. Often, several shades of blue can be keyed out simultaneously, which makes possible the design of more interesting backgrounds. Although blue is most often used in chroma keys, any color can (theoretically) be keyed out of a scene, depending upon the flexibility of your equipment.

The Cyc

The cyc (short for cyclorama) is another type of Neutral set. Traditionally, cys have been made of tightly-stretched ceiling to floor canvas, covering at least two walls by gently curving undetected around the 90 degree corners. (See

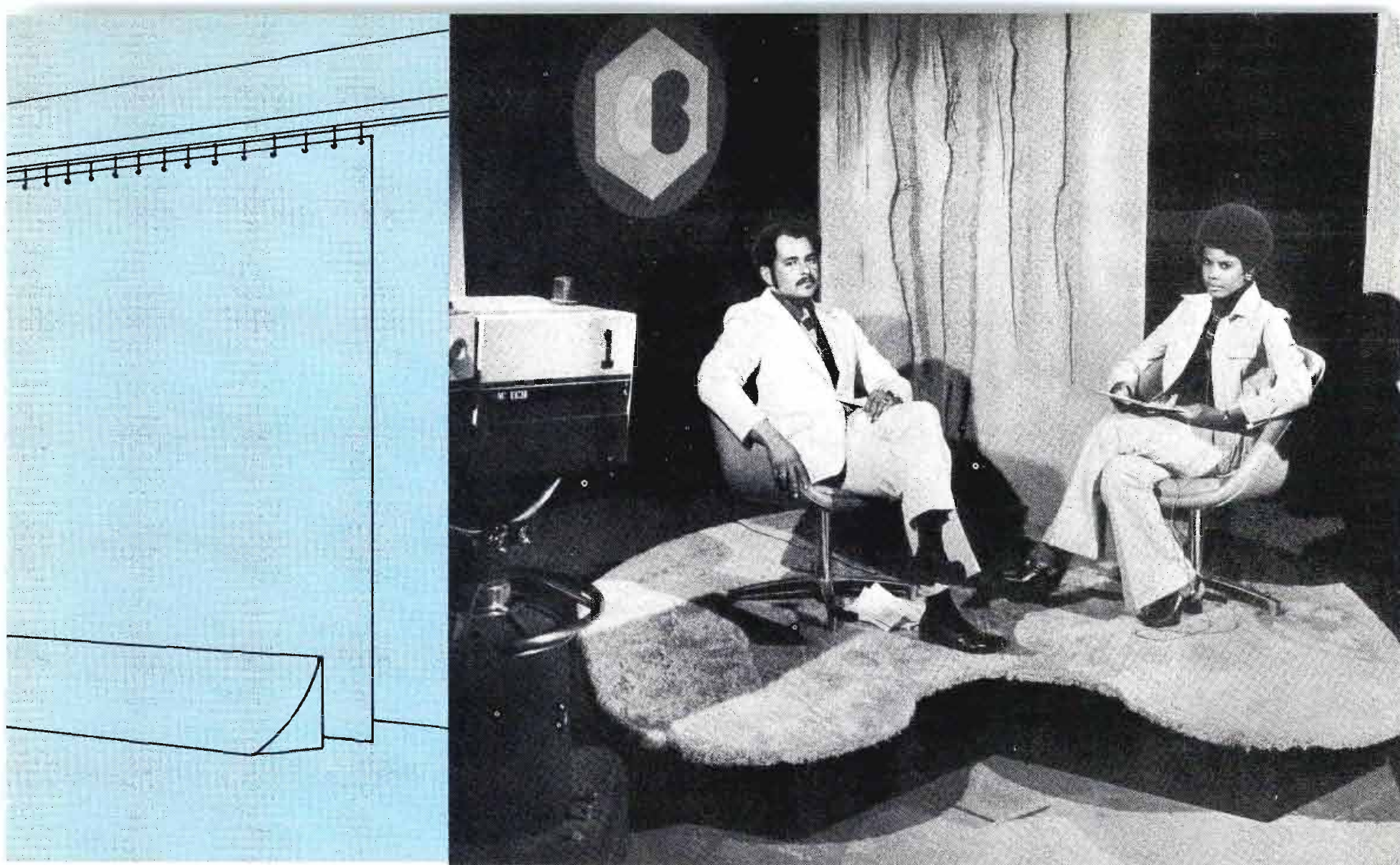


Figure 1

for studio sets By Ron Whittaker, University of Florida, Gainesville, Florida.

Figure 1.) Cyscs can also be made of plaster, or, in fact, any material which can be finished so that seams and corners will not be visible. Through the use of strong, directional lights covered with colored gels, or through the projection of interesting shadow patterns, cyscs can be made into simple but interesting backgrounds for subject matter requiring a relatively large space.

There is one other type of "Neutral" background which (fortunately) has all but dropped from the television scene—curtains. At one time, no respectable television studio was without at least two colors of curtains which could be pulled around the walls of the studio to provide an instant background for anything. Television's reliance upon curtains undoubtedly came from its theatre heritage. For the most part, nowadays, curtains or drapes are useful in a TV studio only when they are made to appear

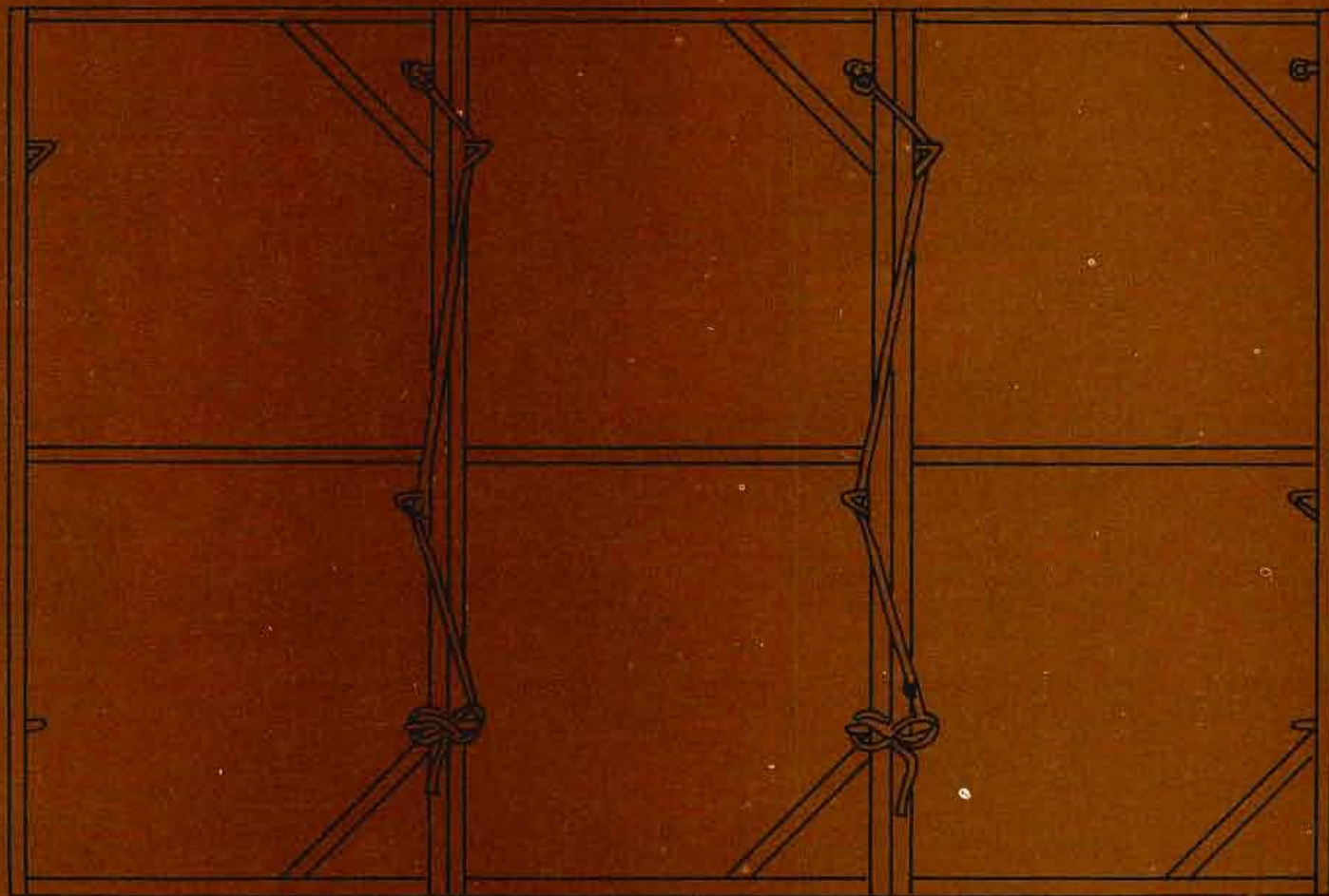
like something other than what they are! Solid, satin-type black curtains can produce an excellent cameo background, which will provide a stark effect (in limited doses). There are also light grey and off-white curtains which can be stretched tightly for a cyc-effect. A curtain fabric which shows wrinkles can be a real curse in the latter situation, however.

Representational-Supportive Sets

News, sports, weather and most studio interview sets fit into the category called "Representational-Supportive". In the case of the weather set, the background is more than just supportive, since it is a vital prop in the show itself. Weather sets need to be simple with highly legible lettering and outlines, and they should be very well lit from the top or sides to hold shadows to an absolute minimum.

If you are set up for chroma key for use in news and sports programs, you will want at least one camera angle on these sets to pick up a background which can be keyed out. If you only have one studio camera available on each announcer, you will probably want to construct a background behind each with an appropriate design done in relief or with different shades of blue. Prior to designing and painting a whole set, it is imperative that you carefully check out background tone and color saturation levels with your particular chroma key equipment by checking the paints and designs on a small test area.

If you have two cameras available for the news and sports sets, you will find it more visually interesting to shoot your announcers from two camera angles; one which leaves open an area of background to one side of the announcer for chroma keys and another, 45 or so degrees



Joining flats by lashlines.

Figure 2 Sets are made up of flats. They usually are from eight to twelve feet high. Here you see the flats joined by lash lines.

to the other side, which picks up a different background area which is not restricted by the chroma key process. Set elements and props containing additional colors and an expanded tonal range can be used in the latter area.

Before discussing the construction and painting of sets, it would be well to cover the other three types of sets, even though they are not used nearly as much as the Neutral or Representative-Supportive types. The "Suggestive" type set (sometimes called the "Atmospheric Realism" type) represents in the most simple and basic way a real setting. A shadow pattern of leaves on a cyc area would suggest the outdoors, or a desk and part of a bookcase could suggest an office. This type of set is useful for simple commercials when you want to suggest a locale without the necessity of completing a full Realistic setting. The "Realistic" or "Replica" set is just what the name implies—an accurate looking reproduction or copy of the scene being depicted. Various types of dramas and situation comedies require this type of set for authen-

ticity. The "Fantasy" setting has little direct relation to any real locale. Often, it is a bizarre and deliberate distortion of reality.

Set Construction and Materials

Sets are made up of unit sections called "flats" which are joined together. Flats are from eight to twelve feet high (depending upon the height of your ceiling) and are four or more feet wide. There are two basic types of construction—hardwall and softwall.

The Softwall Flat—Softwall flats consist of frames made of one-by-three inch wood covered with canvas (bleached muslin). (See Figure 2.) The canvas is stretched over the frames and attached with staples and glue. The surface is then coated with a flame-proof sealer before painting. Softwall flats can be joined together and painted to represent any interior or exterior scene or background. Softwall flats are light, easy to work with and easy to repaint. Their major disadvantages are that they can be easily torn and that they will

quickly show wear with continuous use. Softwall flats are an excellent choice, however, for limited use situations, such as specials, where low cost is a factor and longevity isn't.

The Hardwall Flat—The hardwall flat is the basic setpiece for most stations. This type of setpiece has a frame made from one-by-threes or two-by-fours covered with composition board or paneling. A visit to your local building supply house will reveal the tremendous range of designs and surfaces available. Or, if you can't find a ready-made surface for your needs, cover the frames with unfinished composition board and paint on your own finish. Stippled patterns, for example, make an interesting finish. These are made by applying paint with a coarse brush, sponge, wrinkled paper, or cloth. This technique can be helpful in suggesting stone, cement, or earth. Some sort of texture is desirable for most flats to hide the inevitable smudges, fingerprints, gouges, etc., as well as to make the background more interesting.

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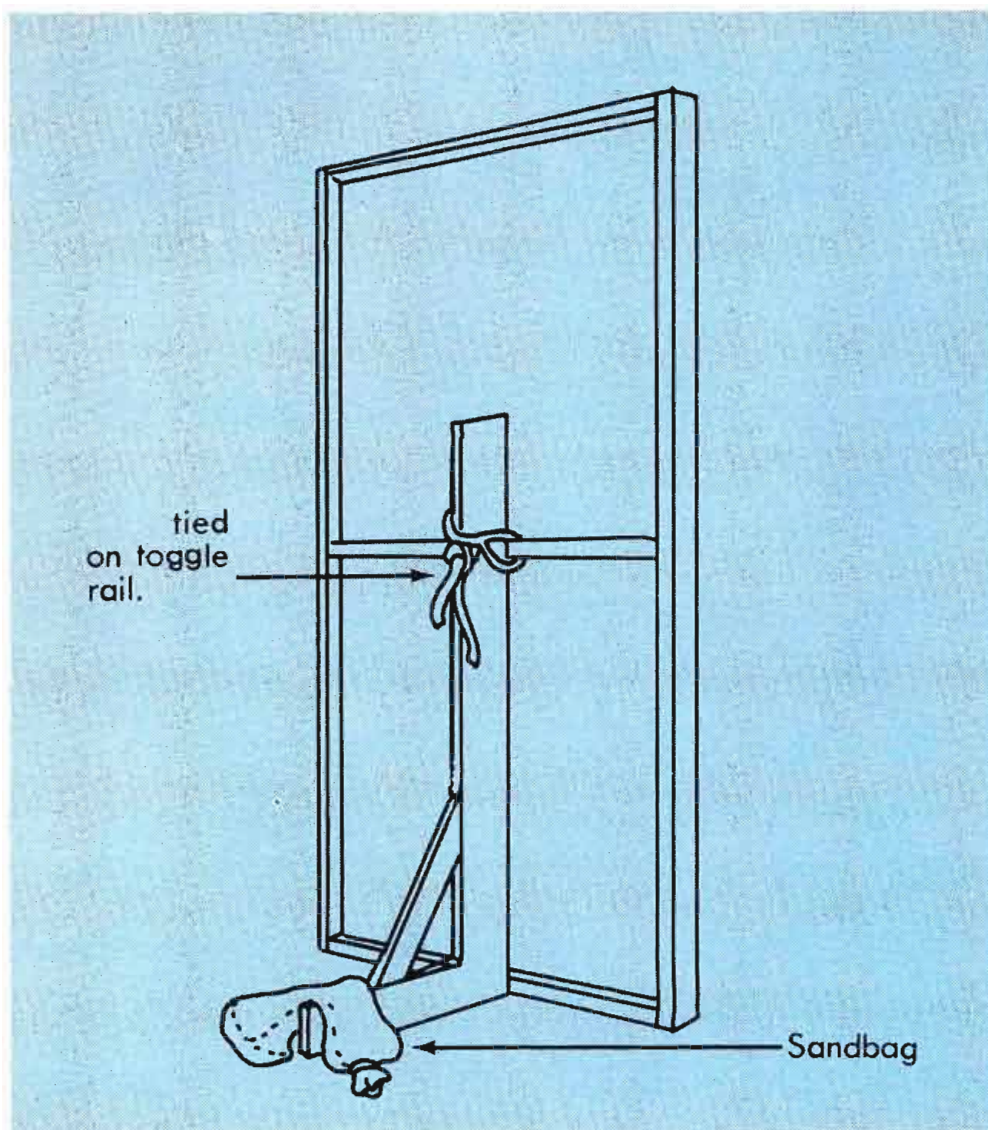


Figure 3 Backside details for supporting a flat.

Wallpaper and contact paper can also be used to cover flats. A myriad of colors, patterns, and textures are available. Contact paper and some types of wall paper have a self-sticking backing which is a vast improvement over the old brush and paste approach. Regardless of the choice of covering, however, remember that a shiny surface can cause some real problems in reflective "hot spots." So, be on the safe side and select a surface with a dull, matt finish.

Supporting Flats

Figure 3 shows how a soft or hardwall flat can be made to stand on its own, away from a studio wall. Here, a one-by-four inch "L" brace is tied to the flat and then sandbagged for stability. The same approach will apply when you want to lash several flats together, as indicated in Figure 3. In the latter case, you can use your discretion about how many "L" braces will be necessary to hold up a section of flats. Just make sure that if you err in your decision, it's on the side of

too many, rather than too few. There is something about the sight of a set coming down upon an announcer's head during a show that chips away at a station's image!

Note how the lashlines are used in Figure 2 to tie multiple flats together. If the flats are well constructed and lashed together tightly, the breaks between the flats can be virtually invisible to a television camera.

Another approach to combining hard or softwall flats is illustrated in Figure 4. Here, bolts and nails replace the lashlines for a more permanent setup. A so-called "pole cat" (a long hollow pipe with a spring loaded extension piece at the top) can be used in place of "L" braces and sand bags (See Figure 5).

Twofolds and Threefolds

Figure 6 shows the twofold and threefold set pieces (illustrated in semi-closed positions). These are just hardwall flats which have been joined with hidden hinges. If you tackle this approach, you will

probably want to make the flat frames out of one-by-fours or even two-by-fours. This type of set is self-supporting, as long as it isn't opened up completely. The twofolds and threefolds can be made large enough to represent a corner, or even three walls of a room, office, kitchen, or whatever. Although twofolds and threefolds are fast and convenient, they have the disadvantage of being hard to move and store.

Seamless Paper

Seamless paper comes in large rolls and can be stapled or taped directly to studio walls to form a quick, inexpensive background. The paper is available from most display houses in 9 x 36 foot rolls. A large variety of matt surface colors are available.

Seamless paper backgrounds are quick and easy to put up but have the obvious disadvantage of easily getting dirty, torn and wrinkled.

Polystyrene Set Pieces

One of the newest and most interesting approaches to the design of set pieces is through the use of expanded polystyrene blocks. These featherweight hardened foam blocks are available at many lumber supply houses at a reasonable cost. They come in four-by-eight feet blocks from one to twelve inches thick.

Patterns and designs can be sculptured and embossed into these blocks through the use of carefully applied applications of paint thinner. The paint thinner causes a chemical reaction with the polystyrene which, in effect, "eats away" designs or patterns, according to how it is applied. (See photo.) The paint thinner can be poured down a sheet to result in a "stalactite" effect; it can be carefully painted on to form designs and crude letters; or, it can be sprayed on to provide still another pattern and effect. The possibilities here are only limited by a person's imagination and creativity.

The polystyrene should be painted only with a latex-based paint. Petroleum-based paints will cause the same chemical reaction as the paint thinner (which, by the way, results in an interesting, but somewhat unpredictable effect).

One of the best approaches with

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Telex/Magnecord series 1400 broadcast quality recorder/reproducer. An old name that spells reliability. A new design for today's state of the art.

- The Old. Telex/Magnecord products are still made in the USA so parts and service are always available. The series 1400 is still built on a solid die cast aluminum main frame for reliable operation around the clock. It's still available in full, half and

quarter track configurations, has fail safe differential brakes and accepts 8¼ inch reels. It also still comes with three motors—but then, that's touching on the new.

- The New. A brushless d.c. servo drive with a crystal oscillator control reference so accurate it virtually eliminates program timing errors. New, three speeds: 3¼ - 7½ - 15 ips. New catenary head block for straight tape loading, the convenience of one hand cueing and the bi-level illumination of push button controls. New DTL logic controls eliminate EMI and provide fast, spill

proof tape handling gentle enough for half mil tape. And new electronics, clean to 60 dB S/N at all speeds.

- If you're looking for a real time, reel recorder with old name reliability but designed for today's demands, you'll find it in the Telex/Magnecord series 1400. For complete information please write:



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polystyrene is to paint the blocks with latex paint and then treat them with paint thinner according to the design you have in mind. This will result in a two-color effect.

Risers

Although many small studios place their news, sports and interview sets directly on the studio floor, there are some important advantages to elevating these sets four to twelve inches above the floor with risers. Since most of the announcers and talent in these situations are seated, the risers should elevate them to the point of being approximately level with camera lenses. **The use of risers in this way does three things: it results in better eye contact, it is easier on cameramen and it looks better on the air by giving a more effective pictorial perspective.**

Depending upon the load and stability requirements, you can choose between one-half to three-quarter inch plywood covered frames for your risers. The frames can be constructed of anything from two-by-fours to two-by-twelves, depending on height needs. As long as risers are built for stability, you needn't worry about a smooth, neat finished job, since you will probably want to cover them completely with carpeting, which will cut down on noise while providing an attractive covering.

Risers are generally constructed in four-by-four or four-by-eight foot sections so that a variety of configurations will be possible in different applications. For a choir or band, you may want to stack

some on top of each other to provide different elevations. Attractive designs are possible on the top of risers by fitting together different sizes, shapes and colors of carpeting. Shag carpet seems to work best with risers, since cracks and slight variations in height will generally not show.

It is also possible to use the polystyrene blocks for risers if they are covered with one-eighth inch plywood. The plywood covering is carefully held in place with nails long enough to anchor it to the polystyrene material. In this way the plywood serves the very important function of distributing weight over an area which can be supported by the polystyrene. The whole riser can then be painted, or it can be covered with a rug. Compared to the all-wood risers previously discussed, the polystyrene risers are cheaper and considerably lighter. They are somewhat less durable in comparison, however.

Holding to Brightness Ratios

In designing, painting and decorating sets, it is quite important to hold to the brightness ratio limitations of the broadcast process. Failing to do so can result in severe distortions in the video's tonal range.

For example, a significant amount of picture content with over sixty percent reflectance can severely darken faces and skin tones.

We have all heard that men should wear light grey or colored shirts on camera instead of white.

The television system is limited in its ability to accurately reproduce a total range of grey shades from absolute black to pure white. In order to make the important middle tones appear accurate, the tonal range on sets and TV subject matter must be slightly restricted. It has been found that if the tonal range is limited to between three percent reflectance (reference black) and sixty percent reflectance (reference white) that the most pleasing and accurate tonal rendition will be possible.

Keep this in mind when you choose paints and fabrics for sets, as well as when you brief guests on what to wear for TV appearances. Also, don't forget about scripts and papers which might appear on camera. Stations which have caught on to the problems that pure white paper can cause on camera, use copy paper which is grey or a pastel color.

Summary

Briefly then, these are some of the more important points on selecting, designing and building sets. In general, make sure sets are complimentary to subject matter and that they support it, rather than fight with it for attention, or drag it down into mediocrity or garrishness. Carefully observe and analyze what you like and don't like on network shows, and what sets appear to "work" and **why**. A little bit of time and effort put into planning appropriate sets can go an amazingly long way toward improving the attractiveness of your studio productions.

Management Highlights

Much of the initial effect of the studio set upon the viewer is probably unconscious. But, studio settings which are dull and unimaginative will instill this initial idea about your show in the mind of viewers. Equally as negative is the garrish, hokey set which tips off the viewer to the low level of sophistication which the whole program may represent.

Fortunately, the design and building of television sets is one area in television where a little bit of knowledge will go a long way. It is the intent of this article to provide a little bit of the right kind of knowledge.

A little time, money and ingenuity invested in the design and construction of sets can go a long way in making your local studio originations appear fresh and attention-getting. Or, to put it another way, your local studio originations do not have to take on the stereotyped characteristics of local, low-budget productions.

It is that first "establishing shot" of the show and its setting which serves to tip off the audience to the caliber of the production they are about to see (or, are about **not** to see, if the initial impression is not positive enough to keep them from turning to another channel).

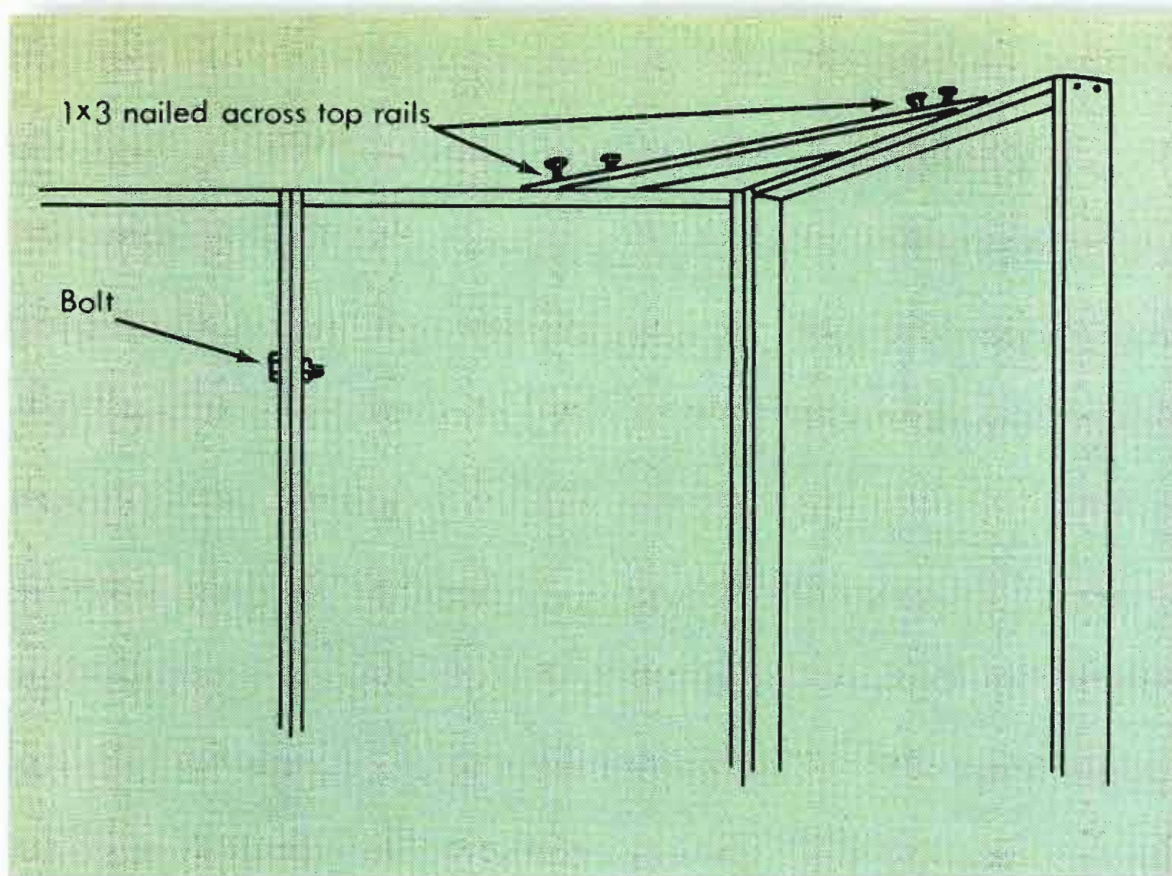


Figure 4 Here you see how to tie flats together with a corner bolted brace.

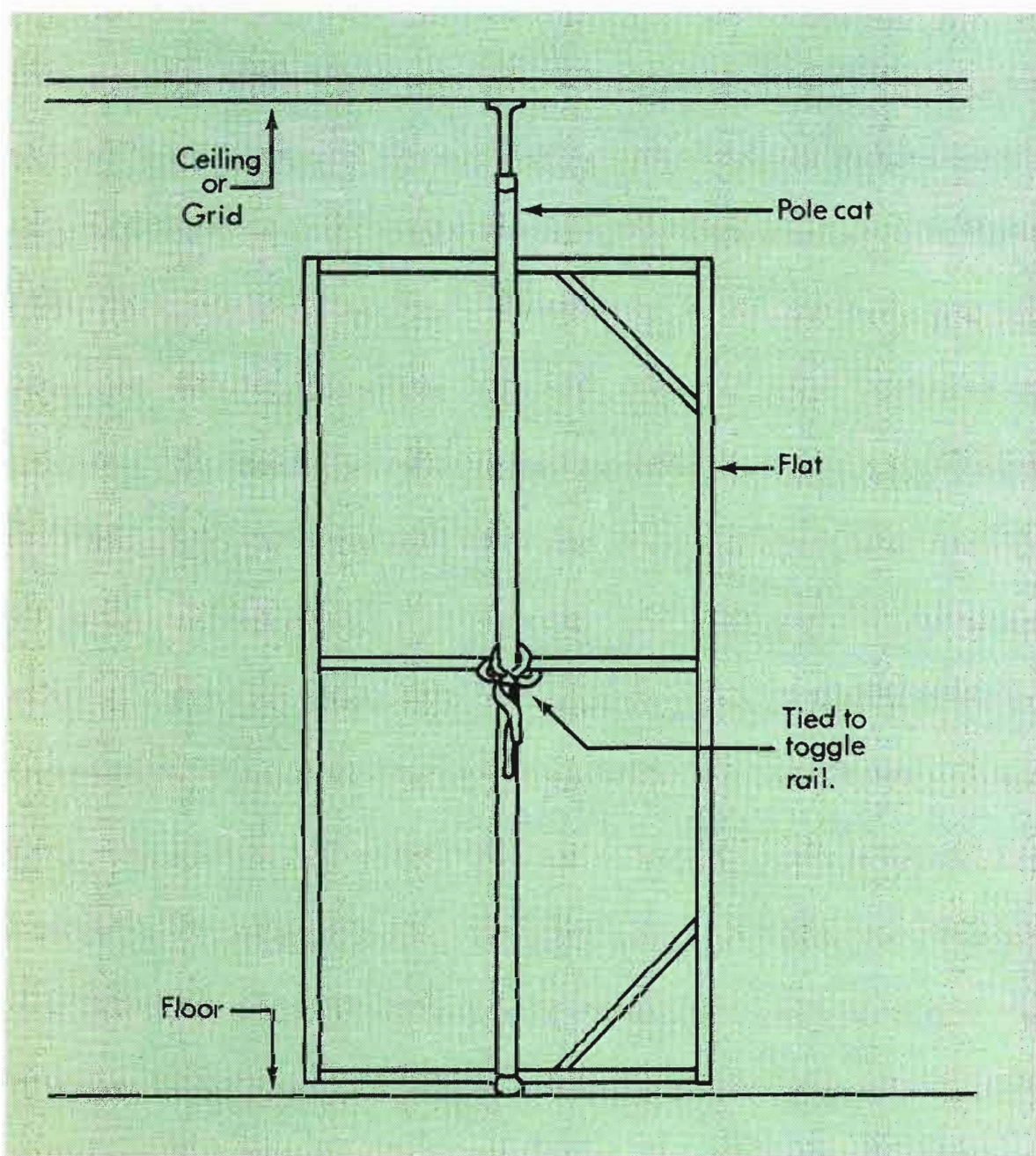


Figure 5 Here you see how to tie flats together with a pole cat.

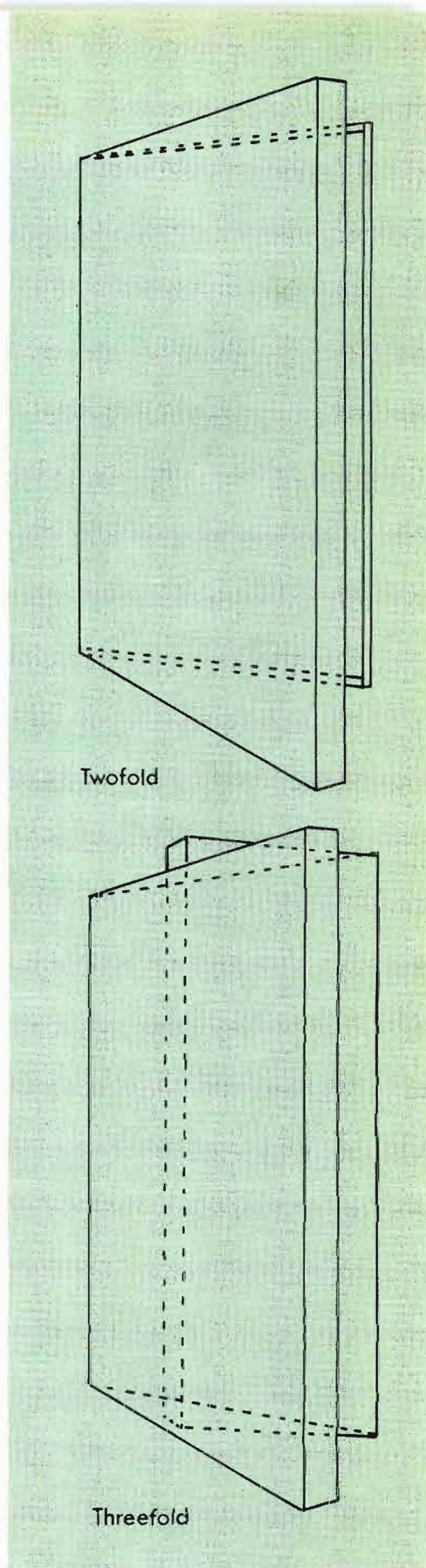
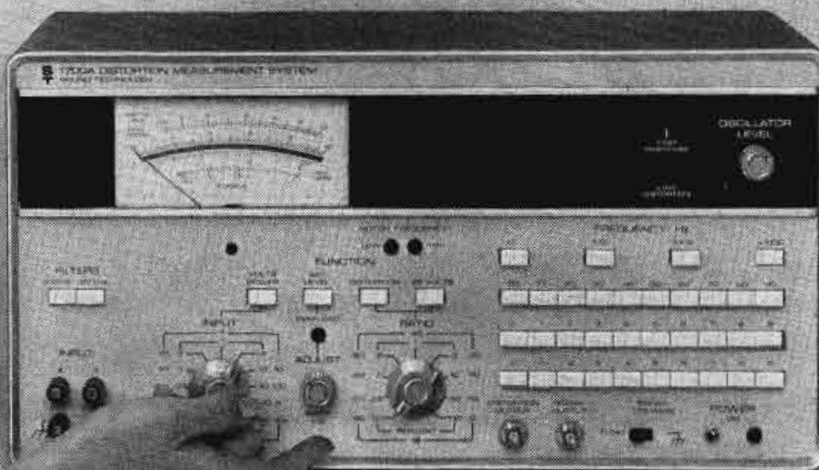


Figure 6 These are two-fold and three-fold set pieces. These are hardwalls which have been joined by hidden hinges. This type of set is self-supporting.

I can measure lower distortion than you've ever seen. I'll show you at NAB



Hi!

Yes, I can measure distortion down to .002% (-94 dB) with this new Sound Tech system.

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That's because Sound Tech's new 1700B is push-button controlled—and it nulls *automatically*.

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- Has differential input
- Measures signal ratios up to 100 dB
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- Reads power into 8 ohms

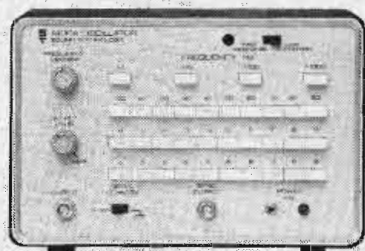
I'll be at NAB to show you how easily the 1700B measures.

Booth 123—it's easy to remember.

See you there.

—Rosemary

Ultra-low-distortion oscillator



See this at NAB, too.

It's an ultra-low-distortion oscillator for use in measuring lowest distortion amplifiers. Has less than .001% distortion. Covers 10 Hz to 110 kHz. Push-button frequency selection. Output variable from less than 1 millivolt to 3 volts.

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Avoid ulcer gulch:

Get ready for the RI

By John H. Mullaney, PE, Consulting radio engineer, Potomac, Maryland.

This Check List is a helpful digest of FCC Rules (Part 73 of those applicable to AM and FM broadcast stations). It includes the primary items that an FCC inspector will check during a station inspection.

It will be noted from a study of the following questions concerning the Commission Rules that many are a so-called catch-all type, and they do not specifically call out what is asked for in the question. It should be understood that the question asked is assumed to come under the Rule cited, or at least the Commission in the past has interpreted the Rule to cover the question.

The Rules should be kept up to date by each station. The simplest way to accomplish this is for a station to subscribe to the FCC Rule service provided by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The technical questions should be checked by the station's chief engineer; whereas, the non-technical items should be checked by the station manager or someone under his direction who is familiar with the subject matter.

The best way to use this Check List is to take the station's copy of the Rules and read each section of the Rules shown to the right of the question asked. This technique will allow you to understand what is being checked, and probably help to give you a better understanding of the Commission Rules.

Although this check list is not complete, if you are able to pass the items listed, you have an excellent chance of passing a **real FCC inspection**.

Frequently Violated Rules

On March 6th, 1975, the FCC released a Public Notice entitled "Rules Frequently Violated by

Broadcast Stations". The following is a copy of this release:

In response to many requests, the Field Operations Bureau has prepared an analysis of violation notices (FCC Form 793-A) issued to Broadcast Stations after station inspection and/or measurements by field personnel of the Bureau during Fiscal Year 1974. The list should not be constructed to be a tabulation of all violations observed or those leading to serious consequences. There is no particular significance to the placement of an item in the list, e.g., Section 73.93 is not necessarily the most frequently observed discrepancy. For further information call 202-632-7090 or write to Enforcement Division, File 1100, Washington D.C. 20554.

PROBLEM AREA & COMMENTS

OPERATOR REQUIREMENTS

Am - 73.93
FM - 73.265

Includes employment of operators with Third Class permits NOT endorsed for broadcast station operation, or operators with expired licenses or permits. Also includes failure to provide the operators with adequate visibility and accessibility to metering and control equipment from their places of duty.

TV - 73.661

Includes failure to provide the operators with adequate visibility and accessibility to metering and control equipment from their places of duty.

EQUIPMENT PERFORMANCE MEASUREMENTS

AM - 73.47
FM - 73.254

Failure to carry out equipment performance measurements each year at intervals not exceeding 14 months.

MODULATION LEVELS (AURAL)

AM - 73.55
FM - 73.268
TV - 73.687 (b) (7)

Levels consistently in excess of 100% on peaks (AM-negative peaks) of frequent recurrence.

MODULATION MONITORS (AURAL)

AM - 73.56
TV - 73.691

Deficiencies include lack of calibration and defective peak indicating device.

REMOTE CONTROL OPERATION

AM - 73.67
FM - 73.275
TV - 73.676

Operation with defective power adjustment control circuits, or uncalibrated indicating instruments. Failure to terminate operation by remote control when malfunctions cause improper control or inaccurate meter readings. Also for TV, failure to generate, insert, or properly utilize the required test signals (VITS).

REMOTE READING ANTENNA AMMETERS

AM - 73.39 (d)

Instruments not calibrated to indicate with 2 of main meter for each power mode of operation.

OPERATING POWER

AM - 73.52
FM - 73.267

Operation for extended periods with power levels greatly in excess of authorized tolerances. Also for certain AM stations, operating pre-sunrise and/or nighttime with full daytime power. In addition for TV, failure to calibrate output power indicators over the tolerance range at six-month intervals.

OTHER GENERAL REQUIREMENTS

AM - Various

Failure to check the antenna lights for proper operation on a daily basis and failure to inspect the lighting system and control circuits at three-month intervals.

Failure to record the results of equipment inspections, adjustments, calibrations, and repairs as well as

operations during experimental periods.

OTHER TECHNICAL REQUIREMENTS

FM - 73.317

Failure to maintain transmitter and associated equipment such that noise and frequency response requirements are met. Failure to

install equipment and associated wiring in accordance with pertinent standards and practices.

FM - 73.322

Failure to maintain the 19KHz pilot subcarrier injection (modulation) level within tolerances.

TV - 73.699 (FIGURE 6)

Pulse durations not maintained within tolerance standards.

TV - 73.682(a) (9), (12), (13), (17)

Includes continuous operation with improper peak video modulation levels and failure to maintain blanking, reference white, and reference black levels within tolerances.

It is no secret that the Commission's R.I.'s also use a check list during their inspections. Your writer's previous article in Broadcast Engineering discussed the old check list. This new list is a good one; study the attached carefully, and if you have questions as to what is meant by any of the questions write directly to:

Mr. Wallace E. Johnson, Chief
Broadcast Bureau
Federal Communications Commission
1919 M St., N.W.
Washington, D.C. 20554

Licenses and Authorization:

All licenses and authorizations should be posted preferably conspicuously at one location. The licenses should be framed, and either hung above a bulletin board, or placed in some type of rack made for the frames. Telegraphic and letter notifications or authorizations should be placed on a bulletin board. In addition, the station's EBS and other instructions should be on this board. It is also suggested that any emergency instructions to operators be posted at the same location.

| Licenses and Authorizations | AM | FM |
|---|-----------|--------------|
| () Posted and Visible Lic/CP/REN/PSA/PGM Test/Modifications/AUX/ALT/SCA/Remote Control | 73.92(a) | 73.264(a) |
| () Operator Licenses posted LIC/756/759 (13.6) | 73.92(b) | 73.264(b) |
| () Operator Licenses signed/valid (Terms) | 73.93 | 73.265 |
| () P1, full or part time (available promptly). Contract for part time—must be full time if DA or over 10 KW or FM over 25 KW | 73.93 | 73.265 |
| () P3-Endorsed for broadcast operation | 73.93 | 73.265 |
| () Copy of notification of designation of chief posted. | 73.93(h) | 73.265(d)(1) |

| Control Point and Studios | AM | FM |
|---|-------------|--------------|
| () Equipment security | 73.67(a)(1) | 73.275(a)(1) |
| () Positive on-off/fail safe, if remote control | 73.67(a)(2) | 73.275(a)(2) |
| () Remote operation terminated if remote control system malfunctions | 73.67(a)(3) | 73.275(a)(3) |
| () Can all required functions be performed if remote control | 73.67(a)(4) | 73.275(a)(4) |
| () Equipment accessible and visible (360° arc) | 73.93(a) | 73.265(a) |

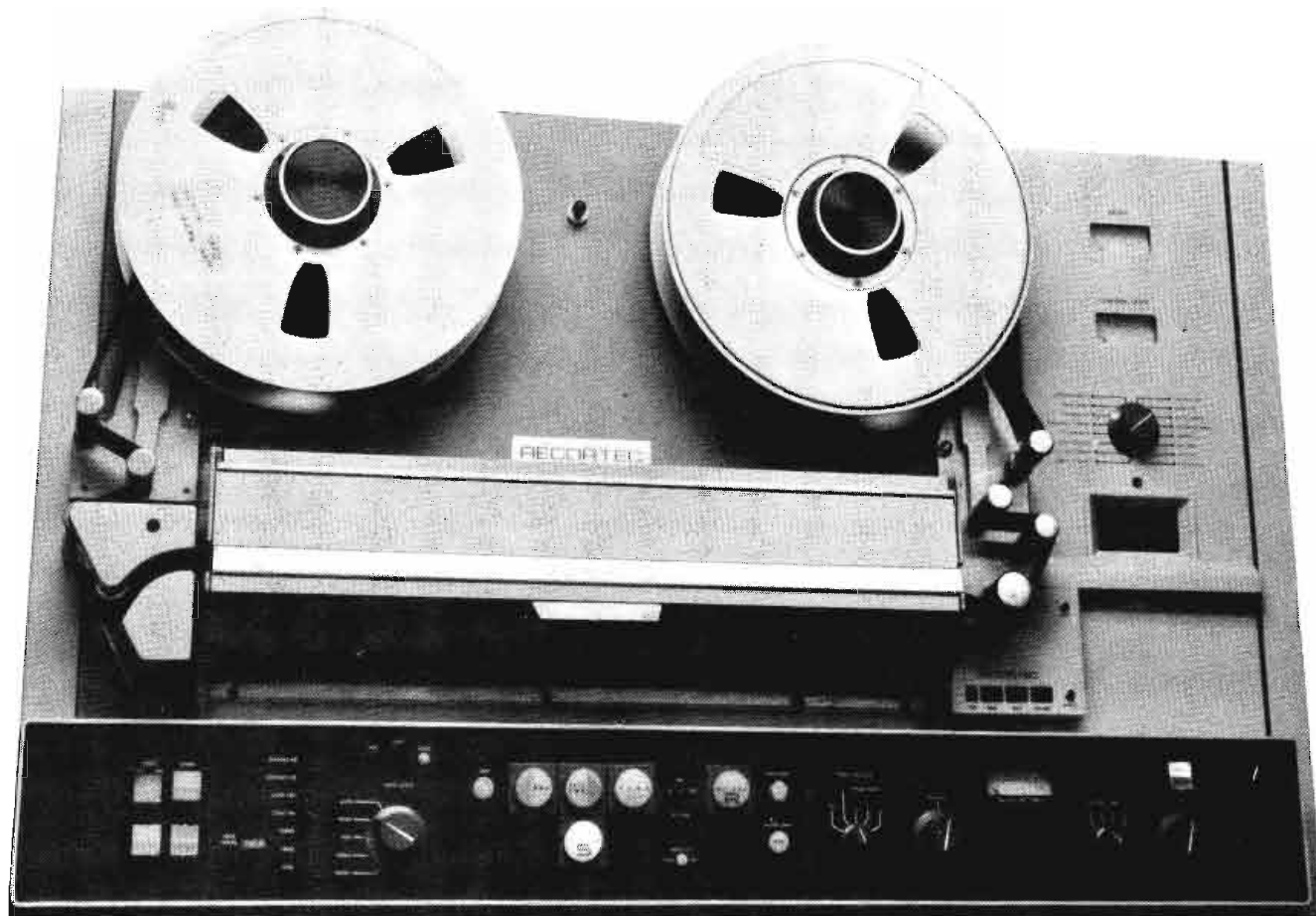
| | | |
|--|-----------------------------------|-----------------------------------|
| () Curves of factors for meters posted/available | 73.67(a)(4) | 73.275(a)(4) |
| () Instructions for lesser grade operator posted. | 73.93(g) | 73.265(f) |
| () Limits for parameters posted | 73.93(g) | 73.265(f) |
| () Remote meters correct scales | 73.93 & 73.67(a)(4) | 73.320 & 73.275(a)(4) |
| () EBS-Receiver/Test Facilities | 73.67(b) & 73.932(a) & 73.961 (e) | 73.275(b) & 73.932(a) & 73.961(e) |
| () Studio location as licensed | 73.31 | 73.210 |
| () Equipment/Wiring-Good Engineering Practice | 73.46(a) & 73.40(a&b) | 73.317 |
| () Automatic Logging Equipment | 73.113(b) | 73.283(b) |
| 1. Does not affect accuracy of indicating inst. | | |
| 2. At least as accurate as indicating instruments being logged | | |
| 3. Calibrated weekly | | |
| 4. Alarm provided | | |
| 5. Reading each 10 min. If alarm does not operate cont. | | |
| 6. Located near operator | | |
| 7. Is checked by operator | | |
| 8. Conforms with 73.39 (scales) | | |
| () Operator's primary duty is operation of transmitter. | 73.93(i) | 73.265(g) |
| () Power can be adjusted and changed (day-night) | 73.67(a)(4) | 73.275(a)(4) |
| () Modulation within tol. | 73.55 | 73.268 |
| () Modulation monitor install/operating properly peak ind. ok (may be at transmitter but must be monitored at R.C. point at all times). | 73.56(a) | 73.253(a) |
| () Frequency within tolerance | 73.59 | 73.269 |
| () Operator welfare Facilities | 73.40(d)(2) | 73.317(d)(2) |
| () FM-Stereo-Pilot within 2HZ, Injection 8 to 10%. | | 73.322(b) |

Technical Inspection

This section consists of thirteen parts. Some of the items will not pertain to your operation, so use the symbol # within the brackets () which means, does not apply. Keep in mind that the check list is for either or both AM and FM operation so read the questions carefully.

Maintenance Logs, proof of performance data and other technical records of the station should be kept in file folders (properly fastened in) within a file case or cabinet readily available to the operator on duty. The station that keeps a neat set of files up to date seldom gets citations for failure to have required information available.

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Inasmuch as the Commission requires that certain measurements be made within a definite period of time, the chief engineer should take a calendar and mark off the dates when certain measurements must be made. If one of the stenographers in the station also kept a card or tickler file on the same items, it would act as a double check for the station that they do not fail to make required measurements within the proper time limits.

It should be noted that the Commission inspector will cite a station that took its measurements as little as two days late, so it pays to have a way to keep track of **due dates**.

Many station engineers check their antenna system for full efficiency by checking the ground system and the base current and operating efficiency of the transmitter for changes. Although this indicates if any changes have taken place, it really does not tell too much about the antenna's efficiency.

Go through the following paragraphs carefully and you will find how your station would look to an FCC inspector:

| Transmitter | AM | FM |
|---|--------------------------|----------------|
| () Transmitter acceptable/as shown on license (if not, was notification made). | 73.48 | 73.250 |
| () All required meters installed/operating | 73.58 | 73.258 |
| () Meters correct scale/range (all powers) | 73.39 | 73.320 |
| () Meters accurate/seal intact/calibration certificate if repaired | 73.39(f) | 73.320(d) |
| () Meters labeled | 73.39(i) | 73.320(f) |
| () Transmitter safety provisions | 73.40(b&c) & 73.46(b) | 73.317(f) |
| () Transmitter Efficiency (in transmitter manual for FM). | 73.46(a) | 76.267(a)(3) |
| () Spurious emissions or harmonics | 73.40(a) & 73.46(c) | 73.317(a&f)(2) |
| () Transmitter and associated equip. operated in accordance with G.E.P. | 73.46(a) | |
| () Operating Power Correct | 73.52(a) | 73.267(b) |
| () Power can be adjusted and changed (day-night) | 73.40(a)(8) | 73.317(a)(8) |
| () Modulation within tolerance | 73.55 | 73.268 |
| () Modulation monitor installed/operating properly-Peak ind. o.k. (may be at R.C. Point) | 73.56(a) | 73.253(a) |
| () Frequency within tolerance | 73.59 | 73.269 |

| Antenna Tower and Base | AM | FM |
|--|----------------------|----------------------|
| () Painting and Lighting/photo cell/number bands/number lights correct. | Terms and Part 17 | Terms and Part 17 |
| () Base fence for series FED AM | 73.40(b)(3)(iv) | |
| () Ground system o.k. | 73.189(b)(4)(5) | |
| () Transmitter line o.k. | 73.40(b)(3)(v) | |
| () Tuning house security | 73.40(b)(3)(iv) | |
| () Base meter(s) proper scale/range all powers | 73.39(b) | |

| | |
|---|----------------------|
| () Remote meters connect in proper manner | 73.39(d)(2) |
| () Remote meter(s) within 2% of base meter | 73.39(d)(2) |
| () Remote common point meter within 2% of common point meter | 73.39(d)(2) |
| () Installation in accordance with G.E.P. | 73.46 |
| () Impedance o.k./Meas. available | 73.116(d) & Terms |
| () Field intensity/adequate | |

| Maintenance Log | AM | FM |
|---|--------------------------|--------------------------|
| () Logs available/2 years | 73.115 & 73.116(a) | 73.285 & 73.286(a) |
| () Entries of: | | |
| 1. Base and remote current reading/cal | 73.114(a)(1) | |
| 2. Aux transmitter tests made | | 73.284(a)(1) |
| 3. Frequency checks made (main carrier, SCA, Stereo) | | 73.284(a)(2) |
| 4. Calibration of automatic logging | | 73.284(a)(3) |
| 5. Calibration check of antenna monitor | | |
| 6. Calibration of remote meters (all) | | |
| () Meters/monitors removed from service | 73.114(a)(2) | 73.284(a)(4) |
| () Quarterly tower light checks/tower Maintenance. | 73.114(a)(3) | 73.284(a)(5) |
| () Experimental Operation | 73.114(a)(4) | 73.284(a)(6) |
| () Other entries required by authorization | 73.114(a)(5) | 73.284(a)(7) |
| () Weekly equipment inspections/time spent/condition/data/signature/repairs made | 73.114(b)(c) | 73.284(b)(c) |
| () Corrections made properly | 73.111(c) & 73.114(d) | 73.281(c) & 73.284(d) |
| () For DA Operation-entries of: | 73.114(a)(8) | |
| 1. Common point current | | |
| 2. Base currents/ratios/% deviation | | |
| 3. Remote base or sample currents/ratios/% deviations | | |
| 4. Phase indications (check Section 73.114(a)(9) for schedule) | | |
| () Field strength measurements for DA | 73.114(a)(6) | |

| Proof of Performance | AM | FM |
|--|-----------|-----------|
| () Proof available/2 years | 73.47(b) | 73.254(c) |
| () Proof made each calendar year (not more than 14 months), proof made 4 months prior to renewal. | 73.47(a) | 73.254(d) |
| () All circuits included in making proof | 73.47(a) | 73.254(b) |
| () Description of Equipment used/procedure/signed/dated. | 73.47(b) | 73.254(c) |

| AM Proof | |
|--|-------------|
| () Data and curves-AF response from 50 to 7500 HZ for 25, 50, 85 & 100 mod. | 73.47(a)(1) |

Our best ad is our price list.

Handwritten notes:
 9 Monitors 3500
 17 Demod 31900
 ELS 100 100
 Underdesk 300
 300
 300

Handwritten notes:
 Any -
 We can't beat
 this anywhere.
 Give them a call.
 Roy

| SETCHELL CARLSON Designed, Engineered, and Manufactured by Audiotronics | | User Price List EFFECTIVE NOVEMBER 1975 | |
|--|--------------|---|----------|
| MONITOR OPTIONS | MODEL NUMBER | DESCRIPTION | USER NET |
| 5" | 5M916C | FIVE-INCH MONITOR and picture tube without cabinet | \$250.00 |
| 5" 5" 5" | 5M916RM3 | TRIPLE-FIVE MONITOR; three 5-inch monitors in a row with rack/desktop metal cabinet | 735.00 |
| 6" | 6M917 | SIX-INCH MONITOR with metal cabinet and adjustable underscan | 235.00 |
| 6" 6" 6" | 6M917T | TRIPLE-SIX MONITOR; three 6-inch monitors in a row with rack/desktop metal cabinet and adjustable underscan | 660.00 |
| 10" | 10M915 | TEN-INCH MONITOR with metal cabinet | 225.00 |
| 10" 10" | 10M915C | TEN-INCH MONITOR chassis and picture tube without cabinet (left panel blank) | 215.00 |
| 10" 10" | 10M915RL | TEN-INCH MONITOR with rack/desktop metal cabinet (right panel blank) | 225.00 |
| 12" | 10M915RT | DUAL-TEN MONITOR; two ten-inch monitors in a row with rack/desktop metal cabinet | 250.00 |
| 17" | 12M918 | TWELVE-INCH MONITOR with metal cabinet | 250.00 |
| 19" | 17M922 | SEVENTEEN-INCH MONITOR with metal cabinet | 465.00 |
| 23" | 9M912 | NINETEEN-INCH MONITOR with metal cabinet | 330.00 |
| 25" COLOR | 9M912R | NINETEEN-INCH MONITOR rackmount version | 300.00 |
| | 9M912S | TWENTY-THREE-INCH MONITOR with metal cabinet | 300.00 |
| | | Optional control compartment door | 400.00 |
| | SEC920M | TWENTY-FIVE-INCH IC-100 COLOR MONITOR | 21.00 |
| | SEC920R | TWENTY-FIVE-INCH IC-100 COLOR RECEIVER | 825.00 |
| | SEC920MR | TWENTY-FIVE-INCH IC-100 COLOR MONITOR/RECEIVER with VTR video/audio drive outputs | 925.00 |
| | SEC920VTR | TWENTY-FIVE-INCH IC-100 COLOR MONITOR/RECEIVER with VTR video/audio drive outputs | 950.00 |
| | DEM919 | RF DEMODULATOR (all monochrome monitors) | 975.00 |
| | MD-1 | MOTION DETECTOR with rack/desktop metal cabinet | 15.00 |
| | | MOTION DETECTOR with metal cabinet | 15.00 |
| | | | 15.00 |
| | | | 349.00 |
| | | | 329.00 |

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| | |
|--|-------------|
| () Data and curves-AF harmonic content for 25, 50, 85 & 100% mod. for 50, 100, 400, 1,000, 5,000, and 7,500 HZ. | 73.47(a)(2) |
| () Percentage carrier shift for 25, 50, 85 & 100% mod. with 400 HZ tone. | 73.47(a)(3) |
| () Carrier hum and extraneous noise. | 73.47(a)(4) |
| () Spurious and harmonic check. | 73.47(a)(5) |
| () Equipment meets standards? | 73.40 |

FM Proof

| | |
|--|--------------|
| () AF response from 50 to 15,000 HZ on 50, 100, 400, 5,000, 10,000 & 15,000 HZ for 25, 50, & 100% mod. | 73.254(b)(1) |
| () AF harmonic distortion for 25, 50 & 100% mod. for 50, 100, 400, 1,000 & 5,000 HZ (also 10,000 and 15,000 HZ for 100% mod.) | 73.254(b)(2) |
| () Output noise level-FM | 73.254(b)(3) |
| () Output noise level-AM | 73.254(b)(4) |
| () Equipment meets standards. | 73.317 |

Program Logs

| | AM | FM |
|---|-----------------------|-----------------------|
| () Logs available/2 years | 73.115 & 73.116(a) | 73.285 & 73.286(a) |
| () Operators signing log at beginning/end of duty. | 73.111(a) | 73.281(a) |
| () Logs orderly and legible/key letters or abbreviations explained | 73.111(b) | 73.281(b) |
| () Pages numbered/dated | 73.111(b) | 73.281(b) |
| () Time entries in local time/adv. or non-advanced time. | 73.111(b) | 73.281(b) |
| () Corrections made properly | 73.111(c) & 73.112(d) | 73.281(c) & 73.282(d) |
| () Program name/beginning and ending times/type source. | 73.112(a)(1) | 73.282(a)(1) |
| () For political candidates give name/party | 73.112(a)(1) | 73.282(a)(1)(v) |
| () Entries indicating announcements for political candidates/local notice (renewal/hearing)/mechanical reproduction. | 73.112(a)(4) | 73.282(a)(4) |
| () Commercial matter/sponsor/ Paid by | 73.112(a)(2)(i) | 73.282(a)(2)(i) |
| () Duration of commercial matter (may be hourly segments). | 73.112a2 & (ii) | 73.282(a)(2) & (ii) |
| () Announced as sponsored indicated. | 73.112(a)(2)(iii) | 73.282(a)(2)(2)(iii) |
| () PSA Logged/organization name | 73.112(a)(3) | 73.282(a)(3) |
| () Station ID/Times | 73.112(a)(4) | 73.282(a)(4) |
| () For auto logging-operator certification/log material can be written out if requested. | 73.112(c) | 73.282(c) |
| () SCA Programming | | 73.295(e) |

Operating Logs

| | |
|---|--|
| () For DA remote control entries at commencement and every three hours | |
|---|--|

FM

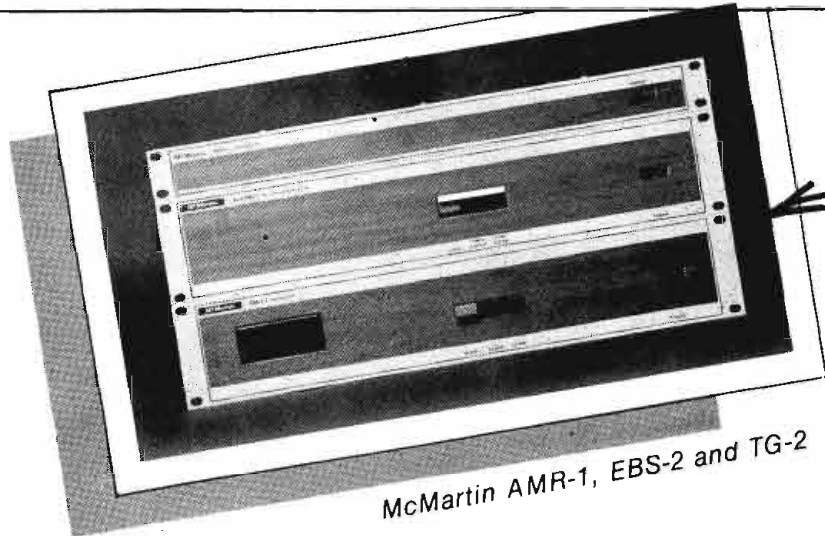
| | | |
|---|------------------------|------------------|
| of: remote base I, or currents from antenna monitor sampling lines or their ratios provided by a type approved monitor and phase indications, if provided by a type approved monitor. | 73.113(a)(3)(i) & (ii) | |
| () EBS tests made/unscheduled | 73.961(e) | 73.961(e) |
| () No variations in readings for long periods | 790 | 790 |
| () Readings on log within limits and reasonable with present limits | Various Sections | Various Sections |
| () SCA operating time | | 73.295(f) |

Logs Available/2 Years

| | AM | FM |
|---|------------------------------|---------------------------|
| () Operators signing logs at start and end of duty. | 73.115 & 73.116(a) 73.111(a) | 73.285 & 73.286 73.281(a) |
| () Logs orderly and legible/key letters or abbreviations explained. | 73.111(b) | 73.281(b) |
| () Pages numbered/dated/AM&PM | 73.111(b) | 73.281(b) |
| () Time entries in local time/adv. or non-adv. time. | 73.111(b) | 73.281(b) |
| () Corrections made properly | 73.111(c) & 73.113(d) | 73.281(c) & 73.283 |
| () Time carrier on and off | 73.113(a)(1)(i) | 73.283(a)(1) |
| () Daily lower light observations | 73.113(a)(1)(ii) | 73.283(a)(5) |
| () Entries required by authorization | 73.113(a)(1)(iii) | 73.283(a)(4) |
| () Entries at commencement and every 3 hours of PV, PI, Base or C.P.I., and any corrections of above, also FM transmission line if power determined direct. | 73.113(a)(1)(iv) | 73.283(a)(3) |
| () For DA not remote control-at commencement and every 3 hours phase indications and remote base current or antenna monitor sample current or current ration indications. | 73.113(a)(2)(i)(ii) | |

Other Items or Records to Check

| | AM | FM |
|--|-------------------------|------------------|
| () Field meter available at DA station/working (if required) | 73.93(e)(4) | |
| () Operating parameters within specifications including field measurements. | Various Sections | Various Sections |
| () Field monitoring points location/description correspond | Terms | |
| () Station ID made/o.k. | 73.1201 | 73.1201 |
| () Sponsors identified on air | 73.119 | 73.289 |
| () Lottery information? | 73.122 | 73.292 |
| () Antenna/common point impedance data available. | 73.116(c) | |
| () DA proof available/partial proof/skeleton proof available for 2 years. | 73.93(e)(3) & 73.116(d) | |
| () Political file available/required data o.k. | 73.120(d) | 73.290(d) |
| () Public inspections file available/contains required info. | 1.526 | 1.526 |
| () RF transmission line meter calibration every six months (when required). | | 73.267(b)(2) |



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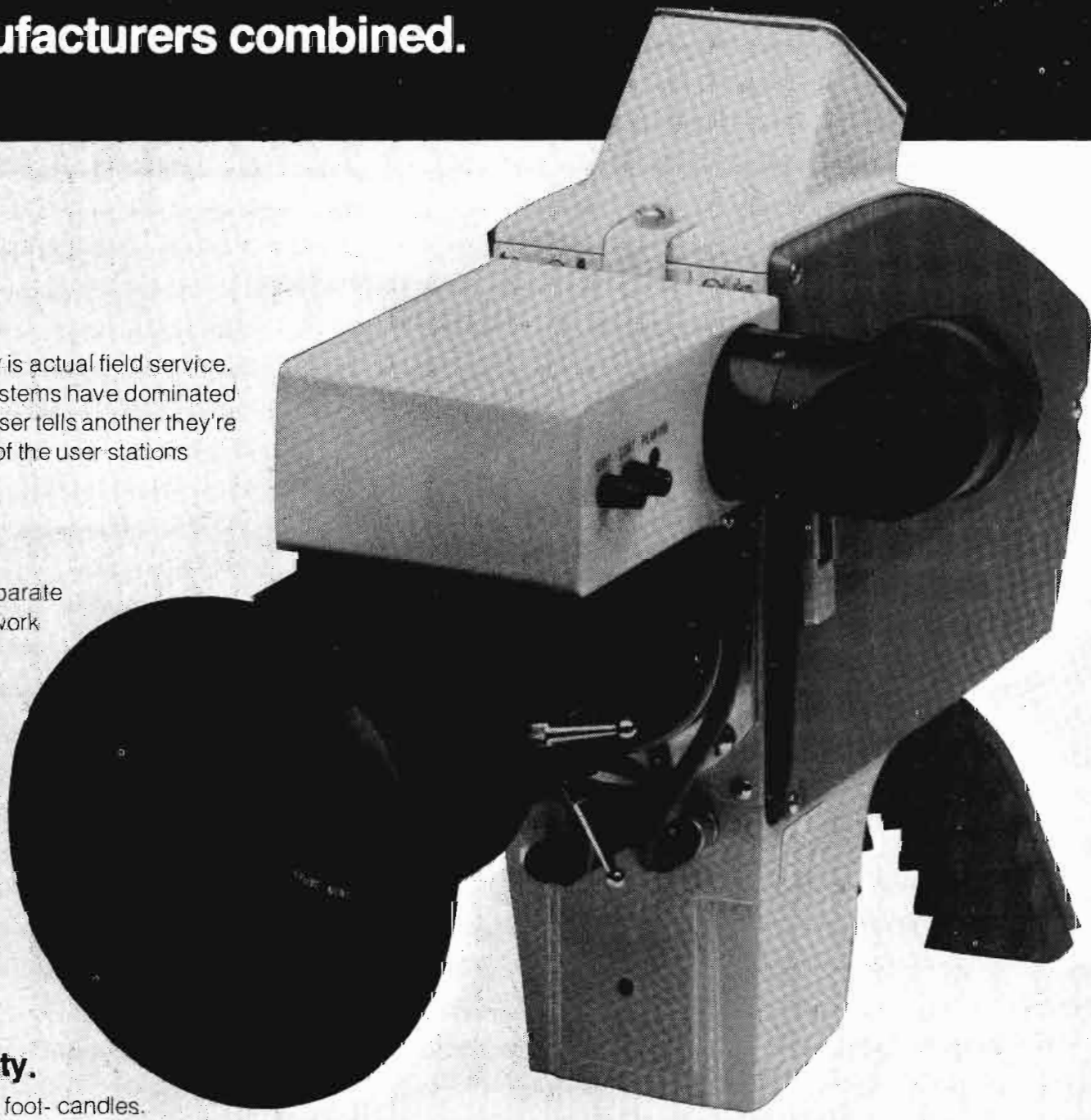
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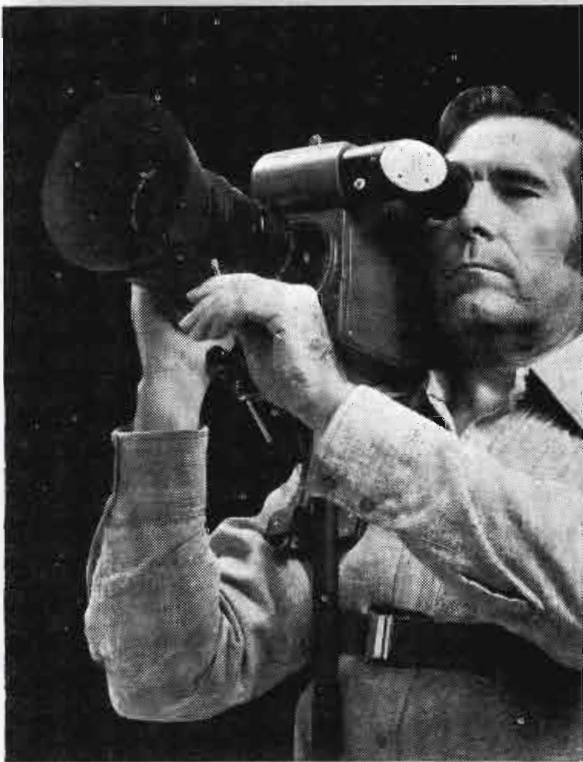
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Switching To Solid State Relays

By Pat Finnegan

Technology continues its advance as many areas succumb to solid state inroads. History has shown that advancing technology does not always replace original methods or components, but instead, often complements and expands the usefulness of the original. The EM (electromechanical) relay, for example, expanded the use of the manual switch but did not replace it. So too have Logic gates in solid state form opened up new horizons for both the switch and the EM relay. Solid state techniques and elements are in the process of doing the same for the EM relay.

Benefits:

New processes often provide additional utility and benefits that are not attainable in the components they are modifying. The SS (solid state) relays have their

share of these benefits. Transients, arcing and RFI from the coil and contacts have been a serious problem in many applications and require suppression techniques. Since many SS relays have no coils or contacts and with ZVS (zero voltage switching) available, these problems do not exist. Acoustical noise from the relay mechanical pull in or drop out action, low frequency buzzing or humming during operation are non-existent.

There are many operational techniques in these relays that were not possible or feasible in EM relays, such as: switching-timing-latching in the same relay, or delays up to 9 hours with built in memories—these are but a few of the many areas opening up.

Two Classes:

SS relays fall into two general

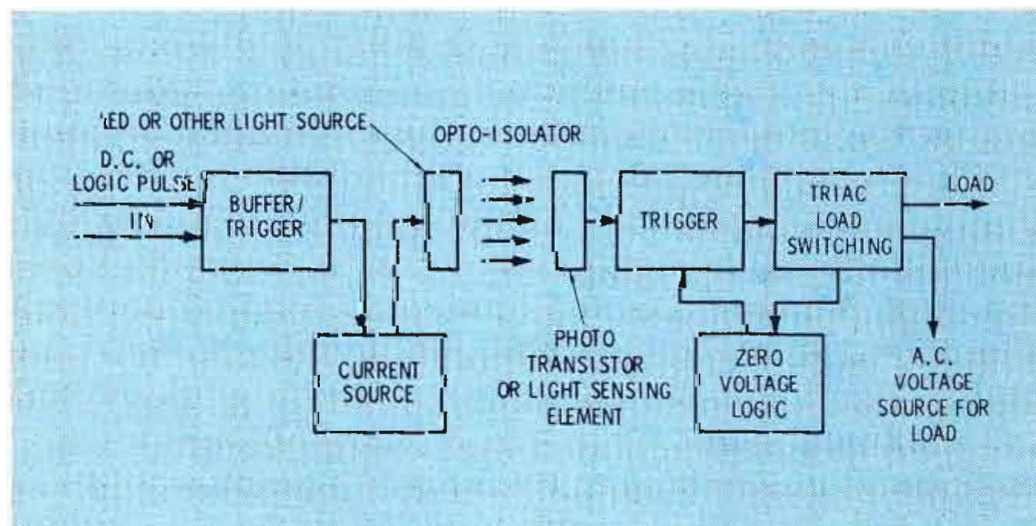


Fig. 1 This is a block diagram of an all solid state relay using optical isolation and triac output switching, and with a zero voltage switching feature.

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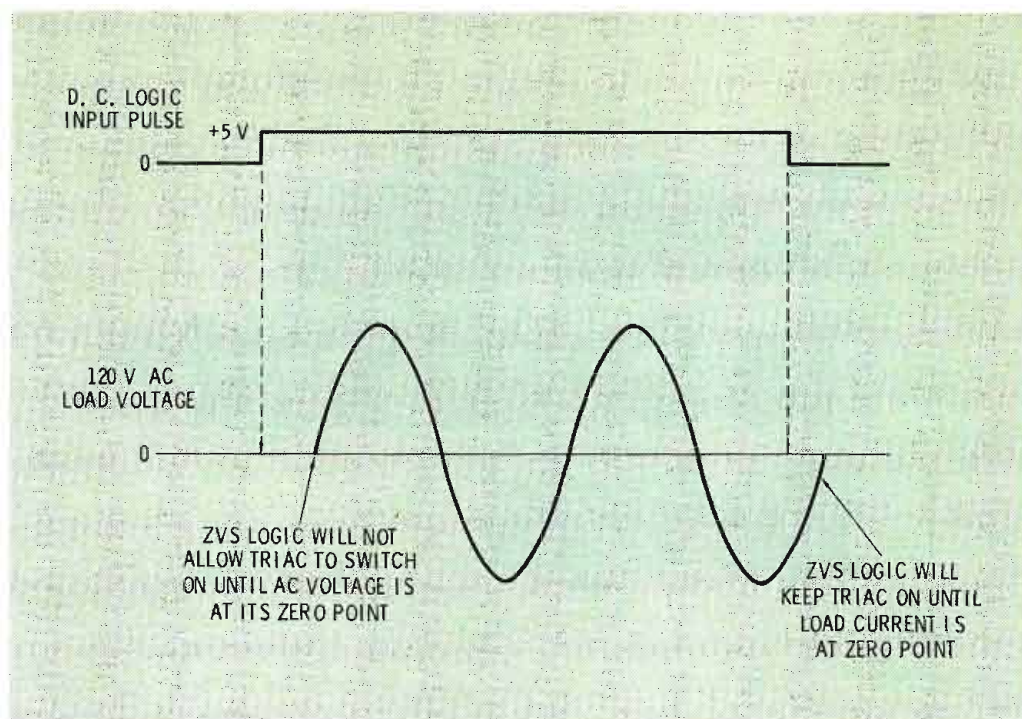


Fig. 2 Zero voltage switching of the load voltage, showing the input DC control pulse and the AC load voltage against time.

classes: the hybrid and the all solid state. The hybrid, as the name implies, is a combination of mechanical features and solid state features. The all solid state relay, on the other hand, is made up entirely of solid state features with nothing mechanical.

The Hybrid:

This relay type is a combination of solid state and mechanical components and the arrangement of its components are proliferating into numerous configurations. General switching relays fall basically into two arrangements. In the first style, the control section (equivalent of the coil in the EM relay) is solid state and in many cases compatible with DTL or TTL Logic, so they can be driven directly from Logic circuitry. The load switching is then mechanical—often in the form of reed relay contacts sealed in a chamber. The second arrangement is a reverse of this in that the input control circuitry is a reed relay whose contacts activate a triac. The triac switches the load voltage and zero voltage switching feature may be included. Although reed relay input, many of these are Logic compatible if the Logic is a current source or the relay may have built-in Logic amplification.

All Solid State:

Both the input control and the load switching are solid state in these relays. Types are available that can accept input control

signals as low as 3V DC Logic and DC signals to 32 volts, and others, AC control signals from 3 volts and on up to 240 VRMS.

One of the basic features of any relay is its isolation of control voltage from the load voltage. The solid state relay accomplishes this function either through a transformer or through Photo-Optic techniques. The Opto-Isolation method can provide isolation up to 1500V RMS AC and resistance values to 10^{10} ohms.

The control input Logic signal, in the transformer isolation type, will trigger a pulser or oscillator which generates an AC signal that can pass through the transformer. The AC signal appearing on the secondary of the transformer will activate a triac which does the load switching.

In the Opto-Isolation type, the Logic input pulse will trigger off a pulse or internal current source that will turn on an LED or other light source. The light output of the optic device is focused onto a photo sensitive transistor or other photo sensitive device or element which turns on the triac for load switching.

Zero Voltage Switching:

This technique is also known as synchronous voltage switching and may be included in SS relays that have solid state switching. It requires additional Logic circuitry within the relay to accomplish this action.

Basically, the ZVS Logic will allow the triac to switch on only when the load voltage is at its next nearest zero crossing point, and will not allow the triac to turn off until the load current is at its next zero point. The relay works in this manner: the control pulse calls the relay on, activating the input circuitry. The optic device lights up and its beam is coupled to the light detector, turning on a trigger to gate the triac into a "ready" condition when ZVS Logic is incorporated, or it will conduct immediately in the absence of ZVS Logic, allowing the AC voltage to reach the load. But when additional ZVS Logic is incorporated, the logic does not allow the triac to conduct until the AC load voltage is at its next zero crossing point—which can be up to one half cycle away. At that time, the triac turns on and allows the AC voltage to pass, and will continue to conduct as long as the input control pulse is present. When the control pulse goes off, the ZVS Logic will hold the triac in a conducting condition until the load current reaches its next zero crossing point.

The greatest benefits of ZVS switching is the lack of transient, RFI and the problem of arcing and pitted contacts in EM relays. This is due to the load voltage and current being switched at or very near the zero crossing point, so there is never more than 5 volts across the triac at the moment of switch.

Others:

As mentioned earlier, the types and applications for SS relays are proliferating. There has been rapid movement into the area of Time Delays. Most of these are hybrid units, but many all solid state relays are also into the area. In one of the Potter-Brumfield relays, the input circuit is an R/C timing circuit that will delay the turn-on of the relay until the voltage across the capacitor reaches a value that will turn-on a solid state trigger. This trigger then operates the coil of an EM relay and closes its mechanical contacts. Another version of this relay with a different arrangement of components in its input circuit, will cause the relay to delay dropping out.

Some timing devices are somewhat sophisticated, for example, the

(Continued on page 78)

BE Tests The dbx System

By Dennis Ciapura, BE Audio Editor

By now, most recording studio technicians are familiar with the dbx noise reduction system and many of these gizmos have found their way into recording studios around the world. So, it is only natural that the company should now work at penetrating the broadcast equipment market and has introduced the dbx 142, which is tailored to the needs of the broadcaster.

We were interested in seeing if the unit could really be used to advantage around the station, so, we decided to put a sample of the unit through it's paces on the test bench and then use it in actual day-to-day operation for a few weeks to test it's actual operational feasibility in a broadcast environment.

The unit is attractively packaged in black and silver and is of sturdy enough construction to withstand



This is an example of the unit BE used for testing the broadcast uses of the dbx system.

the rigors of the busiest production studio. All connections to the unit are made through a large Jones type plug (provided) and socket on the rear apron. The line cord is the detachable type and also plugs into the rear of the unit. The 142 has a

20k balanced differential input, which is transformerless for better fidelity, but sockets are provided for plug-in matching transformers, if they are required for R.F.I. suppression, etc. The sockets have built-in switches which automatic-

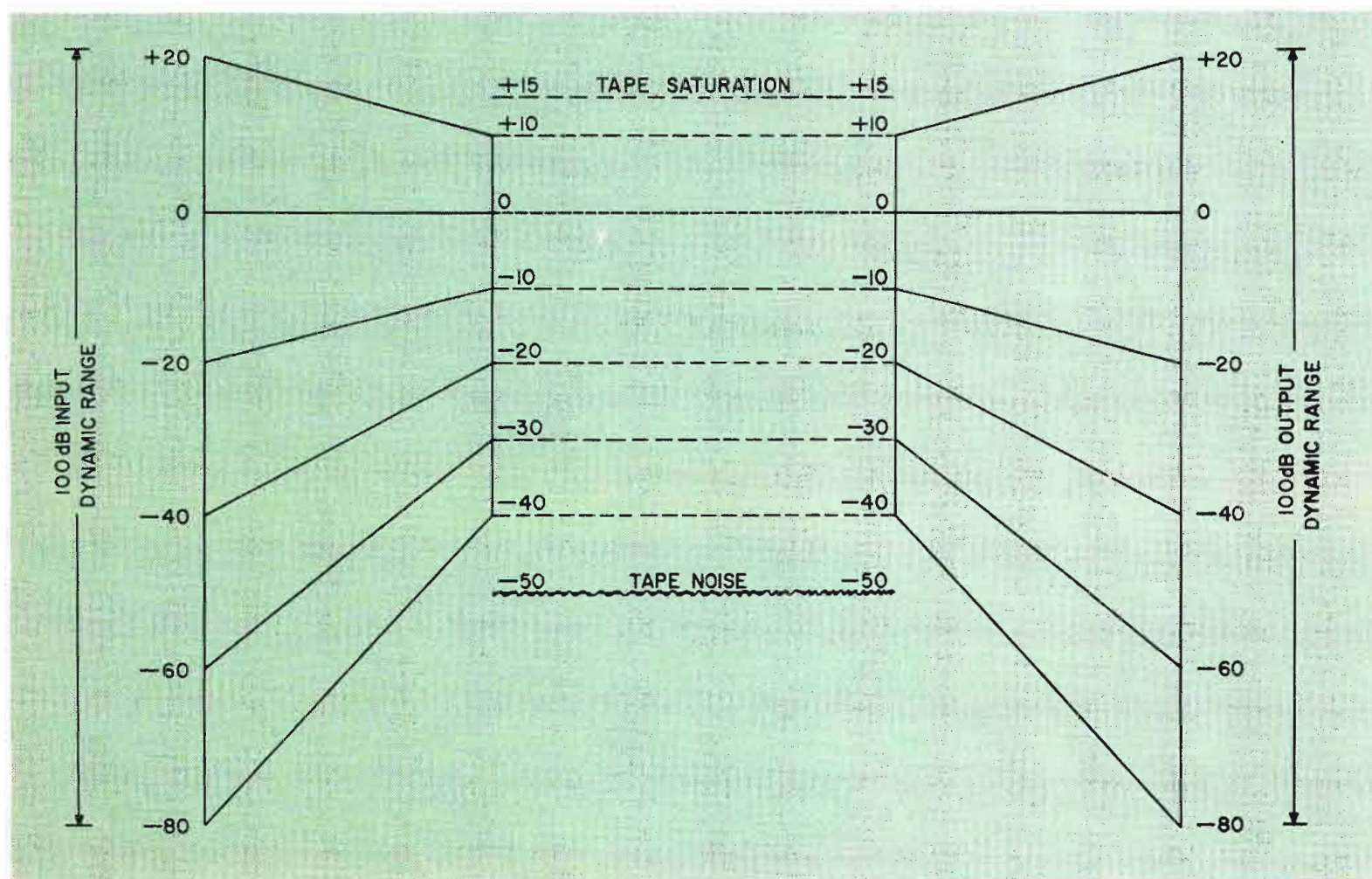


Figure 1 Encode and decode gain characteristics of the dbx II.

ally cut the transformers into the input circuit when they are plugged in, so that no re-wiring is necessary. There is also a 600 ohm input termination switch that provides the proper load for 600 ohm signal sources, so the user has a wide range of input configurations available to cope with the usual interface requirements.

As can be seen from the photograph of the unit, the front panel contains the power and audio switching push-buttons, with LED function indicators. The internal layout of the circuitry is neat and orderly and quite acceptable by broadcast standards. Mechanically, the unit is more rigid than its 8 pounds of weight would suggest.

Before reviewing the test results, let's take a look at how the unit operates and what the mysterious modules inside of it do as they labor quietly in the dark.

Something Old Something New

The dbx noise reduction system

is based on the complimentary compression/expansion (compander) scheme that has been around in various forms for years. Basically, this method of noise reduction employs a compressor to bring the low level audio passages up to a higher level that is farther above the noise level of the recording or transmission medium. Upon playback or reception, an expander restores the dynamics to approximately what they were to begin with. This approximation aspect of the compander approach to noise reduction has the primary factor in limiting its use for broadcast work. After all, any engineer meticulous enough to consider a noise reduction system is likely to insist on accurate level matching. The dbx system takes the approximation out of the compander game and also eliminates another of its inherent problems—noise modulation. The old companders could often be heard operating because the background noise was constantly rising and falling. This phenomena was

most irritating when the recording or transmission had a very bad s/n ratio.

The dbx system also employs complimentary preemphasis and deemphasis, which reduces the noise pumping by about 12 dB. This is sufficient to drop the entire noise floor after decoding to well below the audible level, since the system is capable of 30 dB of noise reduction. This means that a tape deck with a -40 dB noise level would decode at about -70 dB so that any noise fluctuation would be at quite a low level and deemphasized as well.

Input-Output Characteristics

Figure 1. shows the input/output characteristics of the dBxII system. Notice that the dbx system incorporates a linear decibel transfer. In other words, a -20 dB input signal will be increased to -10 dB, double the decibel value, in the encode mode and then reduced from -10 back to the original -20 dB level

(Continued on page 74)

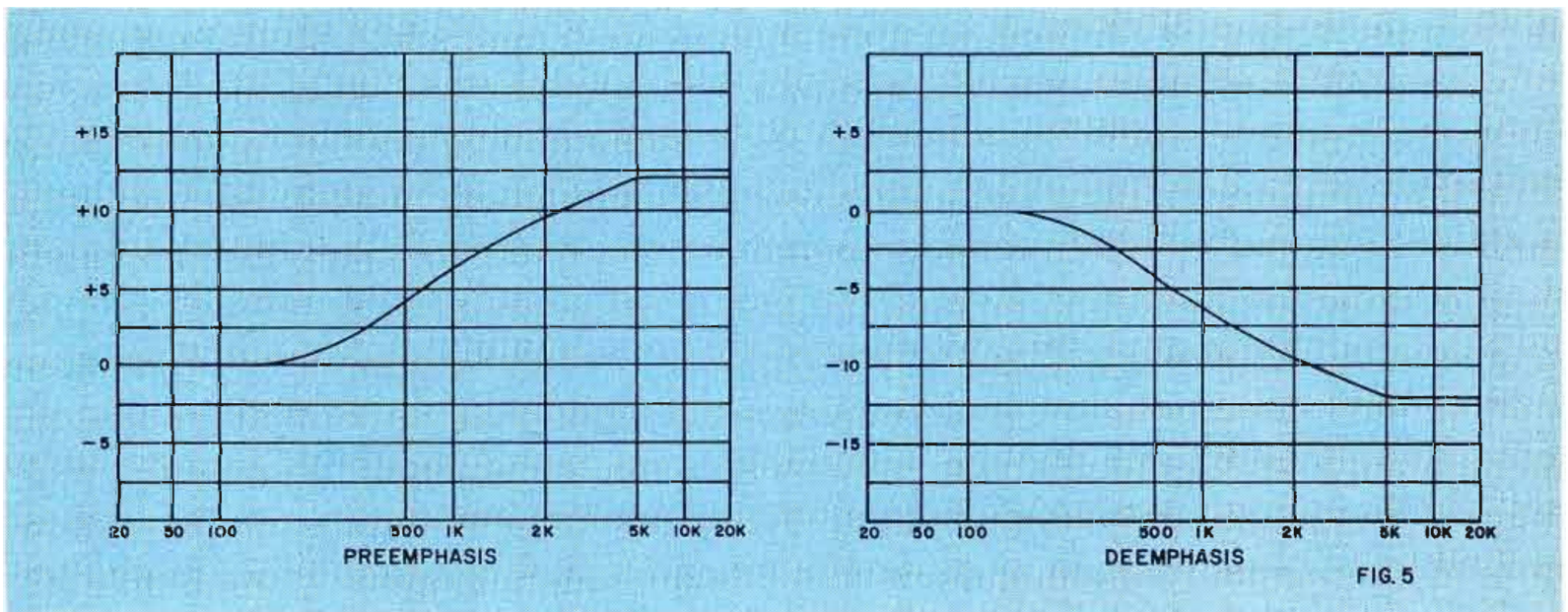


Figure 2 Encode preemphasis and decode complimentary deemphasis.

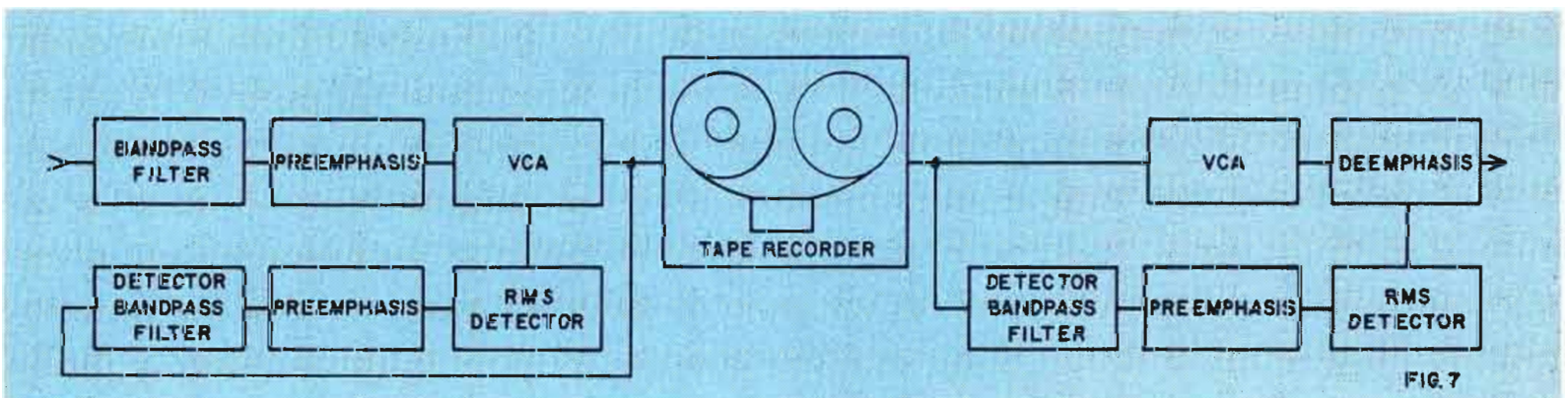


Figure 3 Functional diagram of the dbx II noise reduction method.

Most people in the industry know the Blue Bananas story. Stories like that are a part of broadcasting, and so they will continue. Somewhere in the heat of the day it pays to realize that despite all our industry advancements, we still have humans at the controls and at the mikes.

We invite your tales of horror or humor for a column we will—in the future—call Blue Bananas. Simply address all correspondence to: The Editor, Broadcast Engineering, 1014 Wyandotte, Kansas City, Mo. 64105.

Somebody goofed on the air. Now what do you do?

Do you stop and correct the mistake, or read on as though nothing ever happened? Better take the latter route. Just maybe your audience wasn't all that attentive. Read on...and hope.

One of the remaining areas in which it is possible to put one's foot into the open mouth is in sports broadcasting. Many station managers won't hire a sports man for on-air work who, in private life, is addicted to using colorful language. The excitement of a sports situation could trigger the less-commonly-heard words. On some occasions it has, like the announcer describing the football game. When the runner broke loose and streaked in for a touchdown, one announcer screamed..."Look at that go!"

A paper cup of hot coffee always seems to be present at the scene of a football broadcast. It's there waiting for the appropriate moment to cause unlimited havoc.

One night the engineer on a network football broadcast elbowed a nearly-full cup into the lap of the announcer. There was little time lag before the full flow of short and descriptive words appeared. The engineer, somewhat embarrassed because he had started the incident, faded the announcer while he ran down a little.

When he thought enough time had expired, the engineer brought the gain back up only to find that as the hot coffee soaked deeper, the words came faster. Again he faded...and again and again.

From BLUE BANANAS to SAG TAILS

By Phil Whitney

A listener later commented that the broadcast sounded as though it had been coming across the ocean. Well, finally the color man, the third member of the broadcast team, took over the microphone, and worked it very closely to fill in while things cooled down. After the broadcast he commented that the air was blue, the engineer's face was red and all the time he thought that **he** was supposed to be the "color" man.

Murphy's Law?

Smaller stations often send a crew of only two men to air a game. The color man reads the commercials and runs the remote amplifier. Under these circumstances unforeseen incidents can run through the crew quickly.

One night early in the football season, the lights in the broadcast booth were attracting powdery white moths of fairly large size. They became distracting to the degree that the sports announcer was having trouble concentrating on the game. He started a rapid-fire sentence about the quarterback "stepping out for a quick pitch-out". He got to the middle of "pitch" and decided to change the word to "pass". The result was disastrous.

There was a long pause and the engineer-color man decided it was time to fill. He took a deep breath and in flew one of the moths! The listeners heard a loud "PTOO". The sight of the ejected moth being

catapulted out into the stands was too much for the play-by-play announcer who immediately broke into loud guffaws of laughter. Luckily that night the control man back at the station was in the booth. He began playing the nearest thing he could lay his hands on, which unfortunately was a hymn.

Smokey Stover

When the regular play-by-play announcer became ill, the station quickly hired a part-timer to cover. He had great qualifications; college graduate, sports fan, experience. We later wondered about some of those.

It was a windy afternoon when the game was broadcast and there were problems as a result. The first we noticed wrong was when out of the loudspeaker came the words... "He threw the ball up and the wind blowed it right back at him." Suspicions were confirmed when the ball ended up on the "seventy yard" line. The eager young man was transferred to news and special events after that game. He had some good points, such as dedication to his job and the desire to excell. Somewhere he had heard an announcer describing a "pall of smoke". When a large department store burned down, he began his news feed dramatically with..."tonight a pail of smoke hangs over our city!"

Since announcers have the advantages of tape today, there are fewer commercial misreadings. The problem often appears in the tag requested by many agencies, such as the Ford Motors White Tag Sale. The announcer, reading the tag quickly to join the net, called it a "White Sag Tail", much to the amusement of the listeners. Then there was the horror of all announcers, the alliteration..."See the short sleeve sport shirts at H. C. Sheets and Son!" That one nearly killed three announcers before the store went out of business.

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filled with surprises. One would hardly expect too many of these while broadcasting a symphony concert from the stage of a civic auditorium, but they appear wherever there is a microphone.

Covering a two-hour concert as announcer can bestow a great dignity upon the staff member assigned to the job. Two little old ladies in the front row had been carrying on animated conversations during the louder parts of the concert. They could be seen but not heard. As the music slowly built up to a crescendo, they had more and more difficulty hearing one another. Then came a tremendous cymbal crash, followed by dead silence, when one little old lady screamed at the other... "but I fry mine in lard!"

The engineer thought that he was picking up another radio program in his earphones and began a systematic check of his gear. The announcer stood in front of the microphone with his mouth open but nothing came out. Finally a twitter could be heard in the audience, followed by a roar. The announcer never forgot the incident and his sense of aloofness disappeared.

Such occurrences are all a part of experience. How the broadcaster copes with the unexpected when he is before the public's eyes and ears often determines his future in the industry.

Since the presswires are great offenders at times, it serves a newsman well to read his newscast through before airing it. One letter missing from a word changes it from a five-letter to a four-letter word and unfortunately it is not a rare occurrence. Then there is the imaginative wire trouble which changes a weather forecast to... "hot today with afternoon thunder-doolers." And there was the case of the "child was celebrating his 67th birthday". It is possible for one of these typos in the news to change the entire impact of the story.

Most newsmen who have been around for awhile have a collection of these gems so often responsible for the egg on the face of the beginner. It's best to avoid the possibility of embarrassment by reading the news through before airing it. But if the unexpected happens, DON'T STOP. Keep it moving!

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BROADCAST ENGINEERING

BE covers the **PAN AM GAMES**

By Joe Roizen

The 33 countries of the Western Hemisphere sent over 4,000 of their best athletes to compete in the 7th Pan American Games in Mexico City. The high public interest in athletic events of this nature virtually guarantees a Herculean TV coverage to relay the efforts of the competitors with color images and sound from every venue. Television facilities in the host country are extensive, but for an event of this magnitude some external equipment had to be brought in to provide the added camera coverage and VTR program origination or editing that would be needed for a round-the-clock operation.

Mexico's largest TV network, Televisa, which operates over 100 stations throughout the country, and Channels 2, 4, 5 and 8 in Mexico City, provided several mobile vans with cameras and VTR's for their share of the burden. Channel 13, the other major station in Mexico City, also supplied vans with cameras and VTR's. CBS, the official U.S. Pan Am Games network, leased a local van with two portable cameras and brought in another from New Jersey with five field cameras, one portable camera, three VTR's, and a slow-motion disc.

The Organizing Committee for the games also arranged to lease eight VTR's for the official recording center at the Telecommunications Tower, and three color cameras for the Volleyball Hall, together with a slow-motion disc unit



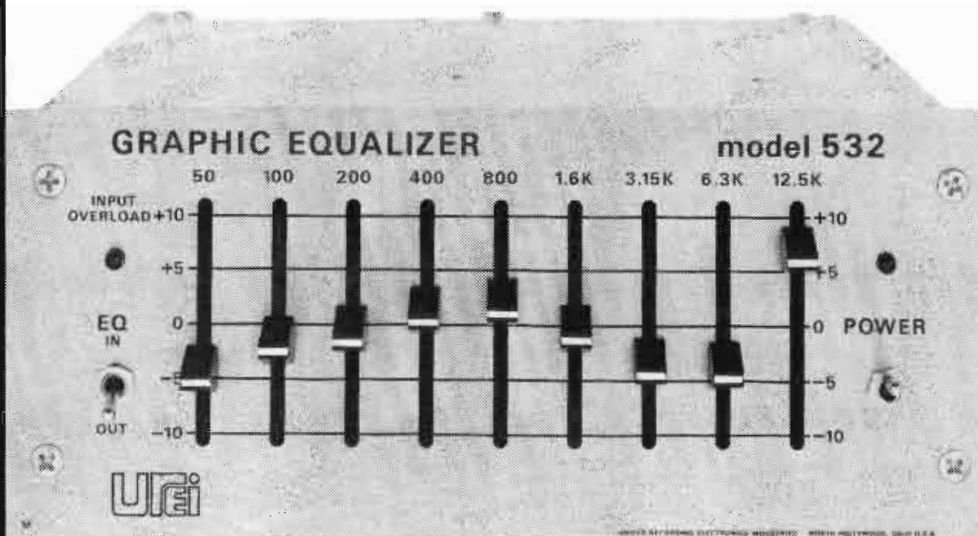
Volleyball is covered at close range by one of three cameras. The other two were setup in the balcony. The floor camera also was used for post game interviews. (Photos by Donna Foster Roizen)

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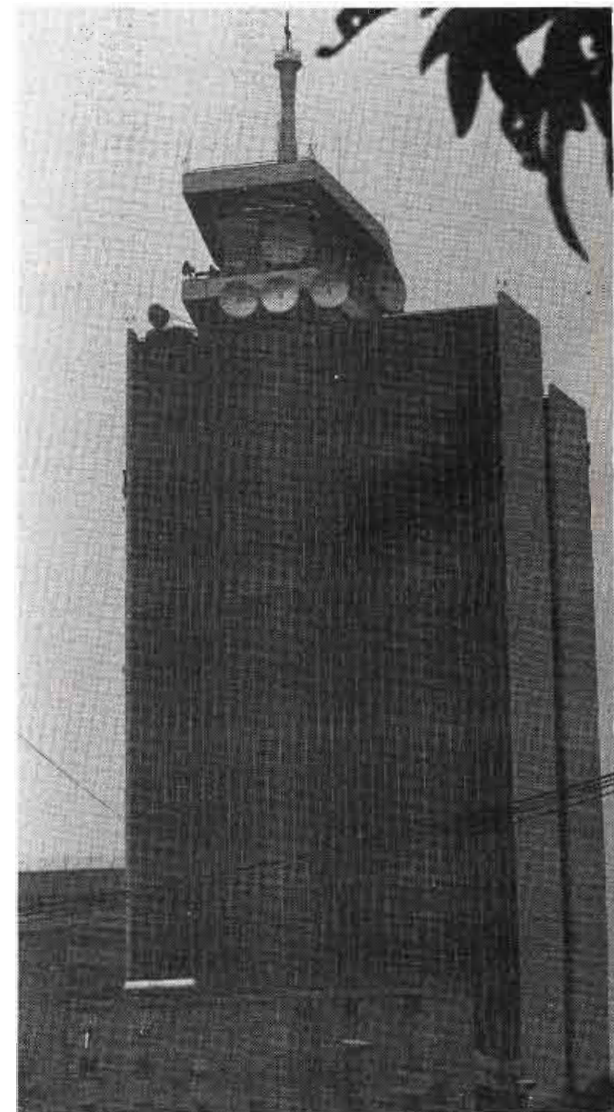
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to provide instant replay in variable speed or fixed images.

Many of the venues were the same as those used for the '68 Olympics, with the major change in television coverage being that everything was now color. The color cameras coming from different sources covered the gamut of well-known brands: Fernseh, IVC, Marconi, Philips, Toshiba, and Thomson-CSF. VTR's at various locations also ranged from IVC 9000 and 800 series to Ampex 2000's, 1200's and VR3000's. HS100 and DMI slow-motion disc recorders were also at a few venues.

Local coverage was the most extensive, with over 12 hours of daily on-air programming. North of the border, American viewers saw highlights of the Pan Am opening ceremony during NFL half-time and before the Sunday night movie. With an editorial and production

This 15-story Telecommunications tower was built for the '68 Summer Olympic Games and was once again used as the central video recording, switching and distribution point.



staff of 19 CBS employees and leased facilities that included 25 technical personnel, CBS put out about 9 hours of programming, concentrating on sports of interest to U.S. viewers and on the athletic confrontation with Cuba.

The Canadian Broadcasting Corporation, with an eye toward the '76 World Olympics to be held in Montreal, sent a number of observers to assess the problems of high-density coverage of huge sporting events. Canada had a large participating team and scheduled at least one hour per day for their English network, as well as a similar amount for the French network. Using their own satellite, they could relay pictures and sound from the Pan Am Games on a 24-hour basis, record and edit locally, and go on the air with great immediacy.

Technical Arrangements

A 15-story Telecommunications Tower built in 1968 to house the TV equipment for the XIX Olympiad was again used as the central switching and distribution center for the TV feeds from the different venues.

Microwave circuits from the top of the Tower fed a bank of eight monitoring and distribution panels on the 13th floor, where eight VTR's were installed to make the official recordings of all of the events at the Pan Am Games. For the first time in an international Olympic contest, segmented-scan helical recorders operating on the super hi-band standard and using two-inch tape were employed for master recording.

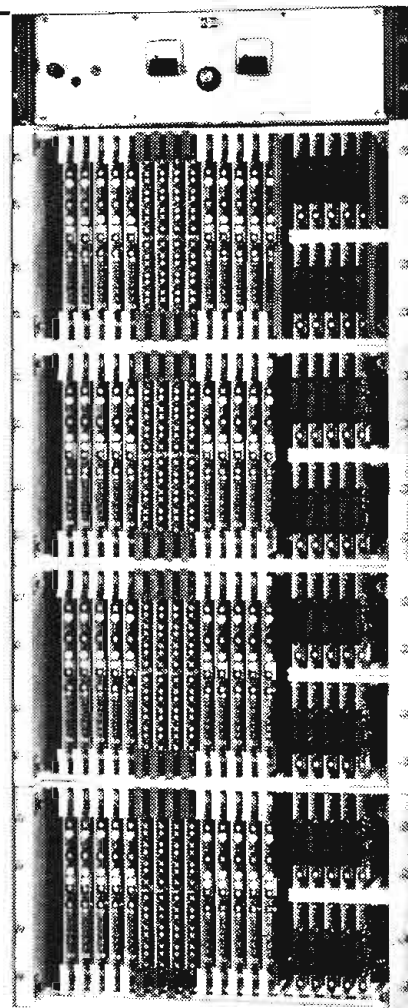
Six IVC 9000 VTR's were used for this purpose, with two Ampex VR1200 quadruplex machines providing the interface for dubbed tapes in the quad format that would be needed for studios so equipped. Recorded tapes made on the 9000's were then edited and put on the air, either for local consumption or for satellite feeds to other countries and continents.

Most of the original coverage came from color camera equipped mobile vans that were located at the major venues and in some cases moved to other ones as the sporting scene shifted.

The first day of competition included a controversial volleyball

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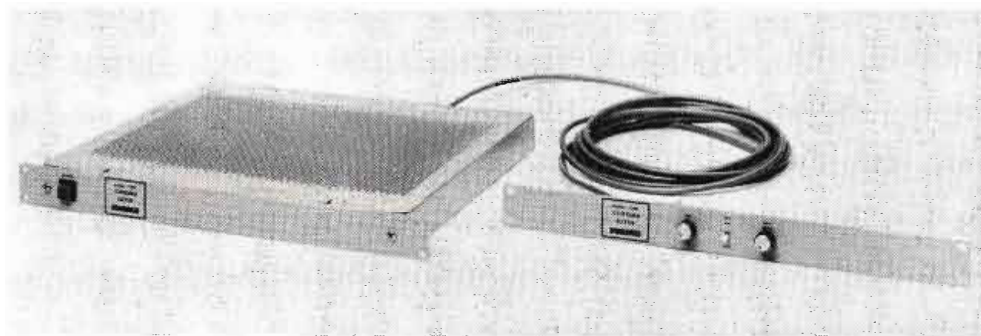


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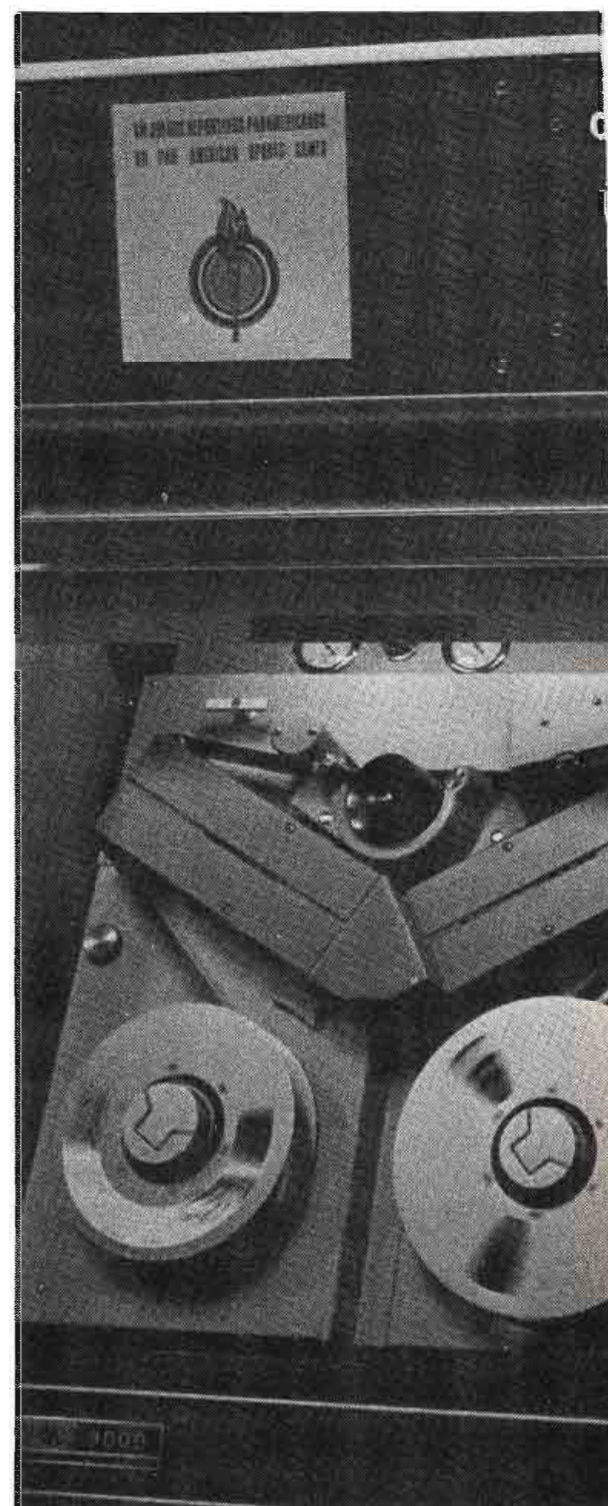
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game between the USA and Cuba. This match was covered by another newcomer to the Olympic TV circuit, the IVC 7000 color camera. Two cameras were located on the balcony of the volleyball court and provided wide to medium views of the action with zoom lenses. The third camera was on the volleyball court floor and had to be equipped with rubber doll wheels to avoid marring the highly polished hardwood surface. This camera could move in to follow the focal point of action or to pick up team huddles during time-outs, as well as post-game interviews.

The competition area of the

This is one of seven IVC 9000 recorders used in the Telecommunications tower.



BROADCAST ENGINEERING

volleyball court was painted a bright orange and provided a very colorful backdrop for the athletes and the TV camera images coming from the 7000's. The temporary camera control room was set up in a closed area adjacent to the volleyball court and contained all the elements of a small studio operation. Since the director's camera monitors and the CCU monitors were small monochrome units, a Conrac 19-inch RHA was used as a color program line monitor. Connected into the system was a portable DMI video disc that gave instant replay for slow or stop motion purposes at peaks of action.

On-site interviews in the Flag Square of the Olympic Village and elsewhere were done with a pair of

PCP-90 cameras, usually on tripods and connected to a self-powered mobile van supplied by Notimex, a TV production company in Mexico City. To provide some unilateral coverage of items interesting to Canadian viewers, the CBC brought in an ENG camera and a backpack quad recorder.

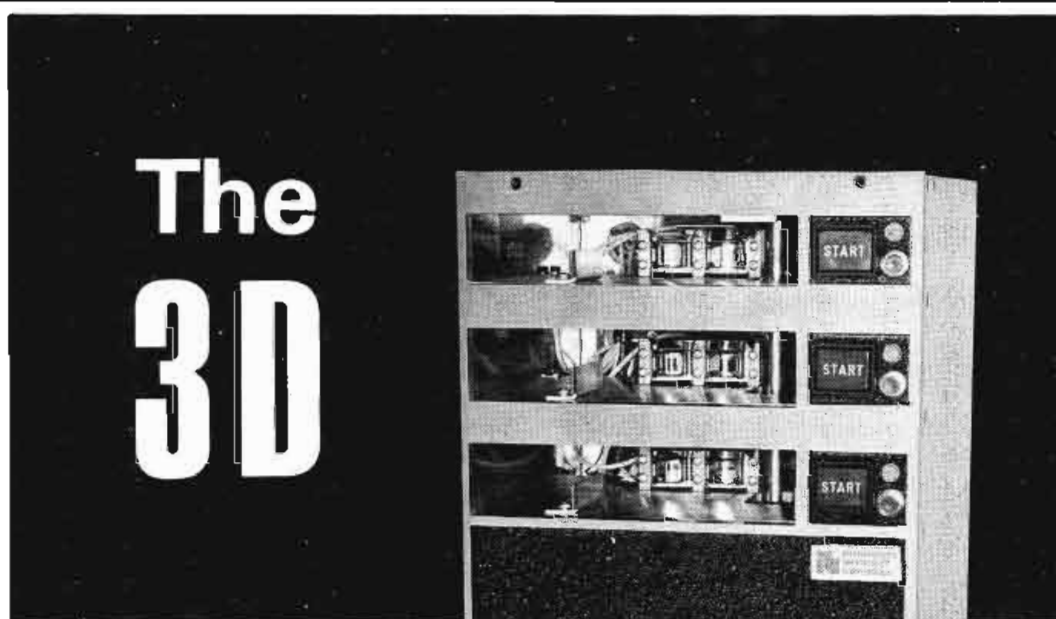
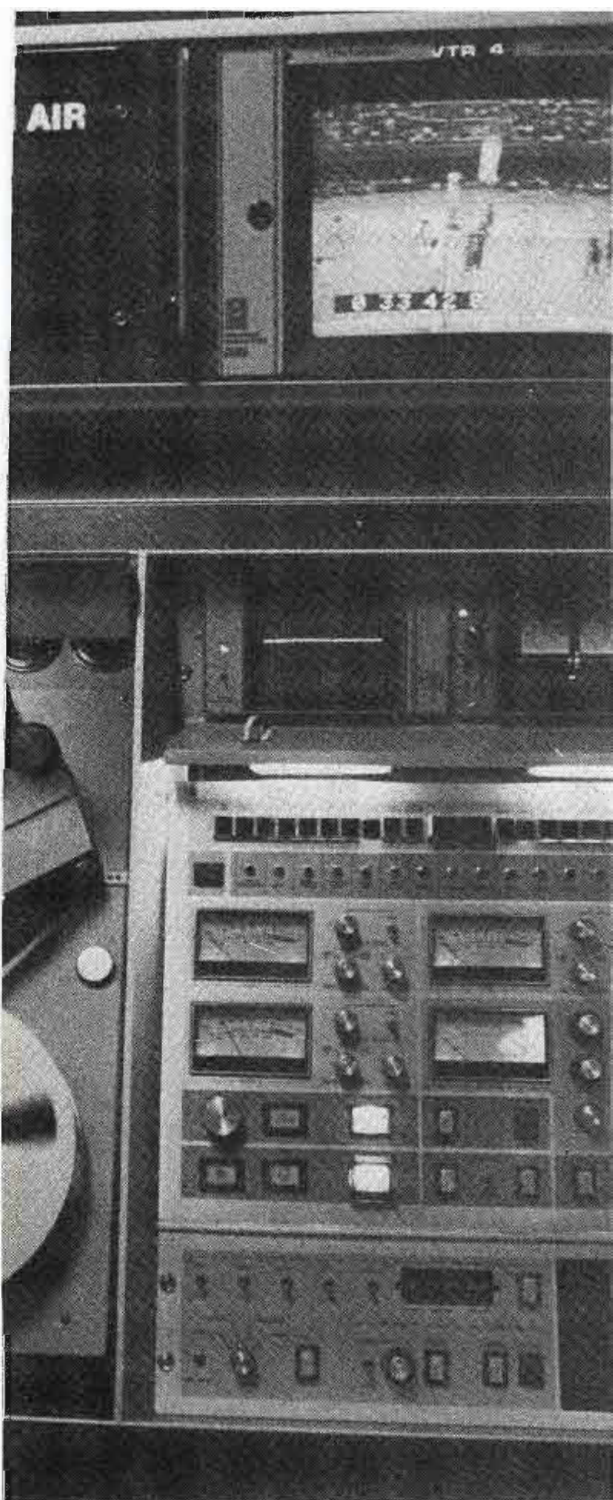
Behind The Scenes

With such a great variety of input signals to the Telecommunications Tower, there were bound to

be some initial problems, but these were quickly ironed out as the games got under way.

One unique difficulty occurred because signals coming in to the Tower from some of the venues had little or no front porch, thereby affecting VTR stability. A round robin of horizontal phase adjustments on sync generators at all of the venues quickly cured that one.

Still another problem came up on opening day for the CBC transmission of the inauguration ceremony.



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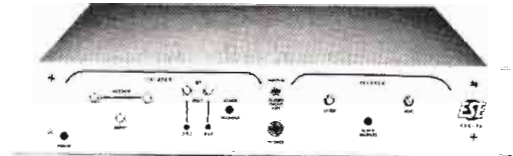
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The French sound came through but the English audio went dead, even though the picture was great. A separate sound track was quickly recorded and sent via satellite in a way that succeeded in keeping any Canadian viewer from detecting the problem.

International Electronic News

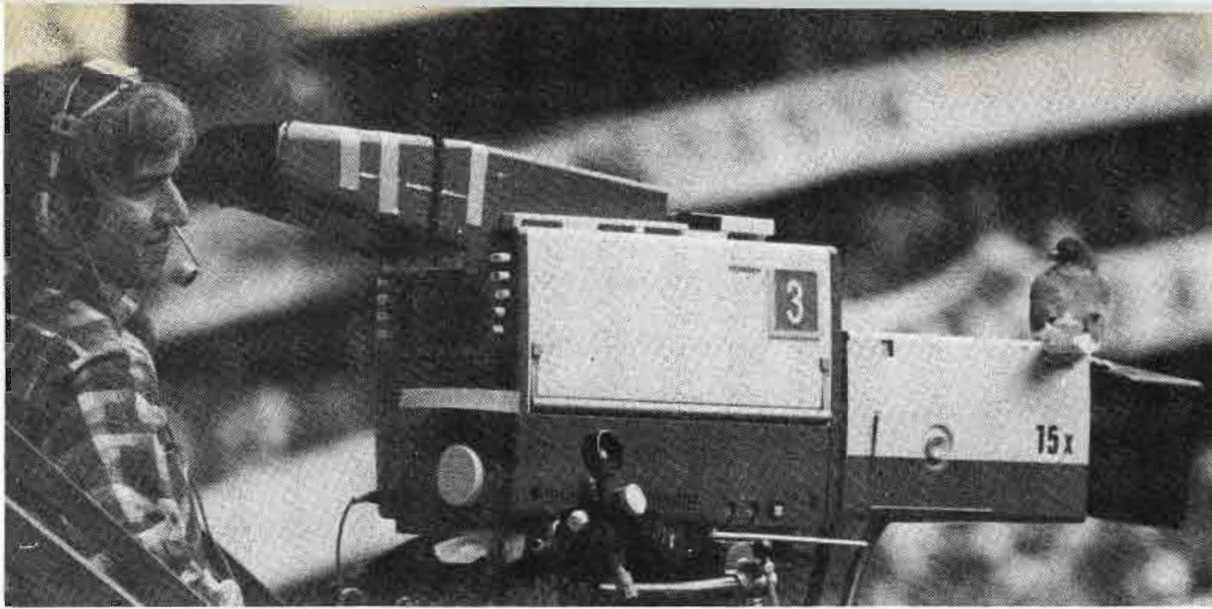
Perhaps the most interesting aspect of the Pan American Games was the use of widespread satellite communications in sending the sound and images to the recipient countries in North and South America. The Telecom Tower in Mexico City is connected by microwave to both ground-based repeaters that go to New York via Laredo and Dallas, and to the Mexican earth satellite station at Tulancingo.

The CBS coverage used the single video and dual audio links through Dallas to feed their network. To reach Cuba with the games, a separate microwave system through Juarez and Miami finally made use of a troposcatter system to cover the last link into Havana. Short, local microwave hops fed Channels 2, 5 and 13 in Mexico City, where they could redistribute the programs to their own internal networks.

The Tulancingo earth satellite station beamed a video and multiple audio signals to the Intelstat IV F3 relay which fed signals to earth receiving station in its window of operation. These included receiving parabolas in Longovilo, Chile; Choconta, Columbia; Camatagua, Venezuela; Tangua, Brazil; and the ETAM station in the USA. To overcome a satellite position problem, the ETAM signals were microwaved to Andover, Maine, and sent up to Intelstat IV F7 which could now relay to Cambita in Santo Domingo and Cayey in Puerto Rico. The Andover terminal also fed the CBC in Montreal, Canada. French and English sound, as well as radio and coordination signals went over a satellite link and land lines which were called SPADE.

In addition to the satellite links, there were daily video-tape reels sent off by jet to various countries

BROADCAST ENGINEERING



A bemused cameraman keeps an eye on an unexpected visitor during coverage of the opening ceremonies. The camera was connected to a CBS van outside Azteca Stadium.

to complete the extensive TV coverage.

Interviews with key members of the various TV teams in Mexico City revealed some ongoing problems with the hastily assembled system that was put together for the Pan Am Games. However, everyone agreed that under the circumstances the results were as good or better than expected. Mexico was not scheduled for the Pan Am in '75; Chile first had the honor and declined due to internal political problems and Brazil was next in line, but an epidemic of meningitis in Sao Paulo took them out of the running. Mexico then accepted the saviour role. By any measure, there was a critically short work period for an undertaking of this magnitude.

Some of the leased equipment arrived on site a few weeks before the opening ceremony and needed a round-the-clock effort to get installed and checked out by game time. The operating crew was recruited from engineering students (who got college credit for their work) and trained for two weeks to run some of the most sophisticated equipment in the television field.

The TV crews from both near and far north of the border suffered from the effects of Mexico City's 7,000 foot plus altitude and the consequences brought on by "Montezuma's revenge," or as it is now referred to in the modern vernacular "Gringo a Go-Go." Nevertheless, a look at the CBS coverage reaching the USA shows a fast paced visual review of the athletic contests and a series of colorful video pageants encompassing the pomp and ceremony of the inauguration and close of the VII Juegos Deportivos Panamericanos.

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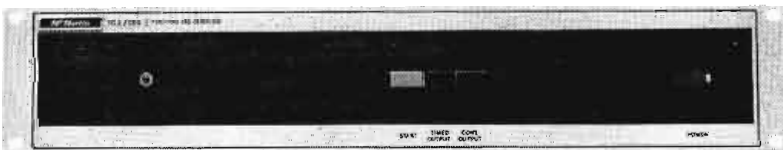
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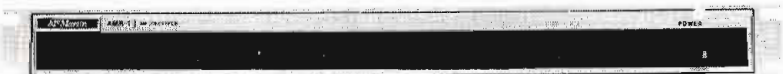


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Globecasting

Electronics is invading The BBC radio network

Electronic aids for newspapers and wire services have evolved over a period of years to practicality. Now, for the first time, electronics is invading the newsroom of a large radio network, the British Broadcasting Corporation.

A new system, using TV-like screens and a big computer, will be placed in operation in 1977 by a British subsidiary of International Telephone and Telegraph Corporation for BBC's international shortwave "External Services." It will greatly aid its 250 people with the logistics of broadcasting 700 program hours per week in 40 languages, the world's most diverse such service.

Previously, incoming news was stenciled, duplicated, and distributed by hand to locations on 17 floors of three different buildings. Some 20 million sheets of paper were used per year. A large part of the workload was the translation of incoming English-language material into the 39 other languages. Each language is handled by an autonomous department.

The new \$2.4 million system is basically a communications-oriented computer which will store and make available material to some 240 terminals that enter and display information.

Extreme flexibility was required in the terminals to give the editing capabilities required by journalists. The usual editorial implements will no longer be pencil, paper, typewriter, and copy, but will be the terminals with their displays.

Incoming copy will no longer be sifted for news value, duplicated, and distributed to the various language desks. Instead it will be centrally evaluated at the incoming desk and entered by a terminal into the computer.

At this time, editing is performed. Letters, words, and sentences can be deleted, inserted or changed, with the lines automatically being adjusted to conform to the changes. While this is going on, the copy editor will be able to see his changes occurring on a TV-like screen before him.

Each line will contain only complete words, none being hyphenated at the end of a line. Each terminal will have its own storage for 40 lines of text, with 25 lines being displayed at a time. When the copy editor has completed his changes in the 40 lines, they will be "dumped" into the central computer's memory and editing can start on the next part of the story. In the computer, stories will be captioned with a code that will enable them to be recalled instantly on any of the 240 terminals.

At this point, the stories can be summoned to appear on the terminals at the translators' locations, where translations can be prepared, edited and also

stored in the computer.

The broadcasters can selectively call out the material for putting it on the air in the form either of a terminal display or as hard copy on a teleprinter-like device.

The storage in the computer will be so large that material can be retained from three to 30 days, or even up to 150 days, a great help when an important story requires periodic updating.

To provide reliability in the system, the computer will actually be duplicated, with two systems working simultaneously, processing all the news, and cross-checking each other.

The system designers estimate that the delays in broadcasting news stories will be reduced from up to two hours with the present manual system to about one to three minutes, depending on the length of the story.

Satellite links open up New communications

Industrial conferences, that would normally have required air travel, soon will be conducted by using a satellite communications link between two divisions of Westinghouse Electric Corporation. The experiment will be conducted on the Communications Technology Satellite (CTS) which is to be launched shortly by the National Aeronautics & Space Administration (NASA).

Teleconferencing between the Westinghouse Defense & Electronic Systems Center, Baltimore, Md., and the Westinghouse aerospace electrical division, Lima, Ohio, will begin after the CTS launch and post-launch satellite checkout. Each Westinghouse location uses a small ground terminal to both send and receive television signals which are relayed by satellite to and from the other plant location. The two plants are about 400 miles (640 kilometers) apart.

"Experimental conference rooms with television cameras have been set up at each Westinghouse location," explained Herb Nunnally, program manager for Westinghouse satellite communications. "To reduce cost and to increase confidentiality of the conferences, there will be no camera operators. Instead, cameras will be switched by the voice of the speaker."

The conference rooms in Baltimore and Lima will receive color video which will be projected on a large screen permitting participants at one location to view facial expressions and gestures of participants at the other location. The impact of video taping, transmitting graphics, and time/cost constraints will be evaluated during the experiment. A scrambling device will make the communications link secure from potential eavesdroppers.

According to Herb Nunnally, the principal investigator, the experiment will attempt to determine how effectively business information can be

(Continued on page 64)

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News

(Continued from page 63)

discussed without the normal personal contact and interaction.

"In addition to the human factors, we will be evaluating the costs of limited satellite time compared to the normal travel costs for engineering, marketing and general management personnel," said Mr. Nunnally. "If this experiment proves practical, high-power communications satellites with low-cost ground stations at industrial facilities may eventually become commonly used for business conferences."

Slow motion replays Celebrate first decade

Today's televiewer is so accustomed to slow and stop motion replays of the key incidents in sports programs that it seems hard to imagine what television would be like without this sophisticated gadget. Surprisingly, this technique is only celebrating its first decade of existence this year.

The first commercial application of a magnetic disc capable of instant replay and stop action was through the use of an MVR Videodisc* in 1965 at the July 8 Baltimore Colts game covered by CBS. It was strictly monochrome and had no variable slo-mo capability.

Notwithstanding its early limitations, the TV Academy quickly recognized the program production merit of this new device and on May 22, 1966 awarded its developer, Kurt Machein, president of MVR their Emmy for technical achievement. By the end of that year, and in time for the World Series, variable slow motion was added and NBC could use this feature at the opening game between the Dodgers and the Orioles on October 4.

Within two years color was added and Ampex entered the market with their own version, the HS-100 disc recorder, based on similar principles but with extended time and capabilities.

Few major studios today do not use some form of video disc recorder for sports coverage or post-production special effects. The viewer gets the benefit of television imagery time expanded to show every detail of Hank Aaron's homers or Chris Evert's double-handed smash. For the TV commercial producer, programmed discs allow every kind of forward and reverse animation from full stop to a Keystone Kops speed up. Broadcast television depends more and more upon this magic magnetic disc to perform the daily miracles that capture and hold the viewers' attention on that color screen at home.

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It's NAB election time

The National Association of Broadcasters announced recently the nomination of 36 prominent broadcasters from throughout the nation for election to membership on its Board of Directors.

Of those nominated, 25 were designated as nominees for 12 seats on the 30-member Radio Board and 11 for six seats on the 15-member Television Board.

The 18 to be selected in mail balloting will serve two-year terms beginning on Wednesday, March 24, the concluding day of NAB's 54th annual convention in Chicago.

Ballots will be mailed to all NAB members later this month and are to be returned to NAB for tabulation by Feb. 17. Results will be announced the following day.

Nominees to the Radio Board are: District 2—(New Jersey and New York)—**William O'Shaughnessy**, president, WVOX AM-FM, New Rochelle, N.Y.; **Oscar Wein**, president and general manager, WDLC AM-FM, Port Jervis, N.Y.

District 4—(North Carolina, South Carolina and Virginia)—**William L. Eure, Jr.**, president and general manager, WSSV/WPLZ, Petersburg, Va.; **Carl V. Venters, Jr.**, president and general manager, WPTF/WQDR, Raleigh, N.C.

District 6—(Arkansas, Louisiana, Mississippi and Tennessee)—**Len Hensel**, vice president and general manager, WSM AM-FM, Nashville, Tenn.; **James M. Ward**, general manager WLAC AM-FM, Nashville.

District 8—(Indiana and Michigan)—**John R. Anderson**, president and general manager, WCCW AM-FM, Traverse City, Mich.; **Bazil O'Hagan**, vice president, WNDU AM-FM, South Bend, Ind.

District 10—(Iowa, Missouri and Nebraska)—**E. G. "Red" Faust**, president, KJAN AM-FM, Atlantic, Ia.; **R. M. McKune**, president and general manager, KTTR/KZNN, Rolla, Mo.

District 12—(Kansas and Oklahoma)—**Pat Murphy**, vice president and general manager, KCRC AM-FM, Enid, Okla.; **Robert L. Pratt**, vice president and general manager, KGGF, Coffeyville, Kan.

District 14—(Colorado, Idaho, Montana, New Mexico, Utah and Wyoming)—**Wayne Cornils**, president and general manager, KFXD AM-FM, Nampa, Ida.; **Frank Scott**, general manager, KTLK, Denver, Colo.

District 16—(Arizona and Southern California)—**Dan B. Speare**, general manager, KGEE/KGFM, Bakersfield, Cal.; **Jack Willis**, vice president and general manager, KHEP AM-FM, Phoenix, Ariz.

(Continued on page 66)

yes it's TRUE... the PRICE of Cross-Pulse & Color monitors HAS DROPPED

Now you can convert any monitor to a cross-pulse monitor with VACC's new \$345* model CPG-1 Cross Pulse Generator. Your monitor requires no modification. Fill out the coupon below for more information. At the same time, ask for a free copy of VACC's Troubleshooting Chart. This handy wall chart has actual photos showing typical video conditions such as normal sync with and without burst, time-base errors, overshoot, clipped sync, and many more. VACC's chart is a valuable aid when adjusting and troubleshooting video problems using a cross-pulse monitor.

If a video monitor is needed, install a VACC Electro-optical Isolator in a Sony receiver. A engineer or electronic technician can install a model A-1 in a 12", 15" and 17" Sony receiver in less than an hour. Model AI-A should be installed in a KV1711, KV1722 and all 19 inch Sony receivers. You add only one-half pound to your receiver and your Sony can be used as a high quality monitor or retained as a receiver by merely flipping a switch. Isolation is far superior to heavy transformer isolated monitors and you can connect up to 20 monitors without troublesome ground loops if all monitors have VACC isolators.

by popular request

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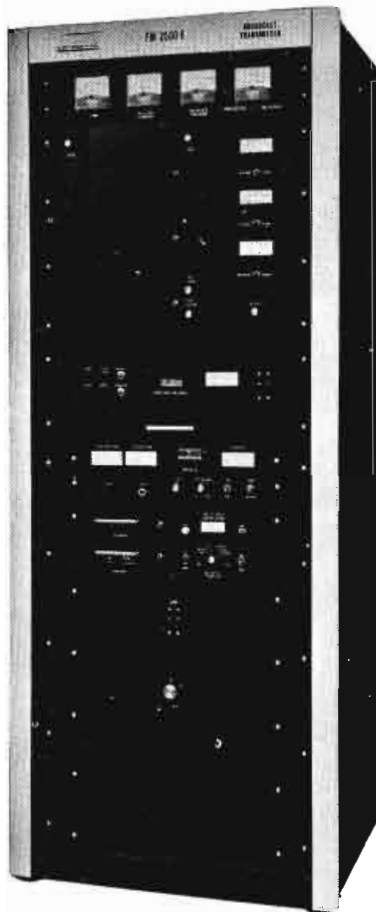
NEED AUDIO/VIDEO-OUT TO RECORD OFF-THE-AIR? Order VACC's new model D1 or D1A Optical Demodulator. Similar to, but smaller in size than the widely used VACC A1 or A1-A Optical Isolator, VACC's new optical demodulator kit is easy to install and has the same outstanding isolation and weight advantages. Use model D1 for Sony's KV1201, 1203, 1212, 1214, 1500, 1511, 1710 and CKV 171 and the D1-A for KV1711, 1722, 1910, 1922 receivers. Yes, you can install the A1 and D1 or A1-A and D1-A in the same Sony receiver to have a receiver monitor demodulator. Add VACC's Cross Pulse Generator and you can have all four functions using one CRT.



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(Continued from page 66)

Class "A" (markets of 500,000 population or more)—**William W. Hansen**, general manager, WJOL/WLLI-FM, Joliet, Ill.; **David G. Scribner**, president, Doubleday Broadcasting, KHOW AM-FM, Denver, Colo.; **Lester M. Smith**, executive director, KJR/KISW, Seattle, Wash.

Class "B" (markets with populations between 100,000 and 500,000)—**Herbert W. Hobler**, president, WHWH/WPST, Princeton-Trenton, N.J.; **Ted L. Snider**, president, KARN/KKYK, Little Rock, Ark.

Class "C" (markets with populations between 15,000 and 100,000)—**J. R. Livesay**, president and general manager, WLBH AM-FM, Mattoon, Ill.; **Dick Painter**, general manager, KYSM AM-FM, Mankato, Minn.

Class "D" (markets with populations below 15,000)—**Bayard H. Walters**, president and general manager, WKCM, Hawesville, Ky.; **Jack S. Younts**, president and general manager, WEEB, Southern Pines, N.C.

(Thirteen Radio Board directors—nine from even-numbered districts and four at-large—have another year to serve. The remaining five directors are appointed to represent national radio networks.)

The Television Board nominees are: **Forest W. Amsden**, vice president and general manager, KGW-TV, Portland, Ore.; **David Baltimore**, president, WBRE-TV, Wilkes-Barre, Pa.; **Charles A. Batson**, president, Cosmos Broadcasting Corp., Columbia, S.C.; **Kathryn F. Broman**, president, Springfield Television, WWLP, Springfield, Mass.; **A. James Ebel**, president and general manager, KOLN-TV, Lincoln, Neb.; **Earl W. Hickerson**, vice president and general manager, WCEE-TV, Rockford, Ill.; **Douglas L. Manship**, president, WBRZ, Baton Rouge, La.; **Daniel T. Pecaro**, president, WGN Continental Broadcasting, Chicago, Ill.; **Mark Smith**, general manager, KLAS-TV, Las Vegas, Nev.; **Leonard A. Swanson**, vice president and general manager, WIIC-TV, Pittsburgh, Pa.; **Walter M. Windsor**, general manager, WFTV, Orlando, Fla.

Changes in the industry

Russ Johnson, Vice President and General Manager of the Panasonic Communications Division, Secaucus, N.J., announced the appointment of **Henry Suto** as Advertising Manager, Communications Division....Appointed Manager of Advertising, Sales Promotion and Publications, for RCA Electro-Optics and Devices in Lancaster, Pa., was **John F. Chattin**.

McMartin Industries, Inc., Omaha, Nebraska, has named **Charles F. "Chuck" Rockhill** as Western Sales Manager....**Edward King** has become Marketing Manager of the Hicksville, N.Y. Division of Amperex Electronic Corporation, a subsidiary of North American Philips Corporation....Elected as President and Chief Executive Officer of International Video Corporation, Sunnyvale, California, was **Ronald H. Fried**.

Zoom in!

ASTVC Welcomes Walter Cronkite and Tom Snyder As Honorary Members

Walter Cronkite and Tom Snyder join Harry Reasoner as Honorary Members in the Society.

"I am greatly honored and I accept with pleasure my nomination as Honorary member in the American Society of TV Cameramen" wrote Mr. Cronkite as he accepted our nomination.

NBC's Tom Snyder wrote his letter of acceptance to say: "...I am highly honored by the consideration of the (ASTVC) as a nominee for Honorary Membership....I don't have to tell you...how pleased I would be to be a part of a group of men and women whose work I have always held in high regard. And without whom I could not do what I do..."

The ASTVC is equally honored to have these two gentlemen join our ranks. Plans for the future call for a dinner meeting where members of the Society and their guests can join in greeting our Honorary members and officially welcoming them into the ASTVC.

By the way, all members of the Society are encouraged to forward the names of those they believe, by virtue of their contributions to the industry, are worthy of nomination for Honorary membership.

EJ Cameras At La Guardia Tragedy!

EJ journalism demonstrated its newsworthiness, once again, when it covered the tragic explosion at New York's La Guardia Airport on the evening of December 29th. Crews from all the nets and many of the local stations were on hand to transmit and record the stark reality of this horror as it unfolded.

ASTVC's Art Weider was TDiing NBC's Nightly News in New York and riding with the tape, preparing to have an uneventful "wrap", when the word came to prepare for

a break-in....Within minutes, a radio link with our crew at La Guardia was setup and Art coordinated the very LIVE insert. To the average viewer, it would have seemed well-planned...well-re-

hearsed. Unsurpassed for timeliness...Unbeatable for realism...EJ has come into its own.

PS: A word of praise must be given to the crews on the scene who
(Continued on page 68)



TOPS!

That's LPB's stereo S-13B console, our top-line audio control center. Features include:

- 18 stereo and 6 mono inputs.
- Step attenuator mixers.
- Telephone-type switches.
- Plug-in fiberglass circuits.
- Stereo 12 watt/channel monitor.
- Internal cue amp and speaker.
- All transformer input and output.

The features and quality of LPB's S-13B just can't be found in other consoles at comparable prices. Take a hard look at the S-13B before you make a mistake!

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(Continued from page 67)

operated professionally (if not calmly) with the threat of another bomb going off about their heads....

Hawaii Next?

With Alaska in and most of the major TV centers around the country boasting ASTVC membership, we were wondering when our most western state would get around to asking about membership.

Well, someone down at the Hawaii Production center has set the ball rolling....If all goes well, we may have our annual meeting under the palms, alongside the roaring surf....How about those (pine)apples?

**For Latest News
See
Direct Current page 4**

International Broadcasting School Planned

A minister who started a television network ten years ago with a three-dollar contribution has announced plans to build a \$23-million dollar international headquarters and communications school to teach broadcasting to students from around the world.

Dr. M. G. "Pat" Robertson, President of the Christian Broadcasting Network, has announced plans for the construction of a new headquarters site in Virginia Beach, Virginia. It will include two large television studios, a satellite-transmitting facility, an office complex, a 2,400-seat conference center, an International Institute of Broadcasting to train students from around the world, and a School of Theology.

The complex will be built over several years on a 142-acre tract of land acquired New Year's Eve.

"What we intend to do," said Rev. Robertson, "is to train Christians from around the world in all phases of the broadcasting industry. When they return to their home countries, they will have both the technical know-how and the Christian commitment to use broadcast for the betterment of mankind, and their home nations."

Robertson is host of the internationally-syndicated "700 Club" television and radio program broadcast on approximately 50 television and 70 radio stations in the United States and overseas.

His network won the coveted "Best Stations Award" from the National Religious Broadcasters Association in 1974, and has won the 1975-76 Distinguished Merit Citation from the National Conference of Christians and Jews.

He pioneered the television-telephone counseling concept in the early 1960's with his "700 Club" television program. As an outgrowth of that ministry, the Network now operates more than 40 counseling centers which answered more than three-quarters of a million phone calls for help nationwide last year.

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CHYRON II **Electronic Graphics System,**

unquestionably the most advanced and versatile system available today...the one system that offers the highest character resolution and do-it-yourself capability for unlimited type font and logo preparation, plus more features than any other TV graphics equipment.

CHYRON III **Electronic Titling System,**

At a moderate price CHYRON III provides more flexibility and quality than higher priced units, including unlimited font and logo interchangeability, large message storage capability, and character resolution exceeded only by CHYRON II.

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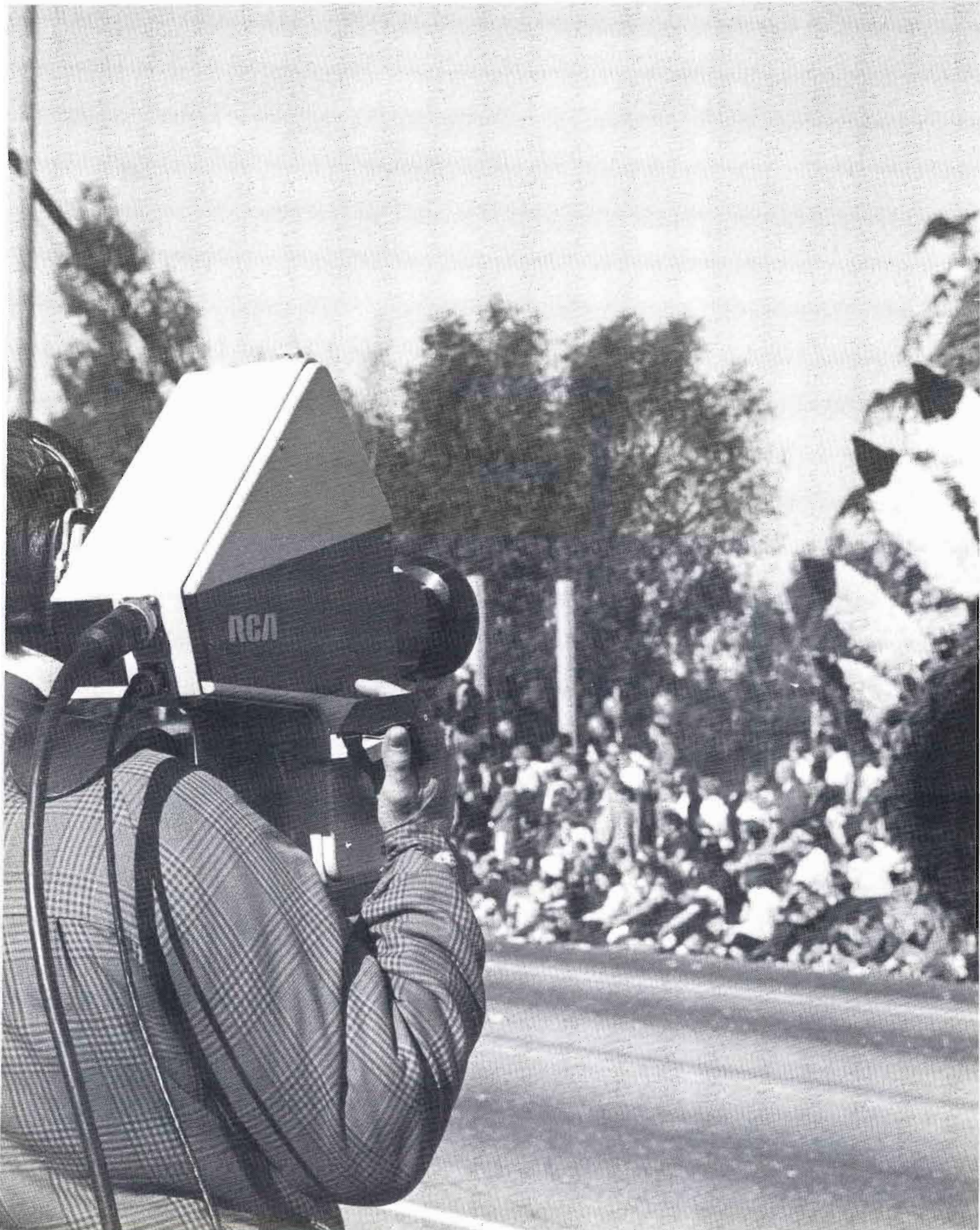
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CABLE engineering



NCTA Seeking Nominations

Technical Awards

The National Cable Television Association is seeking nominations for its annual technical achievement awards, one in technical operation and one in engineering or manufacturing.

The awards, made for the past three years, honor individuals who have made a lasting contribution to the cable television industry. The selection of award winners will be made by a special selection board of the Society of Cable Television Engineers. Award winners will be honored at a reception during the NCTA Annual Convention, April 4-7 in Dallas, Texas.

Previous winners have been: I. Switzer, Switzer Engineering, Ltd.; Henry Diambra, Westinghouse Research; Hubert Schlafly, Trans-Communication Corp.; Donald Levenson, Wheeling Antenna Co. and Keneth Simons, Simons and Wydro Associates.

Nominations, accompanied by a brief biography and comments on the nominee's contributions, should be sent to Delmer Ports, NCTA Vice President for Engineering, not later than February 1.

Leapfrogging Action

Removal of cable television "leapfrogging" restrictions is "a major positive development for the cable TV industry and its subscribers," according to Robert L. Schmidt, president of the National Cable Television Association.

Schmidt also said that the Federal Communications Commission decision on December 19 to lift its signal importation limitations is "an endorsement of the Commission's stated goal to de-regulate cable TV."

"The FCC action makes development of cable TV in some larger markets viable," Schmidt said.

Friday's FCC decision permits CATV systems to use independent

broadcast television signals from anywhere in the country to make up a complement of allowed signals. Previously, the FCC restricted CATV systems located in the nation's 100 largest markets to carrying signals only from one of the two nearest top-25 markets. The FCC action does not change the limitations on number of independent channels which may be carried (maximum of three in the top-50 markets; two in the next 50 markets), nor does it change the rule that the third imported independent signal in the top-50 metro areas is only allowable if there is no local independent station. The FCC action also continues the requirement that if a third independent station is carried, it must be a UHF

station if one is available within 200 miles.

Schmidt predicted that the leapfrogging relaxation will be the stimulus needed to encourage construction of CATV systems in markets which had until now been unattractive because of the limited choices of independent signals available to them.

Schmidt also noted that in some markets it will become economically feasible to carry signals from distant cities because microwave facilities are already in place carrying signals to intermediate locations. This will allow more choice of stations and more economical microwave routing to bring in the signals.

More speakers available Through new NCTA bureau

Cable television speakers will be available to more audiences through the ambitious new Cable Television Speakers Bureau established by the National Cable Television Association.

The "Speaking of CATV" project will make speakers available to non-cable industry meetings, including those of trade associations, civic and fraternal organizations, schools and similar groups.

"One of NCTA's major goals is to make the public aware of the cable TV industry," NCTA President Robert L. Schmidt explained. "The Speakers Bureau will enable us to schedule industry leaders on a variety of programs around the country."

CATV industry spokesmen — including members of the NCTA Board and Committees, cable TV company executives and NCTA staff members — will be available to discuss the status of the cable TV industry and specific issues

about CATV development, Schmidt said. A basic package of materials has been assembled at NCTA, but all speeches will be tailored to specific audiences.

Schmidt called the public information goal one of his top priorities in developing CATV's image throughout the country. He said it is part of NCTA's on-going program to acquaint the public with the issues involved in the growth of cable TV.

NCTA is informing trade groups, educators and business organizations of the availability of Speakers Bureau representatives, Schmidt said. The NCTA Public Affairs Department will schedule speeches and assist in the production of support material for speakers.

Information about the Speakers Bureau is available from the Public Affairs Department, NCTA, 918 16th St. NW, Washington, D.C. 20006.

NOW! LOW-COST CHARACTER GENERATORS



developed for cable operators by a cable operator.

Some years ago, KSN found it difficult to justify the conventional \$12,000 character generator for its own cable systems. So, ignoring the conventional engineering approach and using an entirely new concept, based on the most modern electronic logic, KSN developed a series of new, unique character generators

at a much lower cost.

They're clean and attractive-looking on the outside; and inside, there's a simple, long-lasting, dependable, low-cost workhorse that will set competitive standards for years to come. Custom modifications can be made at extra cost.

THE NEW MESSAGE MASTER!



The new Message Master has eight 12-line pages of storage, optionally expandable to 40 pages built into the keyboard. Masking allows display of only 1, 2, or 4 lines at a time, with unique display advance that

limits the advance to the number of lines displayed, allowing line-by-line use of the memory.

Other functions include: word flash, word or line underline, automatic centering, and two-speed roll or crawl through all or part of memory. Switch to a choice of two display sizes: 12 lines of 32 characters or 6 lines of 16 characters. Preview monitor fed with white letters on blue background. Horizontal edging gives distinct white lettering even on light background. This unit is ideal for HOME BOX OFFICE marquees.

Information about the KSN Weather Master — designed for use with wire from U.S. Weather Bureau — and the News Master — use with UPI or AP cable news services — is available in our brochure.



CHARACTER GENERATORS

Kansas State Network
Write KSN, Box 333, Wichita, Kansas 67201

Yes, send me a free copy of the KSN Character Generator brochure by return mail.

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about everything you can think of in between. (Enough to fill a truck, in fact.)

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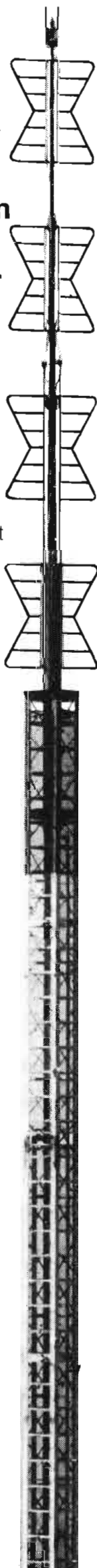
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these Harris
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cast two VHF sig-
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Harris custom-designed and tested stacked antennas installed for WNGE-TV Channel 2 and WDCN-TV Channel 8, Nashville, Tennessee.

For a TV antenna to meet your specific requirements, write Harris Corporation, Broadcast Products Division, Quincy, Illinois 62301.



HARRIS
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INFORMATION HANDLING



For More Details Circle (56) on Reply Card

February, 1976

NEW PRODUCTS

EBS Equipment

Broadcast Engineering Techniques, in Providence, Rhode Island, is introducing its model EBS-100. BET's approach to the re-regulation of the Emergency Broadcast System's methods for alerts and detection of alerts is unique and highly logical, using digital techniques in all frequency generation, decoding, and timing functions.

Precision, temperature-compensated IC square-wave oscillators are used in the generator, with maximum frequency deviation of 0.3 Hz., and Total Harmonic Distortion less than 3% at +8dBm output.

Instead of the common tuning fork technique, BET's decoder utilizes two CMOS digital comparators, matching incoming material to the generator's accurate reference for identification as the EBS signal.

The encoder-decoder (with optional AM receiver) is in a single unit, occupying 3½ vertical inches of normal rack space. The front panel, in addition to controls, is provided with a speaker and LED indicators for Power, Generate, and Decode.

The Generate control, on the front panel, is switchguarded, preventing inadvertent activation. Further, an Interrupt function is provided to disengage the generator. The Reset control mutes the speaker and resets the decoder section to the "ready" state.

For More Details Circle (86) on Reply Card

Dual Cue Controller

A new "chase" feature for the EECO Dual Cue Controller (BE-460) when used with the Wide Range Synchronizer (BE-450) has been announced by **Ampex Corporation**, exclusive worldwide distributor for EECO broadcast products.

The new feature allows the user to select either one of two tape transports to chase the other in a "follow-the-leader" mode during

(Continued on page 75)

MARTI . . .

The Name to Remember . . .

RADIO REMOTE PICKUP 150 - 450 MHZ



RPU
Transmitter

\$975.00 (150 MHZ)

\$1145.00 (450 MHZ)

FEATURES: • All Solid-State • Direct FM Modulator • Broadcast Quality — Continuous Duty • Four Audio Mixing Channels • Plug-in Modular Construction • I.F. Crystal Filter • Taut Band Meters

Radio Remote Pickup Equipment is versatile, dependable and an entree to profitable radio broadcasting. That is the acclaim given to Marti RPU Equipment by American Radio Broadcasters. "How did we ever operate a radio station without it?", is the comment most often heard after equipment has been purchased and put into service.

The progressive minded, community spirited broadcaster, can find many uses for Remote Pickup Equipment. He will do many more remotes than he is presently doing, simply because the equipment is available at a moment's notice. To coin an old cliché, "It doesn't cost — it pays."

Add Color to Your Remotes . . .

PORTABLE BROADCAST REMOTE PICKUP TRANSMITTER

Model RPT-1

\$495.00 (150 MHZ)

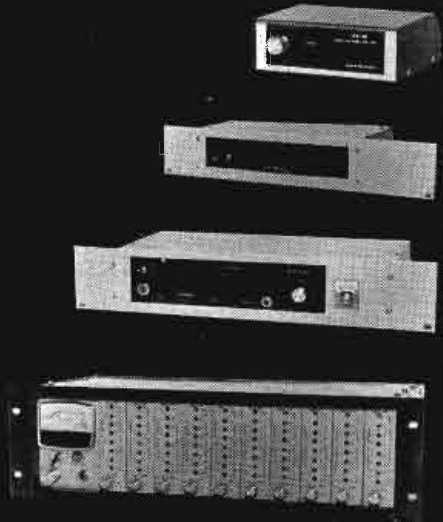
FEATURES: • Portable operation on internal rechargeable nickel-cadmium battery. Total weight only 5¼ lbs. • All Solid-State • Built-in battery charger • Dual frequency operation (One crystal included) • Meter indicates battery condition and modulation • Whip antenna mounted directly on unit • Broadcast-quality Compressor/Limiter handles toughest remote pickup conditions • Two microphone inputs (one push-to-talk) and one Hi-Level input each with individual mixing gain control

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Six different audio DA's designed to solve all of your distribution problems.

From our table top 1 in/6 out to our powerful 20 in/80 out. Stereo or mono operation, output metering, individual level controls and balanced inputs and outputs are just a few of the many features found in these superb DA's. Performance? Response — 10 Hz - 20 KHz ± 0.5 db; Dist. — 0.1%; Output level — +20 dbm max; Signal/Noise — -90 db; Channel separation — 80 db. Quality? All RAMKO products are backed by our 10 day free trial and 2 year warranty. They have to be good to do that.

Call collect or write today!

Models & Prices

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| DA-6/E 1x6 (table top) | \$ 145 |
| DA-6R/E 1x6 (rack) | \$ 165 |
| DA-6BR/E 1x6 (rack, indiv. cont.) | \$ 179 |
| DA-6RS/E 2x12 (rack) | \$ 239 |
| DA-16BR/E 2x16 (rack, meter, etc.) | \$ 295 |
| DA-2080 up to 20x80 (rack) | \$325 - \$1,675 |

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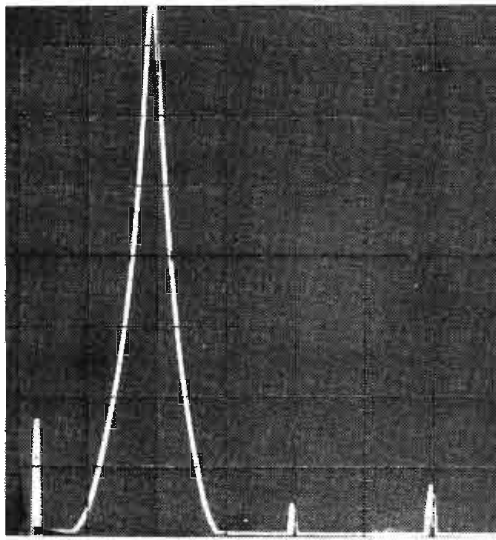


Figure 4a Encode THD with 1 kHz 0 dBm input (.0%).

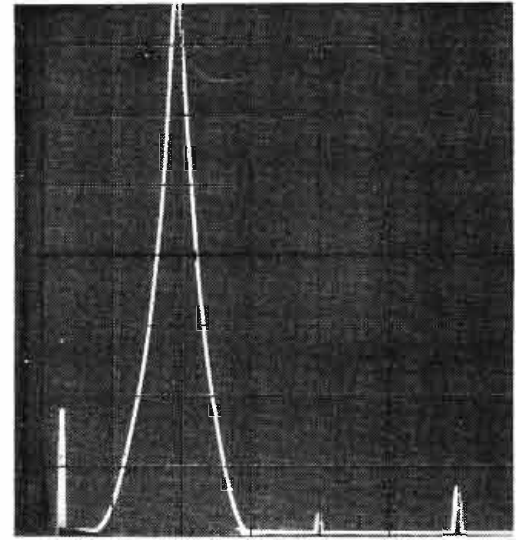


Figure 4b Decode THD with 0 dBm 1 kHz input (.0%).

(Continued from page 52)

the equivalent input noise at -90 in the decode mode. The advantages of the linear decibel system are obvious, in that level matching is not at all critical.

The preemphasis and deemphasis are fixed, as shown in Figure 2. Notice that if the O.V.U. reference level is exceeded at the encode input, the unit will bring the level down and then expand it back up in the decode mode so that about 10 dB of extra headroom can be obtained. As long as the input and output levels are a nominal O.V.U., the area from 0 reference to overload will be a mirror image when encode and decode gain is compared.

Below the 0 reference level, the unit will track accurately, even if the encode and decode inputs are badly mismatched because the gain function is a constant double the dB's going in and half the dB's coming out.

The dbx system also uses r.m.s. detectors so that the level sensing is not affected by phase shifts in the program material as would be introduced by a tape link.

The block diagram shown in Figure 3. illustrates how all of these functions are accomplished. Notice that the inputs to the r.m.s. detectors in the encode and decode function contain pre and deemphasis like the program channels so that tape saturation can be avoided when recording high level passages with lots of high frequency content.

The detectors are also bandlimited so that they will only track audio and not sub-audible record warp, rumble, air noise, etc. The band-pass of the audio channels is flat

within ± 0.5 dB from 20 to 20,000 Hz.

Frequency Response

To check the frequency response of the unit, we first measured the response of the test tape deck, a Scully 280, by itself with the dbx in the bypass mode. We recorded the record/play response error for reference and then made a dbx encoded tape on the same machine. This tape was then played back through the decoder and the difference between the bypass and encode/decode response was plotted as the dbx frequency response error.

Since the dbxII operates in the encode or decode mode, but not both simultaneously, it is not possible to simply feed tones into the input and monitor the output. This is not an operational handicap, however, because the response of the dbx is so flat that no tape deck equalization compensation is required, so, the bypass mode can be used for routine tape deck adjustments.

Figures 4a and 4b show relative second and third harmonic levels for each mode of operation. The measurements were made on a Tektronix 5L4N spectrum analyzer in a 5301 storage scope. The equipment was adjusted for a 10 dB per division display and as can be seen from the photos, the second and third harmonics are below -70dB.

The blip at the left of the fundamental is a start of trace pulse and unrelated to the distortion components. The manufacturer specs

(Continued on page 76)

fast forward and rewind operations.

This feature is in addition to the original capability of cueing two transports (master and slave) automatically to any selected point either individually or simultaneously. Also a code verification routine has been added to improve overall system operations.

With the new modification, two multi-track audio recorders can be used as a single recorder with double the track capacity.

The EECO system allows audio sweetening of video tape to also be "lip sync perfect" even when helical dubs are used for visual reference as the new audio is developed.

It also permits video and FM stereo tapes to be kept in exact sync during musical simulcasts.

Control is based on identical SMPTE/EBU Edit Code indexing recorded on one channel of each tape. Synchronization is exact for any tape lengths, regardless of normal tape stretch or slippage.

List price of the "chase" feature update kit is \$985 each. The price of the BE-460 Dual Cue Controller including the new "chase" feature remains unchanged at \$5,500. Delivery is 60 days ARO.

A four-page brochure describing the EECO Time Code Synchronization system is now available at any Ampex sales office, or at EECO Broadcast Products Group office, 1441 E. Chestnut Ave., Santa Ana, California 92701.

For More Details Circle (106) on Reply Card

Digital Multimeter

This new 3½ digit, five function, fully autoranging digital multimeter from Hewlett-Packard sells for only \$225. Voltages are measured from ± 100 microvolts to ± 1000 volts DC and from 300 microvolts to 700 volts rms AC. Resistance is measured from 1 ohm to 11 megohms. Current can be measured from 100 microamperes to 1.1 ampere DC and 300 microamperes to 1.1 ampere AC. Autozero, autopolarity and autoranging are built in.

This combination of features at a low price has been achieved through a major technological advance, according to William E. Terry, vice president and general

manager of Hewlett-Packard's Instrument Group. "Our development of fine-line, tantalum nitride resistor technology has enabled us to eliminate the use of more costly discrete precision resistors. Using this new technique, we are now able to offer this high-quality, compact DMM with features such as five functions with full autoranging at a very low price," says Terry.

Typical accuracy for DC voltage measurements is 0.5%. DC current accuracy is 1.0%. On AC voltage ranges, frequency is specified to 10 kHz, while AC current measurement is to 5 kHz. Accuracy of resistance measurements on the three highest ranges is to 0.6% and to 0.4% on the two lower ranges. Open circuit voltage is less than 4 volts.

Input resistance on all voltage ranges is 10 megohms with input capacitance of less than 30 picofarads. The 3476 is protected to 1100 volts peak on all ranges. The fuse that protects the ohms function is rated 250 volts rms. The current function is fuse protected to 1.5 amps. No special fuses are

required and they can be quickly replaced without disassembling the instrument.

A range hold feature is included that allows the instrument to be locked to any desired range. This feature is necessary when measuring diode resistance for example. It also makes repetitive measurement faster. The LED readout gives all voltage readings in volts, all resistance readings in kilohms and all current readings in amperes.

Ruggedness is assured with the high impact resistance polycarbonate case. A three-position bail gives the user flexibility in placing the 3476 for most convenient use.

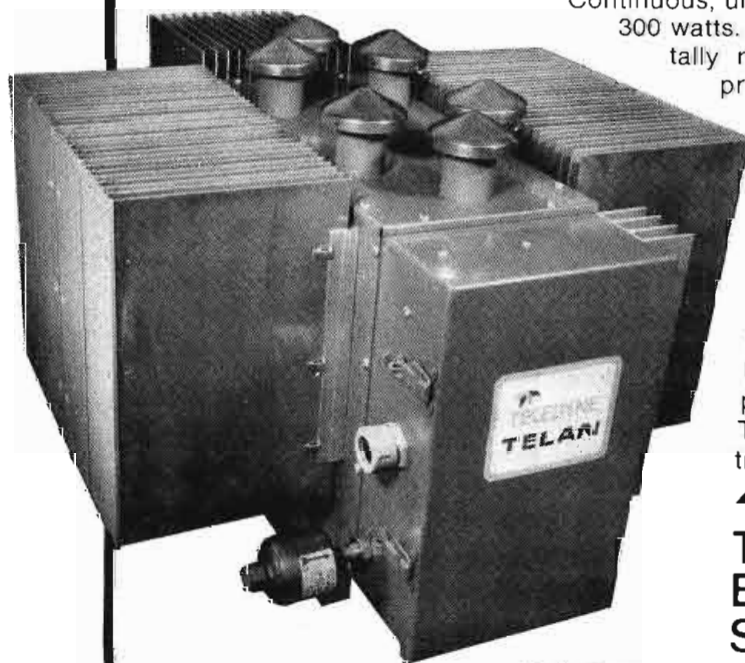
Model 3476A is AC line powered only; Model 3476B is AC line powered and also includes rechargeable nickel cadmium batteries. Typical operating time on fully charged batteries is 8 hours.

Both units measure 6.5 cm (2.3 in.) high, 16.8 cm (6.6 in.) wide and 20.6 cm (8.1 in.) deep. Model 3476A weighs 0.71 kg (1 lb. 9 oz.) and Model 3476B weighs 0.91 kg (2 lb.).

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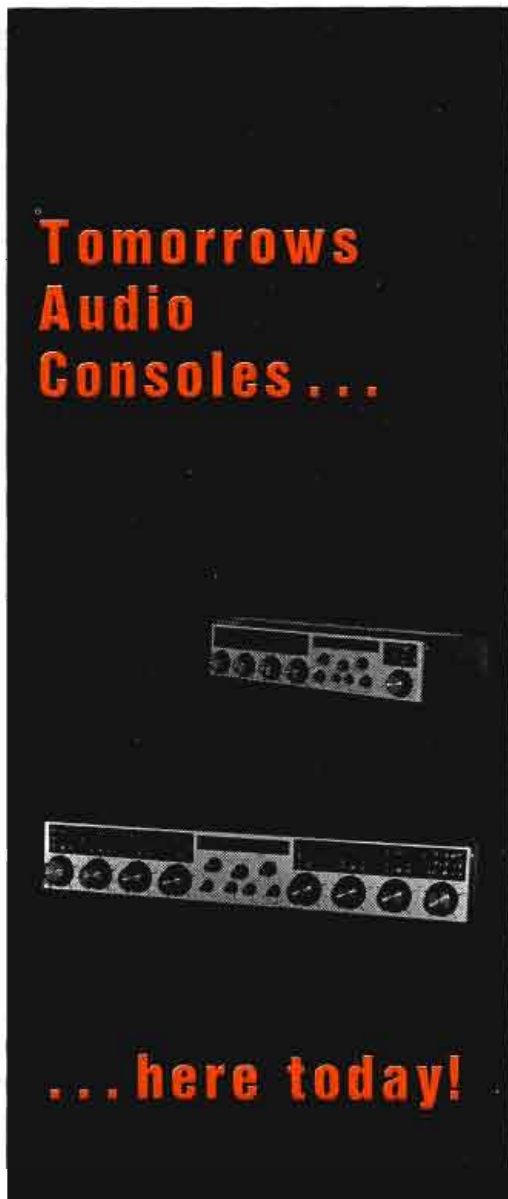


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Models & Prices

| | |
|---------------------------------------|---------|
| SC-5M Single Channel, mono | \$ 605 |
| DC-5M Dual Channel, mono | \$ 742 |
| DC-5MS Dual Channel, stereo | \$ 979 |
| DC-8M Dual Channel, mono | \$1,199 |
| DC-8MS Dual Channel, stereo | \$1,760 |

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For More Details Circle (60) on Reply Card

The front panel bypass switches proved to be a welcome convenience, because much radio production work consists of transferring ad agency masters to carts. These tapes are unprocessed of course, and must be reproduced as they are, but the cart recording can be encoded so that the air product is essentially limited only by the quality of the master that the station receives.

dBm and since the unit is set up for unity gain, the output noise should also be -90 dBm. Our test unit measured -94 dBm, which is a s/n ratio of 98 dB. Overall, we found the unit to be state of the art in audio performance and conservatively rated by the manufacturer.

For the next phase of our tests, we installed the unit in the production studio at WLAK-FM in Chicago to wring it out in actual broadcast use. Our main concern was whether the unit could really affect a worthwhile reduction in noise level without having any audible effect on the program material. We recorded several segments of program material from discs onto tape through the dBxII and slowly faded the end of each selection to -60 dB so that the only signal remaining would be tape noise which we could reference to the program level of the music that was recorded before the fade.

Even when played at threshold of pain levels, the noise was inaudible; a frankly startling demonstration of the effectiveness of the system. We found that on even multiple generation the tape hiss was no longer a factor and lower recording levels could be used to obtain great headroom. We preferred to record at 3 dB below normal recording level to keep the tape distortion at insignificant levels.

Next, we compared the dbx tape copy to the original disc in instant A/B testing to see if we could detect any alteration of the original material. In everything from Elton John to Percy Faith the tape duplicate was exact in dynamics, response and clarity. The number of generations that can be tolerated is really limited more by accumulated tape drop-out (which no noise reduction system can restore) than by accumulated tape noise when the dbx system is used.

Unit Applications

Some less obvious broadcast applications for the system are made possible by the remote control feature of the unit. The bypass function can be remoted so that audio sources that are encoded can be alternated with audio sources that are not with a single unit doing all of the decoding. The decoder would be placed in an audio line that carries all of the signal sources, such as the automation system output, and switched on and off bypass as the sources require. A pair of these units could also be used by a station with marginal noise level telco loops. If the loss in the lines brings the signal level down close to the noise floor, the engineer has historically been forced to opt for repeaters in the lines because, after all, you can only drive those things so far before cross-talk becomes a factor.

With the telco repeaters, most long lines can then be brought up to the 60 dB standard, but then the lines are no longer passive and the telephone company must be depended upon to maintain a device that affects the station's overall audio performance. With a noise reduction system encoding on the studio end and decoding on the transmitter end (before the limiter), a whopping 30 dB noise reduction can be achieved with state of the art audio quality and no one else's quality control to depend on.

An additional bonus of this system comes at proof time because the high frequency audio distortion tests are usually clouded by noise, since even a 5 kHz tone will ride on the line at -8 dB or so, as the signal input is reduced to keep the modulation constant in inverse to the 75 usec. preemphasis curve. The dbx system is **not** an AGC amplifier, since the level coming out is the same as the level going in, and therefore can remain on line at proof time. Microwave S.T.L.'s could be optimized in the same way, of course.

In summary, we can say that the dbxII noise reduction system is based on sound theory, is manufactured to exceed its specifications. Space does not allow a complete review of the other obvious applications like remote broadcasts and high speed tape duplication etc. □

Microphones

Shure Brothers, Inc., Evanston, Illinois, has combined efficient background noise control and quality vocal pickup and transmission in two new, lightweight head-worn microphones for studio and remote professional broadcasting applications.

The new units are available as the Model SM10, which consists of a headband and microphone only, and the Model SM12, which has a headband, microphone, and earphone and is designed for applications where it is important for the user to receive as well as transmit. Also available is an accessory cough button, Model A10CH.

Both units feature unidirectional pickup patterns that reject unwanted background noise and miniature windscreens that block out wind noise and explosive breath sounds.

The SM10 and the SM12 are low impedance models, allowing extra-long lengths of microphone cable to be used. To prevent the microphone wires from getting in the way, each microphone is equipped with a snap-on connector that fastens to the user's belt or shirt. For maximum flexibility, the microphones are engineered to pivot and extend to fit any head and face.

For More Details Circle (88) on Reply Card

Cartridge Tape Machines

The introduction of a completely new line of broadcast audio cartridge tape reproducers and recorders has been announced by Charles E. Collett, Beucart Division Sales and Marketing Manager. UMC Electronics Co.

Each Beucart features the patented pancake hysteresis synchronous direct drive motor developed by UMC's Beau Motor Division. This motor represents a new breakthrough in the areas of size, weight, temperature rise, and power consumption. It provides substantial assistance in reducing Beucart's flutter and wow. The Beucart line of cart machines meet the newly adopted NAB standards for this type of equipment.

Two basic Beucart models are available, each in mono or stereo, record or playback, for either desk

or rack mounting. The Type 10 for A-size cartridges, measures a trim 3½" high x 5¾" wide x 15" deep and may be mounted three units across in a standard 19" rack. Record/playback combinations are mounted side-by-side for either desk or rack use. However, this model may be stacked one above another in various combinations to meet demanding customer applications. For processing A, B, and C-size cartridges, a Beucart Type 20 is available with dimensions of 3½" high x 10-1/8" wide x 12¼" deep. Units may be stacked one above another in different configurations.

UMC's Beau Motor Division has been serving the broadcast industry since the early 1960s and was instrumental in developing the first direct drive audio cartridge machines.

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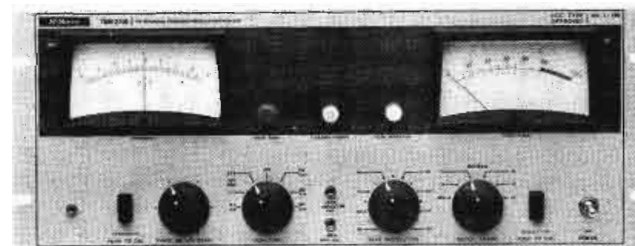
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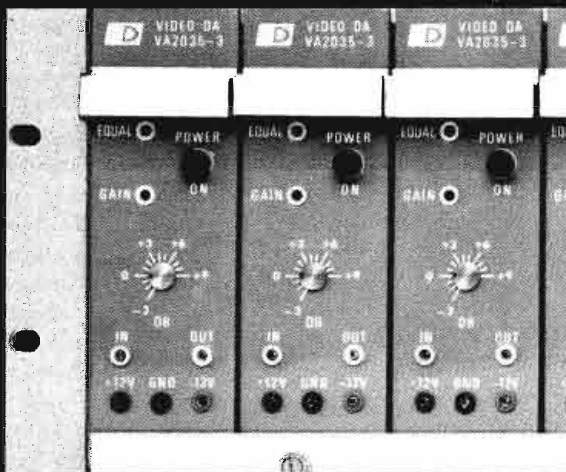
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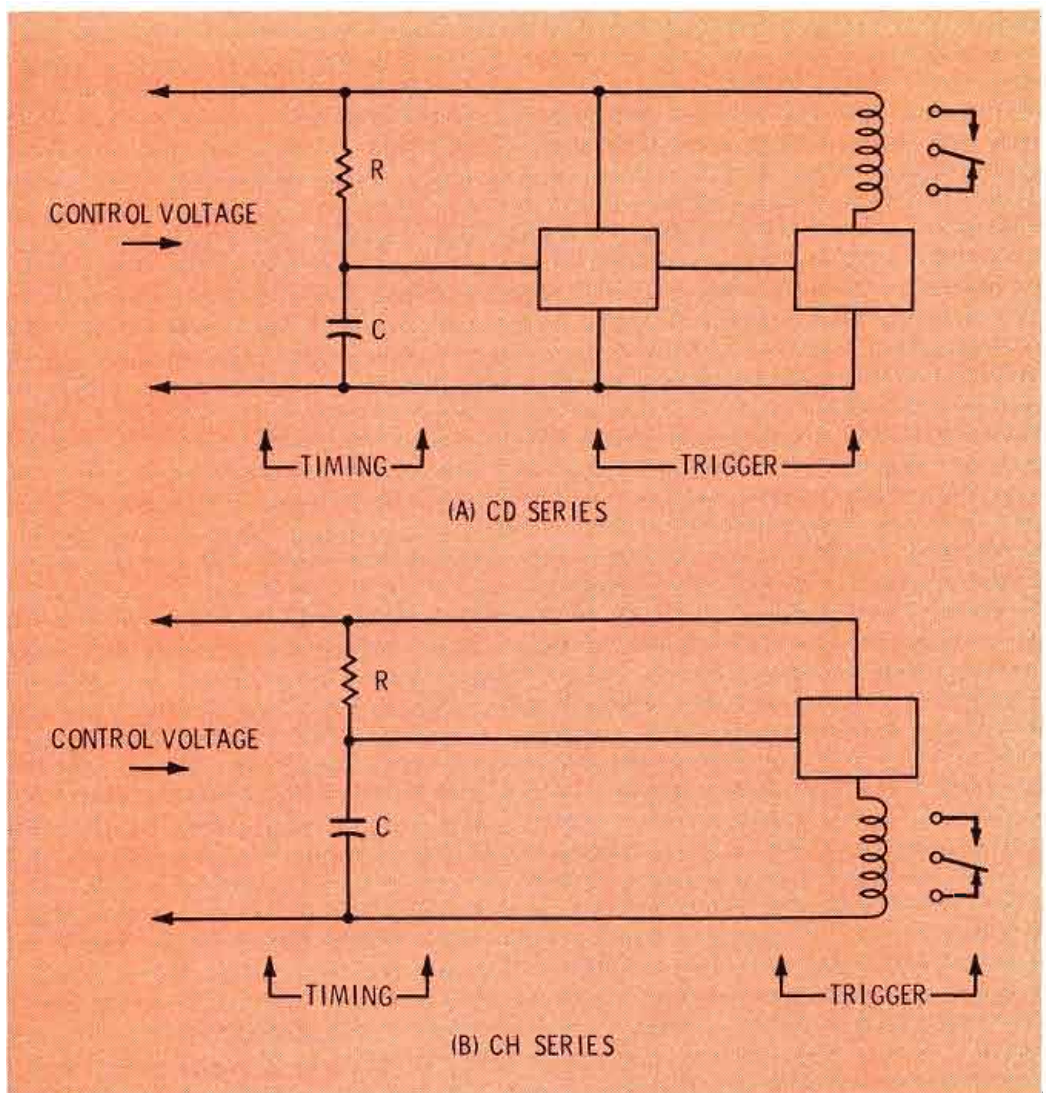


Fig. 3 Two time delay versions of Potter-Brumfield. R/C timing and solid state trigger in the input will cause either a delay in turn-on (A), or a delay in its release (B).

(Continued from page 50)

Microtronics Corp. M-272 "DIGI-LAY". This unit has internal solid state circuitry that will allow it to act as a Time Delay, Flip-Flop, Pulser, and may be 'locked' to the 60 Hz power line. There is enough memory incorporated that will allow it to provide up to 9 hours of delay actions. Its contacts will switch 120 V AC at 10 amps.

The relays just discussed are relatively large. The small ones operate at lower power levels. For example, the Magnecraft® class 505Q1C is an all solid state relay in a DIP package for mounting directly on a PC Board. This relay is capable of Timing-Switching-Latching, all in the one package.

Those relays mentioned previously are only a few of the many varieties available today, and there are many other areas of application other than simple/SPST switching.

Packaging:

A great many of the SS relays are

packaged in encapsulated form. Those designed as simple SPST switching of load voltages to 480 VRMS, even with all the solid state circuitry including ZVS Logic, are encapsulated in a small form with simply 4 terminals—two for the input and two for the load voltage. One such relay is the Crydom Controls (IR) model D4808 which can switch 480V RMS at 8 amps from TTL or DTL Logic, and is encapsulated in a size approximately 2½ x 1¾ x ¾ inches. It has 4 terminals and two mounting holes. Another model, D2404 can switch 240V RMS at 40 amp loads and is mounted in the same size case. Many of the very small relays are in packages that allow direct mounting to the PC Board and the pins solder directly to the wiring traces as do any IC.

Larger Time Delay relays are mounted in larger packages with removable covers, and these may be on plugs for plug in service or straight chassis mount. If faulty action occurs in this type relay,

(Continued on page 80)

BROADCAST ENGINEERING

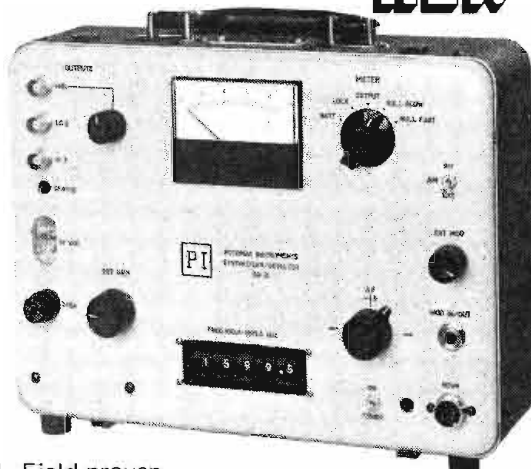
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CONTACT US FOR DETAILS.

The Model F62500 is housed in a compact chassis with brushed-aluminum front panel. Up to five of these amplifiers can be mounted in the company's 662 PM 5¼ by 19 in. rack-mounting frame.

Some important specifications of the amplifier are: power output (8-ohm load), 25 watts continuous; power output (16-ohm load), 15 watts continuous; harmonic distortion at full power, 0.4 percent; frequency response, ± 1 dB from 20 to 20,000 Hz; hum and noise, 85 dB below output; and input voltage for full output, 0.4 volt.

For More Details Circle (90) on Reply Card

Adjustable Bridging Mic Attenuator

The first adjustable, bridging microphone attenuator with six positions is now available from **Sescom, Inc.**, a southern California designer and manufacturer of broadcast accessories.

Designated Model IL-18, the new inline attenuator features a six-position balanced "O" pad, giving

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state studio monitor power amplifier for recording and broadcast studios and for commercial-sound and sound-reinforcement applications is available from **Robins/Fairchild**. This unit, Model F62500, fills the need for an amplifier with higher power output than the company's 10-watt Model 610, but with lower power than the company's 70-watt Model 870 monitor amplifier. One important application of the new amplifier is for use by disc jockeys who want more headset sound than can be provided by lower-power units while monitoring a record.

The new amplifier features extremely low distortion and noise, excellent transient response, flat frequency response, and output-circuit protection against overload, open and short circuits. The unit is completely self-contained with a built-in 110 to 120 volt ac, 50 to 60 Hz power supply.

Operating from a standard 600-ohm audio line, the amplifier readily drives an 8- or 16-ohm monitor loudspeaker.

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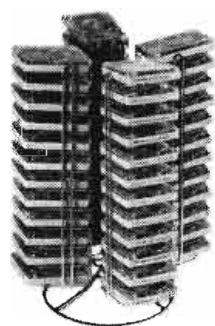
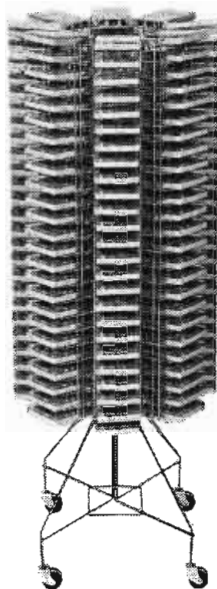


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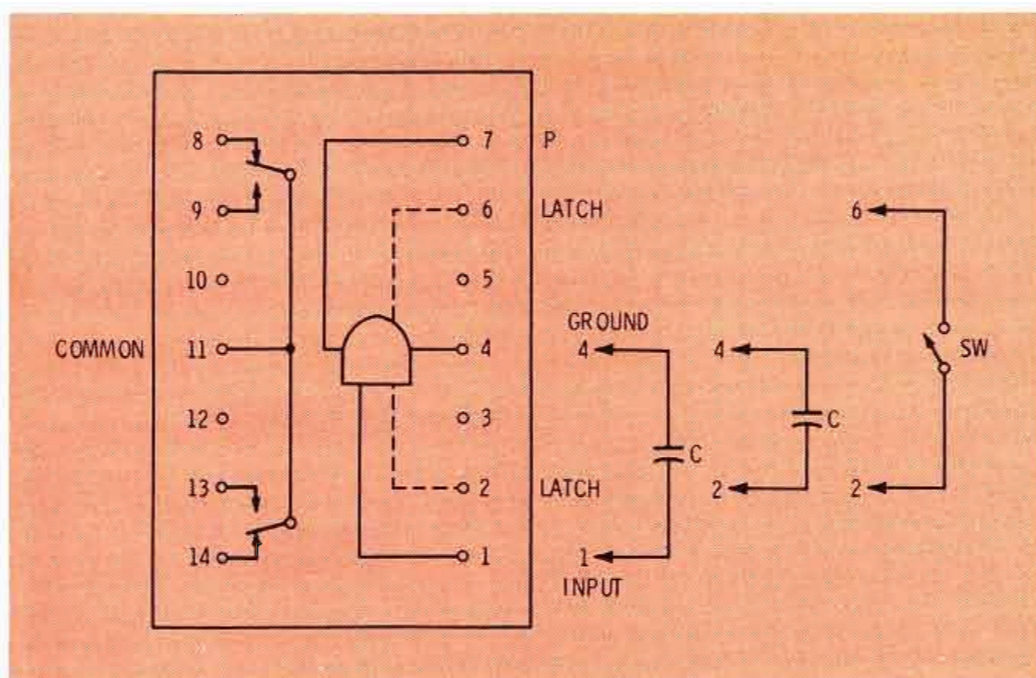


Fig. 4 Magnecraft 505QIC class all solid state relay in DIP package. The relay can act for switching, timing or latching. External capacitor to pins 1 and 4 will delay release. Capacitor at pins 2 and 4 will delay turn-on, and opening external switch at pins 1 and 6 will cause it to latch.

many of its parts can be serviced or replaced, but for the encapsulated units, the only repair is replacement.

Selection:

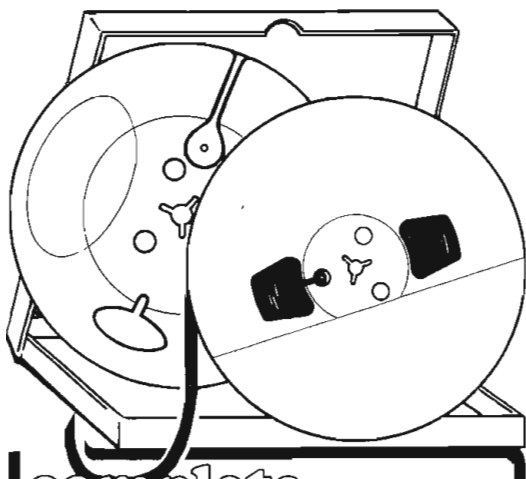
The solid state relay, whether hybrid or all solid state, has many features that may make it seem very desirable as a replacement for that clanging, buzzing, transient spitting model you now have in use. But before rushing out to buy one, first look over the specification sheets very carefully. You will need to find one that will fit the present case without too much circuit modification. You may need to make both electrical and mechanical modifications when attempting to replace an EM relay already designed into a circuit. This does not rule out a solid state replacement, although you may need to select a different model than you originally intended using.

As in any relay selection, whether EM or SS, the nature of the control voltage must be known and given the proper consideration. It is necessary to know the voltage amplitude, whether AC or DC, or if it is Logic pulse. Another important consideration is the amount of current the source can deliver without damage to itself. For example, the control ladder in many transmitters use 120 AC as the control voltage. To attempt dropping this to very

low level DC Logic signal to match a particular SS relay is impractical, while simply connecting it directly into the circuit would be a disaster. But proper selection can usually provide the answer to the particular circuit, and perhaps some modification is even desirable. For example, you could use a transformer to step down the control ladder voltage or at least that control bus in other applications to 3 to 6 volts AC (or DC) and route the control voltage at this safer low voltage. The SS Relay could then be one that uses that low voltage.

Some SS relays require another voltage and current source for operation besides the input control and load switching voltages. The specification sheet will inform you of this information. A great many models, however, require no outside voltages other than the input control and load switching voltages. The solid state elements use these voltages for their operation.

Aside from replacement of EM relays that you now have in use, you may be designing completely new circuits or equipment and controls. There are many models available and with many features that are not possible in EM relays. Almost all major relay manufacturers have various SS relays (both hybrid and all solid state) available, so your choices and application possibilities are numerous. □



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February, 1976

the user a signal loss range of 10dB, 15dB, 20dB, 25dB, 30dB, or the direct position. This versatility offers both better economy and convenience as it can replace all other kinds of fixed pads for field use.

Construction features include: rugged die cast housing with an epoxy finish, a CTS rotary switch with a durable aluminum knob, and 1% non-inductive precision resistors for accuracy.

The Model IL-18 is immediately available and can be ordered from one of Sescom's distributors or directly from the factory.

For More Details Circle (91) on Reply Card

Fluid Head Tripod

Cinema Products Corporation announces the availability of the Miller-Universal Model 2030 fluid tripod head.

It quickly converts to carry 20 lbs. through 30 lbs. cameras. Safely lockable at 90° tilt, totally leak-proof and dustproof sealing, fully operative in temperature range from -20°C to +75°C, it has "Autoslip" automatic self-operating and adjusting free pan. Concentric tilt lock/tension device, hydrostatic or mechanical self-equalizing. Supplied with light weight segmented ball, fully compatible with 2" radius standard ball tripod cups are also features.

For More Details Circle (92) on Reply Card

Background Music

McMartin Industries, Inc., has complemented its background music/commercial sound product line with two new models, a 25-watt unit, the MS-252; and the MS-752, 75-watt amplifier.

The two models, identical in function and mechanical package size are basic line amplifiers with built-in tone compensation and program input volume controls. A unique feature of the MS-252 and MS-752 is the ability to expand the basic line amplifier capability to accept up to two additional plug-in modules (the McMartin standard MSA-Series) where greater input flexibility is required. A wide

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SERIES 1000/2000



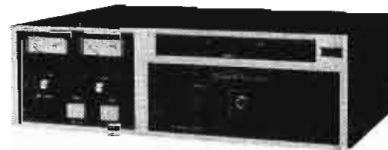
Simple, basic cart machines at very low prices. Available in mono, stereo and delay models. Plug-in modules for record and audition. Full +16 dBm peak output with excellent frequency response.

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VERSATILE PROGRAM TIMERS....



Model 228

Here is a 4½ digit bi-directional counter to measure the duration of programs or events up to 2 hrs. in length. A great convenience for producers and script assistants in TV and radio control rooms, serves a multitude of functions in studio operations.

Measures elapsed time in the UP counting mode or time remaining in the DOWN mode. Thumb-wheel switch lets you preset any desired time for DOWN counting and on reaching 0:00:00 automatically reverts to UP counting, thus indicating overtime.

Provides serial BCD output to drive remote displays in studios, announce booths, recording rooms, or master controls. Can be synchronized to DynaQuip Master Clock System.



Model 229

Functionally identical to 228; however read-out can be switched to display either program time or time of day supplied by master clock.



Model 238

Has keyboard preset instead of thumb wheel switches. Digital read-out displays either program time or real time.

All features of these models, including specifications and other applications not described here, are fully outlined in free illustrated folder which is available on request.



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selection of optional plug-ins, from low-level balanced microphone and RIAA-equalized phono preamplifiers to electronic buzzers or sirens, are available. Electronic mute control of the microphone channel is included in the basic amplifier models. Thus the user may purchase to his specific operating requirements, without paying for "extras" he may never need.

Frequency response characteristics: ± 1.0 dB, 40-15,000 Hz; and low distortion, less than 1.0% at the rms output levels of 25 watts and 75 watts for the respective models highlight the excellent performance from the MS-252 and MS-752 models.

For More Details Circle (93) on Reply Card

Standby Power Source

A new uninterruptible power source (UPS) and a new standby power source, two alternative systems that provide clean, continuous electrical power for critical equipment during line power failure, are being introduced by Sola Electric Division of Sola Basic Industries.

In the UPS system, line power simultaneously charges a 120-volt battery bank and supplies power to an inverter. The inverter supplies power to the load through a Sola CVS (sinusoidal constant voltage transformer), which regulates output voltage to within $\pm 1/4\%$ of nominal, screens out line noise and maintains a near-pure sinusoidal wave shape.

In event of line failure, the inverter simply continues to draw power from the battery bank. Since batteries and inverter are always connected there is no switchover delay and no noticeable voltage fluctuations to the load.

Frequency of the AC output, under normal conditions, is synchronized with AC input. During input line failure, however, the output frequency is determined by a stable internal oscillator.

In the event of internal component failure, a mechanical bypass switch automatically transfers the load directly to the AC input line with a maximum interruption of approximately 100 ms. An optional solid state by-pass switch

is available for those applications that cannot tolerate a 100 ms. interruption. In automatic operation, the solid state switch completes the transfer in 4 ms. or less. Operated manually, the switch provides a no-break transfer.

By contrast, the Standby Power system is designed for applications where transfer delay is less critical. A solid state inverter and a battery bank remain isolated from the load until line power falls below a

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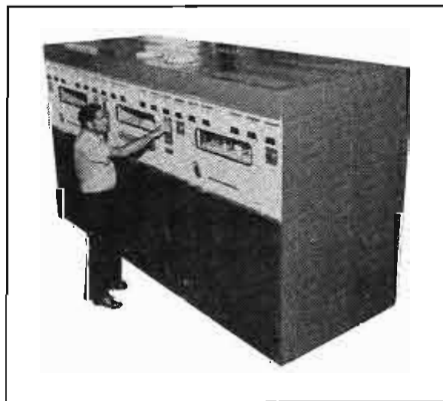
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February, 1976

pre-set level. When that limit is exceeded, a by-pass switch transfers the load to the inverter, which begins drawing power from the battery bank. There is a power delay of approximately 200 ms. during transfer.

For More Details Circle (94) on Reply Card

Recording Console Module

The new series of MAP 8422 Console Control Modules provide comprehensive switching and control facilities for multi-track recording, quad-stereo-mono mixdown, and monitoring required in today's recording and production consoles. They are available from Modular Audio Products, a unit of **Modular Devices, Inc.**, Bohemia, New York.

System features of the 8422 Series include: selectable Mic/High Level inputs with programmable LED peak level indication; an internal power network for condenser mics; switchable 70 Hz Hi Pass Filters; Channel Mute and Solo on all inputs; Quad Panning and Quad/4 Track/Stereo mode selection; Direct Track Feed; two independent Echo channels with pre-post fader selection, delay, echo and monitor send and return functions; two independent Cue channels; and self-contained Multi-track mixing amplifiers with full range rotary Submaster level controls. Complete control facilities for Control Room and Studio Monitoring, Talkback and Slate are also provided.

The entire series has been designed for direct plug-in to printed circuit motherboards, simplifying console layout, assembly and troubleshooting.

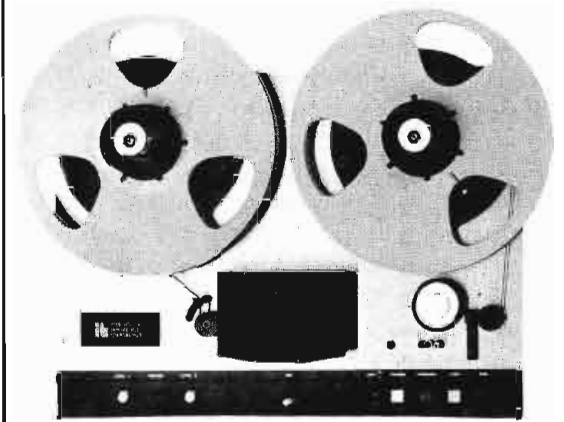
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Modular Tone Detection

Frequency Devices, Inc. introduces modular Touch Tone detectors. Two standard modules are used to provide the functions of Band Separation, Level Control and Tone Identification. Both modules are low profile (0.4 in.) and require no adjustment.

The system consists of two multi-function modules:

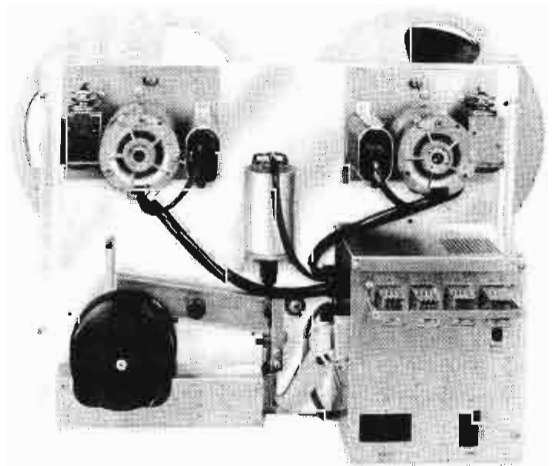
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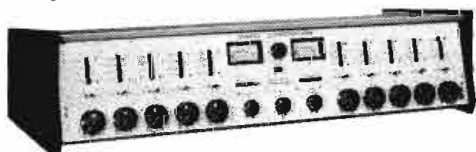
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Station Managers:

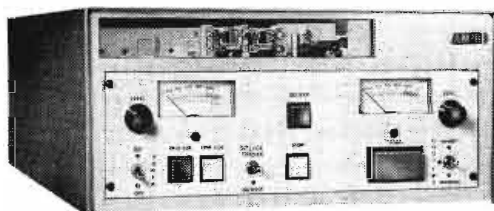
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- 1) Model 550-1 Low Group, Tone Detector Module
- 2) Model 550-2 High Group, Tone Detector Module

When used as a set these components will detect the standard Bell System Touch Tones with relative amplitudes of ± 15 dB and absolute amplitudes in the range from -30dBm to 0dBm. The detection and hold times have been set for non-ambiguous detection of 40 ms. on and 40 ms. off tone bursts. Outputs are open collector logic which may be interfaced with CMOS or T²L logic.

Several band separation, amplitude scaling and level detection operations have been incorporated into the 550 design. These enable the 550 to operate accurately in the presence of dial tones, trunk tones, voice signals and a wide range of input tone amplitudes (0 to -30dBm).

The Model #550-1 and #550-2 Tone Detectors scale the sensitivity of the level detectors to the amplitude of the input signal and filter and level detect to determine which tone is present. If multiple tones are present within the band only

the largest tone will be detected and then only if its amplitude is more than 8dB higher than the other tones.

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Subchannel FM Receiver

With the introduction of its Model TR-E6, FM Subchannel Receiver, **McMartin Industries, Inc.**, Omaha, Nebraska, has expanded its line of FM subchannel (SCA) receivers designed specifically for in-home reception of special programs for use by the visually-handicapped, or for large-audience educational purposes.

The new TR-E6 provides this service at lower costs than previous units.

Simple operation, with only two front panel controls is featured. One is a combination power switch/volume control; the second provides fine tuning for optimum station reception. A telescoping whip antenna may be oriented for maximum signal pick-up and maximum crosstalk effect between the main and subchannels. An external FM antenna may be attached in low-signal locations.

Maximum shock-hazard protection for the user is insured by use of an encapsulated power transformer which plugs directly into any standard wall receptacle. By this method only extremely low voltage, well below shock level, is fed to the TR-E6 unit.

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Mark IV-T Weatherminder

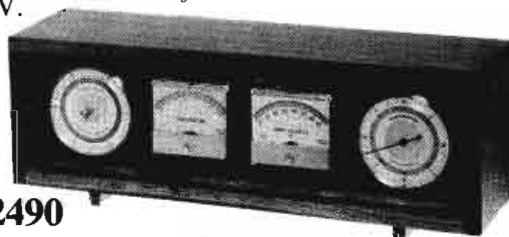
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include a bore-sighting scope and "quick-disconnect" pins for easy and fast removal of the feed assembly.

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Vertical Interval Production Switcher

A totally new switching package—the ADC 553—has been designed by American Data Corporation for the video market.

This vertical interval production switcher was designed to provide small studio and van operations with state-of-the-art features. For example, Soft Wipe and Linear Key are standard features. Also, new designs from ADC allow combining of two 553's for greatly increased capabilities.

The special effects generator provides nine wipes, including circle, square, diamond, diagonal, H&V splits, and corner inserts.

In the key mode, the special effects generator offers a choice of self or matte key on internal or external sources, and an external chroma keyer may be used on the external input. Soft wipes are provided with operator control for the degree of softness.

The keying system is linear in nature so that edge crawl and key

breakup are minimized.

A blackburst and color background generator is included to provide fades or wipes to any color or black, and in conjunction with the matte keyer, will provide colored insert keying.

For More Details Circle (102) on Reply Card

Video Control Center

Dynair Electronics, Inc., San Diego, announces the new Model VCC-310A Video Control Center. This unique video switcher is designed to centralize the normal control functions of a television surveillance system and minimize operating controls and overall system cost.

The unit incorporates three solid-state, 10-input busses, providing automatic alarm actuation, manual selection, and sequential switching. Facilities are provided for interface with a VTR, remote control of cameras/pantilt, door or gate entry control intercom, as well as remote control and status display of each switching buss.

Useful for all surveillance systems, the VCC-310A is ideal for systems using up to 30 cameras. Patient monitoring, industrial process control, and facilities surveillance are a few applications for which this unit was designed. Broadcasters concerned about plant protection, will find the automatic alarm buss particularly useful. It allows essentially unattended operation since intrusion detectors located in areas under camera surveillance are wired to the VCC-310A. Video from the associated cameras will then be switched to a time-lapse or standard VTR.

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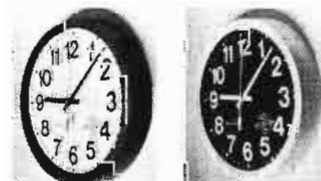
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See the revolutionary Beaucart on page 13.

For More Details Circle (77) on Reply Card
February, 1976

Visual emergency Warnings for the deaf

The Commission has proposed rules to require television stations to transmit all emergency notifications visually as well as aurally so persons with impaired hearing may be made aware of emergency situations.

The action was in response to a joint petition by four organizations representing the deaf — D.E.A.F.W.A.T.C.H. (Demanding Equal Access to Facts and Warnings Aired on Television for Citizens who are Hearing Impaired), the National Association of the Deaf, Deafpride, Incorporated and the Alexander Graham Bell Association for the Deaf.

The petitioners noted that in 1970 the FCC issued a public notice entitled "The Use of Telecasts to Inform and Alert Viewers With Impaired Hearing," to all television licensees requesting them to air emergency notifications and entertainment programming visually as well as aurally on a voluntary basis.

The petitioners noted that the Commission, in stating its concern with the dearth of programming of value to the deaf, said it would "... observe developments in this area . . . and if the situation does not develop satisfactorily it may be necessary to begin rulemaking looking toward the adoption of minimum requirements."

Noting that only approximately 30 percent of U.S. television stations visually duplicate any oral announcements, the petitioners requested the Commission to proceed with its stated intention to initiate rulemaking.

Under the proposed amendments to Part 73 of the rules, television station licensees will be required to:

- Transmit any emergency information aurally and visually
- Conclude emergency transmissions with the request "if you have hearing-impaired or blind friends or neighbors, please pass this information on to them."

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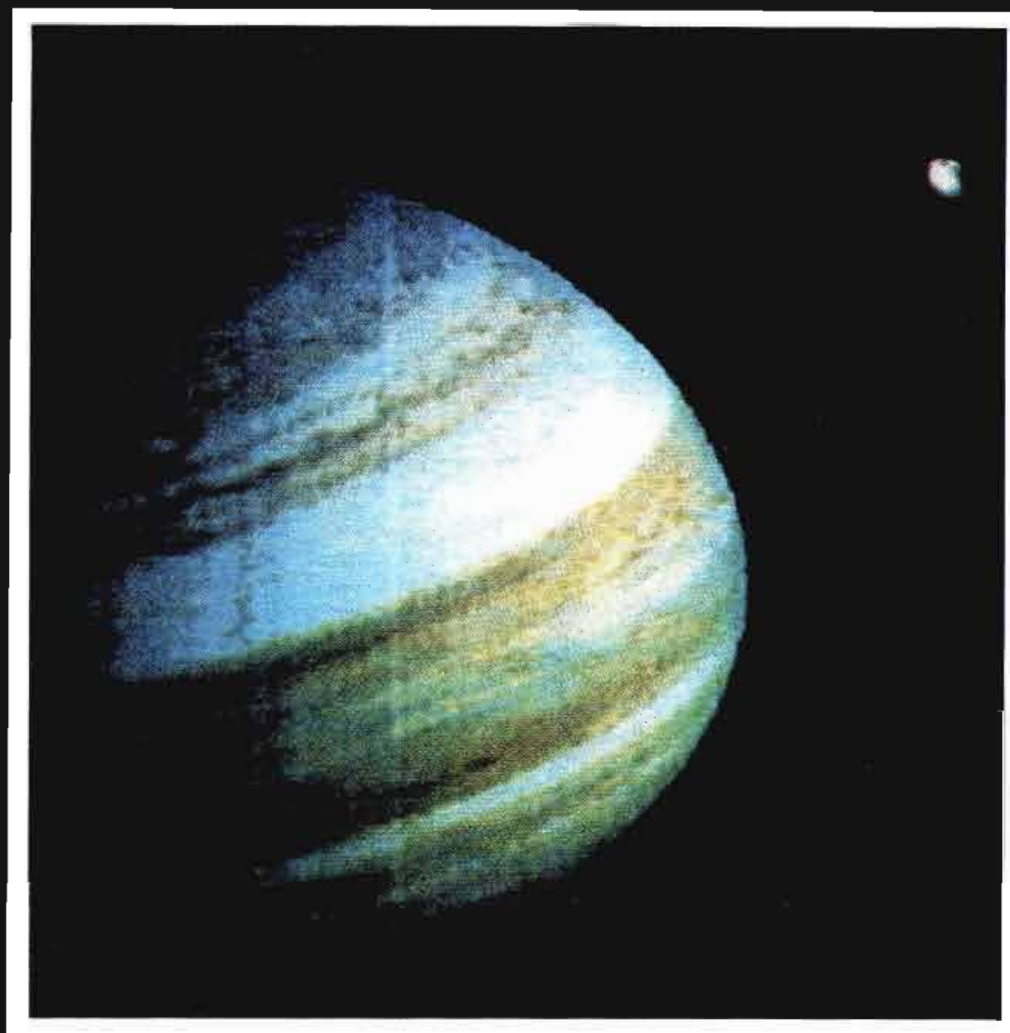
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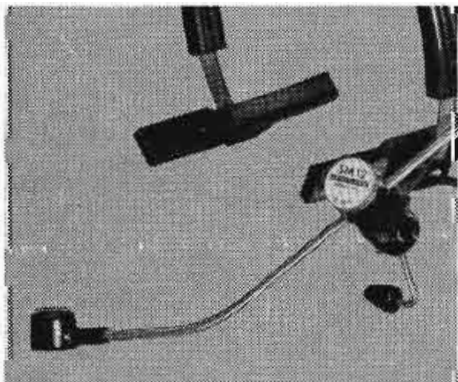
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